SRX-30D

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

- Extended coverage 200 KHz - 30 MHz
- Digital readout in large green display units which give true unambiguous frequency information even when you switch sidebands or use the clarifier
- All new frequency synthesis using Plessey SLE 1641 double balanced modular ICs for a new high standard of performance
- All new audio system which produces outstandingly good quality on the built in speaker; and is capable of driving external hi-fi speaker units for even better sound
- All new IF filters with optimum bandwidth for mode in use. Automatic filter selection from mode switch.

There is so much that is impressive about the SRX-30D that you have to see it and handle it to really appreciate the performance.

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 - 30 MHz with accurate digital readout; high performance USB/LSB AM with switched filters; drift cancelling frequency synthesis, built in mains supply and built in speaker; high quality construction and advanced design and so much more.

Then look at our price for the SRX-30D and you will be even more impressed.

SRX 30D £215.00 including VAT
Securicor Carriage £5.00

LOWE ELECTRONICS
CHESTERFIELD ROAD,
MATLOCK,
DERBYSHIRE DE4 5LE.
TELEPHONE: 0629 2817/2430
The NRD 515 is a PLL-synthesised communications receiver of the highest class featuring advanced radio technology combined with the latest digital techniques. The new NRD 515 is full of performance advantages including general coverage, all modes of operation, PLL digital VFO for digital tuning, 24-channel frequency memory (option), direct mixing, pass-band tuning, etc. JRC’s 65 years of radio communications experience will give you “the world at your fingertips”. The NRD 515 is but a single item from the JRC product range which extends all the way to full marine radio installations for supertankers.

NRD 515HF Receiver
Price £1090.20
now available

NSD 515
matching amateur band transmitter ring for details.

UL1000
£39.50 inc. VAT
The UL-1000 is a new concept receiving station accessories and will help any keen listener to improve the performance of his station, particularly in the difficult conditions existing in the medium wave band (1500 KHz-1.6 MHz).
The UL-1000 is a self-contained variable gain, tuned pre-amplifier suitable for use with various aerial systems. A particular feature of the UL-1000 is the use of a high Q loop aerial for the 500 KHz-1.6 MHz band.

TR9500
70 cm multimode.
£449.88 inc. VAT. Securicor carriage £5.00

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

TR9000
2 metre multimode.
£374.90 inc. VAT. Securicor carriage £5.00

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

TR7800
2 metre FM rig.
£284.97 inc. VAT. Securicor carriage £5.00

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THE SHORT WAVE MAGAZINE

Volume XXXIX

573

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The TS830S has every conceivable operating feature built in for full and lasting enjoyment of the HF bands. It combines VBT (variable band width tuning), IF shift and a IF notch filter as well as very sharp filters in the 455 kHz second IF.

TS830S £694.83 inc. VAT

The TS530S is an HF transceiver based on the reputation of the TS220 series. Included are of course the new bands, and of course the rig has both digital and analogue frequency readout.

TS530S £534.98 inc. VAT. Securicor carriage £5.00

DFC230 £179.86 inc. VAT

A digital frequency remote controller complete with up/down microphone and having four memories. Ideal for simpler mobile operation. Compatible with the TS830S, TS530S, TS130S and V and the TS120 series.

The TS180S is the super de luxe transistorized HF transceiver from Trio. Having so many features, memories, etc. Send for a leaflet, or ring for more details.

TS180S £679.65 inc. VAT. PS30 £88.55

R1000 £297.85 inc. VAT

The TS130S is THE mobile 200 Watts PEP HF transceiver from Trio, again featuring the three new bands. Just the rig for mobile high power operation. Also available the TS130V, a 20 Watt PEP version.

TS130S £525.09 inc. VAT
TS 130V £445.05 inc. VAT.

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YAESU MUSEN

FT-101ZD MkIII

YAESU’s FT-101ZD with FM is the most popular HF rig on the market thanks to its very comprehensive specification and competitive price. Incorporates notch filter, audio peak filter, variable IF bandwidth plus many other features.

FT-480R High technology all-mode 2 metre mobile

The most advanced 2 metre mobile available today - USB, LSB, FM, CW full scanning with priority channel, 4 memory channel, dual synthesized VFO system.

FT-707 All solid-state HF mobile transceiver

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

FRG-7 General coverage receiver

The set with the world-wide reputation. YAESU’s famous FRG-7 out-performs many a more expensive set. Rugged and reliable, it features high sensitivity and Wadley loop stability - a delight to use for the established amateur and new SWL alike.

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.

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

This is the latest and most exotic product from YAESU's superb design team. The new 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 !!!

FT-708R and FT-208R

Synthesized UHF/VHF transceivers

The new 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 lithium battery back-up. RF output FT-708R, 200mW low, 1 watt high. FT-208R, 300mW low, 2.5 watts high.

FT-708R with NC8 standard/quick charger/DC PSU

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Available 7/14/21 MHz £12.99

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ICOM IC 730. All bands 10-180 MHz, 10m, 12m and 12m: 100W RF out and 40W AM. Twin VFO, digital readout, 3 speed tuning down to 100K. Dial lock, RT, N, B and Switchable Preamp. See list for H.P. details

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<td>HANSOON 3/15/100MHz</td>
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<td>HANSOON FS 500H</td>
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DATONG ELECTRONICS LIMITED

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

"CODECALL" SELECTIVE CALLING DEVICE

The new Datong Codemaster selects your desired voice channel. A single soft control button at each end of the line selects or receives a specific audio channel. When the correct code is received, the receiver beeps loudly.

The only connection needed is a standard remote or external loudspeaker jack. Sending is via direct audio into the microphone.

"Codecall" allows total silent standby operation yet with confidence that when that specific call comes in, you won’t miss it.

Over 1000 different codes can be selected by internal DIP or by three-way panel switches, depending on the model.

This practically eliminates false alarms.

Full details free on request.

Avail only late Jan.

Price per unit including programming £24.00 + VAT (£27.60)

Switch-programmable £29.50 + VAT (£35.37)

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

DATONG ELECTRONICS LIMITED

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

WE ARE PROUD to announce the opening of two new branches, and would be so delighted if you went along and said hello to Jack 3PRR in Grimby or Peter G4GSA in Stoke that for the fortnight Monday January 4th until Saturday January 16th, we will be, for personal callers only, be offering, at the above mentioned shop, FIVE PER CENT OFF OUR LIST PRICES (see “Free Finance” section for eligible items).

SMC SERVICE

Free Finance on many items. Two year guarantee on Yaesu. Free Securcor on major Yaesu items. Access and Barclaycard over the telephone. Biggest Branch, Agent and Dealer network. Aby staffed, courteous, Service Department. “B Services” Securcor contract at £3.50! Biggest stocks of amateur equipment in UK. Twenty-two years of professional experience.

GUARANTEE

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

FREE FINANCE

On regular priced items from Yaesu, Ascot SMCS, CDE, HyGain, Channel Master, Hansen, SMC, MFJ, KLM, Mirage and Hy Mound, SMC's two year guaranteed 100%MC offers Free Finance! How is it done? Simple, pay 20%, split the balance equally over 6 months or pay 50% down and split the balance over a year. You pay no more than the cash price.

SWITCHING REGULATED SUPPLY

Extremely compact and light in weight, the switched mode power supply reduces substantially the space required to produce the operating voltages used in the FT-ONE. It is highly efficient, uniquely stable and offers superb reliability.

ELITE CLASS PERFORMANCE

In addition to the above and superb receiver filters, the FT-ONE is packed with subtle virtues. Rear panel jacks allow the use of both an external receiver and an independent receive antenna, when scanning, automatic halting on a received signal may be programmed, an optional Curtis 8044 keyer board is available and there is even a microphone squelch (AMGC) to reduce background noise pickup between words and sentences!

GAIN/INTERCEPT OPTIMIZED RECEIVER

Utilising up-conversion with a first IF of 73MHz, the FT-ONE RF amplifier stage uses push-pull power transistors configured to produce a typical output intercept of +40dBm. The first mixer is a diode ring module, then follows a low noise post amp, for optimum noise figure consistent with modern day intercept requirements. The result is a receiver with a typical two tone dynamic range well in excess of 95dB (14kHz, CW bandwidth). Additional gain tailoring is provided via a PIN diode attenuator controlled from the front panel.

FILTER READY FOR COMPETITION

Three filter bandwidths are available for CW operation (two for SSB II), using optional 600Hz or 300Hz crystal filters. Filter insertion losses are equalised for constant IF gain. Both IF Shunt and Variable Bandwidth are provided, and two CV filters may be cascaded, for competition-grade selectivity. For SSB work, the Variable Bandwidth feature eliminates the need for costly 1.8kHz or 1.8kHz filters, in addition, a high-performance audio peak and notch filter is standard equipment.

EXPANDED OPERATING DISPLAYS

Digital displays for the VFO frequency, memory channel, and RT offset are provided for quick frequency identification. The large front panel meter provides easy viewing of transceiver operating parameters, including final transistor collector current, input DC voltage, FM discriminator centre tuning, speech processor compression level, and forward/relative level power.

NON OPTIONS

Remember with your FT-ONE the noise blanker, speech processor and power supply are all built-in at no expensive options.

FOXY TANGO ONE

THE WORLD BEATER

£1295 inc. VAT @ 15% & Securcor

2 year Guarantee + Free finance available

GENERAL COVERAGE, ALL SOLID STATE

The FT-ONE is a full coverage all mode transceiver, equipped for reception between 150kHz and 29.995MHz, and transmission on all nine amateur bands. Commercial version transmitter 1.6-29.995MHz

KEYBOARD FREQUENCY ENTRY

Fully digital synthesised, the FT-ONE uses a front panel keyboard for initial frequency entry. A change is accomplished via the main tuning dial or the pushbutton scanner, tuning in either 10Hz or 100Hz steps. The FT-ONE permits extremely fine tuning and instantaneous band change with equal facility.

DUAL VFO SYSTEM

Ten digital VFO's with memory are provided, in conjunction with an A-B selection scheme that allows instant recall of any Tx, Rx or transceive frequency. A change is accomplished via the main tuning dial or the pushbutton scanner, tuning in either 10Hz or 100Hz steps. The FT-ONE permits extremely fine tuning and instantaneous band change with equal facility.

FULL CW BREAK-IN

Advances in solid-state technology have made full CW break-in reliable enough to be incorporated into the FT-ONE. Selection of traditional semi-break-in (for use with amplifiers not equipped for full break-in) or full high-speed break-in.

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FT101ZD £635 inc. VAT @ 15% & SECURICOR
2 year Guarantee + Free finance available
- 160-10 metres including new allocations.
- Variable IF bandwidth 2.4kHz down to 300Hz.
- 8 pole filters for razor edge selectivity.
- Selectable CW fixed bandwidth CW-W and CW-N.*
- Semi-break in with sidetone for excellent CW.
- Digital plus analogue frequency displays.
- 6146B PA's with 6dB of negative feedback.
- 180W PIP and -31dB 3rd order intermod.
- RF speech processor fitted - adjustable level.
- VOX built-in and is adjustable from the front panel.
- Wide dynamic range for big signal handling.
- High usable sensitivity, for those weak ones.
- Superb noise blanker — adjustable threshold.
- Attenuator; 0-20dB, front panel switch.
- AGC; slow-fast-off, front panel switchable.
- Clarifier (RIT) switchable on TX, RX or both.
- Low level transvertor drive output facility.
- Universal power supply 110-234V AC and 12V DC.*
- Incredible range of matching accessories.
- 6 models: Digital/Analogue — AM/FM options.
*Option.

FT902DM £885 inc. VAT @ 15% & SECURICOR
2 year Guarantee + Free finance 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.
- 6146B’s with negative feedback.
- VOX built-in and adjustable.
- Instant write in memory channel.
- Tuning button (10 sec. of full power).
- Curtis Keyer — iambic, single or straight.
- Swichable AGC and RF attenuator.
- Optional 350 or 600 Hz CW, 9kHz, AM filters.
- Clarifier (RIT) switchable on TX, RX or both.
- Audio Peak and tunable notch filter.
- Plug in modular, computer style constructor.
- Fully adjustable RF speech processor.
- Ergonomically designed with necessary LEDs.
- Incredible range of matching accessories.
- Universal power supply 110-234V AC and 12V DC.
*Option.

FT107M £725 inc. VAT @ 15% & SECURICOR
2 year Guarantee + Free finance available
- 160-10 metres (including 10, 18, and 24MHz).
- USB-LSB-CW-AM multi-mode.
- Full broad band “no tune” power amplifier.
- 240W PIP. 75 per cent power output at 3:1 VSWR.
- 12 memory channels with clarifier on memory.*
- Digital Memory Shift gives offset from memory.*
- Up/down scanning control from microphone.*
- Variable IF bandwidth — 16 poles of selectivity.
- Bandwidths; 6kHz*, 2.4kHz-300Hz, 600kHz-300kHz.*
- Selectable CW ‘fixed’ width CW-W and CW-N.*
- Tunable Audio Peak (AFP) and Notch filter.
- Diode ring mixer for very high Rx dynamic range.
- Noise blanker — front panel adjustable threshold.
- AGC; slow-fast-off switchable from the front panel.
- Attenuator 0-20dB, plus RF gain on front panel,
- RF speech processor fitted — front panel adjustable.
- Digital (100Hz) plus analogue frequency displays.
- Meter Reads; Vcc, Ic, ALC, Compression and SWR.
- Semi-break in with side tone. VOX built in.
- Choice of built-in or separate power supply units.
*Option.

FT707 £569 inc. VAT @ 15% & SECURICOR
2 year Guarantee + Free finance available
- 80-10 metres (including 10, 18 and 24MHz bands).
- USB-LSB-CWW-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 Schrittky diode ring mixer module.
- Local oscillator with ultra-low noise floor.
- Rx Schrittky diode ring mixer module.
- Local oscillator with ultra-low noise floor.
- 25kHz crystal calibrator feature.
- Internal, xtal or external VFO control.
- Variable IF bandwidth — 16 crystal poles.
- Bandwidths; 6kHz*, 2.4kHz-300Hz, 600kHz-300kHz.*
- AGC; slow-fast-switchable from the front panel.
- VOX built-in and adjustable from the front panel.
- Semi-break in with side tone for excellent CW.
- Digital (100Hz) plus analogue frequency display.
- LED Level meter reads; S, PO and ALC.
- Convenient concentric AF/FR gain controls.
- Indicators for: calibrator, fix, int/ext VFO.
- Receiver offset tuning (RIT-clarifier) control.
- Advanced noise blanker with local loop AGC.
- 29kHz crystal calibrator feature.
- Internal, xtal or external VFO control.
*Option.
FT720 RV £245 inc. VAT @ 15% & SECURICOR

FT720 Control Head
- 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
- LED's for "S" and PO7 status LEDs
- 1½ W of audio to internal/external speaker
- 3.3 (4.3", D x 6" W x 2 (2.2)" H
- 144-146MHz (144-146MHz possible)
- 12½ kHz synthesizer steps, 600kHz shift
- 0.3V for 20dB quieting
- Rx 0.5A, Tx VHF 6.5A, UHF 6.5A
- 5.8 x 5.6 x 5.7 x 2 (2.2)" D
- 220R 10W, 70cm. deck
- 430-434MHz
- 25kHz synthesizer steps, 1.6MHz shift
- 0.5V for 20dB quieting
- Rx 0.5A, Tx VHF 4.5A
- 5.8 x 5.6 x 5.7 x 2 (2.2)" D

FT290R £249 inc. VAT @ 15% & SECURICOR

- 144-148MHz (144-145 possible)
- Multimode USB, LSB, FM, CW
- 2.5W PEP, 2.9W RMS, 300mW W
- LED's, "ON AIR", "BUSY"
- Moving coil meter for S & PO
- Integral telescopic antenna
- Width 2.4kHz & 1.4kHz @ 6dB
- Optically coupled memory tuning
- 100Hz backlit LCD display
- 10 memory channels
- "Five year" memory backup
- FM: 25kHz and 12.5kHz steps
- SSB: 1kHz and 10kHz steps
- Any TX/RX split with dual VFO's
- AF output 1W @ 10% THD
- Mobile bracket available
- Matching 10W Amplifier, 2W DC External
- Scan on memory (=1kHz)
- Long battery life SMC 2.2A/Hr

FT480R (2m) FT780R (70cm.)

- USB-LSB-CW-FM (A3j, A1, F3l
- 30W PEP A3j, 10W or A1 F3l
- Bandpass filter no tune design.
- Bandwidth 2kHz and 1kHz at -6dB.
- SSB: 1kHz, 10kHz steps.
- Semi break in with side tone.
- Very bright blue 100kHz digital display.
- Display shows Tx & Rx freq (inc RIT).
- String LED display for "S" and PO.
- Digital receiver offset tuning.
- Advanced effective noise blanker.
- Memory scanning with slot display.
- Up/down tuning/scanning from mic.
- Priority channel on any memory slot.
- Satellite mode allows tuning on Tx.
- Scanning for busy or clear channels.
- Size (Case): 8.3" D, 2.3" H, 6.9" W.
- LED's: "ON AIR", "Clair, Hi/Low, FM mod.
- Matching PP80 Mains PSU available.

FT480R £379 inc. VAT @ 15% & SECURICOR

- 144-148MHz (143.5-148.5 MHz possible).
- Excellent dynamic range sensitivity.
- FM: 25kHz and 1.2kHz steps.
- SSB: 100, 10kHz steps.
- Any TX/RX split with dual VFO's.
- ±600kHz standard repeater split.
- Four easy write-in memory channels.

FT80R £449 inc. VAT @ 15% & SECURICOR

- 430-434MHz (440-445) possible.
- GaAs FET RF for incredible sensitivity.
- NMOS four bit micro control.
- FM: 10kHz and 25kHz, 1kHz steps.
- SSB: 1kHz and 10kHz steps.
- Repeater access by use of dual VFO's.
- Four easy write-in memory channels.

1 MHz shift now available.
**FT208R(2m) FT708R(70cm).**

2 year Guarantee + Free finance available

- 4 bit CPU chip frequency control
- Keyboard entry of frequencies/splits
- LCD digital display with backlight
- Ten channels of memory
- Memory back up five-year lifetime cell
- Up/down/manual tuning
- Manual or auto scan for busy/clear
- Priority channel with search back
- Memory scanning feature
- Scan between any two frequencies
- Auto scan restart
- Quick change NiCad pack
- 1.750kHz ‘S’ meter
- Built in condenser microphone
- 500mW AF to int/ext speaker
- External speaker/mic available
- Keyboard offers 16 tone DTMF
- 168Hz x 611Hz x 3910mm
- C/w NiCad pack, helical

**FT208R £209 inc. VAT @ 15% & POSTAGE**

- 144-146MHz (144-148 possible) 2 year Guarantee
- 12.5/25kHz synthesiser steps
- Any split + or – programmable
- ±600Hz EU split standard
- 2.5 or 0.3V RF output
- Rx: 20mA squalch 150mA max AF
- Tx: 800mA at 2.5W RF
- 0.25V for 120Hz S/N/D
- Dual conversion 15.5MHz and 45kHz

**FT708R £219 inc. VAT @ 15% & POSTAGE**

- 430 440MHz (440.450 option) 2 year Guarantee
- 25kHz synthesiser steps
- Any split + or – programmable
- ±7.6MHz EU split standard
- 1W or 100W RF output
- Rx: 20mA squalch 150mA max AF
- Tx: 500mA at 1W RF
- 0.4V for 12dB S/N/D
- Dual conversion 46.255MHz and 455kHz
**Buy direct from us, get two years full**

**The Tiny Tiger!**

**IC25E. 25W 2M FM Mobile.**

Amazingly small, yet very sensitive. Two VFO's, five memories, priority channel, full duplex and reverse. LED S-meter, 25KHz or 5KHz step tuning, same multi-scanning functions as the 290 from mic or front panel. All in all the best 2M FM mobile ICOM have ever made.

**IC290E. 2M Multimode Mobile.**

10W RF output on SSB, CW and FM. Standard and non-standard repeater shifts. 5 memories and priority channel. Memory scan and band scan, controlled at front panel or microphone. Two VFO's. LED S-meter. 25KHz and 1KHz on FM – 1KHz and 100KHz tuning steps. Instant rev-repeat.

**IC24G. 10W 2M FM Mobile.**

This is the low-cost, easy to use economy model. Full bank – 80 channels at 25KHz spacing by easy to use press button switches. 12½KHz spacing if required, and the same reliable performance as the famous IC240. Price £169.

-Nearly everybody has an IC2E – the most popular amateur transceiver in the world – now there is the 70cm version which is every bit as good and takes the same accessories. Check the features.

- **Fully Synthesized** – Covering 144 – 145.995 in 400 5KHz steps. (430-439 999 4E).

- **Power Output** – 1.5W with the 9v rechargeable battery pack as supplied – but lower or higher output available with the optional 6v or 12v packs.

- **BNC Antenna Output Socket** – 50 ohms for connecting to another antenna or use the Rubber Duck supplied (flexible ¼ λ whip – 4E)

- **Send/Battery Indicator** – Lights during transmit but when battery power falls below 6v it does not light, indicating the need for a recharge.

- **Frequency Selection** – by thumbwheel switches, indicating the frequency. 5KHz switch – adds 5KHz to the indicated frequency.

- **Duplex Simplex Switch** – gives simplex or plus 600KHz or minus 600KHz transmit (‘+’ 1.6MHz and listen input on 4E).

- **Hi-Low Switch** – reduces power output from 1.5W to 150mW reducing battery drain.

- **External Microphone Jack** – If you do not wish to use the built-in electret condenser mic. an optional microphone/speaker with PTT control can be used. Useful for pocket operation.

- **External Speaker Jack** – for speaker or earphone. This little beauty is supplied ready to go complete with nicad battery pack. charger, rubber duck.

A full range of accessories in stock.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>ICM1</td>
<td>10W booster for IC2E</td>
<td>49.00</td>
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<tr>
<td>BP5</td>
<td>11 volt battery pack</td>
<td>30.50</td>
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<tr>
<td>BP4</td>
<td>Empty battery case 6 AA</td>
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<td>Standard battery pack</td>
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<td>BC30</td>
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<td>BC25</td>
<td>Mains charger as supplied</td>
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<td>DC1</td>
<td>12 volt adapter pack</td>
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<tr>
<td>HM9</td>
<td>Speaker/microphone</td>
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<tr>
<td>CP1</td>
<td>Mobile charging lead</td>
<td>3.20</td>
</tr>
</tbody>
</table>

All prices include VAT

The IC4E is going to revolutionise 70cm!
or our agents and warranty on all equipment.

ICOM produce the complete HF line-up!

**IC730. 100W HF All Band Mobile.**

80 – 10M, 8 bands SSB, AM and CW. Two VFO's with 10Hz – 100Hz and 1KHz steps. Memory for each band. Noise blanker, vox, CW monitor, APC and SWR detector. Speech processor and fan. Switchable RF pre-amp and WWV. 13v DC operation or use ICPS15 mains.

**IC720A. 100W HF + Gen Coverage Transceiver.**

This is the best money can buy. AM, SSB, RTTY and CW. Built-in fan, speech processor, two VFO's and APC. Tuning rates down to 10Hz and memories. General coverage receiver from 100KHz to 30MHz (transmit too if you have a licence) Run from 13vDC or use PS15 mains PSU.

**ICAT500.**

Automatic ATU which really is automatic and even selects the correct antenna for you! Faster than its competitors. Handles 500W (1Kw PEP) – 100W version is AT-100.

**IC251E and IC451 2M and 70cm. All Mode Base Stations.**

Both well proven designs with twin VFO's, variable tuning rates and power output, scanners and memory channels, automatic repeater operation with full reverse, 144 – 146 or 430 – 440, low output on FM, SSB and CW, built-in 12 and 240v supplies. None other like them.

---

**TONO PRICE LIST**

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Price (£)</th>
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<tr>
<td>7000E</td>
<td>CW/RTTY/ASC11 Terminal Tx/Rx</td>
<td>599.00</td>
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<tr>
<td>350</td>
<td>CW/RTTY/ASC11 Terminal Rx Only</td>
<td>259.00</td>
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<tr>
<td>CRT 120G</td>
<td>VDU 12 inch Green Screen Mains Power</td>
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<tr>
<td>HC900</td>
<td>Intelligent Line Printer 4 Cases</td>
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<td>HC600</td>
<td>Line Printer Centronics</td>
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<td>SK7</td>
<td>Plug Adaptor For Printers</td>
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<td>2M-50W</td>
<td>40 Watt Linear For 2 Metres</td>
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<td>MR-250W</td>
<td>210 Watt Linear For 2 Metres</td>
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<td>RX-144</td>
<td>Mast-Head Preamp For 2 Metres</td>
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<td>Mast-Head Preamp For 2 Metres</td>
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**Communications**

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<tr>
<td>CWR-685</td>
<td>CW/RTTY Terminal + VDU + Keyboard. Tx &amp; Rx</td>
<td>699.00</td>
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<tr>
<td>CWR-680</td>
<td>CW/RTTY Terminal Rx Only No VDU</td>
<td>189.00</td>
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<tr>
<td>CWR-670</td>
<td>As Above But De-Luxe Model</td>
<td>259.00</td>
</tr>
</tbody>
</table>

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**FM variable output 1-25 watts.**
- 144-146/1kHz 25/2 kHz steps.
- Xtal tone burst unit. 60kHz normal and reverse repeater 12V

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**TOP SELLING RIG**

**FDK 700EX**

**£199**

**Free Delivery**

**DC 2 5.5 amps. 2 programmable priority channels. Priority/main dial scanning. Ultra sensitive receiver. Large digital readout display. Microphone & mounting kit included.**

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**2m MONITOR**

**TM56B**

**THE PROFESSIONAL ONE**

**£89**

**Free Delivery**

**FM monitor receiver.**
- 140-160/1kHz xtal control, 10 standard channels supplied. 12V DC or 230V AC. 12 xtal controlled channels. 4 scanning channels. Manual or Auto scanning. Ultra sensitive front-end. Squelch control and speaker. Complete with mobile mount.

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**DETACHABLE HEAD**

**AZDEN PCS 3000**

**£219**

**Free Delivery**

**FM switched output 5W/25W.**
- 144-146/1kHz or 12kHz steps. 1750/1kHz toneburst & 600kHz shift. Instant input listen. 12V DC 2-5A. Auto scanning band, or memories. 8 memories/band edge stops. Removable control head. Priority channel. Remote mic. control.

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**NEW MODEL**

**AZDEN PCS 300**

**£184**

**DELIVERY EARLY 1982**

**FM 1-3 watt output 144-146/1kHz 12kHz steps. Toneburst and 600kHz shift. Band and memory scanning 8 memory channels. Programmable segment scanning. LCD readout with meter. Illuminated dial switch. Comprehensive facilities etc. Complete with nicad and charger.**

---

**NO MORE TV INTERFERENCE FROM CB OR AMATEUR!**

**GLOBAL HP4A £5.95**

**Post free.**

If you’re suffering T.V. interference, here’s a brand new device specially designed and made for us in Japan. The HP4A now offers about 100% cure against T.V. interference because of its advanced design, yet it has no effect on the picture. Be prepared, keep one handy!

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**Goods required**
**Address**
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**Send S.A.E. for copy.**

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(Closed Wednesday afternoon)

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**2m HANDHELD**

**FDK T1200**

**EXTRA HIGH POWER**

**£179**

**Free delivery**

**FM 1 or 3 watts output, 142-149/1kHz Tx and Rx Programmable steps 5-100kHz. 10 programmable memories. Band and memory scanning. Toneburst and 600kHz shift. Digital readout display. Comprehensive facilities, etc. Remote mic., case etc. options. Complete with nicads and charger.**

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**GLOBAL**

**HP4A £5.95**

**Post free.**

**If you’re suffering T.V. interference, here’s a brand new device specially designed and made for us in Japan. The HP4A now offers about 100% cure against T.V. interference because of its advanced design, yet it has no effect on the picture. Be prepared, keep one handy!**

**HUGE STOCKS OF YAESU TRIO etc. . . .**

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FOR LESS THAN £500!

JUST THINK... 2m & 70cm... FM/SSB/CW... DIGITAL READOUT...
AUTOMATIC REPEATER SHIFT... CROSS BAND OPERATION...
AUTOMATIC AERIAL SELECTION... AND ALL FOR...

BEAT THE 1982 PRICE INCREASES ORDER TODAY!

SPECIAL OFFER!

MULTI 750E PLUS EXPANDER
144-146MHz & 430-440MHz

SPECIFICATION
Frequency range: 144-146 (or 148) MHz
30-440MHz
Frequency steps: 5kHz & 100kHz
Operating modes: FM/USB/LSB/CW
Supply requirements: 11-15 volts DC (13.8V nominal)
Power consumption: 3 amps on transmit
RF output: 10 Watts or 1 Watt
Sensitivity SSB/CW: -10dBm at 10dB S/N
FM: -4dBm at 20dB N.Q.
Audio output: More than 1.2 watts a 10% THD
Size (each unit): 163W x 73H x 26W in mm
Note: all interconnecting leads are provided.

UNITS AVAILABLE SEPARATELY:—
M750E £289 EXPANDER 430 £219

MONITOR RECEIVERS
SUPER VALUE
SUPER PRICES!

1200 CHANNELS!
AR22 VHF FM MONITOR
AMATEUR MODEL £89 inc. VAT
(Marine version £95)
Truly amazing! The AR22 tunes across the 2 metre FM band 142-146MHz. FM/USB/LSB/CW. Also includes Police and Fire Brigade in 5kHz steps. So small it will fit into a shirt pocket and yet nothing is sacrificed in terms of performance. Price includes rechargeable batteries, mains charger, fly aerial, etc. You won't find a smaller monitor anywhere.

PROFESSIONAL AIRCRAFT MONITOR
R517 £49.50
(as supplied to pilots, ground crew, etc.)
The R517 is a professional aircraft monitor receiver, having superb sensitivity and capable of tuning across the entire aircraft band 118-143MHz. For easy tuning there is both a coarse and fine tuning control. In addition there is a 3 position switch for selecting xtal controlled channels (xtals £3 extra) for your local airport. The unit is completely portable running off self-contained batteries.

SR9 VHF RECEIVER
AMATEUR/MARINE
£46 inc. VAT
The SR9 must be one of the most popular monitors for 2 metre amateur radio enthusiasts. (Also available as a marine version at the same price). It is fully tuneable across the band with the option of also installing up to 11 xtal controlled channels. Power requirements are 12v DC negative earth at 200mA approx. The unit comes complete with mobile mounting kit and built-in speaker.

ORDER TODAY!
The New Year is a time for good resolutions, so here are a couple which we have made for your benefit.

1. Brenda G8SXY will continue to serve her celebrated coffee to all customers whether buying, selling or just browsing.
2. Bernie G4AOG will also be brewing up... in his case some exciting new flavours for our product range... and, right now, in addition to the expected full selection of radio equipment by ALL the leading makers, you will find...

- A really comprehensive range of Amateur TV transceivers and converters, both slow and fast-scan, with some items exclusive to us... and we're going to build on it.
- TRIO Test Equipment – fully professional in specification, but at prices which are still attractive to the Amateur market... and, if the interest is there, again we will build on it.

What will we think of to keep us ahead of the pack in 1983?

**THE FT-ONE**

at very special prices

£895 plus your old FT-902DM or
£995 plus your old FT-1012D/3

And remember, our FT-ONEs come complete with CW Filter, AM Filter and FM Board.

**FRG-7700**

Yaesu’s latest receiver with FM right across the band now offers all these optional extras:
- Memory facility
- FRT-7700 Aerial Tuning Unit at only £37.85
- Four VHF converters running from 50MHz up to 170MHz.

BASIC RECEIVER £319 inc. VAT and FREE HELISCAN AERIAL.

Converter specifications:
- Phone for prices.

FRV-7700A
118-130MHz 130-140MHz 140-150MHz

FRV-7700B
118-130MHz 140-150MHz 150-160MHz

FRV-7700C
118-130MHz 140-150MHz 160-170MHz

FRV-7700D
118-130MHz 140-150MHz 70-80MHz

**ATV-2 TV TRANSCIEVER**

Available only from us, this has been developed from the very popular ATV-1 TV Transmitter and it represents a real triumph of miniaturised solid-state technology.

So simple to go on the air, transmitting or receiving high-definition fast-scan video... Camera or VCR in at one end, 70cm antenna and normal domestic TV out of the other, connect to 12v, and there you are... who needs the BBC?

What’s more, it’s made for us in Britain by WOOD & DOUGLAS, who are building up a tremendous reputation internationally for high-quality design and construction.

Just look at all these features:
- 2-channel input from video camera or recorder in B/W or colour (switchable on front panel)
- Separate gain controls on both input channels
- Pre-set, adjustable video and modulation controls inside unit
- Built-in receive converter – just connect direct to UHF TV for instant ATV reception
- Built-in diode changeover for Tx/Rx
- Microphone socket for announcement of video Tx on 70cm (switchable between audio and video)
- Video transmitter gives full 3w PSP output
- Spurious better than 50dB down
- Unit housed in steel case and constructed on high-quality fibreglass PCB
- Full range of matching accessories available soon

Just look at the price: ONLY £119

ATV-1 still available for Tx only (with diode c/o for Rx converter) at just £87.

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STOP PRESS
Some price increases notified by manufacturers, but we will hold advertised figures while stocks last.

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SHORT WAVE MAGAZINE

(GB3SWM)

ISSN: 0037-4261

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587
The latest general coverage from Trio. Frequency coverage 200 KHz to 30 MHz in 30 bands. Using an advanced PLL system. Full digital readout. Three filters 12 KHz for AM, 6 KHz narrow AM, and 2.7 KHz SSB. Also incorporates a noise blanker. Operation is from 100-240V AC or 12 V DC.

The TR9000 is a compact lightweight 2 mtr. FM USB/LSB/CW Transceiver with an outstanding array of functions. FM1 for 100 KHz steps (for mobile use) FM2 for precise 100 Hz steps (for base station use). Microprocessor control giving many advanced features. Built in channel memory. New type microphone with up/down switching. Built-in high performance N. Blanker. Side tone for CW.

- **TRIO**
  - TS8055 HF Transceiver: £694.93
  - AT210 All band Antenna Tuner/SWR: £119.83
  - TS100 HF Transceiver: £534.98
  - SP230 Speaker: £346.94
  - DFC230 Digital remote control: £179.86
  - R300 Receiver: £659.90
  - TS1305 Solid State HF Transceiver: £525.09
  - TS120V Solid State HF Transceiver: £446.05
  - PS20 Power supply: £88.55
  - AT100 Antenna Tuner: £79.12
  - TR122 2KW Linear Amplifier: £624.91
  - TR3050 Portable 2m Transceiver: £116.75
  - TR4040 Hand Held portable 2m: £198.95
  - TR7730 compact 2m Transceiver: £247.94
  - TR7800 25-watt 2m Transceiver: £284.97
  - TR7850 40-watt 2m Transceiver: £314.87
  - TR9000 2m Multimode Transceiver: £295.98
  - TR9600 70cm Multimode Transceiver: £440.88
  - TR9600 2m FM Mobile Transceiver: £335.88
  - R1000 Solid State Receiver: £257.95

**J.A.C. NRO515D**

General coverage receiver 100 KHz to 30 MHz fully synthesised. Digital readout. PLL synthesised with a type encoder pass band tuning – modular construction.

- **TRIO**
  - TS8055 HF Transceiver: £694.93
  - AT210 All band Antenna Tuner/SWR: £119.83
  - TR7730 the new compact 2m Transceiver: £374.90

**TR7800**

Continuing Trio’s policy of presenting the Radio Amateur with the finest equipment available, we are pleased to announce the NEW TR7800 2m FM Mobile Transceiver. 16 memory channels – Priority channels with simplex ±0.1 KHz or non-standard operation – “Priority alert” bleeps when signal on M14 priority channel. Frequency coverage 144-146 MHz includes the latest 144 MHz SSB bands. Front keyboard for selecting frequencies, programming memory and controlling scan function. All THIS and MORE for £284.97.

**DATATWING PRODUCTS**

- **PC/General Coverage Converter**: £120.75
- **Low Frequency Converter**: £26.30
- **PLL Audio Filter**: £67.15
- **Multi Mode Audio Filter**: £63.90
- **Automatic RF Speech Clipper**: £75.35
- **RF Speech Clipper**: £26.45
- **D70 Morse Tutor**: £49.45
- **AD201 Active Antenna (indoor)**: £37.15
- **AD270 Active Antenna (outdoor)**: £38.45
- **Keyboard Morse Sender**: £128.00

**TRIO R1000**

The R1000 Receiver is £257.95.

**TR2300**

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

- **JAYBEAM**
  - 8V/2m element yagi: £12.08
  - 8V/2m element yagi: £15.03
  - 10V/2m 10 element: £33.35
  - RBM/14k2.14 element Parabean: £49.30
  - 8V/3m 2 element crossed yagi: £24.73
  - 8V/3m 2 element crossed yagi: £31.06
  - 10V/2m 10 element crossed yagi: £40.83
  - 16V/3m 4 element quad: £25.96
  - 48V/3m 4 element quad: £33.93
  - 48V/3m 8 element quad fed yagi: £21.65
  - 48V/3m 8 element quad fed yagi: £29.03
  - UGP/3m ground plane: £10.12
  - MMB/370cms. Multibeam: £35.76
  - MMB/270cms. Multibeam: £42.55
  - TAS 3 x 3W. whip mobile: £17.33
  - C5m. Coilear: £47.73
  - C870cm. Coilear: £94.06
  - D15/1226 20cm. Antenna: £36.80
  - Carriage on Antennas: £49.90.

**MOD. 1210 S**

**SOLID STATE STABILISED POWER SUPPLIES**

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**TRIO TS530S NEW**

- **15 Band HF Transceiver**: £534.98
- **R1000 Receiver**: £257.95
- **SP230 Speaker**: £346.94
- **R222 Hand Held Aircraft Receiver**: £88.55
- **RFX Station Wavemeter**: £25.65
- **3 Way Antenna Switch 3-30 MHz**: £5.00
- **2m Antenna Switch 3-30 MHz**: £10.45
- **FDQ 7000 Receiver**: £198.95
- **FDQ 750 Receiver**: £199.95
- **DL5 DU 2m 430 MHz DUMMY Load**: £6.85
- **DL5 DU Dummy Load 1 Watt**: £8.40

**TRIO TS830S NEW**

- **HF SSB TRANSCiever**: £694.83

- **TS830S HF SSB TRANSCiever**: £694.83

The new TS830S, the latest from Trio. A high performance, very affordable HF SSB/CW Transceiver with every conceivable operating feature built in. Available in all 160 bands. The TS830S combines a high dynamic range with variable bandwidth tuning (VBT), IF shift and all RF notch filter, as well as very sharp filters in the 245 KHz second IF. Together with the optional VFO230 remote digital display VFO which provides split frequency operation and memory for frequency hold, the amateur has available today’s advanced technology, linked to the proven reliability and exceptional linearity of valve PA.

- **VBT variable bandwidth tuning**
- **RF notch filter**
- **IF Shift**
- **Various filter options**
- **Built in digital display**
- **Built-in final with RF negative feedback**
- **Optional Digital VFO for increased flexibility**
- **Innovative PLL system of frequency generation**
- **RF speech processor**
- **Adjustable noise blanker level**
- **Adjustable audio tone**
- **RF attenuator**
- **BITXTR**
- **SSB monitor circuit**
- **Expanded frequency coverage**
1982

As this is written, 1981 is almost behind us. Let us hope that 1982 sees an improvement in the depressing economic condition of this country — and, indeed, the world.

By contrast, amateur radio will start off the new year in good shape, by way of the first opening of the new 10 MHz band on January 1st; but we must not let either Top Band or Ten be neglected, and we must take note of the loss of the upper 200 kHz of 70 MHz, and the change on our 1.3 GHz band to 1240-1325 MHz, both changes also with effect from January 1st.

In case there are still readers who are concerned that the coverage provided by Short Wave Magazine may change, it is perhaps worth re-stating that this journal in the year (and years) ahead will remain uncompromisingly true to its motto “For the Radio Amateur and Amateur Radio”. We shall continue, as we always have done, to put forward and support the interests of Amateur Radio to the exclusion of all others, from our unique and fiercely-guarded independent position. To do otherwise would seriously break faith with the vast majority of our readers.

However this does not mean that we must adopt an intolerant or damning attitude to CB (though such an attitude could be hard to avoid sometimes?), which will have its first full year of legal operation during 1982, and which is here to stay. In spite of all the problems which have flowed from the official mishandling of the question of CB over the years, at some point in the future the separate entities of Amateur Radio and CB will have to exist at peace with one another, with appropriate understanding and recognition on both sides. It is in the interests of amateur radio if we can all start working towards that end now.

If this task is performed successfully, one result will be many, many more licensed radio amateurs.

WORLD-WIDE COMMUNICATION
VHF BANDS
NORMAN FITCH, G3FPK

Satellite Notes

Oscar 8 is now coming into 24 hours-a-day sunlight and the transponders' base plate temperature will likely rise considerably. AMSAT-UK would like any telemetry readings readers may copy, particularly channel 4. The lower the reading, the higher the temperature, the decoding formula being $9.8 \text{min} \times 1.48N$, where $N$ is the last two figures of the group, e.g. 420 would indicate a temperature of 66.2°C.

UK-Oscar 9 is still spinning at quite a rate so the suggested all-fully-operational-by-Christmas idea has gone by the board. However, the camera has been activated a couple of times to prove the system and useful particle measurement and other data has been received. There was a glitch at the University of Surrey Command Station when the PA in the Command Tx failed.

AMSAT has published data on the orbit parameters for $U-0-9$ for orbit number zero. The period was 95.4635 minutes with a drag factor of $\text{minus} \ 0.000161 \ \text{mins. per orbit}$, and the track separation 23.8634°W per orbit with a drag factor of $\text{minus} \ 0.000025^\circ \text{per revolution.}$ The mean altitude is 554.596 kms. and the inclination 0.000025° per revolution. The mean temperature of 66.2°C. AMSAT expects to be able to supply printed circuit boards for the interface unit between an NBFM receiver and a standard TV receiver by mid-January. The circuit is in the up-dated $U-0-9$ Technical Handbook. For full details and prices of the boards, send an s.a.e. to AMSAT-UK at 94 Herongate Road, London E12 3EQ.

For the Phase 3 satellite program, AMSAT-UK has donated £1,000 to AMSAT.

There seem to be conflicting reports concerning the launch of further Soviet amateur satellites. Leonid Labutin, UA3JR, mentioned a “severe hold-up” in the program, but the launch of an Indian satellite seems imminent and the three RS birds could get a piggy-back lift on that mission. If so, they would be in a high, polar orbit, like RS-1 and RS-2.

On the ground, RS0 is still operating daily from Moscow sending streams of telemetry on 29.331 MHz. A frequently copied frame format comprises lines of two figures, preceded by one or two letters. A typical set would be:

```
K00 D85 O78 G00 C00 S25 and W39, was followed by RS0, then IK00, ID00 1057. . . . Succeeding sequences have NK, AK1, and ME prefixes, each preceded by RS0, before starting on the single letter prefix frame. On November 24, your scribe followed the copying message from RS0:— **CQ CQ CQ de RS0** QSU on FQ 145830 kHz K**.** Presumably those within 2m. range of Moscow could call RS0 on 145.83 MHz and get a reply on 29.331 MHz.
```

Beacony

As reported in the November feature, the 4m. band will be 70.025 - 70.500 MHz from January 1. Accordingly, the GB3SX beacon on 70.685 MHz has been shut down and will reappear on its new QRG of 70.040 MHz as soon as it is re-erected and overhauled.

Your scribe spoke recently to Yve Drouault, F6EOQ, who lives 500 metres from the Lannion beacon site. He said there was much trouble from QRM to other vital services which is why FX3THF on 144.905 MHz has not been commissioned.

Band Plans

Under Operating Notes in the October issue, mention was made — again — to the VHF/UHF Band Plans, primarily for the benefit of new licensees. Now, Ted Batts, G8LWY, the secretary of the British Amateur Radio Teleprinter Group, has asked that mention be made of the RTTY frequencies of 144.60 and 145.30 MHz. It seems that FM-ers, perhaps unaware of the Band Plan, have been using these frequencies and causing interference to RTTY buffs.

This leads to another plea that the internationally agreed beacon sub-band of 144.845 to 144.999 MHz be left free for those many who monitor beacons in furtherance of propagation studies. In the London area, 144.90 MHz is often used by strong FM stations, thus blighting reception of FX0THF on 144.895 MHz. Other nets crop up on the Angels beacon QRG of 144.975 MHz and QSOs have even been heard on the GB3VHF frequency! It can only be hoped that a polite word of explanation to the operators concerned will persuade them to move.

Six Metres

Ken Ellis, GSKW, was due to leave the Scilly Isles on December 17, to return in mid-January for a couple more months. He reckons that 6m. conditions have compared very favourably with those of Autumn 1980, even though it is two years since the peak of the present sunspot cycle. October and November produced ten new crossband countries in the guise of C5AEH, HC8VHF, HB8DAC, HK0BXK, PJ9EE, T12NA, V56BE, ZD8TC, 8P6KX and 9Y4AL.

Ken reports that C5AEH has returned to California after a very successful DX-Pedition, but leaving one **Hy-Gain Yagi** and 10w. transmitter behind. Sveinn Gudmundsson, who operated TF3SG on 6m., now has the call TF3T on 50.007 and 50.104 MHz. His fixed station runs 100w. and the mobile one, 10w. A 5-over-5 aerial...
is promised and he is looking for crossband contacts. New 6m. stations heard at G5KW include FM0GA on 50.090 and HD1RDC. Ken says that VU2AID is active around 50.085 to 50.090 MHz and has made 6m. QSOs with several VE1s and others. Also, EL2CA will be QRV on 50.035 MHz for the next couple of years.

John Baker, GW3MHW, also reckons that conditions to the West have been as good, if not better than, those of 1980 and he reports transatlantic QSOs possible every day from XM660 in November, except for the 7th. He has managed crossband 10/6m. QSOs with all U.S.A. call areas except the 6th and 7th. John is claiming more GW crossband “firsts” with VP5D and HI8DAF on November 13, and with G5AHE on the 15th. Other DX heard on 6m., but which operators were not listening on 10m., were HC2FG on November 8 at 1245, peaking 58; HC1FM at 1330 on the 12th, peaking S4, and XE3VV at 1425 on the 13th at S3. A Colombian repeater on 50.070 MHz was also copied on the 13th. John has worked T2NA on November 13 and Eric runs 200w. to a 5-ele. yagi.

GW3MHW noted an odd propagation phenomenon on Nov. 11 that in at 1220, while beaming to Central America, the Gibraltar beacon, ZB2VHF, could be copied at RST339, together with VE1YX (ex-VE1AXY) at the same strength. Both signals disappeared when the correct azimuth was used. The FY7THF beacon was copied on Nov. 12 of a couple of hours from 1200.

Following the consistency of G5AHE’s 6m. signals, John wonders if any VHF folk in other African countries would install 50 MHz beacons. He hopes that, when the Peace-Keeping Force goes to the Sinai Desert, it might include a radio amateur prepared to operate a 50 MHz beacon. This year, John proposes to move up to YM2e and to put up a 4 times 6-ele. array like to carry out crossband tests with British stations equipped for MS work on 4m. so he can conclude more cross-band contacts. Via GW3MHW, news that Andras Bato, HA6NN, is getting a 4m. converter and putting up a yagi. He would like to carry out crossband tests with British stations. His QTH is: P.O. Box 115, H-3100 Salgotarjan, Hungary.

On Nov. 3, GW3MHW reports that Mike Probert, GW4HXO, (Dyfed) got his 4m. CW across to VE1ASJ at 1422 for a “First” GW/VE, 4/10m. crossband QSO. Derrick Dance, GM4CFP, (Borders) says he has a 3-ele. yagi up for 4m. which is working fine.

**Two Metres**

Mike Allmark, (Leeds) lists the following stations heard via MS in November:— 1st SP6GZ (IL), LA51H (CU), 2nd DF5IZ (EJ), YU2RTU (HD), 12th Y22QG (FM), 14th OE5KE (HI), 21st SP6GZ. Mike reckons he heard

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### ANNUAL VHF/UHF TABLE

**January to December 1981**

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Three bands only count for points. Non-scoring figures in italics.
some E-M-E signals off the setting Moon during the weekend Nov. 5/6 from OK1MBS. He caught the end of the Ar on the 11th hearing G5MFSM (WR) on SSB plus a few local GMs on CW. From 1703 on the 14th he heard weak Ar signals from GMs in WR, WS and YR squares. On the 2nd tropo. propagation was good to Spain and several EAs in VD square were heard, plus EA1CR (XD) and French stations on AG, ZE, etc. The next day brought more EAs, F9NL (AD), Germans in E1, EJ and FJ, L1XDB and OE5XDL (H1). On the 6th and 7th Mike heard more EAs in VD and XD squares and F5s in the E, F and H rows. Best DX heard in the CW contest on the 7th was DK5AI (FL). On the 14th, G8MJD visited Mike’s QTH and, working –/A, netted some EAs and EA2EG in YC but who seems to have a rather deaf Rx. During the Cray Valley Club’s contest on the 15th DL2KAL/A (DK) and F1CYB (BH) were the best DX.

Bill Hodgson, G3BW, (Cumbria) says conditions have been quite atrocious and he is still operating with rather battered aerials following damage by gale after gale. New ones are adorning the shack floor awaiting more clement weather. Bill’s sole source of satisfaction is in MS work, these days. Dave Sellars, G3PBV, (Devon) reckons he had his own private lift towards Switzerland on Nov. 5. Between 2000 and 2200 he contacted HB9PDPN/P (EH), HB9MFL (DH) and HB9MITY (DG) and F1AHQ (DG), F6DKO (DH) and several other F5s in BH, BI and AI squares. He heard EA1YY (WD) on the 7th but did not stay up long enough to work him.

Ray Elliott, G4ERX, (Essex) is now up to 104 squares on 2m. November additions being F1BOF/P (AE) on the 3rd, PA0OOS/A (DN) on the 8th and PE1DTU (CN) and GM4CXM (XP) on the 14th. In a brief trip home to Liverpool on Nov. 14, Rob Mackean, G4HAO, worked EA1ED (VD59h) for an all-time DX pile-up. Central and Tayside Regions still elude Rob for 1981.

Martin Blythe, G4HFO, (Cw.1) got EA2EG (YCI7a) on Nov. 14 for a welcome new one, but missed out on PDDOD/MM on the freighter Bloemegraaf when Jos was in rare squares. On Nov. 2 he contacted him in X1 and learned he was en route for Algiers. A sched. was arranged for the following evening and Martin alerted G3CHN as well. By sched. time, Jos was in FV square and, although he was S9 with G3CHN in Devon, and with G8JDX in Plymouth, there was no ducting into St. Austell. (Murphy at it again!)

Martyn Hunt, G6AJA, (Cumbria) using 12w., worked GJ6FCU, who was running 10w., on Nov. 6, for a new country on the band, and FI1F1H (ZH). He heard EA1TA in VD square but was unable to crack the pile-up. In spite of a poor take-off to the north, GM3WCS, (Fife) was worked on Nov. 1. Adrian Chamberlain, G6A6C, (Coventry) spent some weeks in Florida a few months ago and used his Trio TR-2400. He managed to work into the Dayton repeaters from 22 miles away with only 2w. and a quarter wave aerial on the car. He noticed how the propagation changed around 8.00 a.m. quite suddenly when the temperature reached 75-78°F. As the sun got higher, copy became quite scratchy, this pattern occurring every morning. Since he returned to England, Adrian has added another square, ZE, thanks to F1EBQ on Nov. 6.

Graeme Caselton, G6CSY, (Kent) took part in the Cray Valley Club’s 2m. contest on Nov. 15 and found plenty of activity. He now has a mobile Halo aerial and, with 15w. has worked PA0F6H/A for best DX. Welcome to another new contributor Graham Owen, G6DDK, (Ipswich) who passed the May R.A.E. and got his call on Aug. 14. As G4HMF is his father, he was on the air as soon as the licence arrived. The station comprises a Kenwood TS-770E and single 4CX250B amplifier, the aerial array being a pair of vertically stacked 16-ele. Tonna Yasig, atop a 60ft. Versatower. To date, 53 squares and 16 countries have been worked, including C31, HB9, OE, OZ, EA and Y.

According to Peter Thompson, G8DDY, there are probably 70-80 licensed fellow amateurs on the Isle of Wight of whom some 30 are on FM and 20 on SSB on 2m. Jackie, G8RZO, and John, G8RZP, Brakespear caught the little Ar affair on Nov. 11 and added a couple more GM counties and squares to their mounting tally from the Isle of Sheppey. F1DYD (CF) on the 15th and G5KW (WJ) on the 22nd, were also new.

Chris Easton, G8TFI, has not been too active from the new, Gloacs. QTH but nevertheless lists some very nice DX worked since mid-August. EA1TA was contacted on Nov. 2 and EA1CR the next day before the tropo. lift moved round to the east. That produced German QSOs with DK, EI, EJ, EL, FJ and DL squares. EA1ED (VD) on the 7th is the best southerly DX so far, and DF3RU (FJ) the best in the easterly direction. John Cooper, G8WUW, (Essex) now has two 9-ele. Tonna Yasig aloft and added EA1ED and 1QJ on Nov. 2. A DK1OF amplifier is well under way now to boost the present 40w. in the hope of working further afield.

G8VR has installed the muTec "front end" board in his Yaesu FT-225RD and finds a marked improvement in strong signal handling. During November, Ken concentrated on MS mode and had completed QSO’s with SM2CXR (KK), OE5XDL (HH), SP6FUN (IL) and for the first time on MS, SSB with EA1TH in YC and F11G in CD.

Pete Hibbard, G8XMP, is another new contributor, operating from Scunthorpe. He enters the tables for 2m. work. The 17 countries include SP and UB5 worked via E’s in June, all the rest being tropo. QSOs. (By the way, we allow GM/Shetland Is. as a country, but nor Orkney Is. or the Isle of Wight, Pete.)

David Dawson, GW3NYY (Swansea) has replaced his 9-ele. Yagi by a 14-ele. Cushcraft "Boomer" 25ft. up a mast at the bottom of the garden. He took advantage of the good, southerly propagation at the beginning of November, working a number of EAs. New squares, all SSB, were FICDS (AH), F6FQQ (ZC), F6CCH (ZG) and EA1YY (WD). Using CW for MS operation, November yielded completed QSOs with HG8CE (KG) on the 1st, IV3HWT (GF) on the 2nd, OZ1DOQ (GP) on the 8th, 11JTQ (DF) on the 12th, Y23SJ (FK) on the 15th, DK1WB (FM) on the 22nd and K01DPB (HK) on the 24th. The sole SSB MS contact was DF3RU (FJ) on Oct. 31. In the Nov. 11 Ar, Walt lists four GMs on CW in YP, YQ and YR squares.

Peter Whitburn, GW4EAI, (Gwent) is now up to 150 squares worked on the band, the latest addition being EA1YY (WD) one of a collection of EAs worked in the tropo. lift on Nov. 6/7. During compiling this offering, the 144 MHz Fixed Contest on Dec. 6 was happening. Activity was high with new licensees much in evidence. Several GMs and GIs were logged at G3FPK and, in a post-contest round-up, near neighbour Steve Marsh, G4BWW, said he had made 410 contacts, including numerous near continents and DLs in the 5 squares, plus an F in BH and the usual GDX. John Regnaull, G8FQQ, reported that G4BPO had 375 QSOs including as far south as BG and over to FL and FM squares to the east. The proportion of grotty signals seems to be on the increase, unfortunately, perhaps time

For anything radio you want to buy, sell, or exchange, use the Readers’ Advertisements columns in “Short Wave Magazine”
to suggest attention to the following:-

- make sure any PA stage is properly tuned up and loaded; maximum output on a whistle or "w-a-a-a-a-l-o-o" will not result in the best linearity: don’t overdo the mike gain: don’t screw up the speech processor so that breath noises sound like you are rattling stones in a metal bucket. These points are raised with monotonous regularity but seem to fail on many deaf ears.

### Seventy Centimetres

A number of readers enjoyed the good tropo. at the beginning of November. Mike Allmark in Leeds copied DB2YV (DJ), F1EZQ (CH), DD3UD (EI) and F9FT (CJ) on the 3rd, F1AJD (AF) on the 6th and EA1CR (XD) on the 7th, who, at 1,179 kms. is the best 70cm. DX. Mike located in one B.A.C.’s, Cumulatives, on the 15th and saw pictures from G4AGE (Derbys.), G8GQS (Lincs.) and G4GPO (Suffolk). In the Dec. 1 leg, G8MJDA/A was operating from Mike’s QTH again and worked a number of TV stations.

G3PBV reports the Paris beacon as 20 dB, over noise on Nov. 5, fading out by 2200, not to be heard since, with the beacon in ZD square being heard weekly the following weekend. According to HB9MFL, the HB9F beacon is QRT for the time being, due to aerial problems at the 3,500m. a.s.l. site. Dave worked several F5s on the 5th in the A. and B squares. G4HFO got three new squares in the Nov. 2/3 period:— F1BOF/P (AE), F1EEH (ZF) and F1ETX (AF) to make up for the dis-appointment in missing out in the Dutch/MM in VF on 2m.

Apart from the Cumulatives in which Graham Taylor, G4JZF, (Staffs.) worked GD2HDZ, things have been very quiet. Best DX for GD6DK from Ipswich was EA41ED (VD) worked at 2002 on Nov. 11. Graham uses the TS-770E with a single 250W amplifier, the 21-ele. Tonna Yagi being mounted between the two 2m. beams. G8ZRR advises that G4HFO (XX) is looking for contacts and was quite a good signal in Sheppey on Nov. 25.

In spite of a late start in the Nov. 2 log of the Cumulatives, G8TFI made 42 QSOs worth 282 pts. The next day produced DF1JCE and DF3JEE in DL, and DL7QY (FJ16e) at 920 kms. On the 7th, Chris got EA1ED (VD59h) at 970 kms. In the Nov. 10 log, conditions were fairly good to the east with 39 stations worked for the 21-ele. Tonna Yagi being mounted between the two 2m. beams. G8ZRR advises that G4HFO (XX) is looking for contacts and was quite a good signal in Sheppey on Nov. 25.

### Final Round-Up

The 70MHz CW Contest is on Jan. 17 presumably 1000-1500 as last year. The first leg of the 70MHz Cumulatives is on Jan. 31, but no idea of times. Congratulations to Paul Broadhurst, ex-G8LGL, now G4NFD. Ron Ratcliffe, G4RKY, writes that the 'phone numbers for Room 208 at Lancelse House are:— 01-432 5369 and 5444 — see p. 560 of the December issue. Also, to save expensive hanging on at the main switchboard, the Radio Regulatory Department’s direct line numbers are:— 01-275 3316 and 3022 if you really must contact them urgently.

Finally an odd tale from G4JZF, who had been suffering a lot of interference from an elusive "sproggie" from a local station. Eventually it was found that the mains supply lead to the amplifier on 2m. was 39 inches long. The crud was cured by a capacitor across the P.S.U. terminals and a ferrite ring in each lead.

### Deadlines

So it’s “Goodbye 1981 and Welcome to 1982” and a Happy New Year to all readers from your scribe. If you are not all suffering from a surfeit of Christmas Fare and New Year hangovers, the deadline for February with all your final table scores is Jan. 6 and for the March piece, Feb. 3. Everything to:— "VHF Bands," SHORT WAVE MAGAZINE, 34 High Street, WELwyn, Herts., AL6 9EQ. 73 de G3F PK.
A HIGH PERFORMANCE POWER SUPPLY AND CONTROL SYSTEM FOR 4CX350/4CX250 AMPLIFIERS, PART VII

CONCLUDING THE DESCRIPTION OF THE EHT SUPPLY; CONSTRUCTIONAL DETAILS

JOHN H. NELSON, B.A., G4FRX, and M. C. A. MORONEY, B.Sc.

A NOTHER possibility in the capacitor department is the use of paper capacitors. The older block-paper type, which is physically enormous for its values of capacitance and working voltage, is fine for the job if you have the room to spare in the EHT supply for it. There also seems to be a new breed of metallised-paper components coming on to the surplus market; for instance, one particular make of 40µF 2500V component has been available at recent rallies and so on. On the face of it, these are most attractive particular make of 40µF 2500V component has been available at recent rallies and so on. On the face of it, these are most attractive for the job: lots of capacitance, high working voltage and a reasonable size. But, here again, the big question mark lies over the matter of their ripple-current ratings. A long series of telephone calls and Telexes to the manufacturers and their distributors produced the information that this type of capacitor is intended for “short-time” energy storage in such things as photoflash units and laser power supplies: their maximum ripple voltage is only 200V, although the ripple current at this voltage is 8 amps. They will not handle 2500V continuously; their continuous rating at 500mA ripple current (100Hz) is 1800V, and much less, as mentioned above, at higher currents. So although they look, on the face of it, an alternative to the ubiquitous chain of electrolytics, as mentioned above, at higher currents. So although they look, on the face of it, an alternative to the ubiquitous chain of electrolytics, apparently signifies the intermittent nature of their intended use, so it may be worth making a note of this before spending your money.

And so finally, before returning to the thyristor-controlled unit itself, we may give some thought to the topic of fuses and fusing. This is yet another of those areas where all is not what it seems. Protection for the thyristors against catastrophic failure of the EHT rectifier board itself; panel-mounting fuseholders are emphatically not recommended and are anyway unnecessary since if one of these fuses blow it must signify a serious fault somewhere which will require investigation.

The example given above is a relatively straightforward use of fuses, but matters become rather more complex when the question of protection for the thyristors is being considered. On the face of it, nothing could be simpler than a fuse, except that the actual mechanism of a fuse blowing is surprisingly complicated and has some repercussions when one is attempting to protect semiconductor devices. Theoretically, even semiconductor rectifiers require something a little more subtle than the simple half-amp fuse as discussed above to protect them, especially in high-voltage supplies.

It is not proposed to write a solemn treatise on fuse rupture mechanisms, especially since the subject is covered in depth by Ref 1. However, a brief explanation of the problem is necessary to understand the solution.

Most devices are rated in terms of average or RMS current, which means that if they are used in a pulsed or modulating application the instantaneous current can be considerably greater than the rated current provided that the RMS value remains within the rating. Obviously there are limitations; it would not be possible to use a 1 amp device for 1000 amp pulses, even if they only lasted for one microsecond every second. The device would probably explode.

The manufacturers of power semiconductor rectifiers and fuses quote two parameters which are of some importance in defining the limitations of the device. These are the “peak repetitive single cycle current”, or \( I_{brm} \), and the “I’t”. The I’t of the device is a statement of the energy that it can safely dissipate during a fault condition, and is stated for a period of time (usually one half-cycle). As applied to a fuse, it is a statement of the energy that it will allow to be dissipated in the protected device during a fault clearance. When selecting a combination of a fuse and protected device it is good practice to take both these parameters into account, together with the “prospective current” (maximum possible fault current with the fuse shorted out) to determine the ratings of the devices. However, for us lesser mortals, it is usually satisfactory to ensure that the I’t of the fuse is less than that for the power semiconductor.

I can hear the wallabies already. “I’ve never heard of any other value for a fuse than its rating. What the devil is this ‘I’t’ business?” Nelson really has gone too far this time!”

WELL don’t worry — have another cup of tea and read on. The type of fuses habitually found in electrical shops and so on are intended for non-critical domestic-type applications; however, when electronic equipment, especially when it employs semiconductors, is to be protected, the professional engineer will employ a class of fuse distinguished by the mystic letters “HRC”.

This stands for “high rupture capacity” and represents a high-speed device capable of blowing much faster than the ordinary glass-type fuse link, and which limits the fault current by controlling the arc which forms as the fuse ruptures.

We can bring the discussion a little nearer home by considering the fuse in a domestic 13 amp plug; the clue here is in the magic phrase “prospective current”, which was mentioned above. I can’t even begin to estimate the prospective current from the mains, and it is probably enough to imagine that it will be very large. Next time you have occasion to change a 13 amp fuse, which will probably be a ceramic tube (as opposed to the ordinary glass tube of an “ordinary” fuse) try breaking open the faulty one: you should find that a small quantity of sand, or a similar material, will trickle on to the floor. This is one distinguishing mark of an HRC fuse, the purpose of the sand or whatever being to quench the arc which may, under certain circumstances, form within the fuse and hence help to clear the fault current.

In other words, a high-speed HRC Fuse has the ability to (a) limit considerably the level of peak fault current from the estimated prospective value in a very short period of time, and (b)
to clear high values of short-circuit current, which is extremely useful if power semiconductors are being protected.

Again without wading into the mathematics of the situation, the points to consider when selecting a fuse for this kind of application are (a) the steady-state RMS current, (b) the prospective fault current, (c) the \( I_{\text{t}} \) ratings of the semiconductor device and of the available fuses, (d) the voltage at which operation is taking place, and (e) the ambient temperature. This may sound more than a little daunting but the fuse manufacturer, certainly in the case of an HRC fuse for use in this application, will have done most of the work for you: for instance International Rectifier, who manufacture a wide range of HRC fuses for this type of application, have a data sheet available for the asking which sets out all you need to know.

Let us consider, as an example, the present case, where it is desired to protect a BT152-600R thyristor — there are, of course, two in inverse parallel in our circuit, but the considerations will apply to both devices. At full power, we may assume a current of about 7 amps flowing in each device; the prospective fault current, since we are dealing with the mains, can simply be thought of as enormous! We know from the published data for the thyristor that its \( I_{\text{t}} \) is 200A's, and we will assume that the temperature is 20°C.

If we look at the data sheet thoughtfully drawn up by the manufacturers of the fuses, we are primarily interested in two things (the maker has conducted his tests at 25°C, so the ambient temperature variable can be forgotten). We consider first the RMS current rating of the fuse, and we might consider, for example, the fuse type E1000-8 with its rating of 8 amps RMS. Since the permissible on-state current (\( I_{\text{TRM}} \), as discussed above) for a BT152-600R is 20 amps, although we only require about 7 amps, this looks promising. We next look in the column headed “Total \( I_{\text{t}} \) at 700V” — we require the 700V column since this represents a worst-case for thyristors in inverse parallel and will thus give a conservative rating. For the E1000-8, the total \( I_{\text{t}} \) turns out to be 28A's. Since the figure given in the data sheet for the thyristor is 200A's for 10 milliseconds, the protection given by this fuse would obviously be very good.

In fact, this is partly because the thyristors used in this design are somewhat underrun: if one considered lower-power devices, it would be found that their \( I_{\text{t}} \) would not be very much higher than that of the fuse. This is a corollary of the fact that 20 amp devices are used to handle about 7 amps, both in the interests of reliability and because the BT152-600R, since it is a fairly standard device in use in industry, is very cheap. The main point to bear in mind is that as long as the fuse has a value of “total \( I_{\text{t}} \)” less than that of the thyristor and will pass the appropriate current (RMS) the device will be protected against untoward events taking place downstream of it. The user should also be spared embarrassing explanations of the type “ah well, you see, the thyristor blew to protect the fuses again.”

Having said all that, there is theoretically no reason for the “anti-Murphy” fuses F402, F403 and F404, which we said were to protect the transformer and rectifier; in fact, the odds are that a fuse of the type discussed above would blow before they would! However, it is said that an ounce of protection is worth a pound of cure, and we may as well apply the points above to these fuses. Bearing in mind that they are working at high voltages, an HRC fuse is very desirable so that any arc which might form can be quickly quenched — again, the various forms of protection used in this unit render such an event unlikely but the cost is only a few pence more than “ordinary” fuses. 20mm HRC fuses, as available from RS Components for example, should be used in these positions, and during the various tests they have never yet failed to clear any fault currents — heaven knows they have had enough practice at it! The current ratings of these fuses were, of course, discussed above.

That concludes our look at some of the slightly off-beat areas of interest which came in for some attention during the design of this power supply unit, and they are relevant to practically all EHT supplies whether they are slightly sophisticated or very basic. With
them in mind, we may now pass on to a practical realisation of this system.

**Construction**

The complete unit falls naturally into two sections: the "control unit", which consists of Figs. 2, 3, 4 and 7 and which is contained in the same box as the control logic, bias and screen supplies, auxiliary transformers, etc; and the thyristor stack, Fig. 5, which may be constructed as a part of the EHT unit. Since this latter contains the EHT transformer, smoothing capacitors and other rather bulky components, it can best be treated as a separate unit from the main control system and built in a separate box placed away from the main operating position; because all its functions are controlled remotely, its existence can be forgotten (unless of course it either goes wrong or, because of its weight, falls through the floorboards . . . .). There is also something to be said for this arrangement from the safety point of view, especially if there are animals or young children to be considered.

To discuss the control unit first, the final versions were constructed on single-sided PCB to fit one of the standard die-cast boxes. As usual, the necessary connexions were taken into and out of the box via feedthrough capacitors, with some ferrite beads on the appropriate wires. RF screening is important in this system: one of the earlier prototypes was built on Veroboard and as well as being a rather good broadband noise jammer (as discussed above) there was a nice rough justice in the fact that it was itself very vulnerable to RF. A couple of watts of FM from a 432 MHz handheld was sufficient to stop the system from working, and some otherwise inexplicable fluctuations in the output from the unit held was sufficient to stop the system from working, and some otherwise inexplicable fluctuations in the output from the unit could hardly be regarded as critical.

The opto-isolator shown in Fig. 4 was a TIL111 in the early prototypes, although practically any of the standard types should work in this circuit. It is worth noting that the transfer characteristics of an opto-isolator are said by the manufacturers to change during the course of their working life as the LED ages, although we are not sure of the practical consequences of this.

Otherwise, the control unit is a perfectly standard piece of "home-brew" and should not cause any difficulties whatever method of construction is used provided that it is RF-tight. The thyristor stack, Fig. 5, does need a little more care, although here again it could hardly be regarded as critical.

It will be remembered that the functions of R312, C304 and C306 were discussed. The voltage regulators IC1 and IC2 were standard "Suppression types". They are normally available at rallies for about 5p! All the tantalum capacitors for use in this project were purchased at this year's Alexandra Palace exhibition for the princely sum of 40p, and most of the professional-type component suppliers seem to have been quietly reducing their prices for tantalum capacitors. They are also, of course, a good deal smaller than ordinary electrolytics, which can be helpful as far as PCB layout is concerned.

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It will be remembered that the functions of R312, C304 and C306 were discussed in some detail above. Since these components will effectively spend their working life connected between mains and earth, it is essential to use properly rated components; to the professional engineer these are known as Class X and Class Y "suppression types". They are normally polyester film or polycarbonate components, and probably the easiest way to be sure of obtaining the correct types is to order them from, for example, RS Components or Maplin. They have some very interesting self-healing properties, and are a much

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The PCB carrying the phase control oscillator and driver unit for the main thyristors. Note the opto-isolator IC (a 6-pin DIL device). Adjacent to it is the UJT circuitry — the second 10-turn preset visible in the photograph was used on this particular board to experiment with the source impedances, and is not shown in Fig. 5 or required in the final design. The square black object next to the UJT is the pulse transformer, with the two driver thyristors (BTX18-100 in this particular unit, although the specified 2N5061 is as good or better) adjacent to it. The 47 and 82 ohm resistors are carried on ceramic stand-offs. This unit underwent a 1000 hour full-power soak test with no problems.
better proposition than the ordinary polyester or mixed-dielectric types. Capacitors of this style should always be used when the application requires direct connexion across a mains supply — the fact that we are amateurs and not professionals does not give us some kind of strange exclusion from the normal laws of physics or of component reliability . . . .

The ratings of the main thyristors have already been discussed and in general terms any device for use in this type of application which possesses an adequate $V_{RRM}$ and enough of an average on-state current rating to do the required job is practically guaranteed to work. The BT152-600R seems to be something of an industry standard and hence turns up quite often on surplus PCBs, etc, although it should only cost about £1 if bought new. The "pilot" thyristors SCR301 and SCR302 can be of the same kind as used in the output amplifier, Fig. 4.

As far as L301, L302 and L303 are concerned, it must be admitted that (a) there must be a better way to do the job than the way in which we have done it, and (b) we don't know what it is! The original plan was to use some Mullard RM10 pot core assemblies, of which half-a-dozen had been sitting in the G4FRX junk box for some time: 20 µH implies some twelve turns round the bobbin, and it was decided that quite heavy-gauge wire should be used to minimise any heating effects or losses. Now the plastic bobbin which is supplied with a ferrite pot core is quite diabolically fragile; it is no doubt adequate for its job if the coil was triumphantly wound and terminated on the pins of the output amplifier, Fig. 4.

A yield of one out of six is rather more reminiscent of VLSI manufacture than the construction of pot cores; we draw a veil over the proceedings after that, except to say that after much fiddling and cursing, three complete 20 µH pot cores were obtained! It is suggested that when they have been wound — and the consideration of the matter further, it was thought that one might be able to do without the wretched things, but a few experiments did not lead to a satisfactory solution. In desperation, two of the author's friends assisted in the next attempt, and after some ten minutes' nerve-racking effort one coil was triumphantly wound and terminated on the pins of the bobbin. Sad to say, the final bobbin broke halfway through our attempts to make another one . . . .

A yield of one out of six is rather more reminiscent of VLSI manufacture than the construction of pot cores; we draw a veil over the proceedings after that, except to say that after much fiddling and cursing, three complete 20 µH pot cores were obtained! It is suggested that when they have been wound — and any views on better ways of doing the job will be welcome — they should either be heavily varnished or "potted" in some suitable compound, since if the windings are not well fixed they will tend to rattle at 50 Hz in service.

T301 is a standard 1+1:1 pulse transformer, of the sort sometimes found in television power supplies or surplus equipment, although the $RS Components$ stock number is quoted in the components list for those wishing to purchase one new. T302 is shown in the same way, since a few of the regular rally traders seem to have large stocks of them in original boxes; the author's original component cost 30p, although it is £2.50 from $RS$ themselves. Any small 12V "filament" transformer would be adequate for the job, however.

As far as the ramp and pedestal generator is concerned, there is nothing very noteworthy; the UJT T301 can be almost any small-signal device, and D306-9 may be either built up from discrete components or a small encapsulated bridge — a capacity of about half-an-amp is quite adequate. The mains filter, which was mentioned earlier in the article in connexion with RFI and $dV/dt$, was a proprietary 10 amp component from a surplus computer power supply and cost 50p in the Edgware Road, although any small mains-type filter would do provided that its rating was adequate for the rated current. D301 is dissipating about 700 mW, which means that the usual small Zener diode is not quite adequate; it is suggested that a BZX61 or BZX70 series device is used in this position.

Layout of the thyristor stack, with two provisos, should not be critical. The important points are that the leads to the gates of SCR303 and SCR304 must be kept as short as possible and that the suppression components mentioned above — R312, C304 and C306, plus their opposite numbers on SCR304 — must be mounted as closely as possible to the thyristors. This is to minimise the lengths of leads and thus to keep any RFI problems to a minimum. The thyristors themselves require a heatsink of about 4°C per watt each, and these could be mounted on the end or the lid of the die-cast box. The author's own solution to the mechanical design requirements is shown in the photographs, but there are many possibilities. Do not, however, attempt to construct the unit as though it were the screen supply, i.e. with the thyristors mounted on heatsinks mounted remotely from their drive circuitry, Fig. 5, since the level of RFI which may result is likely to compromise the receiving system's weak-signal performance.

(to be concluded)

**Correction**

In Fig. 5 (Part VI, December issue, p. 547), the 'top' terminal of R302 should be connected to the line between the positive output of the rectifier (D306-D309) and R304, and not as shown.
It seems we must address ourselves again to this old business of valves versus solid-stater, at least insofar as it refers to the things around the shack. R. J. Payne (Daventry) is the one who has put up the Aunt Sally — and unwittingly also handed us the avenging coconut. Essentially, he was generalising while J.C. was discussing the particular. So, let us take Robert’s points one by one.

Firstly, lots of amateurs and SWLs have stocks of valves. Agreed, but not the facilities to test ‘em, without which they are, at best, doubtful for use in the station receiver, and at worst junk, unless they can be tested and listed so that one knows about each specimen. Using them as a means to obtain learning: agreed, with some limits, insofar as there isn’t a fat lot to learn about how a valve itself works, and all the remaining circuit work can as easily be learned with solid state. I certainly don’t think such fine receivers as, for example, the Edystone 888 or the Racal RA17 should be slung in the dustbin, but it is very definitely a case here of taking the cream and comparing it to the cheap-and-cheerful. Finally, Robert reckons that to say a TRF receiver is a toy compared with a direct-conversion receiver is an indication that J.C. has been unlucky with TRFs — far from it, this old greybeard was trading in basic facts in all these cases; and so it must seem that Robert has been unlucky with his homodyne receivers!

Let’s put it all into perspective. There are some very fine receivers about still, full of valves, and after 25 years they are as good as the modern receiver in many respects if they are in good condition. But, the valves wear out, and then one must service the beast by replacing the offending valve by another of known equal goodness plus a re-alignment. The latter requires the skill and the equipment, but the former needs an awful lot of skill (luck?) in selecting your valve supplier if you must take his “new, boxed” equipment, but the former needs an awful lot of skill (luck?) in selecting your valve supplier if you must take his “new, boxed” valve on trust and plonk it into your otherwise good receiver. But, having sorted out all this, there still remains the operational problems, of which the foremost is the warm-up drift, with microphony a close second. But they certainly were the best goodness plus a re-alignment. The latter requires the skill and the equipment, but the former needs an awful lot of skill (luck?) in selecting your valve supplier if you must take his “new, boxed” equipment, but the former needs an awful lot of skill (luck?) in selecting your valve supplier if you must take his “new, boxed” valve on trust and plonk it into your otherwise good receiver. But, having sorted out all this, there still remains the operational problems, of which the foremost is the warm-up drift, with microphony a close second. But they certainly were the best
designs to appear until the last few years, simply because they had the right gain distribution to take account of the unwanted big signals, and so were far better on cross-mod and similar problems than any of the first fifteen years-worth of solid-state commercial gear. Lastly, reader Payne says there are still lots of AM stations about — most of them would be quite surprised and/or upset if you told them they were on AM!

What it boils down to is “horses for courses” — if your new SWL has a very modest sum to splash out then a good old valve receiver well-maintained will serve quite nicely. For homebrewing a receiver, the valve shortcomings and the difficulty of being sure the valve you have in your hand is a good one (i.e., does what the data book says it should, or better), make it all but pointless to even think of a valved receiver. But not to chuck the old receiver straight into the dustbin — an old HRO Senior, for example is well worth buying, with a complete set of bandspread coils, just for the chassis, coobilxbox drive and tuning capacitor, not to mention a very close look to see how National manages a stable design without the need for screening all over the place — compare with, say, a CR-100.

The Mail

Having used up our preamble on answering reader Payne — and hoping he doesn’t mind that! — we must look at all the mail now. A couple of HPX queries come from J. Hayes (London N.9). The answer to the first is that the shift up to the All-Time Post War table is automatic on reaching 500, by which time we reckon you have enough nous to take the old-timers on somewhere near level pegging. Secondly, and one that doesn’t seem to have cropped up for years, is the rule about no undercover or MARS stations. Taking the former, there have been cases enough where no amateur radio is permitted in a country and stations have come on the air illegally from that country. Regardless of whatever we may personally think of that country’s ‘isms’, if they say it’s illegal, that is as far as we are concerned. There are, even in this area, some ‘grey’ ones . . . for instance it does seem as though the Turkish regime is deliberately turning a blind eye to amateur radio operation while retaining the embargo, on paper at least. We feel inclined to regard the TA stations therefore as valid for HPX — but it is hard to draw a clear line. Now, as to MARS: these stations are American, and military, largely handling “traffic” as they call it, and being operated by holders of amateur radio licences.

G. H. Coulter (Whitfield) runs an FRG-7 and a random length wire aerial, on which he recently heard VP8ANT, and he wonders about the station. VP8ANT is in fact G3CWI, and if you snug him you may well find that you have some rare DX — like Adelaide Is. and S. Georgia.

An interesting letter we have from P. Dawson (Northam) — a spot beloved both by the present Editor and his predecessor. Pete wants to know about using a couple of inverted-tee aerials as a Yagi-type beam for 40 and 80. The problem is fairly simply stated, in that the spacing between the elements needs to be held within limits if the thing is to work well — not closer than 0.1 and not much more than 0.2 wavelength. The biggest snag is that as they are, electrically speaking, so close to ground, the feedpoint impedance falls to a low value, lower even than a normal two-element. It thus must follow that it is important to match the feeder to the aerial, or to use a folded dipole construction for the driven element — but of course you can’t really expect it to work with low VSWR right across the band on 80m.

G. Caselton (Orpington) wonders whether V3 is the new prefix for Belize — and so it is, Graeme.

The usual nice informative letter comes in from E. W. Robinson (Bury St. Edmunds); he seems to have had quite an interesting time on the air, one way and another, including hearing his first ever YO1 station.

Now we move on to J. Goodrick (Bognor Regis) who has some pertinent remarks on the costs involved in the direct QSL plus IRCs or s.a.e. business — indeed it is a financial pain, but there is no doubt that there are times when amateurs appreciate reports, particularly when they are obviously not pulling replies, or getting replies and not hearing them; and most of the DX-peditions will come up with a card if they get a decent report over several successive contacts.

In Chorley, P. Catterall now has a Drake MN-7 ATU to add to his collection of gear — he uses the ATU to obtain signals from an end-fed 132-foot and Yaesu receiver.

Congratulations to M. Cuckoo (Herne Bay) who is now licensed as G6ECM and will be transferring his reportage to “VHF Bands”.

Appeal

R. Taylor (Bolton) has a problem in that he reckons his SR-550 is rather dead on 21 and 28 MHz — so he would like to hear from anyone who has successfully modified one of these receivers. As far as the writer is concerned, one needs to sound a note of warning: before modifying the front-end of the receiver, be quite sure you have a problem, and even more certain that you have the right solution! A pretty good test for any receiver on 21 and 28 MHz is to twiddle the aerial trimmer, or preselector, control on the front panel, with aerial feed disconnected, and listen to the,
'sharsh' coming out of the speaker. You should be able to 'peak' it; easy enough on the lower bands, but a stiff test on the two higher bands, and the peak will be only just audible, if at all, on 28 MHz. If the receiver meets this test, resolves SSB and CW satisfactorily (maybe with the AGC off), and works well enough on 40, then you will do well to confine yourself to improving the cooling. Drilling holes in the chassis helps a lot, as the underside of a pan-shaped chassis is a good heat trap! Make sure before you start to drill that there's nothing in the way; and stick a bit of masking tape underneath where the hole comes through. Drill the hole and remove the tape with all the swarf stuck to it. A little of this and a cropping-open of the lid will help no end — most cabinets/chassis seem to be designed on the idea that hot air won't rise! The sooner you can get the air warmed, rising, and flowing out of the cabinet, the sooner you'll get the thing to settle down to a stable temperature and hence no more drift.

**Contest**

Our pleasure to mention once again the White Rose club's second SWL contest; noon January 23 to noon on January 24, listeners to be on for 18 hours out of the 24. Bands 1.8, 3.5, and 7 MHz, and they deprecate the practice of logging all the stations who call someone; so the same entry in the 'station worked' column must not appear more than ten times on any one band. No CQ or QRZ or similar calls to be logged. Score one point for a station heard on a band from within one's own continent, five points likewise for a station outside one's own continent. Total points so amassed should be multiplied by the number of countries heard on each band added together. Logs to show: date, time, band, station heard, station being worked, report at SWL's QTH, and if you are claiming both ends of a contract, then both calls must appear in the 'station heard' column. W, VE, VK, ZL suffixes, these indicate the station was operating from some other location and so they both count.

**Mrs. T. Parry (Blackpool)** has had to move home — not very pleasant with a tiny baby to cope with as well — and so of course most of the possessions, including the receiver are in store until the problems can be resolved. All we can say is that we hope things sort out soon, and send out best wishes to Tina, the OM, and the youngster.

Poor J. Worthing (Shrewsbury) — his September entry missed the 'bus, but at least it did get here and he can now stop wondering where it went! This is not usually a problem from the SWL's point of view, in that most seem to keep carbons or an overall list from which they can check — but to have to write up a four-figure score...

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**ANNUAL HPX LADDER**

Starting date, January 1, 1981

<table>
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<tr>
<th>SWL</th>
<th>PREFIXES</th>
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<td>G. Caselton (Orpington)</td>
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200 Prefixes to have been heard since January 1, 1981, before an entry can be made. Entries in accordance with HPX Rules, (see p. 365, September 1981 issue).

Winner of the first White Rose A.R.S. SWL LF bands contest was Paul Tiltenser (centre). On the left is David Whithaker, BRS25479, contest organiser; chairman of the White Rose club, David Magguror, G4IDM, is on Paul's left. Their second SWL contest is scheduled for January 23/24.

All over again would be a bit of a bind. So — glad the list arrived! Always something new in the letters from H. M. Graham (Chesham); in response to the comments last time about QSLs, Maurice checked his own lists and found his return rate was 73% — a bit above average, but he uses IRC's or an s.a.e. with his reports, and also, we guess, sends out the sort of report the transmitter likes to see and read. Changing tack again, Maurice mentioned a Pestilence in his new QTH in the form of a nasty noise every so often; it has now all but disappeared most of the time, but does crop up occasionally with much louder bursts now. It sounds to this writer that some poor old thermostat is on its last legs and spending most of its time welded solid; so the next move is to check the fire insurance, be sure it isn’t in one’s own patch(!) and await the arrival of the fire-engine!

The first entry from N. G. Jennings (Rye) is with an interesting letter; Norman seems to have made his start before Hitler’s War and in those far-off days had a Yaesu 7700 and ATU, plus a trapped vertical which seems more effective than the old end-fed wire. One problem is, at 73, a little deafness sometimes causes half of a QSO to be not copied — something for which a pair of headphones is probably as good a cure as any.

Next we come to J. Doughty (Bloxwich) who missed the deadline last time round; John has been enjoying the little bit of summer there was, and working hard as well, which accounted for his absence; but he is still active, as his list shows, and getting quite a bit of fun from SWL contesting and listening to 28 MHz.

We are put to rights this time by N. Neame (Lancing) who refers to our comments on the Hambander and the Commander. Nigel says the Hambander was a basic Rx with a mixer, IF, Det/AGC, and output stage, which was intended to be used with a two-valve pre-selector sold as an accessory. The receiver based on the R.1155 was a different animal altogether, called the V55R. The Hambander had a regenerative IF stage for a bit of extra selectivity and to act as BFO — common in those days among the more basic receivers. As for the Radiovision Commander, Nigel reckons this was years ahead of its time, and worthy of house-room to even today. Thanks for the convention to our somewhat weed-encrusted memories of those early years.

M. Evans (Llanbradach) is a sixth-former studying for a couple of A-levels who has a family background in amateur radio going back to Dad's R.1155 receiver in the sixties. However the present set-up for Martin shows an R-300 fed from a separate DC PSU to reduce the hum in the receiver's own PSU, an ATU, dipoles for 14/21/28 MHz, an attic long-wire, and a mast-mounted Joystick;
**HPX LADDER**  

*All Time Post War*

**SWL PREFIXES**

**PHONE ONLY**

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<tr>
<th>Prefix</th>
<th>Callsign</th>
<th>Score</th>
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<tr>
<td>B. Hughes (Worcester)</td>
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<td>F. D. Barnes (Cardiff)</td>
</tr>
<tr>
<td>S. Foster (Lincoln)</td>
<td>2166</td>
<td>D. J. F. Gordon (Chepstow)</td>
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<td>E. W. Robinson</td>
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<td>Mrs. R. Smith (Nuneaton)</td>
<td>1755</td>
<td>P. Eggeman (Borehamwood)</td>
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<tr>
<td>M. J. Quintin</td>
<td>1532</td>
<td>J. M. Short (Thornbury)</td>
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<tr>
<td>(Wotton-u-Edge)</td>
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<td>J. Singleton</td>
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<td>B. L. Henderson (Ryde, IoW)</td>
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<td>B. A. Payne (Leeds 18)</td>
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**CW ONLY**

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<td>A. Rowland (Bude)</td>
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<td>D. J. S. Williams (Romsey)</td>
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</tbody>
</table>

Minimum Score for entry: 200 for CW, 500 for Phone. Listings to include only recent claims and are in accordance with HPX Rules. A 'Nil' return is permissible in order to hold a place.

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S. Foster (Metheringham) missed Donington; he took the family to Suffolk for half-term instead. He notes the comment from G. W. Raven last time about that HHON operation from Navassa. It seems Navassa is still US territory so the Haitian prefix was a try-on; and if the Americans were to cede Navassa it would disappear as a country for DXCC anyway, not by being the requisite distance from Haiti. So — you can't win!

F. C. D. Barnes (Cardiff) has been kept away from SWL activities by decorating and gardening, and by the fact of having just got hold of an HQ-180 receiver that needs some work doing to it; but having used one in good condition, there is the thrill of anticipation over pleasures to come.

M. N. W. Thornton (Romford) has been kept away from his shack by holidays and the rest, not to mention a first grandchild to fuss over. However, Michael reckons to be back in the hunt by the time this comes to be read.

A starter list comes to hand from N. T. P. Lewis (Swansea); some 227 prefixes sorted out by an R-1000, plus ATU and end-fed wire aerial.

Another first entry comes in from K. Cooke (Cardiff) claiming 263, but with no details on the gear used.

Yet another new one is entered by T. Kirby (Cheltenham) who has a Sony ICF-2001, used either with a wire aerial in the loft, or the built-in aerial; the best reception seems to have been on Ten.

Not too much news, says B. A. Payne (Leeds) save that he has now made it to G4MLN — and your scrib can report hearing him round his neck of the woods with a very fine signal.

B. Henderson writes this time from 'digs' in Ryde, I.o.W. where he has been moved as a result of reorganisation by his employers. The snag is that although he has got a cottage on the Island, the educational needs of the family result in them and the XYL having to stay in Salisbury for another year at least — not to mention knocking Brian out of the Salisbury RAE class! However, he should have taken the December RAE before you read this, so we have fingers crossed for his success.

J. Singleton (Skelmersdale) sometimes uses his FT-767 from the family canal-boat at weekends, with a three-foot aerial out; this makes him a /M, as the /MM is used for estuary, tidal waters, or dock, or on the open sea. Most of the listening seems to have been on Ten and there is some fair DX to be had when the band is open on Joe's set-up.

B. F. Hughes (Worcester) spent three days at the Donington exhibition, and reckoned it was a good venue. There's dedication and enthusiasm for you!

Our last letter comes from P. Lincoln (Aldershot) who whose score we managed to leave off the last HPX ladder. Sorry Peter! However, this time he has better luck, and some 430 prefixes make a good start. On our side, we must thank him for the nice words about this column.

**Others**

As always, some few just sent in scores, possibly with a very brief covering note. These included N. Beadsworth, Londonderry; A. Rowland, Bude; N. Askew, Coventry; M. Rodgers, Harwood; Mrs. R. Smith, Nuneaton; G. W. Raven, London SE13; M. Law, Chesterfield; L. Stockwell, Grays. Thanks to one and all, and keep 'em rolling in, please!

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**Finale**

It just remains now to thank you all very much for your support through 1981, and for your kind Christmas and New Year Greetings. Each one was greatly appreciated.

Deadline now — and it is January 21st, 1982, for the March piece, with your closing scores for 1981 if you are on the Annual Ladder, and we will take the first scores for the 1982 HPX Table when you send us your March offering. The address of course is to your J.C., "SWL", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.
"BEN" — THE LITTLE TRANSCEIVER FOR TEN, PART I

A SIMPLE, LOW-COST QRP TRANSCEIVER FOR THE NEW 10.10 to 10.15 MHZ BAND. MAKES AN IDEAL FIRST SUPERHET TRANSCEIVER PROJECT FOR ANY CONSTRUCTOR

REV. G. C. DOBBS, G3RJV

RUMOUR has it, at the time of writing (and now confirmed — Ed.), that the new 10.1 to 10.15 MHz amateur band will be available for use after January 1st, 1982. Rumour also has it that, in line with the ARRL recommendation, this small band will be unavailable to single sideband users and kept free for contests. This adds up to a useful little band, in a convenient part of the radio spectrum, which may prove ideal for low powered amateur radio operation. With this in mind, I set about building a transceiver for the band so that on January 1st, 1982, at 0000z, my eager sweaty hand can be poised over a Morse key to be in there from the first.

Readers who have followed my previous offerings to Short Wave Magazine will probably expect that I am to launch into describing a direct conversion transceiver akin to the S.C. Deluxe. Sorry to be unpredictable, but the transceiver about to be described is a superhet with crystal filter and crystal mixing. This approach is not to abandon the "kitchen table technology" approach. Ben is a simple transceiver, using easily and cheaply available parts and can be built without difficulty by the average amateur. No special tools are required and the only essential item of test gear is a multimeter, although a general coverage receiver is useful. The whole of the prototype Ben was built using my stock of components which is the result of careful buying of standard components from radio rallies and other cheap sources.

Fig. 1 shows the block diagram of the transceiver. A quick glance will show it is a typical superhet CW transceiver, with transmit and receive sections running from a common variable frequency oscillator offset by the intermediate frequency. One of the problems about Ben is that as the band is not part to build. Once the receiver is working, the constructor is for the receiver. In any transceiver the receiver is the most difficult part to build. Once the receiver is working, the constructor is "home and dry" because the transmit circuitry is much more simple. One of the problems about Ben is that as the band is not yet available for use at the time of writing it has been "used in anger". My simple test bench set up seems to show that it is on a par with the receiver in the little 20m transceiver mentioned above and I have heard a lot of DX on that receiver. It certainly picks up a lot of teleprinters where the band is going to be! The receiver is a lot more simple to build than might first appear and the results from the prototype were pleasing.

The Receiver

This first part of the description of Ben contains the circuitry for the receiver. In any transceiver the receiver is the most difficult part to build. Once the receiver is working, the constructor is "home and dry" because the transmit circuitry is much more simple. One of the problems about Ben is that as the band is not yet available for use at the time of writing it has been "used in anger". My simple test bench set up seems to show that it is on a par with the receiver in the little 20m transceiver mentioned above and I have heard a lot of DX on that receiver. It certainly picks up a lot of teleprinters where the band is going to be! The receiver is a lot more simple to build than might first appear and the results from the prototype were pleasing.

The Circuit

The full circuit of the receiver is shown in Fig. 2. At first glance the less experienced constructor might think that there is a lot of it. However the whole receiver is built up in sub-board sections, and each board can be built and tested in its own right and the constructor who is capable of building simple circuits like the S.C.D. series should find Ben no problem. In fact it represents a good circuit for those perhaps considering a first attempt at superhet construction. Let us follow the circuit through the various boards from the aerial to the audio output.

Fig. 1 "BEN" TRANSCEIVER BLOCK DIAGRAM

Hz bandwidth 9 MHz crystal filter; the receiver sounds nice, but so it should with a £25 filter. Ben uses the familiar old, and sadly sometimes forgotten, amateur technique of taking something that is cheaply available and pressing it into service. The IF filter and the associated crystals for the BFO and the transmit mixer oscillator are likely to be the most expensive items, so that the starting point for Ben was to look for a cheap alternative.

True amateurs prick up their ears when they hear of anything which is becoming commonly and cheaply available for their possible use. Hence in recent years some amateur comment has been around about the various crystals used in computer and television applications which are cheaply and readily available. The commonest and the cheapest seem to be the 4433 kHz ones available new and surplus as European TV colour burst circuit crystals. Don't ask me what they do — I steadfastly refuse to understand anything about the circuitry of television sets, so that when people approach me saying "You know about radio and things... can you have a look at my television?", I can look them honestly in the eye and say I don't know anything about it. I rent my set! But back to Ben...

The transceiver makes use of these crystals for a simple crystal filter, the BFO and the transmit mixer oscillator. They are available from a wide variety of sources, so check carefully, £1 each would be a high price to pay. At a recent rally I saw a large box of surplus TV PCBs with one on each at 20p. Although I already had quite a few of the crystals I bought a board because some had them in the small HC25u mounting; the most commonly available ones are in HC6U mountings.

The Receiver

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The first board is the band pass filter board. This is merely three tuned circuits at the aerial input frequency loosely top coupled by the two capacitors C1 and C2. Three stages of input tuning may seem a luxury in a simple receiver, but poorly tuning the front-end of a receiver is, in my experience, a corner not to cut. The coils are very simple to wind on inexpensive formers. The input coil L1 has a small input winding to match the 50 ohms from the aerial and L3 has a tapped output to match it into the gate of the dual gate MOSFET RF stage. The three trimmers are used to set the coils on frequency in the centre of the band, the 50 kHz of the band can be covered without manual front-end tuning.

The RF/Mixer/IF board forms the heart of the receiver and is the largest board. TR1 is a conventional dual gate MOSFET RF amplifier. A gain control could have been added to this stage but was thought unnecessary as an IF gain control is used in a later stage; TR2 is a simple dual gate MOSFET Mixer stage. The input from the RF stage is fed into the gate 2 and the variable frequency oscillator is fed into gate 1; the VFO operates 4.433 MHz below the input frequency and the signal difference is tuned out at the drain of TR2 with L5 and C9. Both TR1 and TR2 are named as the 40673, but in the prototype the cheap equivalent of this device sold by J. Birkett of Lincoln was used. I don't know how these compare in use with a more expensive 40673 because these cheap versions are all I ever use.

The VFO is a familiar circuit. Like all good VFOs it is an old and faithful friend. I had problems with VFOs until I used this circuit... sounds like a television commercial for a patent medicine, but it does sum up my reasons for repeating this circuit. It is the Hachett JFET Sieler oscillator beloved of writers in America, G3RJV and a lot of constructors in the G-QRP Club. A full description of it was given in "The S.C. Deluxe" in Short Wave Magazine, May 1981. All that needs to be said is build it like Table of Values

Fig. 2

| R1, R5 | 150K |
| R2, R13 | 22K |
| R3 | 330R |
| R4, R17, R25 | 1K |
| R6, R20 | 100K |
| R7, R15 | 2.7K |
| R8 | 82R |
| R9 | 5.6K |
| R10, R23 | 3.3K |
| R11, R22 | 10K |
| R12 | 2.2K |
| R14 | 1M |
| R16 | 82K |
| R18 | 47K |
| R19, R21 | 100R |
| R24 | 56R |
| R26 | 27K |
| R27 | 470R |
| C1, C2 | 6.8 pF |
| C3, C4, C7, C15a, C17 | 0.1 pF |
| C24, C30, C32 | 0.1 pF |
| C5, C8, C13, C14, C16, C21, C25, C31, C33, C34 | 0.01 pF |
| C9, C15, C23 | 400 pF |
| C10, C11, C12 | 100 pF |
| D1, D2, D3 | 1N914 |
| ZD1 | 9.1v. zener |

Coil winding data: L1, L4 = 25t 30 s.w.g. (primary 4t); L2, L5, L7, L8 = 25t 30 s.w.g.; L3 = 25t 30 s.w.g. (tap at 17t); L6 = 25t 30 s.w.g. centre tapped (secondary 6t; 3t either side of c/t on main winding). Note: All coils are wound on 1/16" dia. formers with slugs in screened cans.

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a tank and it will work without problems. The actual coverage required for the full band is 5.667 MHz to 5.717 MHz.

The filter and IF stage is the section of Ben which contains the most compromises, but the final circuit is simple and seems to work surprisingly well. The circuit shows that a single crystal is used for the filter. The immediate question must be... if these crystals are so cheap, why not use several of them for a better filter? Ladder filters, back ladder filters, series filters and so on were all considered and some were tried. But whenever more than one crystal is used in a homemade filter the selection of suitable crystals with appropriate relationships to the centre frequency requires test equipment of a standard that many amateurs do not own and a good supply of spare crystals for the selection process.

The filter used in Ben, like most of my circuits is a mixture of plagiarism and experimentation. What has emerged is a cross between the old HRO crystal filter and the filter used by Doug DeMaw, W1FB, in his “Mini-Miser’s Dream Receiver”, QST, September 1976. I well recall the crystal filter in my old HRO with its single crystal and phasing control, and the circuitry around X1 and VC1 is very similar. A crystal offers low impedance at its series resonant frequency, a very high impedance at its parallel resonant frequency and quite a high impedance at all other frequencies: this is the stuff of crystal filters. This simple filter cashes in directly on these effects. When the series resonant frequency of X1 is that of the incoming frequency it forms a sharp acceptor circuit. The phasing control, which balances out mounting and circuit capacitances governs the parallel resonant frequency. I have no means of accurately checking performance of a filter, except for a pair of ears, but this type of filter can have a bandwidth of 1 kHz at the nose, and the rejection notch, which can be moved through the passband with VC1, can be some 40dB.

What that really means is... fiddle about with it and it works very well for what the circuit contains, but more of that when the construction is discussed.

The IF amplifier does follow the DeMaw circuit, which is the basic Motorola application circuit for the MC1350P, but using AGC input as a manual gain control line. (The reason for using a 1350 IC for this stage is that J. Birkett has been selling them for 50p each.) It proves to be a useful little device able to offer up to 40dB of gain with little noise. RV1 provides a manual IF gain control: as the slider is moved towards the 12 volt line the gain of the 1350 decreases. This is because the AGC pin of the IC is being used, so when wiring RV1 remember that R9 is at the maximum end of the IF gain control. The output of the IF amplifier is tuned by L6 and C15 and the secondary winding of L6 couples into a simple two-diode demodulation mixer circuit, formed by RV3, D1 and D2. R11 provides a load and RFC3 and C16 filter out the RF component of the signal.

Remember tuned anode, tuned grid, oscillators? Well, the BFO circuit is the FET equivalent. X2 is another 4.433 crystal and a trimmer, CT5, of quite high value serves to pull X2 to give the required beat note.

The audio stages, TR3, TR4 and TR5 follow another tried and tested circuit. This in fact is the audio amplifier used in the S.C. Deluxe (Short Wave Magazine, July 1981, which gives a full description of the circuit). TR3 and TR4 are a complementary pair of low noise transistors and TR5 is the same type as TR3. The line-up of BC318/BC321/BC318 works extremely well in this circuit, but there are many other similar transistors which would serve the purpose. The circuit gives more than adequate gain and will match into headphones of any impedance over about 80 ohms. There are many surplus headphones available with impedances in the hundreds of ohms and these work very well
with this circuit; I use a surplus pair of language lab type headphones.

**Construction**

So much for the circuit, what about the construction? Although I consider myself to be quite an experienced constructor I still build all my equipment in small sections, each capable of individual testing. Building a large circuit board only to find that it does not work can be very frustrating, so for peace of mind, the little-bit-at-a-time method of construction is better. With receivers, begin at the back and work to the front and with transmitters begin at the front and work to the back. So with the Ben receiver I began by building the audio amplifier.

Ben was built on homemade printed circuit boards. Many amateurs new to construction flinch at the thought of making printed circuit boards. In fact once the first few boards have been made it becomes second nature to mark out and etch PCBs. I use cheap offcuts of fibreglass copper-clad board and mark them out with normal spirit felt pens; I rarely buy the special, and expensive printed circuit board pens. It is quite possible to build up all the boards in Ben on perforated circuit board: I refer to the 0.1" matrix boards, like Veroboard but without the copper tracks. I would not advise Veroboard with copper strips for RF circuit boards, the unused copper strips seem to be asking for trouble. Some experienced Veroboard users do use the board for high frequency work and cut the tracks short, using spare unused track as an earth mat, but this seems harder work than etching PCBs.

Fig. 3 shows the layout of the audio amplifier board. My board is quite small, but constructors can adapt the same layout with wider spacing. The audio amplifier uses tantalum bead capacitors. The audio amplifier uses tantalum bead capacitors.

The RF/Mixer/IF board (Fig. 4) appears to almost break the rule about building "a bit at a time" as it is quite a chunk of circuitry. However the stages were built one at a time, beginning from the output. The coils L4, L5 and L6 are wound on surplus 1/8" diameter cores with slugs each in their own small screened can. These are readily available as surplus items from a variety of sources including J. Birkett. The coils are mounted vertically on a plastic base with either 5 or 6 pins. Stiff wires can be soldered onto these pins to run parallel with the former and the ends of the windings can be soldered neatly onto these vertical wires. The full coil winding information is given in the coil winding table. L6, the first coil to be mounted on the board, is probably the most difficult to wind. It consists of a single winding of 25 turns with a centre tap. Half way through making this winding pull out about 1 1/2" of wire, twist the loop, scrape off the enamel and solder the bare wire and then complete the winding. The secondary winding consists of 6 turns wound over the centre of the first winding; the 6 turns are arranged with three each side of the tapping point.

The first section of the board to build is the circuitry from RFC2 to the output C17. The two RF chokes have a value of about 1mH. Suitable chokes can be bought, the ones in the prototype were home-wound on some unknown ferrite toroid formers. These were bought as surplus items and are about 1/2" outer diameter and painted red. About 25 turns of thin gauge copper wire wound on these formers seems to give a suitable inductance for all three RF chokes on this board. (With the exception of RFC1, it might also be possible to make do with the old dodge of winding as many turns as possible onto a ferrite bead to make inexpensive chokes.) The circuit construction follows conventional lines, but notice that D1 and D2 are mounted vertically from the outer ends of the preset RV3. RV3 is a horizontal PCB preset with the tag to the slider bent parallel to the track, mounted vertically, upside down! When this amount of wiring has been completed, a simple test can be applied by connecting the output via RV2 to the audio board. Listen to the amplifier alone, then apply power to the IF stage and an increase in noise should be noticed. The noise should not be great, but will increase and decrease with the operation of RV1. Before the rest of the RF/Mixer/IF board is completed, it is a good idea to build the BFO board; the layout for this board is shown in Fig. 5. The circuit is simple to build and should give no problems, a good idea is to earth the metal can of the crystal X2, with a soldered lead to reduce stray radiation. Note that C23 is mounted under the circuit board directly across the coil L7, this applies to all the capacitors used to tune windings in this receiver. In the prototype receiver small polystyrene capacitors were used for C9, 10, 11, 15 and 23 to enable them to fit under the board, but silver mica types are also suitable. The BFO can be tested by listening for its signal on a receiver which tunes 4.433 MHz or, if you are lucky enough to have one, it can be checked on a frequency counter. CT5 should give a little over 1 kHz of shift, enough to produce a beat note in the 4.433 MHZ IF. If a signal generator is available it can be used to test the IF stage and BFO by injecting a
signal at the junction of C12 and RFC2. Set the signal to 4.433 MHz and it should be possible to adjust CT5 to give a beat note from the audio output.

The IF filter, L5, C9, X1 and VC1, can now be built. VC1 in the prototype was an airspaced trimmer with a nominal value of 11pF, but a compression trimmer or even a variable capacitor with a shaft would do the job. The case of X1 was earthed with a soldered wire and this seemed to remove any need for screening around the filter section. It should be possible to inject a signal at 4.433 MHz into L5. If this can be done L5, L6 and VC1 can be adjusted to give the desired signal output peak. Try tweaking VC1 and swinging the input signal either side of the nominal IF frequency to see what difference in selectivity can be had. This is only a first check as the final adjustments cannot be done until the whole board is completed. The mixer stage around TR2 can now be built.

After the mixer has been wired onto the board the next task ought to be to build the VFO. The layout for the VFO is shown in Fig. 7. This is my “Sunday Best” layout for this circuit. I have built this circuit many times and this is the neatest layout I use. Beginners may find it too small, if so make it larger but the layout plan can still apply. The important thing is to build it robustly. L8 is calculated to give the required coverage with just a little core inserted in the former. Cores can be a source of drift in VFOs, but usually they are no problem if the minimum of core is inserted in the coil. The components likely to give trouble and cause drift are those around the tuned circuit, especially the capacitors C26, 27, 28 and 29. NPO ceramic types are ideal if you can find them, but polystyrene types serve very well and should produce a good stable VFO. The VFO should be mounted in a stout screened box with rigid wiring and should be built for “drop testing from 30,000 feet”! More often than not a drifting VFO indicates poor construction. VC2 may be fitted with a simple 8:1 reduction epicyclic slow motion drive. Test the output on a receiver or frequency counter.

With the VFO built, and the RF/Mixer/IF board built as far as L4, it is possible to give a receiver test by injecting a 10.1 MHz signal into the primary of L4. If a signal generator is not available an aerial can be coupled into L4. Prior to the band being available for amateur use, there was not a lot of interesting signals when I listened, but several loud teleprinters could be heard and some CW. Although final adjustments of VC1 and L5 could be made, it is better to complete the whole receiver first; this should present no difficulty. The RF stage TR1 is conventional and simple. The band pass filter board shown in Fig. 6 is also straightforward. Again the layout is compact, but can be scaled up if required. The Mullard semi-airspaced capacitors were used for CT1, 2 and 3; and C1 and 2 are small dipped mica capacitors. The receiver is now complete and can be tested as a whole.

**Testing the Receiver**

The way not to test it is to scatter the boards around a bench and interconnect with long leads. It may be that testing is required before the receiver is mounted into a case, if so do it as neatly as possible. I sometimes screw boards for testing to a scrap metal panel and I keep a spare front panel metal strip with several 1/4” holes for control mountings. This enables bench testing to take place without problems which may not be attributable to the boards. Scruffy testing can be a source of trouble. If a signal generator is available the testing of the receiver is easy; without a signal generator it is a little more fiddley. The first check is to ensure that the VFO is covering the required frequency range. This can be done with another receiver tuning the VFO frequency or a frequency counter. If the receiver is being tested without a signal generator, a signal will have to be found on the band using an aerial at the input. Once a signal has been detected, the coils are all peaked to give maximum output, and CT1 to 3 are used to peak the signal. A CW signal is required to set the filter using the technique as for a signal generator.

Using a signal generator, the setting of the receiver follows the usual procedure. Inject a small signal into the input and peak up the output working from the IF stage to the front of the receiver. Adjust RV3 to produce the optimum output, set the cores in L6 and L5 and adjust CT1, 2, and 3 for maximum signal. The BFO trimmer CT5 can be adjusted to give the required beat note. The setting of the filter requires some trial and error; L5 seems to affect the operation rather more than any other adjustable factor and will probably give the best results set a little below the IF frequency. VC1 is adjusted in conjunction with the core of L5 until tuning around the signal produces the required degree of selectivity. This sounds a very subjective process, and in practice that is how it proved, but a little patience and effort can produce good results from this simple filter.

The receiver is now completed and needless to say, with a change in the tuning range of the VFO and suitable wound coils in the front end, this circuit could be adapted for other frequencies. Part II will describe the construction of the transmit circuits for Ben — the easier bit.

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CLUBS ROUNDUP

By "Club Secretary"

DESPITE deletions for lack of updates this time, we still have plenty to mention. Before we dive in, may we ask readers to note our comments in the MCC report on p. 609, and try and organise debate on the question with a consensus view being sent to your scribe, who will collate all views received before passing them to the Contest Committee.

The Clubs, In Brief

Acton, Brentford & Chiswick have the AGM on January 19, 1982, at Chiswick Town Hall, High Road, Chiswick. A.R.M.S. caters for the keen /M operator or SWL. The details can be obtained from the Hon. Sec. —see Panel.

At Ashford they are at the top of Hart Hill, near Charing in Kent, every Tuesday evening; no formal programme but lots going on.

Aylesbury Vale have their AGM on January 26 at Elmhurst Youth Centre, Fairfax Crescent, Aylesbury. Latest news from the Hon. Sec. —see Panel.

On to Barking who have Mondays to Thursdays at Westbury Recreation Centre, Westbury School, Ripple Road, Barking, Essex, the 'main' meetings being normally on Thursdays. High spot is January 28, for the AGM.

Barry College of Further Education have their Hq in Weycock Cross Annexe, next door to the zoo, every Thursday; talks and other activities are arranged and when possible.

The locals foregather at ‘The Angel’ in Bolsover; it seems to be a weekly effort with something special fixed up once or twice a month. For the rest, quiz the Hon. Sec. —see Panel.

Borders Hon. Sec. found himself writing a quick alteration so that we could advise that they are no longer to be found at the usual place, and that a search is going on for a new Hq. Latest details on the state of play from the Hon. Sec. —see Panel.

At Bournemouth there is a new Hon. Sec.—see Panel—and a note of a new Hq; the first and third Fridays at Kinson Community Centre, Pelhams, Millhams Road, Kinson, Bournemouth.

The first and third Mondays are down for Braintree, and the venue is Braintree Community Centre, Victoria Road, next to the bus station.

Brighton have an Amateur TV Night on January 13, and what they call an ‘RSGB Night’ at which we gather they will have a speaker from Hq. They meet at 47 Cromwell Road, Hove, Sussex.

It seems quite a while since we last heard of Bristol City RSGB group; they are based on the Queens Building, Bristol University, and have their AGM on January 25.

At the recent AGM of the B.A.R.T.G. a new Hon. Sec. was elected, and his details appear in the Panel. This club is the one for those readers interested in radio teletype activities.

Now Cambridge, where the Hq is at the Visual Aids Room, Coleridge Community College, Radegund Road. They have a regular Friday evening session, and are always on the look-out for new members.

Chelmsford's Hq is Marconi College, Arbour Lane, where they foregather on the first Tuesday of each month. For January they have a film show—but we wonder about the December effort entitled “Junk Sale or Chinese Take-away”!

The Cheltenham crew will be looking at Dud Charman's, G6CJ, famous Aerial Circus video tape on January 7, and this will no doubt be the main topic on 19th's natter night. The meeting-place is the Old Bakery, Chester Walk, Clarence Street.

The place for Chesham is the Whitehill Centre on the second Wednesday in each month; January 20 is a chat on Raynet by G4BSM.

The Spitfire Social Club, Tangmere, is now the Hq for the Chichester gang, where they have the first and third Mondays booked.

Every Friday evening the Clifton club foregather at the New Cross Inn, which lies at the junction of New Cross Road and Clifton Rise, London; January 15 is set apart for a contest discussion.

Always looking for new members are the Cheshunt group, according to their chairman; they are to be found on any Wednesday at Church Rooms, Church Lane, Cheshunt. This is just north of the Berni Inn on the A1170 road from Broxbourne.

Next we head for Chiltern where January 27 is down for the AGM; this is at the John Hawkins’ furniture works, Victoria Street, High Wycombe, off the main Oxford Road.

The Colchester Hq is Colchester Institute, Sheepen Road. January 7 is for G3PED to talk about the electronic keyboard; and on January 21, G3WRT will be talking about the local repeater, GB3CE.

The Conwy Valley club revival continues apace with new members showing at almost every meeting; find them on the second Thursday of each month at Green Lawns Hotel, Bay View Road, Colwyn Bay. We have it that a programme is fast being pulled together at the time of writing, and it will doubtless be completed by the time this reaches you.

Deadlines for “Clubs” for the next three months—

February issue—December 31st
March issue—January 29th
April issue—February 26th
May issue—March 26th

Please be sure to note these dates!

Cornish have a remarkable record; bearing in mind that they have to be to a large degree self-supporting in the programme direction, they seem to have been pulling full capacity houses for as long as the writer can recall, with 60 attendances the norm. Find them at the SWEB Club Room, Pool, Cambourne; and for this month the date is to be January 7, when G3WKP will be talking about ‘Beetling around Africa.’

On to Crawley and the United Reformed Church Hall at Ifield, January 13 is informal—which is a visit to a member’s home—and January 27 for the AGM.

There is a slight change to be noted for Cray Valley; January 7 is a natter night, and on 28th G3FWI will be talking about television outside broadcasts, at Christchurch Centre, High Street, Ewell.

We now head up to Derby and 119 Green Lane, where the club has the top floor complete, and use it on Wednesdays. We see January 6 is a junk sale, with films on 13th. A visit to British Midland Airways at E. Midlands Airport is down for 20th and January 27 for the AGM.

The second Tuesday in each month is the date for the Edenbridge members to head for the Women's Institute Hall, Station Road, where they are booked into the Conference Room. The second and fourth Thursdays, at Watling Community Centre, 145 Orange Hill Road, Burren Oak, is booked by the Edgeware group. January 14 is the AGM and there is an informal on 28th.

Next we have the Ex-G Club; as its name implies it is for those of British nationality or naturalisation, who are domiciled abroad. The details may be obtained from the U.K. Hon. Sec. at the address in the Panel.

We must now head for Exmoor (January too—Brrrr!) and in particular to Loughrigg, East Street, South Milton, every
Thursday evening, and we have it that they have various activities planned. We go north of the border now, to Glenrothes, but sad to say.

The Farnborough group are to be found at the Railway Enthusiasts Club in Hayle Lane on the second and fourth Wednesdays; January 13 is a talk by Messrs. Wood & Douglas, and on 27th G3ZUM will talk about his prize-winning amateur ATU.

The letter doesn’t give us any more details; so we refer you to the Hon. Sec. for the information.

Now Guildford where they are found on the second and fourth Friday evenings at the Model Engineer’s Hq in Stoke Park. Details of the rest from the Hon. Sec. — see Panel.

January at Harrow goes like this: no meeting on 1st, and on 8th a talk by British Telecom on their Radio Phone and Radiopagers. There follows a film show on January 22, with informals on Friday evenings at the Model Engineer’s Hq in Stoke Park.

Now let’s go to Hastings where the third Wednesday of each month is the formal at West Hill Community Centre, High Road, Harrow Weald.

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on Monday evenings there is a computer group at the same place.

At Havering the venue is Fairkytes Arts Centre, Billet Lane, Hornchurch; January 6 is the AGM, and they are there every Wednesday evening in addition. It seems the Hon. Sec. at Hereford was struck by lightning (or rather his house was) which made the shack look as though a grenade had gone off in it. Nonetheless, he still got the newsletter out, and we see they are still at County Control, Civil Defence Hq. Gaol Street, Hereford, on the first and third Friday of the month. At Horndean, the Merchiston Hall, Horndean is the focus for the local club, every second Thursday in the month.

A change of Hq is noted by the Hull Hon. Sec., to West Park Recreation Centre, Walton Street, Hull; more details from the Hon. Sec.—see Panel. Next stop Ipswich at the “Rose & Crown”, on January 12, for an “Illustrated History of Suffolk” by Phillip Willis; and on 27th, there will be an explanation of the RAE by G8XYZP. There is often Morse practice on the other Wednesdays; and the pub is at 77 Norwich Road, Ipswich.

Over to E1 now, and IRTS; this is the EI equivalent of RSGB and should be able to give you all the gen if you are interested in amateur radio in any part of Eire. The Hon. Sec. is at the address in the Panel.

Next we have the Isle of Wight; look for the Sloop Inn, and then nearby you will find Unity Hall, Wootton Bridge; Tuesday evenings are for operating, and Friday evenings for a natter.

Into the Black Country now, and Kidderminster where we are given an update of the Hon. Sec’s address—see Panel. As we have no other details we must refer you to him.

At Kilmarnock & Loudoun they are now meeting at the Broomhill Hotel, London Road, Kilmarnock on the second Tuesday in the month—more details from the Hon. Sec, see Panel. Malvern Hills have their base at the “Red Lion”, Great Malvern on the second Tuesday of each month. Again, more from the Hon. Sec.—see Panel. January 7, at the Royal Ship Hotel, Dolgelau, is the date for the Meriton constructor’s contest.

Melton Mowbray on January 15 will have a talk on VHF DX by G8RBY, at St. John’s Ambulance Hall, Asfordby Hill, Melton Mowbray. A brief note from Mexborough says that they are still at Harrop Hall, Doldcliff Road, Mexborough on every Friday evening, for Morse, RAE, talks, films and whatever.

January 14 and 28 are the dates for Mid-Sussex; on the former we have no details but the latter is the AGM. The venue is Marle Place Further Education Centre, Leylands Road, Burgess Hill.

The Midland Hq nowadays is at 294A Broad Street, Birmingham, and we understand they will be there on January 19 for RSGB films.

Now we go to Gl, where Mid-Ulster is to be found on the first Sunday in each month chec G14BAC in Banbridge, Co. Down, the start being set for 3 p.m. The programme mentioned for the first part of 1982 seems a very good effort.

A change of evening falls now to be noted; the Mid-Warwickshire gang are now in session on the first and third Tuesdays at 61 Emscote Road, Warwick, starting at 8 p.m.

Pontefract look forward to their Component Fair on March 14 at Hq, but meanwhile they have January 7 for the AGM, and 21st for a junk sale. Find them on the top floor of Carleton Community Centre.

R.A.I.B.C. look after the interests of the blind and invalid radio amateurs and SWLs; and of course they could always do with some supporters and representatives—get the details from the Hon. Sec.—see Panel.

The St. Helens group has a place at the Conservative Club, Boundary Road, on Thursdays. We don’t have the current data, for which contact the Hon. Sec.—see Panel.

At Southampton it is again a weekly meeting, this time on Wednesdays, at Toc H, Little Oak Road, Bassett, Southampton.

Once in each month they have a lecture, with the remaining dates informal.

A change of Hon. Sec. is noted for South Birmingham, but they are still meeting at Hamptstead House, Fairfax Road, West Heath, Birmingham 31, and on January 6 have G4EQI talking about the workings of the RSGB Bureau. The club is open every Thursday and Friday as well.

The first Monday in every month sees the Southdown members heading for the Chaseley Home for Disabled Ex-Servicemen, Southcliff, Eastbourne. We don’t know what’s on for January, as the previous date was the AGM—but they have something lined up every month.

Now Stevenage; they have a Computer Evening on January 7, and a talk by G3WTV on the QSL Bureau on 21st. The venue is the Staff Canteen, British Aerospace Dynamics, Six Hills Way, Stevenage.

David Evans of RSGB is to show his versatility on January 4 at Surret, by talking (a) on RSGB, and (b) on GASFETS. The club also have an informal on January 18, and both are slated for T.S. Terra Nova, 34 The Waldrons, South Croydon.

Thames Valley have their base at Dittons Library, Watts Road, Thames Ditton, where January 5 will be taken by G3FTR talking about the time he spent in Russia.

Torbay meet monthly on the last Saturday, and every Friday as well, at Bath Lane, rear of 94 Belgrave Road, Torquay.

The Community Centre, Vine Street, WallSEND, is home to the Tynside club, where they may be found every Monday evening, with a varied menu of activities.

University of Kent, Canterbury get together on Wednesdays in Eliot Seminar Room 4, and they are often heard on two metres where S15 is a favoured chat channel. More details from the Hon. Sec.—see Panel.

Next we head for the Vale of the White Horse, where the card-index says the first Tuesday in every month at the “White Hart” in Harwell village. Firstly in the bar, with a shift upstairs to listen to the chairman’s talk on aerials.

The Wakefield group have alternate Tuesdays; this says January 12 for a talk on crime prevention, and 26th for a junk sale. The Hq is at Holmfield House, Denby Dale Road, Wakefield.

West Kent are to be found at the Adult Education Centre, Monson Road, January 8 and 22. The first date is for a talk on “System X and Beyond” by GB2CA, followed on 22nd by a junk sale. Informals are taken on the Tuesday of the week following the main meetings, at the Drill Hall, Victoria Road; both venues are in Tunbridge Wells.

Nice to hear from Wimbledon again; they now foregather at the St. Johns Ambulance Hall, Kingston Road, Wimbledon. The dates are the second and last Fridays—more details from the Hon. Sec.—see Panel.

The new Hq of the Wirral crowd is Minto House School, Birkenhead Road, Hoylake, on the first and third Wednesdays each month.

It is nice to hear that a club is increasing its attendances, the more so when one can recall it having been in the doldrums; Worcester can now boast that late-comers may have to stand—on the first Monday of each month at the Old Pheasant, New Street, Worcester.

The base for the Yeovil operations is Building 101 at Houndstone Camp; they have a videotape on January 7, called the Secret Listeners, and on 14 G3MYM will tell how to use JFETs. January 21 lets G3DSS talk about receiver front-ends, and on 28th there is a natter night.

Finally, York who are in session every Friday (except the third) in each month, at the United Services Club, 61 Micklelegate, York.

Finale

That’s it for another month; all your news and future programmes should be sent to your conductor, at SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts AL6 9EQ. Deadlines for arrival are as shown in the ‘box’.

608
1981 “MAGAZINE CLUB CONTEST”

THIRTY-FIFTH ANNUAL EVENT

By “Club Secretary”

HOW indeed have times changed over the last ten years or so! Only twelve clubs entered logs this time round, plus a couple of check logs. Clearly a rethink of the whole structure of MCC is required, for which a great deal of feedback from clubs is necessary, before we can run another contest to help fill the club calendar: but we can leave theorising for the moment in favour of reporting.

Those who did enter all had points to make, and in general the contest was as well-liked as of yore. The snag was just the lack of clubs actually taking part. The winners were Plymouth, G3PRC, making some 43 QSOs on the first evening and 112 on the second, of which 14 on the first night and 15 on the second were clubs, for a final score of 16344 points. This success makes them first winners of the MCC Cup — and we would like to think not the last. Anyway, congratulations to Plymouth! Whipping-in the locals had something to do with the length of their logs — they had a member with a /M Top Band station who went around all the likely lads and got them on the air to the tune of 18 QSOs they would not otherwise have made. Runners-up (and last year’s winners) Tyneside again used their tactic of going to their favourite contest site north of the border to net the extra points from the GM prefix. They also had a super aerial — 918 feet of it, supported on five masts and a handy tree, on a south-facing hillside, and with a maximum height of 55 feet. This put very strong lobes into the SE and the SW, and in the other directions seemed as good as the shorter wire of last year; the ground was made up of three quarter-wave radials plus several good long earth spikes. The logs were kept up to date by the use of a Commodore CBM 4030, which noted the time, said whether the QSO was a ‘multiplier’ and whether there was a duplicate contact; and at the end of the contest the calculations of scoring and totalling were also done, with the result being a very good log — G4HUX wrote the program for this, as a preliminary to use on other contests in the future. Someone had done their homework in the matter of silencing the RFI from the computer, as their photograph — alas not good enough for reproduction — shows the computer display in the background to the operational station. They made 44 contacts on CW and 103 SSB.

At the other end of the list were Grimsby, who made 13 CW and — oddly enough — twice that number of SSB as G3CNX.

Results — 35th MCC

<table>
<thead>
<tr>
<th>Place</th>
<th>Club Name &amp; Call</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plymouth (G3PRC)</td>
<td>16344</td>
</tr>
<tr>
<td>2</td>
<td>Tyneside (GM3ZQM/P)</td>
<td>13992</td>
</tr>
<tr>
<td>3</td>
<td>BBC, Pebble Mill (G2BBC)</td>
<td>9119</td>
</tr>
<tr>
<td>4</td>
<td>Swansea (G4I0I)</td>
<td>8570</td>
</tr>
<tr>
<td>5</td>
<td>Edgeware (G3ASR)</td>
<td>6949.5</td>
</tr>
<tr>
<td>6</td>
<td>Pontefract (G3FYQ)</td>
<td>5717</td>
</tr>
<tr>
<td>7</td>
<td>Sutton &amp; Cheam ‘A’ (G2DMR)</td>
<td>5058</td>
</tr>
<tr>
<td>8</td>
<td>Sutton &amp; Cheam ‘B’ (G4HSD, G4CMU/A)</td>
<td>4296</td>
</tr>
<tr>
<td>9</td>
<td>Penenden Heath (G4DUT)</td>
<td>3798</td>
</tr>
<tr>
<td>10</td>
<td>Acton, Brentford &amp; Chiswick (G4HIO)</td>
<td>2695</td>
</tr>
<tr>
<td>11</td>
<td>Silverthorn (G3SR)</td>
<td>2393</td>
</tr>
<tr>
<td>12</td>
<td>Spalding (G4DSP)</td>
<td>2556</td>
</tr>
<tr>
<td>13</td>
<td>Grimsby (G3CNX)</td>
<td>1670</td>
</tr>
</tbody>
</table>

Check logs were sent in by G3ADV and SWL J. Dunnett.

G2BBC operators in MCC 1981. Left to right, G3NKC, G4JGY (CW ops), and SSB ops G3YXM and G4FPH. Their FT-101Z with keyer and Datong FL-1 is on the left, next to the FT-101E.

Gear

Of those who mentioned their equipment, the majority used Yaesu FT-101 series equipment, with some Trio TS-520 series, and one Drake station using a TR4-C plus an SSR-1. We have already noted one of the aerials; G2BBC came on from the Pebble Mill transmitter site, with one end of the aerial at 120 feet and t’other at 70 feet, set out in the form of an end-fed half-wave. At the other end of the scale there was an invigilator using around forty feet of wire, end-fed, 10 feet above ground at the highest and 18 inches at the lowest, fed against a very good ground system, one radial of which was completely under water; he heard most of the goings-on, and in particular noted DJ8WL as 59, and an EA3 who obviously thought he was missing-out on a world-wide contest as a result of hearing Gs swapping numbers at the tail-end of the Phone leg.

MCC 1981 at Pontefract and District A.R.S, G3FYQ. Left to right, SWL Bill Hartley, Reg Greenhough G4KMW (logging), Brian Booth G3SYC (check list), and John Arundel G3HCU on the key. photo by G4JSU

Conditions

Difficult to tell with any degree of certainty, but we got the impression that the Saturday evening was not exactly helped by the conditions, which perked-up no-end towards the back-end of Sunday’s contest-hours. One or two stations noted the noise level as compared with last year with comments that were, so to say, self-cancelling!
Check Logs

We received two this time, from J. Dunnett (Prestatyn) and G3ADV, who came on to give the gang a point or two; to both these gentlemen our thanks for their time and trouble. SWL Dunnett suffered from time-base hash on both nights; he notes on the CW leg too many long CQs, and several stations not listening long enough to pick up calls to them before returning to the CQ-grinding. As for the SSB leg, Jim noted some confusion resulting from non-use of phonetics and lack of clear statement as to whether a station was or was not a club.

Future

Clearly a change is called for, if MCC is to continue. We want, and need, some feedback as to what sort of event could fill the bill — should it stay on 160m. (which is perhaps the most important question) should it be Phone or CW, or both; if not 160 what band would be preferred, and so on and so forth. We shall keep plugging away for this feedback in the next few months in order to see what the consensus opinion is; and, of course, look into ways of making the dates and details more widely known. We need your club’s views!

Conclusions

As always, good clean contest operating and no sign of serious deficiencies of signal quality; but there just weren’t enough clubs active. Nonetheless, our thanks to those clubs which did participate, and congratulations once again to the winners, Plymouth Radio Club.

A WEEKEND AT SUTTON WINDMILL

THE STORY OF GB2SW

KEITH HAYNES, G3WRO

WHILST on holiday in Norfolk last July, the writer and his family visited Sutton Windmill, near Stalham. The mill was built in 1789, has nine floors, and is mentioned in the Guinness Book of Records for being the tallest windmill in England. The mill is in the process of being completely renovated, and the owners Chris and Marian Nunn, together with their daughter Robyn, are hoping that the mill will be completely working by the end of 1983/early 1984.

It was mentioned to the Nunn’s that the writer is a radio amateur and that the windmill would be an ideal location for a special activity station for one weekend, which would be good publicity for both amateur radio and the windmill. The offer was readily accepted and it was agreed that the event be organised before the end of September, as then the mill is closed to the public until the Spring. The dates decided on were 12/13th September and arrangements were put under way. The party (all members of the Harlow & District Amateur Radio Society) consisted of Keith Haynes G3WRO, Terry White G8LXB, Terry Maton G4GHU, Alan Martin G4JRO, Tony Haas G4LDY, Les Adams G4KUI, and Mark Cracknell G6ABB. Application was made via RSGB to the Home Office for a special callsign and GB2SW (Sutton Windmill) was granted.

Rendezvous point for the beginning of the weekend was the club’s headquarters at Mark Hall Barn, First Avenue, Harlow, at 6.30 p.m. on Friday, 11th September. All the gear was piled into respective cars and consisted of a Trio TS-510 for HF, FT-225R for 2 metres, and a separate rig owned by G4LDY for use on 70cm. In addition to these and the usual accessories and aerials etc., it was made very sure that the club’s tents were also put aboard as the only other alternative for sleeping would have been the cars! The heavily laden brigade then set off around 7.00 p.m.

The hospitality the party received during the entire weekend was second to none, and Sutton Windmill is certainly a very worthwhile place to visit. It is open from April until September, breakfast the 2m. beam was fixed to the very top of the mill (unfortunately it couldn’t be rotated easily), an 80m. dipole strung out with the two legs sloping to ground either side of the mill, and a long wire — which loaded beautifully on 15 and 20m. Once the public were admitted, the station GB2SW went on the air and it was very apparent that not only were there people far afield taking interest, but many of the locals also took a particular interest, and indeed many visited the mill during the course of the weekend to personally claim their QSL card. Meal breaks were taken on a rota basis and on the Saturday evening some pints were ‘downed’ in one of the locals in Stalham. The sleeping arrangements was the same as for Friday except that G3WRO found the back seats in the car more conducive to a good night’s sleep than the hard Norfolk soil plus a sleeping bag!

The Sunday proved most successful, with an even larger public attendance than on Saturday and a tremendous amount of interest shown in the station. Most of the local amateurs were expressing their disgust at not having thought of the idea themselves! The QSL cards used for the event were a standard postcard of the windmill with a callsign embossed on the front (every station worked will receive one via the RSGB bureaux).

The hospitality the party received during the entire weekend was second to none, and Sutton Windmill is certainly a very worthwhile place to visit. It is open from April until September,
and inside, apart from the interesting features of the mill itself, there are many items of local historical interest on view including old farming implements, woodworking tools etc., and on one whole floor there is a very comprehensive gift and souvenir shop. Warm thanks are indeed due to Chris, Marian and Robyn Nunn for a most enjoyable weekend, with obvious benefits to Sutton Windmill and amateur radio.

**Donington Raffle Prizewinners**

These were, in first to eighth place: G4JCH, G8JVB, G8YDF, G4DCS, G4EGB, G3SMK, G8CHC, and G4DMX.

**ZX81 Program Correction**

In "VHF Contest Scoring with the Sinclair ZX81" (December issue), there are two errors in Table 1 on p. 541. Line 70 has been omitted, which is \( \text{LET } T = C \); in line 300 the expression \( \cos(D - B) \) should appear, not \( \cos(C - B) \).

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**muTek Limited**

muTek Limited announce the availability of their new SLNA144s switched, low noise pre-amplifier for the 144 MHz band. The design combines excellent RF performance, including first-class bandpass filtering, with a sophisticated switching control circuit; it is suitable for use with all currently available transceivers. Noise measure is typically 1.2dB, and gain typically 15dB; bandwidth is 144-146 MHz plus/minus 1dB greater than 40dB rejection at 130 and 160 MHz. The unit costs £34.50 including VAT and post/packing. Further information is available from muTek Ltd., Bradworth, Holsworthy, Devon EX22 7TU. (Tel: 0409-24543).

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**Packer Communications**

Packer Communications have designed this new UHF VSWR meter specially for the 1296 MHz band, which has a maximum VSWR of 3:1 and a maximum insertion loss of 0.15dB. Price for single band is £39.95, and for multiband £44.45 (including VAT and post/packing). Contact Packer Communications, Old Station, Coniston, Cumbria (09664-678) for full details.

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**Sommerkamp TS-800**

Shown here is the Sommerkamp TS-800, latest in their range of VHF transceivers. The unit covers 140 to 149.9875 MHz, and thus has a wide range of applications. Features of the TS-800 include instant frequency selection, and 600 kHz offset for Simplex or reverse repeater operation; the receiver section incorporates low noise FET's double-conversion and varicap tuning so that the transceiver is peaked automatically for whatever frequency is selected within the 10 MHz range. The basic unit incorporates a tone squelch circuit so that, if required, it can only be activated by another similar equipment. The TS-800 is also designed to operate with the Sommerkamp TS-851 Cityplex Autopatch. Full details may be obtained from the importers, Arrow Electronics Ltd., 7 Coptfold Road, Brentwood, Essex.

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In next month's "Short Wave Magazine": a review of the Icom IC-730 all-band mobile transceiver.
EQUIPMENT REVIEW

SMC-HS HF MOBILE ANTENNAS

In the past, mobile antennas for the HF bands have tended to be large and unsightly. Now that many HF rigs have the ability to run from 12V DC supplies, it is probably the ugliness of the antennas which dissuades many amateurs from trying HF mobile. The SMC-HS antennas are attractive, single-band base-loaded whips available for 10, 15 and 20 metres, which overcome this objection. They are large (1.75m high) and for this reason are unsuitable for magnetic mounting, but with stainless-steel whips and black-and-chrome base loading coils they are not obtrusive. A two-metre ¾-wave whip of identical appearance is also available.

The antennas are supplied disassembled, with a stout lower whip section, jointing piece, flexible top whip section and the loading coil. No instructions are provided, but assembly is obvious with the Allen key supplied. The loading coil fits a readily available SO-239 type mounting, which permits easy removal for band-changing or garaging. By lifting a spring-loaded sleeve on the base, the antenna may be folded back so it is not necessary to remove it for garaging.

Because no instructions were provided, it was assumed that it was not necessary to cut the whips to achieve resonance. However this is not the case, and about 3 inches had to be cut from the 10m. whip in order to achieve a satisfactory SWR. About 1 inch was cut from the 20m. whip to allow the phone part of the band to be covered at 1.7:1 or less. The 15m. whip was not cut. The SWR curves obtained are shown at Fig. 1.

Coverage of the CW portion of 20m. may be obtained by sliding the whip out of the base coil a small amount and retightening the Allen screws.

Cutting the stainless steel whip was accomplished by filing a notch and then snapping off the excess. While adjusting for resonance, it was found easier to put a piece of stout copper wire in place of the top section. This could then be trimmed a little at a time with pliers, the whip then being cut once to the final correct length.

On the air with the writer’s FT-7 running about 10 watts, reports have been very gratifying, typically one or two S-points lower than the station being worked. During the summer stations from all over Europe were worked mostly on 20m, including one Italian who said “you are so strong OM I would not have realised you are working from a car!” Best DX is VK at RS56 on 10 m.

The reviewer strongly recommends these antennas to anyone contemplating HF mobile operation.

J.V.M., G4ILO

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The formidable aerial array of Pertti Mure, OH3TH, a well-known VHF/UHF operator from Tampere in Finland. Closest to the tower are two 27-ele loop Yagis for 23cm., and on the other side of them are two 16-ele Tonna Yagis for 2m. The main array consists of sixteen 21-ele Tonna Yagis for moonbounce work on 70cm.

Photo by OH3MS
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 really must take issue with Justin Cooper (SWL, November 1981), over his statement that there is no reason why anyone today should build a receiver using valves.

Two excellent reasons are (a) you have them to hand and are a bit short of money, and (b) you feel happier using them.

Now whether or not you can build a better receiver using transistors rather than valves is debatable. It depends entirely on what you are personally building, and not the professional state of the art. The main thing is to build something yourself: you will learn a lot and get much pleasure no matter what technique you use.

G. P. Stancey, G3MCK

Dear Sir — As a G6 of only nine months standing, I read with dismay some of the letters in “A Word in Edgeways”, and I suggest that the RAE should embrace aspects of amateur radio which would ensure that a new operator on the air understands exactly what he/she is doing.

The various suggestions put forward for novice bands by ‘superior’ gentlemen, and the antics of irresponsible people to annoy these folk, will do nothing but inflame a difficult situation; nor will the witch-hunting of CB-ers help either. Character and temperament are the real problem, together with anger and resentment; radio is irresistible to both amateurs and CB-ers alike.

Amateurs — the chosen few — have enjoyed many years of pleasure in their hobby, and I have found them generous and helpful. Most give their time unstintingly, and many of the technically very efficient are assisting CB-ers in many ways. New amateur licensees will have their teething troubles, unavoidably, but learning as we go along we can all take care if not to help, then at least not to hinder the activities of our fellow, long-standing, amateurs. Change is never very pleasant to old-timers (I am one), but our hobby is widening rapidly. The great joy to us all is to be in touch, listen to the more knowledgeable and be able to ask questions. If you segregate the novices, how will they learn?

Many, like myself, must hate this endless outcry by the “few of the few”. Let us not have exclusive new bands: there are enough already.

name and callsign supplied

Dear Sir — In reply to G3RKH and G3DRN (December) — yes, Class B licensees theoretically have rights to a little more of the spectrum, as the Morse requirements were internationally changed at WARC ‘79. When implemented this should entitle us to operate in the little used, diminishing, 70 MHz band. Referring to Rad Com; as suggested, this band is said to be a privileged band ‘B’s’ won’t be granted. So what chance do we stand of one day getting a 50 MHz allocation. That’s not to say I don’t appreciate and enjoy my current ‘B’ licence.

I’m sorry to annoy G3DRN as I, like most amateurs, are fully aware of the worthwhile work he does — but the RSGB does have the image of a lot of old boys sitting on many committees, and regretfully I’ve seen nothing to change this view.

This chaos on 27 MHz is something I’ve never wanted any part of, and my reference to CB is not unfortunate but perceptive, for I’d like to ensure that the 28 MHz band is not taken over by outsiders. Like many others who don’t wish to just play, I’m doing as suggested, hoping to earn my G4 by learning Morse.

CB has shown that, when a determined body legally pursues its aims, the seemingly impossible can be achieved. So there is a need for a body to correlate the many views expressed in our media, relating to the ‘B’ licence, be it 28 MHz, 70 MHz, or whatever. Regrettably this type of organisation and campaign is not my forte; yet like the CB-ers did, I’m willing to support those who are skilled in this area.

But why another organisation, when we already have a body claiming to represent the views and interests of radio amateurs, which could if it wished pursue these aims — yes, the RSGB, which G3DRN omitted from his democratic list. Perhaps with only approximately 6% of its many committee positions being held by ‘B’s’ its views may not be as progressive as mine, but I look optimistically to the future.

P. Thurlow, G8SUH, and p/p G8WAS G8XWG, G8ISH

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P. Thurlow, G8SUH, and p/p G8WAS G8XWG, G8ISH

Dear Sir — In reply to G3RKH’s status as ‘Reverend’, it seems a pity that he opted for cheap sarcasm instead of Christian charity. No, there is no reason why anyone must be satisfied with the limitations imposed by authority, particularly when they don’t make sense. As for “rights” — well, I suppose we all realise that in reality there is no such thing as “rights” — there are only opportunities — and opportunities can be created. As the CB fraternity has shown us, the most effective way to create opportunities is to make one heck of a row about what you want. It is clear that the RSGB won’t help in any campaign of this sort, as they have their feet under the Home Office table and don’t want to rock the boat.

I think that neither G3RKH nor G3DRN have appreciated the important point, which is that CW is as irrelevant to the average ‘A’ licensee as it is to the average ‘B’ licensee. No, the new licence did not “separate the real amateurs from those who only want to play” (and, by the way, why should it?). This is shown by the number of ‘A’ licensees who have forgotten their CW, probably more than 90% of them!

Since the majority have no interest in CW, except as a whimsical hurdle to surmount before operating below 144 MHz on Phone, it follows that, ideally, CW tests should be directed at those who wish to use that mode, with no reference to frequency.

In such a situation there is no reason why ‘Er licensees should not be able to operate in the little used, diminishing, 70 MHz band. Referring to Rad Com; as suggested, this band is said to be a privileged band ‘B’s’ won’t be granted. So what chance do we stand of one day getting a 50 MHz allocation. That’s not to say I don’t appreciate and enjoy my current ‘B’ licence.

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COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

Back again, and with thanks to all who enquired after my health — no, it wasn't your scribe who got the new heart! But at least one kind soul was moved enough to telephone the Papworth hospital to make sure. Thanks to you all, and my very best wishes to my namesake and his new heart — long may it serve him, and well.

For myself, I have been interested this past month with the concept of proving that, on Top Band at least, the earth is a darned sight more important than the aerial or for that matter the power of the rig. At the /A place there is some forty feet of wire out N/S, with its highest point at about seven feet, and lowest a measured 20 inches above ground. On the earth side we are at the confluence of two rivers, and so some fifty feet of wire is down to one of 'em as the ground. The ATU doesn't seem to want to play with this at the moment — with maximum L and minimum C it is trying but not quite there. Even so, it is astounding what this bit of wire it capable of with things as they are. One wonders just how effective it will be with some RF pushed up it from the transceiver, but it certainly has been an eye-opener on receive despite noises-off from power-lines far too close for comfort, though mitigated by the absence of TV timebase QRM. But we are talking of Top Band, so we ought to make a heading!

Top Band

Despite some fearfully loud 'cracks' from the power-line, we can still listen as the Trio TS-830S noise blanket just about eliminates them. But enough of our own doings for the moment; let's turn to G4AKY (Harlow). An apology is due for a couple of howlers we made last month with about six watts of output RF, and Dave is seriously thinking of having a little dabble with the QRP rig — a few milliwatts. This month, he found Africa in the form of EA8AK, Asia by way of eight assorted Asianic Russians and 4X4NJ, 22 EU countries not counting G, North America by way of W1, W2, W3, W4, W5, Canada VE1, VE2, VO1, Oceana as already mentioned, South America in PX1ARS; he missed VS6DO who was working simplex on 1820-ish kHz, and heard but couldn't raise a couple of JAs and N9MM.

Nice to hear again from GM3IAA (Inverness) after a long silence; Jim is just back on the air, and writes to note that he too worked VK6HD, heard the KP4KK/DU2 signals weakly, and later still heard G3QQR after VS6DO. Now, this is quite something, insofar as GM3IAA is on a known poor site for Top Band, suggesting VK6HD must have been working quite hard on the skywires.

Turning to more parochial activity, were very disappointed to have such a low turnout for MCC, and we would like some feedback, as suggested in the report elsewhere in this issue. If there ain't any interest in keeping MCC going in some form or another, then we'll just have to drop it. (And as we type that last sentence, turn - out for MCC, and we would like to make sure also connected to interested parties insofar as Aus - south of the Isthmus — Australian clubs being the lynchpin of this being G2OT/A, the club call, with G2UV at the controls for the full hour, 1500-1600. Please be sure to note these dates)

Eighty

Quite a crop of stuff this time. G2NJ (Peterborough) starts the ball rolling by mentioning the CW net of the RAOTA, the lynchpin of this being 2G0T/A, the club call, with G2UV at the controls for the full hour, 1500-1600. Find them on Wednesdays around 3515 kHz. As it's an OT assembly rather than a net, you may find other OTs around the same area and time. Working 2G0T/A results in a special QSL, which will be issued to all contacts up to March next year. On a differencing, G2NJ mentions that he has been hearing Russian signals at the low end of Eighty from as early as 1430; at that time Nick heard, November 4, UK2RDX peeling off a string of JAs, and on the following day at the same time W7ZRC was worked.

Now G4LDS (Chelmsford) who continues his running battle with the rig; this month a little tweak here and there
at the front-end raised the sensitivity, and an 80/40 inverted-vee trap dipole was put up. The latter was found to be quite effective both audibly and as seen by the SWR indications.

G3ADV (Basingstoke) emerges, so he says, from many years hibernation; he put in a check-log for MCC, and on 80 SSB contacted SP2JDI, SP21JJ, SP9YP, SN0MSP, YU2ACF, OK3CKA, OZ1XL, and IK0JX; all in the cause of learning — to drive a Japanese grey box!

In Wells, G3PKS found the early-morning period between 0700 and 0740 quite nice; two sessions adding in all to about thirty minutes accounted for WA8QZA, OZ7BW, WI8M, DJ2YA, W1YN, K08TU, W2LYL, and N9MM. The daylight period, however, Jack covers with some rude words.

Turning to G2HKU, we find he has just had one QSO on Eighty, this being with PA3AFI, using the QRP CW rig.

Nice to hear again from G3CED/G3VFA (Broadstairs), who seems well recovered from his recent massive body blow, and is now back to work and enjoying it. His current ploy is the Joyframe aerial and his super-compact two-foot long 'thing' — and of course the low power, normally two watts. Eighty was pretty flat whenever he looked at it, George reckons, but he did manage QSOs with G3WNG, G4GZQ, L21KSZ, Y26TL, and G4JRE.

Fifty

Most people "pass by on the other side" but it is a good band on which to learn the tricks of the trade. We know several people who have the secret, but it seems they just aren't going to write in, lest more come on to fill up the pool! G3PKS says he found things quite excellent: ground wave contacts with Bristol, over the Mendips, and this month it is his sad task to report the death of both ZL1SE; both passed away after a long period of suffering. ZL1VN long had an ambition to make 1000 skeds contacts with G2HKU, and he indeed achieved this just a couple of days before he died. Both will be much missed.

More Snippets

We have notice of BARTG's Spring RTTY Contest on March 20-22, 1982. This is the big one — a world-wide RTTY contest. There are some minor changes, and we suggest the intending entrants get in touch with the Contest Manager, E. Double, G8CDW, 89 Linden Gardens, Enfield, Middlesex. EN1 4DX, enclosing, in UK, a 9" by 6" s.a.e., or from overseas 2 IRC's for a copy of the rules, summary sheets and log sheets. Completed logs to be received by May 31.

Turning now to the future, we see that DL1VU hoped to be on Norfolk Is. (VK9N) sometime in December; and of course as we write we should be hearing ZA2HAM from Albania — but we haven't heard anything much yet.

As to the possibilities of Heard Is. operation TDXB notes the chances as of mid-November as being about 50-50. There is it seems another scientific group going there, but space is a problem.

There seems to be some undignified scuffling going on over the recent San Felix operation; on the one hand the president of the Radio Club de Chile says KF10/CE0X was not legal and never set foot on San Felix, and that the data in TDXB issue 113 was a load of boloney. On the other, TDXB's editor has seen the papers put up to ARRL's DXCC desk and accepted as OK by ARRL. It sounds a bit like sour grapes from where we sit.

To add to the spordical operations of Y11BGD, we heard Y11AS is on, and will be there for a couple of years: QSL route is DK2OC.

Twenty

To GW3NNY we give the first over. Walt notes that on CW, new ones were 9U5WR and T1J1, while Iris Colvin was noted on SSB signing 9Y4KG.

Next we have a relatively short note from G3NOF (Yeovil); Don had things other than amateur radio to occupy his mind, and so was not very active. He listened around 0800z, and found conditions usually good to W6/7, VK and ZL; his only SSB QSOs were with FM7CD, KC4USV, KL71ZZ, V2ADX, and V2AU.

Our next reporter is G3VXJ (Findon) who runs a Ten-Tec Delta to an 80-metre Wendom at thirty feet, has a separate QRP rig, and makes his contacts as he says, at
civilled hours, like evenings and weekend days. All CW, and including KC1Q/KC2 (where’s that?), T12PZ, HL1XC, PJ2JB, KH6J1, 9M2AV, and AH2G for the fortieth Zone worked in 1981 from Findon.

The two watts QRP and two-foot Thing at G3VFA/G3C3E were applied to Twenty, and we note CT4BK, UK2GAT, HA5WG, W1WKP, WB8ZJY, W4FM4R, 4ST7/ML in the North Atlantic, DK9TY, UK0OA, HA8KCU, a QRP UB3, and small fry.

At G2HKU Ted managed to work both ZL1VW and ZL3E before they died, plus SSB with ZL3F, ZL3RSS and KOEHT; on CW KB8MFO/C6, UM8NAP, HK4UT, UK0KF, and JA3JYX were also booked in.

Then there was G3ADW who harks back to the J-O-T-A weekend, and some “heavy breathing scouts” from UK Jamboree stations; and AP2AC, VK6AOK, and ZL3MA show that the hand has not lost its cunning.

**21 MHz**

G3TVW (Henham) operated 21 MHz in the CW WW CW contest, using his HW-100 and a ZL Special in the skywire department — the latter actually stayed up this year for the full contest period. This combination netted some 678 scoring QSOs, 72 countries and 26 Zones, of which the pick of the crop were, on the Saturday: 9K2DX, UK1FOA in Zone 19, AL7H, KL7FRA, YW5A, EA9EO, A4XIO, PJ1E, FM0GA, P47A, EL2AV, V3MS, XE2BC, XE2MX, H2ZPV, J6LZA, V2AAW, ZP5XJA, ZD8TC, and GW3RRS on back-scatter. Sunday contacts included PY2RAN, N6TH/AB in Zone 27, SU1AA whose CW WW contest QSOs only go via OH2MM, HK3A, SP2BHJ/1Z, CN4CY operated by G3GJQ, HC8M in Galapogos, FC0FOO, and G5YH who was wrestled from a pile of Ws, and as already indicated, much small fry.

GW3NYY managed 9U5WR on CW, plus HC8, and a couple of Falkland isls. VP8s, plus WN5UT/P7/17 all on SSB.

21 MHz for G3C3E/G3VFA included L21KDP, UC2SE, UA6IBC, UA3VAD, EA7AQL, and four very smart QSOs with TY9ER.

Now to G3VXJ, who keyed with XE2MX, KL7RA, XE2BC, HK3A, SP6BHJ/1W, 8P6LJ, SU1AA, K8MFO/C6A, 9Y4VT — all these in the CW WW CW contest — F0OUC, KH6CC, 5Z2CS, 3B8CD/7, TF3GCN for a two-way QRP contact, and for the month’s best ZK2RU with just five watts input. Interesting to note that the FO, KH6, and ZK2 were all worked by replying to their CW, with no other takers noted.

Most of what little time was available to G3NOF on this band was spent beaming over the short path to the VK area around 1000-1130z, when it was often good to VK, P29, VK9, FK8, JA1, YJ, and other such. It added up to SSB QSOs with CT3AB, FK8DH, H13PG1, JD1BAT on Minami Torishima, K8CW/C6A, KH6CF, P29FV, TF3A, VK9NND, W7KT1, W7LRX (Oregon), YJ8NMP.

Now to G4LDS who offers W2ZQ, A9XP, J5HTL, V3ME, KA3GBU, KE4DQ, W7FOF, WB011, AF7A (these last three being from the Honeywell computer station), HC8MD, KG4DI, SM0MG/P/POH0, VE1BEF, ACON, KA2, W0TXW, VP8ANT, VK4NUJ, VK8JC, VE3MBJ, VE3KXU, 8P6OL, VE3KAD, and VE2GFS (the last five resulting from CQ calls), then VE3DZT running 10 watts, and VE3HAB at two watts.

**Ten Metres**

First G3VXJ; Bob notes ZP5XJA, W4UY/P17, LA2Q, 9K2DX, and FR0GGL, all in the CW WW CW contest, V2ARS and YV1AD raised with QRP five watts, and K8LX with just 100 milliwatts. GW3NYY notes that signals have been good in the mornings around 1000 to VK, with Africa and South America dominating early evenings, peaking around 1830-1930. The short-skip has not been so much in evidence, so the CQ-ers have not been such a nuisance to 28 MHz CW operation. Light relief was provided by a UA3, who asked if there was a reason for the signals around 27-28 MHz, like perhaps a special band for Western Europe, as he had heard people calling CQ DX! Walt tried to explain to him, but had great difficulty as the UA3 couldn’t grasp DX! Walt used SSB to 7X2BK, 8Q7A2, A4XCB, AP2ZR, FY7BW, GW3NYY, and VE2GFS by back-scatter for a new country, CH8MD, OH1TD/4U in Syria, HL9RH, JAs by the dozen, JR6QHA (who had only ten watts but a six-over-six beam!), J1L1MT, JW2CF (Spitzbergen), JD1BAT, JT1KAI for that elusive last Zone 23 for a complete set on Ten; KH6BIA; lots of CW W6/W7 in the CW WW CW contest, K8JGZD, W0ZTL (N. Dakota), LA4NY who had five watts to a long wire, TAI1AB, UA9IS including UA9OS was running one watt, UL7s, UW1ID, AU0CDN, RA0UPB, UK0SAY, UK0AMM who had a six-over-six beam and a rock-crusher of a signal, VU2NR, SM0MG/0H0, VK1-6, VS6CT, VS6JS, VS5DD (Brunel), ZL4BO, ZL2BFU (twice, for discussion of their mutual interest in ornithology), ZS6XC, Z21AR (Zimbabwe). Plus a QSL from Tennenese to make the set of fifty states, confirmed on Ten.

**Finis**

All done for another month. Thanks very much to you all for your greetings and cards, and thanks to those who came up this time to report for the first time — keep up the good work!

On the other hand, heartiest maledictions to the character your scribe found one evening on 21 MHz (we think!) who was producing a chirp which covered 100-200z.

At G3CED, North Americans have been heard from 1130 to 1900z with the W6 and W7 areas peaking around 1600. A few Asiatic and Vks came in short path around 1230. SSB QSOs were made with AP2P, AP2ZR, CP1EQ, CR9AN, FH8OM, FMC7FD, FY7BY, G4C0A/W0 in North Dakota, HK0FBB, J3AH, J3JP, KB6SL, KL7JFY, VE7CVM, VP2MR, VS6CT, W71AA (Idaho), WB7RGN (Wyoming), WD0BFT (Colorado), YV4VDB, Z7BW, 4U1JN, and 8P6OR.

First, we will take the G3CED/G3VFA efforts with the Joyframe: UA6LNY, UK4CBB, UK4FAV, UK6HVR, RG4C raised as G3VFA for a computerised 599, UA9FIS, UA4ADG, RG4C again (this time as G3CED) which netted another 599 report as “SNN” for an op in a hurry(); then came the mini-aerial and UA6ABM, UB3MFY, UA6HC, JA1WBW, and the two TY9ER contacts already mentioned. G4HZW (Knutsford) is all-ten metres, with a TS-820 into a two-element quad at 24 feet. Tony reckons that not all the ‘list’ operations are all bad, as some people just aren’t able to cope with a full-blooded pile-up on their own — to which one must comment that they’d soon learn! The month started and ended well, but had a soft centre. He worked SSB to wake himself up in the mornings before a quick bike-ride to work, and then dug around in the evenings; around midnight to 0200 the band opened up on occasion to W6/W7, which is fun but hard work next morning at work! Tony used SSB to 7X2BK, 8Q7A2, A4XCB, AP2ZR, FY7BW, GW3NYY, and VE2GFS by back-scatter for a new country, CH8MD, OH1TD/4U in Syria, HL9RH, JAs by the dozen, JR6QHA (who had only ten watts but a six-over-six beam!), J1L1MT, JW2CF (Spitzbergen), JD1BAT, JT1KAI for that elusive last Zone 23 for a complete set on Ten; KH6BIA; lots of CW W6/W7 in the CW WW CW contest, K8JGZD, W0ZTL (N. Dakota), LA4NY who had five watts to a long wire, TAI1AB, UA9IS including UA9OS was running one watt, UL7s, UW1ID, AU0CDN, RA0UPB, UK0SAY, UK0AMM who had a six-over-six beam and a rock-crusher of a signal, VU2NR, SM0MG/0H0, VK1-6, VS6CT, VS6JS, VS5DD (Brunel), ZL4BO, ZL2BFU (twice, for discussion of their mutual interest in ornithology), ZS6XC, Z21AR (Zimbabwe). Plus a QSL from Tennenese to make the set of fifty states, confirmed on Ten.

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"S.A.M." DX ZONE MAP

9th Edition!

Great Circle Projection on durable, quality paper for wall mounting, 33¼" in. wide by 24½" in. deep. Giving essential DX information — bearing and distance of all parts of the world relating to the DX Zones areas into which the world is divided for Amateur Radio purposes, with major prefixes listed separately, distance scale in miles and kilometres. Time scales in GMT. Long close enough for accurate plotting. Hundreds of place names, mainly the unusual ones, and most of the rare islands.

Zones and Prefixes corrected to August 1980

Price £3.35 inc. p/p

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<table>
<thead>
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<th>Price Group</th>
<th>Price</th>
<th>Adjustment</th>
<th>Frequency Ranges</th>
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- Orders are only accepted for 10 or more crystals at the same frequency specification. Special rates for bulk orders.
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<th>Price</th>
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<tr>
<td>9502 Rotator</td>
<td>£55.75</td>
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<tr>
<td>PMH/2M 2m stacking</td>
<td>£24.70</td>
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<td>PHASING HARNESSES:</td>
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<td>PMH/2C 2mcircular</td>
<td>£8.05</td>
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<td>PMH/70 70cm stacking</td>
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<td>MASTS, ROTATORS, etc.:</td>
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<td>PMH/2M 2m stacking</td>
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<tr>
<td>PMH/70 70cm stacking</td>
<td>£10.90</td>
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Volume XXXIX
624

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<tr>
<td>Antenna Handbook (Orr and Cowen)</td>
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<tr>
<td>Amateur Radio (Lutterworth Press)</td>
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