R-1000 “hear there and everywhere”

The R-1000 is an amazingly easy-to-operate, high performance, communications receiver, covering 200 kHz to 30 MHz in 30 bands. This PLL synthesized receiver features a digital frequency display and analog dial, plus a quartz digital clock and timer.

**R-1000 FEATURES:**
- Covers 200 kHz to 30 MHz continuously.
- 30 bands each 1 MHz wide.
- Five-digit frequency display with 1-kHz resolution and analog dial with precise gear dial mechanism.
- Built-in 12-hour quartz digital clock with timer to turn on radio for scheduled listening or control a recorder through remote terminal.
- Step attenuator to prevent overload.
- Three IF filters for optimum AM, SSB, CW. 12-kHz and 6-kHz (adaptable to 6-kHz and 2.7-kHz) for AM wide and narrow, and 2.7-kHz filter for high-quality SSB (USB and LSB) and CW reception.
- Effective noise blanker.
- Terminal for external tape recorder.

**Built-in 4-inch speaker.**
**Dimmer switch to control intensity of S-meter and other panel lights and digital display.**
**Wire antenna terminals for 200 kHz to 2 MHz and 2 MHz to 30 MHz.**
**Coax terminal for 2 MHz to 30 MHz.**

**OPTIONAL**
- SP-100 matching external speaker.
- HS-5 and HS-4 headphones.

R-1000 receiver **£285.20** inc. VAT
Matching speaker **£23.45** inc. VAT
Securicor carriage **£4.50**

LOWE ELECTRONICS Ltd.
CHESTERFIELD ROAD, MATLOCK, DERBYSHIRE DE45LE
TEL. 0629 2430/2817
Now most Amateurs can afford a high-performance SSB/CW transceiver with every conceivable operating feature built in for 160 to 10 metres (including the three new bands). The TS-830S combines a high dynamic range with variable bandwidth tuning (VBT), IF shift, and an IF notch filter, as well as very sharp filters in the 455-kHz second IF. Its optional VFO-230 remote digital VFO provides five memories.

TS-830S FEATURES:
- 160-10 metres, including three new bands
  Covers all Amateur bands from 1.8 to 30MHz (LSB, USB, and CW), including the new 10, 18, and 24MHz bands. Receives WWV on 10MHz.
- Wide receiver dynamic range
  Junction FETs (with optimum IMD characteristics and low noise figure) in the balanced mixer, a MOSFET RF amplifier operating at low level for improved dynamic range (high amplification level not needed because of low noise in mixer), dual resonator for each band, and advanced overall receiver design result in excellent dynamic range.
- Variable bandwidth tuning (VBT)
  Continuously varies the IF filter passband width to reduce interference. VBT and IF shift can be controlled independently for optimum interference rejection in any condition.
- IF notch filter
  Tunable high-Q active circuit in 455kHz second IF, for sharp, deep notch characteristics.
- IF shift
  Shifts IF passband toward higher or lower frequencies (away from interfering signals) whilst tuned receiver frequency remains unchanged.
- Various IF filter options
  Either a 500Hz (YK-88C) or 270Hz (YK-88CN) CW filter may be installed in the 8.83MHz first IF, and a very sharp 500Hz (YG-455C) or 250Hz (YG-455CN) CW filter is available for the 455kHz second IF.
- Built-in digital display
  Six-digit large fluorescent tube display, backed up by an analogue dial. Reads actual receive and transmit frequency on all modes and all bands. Display Hold (DH) switch.
- Adjustable noise-blanker level
  Built-in noise blanker eliminates pulse-type (such as ignition) noise. Front-panel threshold level control.
- 6146B final with RF NFB
  Two 6146B's in the final amplifier provide 220W PEP (SSB)/190W DC (CW) input on all bands. RF negative feedback provides optimum IMD characteristics for high-quality transmission.
- More flexibility with optional digital VFO
  VFO-230 operates in 20-Hz steps and includes five memories. Also allows split-frequency operation. Built-in digital display. Covers about 100kHz above and below each 500kHz band.
- Built-in RF speech processor
  For added audio punch and increased talk power in DX pileups.
- RIT/XIT
  Receiver incremental tuning (RIT) shifts only the receiver frequency, to tune in stations slightly off frequency. Transmitter incremental tuning (XIT) shifts only the transmitter frequency.
- SSB monitor circuit
  Monitors transmit IF signal whilst transmitting, to determine audio quality and effect of speech processor.

TRIO TS-830S £639.52 inc VAT.

MATCHING STATION ACCESSORIES
- SP230 EXTERNAL SPEAKER WITH SELECTABLE AUDIO FILTERS £33.14 inc VAT
- VFO 230 EXTERNAL DIGITAL VFO WITH 5 MEMORIES £194.45 inc VAT
- AT 230 ANTENNA TUNER £106.75 inc VAT
- YK 88C 500Hz C.W. FILTER £26.45 inc VAT
- CARRIAGE BY SECURICOR £4.50

LOWE ELECTRONICS Ltd.
CHESTERFIELD ROAD, MATLOCK, DERBYSHIRE TEL 0629 2430/2817
TR8400 70 cm is on the move

The TR 8400 synthesized 70 cm UHF FM mobile transceiver covers 430-440MHz in 25KHz steps and includes five memories, automatic memory and band scan. UP/DOWN manual scan, and two VFOs.

TR 8400 FEATURES
- Synthesized coverage of 430-440MHz in 25KHz steps.
- Five memories and memory backup terminal on rear panel.
- Two VFOs.
- Offset switch for ±1.6MHz.
- Transmit offset and simplex operation. Fifth memory allows any other offset by memorising receive and transmit frequencies independently.
- Automatic scan of memories and of 430-440MHz band (in 25KHz steps). Locks on busy channel and resumes when signal disappears. HOLD or mic PTT button cancels scan.
- Up/down manual band scan in 25KHz steps with UP/DOWN microphone supplied with TR 8400.
- Only 53/4 inches wide, 2 inches high, and 75/8 inches deep.
- TONE switch.
- Four-digit frequency display and S/RF bar meter. Other LEDs indicate BUSY, ON AIR, and REPEATER operation.
- HI/LOW (10 W/1 W) RF output power switch.

TRIO TR 8400 £279 inc VAT. Securicor carriage £4.50.

TR7800 the only 2 metre FM mobile rig

Frequency selection with the TR 7800 2 metre FM mobile transceiver is easier than ever. The rig incorporates new memory developments for repeater shift, priority, and scan.

TR 7800 FEATURES
- 15 multifunction memory channels, selected with a rotary switch. M0 to M12 memorize frequency and offset (±600KHz or simplex). M13, 14 memorize transmit and receive frequencies independently for nonstandard offset.
- Internal backup for all memories, by installing four AA NiCd batteries (not Trio supplied) in battery holder.
- Priority channel (memory 14) and priority alert.
- Covers 144-146MHz, in 25KHz or 5KHz steps.
- Front-panel keyboard for selecting frequency, transmit offset, programming memories, and controlling scan.
- Automatic scan of entire band (5KHz or 25KHz steps) and memories.
- Manual scan of band and memories, with UP/DOWN microphone (standard).
- Repeater REVERSE switch.
- Selectable power output 25W (HI)/5 (LOW).
- LED S/RF bar meter.
- TONE switch.

TRIO TR 7800 £268 inc VAT. Securicor carriage £4.50.

LOWE ELECTRONICS Ltd.
CHESTERFIELD ROAD, MATLOCK, DERBYSHIRE  TEL 0629 2430/2817
THE SHIMIZU SS 105S 80 - 10 metres ssb/cw transceiver

This super new transceiver covers 80-10 metres, gives 10W out and is smaller than anything else we have seen so far. Ideal for transverter driving, the SS 105S has FM transmit and receive options as well as excellent performance on SSB/CW for HF band use. The SS 105S is supplied in semi kit form so as to keep down the price, but all the RF and mixer boards are ready built and aligned so no test equipment is required. All the cabinet work has been carried out so all you have to do is assemble the IF strip, xtal oscillator, and fit them to the completed chassis. Great idea and it brings back the flavour of home brew with the added advantage that the rig will work when you've finished it. For more info, just ask or come along and see it. It's a great little rig.

SS 105S 90 £141.00
SE - NB Noise blanker kit £7.76
SE - FMx RX FM discriminator kit £17.25
SE - FMx TX FM generator kit £12.65
SE - MK RX marker kit £11.04
0.5 CWF 500Hz CW filter £22.43
Optional band crystals £3.46

Please specify any particular interest and we will send full information.

The Short Wave Magazine
February, 1981

THE WAY TO HAVE TOMORROW'S EQUIPMENT TODAY

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For equally helpful attention in Scotland contact Sim, GM3SAN, 19 Ellismuir Road, Baillieston, Nr. Glasgow. 041-771 0364.

Send 48p in stamps for complete catalogue and antenna book.

AR 245 2 metre hand held FM synthesized transceiver

"A staggering technical achievement"; "How can they get it into such a small size"; "Outperforms any rig I've ever had"; these are typical of the comments made by amateur radio operators after seeing and using the remarkable AR 245 2 metre FM handheld transceiver. What does it mean to you? Well, at last you can really take your amateur radio with you, anywhere you want to go, because in this handheld unit, you have a complete synthesized 2 metre FM transceiver covering 144-146MHz in 5kHz steps. Also included are + and - 600kHz repeater shifts, crystal controlled tone burst unit and nicads.

Operation of the AR 245 is very simple indeed. You simply select the frequency required on the direct reading frequency decade switches, switch on the transceiver, pull out the telescopic whip and speak into the microphone. Repeater shift is selected by a switch on the rear panel and tone burst activated by a secondary button on the PTT bar.

If you are considering a handheld 2 metre unit, there is nothing to compare with the AR 245.

AR 245 5 watts/1 watt £179 inc. VAT carriage £1.50.
AR 240A 1½ watts £158 inc. VAT carriage £1.50.

Lowe Electronics Ltd.
Chesterfield Road, Matlock, Derbyshire Tel 0629 2430/2817
Whether you are: just starting, taking an R.A.E. course, just licensed, or an old timer, SMC has something for you. . . . And at very good prices. Advertised PRICES on this and the following four pages INCLUDE VAT at 15%, INCLUDE SECURICOR speedy delivery and INCLUDE A TWO YEAR WARRANTY (remember as Yaesu Musen UK distributors our guarantee is FACTORY BACKED).

SMC YOUR CHOICE, FOR CHOICE, IN GENERAL COVERAGE RECEIVERS

**FRG7**

The FRG7 is an economically priced general purpose communications receiver employing all solid state construction for reliability and performance. It uses a Wadley-loop drift cancellation system for high sensitivity, stability and image rejection. Listen to Radio Amateurs, shortwave broadcasts, BBC and commercial medium wave stations, CB and much much more.

A side by side comparison between the FRG7 and any of the mass of “all singing and dancing” transistor portables, possibly costing much more, will soon reveal why the FRG7 is a most popular choice.

- "Industry standard" receiver.
- 0.5-3MHz.
- SSB (LSB/USB), CW, AM.
- Selectivity of ±3kHz at -6dB.
- Wadley-loop triple conversion.
- 10kHz Direct dial readout.
- Well calibrated "sharp" preselector.
- AM Automatic noise suppression circuit.
- Antenna Hi to 1.6MHz, 500ohm to 30MHz.
- 3 position RF Attenuator.
- 3 position AF (LP, WBP, NBP).
- 110-240Vac and 12Vdc.
- Internal Battery holder option.
- Illuminated edge type “S” meter.
- Optional Battery holder £5.00.

**£199 INC. VAT @ 15% & SECURICOR**

**FRG7700**

The FRG7700 is a deluxe all purpose communications receiver using the latest in large scale integration, phase locked loops and bandpass filters for superb performance. It uses an up conversion circuit with 48MHz first IF with professional quality crystal filter.

The receiver can be used for listening to all normal HF services, and the inclusion of FM allows reception of 10m FM, and with a convertor VHF Amateur and Marine bands. The FM detector, the clock/timer, and the optional 12 channel memory (instant write in recall of frequencies anywhere in the tuning range) places the FRG7700 head and shoulders above similar priced receivers.

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

**£309 INC. VAT @ 15% & SECURICOR**

SOUTH MIDLANDS COMMUNICATIONS LTD

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SMC FOR CHOICE IN HYBRID HF TRANSCEIVERS

FT101ZD

The "Z" series is base station design at its best, a no compromise, go anywhere unit of the highest quality. The FT101ZD is an all new design using today's technology backed with the 101 name — the name of the world's most popular amateur station.

The FT101ZD is a complete, value for money, yet uncompromising, HF station. It includes such state-of-the-art features as variable IF bandwidth for "digging out" the real dx and an advanced noise blanker, which for optimum results has front panel adjustable threshold level.

The FT101ZD transceiver, provides USB, LSB, AM and CW and covers from top band to ten metres (including the new 'Warc' bands). It combines a sensitive receiver, with a good front end with a powerful, spurious free transmitter featuring a pair of rugged 6146's with negative feedback in the PA.

Ergonomically designed throughout, the transceiver is aesthetically completed by a pleasant bright orange LED display.

The 101ZD is fully compatible with all the '902 accessories, hence as the budget allows, you can expand your station with such matching items as an external VFO, transvertor (4, 2, 70m in one box), RTTY/CW reader, keyboard, VDU, linear, ATU, monitorscope, external speaker.

- 160-10 metres including new allocations.
- Variable IF bandwidth 2.4kHz down to 300Hz.
- 8 pole filters for razor edge selectivity.
- Selectable CW fixed bandwidth CW-W and CW-N.
- Semi-break in with sidetone for excellent CW.
- Digital plus analogue frequency displays.
- 6146B PA's with 6dB of negative feedback.
- 180W PIP and — 31dB 3rd order intermod.
- RF speech processor fitted — adjustable level.
- VOX built-in and is adjustable from the front panel.
- Wide dynamic range for big signal handling.
- High usable sensitivity, for those weak ones.
- Superb noise blanker — adjustable threshold.
- Attenuator; 0-10-30dB, front panel switch.
- AGC; slow-fast-off, front panel switchable.
- Clarifier (RIT) switchable on TX, RX or both.
- Heaters switch for battery conservation.
- Low level transvertor drive output facility.
- Ergonomic design and position of controls.
- Universal power supply 110-234V AC and 12V DC.

£515 inc. VAT @ 15%

SOUTH MIDLANDS COMMUNICATIONS LIMITED

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£799 inc. VAT @ 15% 

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GW3BB Peter Swansea (0752) 872525
GJ4CD Geoff St. Savour (06534) 267985

February, 1981
Communications Ltd

SMC FOR CHOICE IN SOLID STATE HF TRANSCEIVERS

FT107

If you have been searching for an all solid state HF transceiver with a "broad band" output that will deliver 75 per cent of maximum power into a 3:1 load, then look no further than this Yaesu. The FT107M covers 160-10M inc. bands and is fully equipped with: variable IF bandwidth, audio peak/notch filter, RF speech processor, variable threshold noise blanker, full metering — including SWR, and boasts a schottky diode ring mixer for excellent receiver dynamic range. The all new memory system provides 12 stored channels (with fine tuning), scanning from the optional microphone and the exclusive DMS — digital memory shift. This system using a photo interruptor (with fine tuning) to control the synthesizer to provide any offset up to 500kHz, from the memory channel (almost the equivalent of 10 VFOs).

★ 160-10 metres plus WWV plus 2 auxiliary bands.
★ USB-LSB-CW-FSK-AM multi-mode.
★ Full broad band "no tune" power amplifier.
★ 240W PEP. 75 per cent power output at 3:1 VSWR.
★ 12 memory channels with clarifier on memory.
★ Digital Memory Shift gives offset from memory.
★ Up/down scanning control from microphone.
★ Variable IF bandwidth — 16 poles of selectivity.
★ Bandwidths: 6kHz, 2.4kHz-300Hz, 600Hz-300Hz.
★ Selectable CW "fixed" widths CW-W and CW-N.
★ Tunable Audio Peak (AFP) and Notch filter.
★ Diode ring mixer for very high Rx dynamic range.
★ Noise blanker — front panel adjustable threshold.
★ AGC; slow-fast-off switchable from the front panel.
★ Attenuator 0-20dB, plus RF gain on front panel.
★ RF speech processor fitted — front panel adjustable.
★ Digital (100Hz) plus analogue frequency displays.
★ Meter Reads; Vcc, Ic, ALC, Compression and SWR.
★ Semi-break in with side tone. Vox built in.
★ Choice of built-in or separate power supply units.
★ Option.

£690 inc. VAT @ 15% & SECURICOR

SMC (Jack Tweedy) LTD.
Roger Baines. G3YBO
79 Chatsworth Road.
Chesterfield, Derby.
Tel.: Chesterfield (0246) 34982
9-5 Tuesday -Saturday.

SMC (Leeds)
Colin Thomas. G3PXM
257 Otley Road.
Leeds 16, Yorkshire.
Tel.: Leeds (0532) 782326
9-5.30 Monday-Saturday.

FT707M

The FT707 'The Wayfarer' is an ultra-compact transceiver ideally suited for the home station or as a travelling companion. The FT707 is THE radio of the eighties: 80-10m, including 30, 17 and 12m — all factory installed — 100W output (10W's model) 50% developed in 3:1 VSWR — Digital, bright LED's in mode sensitive counter and analogue readout — Transceiver status at a glance, from string LED and single displays — 16 poles of crystal filtering provides continuously adjustable IF bandwidth 2.4kHz to 300Hz (N.B. This is true 'variable bandwidth' that minimises much of the adjacent channel interference not 'IF shift') — Noise blanker of most advanced design using local AGC loop — Schottky diode ring module, power transistor buffers, ultra clean, low noise local oscillator are combined to produce, size and price notwithstanding — a remarkable Rx.

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

£529 inc. VAT @ 15% & SECURICOR

SMC (Jack Tweedy) LTD.
Jack Tweedy. G3ZY
150 Horncastle Road,
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South Midland Communications Limited

SMC FOR CHOICE IN 2m MULTIMODES

**FT480R**
- 144-146 MHz (143.5-148.5 MHz possible).
- Special linear PA module fitted.
- 12 V dc (13.8 V dc) operation.
- 12V PIP A3, 30 W dc A1 and F3.
- A1 and F3, 10 W or 1W output switches.
- Bandpass filter no tuning design.
- Excellent receiver dynamic range.
- Outstanding sensitivity on SSB and FM.
- 3SK59 Mosfet RF, 3SK51 mixer.
- Bandwidth 2.4 kHz and 14 kHz at -6 dB.
- Semi break in with side tone.
- Very bright blue 100 Hz digital display.
- Display shows Tx and Rx freq (inc RIT).
- String LED display for “S” and PO.
- Convenient Concentric AF and squelch.
- Digital receiver offset tuning.
- Advanced effective noise blanker.
- FM; 100, 25 (1/2), 1 kHz steps.
- SSB; 1000, 100, 10 kHz steps.
- Dual digital VFO system.
- Any Tx Rx split with A and B VFO's.
- ± 600 kHz standard repeater split.
- Four easy write-in memory channels.
- Memory kept alive with 12 V supply.
- Memory scanning with slot location display.
- Up/down tuning/scanning from mic.
- Priority channel on any memory slot.
- “F set” clears non step component.
- Lock on tuning controls on Tx.
- Satellite mode allows tuning on Tx.
- Scanning for busy or clear channels.
- Size (Case): 8.3" D, 2.3" H, 6.9" W.
- Size (Projections): 10.1" D, 3.0" H, 7.0" W.
- Size (Bracket): 10.1" D, 3.5" H, 8.5" W.
- Weight 5 lb (2.6 kg).
- Generous 2 W audio output.
- Indicator for FM modulation level.
- LED’s: “On Air” Clarifier, Hi/Low.
- Matching FP90M Mains PSU available.

**£359 inc. VAT @ 15% & SECURICOR**

**FT225RD**
- 144-148 MHz inclusive Coverage.
- Multimode SSB-LSB-FM-AM-CW.
- AC mains or 12 V dc working.
- Smooth Dual speed VFO.
- Digital readout to 100 Hz.
- Mode sensitive digital readout.
- Analogue readout to 1 kHz.
- 22 Fix Channels (2 x 11) (2 MHz).
- Memory Option S or split use.
- “S” / centre zero / P output meter.
- Switchable 20 dB RF attenuator.
- Switchable meter function on Rx.
- Accessory rear panel DIN socket.
- Front Panel FM power control.
- Front Panel VOX/VOX/Control.
- Front Panel SSB Mic Gain control.
- Switchable effective noise blanker.
- Switchable AGC - Slow or fast.
- Switchable lights/readout brightness.
- Semi Break in CW with side tone.
- Clarifier works on VFO, xtal & mem.
- ALC external phono socket.
- Bandwidth 2.4 kHz and 14 kHz at -6 dB.
- Switchable 20 dB RF attenuator.
- SSB; LOCO, 100, 10 kHz steps.
- Switchable lights/readout brightness.
- Auxiliary repeater shift option.
- Relay make - break - common sockets.
- Memory kept alive with 12 V supply.
- Memory scanning with slot location display.
- Normal/Reverse repeater split.
- Relay make-break-common sockets.
- Front panel adjustable squelch.
- LED’s for; MEM, Burst, NB & Attn.
- LED’s for; RPT, CLAR, VFO, MEM, On Air.
- PLL (VCO) at 130 MHz for clean signal.
- 2 W of AF to inbuilt speaker.
- Highly sensitive and selective.
- Conservatively rated PA for low IMD.

**£565 inc. VAT @ 15% & SECURICOR**

SOUTH MIDLANDS COMMUNICATIONS LIMITED

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SMC FOR CHOICE IN VHF/UHF FM

FT720RV

FT 720 Control Head ........................................ £120.00 inc.

* Four easy write-in memory channels
* Rx priority channel (auto check)
* Scanning of band or memory channel
* Up/down tuning/scanning from mic.
* Scanning for empty or occupied channels
* Optically coupled tuning control
* Easy selection of up/simplex/down
* Manual and automatic tone burst
* String LED’s for ‘S’ and PO
* Seven status report LEDs
* Convenient concentric AF and squelch
* 1 1/2W of audio to internal/external speaker
* 3.3 (4.3)" D x 6" W x 2 (2.2)" H

MMB3 Bracket for deck option ................................ £5.00 inc.
720RV 10W, 2M deck ........................................ £133.00 inc.
720RV/25W, 2M deck .......................................... £143.00 inc.

* 144-148MHz (144-148 possible)
* 12.5KHz synthesizer steps
* ±600KHz repeater offset
* 0.3V for 20dB quieting
* Rx: 0.5A, Tx: 4.5A
* 16.9MHz + 455KHz double conversion
* 5.8 (6.5)" D x 6" W x 2 (2.2)" D
720RU 10W, 70cm. deck ....................................... £156.00 inc.

FT207R

* 430-440MHz
* 25KHz synthesizer steps
* 1.6MHz repeater shift
* 0.5V for 20dB quieting
* Rx: 0.5A, Tx: 4.5A
* 16.9MHz + 455KHz double conversion
* 5.8 (6.5)" D x 6" W x 2 (2.2)" D
E725 Extension cable 200cms ............................... £23.00 inc.
E725 Extension cable 400cms ............................... £29.00 inc.
S72 Switching box ............................................ £56.00 inc.

* Permits control head with two decks
* Single button change of band
* Auto change of synthesizer steps
* Auto change of repeater split

£253 inc. VAT @ 15% & SECURICOR

SMC (Jack Tweedy) LTD.
Roger Balnes, G3YBO
79 Chatsworth Road.
Chesterfield, Derby
Tel: (0246) 34982
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SMC (Leeds)
Gail Thomas, G3PSM
257 Ootley Road.
Leeds 16, Yorkshire.
Tel: (0532) 782326
9-5.30 Monday-Saturday

£195 inc. VAT @ 15% & SECURICOR

SMC (Jack Tweedy) LTD.
Jack Tweedy, G3ZV
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Woodhall Spa, Lincs.
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9-5 Tuesday-Saturday (+ appoint.)
AMATEUR ELECTRONICS UK

AEUK — Your number one

YAESY FT-101ZD (WARC)

Here is the brand new FT 101ZD which now comes complete with the new WARC bands and retains all the superb features which have made this the finest value for money HF Transceiver ever available to the discerning amateur.

Negative feedback:
6 dB @ 14 MHz

Antenna output impedance:
50-75 ohms, unbalanced

Microphone input impedance:
500-600 ohms

RECEIVER
Sensitivity:
0.25 µV for S/N 10 dB (SSB/CW) 0.5 µV for S/N 10 dB (AM)

Selectivity:
2.4 kHz at 6 dB down, 4.0 kHz at 60 dB down (1.66 shape factor). Continuously variable between 300 and 2400 Hz (-6 dB). CW (with optional CW filter installed). 600 Hz at 6 dB down, 1.2 kHz at 60 dB down (21 shape factor).

Image rejection:
Better than 60 dB (160-15 metres);
Better than 50 dB (10 metres).

IF rejection:
Better than 70 dB (160, 80, 20-10 m);
Better than 60 dB (40 m).

Audio output impedance:
4-16 ohms.

Audio output power:
3 watts @ 10% THD (into 4 ohms)

Specifications subject to change without notice.

The brand new FL-2100Z Linear Amplifier matching in style of course to the FT-101ZD and FT-902DM, and now incorporating the new WARC bands also.

Specifications

FT-101ZD SPECIFICATIONS

GENERAL

Frequency coverage:
160m 1.8-2.0 MHz, 80m 3.5-4.0 MHz, 40m 7.0-7.5 MHz, 30m 10.0-10.5 MHz, 20m 14.0-14.5 MHz, 17m 18.0-18.5 MHz, 15m 21.0-21.5 MHz, 12m 24.5-25.0 MHz, 10m 28.0-29.9 MHz.

Operating modes:
LSB, USB, CW, AM.

Power requirements:
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Power consumption:
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345 (W) x 157 (H) x 326 (D) mm.

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FROM NORTH. Leave M6 at Junction 6 (Spaghetti) and follow left fork down to traffic island beneath motorway complex. Take third turning off to Lichfield. One mile further on follow A440 to the right and within 1000 yds veer again to the right, approximately one mile further on brings you to the Fox & Goose. Turn right and see preceding directions.

FROM THE WEST AND SOUTH-WEST. Follow M5 then M6 to Spaghetti Junction (see above). Alternatively, leave M5 at junction 4 or 3 and proceed to inner ring road. Turn South on ring road and leave on A47 (East). We are located three miles from this point.

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SHORT WAVE MAGAZINE

(GB3SWM)

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Advertising: Charles Forsyth

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The 70cm. section of the table produced a photo finish with Gary Allitt, G4HNS, in top place just one point ahead of Tony Collett, G4GXE. G4CMV came third. One third of the participants worked ten or more countries in 1980 and mention must be made of the 17 worked by G4JCID and the 15 by G8GXE. Will anyone work 20 countries on 70cm. this year?

The 1981 Annual Table will break new ground in that it will be a four band competition including 23cm. for the first time. It is anticipated that there will be increased use of this band for various reasons. These include the ready availability of more, excellent commercial gear, such as aerial arrays, low noise Rx preamplifiers, transverters, etc. There is evidence that some 2m. operators are getting thoroughly fed up with the increasing anarchy on the band, with FM stations operating in the CW, beacon, SSB and satellite sub-bands. They are now concentrating more on 70cm. and 23cm.

The inclusion of 23cm. in the Annual Table will allow Class B licensees to enter on three bands and Class A folk on all four although only the highest three of the four band scores will be used to calculate the points. Finally, henceforth both the Shetlands Islands, GM, and Sicily, IT9, will be counted as countries for the tables.

Beacon News

There is a new 2m. beacon on the air from Austria. Its callsign is OE5FO, the QRG being 144.955 MHz and the QTH Locator GI17a. The power is 15 watts and the aerial a 5-over-5 array beaming northwest. Keying is F1 and the a.s.I. 600 metres. Several readers have heard this during recent tropo. Lifts. During the Quadrantids meteor shower, several operators heard EA3XS on 144.153 MHz. G4IRX received some S9 bursts lasting up to 30 seconds. EA3XS is the call of an amateur station in the Barcelona region and this “beacon” could be a private or unofficial one, perhaps for a specific research purpose, like MS. Perhaps EA3LL could enlighten us?

Both Roger Thorn, G3CHN, and Dave Sellers, G3PBV, report reception of a weak burly carrier on 144.003 MHz when beaming south from Devon. It was audible as a continuous carrier on Dec. 30, possibly with some form of unencryptable modulation.

Satellite News

There is now a Sunday evening UHF net for AMSAT members and satellite users. This is on 432.21 MHz from 1800 local time, chaired by G4CUO in Cheltenham. On 2m. G8CSI still runs the Sunday net on 144.28 MHz from 1930 local time. Your scribe tries to check in, beaming north from the Surrey hills, and AMSAT-UK Secretary, G3AAJ, usually calls in. The rather hastily promoted Activity Week for satellite users attracted only 20 entries and Andrej Ovarec, OK3AU, won the transmitting section with 558 points. In the s.w.l. section, Berger Lindholm from Finland scored 173 points. G3AAJ described activity as “disappointing”, so perhaps when another such event is proposed, the details will be available well in advance for greater publicity.

Repeater News

It was announced in a recent GB2RS news broadcast that another eleven UHF repeaters had been licensed. They are;—GB3CW on RB6 in Powys; GB3GR/RB11 Grantham; GB3GY/RB11 Grimsby; GB3LS/RB2 Lincoln; GB3MT/RB12 Bolton, an RTTY relay; GB3NF/RB11 Southampton; GB3PU/RB0/Perth; GB3SW/RB6 Salisbury; GB3TD/RB13 Swindon; GB3YS/RB13 Glastonbury and GB3WG/RB6/Port Talbot.

Contest Notes

Results;— The 12th. VHF-UHF contest organised by the BARTG took place on Sept. 13 and 21 last year. Rough conditions kept activity down and only one QSO over 350 kms. was made. On 2m., 63 U.K. and 31 Continentals took part and on 70cm., 21 and 10 respectively. In the Single Operator section, G4ARD/A, operated by G3VZV, was the winner, with DC1ZP/P just a few points less for 2nd. place. In the Multi-Operator part, GW3UUP/P, the Ealing Club, were the winners with G3NNG second.

Coming attractions;— The BATC has organised an Activity Contest this year, split into seven sessions of which a maximum of four will count for points. The dates are;— Jan. 31, Feb. 8, 16 and 24, and Mar. 4, 12 and 20. The times are 2000-2300 GMT. The Secretary of the BATC is G8HUA, whose address appears in our Clubs Roundup feature from time to time.

Feb. 8 sees the 432 MHz Fixed Contests, a five hour event starting at 1000.
The South London 2m. repeater, GB3SL, was taken out of service by the operating group at Christmas and was still silent on Jan. 12. The Home Office requires that when a repeater is taken out of service for any prolonged period, the operating group informs the licensee — the RSGB — of the fact and reasons. Your scribe spoke to Dave Evans, G3OUF, at RSGB HQ and he seemed to recall the reason for shut down was given as “technical”. No doubt, by the time these notes are read, it will be back serving its clientele of licensed amateurs, pirates and frustrated CB-ers.

**Band Plan**

During a contact with Tim Douglas, G3BA, the topic of the DX/Local SSB concept was discussed. It seems that reactions range from those who fully support the idea that local and DX QSOs should be conducted in separate parts of the SSB sub-band on 2m., to strongly opposition from those using limited coverage gear that cannot tune much above 144.33 MHz. However, such equipment can usually be modified so as to extend its range — as with the Belcom Liner-2. It does seem unrealistic to expect to evolve a sensible band plan for the 1980s if we are to plan it around the capabilities of a diminishing number of restricted range sets. If that approach was continued, we would still be transmitting SSB around 145.41 MHz!

A disturbing feature of the 2m. band is the growing "invasion" of the beacon, satellite, SSB and CW sub-bands by FM stations. While some are obviously pirates using "borrowed" call signs, many are genuine amateurs. A few of the latter behave in a rude manner when asked to QSY to the appropriate part of the band, but others are genuinely ignorant of any band plan. It seems a great mistake that the RSGB's **Call Book** no longer includes any mention of band plans. Perhaps those running R.A.E. courses could be persuaded to acquaint their students with this aspect of the hobby at the end of the course. Better still if successful candidates could be sent a copy of the current band plans with their pass slips. Meantime, all we can do is to politely ask folk to QSY and explain the reasons.

It continues to amaze our scribe how reluctant many operators are to stray more than 20 or 30 kHz from the SSB calling frequency on 2m. Why not, "Boldly go where no man has gone before", to quote from *Star Trek*, and explore the wastes of 144.40 to 144.50 MHz? History tells us we have explored the uncharted seas of the World in past ages, so why not colonise this part of the band with SSB operators.

**The Aurora**

December 19 will certainly be remembered for a long time as it saw one of the best periods of Auroral propagation for a long time. Chris Reed, G8MFP, noticed a solar prominence at 1300 on the 17th. which he reckons lasted some 14 hours. At Boulder, Colorado, the “A” index shot up to 50, on the 19th. The event seems to have started around 1330 and went on continuously till 2051. In much of mainland Britain, it was pouring with rain and blowing a gale, but in Ulster, it appears a visual *Aurora* was observed from horizon to horizon.

From written and verbal reports, it seems that at least 27 countries were worked from Britain and that the reflecting curtain was much further south than usual enabling southern stations to "get in" using quite low power. A fine example was the effort of Nick Button, G4IRX, ( Beds.) who contacted 9 stations using just 3 watts from an *Icom* IC-202ST to a 9-ele. Yagi at 20ft. on a portable mast. His first QSO was with G3BW on CW at 1459. After a break for Christmas shopping, he returned to the fray at 1555 and added 4 new GM regions and 3 new squares — YP, YQ and DF7OG (FM) on SSB.

Bill Hodgson, G3BW, (Cumbria) was an enormous signal without and worked 76 stations, adding several new squares. As so often has been the case, Bill's friendly rival Arthur Breeze, GD2HDZ, missed it all. (Never mind, Arthur, you beat him in the Annual Table). John Hunter, G31MV, (Bucks.) operated from 1520 to 1915 and made 55 QSOs, including YO2IS (KF), YU2EZA (IG), OK3AU (Kl), HG8CE and BLG in KG, HG0HO and KLZ in KH and HG0KLW (LH), 6 SPs, 2 SM6s, 3 OZs, 4 Ys, 21 DLs, etc. QTFs were between 50° and 80°

Colin Desborough, G3NNN, (Berks.) had 58 QSOs including an LA in EU square, an SM in HU, 7 SPs, an RQ2 in KQ, a UC2 in NN and a UA3 in PP19a, but Des could not get the full call due to QRM. His QTF was 40° for the most part. Dave Sellars, G3PBV, (Devon) only came into the event at 2010 for it to fade out at 2031, but with a brief final fling at 2051. At that time, all he heard were GB3GL, G3BW, GM3XNE, G3XYD and F6EOQ. Dave has yet to make an Ar contact from his present QTH. He mentions that G8KBQ in Glastonbury heard a UB5 in RN square. Mike Kipp, G4FBK, (London) was also a late comer to the affair and worked GM3XNE at 2040 at a QTF of 35°, a sure sign the *AR* was about to switch off. John Wilkinson, G4HTG, (Liverpool) was only on for 45 mins. so only made a few G contacts, plus DL6BF (DM), PEICK1(CM) and F9XG (AJ). John Pilags, G8HHI, (Hants.) was on from 1800 till 1915 and worked a few German and Dutch stations in CM, DK, DL and DM squares at QTF 45°, plus G5MPS (WO) and GM4EJ (Y) at 5° and finally F1KBF (BI) at 45°.

Welcome to Len Challis, G8SKG, (Lincs.) who enjoyed his first ever Ar experience and whose haul included 5 Germans in DK, EM and FM, 2 F5s in BH and BI, a PA in CL, a GM in XP and a G in ZL square. Chris Easton, G8TFI,
A phone call from G41YA brought G8VR hurrying to the shack for what turned out to be the biggest Auroral event ever heard at Ken’s Hartley, Kent, QTH. He wasted a lot of time just listening to the incredible number of stations on the band, but nevertheless worked 4 GMs, 3 OZs, EI6DN, L3ARU and a host of German stations. Ken heard UC2, UQ2, UR2, SP, and numerous SMs, and a host of German stations. Ken got so fed up that he packed up and QSY-ed to the local ale house! It does seem quite ridiculous that stations which can be heard very far south. For example, 16W113 in the USA worked Y22ME, SP2DX and HB9RO. Without doubt, this Ar was the most widespread one heard by your scribe since 1969 and gave an insight into what they sound like in the more northerly latitudes. The band was dominated by hundreds of German stations, all S9 plus, which made it very difficult to hear the weaker signals from further afield. Many British operators were disappointed at not being able to work the real DC. Doug Parker, G4DZU, (Leeds) called “CQ U” repeatedly, only to be called by dozens of DLs. He got so fed up that he packed up and QSY-ed to the local ale house! It does seem quite ridiculous that stations which can be worked during any slight tropo. Opening insist on calling when a station is obviously trying to work DX.

This event was characterised by being very far south. For example, 16WJB in HC square heard an F stations in AI and many YUs took part in the event. YU3ES (GF) had 14 QSOs and heard a further 10 stations, including some Gs, while YU7BCU (KF?) heard G3NSM, G3VYF and a G in ZN square. UA3LBO (QQ) says he did not work any G stations. All-in-all, a memorable event; will there have been a replay around Jan. 15?

**Meteor Scatter**

At their sixth attempt, Paul Turner, G41JE, (Essex) and Pete Etheridge, G4ERG, (Hull) completed an MS contact via back scatter by pointing their aerials to EO square and eliminating all direct path signals. Paul got 18 pings and 9 bursts from Pete, one being of 28 seconds.

Majority opinions seems to suggest that the Geminids shower was not as good as last year. G31MV had QSOs with SM6CMU (FR) and LA1K (FX) and G3VYF also worked the latter, plus YU2I (HE). G4HGT heard SP7GPW and OK1MBS (HK) on the random SSB frequency, but ‘flu and a throat infection kept John quiet! G41JE also worked YU2I and completed a sked on SSB with F1JG (CD).

G8VR only completed one sked out of more than a dozen, but fared better on the random CW QRG where he worked LA3VU and OK1LG. At the peak of the shower, Ken monitored SK4MPI (HU) and the Gdansk FM broadcast station...
(JO) on 70.31 MHz, simultaneously but found absolutely no correlation between the two. The bursts on 70 MHz were much longer and the signal strength much greater. (This is to be expected as the BC station runs 40 kW.)

Darrell Mawhinney, ex-GI8JPG, is now GI4KSO and worked SM0EJY (IT), DH4DAB (DL), DF5JJ (DL), PA3BBI (CM) and SM5CHK (HS), all on SSB. Mike Allmark heard F, I, OE, OK, OZ, SM and YU stations in many squares.

On Jan. 1, G31MV worked LA8AK (DS) for a new square but heard nothing at all in the peak of the Quadrantids on Jan. 3 from U050GX. Several readers have queried whether anyone has ever heard anything from this chap. It seems some of the Russians say they have much better stations than they really have, just to get some skeds. John did complete with EA3LL (AB) on SSB and later, on CW, with OH7TN/4 (OV) complete with EA3LL (AB) on SSB and HG8ET (KG) for another three new squares. The sked with UR2RQT (MS) was incomplete and only a few brief reflexions were received from OH7RJ (NW).

Clive Penna, G3POI, (Kent) added just one more square, making it 299, in

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Four and Six Metres

On Dec. 14, VS6BE and VS6FX on 6m. were worked by G4BPY, G3COJ and G3UUT on 10m. E16AS worked VS6BE direct on 6m. for a "first". On Dec. 27, Mike Allmark heard VE1AVX on 6m. at S9-plus working stations on 10m. He also heard F6CTT (ZH) on the band on Jan. 1! John Baker, GW3MHW, (Dyfed) reports that ZD8TC often leaves his Tx on autokerying on 50.110 MHz. On Dec. 12, FY7THF was S9-plus -40 dB for over an hour from 1150. John has had 262 10/6m. crossband QSOs so far this "season". During the Dec. 19 Ar he heard the auto-CQ signal from PA0RYS on 50.027 MHz but could not find him on 10m.

On 4m. GW3MHW's nightly skeds with G2AOK seem no longer possible probably due to a higher roof at the latter's QTH now. During the Ar, John heard many strong signals but complains that operators will not spread out enough to avoid QRM. John worked GM3WOJ, GM3ZXE, GM4DIJ, G6WR, G3FDW, G4FXW, and G4BPY G2AOK and GM3YOR were also heard. SM6PU on 10m. worked G4BPY, GM3WOJ and GW4BCD on 4m. in this event. In an attempt to stir up activity on 4m. John runs an automatic
transmission near 70.2 MHz over-riding it with “QSX NW” when listening.

G8VR has worked a few new countries on 4m. and says that DK1PZ (FL22h) has converters for 4m. and 6m. with aerials and is interested in 10m. crossband working. He can often be found on the 20m. VHF net.

Two Metres

On Dec. 29-31, Mike Allmark and Kevin Jackson, were out portable in AN21j with Andy Cole, G8MJD, and Dave Shaw, G8MDG, during what proved to be reasonable tropo. conditions, both on 2m. and 70cm. Best DX was to FN square. From Devon, G3PBV heard, on Dec. 24, the HB9HB beacon on 144.125 MHz but found activity very low with DD3UD (EI) the best DX. On the 30th, this beacon was again heard, along with a couple of EAs and some Fs as far as DI and CF squares. The Britannia folk were working into SM and OZ at the time.

On Christmas Eve, Tony Collett, G8GXZ, (Berk.), heard Germans in EJ and EK squares but could not raise them. He did contact DK8VR (DJ), DF6IY (EI) and FIEGS (DI), which latter was a new square. The end of year lift produced a QSO with DD3UD (EI) at 1037 on the 31st. for G8HH1.

Brian Morrison, G8SEZ, (London) has received a QSL from 13DDS/1 whom he worked on tropo. in late Nov. or early Dec. 1979. The Italian was near Aosta, 5,000 m. a.s.l., which is remarkable as Mt. Blanc is only 4,810 m! Brian wonders if anyone else worked this station who is not listed in the 1980 Call Book, by the way? In the latter part of 1980, G8SKG moved to a better QTH in Lincoln and now has a 16- elem. Yagi. On Dec. 24, Len had a ball and worked 23 Germans in several D and E squares, along with 5 PAs, 4 ONs and 5 Fs.

Jeff Brown, GJ4ICD, enjoyed some nice ducting to the northeast on Dec. 30 and, when he had this beam to SM, he heard EA1CR (XD) off the back of the beam. After a 15 min. QSO, chaos reigned as half of Scandinavia was trying to work Rubén. The time was 2330. Geoff’s best DX was to HR and HS squares.

Seventy Centimetres

The aforementioned ‘‘AN’’ operation by G8MJD, G8MDG and party worked 31 squares on Dec. 30. The gear comprised a Trio TS-120V and

Microwave Modules 10 watts transverter with a 19-ele. Yagi. The 50 watts PA blew up and they suffered a lot of Syledis QRM. G8MJD/P provided another new square for G3VVF, along with DK6AS (FM), on Dec. 30. During the Dec. 19 Ar, Mike worked DF1OH (EM) on 70 cm. exchanging 51A/52A reports.

G3PBV found conditions poor in both the Dec. 24 and 30 events but did copy HB9F on the 30th. and worked DF1EQ (DL) with deep, slow QSB. On Dec. 24, G8GXE was on and heard F9NL (AD) and worked DK8VR (DJ) and F6CBC/P (ZD). On the 30th. Tony contacted DJ3ZU and DFIEQ in DL square together with GW8GKF and G8MJD/P, the latter being more consistent on 70 cm. with 10 watts than they were with 150 watts to four 9-ele. Yagis on 2m.

Ian Gordon, G8IFT, (Birmingham) writes that he has a 4CX250B amplifier on its way when he can find time to finish the power supply. The Dec. 30 lift brought two new squares for GJ4ICD in the shapes of DK2NH (FN) and DF200 (EM) to make it 84.

Twenty-three Centimetres

In the Dec. 30 lift, G8GXE was copying DJ3ZU’s signal at up to S4 but could not be detected by the German, who was running 300 watts to a 2m. dish. G8IFT’s best three sessions in the Cumulatives produced 41 QSOs worth 3,920 points, best DX being 220 kms. to G3XYD and G8HPU in Ipswich. N. Yorks. was a new county on the band, thanks to G8SFI/G4KCT at 184 kms. GJ4ICD is now QRV on the band, the gear consisting of a YAESU FT-480R, feeding a Microwave Modules transverter, driving a rebuilt S.O.T.A. 70cm., amplifier, driving a YD 1302 PA giving 300 watts output, hopefully, when completed. Eight 15-over-15 aerials are promised which should certainly provide Geoff with the proverbial big mouth!

Final Miscellany

Peter Burden, G3UBX, writes that a group of Midlands VHF operators is planning a VHF Convention at the Wolverhampton Polytechnic on Oct. 10 from 1100 to 1800. A lecture stream is proposed and simple catering at a reasonable tariff is promised. As attendance must be limited to 400, attendance will be by ticket only. More information later.

It seems that the long silent Lannion beacon, FX3THF, could be operating again from the old site, in the 2m. band on 144.905 MHz. This information via Roger Thorn, G3CHN, who has offered to pass on any definite details from F5ZA.

Deadlines

All your copy for the new, bigger S.W.M., starting with the March issue, by Feb. 4 please and for the following month, by March 4. As usual, everything to:- "VHF Bands", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts., AL6 9EQ. 73 de G3FPK.
Hints and Tips on the K2RIW Amplifier

Geoff Brown, GJ4ICD

As most readers who operate on 432 MHz will know, Dick Knadle, K2RIW, designed an amplifier for the band using a parallel pair of 4CX250B’s some years ago (see “A Strip-line Kilowatt Amplifier for 432 MHz”, QST April and May 1972, pp 49-55 and 59-62). During the past few years UK amateurs have been building this QRO device with some success, but the odd intending constructor or two have tried to take short cuts, or have been ‘conned’ at rallies into buying the wrong valve bases or ‘used and tested tubes’. Unfortunately, this has led prospective builders to believe that the design is in some way deficient. GJ4ICD is now producing a modified version of this unit, after two years of testing, and a few tips on the ‘beast’ which follow will ensure a very stable and powerful amplifier.

Firstly referring to the original article, or to the ARRL VHF Manual, it is noted that the original valve bases used were the SK 610 type. It has, however, come to light through extensive tests that the SK 620A sockets are the correct ones for use in this amplifier (see Part I of the article by J. H. Nelson, G4FRX, in January Short Wave Magazine for further explanation), the main difference being in the screen decoupling capacitor. The SK 620A is readily available from Cambrian Electronics, P.O. Box 10, Stanmore, Middlesex, who also stock valves to match.

In the course of building several parallel 432 MHz amplifiers of this type, slight modifications have been incorporated as follows. Firstly, the grid line length is reduced by ½-in. — this gives a better resonance curve, better input VSWR and improved efficiency. Next, for easier tuning of the anode tank circuit, the plate line length should be reduced to 8¼ inches from its original 9 inches, still with the corners rounded off. Also with reference to the anode line (L1), the writer has tried three different double-sided epoxy p.c.b. lines; standard p.c.b., silver plated and gold plated. A comparison between the standard and the gold plated line revealed an 8% increase for the latter which must make it very cost effective.

The next item is the usual problem of obtaining the phosphor-bronze or beryllium-copper required for the anode “flapper” capacitor. The correct thickness is hard to come by, but 22 gauge phosphor-bronze should be available from a good sheet metalwork shop: this, however, would mean a change from the “fish line” tuning system to a brass or steel wire system, as otherwise the fish line would break under the added stress. When, however, a brass wire system was tried, the Teflon rod in the under-chassis started to burn, probably due to RF finding its way down the wire to earth! So if 22 gauge, or thicker, phosphor-bronze is used, along with a brass or steel wire, the ¼-in. Teflon rod in the under-chassis should be replaced with ¼-in. brass rod — which will ensure a good DC earth to the anode end of the “flapper” capacitor and, incidentally, give a better tuning range.

Finally, to ensure maximum stability, two ferrite beads should be fitted between the screen grid connexions on the valve base and the inner box leadthroughs (which should be p.t.f.e. only and should also be decoupled with a 1000 pF 750VW capacitor, available from RS Components).

If all the above modifications are carried out and the correct bases used, it will be practically impossible for the amplifier to be unstable — but note that a well-regulated screen and bias supply must be used.

Two-Metre Band “Aide Memoire”

Peter Lloyd, C.Eng., MIEE, G8XGH

Many of those would-be ‘hams’ who received the good news during last August of their success in the RAE will have, by now, been granted their Class-B licence. This new batch of G8’s will be keen to get on the air as soon as possible, and with the range of multimode transceivers now available, will have a wide choice of operating frequencies and emissions.

It is with the needs of these newcomers to the band in mind that the “2-Metre Aide Memoire”, Fig. 1, has been devised. Intended for quick reference desk use, it is a suitable format dictated the splitting of the band scale into two sections covering 144 to 145 MHz, and 145 to 146 MHz, respectively. This division is also convenient, as the upper scale deals with CW, SSB and ‘all-mode’ allocations, whilst the lower portion is mainly devoted to FM channelled transmissions; IARU allocations for moonbounce, meteor scatter and TV have not been shown. (Operators are reminded that the licence does not permit use of 144.00 and 144.54 MHz which are aeronautical frequencies).

The major scale divisions are indicated at 0.1 MHz (100 KHz), with sub-divisions every 50 KHz; in the channelled FM section of the band the scale is further divided into 25 KHz steps, with the appropriate channel numbers adjacent. Repeater input R0 to R9 are shown, as are the outputs shifted by the fixed 600 KHz increment. Within the Simplex channels, S10 to S24, there is a section described as ‘basic’ which covers the most commonly used frequencies of S20 to S24. When purchasing transceiver crystals (in the case of non-synthesised equipment) these channels should be considered, next to those used by local ‘repeaters’, the minimum with which to start. With reference to S9 and S33, it has been proposed that these should be phased out in Europe and used for satellites.

Also shown on the scale are the major calling frequencies such as 144.05 MHz (CW), 144.30 MHz (SSB), and 145.50 MHz (FM) etc. The number of repeater stations has increased to such an extent in recent years that it has been impossible to include all but a fraction of them. Those listed are considered to be of interest to users whose QTH is in the central part of the country, and an abbreviated form of location is used, e.g. GB3MH Malvern Hills is MAL. Where the name of the repeater QTH is not too familiar, the county abbreviation is given: hence GB3PI Barkway has HERTS only after the callsign.

It should be noted that, to save space, the repeater callsigns are only listed once, either under input or output frequency. For example, GB3BM Birmingham has its input on R5, but against its output channel (S29) will be found GB3SN Fourmarks (Hants.) — which uses the same input and output frequencies at 145.125 and 145.725 MHz, respectively.

It is hoped that the novice will find the “Aide Memoire” helpful in obtaining a perspective on two-metres, and a device which he can readily modify for use in other parts of the UK.

Fig. 1 2 METRE BAND 'AIDE MEMOIRE'
CLUBS ROUNDUP

BY "Club Secretary"

The Mail

Acton Brentford & Chiswick stick to, as they have done for so many years, the old routine of sending a letter every month, come hell or high water. On February 17, George Grzbekiak will be talking to them about the reception of DX TV signals. This is something we've not heard much of in recent years although at one time there was a fair-sized group up north who used to report results.

A.R.M.S. is the club for the mobile operators, and a very good one too; detail from the Hon Sec — see the panel for his address.

Now to Ashford (the Kentish one) where the HQ is at the top of Hart Hill, which in its turn is near Charing, so — up the hill it is, every Tuesday evening.

B.A.R.T.G. have had an AGM, and sundry members have changed round, but not the Hon Sec — see Panel for his address. For those who don't already know, BARTG is the specialist group covering the use of an amateur station for radio teletype.

Next we have Bournemouth, based as ever on the Dolphin Hotel, Holdenhurst Road, where they have February 6 as a project night, and on 20th a film show covering the manufacture of thin film microcircuits and the manufacture of junction transistors. Incidentally they recently had an auction sale for RAIBC, and raised some £250 which will have helped no end — other clubs going to follow suit?

Still on the South Coast, at Brighton they foregather at 47 Cromwell Road, Hove, on alternate Wednesdays, the start being sharp at 7.45pm.

We got a newsletter with nary a mention of which club generated it, let alone the address! However, it did have across the top something which gave it away, which was the after-end of the club callsign: Bromsgrove it turned out to be. Our own records could then tell us they have the second Friday at the Avongate Art Centre, and we also note an informal now appears on the lists for fourth Tuesdays at the Parkgate Inn. However, we recommended a contact with the Hon Sec to be sure — see Panel.

With a paid-up membership of 107, Bury must now rate as one of the big 'uns — however, they can still get in their room at the Mosses Community Centre, Cecil Street. Their "secret of success" is that although they are to be found on every Tuesday evening, the second Tuesday is always given over to a formal meeting with a talk or whatever. The club also has a policy of buying quality accurate test-gear for members use (we hope they have a facility for keeping it calibrated within spec!). They have a bit of nostalgia on February 9, when G2AKR will be talking about The Good Old Days.

Over to Cheltenham and the Old Bakery, Chester Walk, Clarence Street, on the first Thursday and the third Friday each month, with the first of these being the "formal" evening, which for February means a talk on radio controlled models.

Pressing on, we come next to Coventry who mention they are based on Baden-Powell House, Radford, Coventry; they do not say which evening, although we believe it to be a Friday each week — but check with the Hon Sec and be sure. He will also give some guidance on how to find the HQ address — see the Panel for his name and telephone number.

Chiltern are booked for February 25, for an auction junk sale, at the canteen of the John Hawkins furniture factory, Victoria Street, off Wycombe Road, High Wycombe.

On to Colchester now, where the venue is the Colchester Institute, Sheepeen Road; February 5 is down for G4JIE to talk about power supplies, and on 19th they have a selection of films, RSGB, ARRL and other.

It's the first Wednesday in each month for the Congleton gang, who have a place each month at Congleton Library — latest details from the Hon Sec at the address in the Panel, or just pop along and join!

Deadline for "Clubs" for the next three months—

March issue — January 30th
April issue — February 27th
May issue — March 27th
June issue — April 24th

Please be sure to note these dates!

Down in the West Country, one eventually comes to Cornwall; but once there, the club is well worth the trouble of a visit. Find them in the SWEB Clubroom, Pool, Camborne, on Thursday, February 5, when there will be three different members speaking on propagation at, respectively, VHF, UHF, and HF. They also have a section meeting separately who are "home-computer" addicts, as well as members of the main group.

Unfortunately our information about the Crawley programme is not quite up to date, but we do know they are based on Trinity United Reformed Church, Ifield, on the second Wednesday each month; there is also an informal each month at a member's home.

Now for Cray Valley we have a bit of a problem, because they in their turn also have a problem, due to overbooking at Christchurch Centre, Eltham High Street, SE9. No alternative dates were offered either, all of which sounds somewhat like a polite way of applying the frozen mitt. So — we refer you to the Hon Sec for the latest situation, and hope that they can find something to suit a membership of 125.

Crystal Palace have Saturday February 21 at Emmanuel Church Hall, Barry Road SE22, starting at 8pm for the Annual General Meeting. It is nice to hear that this is another club where the membership is rising.

We have details of the Denby Dale group mobile rally from their Hon Sec — so we can refer you to them for all the details.

Regular as clockwork, we get an update from Derby as to what's going on at 119 Green Lane, where they have the whole top floor, and make it work for them. The "proper"
meetings are on Wednesdays: a Junk Sale on 4th, and a slide show by G8KSW on 11th. February 12 they are to hear the G2FKZ tape and slide lecture on Radio Aurora, and on 25th G3WFU will be talking about line transmission systems — he is from British Telecom, and on 25th G3WFU will give a talk on aerials on February 10 from the Hon Sec — see Panel.

Over in GD, the East Antrim lads are based on Carntall Point of view is that they seem to have several places to meet. February 5 is down for films at the Dominican Hall, Canterbury, and on 19th they have a pub evening at “The Sun,” St Nicholas at Wade; a glance at the map to find the Dover chaps are at the YMCA, Godwyne Road, Dover on Wednesday evenings — hint to their Hon Sec to the effect that we need an update!

In GD, the East Antrim lads are based on Carntall Hall which is near Messley — details on dates generally, and how to get to the talk on aerials on February 10 from the Hon Sec — see Panel.

Now it’s East Kent, where they have a nice new newsletter; the last chairwoman, G3ZZZ, did the first issue and then said “find yourselves an editor”, which they did — and with quite a good standard too. The only snag from our point of view is that they seem to have several places to meet. February 5 is down for films at the Dominion Hall, Canterbury, and on 19th they have a pub evening at “The Sun,” St Nicholas at Wade; a glance at the map to find where this fascinatingly named village is, shows it to be almost at Thanet.

Edgeware have the second and fourth Thursdays of each month at Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgeware. On February 12 they are to hear the G2FKZ tape and slide lecture on Radio Aurora, and February 26 is down for an informal.

Our next on the clip is the latest issue of the G-QRP Club magazine; and some degree of reorganisation helps to cope with the now 1,000 members. Incidentally, member number 1,000 was John Bazley, G3HCT, Past President of RSGB and a real DX-er; and five members in Austin, Texas have formed a section of this UK club, which has grown to have members in all continents and both sides of the Iron Curtain.

Over to Guildford where there is a report that a member has joined as a result of reading this piece (thus proving to sceptics that we have at least one reader!). The gang are to be found at the Guildford Model Engineers HQ in Stoke
Park on the second and fourth Fridays of each month; February 13 is down for a talk by G8PHG. We don't know how much of their banter to take seriously but there is a statement that the Construction Contest entries included a QRP rig in a bottle!

Every third Wednesday in the month, Hastings have a formal ‘do’ at West Hill Community Centre, Croft Road, Hastings; they also have their own clubroom at 479 Bexhill Road, St Leonards-on-Sea, which is in use most evenings of the week for one thing or another, Fridays being the chat night.

On to Hereford, where the venue is the County Control, Civil Defence Headquarters, Goal Street, Hereford, where they are to be found on the first and third Fridays of each month; we aren’t quite up to date on the newsletter to hand, albeit it does mention the Annual Dinner on February 14.

A change of venue for most meetings occurs at Ipswich; the second and last Wednesdays will be taken at the ‘Rose and Crown’ in the upstairs clubroom. This is 77 Norwich Road, and looking at the map with the current edition of QUA, it would appear to be the junction of the A45 Norwich and Bramford Road, the latter being on the left as one heads for Norwich. The dates are February 11, when they have a talk on cacti — an unusual subject and a change from Amateur Radio; with February 25 for a talk on oscilloscopes by G3NYK.

The I.R.T.S. news is still coming out, thanks to the work of the President; and there are some hints in his editorial that someone may have offered to remove some of the load from him. IRTS is, of course, the EI national society, and so any queries about club life in EI that are aimed at the Hon Sec — see Panel — will be dealt with or re-directed as may be necessary.

The Isle of Wight group has another aerial up, and so the G8 types are getting to know a bit more about the lower bands as the club station, G3SKY, has now aerials for 80 and 20 metres. Listen out for them around 3.170 MHz, on Friday evenings, from the Unity Hall, which is near the Sloop Inn, Wootton Bridge.

The Kidderminster membership list has gone up to no less than 48 — quite remarkable; they can be found on alternate Tuesday evenings at the Aggborough Community Centre, Hoo Road, Kidderminster, which is adjacent to the Harriers football ground. We believe that in between the forthrightly affairs just mentioned they also have informal sessions at another venue. To revert to the Aggborough sessions, the one on February 3 will be graced by a visit from a GPO gentleman but our list doesn’t cover February 17.

Up to Liverpool now, where they have February 3 for a quiz, and a ‘mystery guest speaker’ on February 10. February 17 will be taken up with a dissertation by a Mr B. Emmanuel on canal cruising; February 24 is set for the surplus sale where everyone gets rid of their ham gear to buy a boat! The Hq is at the Conservative Rooms, Church Road, Wavertree.

Another group to find themselves a new home are Medway, who now get together on Friday evenings at St. Luke’s Church Hall, King William Road, Gillingham; the new venue is understood to be about half a mile from the previous place and quite easy to find. Details from the acting Hon Sec — see Panel.

GW amateurs and SWLs within reach of Dolgellau will no doubt be aware that the Meirion group are to be found at the Ship Hotel on the first Thursday in each month; on February 5, SWL Bob Smith will be talking about power station instrumentation.

It is every Friday for the Mexborough crowd, and they are to be found at Harrop Hall, Dolcliffe Road. Latest details from the Hon Sec — see Panel.

February 20 at Melton Mowbray is down for a talk on Raynet, by G3STG, at the St John Ambulance Brigade Hall, Asfordby Hill, Melton Mowbray.

Another ‘every Friday’ group is the one known as Mid-Lanark; they get together at the Wrangholm Hall Community Centre, Jervision Street, New Stevenson, Motherwell.

After reading the current issue of the Midland newsletter we feel you should contact the Hon Sec at the address in the Panel, as it is not clear at the time of writing whether or no the new Hq in Broad Street is being put into use on schedule.

Northern Heights newsletter carries the weekly programme data until January-end, but they will no doubt have something going on each week: Wednesdays at the Bradshaw Tavern, Bradshaw, Halifax.

Peterborough continue their merry way, with their regular sessions on the third Friday of each month at the Scout Hut, Lincoln Road, Peterborough. Details from the new Hon Sec — will they doubtless have the programme all settled by the time this comes to be read.

The Radio Amateur Invalid and Blind club is better known as RAIBC; and we commend to your attention the thought, that, quite apart from pointing any suitable candidates for full membership in the right direction, much can be done by supporters and representatives, and a fundraising effort is always well appreciated. All the ‘gen’ from the Hon Sec — see Panel.

At Scunthorpe they have booked February 3, 10, 17, and 24. In order, the activity will be first a talk on ‘my favourite QSLs’ by G4GZB, a dinner evening, a junk sale, and a talk on Ceefax and Teletext by G8XMP. Find them at the Shack, Grange Farm Hobbies Centre, Franklin Crescent, Scunthorpe.

Nice to see Silverthorn club newsletter again after an interval; they are still based on Friday Hill House, Simmons Lane, Chingford, where they are in session each Friday evening, with some quite remarkable facilities available to them.

Down South again to Southdown — there must be something in the South Coast air that causes radio clubs to form spontaneously! This group meet at Chaseley Home for Disabled Ex-Servicemen, Southcliff, Eastbourne, on the first Monday of each month; as they have, at the time of writing, just had their AGM, we will no doubt hear next time of the detailed programme. Meantime, either go along or contact the Hon Sec at the address in the Panel.

On now to Southgate at the Scout Hut, Wilson Street, Winchmore Hill Green on the second Thursday of the month. Details from the Hon Sec — see Panel.

At Stevenage we see February 5 for a talk by G4BGP, on microwave communication, and February 19 for a talk by a representative of the Lea Valley Water Board. The meetings are held in the canteen of the British Aerospace Dynamics Group (ex-De Havilland, ex-HSD) in Gunnels Wood Road.

A very abbreviated newsletter from Stourbridge, and also minus the rather nice cover they used to have. It tells us
that the Hq is at Longlands School, Brook Street, Stourbridge, but for all the rest of it we must refer you to the Hon Sec — see Panel.

Surrey members are still getting used to the change of meeting night; but February 2 is down for a talk on “Electronics in the Home and Shack Security”, while there is an informal on February 16, both at T. S. Terra Nova, 34 The Waldrons, South Croydon.

Sutton and Cheam have two meeting-places; on February 13, at Sutton College of Liberal Arts, G3FZL will be giving a talk on VH/F, operating and other aspects. Then on February 27, at Banstead Institute, G4CQR will be telling them how a photocopier works.

Every Tuesday evening sees the local lads heading for the Thurrock Hq on the top floor of Grays Park Hall, Orsett Road, Grays. Details from the Hon Sec.

Up at Tyneside, the group are based on Vine Street, Community Centre, Wallsend, where they are to be found on Monday evenings. Operating must be a major interest, as we understand a tri-band beam has been put up for use with the club station. Details from the Hon Sec at the address in the Panel.

Verulam have moved themselves out of St Albans to Hq at the Charles Morris Memorial Hall, Tyttenhanger Green, Tyttenhanger; details from the Hon Sec — see Panel.

A long list of dates come to us from Wakefield, and from it we gather that on February 10 there will be some Post Office films, and on 24th the club will be on the air and nattering; the venue is Room 2, Holmfield House, Denby Dale Road, Wakefield.

On we go now to West Kent, at the Adult Education Centre, Monson Road, Tunbridge Wells, on the first and third Friday in each month — it sometimes confuses them with the club station. Details from the Hon Sec at the address in the Panel.

Wisbech meet fortnightly at the “Five Bells”, Parsons Drove — again details from the Hon Sec at the address in the Panel.

The Worcester lot seem to have forgotten us — but against this eventuality (which arises because of their newsletter coming out irregularly) we have a standing message from them which says that they will be in the Old Pheasant in New Street on the first Monday in the month. Details from the Hon Sec if you need it — see Panel.

Every Thursday evening at Building 101 of Houndstone Camp the Yeovil group foregather, but we do not at the time of writing have details for February, but no doubt the Hon Sec would be pleased to tell you what is to go on.

We always like to see the York letter, partly because it’s usually the bottom of the pile, but more because two successive scribes have had the gift of putting into words the atmosphere of the club — we feel almost members ourselves. They have Hq at the United Services Club, 61 Micklegate, York, and one day we will drop in and see just how accurate our imaginary crowd is! Be careful though, as they are booked in on all Fridays of every month except the third Friday in each month — it sometimes confuses them as well as us!

More Mail

Just as this piece was enveloped up and ready to go, your scribe received a missing “Special Delivery” packet, with apologies from our friends in the Post Office. In it were letters from: Mexborough, Dartford Heath D/F, Crawley, Midland, G-QRP, all of which will be taken in next time; plus news of the formation of a new club at Chesham — the contact is G8PUC on 02-405 5625. Also a letter from Tolworth Venture Scouts, who will be having an auction of surplus equipment of G3DQT, from 11am till 4pm on Saturday, February 7, the venue being the Berryfields Scout and Guide Hq, Stirling Walk, Surbiton. For more details on this one, Contact: R. P. Abbott, 151 Beresford Avenue, Surbiton.

QRT

Which is where we pull the Big Switch on Clubs Roundup for another month; deadline dates are in the ‘box’, and if you miss a bus, you’ll go into the next one anyway!

Address, as ever, to “Club Secretary”, SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts AL6 9EQ. Cheers for now!

1980 “MAGAZINE” CLUB CONTEST

The contest this year was fun for those who entered, and pretty well every station who sent in a log managed at least one QSO outside the UK. From that point at least it served its purpose; on the other hand, while the clubs who entered had, in general, a good time the snag was not enough clubs putting in logs.

The winner was quite out of the blue as far as the pre-contest forecasts of the invigators went — none of us won the pint of bitter! Tyneside remembered words of yesteryear in the context of MCC, and thought about the wild blue yonder — hence the big booming signal from GM3ZQM/P just north of the Border, some 20 km southwest of Jedburgh, on “nice muddy farmland with trees in all the right places” — they certainly were the biggest signal on the band, and that on an end-fed aerial is quite something even if it was 3/4-wavelength long with “vertical” in the right place. At times they were knocking up a scoring rate of one a minute for most of the time and, believe it or not, sitting crystal-controlled on 1.9114 MHz all through the contest, leaving the VFO of the Trio TS-520SE to make the best use on receive of the crystal filters (they had the 250 Hz one for CW).

Dundee were second placers, but at no time were they of the booming strength of the Tyneside lads, despite their half-wave at 180 feet at the feedpoint as an inverted-vee, with FT-101B down below. We know their spot pretty well and would have thought they too would have been a big signal with their take-off to the South, but it seems they weren’t to be lucky; we’d doubt if they lost out due to equipment or aerials but rather to the skip — and the chance that gave Tyneside a fine site to go with the best location from the skip point of view. Certainly
Dundee weren't putting in their usual signal strength at the writer's operating shack.

On the debit side, there was little to find. One club didn't know how to calculate their results. To clarify: add up the sum of the QSO points for the first evening; add up the total number of multiplier points for counties and countries; multiply the first by the second. Ditto the second evening. Add first evening and second evening totals. In our case of course, the CW total needed to receive also the 1.5 multiplier, and for some entrants the total score needed a further multiplier for location — nobody got the last two bits wrong, save for the incurable optimist who said "we thought you'd left our part of the country out of the list of those to receive the extra multiplication, so we've multiplied it anyway!"

However, perhaps we should consider the multiplier situation more closely for next time. But, for this year, the rules are the rules, and everyone must abide by them.

Now, as to the operating; by and large it was very good, and certainly the stations were better spread out with very few huddled in the lee of a coast station as used so often to occur. Conditions were more difficult for your invigilators to assess, huddled in the lee of a coast station as used so often to occur. Certainly the stations were better spread out with very few rules are the rules, and everyone must abide by them.

For the rest, Yaesu's FT-101 and variants thereof predominated, with several Trio TS520S's and SE's. One of the invigilators was having fun with his Trio TS-830B and its outboard VFO, monitoring his outgoing signal by listening to the second harmonic as heard by his TS-520 — quite a tangle, if his check log is anything to go by. One thing that does bother us a bit is the question of how one gets one of these Japanese transceivers to give a real 10 watts input as required by the licence conditions; we accept that it was done, because we have the declarations, and because we could do it on our old KW machine. But it does require some messing about and the obvious alternative, namely to make the licence conditions the same for CW and SSB, would make it ever so much easier.

It is interesting to notice the effect of the "opposition contest" on the CW evening, as reflected in the winner's score. On SSB, it was the mainland UK plus the Channel Isles and GD, with just one other country in UP2. On the CW evening there were twelve countries outside UK — but it is clear after going through all the logs that we will have to define countries in the rules for next year — after all, the UK comprises G, GI, GD, GM, GW, GU, GJ as separate countries, and some logs were not scored with this in mind. So — we had to rescore all the logs to be sure of correct totals.

The present format seems to please the majority; but how about some more clubs coming back for the 1981 MCC? Start thinking about it NOW, since you'll have had time to break your New Year Resolutions and will need something to cling to for the rest of 1981! We'll be there — will YOU?

As a final, we might note that part of the fun is overcoming the problems. Acton, Brentford & Chiswick lost their Hq in a fire some time ago, it will be recalled; and the new place doesn't permit use of an aerial system. So they negotiated with the London Transport Amateur Radio Club for their aerial and site at the new sports ground in Acton. Thus, the deal was that the boys used their own gear and put up the aerial, but used the LT callsign of G4H10 instead of their own. An interesting bonus for them was to find they had such an electrically quiet site, infinitely better than their old KW. The other operator, G4AZB, took the photograph.

## Thirty-Fourth MCC — Results

<table>
<thead>
<tr>
<th>Place</th>
<th>Club name &amp; Call</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tyneside, GM3ZQM/P</td>
<td>21944</td>
</tr>
<tr>
<td>2.</td>
<td>Dundee, GM4AAF</td>
<td>13602</td>
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<td>3.</td>
<td>Shefford 'C', G4IRX</td>
<td>9864</td>
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<td>4.</td>
<td>Sutton &amp; Cheam 'A', G2DMR/G3MES/A</td>
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<td>5.</td>
<td>Maidstone YMCA, G3TRF</td>
<td>8024</td>
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<td>6.</td>
<td>BSC Port Talbot, GW4NZ</td>
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<td>7.</td>
<td>Edgware, G3ASR</td>
<td>7302</td>
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<td>8.</td>
<td>IOI Contest, GW4IOI</td>
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<td>9.</td>
<td>Wimbledon, G3WIM</td>
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<td>10.</td>
<td>Acton, Brentford &amp; Chiswick, G4HIO</td>
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<tr>
<td>11.</td>
<td>Sutton &amp; Cheam 'B', G4BFJ</td>
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<td>N. Staffs, G4BEM</td>
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<td>13.</td>
<td>Grimsby, G3CNX/A</td>
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<td>14.</td>
<td>Sunderland RSGB, G3ZOG</td>
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<td>15.</td>
<td>Silverthorn G3SRA</td>
<td>2150</td>
</tr>
<tr>
<td>16.</td>
<td>Bromsgrove, G4IVJ</td>
<td>1904</td>
</tr>
</tbody>
</table>

The winners of MCC 1980 were Tyneside A.R.S., signing GM3ZQM/P. Seen here 'on location' in Scotland are the Contest operators, left to right, G4ILW, G4HUX, GRCYW, G4JGL, and SWL Teddy Tomiak. The other operator, G4AZB, took the photograph.

As a final, we might note that part of the fun is overcoming the problems. Acton, Brentford & Chiswick lost their Hq in a fire some time ago, it will be recalled; and the new place doesn't permit use of an aerial system. So they negotiated with the London Transport Amateur Radio Club for their aerial and site at the new sports ground in Acton. Thus, the deal was that the boys used their own gear and put up the aerial, but used the LT callsign of G4HIO instead of their own. An interesting bonus for them was to find they had such an electrically quiet site, infinitely better than their old place.

So — that's it for 1980. See you in MCC 1981!
THE RABBIT PATCH, PART VI

THE FOURTH OF FOUR PARTS DESCRIBING THE CONSTRUCTION OF A MULTI-TEST UNIT

By “Buck”

On the rotary switch (S2) the unused tags can be utilised as a 'tag-stripe' to accommodate any resistors that are used to make up a particular value. The loudspeaker is fixed by four solder tags held to the panel by 6BA nuts and bolts and which grip the edge of the speaker; in the area under the speaker cone the front panel is drilled with $\frac{3}{4}$” holes to form an acoustic grille. The remainder of the construction is simple. The components are mounted on the panel and the interwiring soldered in as shown in Fig. 21. The sub-chassis is made up and fixed in position, and the 10 leads joined into the rest of the circuit. After checking all connections the CMOS IC can be inserted into its socket — making sure that it is the right way round!

Operation: Test out the continuity side to begin with by using flying leads to join the following terminals together: positive output to speaker positive, continuity output to speaker input. Using a piece of wire to short out the two continuity probe terminals should cause an audible note to be heard in the loudspeaker. If not, check the connections and wiring on the continuity half of the circuit, including the voltage supply to the IC; there will be a dry joint, or a wrong or missed-out connection lurking in the undergrowth. When the continuity section functions satisfactorily remove the flying lead from the continuity output terminal and reconnect it to the capacitor output terminal. Set the range switch (S2) to position no. 1 (0-0.01µF). If a faint whistle is heard in the loudspeaker at this point — rejoice! The circuit is thus indicating that it is sensitive enough to react to the tiny capacitance that exists between the capacitor probe terminals.

Whether the whistle is there or not, connect the capacity substitution box between the capacitor probe terminals and select any value between 100 pF and 1,000 pF. This should produce a definite audible result. Varying the value of the capacitor will vary the note produced, and — Voila! — an electronic organ as a spin-off. Testing up through the ranges by the series impedance between the emitter and the collector meter will only measure the current which is allowed to flow by the series impedance between the emitter and the collector junctions. This is the 'leakage current' and, in good transistors, is very small or non-existent. By closing S1, the base voltage is brought closer to the collector voltage. This gives a measure of the diode's performance. For a simple diode a circuit as shown in Fig 22(c) is required. Here a diode is connected in series with a meter and a power supply. With S1 open, the meter will only measure the current which is allowed to flow by the series impedance between the emitter and the collector junctions. This is the 'leakage current' and, in good transistors, is very small or non-existent. By closing S1, the base voltage is brought closer to the collector voltage. This causes the transistor impedance to be less thus increasing the collector current which, in turn, increases the meter deflection. The amount of increase is a measure of the gain of the transistor.

Testing Diode Performance: To test the performance of a diode a circuit as shown in Fig 22(c) is required. Here a diode is connected in series with a meter and a power supply in such a way that the diode is 'forward biased' (positive of circuit to positive anode of diode). In this situation, the forward impedance of the diode will be low and the meter deflection quite high. By 'reverse biasing' (positive of circuit to negative cathode of diode), the diode is caused to present a high impedance to the current and the meter deflection drops. Comparing the difference in current flow in the 'forward' situation to that in the 'reverse' situation gives a measure of the diode's performance. For a simple "go-no go" test, which also determines which end of the
diode is the anode and which the cathode, see "Operation".

The circuit for the Tester follows the above mentioned principles but will have a few extras put in by way of 'on-off' warning lights, and switching arrangements, etc. Fig 23 gives the details.

Construction: The wiring diagram in Fig 24 follows the circuit diagram, and the front panel layout is shown in Fig 15. From left to right the controls are: three terminals for collector, emitter and base leads of transistors under test (the 'c' and 'e' terminals being also used for diode testing); the "PNP — NPN — Test" switch (S2) which allows the

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**Fig 21** WIRING DIAGRAM OF CAPACITY AND CONTINUITY TESTER

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**Fig 22** BASIC THEORY CIRCUITS FOR TRANSISTOR AND DIODE TESTING

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(a) PNP or NPN Indicator

(b) Transistor Performance Checking

(c) Diode Performance Checking
type of transistor to be checked before going into the 'test' position; the "Leak — Gain" push-to-make switch (S3), normally in the 'leak' position (being spring-biased it cannot be inadvertently left in the high-current-producing 'gain' position); the "High — Low" switch (S4) which should be in the 'low' position when diodes are to be tested (hence this position is marked "Low/Diode"); the "PNP — NPN" switch (S5), which determines the voltage polarity when measuring the gain of the transistor also determines whether the bias on a diode under test is 'forward' or 'reverse' (switch is marked "PNP/Forward" and "NPN/Reverse"); the "on — off" switch (S1), with its associated LED; and the positive and negative output terminals to allow a meter to be connected into circuit.

The components are mounted on the panel and then wired as shown in Fig 24. A partial view of the wiring is given in the bottom half of Fig 16, though this is somewhat obscured by the sub-chassis (mounted on a single 40 mm. stand-off pillar) which carries the resistors R2 to R7 inclusive. Care is needed in the inter-switch wiring, and for this reason the tag points have been numbered in both the circuit and the wiring diagrams to reduce the chances of confusion. Patient cross-checking as the wiring is done will pay dividends in saving heart- and headaches later. Operation: (Diode Testing). Switch on S1 and check that the 'on-off' light glows, then set S2 to 'PNP', S4 to 'diode' and S5 to 'forward'. Connect flying leads to meter terminals, observing the terminal polarity; select a 50mA. range on the meter. Next, connect diode leads to the 'emitter' and 'collector' terminals: if the PNP LED glows, the polarity of the diode is as you have it, i.e. diode anode to 'emitter' and diode cathode to 'collector' as indicated by the symbol legend at the side of the terminals. If the light does not glow, reverse the diode leads: the PNP LED should glow this time. If it doesn't, the diode is open-circuited (o/c) and can be discarded.

With the PNP LED glowing, switch S2 to 'test'; the meter should now read some value or other. If necessary, adjust meter range to give nearly f.s.d. Switch S5 to 'reverse', whereupon the meter reading should fall considerably. If there is no change in the reading the diode is short-circuited (s/c) and can be discarded.
Note that silicon and germanium diodes have a comparatively low resistance and will give a higher meter reading than selenium or copper oxide types which, having roughly twice the resistance, will only give about half the meter reading values of the first category.

Operation. (Transistor Testing). To test a transistor it is first necessary to know which of the three transistor leads belongs to the base junction. If, for any reason, the lead-out details cannot be found from charts, an ohmmeter must be used.

Select the "ohms" range on Meter 2 and connect a black flying lead to the red terminal, and a red flying lead to the black terminal. The colour of the flying leads will now be in accord with the polarity of the voltage they carry; knowing the true polarity of the leads is an essential part of the process.

Work methodically round the leads of the transistor measuring the resistance between each pair. Actual values are not important, only the relative values being significant. Find a pair of junctions which are of relatively high resistance no matter which way round the meter leads are connected to them; the base junction will be the remaining, third lead.

PNP or NPN action can be established by the ohmmeter once the base connection is known. With a positive connection to base, and a negative connection to either of the other two junctions, a low resistance reading indicates the base is a P-type and that the transistor is, therefore, an NPN type; the reverse case is true for PNP varieties. Type determination — and distinction between collector and emitter junctions — will be revealed by the test procedure.

When the base junction of the transistor has been identified the steps in the testing process are as follows. Switch on S1 and check that the 'on-off' light glows, then set S2 to 'PNP', S4 to 'low' and S5 to 'PNP'. Connect flying leads to meter terminals, observing polarity, and select a 50 m/A range on the meter. Next, connect the transistor base lead to the 'base' terminal, and connect the other two transistor leads to the remaining terminals in any order. One or other or both of the 'PNP' and 'NPN' LEDs may glow; and one may glow more brightly than the other when the switch (S2) is varied between 'PNP' and 'NPN'. Changing over the 'collector' and 'emitter' connections will result in only one light glowing in either the 'PNP' or the 'NPN' as the switch is altered. When this condition has been established the transistor type and lead-out details have been determined. Provided that the base junction has been correctly identified, failure to produce the single light condition indicates that the device is unserviceable, and that it can be discarded.

Leaving the transistor in circuit, set S2 to 'test', and set S5 to 'PNP' or to 'NPN' according to the type determined. The meter will now read the leakage current value. If the meter reading goes to f.s.d. the transistor is s/c and useless; no reading at all may only signify that the leakage current is too tiny to be measured on that particular range of the meter.

Push S3 to the 'gain' position and note any increase in meter reading that occurs: the increase in meter deflection indicates the gain that can be obtained from the device. No increase at all in the meter reading (provided the correct meter range has been selected) means that the transistor is o/c or is such a poor performer that it can be thrown away.

The Multi-Test Unit performed well up to standard, and continues to earn its keep. Almost immediately the Unit had been completed, however, another need clamoured for attention. There had to be some way of determining the precise values of capacitors, to a lesser degree resistors, and to a lesser degree still, inductors. So an RC(L) Bridge had to be made.

(to be continued)
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 — One often hears arguments, both on the bands and at club meetings, as to when SSB first came into use. The general opinion seems to be either just before or just after the last war . . . . . but how wrong can a guess be!

Whilst glancing through a recent addition to the archives of the National Wireless Museum, I found the following: “The Western Electric Company has devised a system in which the carrier wave and one sideband are filtered out, and only the second sideband is radiated. In order to render the speech intelligible, however, the carrier wave must be re-introduced at the receiving point, and this is accomplished by employing an oscillating detector, the frequency of the heterodyne oscillation being the same as that of the carrier wave suppressed at the transmitting point. Since the sideband amplitude is only one-half that of the carrier wave, the total power to be radiated is only one-quarter of that required with the ordinary system, while the band of wavelength required is considerably reduced”.

This paragraph is taken from Radio Engineering by J. H. Reyner, published in September 1925 — in the era of bright emitter valves and horn loudspeakers!

Truly, there is nothing new under the sun.

Douglas Byrne, G3KPO/GB3WM.
Hon. Curator, National Wireless Museum, Isle of Wight

Dear Sir — When things are ‘dead’ on 28 MHz, I often tune down that odd one meg. to 27 MHz — and my mind boggles!

Why does that small change in frequency bring forth such enthusiasm and organisation? I am sure that at any one time in the UK, there are more ‘good buddies’ using that bit of the spectrum than all the amateurs on 160 to 10 metres put together.

Could the answer be, as I heard one CB-er say, that “I only enjoy CB because it’s illegal”. Perhaps we would get more fun from amateur radio if we dropped the next licence renewal fee demand down the nearest drain! Or is it simply that the 27 MHz operators are the new breed of radio amateurs and we, the “come day go day, operate on Sunday” types, should take our Tony Hancock image and quietly tiptoe away.

We could, of course, actually use that ‘dead’ 28 MHz band. It certainly makes you think — rather like taxing your car for a year and then using it only on Sunday mornings!

Nev Kirk, G3JDK

Dear Sir — I am a short wave listener and keen on entering for awards open to SWL’s; also I hope to receive a full licence this year.

I would like to take up the matter of QSL cards. To obtain an award it is necessary to forward QSL cards for confirmation of the contact, and I wonder if other SWL readers are experiencing the same problem as myself, namely, failure to receive a return QSL card when dealing with some ‘managers’.

The return is about 25%, against 90% when sent direct to the address given in the Call Books. It would appear that managers do not treat reports and cards from SWL’s with the same respect as they do licensed operator’s QSL’s — even though they are sent addressed envelopes, IRCs and return Air Mail stamps. This causes resentment and is a poor reflection on the Amateur scene generally. It should be remembered that a keen SWL is a future licensed operator, becoming a member of the ‘club’, hoping to enter for awards and contests, and expecting replies to his QSL cards.

This failure to reply does not occur very much when correspondence takes place direct with a station operator himself, so it seems that this must be the way to overcome the problem; however not all operators have QSL cards available, having delegated the job to their manager. Of course there is always the QSL bureau, but the years pass before enough of the necessary cards are collected.

B. Woodcock, Leeds

Dear Sir — Most two-metre operators will by now have heard about the proposed plan to divide up the SSB section of the band, with DX working below 144.40 MHz and local working above it.

There must be a few thousand rigs, such as Liner-2’s, which are only capable of tuning up to about 144.330 MHz and these are most likely to be used for local and mobile contacts. DX operators, on the other hand, are more likely to be equipped to work anywhere on the band. I therefore propose that 144.150 to 144.300 MHz be used for local working, and 144.300 to 144.500 MHz for DX; this would give limited-coverage equipment access to the full local/mobile sub-band and a small part of the DX segment. It would also keep the DX clear of those reactionaries who will never move no matter what the band plan says.

I must state my personal view that there is already too much ‘bureaucracy’ on 2m. in the form of calling channels etc. People still manage to work DX on the more crowded HF bands without all this band planning. I don’t advocate a free-for-all with satellites, repeaters and SSB all in there together, it is simply a matter of degree. I think some of the people making the rules forget that amateur radio is supposed to be a hobby.

In any case, I think it is wrong that a handful of influential amateurs in their ivory tower should be able to make hundreds of rigs obsolete overnight. This plan should either be forgotten, or modified as I have suggested.

Julian Moss, B.Sc., AMBCS, G4ILO

Dear Sir — Could we use your pages to offer thanks to the following people and companies who have helped us so much in the last six months. We are involved in the care and rehabilitation of young men who wish to be helped with their drug, alcohol or other problems, some of whom have spent time in prison or borstal. We use amateur radio as one of our hobby projects as it encourages diligence and co-ordination,
and brings our lads into contact with people all over the world.

A Trio 9R-59DS was donated by Lowe Electronics Ltd. Our other receiver is an RX-80, designed by A. L. Bailey G3WPO, the circuitry for which was donated by Roy Stevens of the IARU. Decca and Cable & Wireless donated equipment and funds to enable us to build a very efficient antenna system, using an 18-AVQ vertical and a 108-ft. trap dipole. Amcomm provided the ATU; Heathkit and C. Bowes provided kits for the Morse code oscillator and wideband pre-amp., respectively. We have also been encouraged by Dr. Tong's gift of a Datong Morse Tutor, and Mr. F. L. Curtis's gift of the G3SVK Morse Course.

We would like to thank Short Wave Magazine and the RSGB for their generous gifts of books and subscriptions; and last but not least, Mr. Geoff Stone G3FZL and all the other radio experts who have helped us so much.

Two of this household are attending evening classes at Ferndale and hope to sit the RAE next May.

Thank you all for your help.

Arthur (BRS44147) and Susie McBryan, house parents, Pye Barn Ltd.

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

**"IT'S THE SECOND BIGGEST THING SINCE '46"**

Jack Hum, G5UM

ANOTHER clubnight had come and gone. The members drifted off into the chill of the night, and as Old Fangler, standing in the doorway of the clubroom, watched their figures merge into the darkness, an old church bell from somewhere down in the city below tolled the knell of passing day and registered 2200 hours logging time.

At that moment Old Fangler suddenly realised he was not alone. There was still somebody behind him in the clubroom. He turned round to look. Now why, thought Old Fangler, was that member whom he knew as the Sceptic At The Club hanging around? Why was he lurking? Had he been indulging in a furtive draining of the teapot in the kitchen? Wasn't he feeling well?

It was none of these things, explained the SATC when Old Fangler asked him. The reason he was delaying his home going, he said, was that he had one or two important things to ask of Old Fangler.

"'H'm'", thought the O.F. "This sounds a bit portentous ... after all, he's been in amateur radio a long time and there's not much you can tell him ... in fact, he's the one who usually does the telling. Many's the young squirt who has caught the sharp edge of his tongue by daring to ask for his 'handle'. It was said he replied "'It's in the smallest room in the house'. And it's a standing club joke how he put down a chap who kept on saying on the air 'We this' and 'We that' by asking him if he customarily used the Royal plural and did he have a coat of arms!

All these thoughts flashed through Old Fangler's mind at 186K/per sec; he shook himself clear of them and asked the Sceptic At The Club what he could do to help.

Came the reply from SATC: "Do you remember a few weeks ago we had a most interesting conversation about getting going on the metre waves, and we'd reached the point where I'd asked you about repeaters (see "SWM," August 1980, page 367). You shut up like a clam at this and said it was another story for another time. How d'you feel about giving me the lowdown on it now?"

Seeing he was cornered, metaphorically if not physically, Old Fangler observed that a draughty doorway at the clubroom (which he was trying hard to close) was no place to hold a dissertation. "Home to a last cuppa" he suggested, feeling that his chances of a quiet diddle-dee-dah before he went to bed were rapidly becoming subject to inexorable QSB.

Fourteen minutes and four cuppas later, Old Fangler stretching out in his armchair said:

"'Now, repeaters ... they are the second best thing to have hit amateur radio since the Great Resumption back in 1946'.

The SATC couldn't help asking what the First Thing was if repeaters were the second.

"'Why, single sideband' replied Old Fangler: "It revolutionised the amateur radio scene as nothing else before it had ever done. Think of the chaos we'd be in today if it hadn't been for those dedicated chaps who pioneered the A7J mode for amateurs about a quarter of a century ago ... yet, d'you know, it wasn't new? The professionals had it across the Atlantic well before the war but the amateurs didn't'.

Fidgeting slightly, because the hour was late, the SATC reminded Old Fangler that it wasn't SSB he'd come to talk about but repeaters.

"'Oh yes' replied the O.F.: "'H'm, repeaters ... the second best thing to hit amateur radio ... I'll tell you all about them in just a few short swift sentences'"

What Old Fangler had to say went something like this:

In the Sixties and Seventies the British amateur radio scene experienced a growth in VHF activity which could only be described as explosive, maybe exponential and certainly quite extraordinary (the advent of the Class B licence in 1964 was only one of several reasons for this trend). Along with this growth went an equally emphatic expansion of mobile operation. Yet herein lay a snag; on the metre waves you get best results not only when you can cover a line of sight path but also when you can obey that dictum uttered without number over the last three decades in Short Wave Magazine: get as much antenna metal high up and in the clear as you possibly can.

Quite evidently no mobile installation can obey these two dicta of high antenna and lots of it: mobiles by definition operate at ground level and the antennas fixed to them are not much higher than that. At the same time they must be smallish enough to attach to a vehicle.

Result: mediocre performance at VHF, with contacts limited to those stations (fixed or mobile) who coincidentally happen to be within electronic line of sight with you when you put out that optimistic CQ.

The remedy? To instal a VHF repeater station on a high spot overlooking known areas of vehicular activity. Equip it with a receiver for accepting signals from those same vehicles, and a transmitter which automatically re-radiates your call on another frequency where you hope someone will be listening and waiting to talk with you.
Nothing new in that: the professionals had done it for years, asserted Old Fangler. But when a handful of professionals holding amateur call-signs noted the shortcomings of mobile VHF operation they came up with the suggestion that there could be amateur operated repeaters, too. And now, not quite ten years after the initial thought, there are a hundred-plus repeaters covering most of the British Isles on either the 145 MHz band or the 433 MHz band — and from some sites, both.

The Old Fangler went on to describe the operational technique of bleeping up a repeater when you wanted to talk through it, of always checking the input to determine if, hearing your correspondent's signal, a simplex contact might be possible, of getting off the repeater a.s.a.p, lest others be waiting to use it — and most important of never, never using it from the home site if direct communication was viable, remembering always that repeaters were for the disadvantaged and not for people sitting comfortably at home (unless they honestly could say that communication by any other means was impossible). Old Fangler waxed especially vehement about so-called nets forming up on repeaters, thus inhibiting their intended use (which, as he said, was for the electronically disadvantaged).

All of which seemed to make a positive impression on the SATC: "I've been in this amateur communications game a long time, as you know, but a lot of this is new to me" he said. Then a thought struck him:

"If you talk through repeaters isn't it rather like cheating? After all it's the magic box that's doing the work and you're not having a real QSO at all!"

"Point taken, chum", replied Old Fangler, adding:

"What's more, when there's a bit of a lift on the band and the distant stuff is coming through, perhaps laced with a foreign body or two, you have to keep a sense of balance and remember that it's the automatic box up on that hill that's doing the work, not you. I find it quite pathetic when you hear chaps begging for a QSL for what they call a QSO . . . it's nothing more than a proxy QSO if it's done through a repeater, and the QSL anyway should logically go to the repeater and not to the person you talk to".

With a glint in his eye the Old Fangler murmured: "You won't get a card back in return if you do QSL a repeater. The thing can hear and it can talk, but it can't write!"

At this point the Sceptic At The Club muttered something about a lot of room being taken up in the bands by all these repeaters, what with space in which they can listen for calls and more space in which to reply. Back came Old Fangler with a quick answer: "Just 175 kHz input on the 2m band plus another 175 kHz output, a total of 350 kHz devoted to repeaters . . . not much when you consider that the 2m band is 2000 kHz wide. There's an enormous amount of room left to do your own thing if you don't like repeaters".

Quickly he apologised: "I shouldn't have said 'Don't like repeaters'. That's negative thinking. I should've said 'If I choose not to work via repeaters'. After all, it's every operator's free choice whether he wants to use them or not. I always like to think of a repeater as an electronic motor car: it's a marvel of complex engineering which will take you places when you want it to, but there are other modes of travel".

The SATC thought this a nice analogy and he capped it by saying: "Yes, and like the motor car it depends on how they are used". Which could almost have been the last aphorism of the evening until a final thought occurred to The Sceptic: "You still haven't fully explained why you think repeaters are the second best thing to have hit amateur radio".

Smiling wryly, Old Fangler excused himself for this lapse, and, pouring out the final-final cuppa, gave it as his opinion that rarely before in British amateur radio had so many people been so inspired by a technical project as they had shown themselves to be about the repeater concept. All those repeaters dotting the map of the country came about because of the dedication of often small groups of local enthusiasts firm in their belief that a repeater in their vicinity would be of benefit not just to themselves but to all others who were passing that way on their lawful occasions. These enthusiasts were prepared to find the cash to buy the parts to make the things, they were prepared to submit their technical expertise to the scrutiny of the central body (the Repeater Working Group) which co-ordinated all UK repeater activity; and thirdly, added the O.F., they accepted the responsibility that their repeater, once authorised, must, come heck or high water, give a 24-hour service.

"Service" . . . that's what amateur radio is all about" said the SATC quietly, as he reached for his raincoat.

The front cover of the 1981 edition of the radio amateur's 'bible': ARRL's "The Radio Amateur's Handbook". Revised each year to reflect changes in the state of the art, this 58th edition has much useful added material as well as several new construction projects, while retaining its long-established reputation as perhaps the finest standard reference book in its field. Obtainable from Short Wave Magazine Publications Dept., it is available in both soft and hard cover, at £7.80 and £10.80 respectively, including post/packing.
A SIMPLE TUNING AID FOR BLIND OPERATORS

BRIAN CASTLE, G4DYF

The device described in this article was developed from one which appeared a few years ago in Ham Radio. It is intended for use by blind or partially sighted operators, and affords some assistance in tuning the transmitter output stage and the coupling to the aerial. It is not recommended for use with a solid state PA which might be damaged by a small mismatch or might give much reduced output under these conditions.

These simple devices are in daily use at the stations of at least three well known British "white stick" operators on the HF bands. They use rigs having the rather delicate TV sweep tube PAs and tune them in this way without problems.

Circuit Operation

The tuning aid works by detecting a fraction of the RF present at the aerial socket of the transmitter and using it to power an audio oscillator. The tone varies according to the amount of RF present and with experience is interpreted by the operator as he tunes the PA and aerial matching circuit. The device is switched out of circuit by SW1 when the operator is satisfied with result.

The circuit is shown in Fig. 1. The variable potential divider formed by R1, R2 and RV1 is adjusted for maximum sensitivity to changes in the RF. Diode D1 rectifies the signal and C1, L1 and C2 remove the ripple so that DC is passed on to the oscillator. This consists of an astable multivibrator which will work down to about 0.4 volt (at 1.5 volts it takes only about 300 uV). The audio transducer is a crystal microphone insert or crystal earpiece connected between the collectors of the two transistors. One collector is at maximum positive when the other is at minimum, and vice versa. An earpiece of lower impedance, say 200 ohms, might give satisfactory results if connected in place of one of the collector resistors R3 or R6, but then the circuit would draw a larger current; an 8 ohm earpiece would not be satisfactory.

The device is connected in parallel with the aerial socket of the transmitter. The easiest way to make this connection if the rig has an SO-329 socket is to use a PL-259 T-connector and to plug the aerial into one side of the ‘T’ and the tuning aid into the other, via coaxial cable. Otherwise the aid can be fitted with a socket similar to the rig, wired via coaxial cable to a suitable plug.

Switch SW1 can be a cheap slide-switch type in spite of the RF present. The circuit can be made on stripboard provided that the full RF voltage does not reach it; resistor R1 should be connected directly between the input terminal and the switch. The whole circuit, including the crystal transducer, should be fitted in a fully screened enclosure, i.e. aluminium box, diecast box, tobacco tin or suchlike; this is to prevent RF bypassing the filter, C1, L1, C2. If unscreened, the tuning aid may produce very weird noises even when switched off. Holes will have to be drilled in the box through which to hear the tone.

When a tuning aid is constructed for a blind operator it is desirable to assist him initially by tuning up visually while the aid is in circuit so that the squeaks and squawks which it makes can be related to the correct tuning, loading and matching settings. Much more sophisticated circuits to make it possible for blind operators to carry out all operations unaided have been designed but the little gadget described here is simple and, with its limitations, undoubtedly serves the purpose.
COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

AS FAR as the writer is concerned, the month in review has seen quite a bit of “playing with wireless” but not much operating activity! And indeed, operating isn’t all the hobby has to offer, even for the “appliance user” so-called. In my own case it has been questions of aerial design, for example, which have kept me amused, not to mention mending the machinery, and some constructional work.

Events

Perhaps the most important news is that of the BY situation; the Chinese authorities are on record as saying it will soon be possible to work BYs. Now, your old scribe has two comments to make on this; they won’t let loose any amateurs until they are sure their operating will be a credit to BY as a country and, having said it will in due course be possible to work BY, it will happen. We have had occasion to deal with Chinese, and IT is a part of the Chinese code of things that a public statement like this will be honoured, particularly when the statement has been made at international level. To be a bad operator, or to fail to keep a promise, involves loss of face and no Chinese will happen. We have had occasion to deal with Chinese, and IT is a part of the Chinese code of things that a public statement like this will be honoured, particularly when the statement has been made at international level. To be a bad operator, or to fail to keep a promise, involves loss of face and no Chinese will happen. We have had occasion to deal with Chinese, and IT is a part of the Chinese code of things that a public statement like this will be honoured, particularly when the statement has been made at international level. To be a bad operator, or to fail to keep a promise, involves loss of face and no Chinese will happen. We have had occasion to deal with Chinese, and IT is a part of the Chinese code of things that a public statement like this will be honoured, particularly when the statement has been made at international level. To be a bad operator, or to fail to keep a promise, involves loss of face and no Chinese will happen.

We hear of a visit to Nepal being planned for April by a group from JA. We also hear that the proposal by P29JS to activate Hearld Is. is up against the wall, partly because Jim has moved to Norfolk Is. as VK9NS but rather more by the lack of support for his activity by others. This one, if it comes off, will cost a bomb; indeed VK9NS himself has a lot tied up in it. He repeats that any donations will be returned if the trip does not materialise. None of the big DX groups has committed any money to it, but donations are still welcome. By the time this is in print, the operations may have begun, or be about to do so, but the writer has to admit to a feeling that this one won’t happen for a while yet.

South Birmingham Radio Society are the inventors of an award called the Birmingham Postal Zone Award; you have to get either 25, 50, or 75 points for the different classes. A first qualification is to work either G3OHM or G8OHM, for five points; you must have a QSO with one or the other (not both) to qualify for any of the awards. Work members of the club for two points, or non-members for one point, one contact in each postal zone (of which there are some 98 in the city and surrounding districts). All QSOs to be direct, and all from the same station (i.e. all from home, all from one /A place, all /M, or all /P). An exception to the rule about direct contacts is made if you work them via OSCAR — but you need the lot to be on OSCAR and the award is suitably endorsed. For full details, get in touch with J. Harvey, G4IVJ, 38 Bodenham Road, Birmingham B31 5DS, W. Midlands. As for the cost of the award, it is £1, or 6 IRCs, or three dollars. An S.a.e. is required.

The RSGB 7 MHz contest comes up soon; Phone over the weekend February 7/8, CW February 28/March 1. This is a good one on which to test the station out — and a good contest into the bargain. Entries: Phone to be received by April 4, CW by April 25, to the RSGB HF Contest committee, c/o P. A. Miles, 28 Scotch Orchard, Lichfield, Staffs WS13 6DE. Note that in the Phone section you will have to be able to work split-frequency, as the Ws are up above 7.1 MHz.

QRP merchants should note that February 28/March 1 is also the date for the G-QRP Club Activity Weekend. Look on 3560, 7030, 14060, 21060 and 28060 kHz, starting at 0900 on the Saturday through to 2359 on Sunday, the band change being hourly in accordance with propagation. Details from G3RJV, QTHR.

Some results: the CQ WW 160 1980 contest. The World Trophy goes to K1PBW — a nice way to bow out indeed! For Europe the winner was G3XWZ/A, although G3SZA had more points and QSOs — this is doubtless the rule about holding the Trophy for one year only. K1PBW found 555 QSOs, G3XWZ/A 227 QSOs and G3SZA 343. It is of some interest that KV4FZ only managed 303 contacts.

1981 is the 25th anniversary of the founding of the Duke of Edinburgh Award. The commemoration as far as our hobby is concerned will be from HMS Belfast, planned for 6/7/8 February. Details from P. Carey, G3UXH, 99 Bells Lane, Hoo St., Rochester, Kent, or Medway (0634) 250562. He particularly wants to hear from anyone who has been active in the scheme, either as a helper or a participant.

In the past we have on occasion mentioned the YL/YL QSOs of G4EZI (she is Hon. Sec. of BYLARA, incidentally, if any YL reader is interested), and by way of a note in the Geoff Watts DXNS we see Diana has now worked YL/YL contacts with 193 countries — which must be a top score.

Some people who report to this piece seem to be having rig troubles: G4EZA (Colchester) lost the coupling capacitor between PA anode and pi-tank, after a little fire and smoke. G4HZW (Knutsford) has an FT-75, which has...
been back a couple of times to the
supplier, each time with the same fault,
and each time the fault has recurred
within a short time. We’re not very
surprised, as there is a tendency in
“servicing” engineers to assume that if a
valve, say, is u/s, that’s the fault, instead
of asking themselves what wrote it off in
the first place! (Indeed, when TV sets
were full of valves, at least one maker in
a paper on reliability was quite blunt
that almost all valve failures were
attributable to their being used as means
of isolating stages, and his graphs
showed the spectacular differences in
mortality rate for wire-ended valves.)
Still with the wreckers, Bill of G2ADZ
(Cheshington) has had an attack of
Murphy’s mice who ate the rotator cable
clean through in several places and then
added insult to injury by eating the
speaker cone! Finally (we hope) the
writer’s autokeyer; he thought his
problem was in the ALC circuit of the
cassette recorder and tore
it to bits
having been QRT since seven years
Having an indoor dipole on this band
always from an “invisible” aerial.
G5LD has an indoor dipole on this band
too, and was a good signal at teatime
from Newcastle. Another odd one was
to work DK9XT shortly after midnight
and to receive a prompt SWL report
from an old colleague of wartime days
—a small world!

Forty
It is well said that “if you can’t hear
‘em, you can’t work ‘em”. This simple
fact puts many people off operating the
band.

G4EZA (Colchester) says he must
get up early and go after something
interesting but his evening look
around resulted in a QSO with K2VV on
CW.

On to G2HKU where the ear trouble
continues to reduce enthusiasm, and so
on 7 MHz there was just CW to UA0AG
and K4YF.

G4BUE used the Argonaut at five
watts to work other QRP stations, like
G3PKQ, GM30XX, G3GBD, G3RJV,
HB9AJSJ, G4DQP, OK1DKW, G4JRE,
GM3MXN, and
g3FXN. He tried an early start (0400)
to raise WB3AVN on the inverted-vee—
a pity the W was QRO.

At the G3CED/G3VFA establishment,
the surge of 50 watt operating soon gave
way to the usual two watts, and of course the
little comments still abound. For example,
about a contest: first, “pea-shelling
contest”; second, to a 599 report,
“lari”!; and third, “don’t these guys
know log books cost money?”. Further
down the log there was a little gem,
“never give up — there is always
UA3!”.

Twenty
Where it all happens — whether by
“happens” you mean DX, or noise, or
QRM or whatever, the word still applies!

Let’s start with a look at G3VFA and
his Joyframe and two watts input; OZ8AA,
OE6CTG, Y57SH, DL8AN,
DL1HAK, DL2CT, GW4DZE
plenty enough to show that he is getting
out with the low power, but the big
effort concentrated on 21 and 28 MHz
as we will see.

G4BUE operated QRO to reach the
J20AA expedition to Abu All to give
overall country number 294; with the
Argonaut, he worked other QRP
stations, namely GM30XX,
DL7MAM, OK1DKW, HB9ASJ, OZ5XW, SM6AWA, and GM3MNX.

G3EZA simply says he had several looks at the band, heard the rumpus and hastily cranked the bandswitch!

For G2HKU, Twenty was in the main the ZL skeds; ZL1VN, ZL1YS, ZL3SE, and ZL3FV. As a matter of interest Ted has made 1000 QSOs with G6AB, and well over 900 with ZL1VIN; it is of interest to note that the latter has a TA33 and a delta-loop up, and the delta is always a better signal than the beam by quite a bit.

**21 MHz**

This is the place to be, pronounces G4EZA, and Tim then offers his CW contacts with lots of JAs, K6ORT/7 KV4AA, UJ8JAS, UK8MAA, VE6HH, VK2NAV, VK3NNW, VK7NRT who was running two watts to a two-element quad for an S6 signal, YV1AD, YV2BE, 4Z4NUT; and SSB to JA1SHC, JE2CHJ, OE5GML/YK, SV0AM/SV5 in the Dodecanese, VK3VDW, and 9K2FO.

Steps of power about sums up the G4BUE activity on the band. At 350 milliwatts input, WA1JYY (two watts) and AA9N (five watts) were worked, than a lift to 500 mW brought a QSO with KA9J who was QRO. Next comes the 750 mW, and it managed to work WA7ZBL in Oregon who was running five watts; finally the five watts input, which brought in QRP stations five watts; finally the five watts input, WA7ZBL in Oregon who was running 214 mA made 750 milliwatts input, and with the 4-element beam some 149 QSOs were made with North America among 41 states, including most of the difficult ones. The G-QRP Club Winter Sports produced a QSO with DK5RY/LX on all five bands — his 180 metre long-wire made him easy on the LF bands but it was a real struggle on 21 and 28 MHz. Another interesting QSO was at 750 mW input with WB2RZU who was running his PA at 500 milliwatts; less than a watt either way for a solid contact. Other QRP stations included K9XL, E6AYE, PY2EGM, KB9K, WA2SON, WDODGU, WB80WM — a long time since we last heard from Skip — G3VXJ, SP9AAB, UB5QGC, and UA3ACB who was running an output of 100 mW.

On to G2HKU, who also stuck to the Argonaut and three watts, with which the CW got over to W77A, W0ONM (Minn.) VE3BMW, W7CT (Oregon), K6ELW, K6OQA, K0ZZ (South Dakota), WD9DCL, W9OA, and WDOBW8 (South Dakota).

G4HZW, as already recounted, had had more than a share of rig problems, but when it was working its 25 watts went to a two-element quad at 24 feet. So Tony offers (we believe SSB, as he doesn't say) VE3HFN, KA3CHD, W2HBC, WB6YEJ, W6ZNL, W7KWK (I dahoo), WB6GEN, WB2OKB, VE5JN, KA0CUQ, W6NSU, WB0CVM (Iowa), W6IH, KGND (Nebraska), WD8JWF; then in the ARRL ten-metre shindy OH1ZE, UW6DR, HA9RE, UK9UA, UR2KEB, UA9AED, UK7PAL, plus hordes of Ws including such as K3HPB (Delaware), AASB (New Mexico), WI6YX (Montana), N7DD (Arizona), VE7CM, N7AOS (Delaware), KI1K (Vermont), K6JHV, K7CA/HCI, U40EL, PY3CB by long path(!), UA0SAU, GM3RAO by back-scatter, UL70AA, P2JFR, HK3TF, H19HC, VO2CW, W6LH (Arizona, believe it or no!), KA1EHR (Rhode Island), WB0MWM (S. Dakota). Then after the contest we find FP8HL, WD9DRM, WD6CBX, W95NZ/M/9, VP8QG, VK8UK, W0DQ, W0BND, K7CR, WD4KKK/P/VE4, WB7SMU, VE6SP, VE1-7 in the Canada Day contest, VESDB who had 12 watts to a vertical, XL3ON, VP2AZE, WS9M, KB4WX, and JA5OKY, and then — the rig died!

G2ADZ (Chessington), apart from his Murphy's mice problems, had his fair share of chokes over the holidays, which restricted activity. Never mind, Bill stuck to his 28 MHz CW last, and found TU20JB, OA8CP, VK3MR, VK4AIN, VK5MD, VK6NLU and others, FG7AS, CO7FM, 8P6JD, 3BBCF, 5T5NC, 5N0MAS, VP8AI, VU2BK, 9M2KG, HZ1HZ, AP2TN, and CE3WD, plus some W6-7 and VE7.

G4EZA says he heard a JA talking to a G on Ten, saying the JAs weren't going to be allowed 10 and 24 MHz, and as a result some JAs were going to make a fuss with their authorities. Turning to the QSOs, Tim comments that a bigger proportion of QSOs were on Phone on this occasion, and wonders why — lower noise levels maybe? Anyway CW gobbled up DL8NU/OH0, ZS3A, while the SSB dealt with AA6AA/38B, JABC1J, JY9XK, LUM3CJ, UJ8JQ, VE6EO, VK6MV, VK6NE, VP2AEE, VP2VDH, YB2SV/9, Z2Z0W (a PY in a contest), 4X6CW, 9Y4VU, and lots of Gotaways of course.

G3CED found UK5EDF, UT5YV, LZ2KSU, UC2FI, UA3PDE, UC2CFH, W3ARK, OH6NH, W9MYD, UB5INK who came back to a CQ QRP call, UA3AH, UA3DNU, UB5QHJ, UA9CPJ, UA3DMJ, UK9CCJ, UC2AFI, W2BAI, IT9AF, VE3DFM, WA6CIL who disappeared "in all that Californian fog" says the log, WB8NXX, UK5EEZ who was using AM (crikey!), and YU4FST.

No doubt about it, there is a certain fascination about this QRP lark, which grows on you; George, G3CED/G3VFA has donated a cup to the G-QRP Club, aimed at "the ordinary mortals using backyard aerials" for which entries are to be in by February 1 — and we bet there will be quite a few entries for it.

**Time-Out**

Which is where we say our farewells for another month — the dates are in the box, and we can always use more reports. Thanks to those who make time to find pen and paper, to the DX Bulletin, and of course to Geoff Watts' DX News Sheet. Now your scribe sits to find pen and paper, to the DX reports. Thanks to those who make time for another month — the dates are in the transit but which will arrive too late — notably from G3NOF and G3PKS, two of our closest observers of activity. It's a great pity they missed the bus, but deadlines, like time and tide, wait for no man! Address everything to "CDXN", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. Cheers!
NEW QTH's

This space is for the publication of the addresses of holders of new call-signs, or change of address, in EI, G, GI, GJ, GI, GM and GW of stations not already listed. All addresses published here appear in the edition of the American "CALL BOOK" in preparation. Please write clearly and address on a separate slip to QTH Section. Be sure to give correct County designation and post-code. In the case of direct subscribers needing Change of Address, please state for card index adjustment. Address items for this space: "NEW QTH Page", SHORT WAVE MAGAZINE, 34 HIGH STREET, WELwyn, HERTS., AL6 9EY.

G4JVB, G. M. Murphy, 49 Lavarra Grove, Teerneuse, Dublin, 6. (Tel: 01-909639).
G4RD, G. P. Fitzgerald, 40 Maigue Way, Cottingham Grove, OAS. (Tel: 036-44-3608).
G4RE, A. Espiau (ex-G80GC), 40 Morgan (ex-G8VWY), 5 Eden Close, Hatfield, Herts.

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Change of Address

GLD, H. F. M. Baker, "Priorswood", 64 Front Road, Woodchurch, Ashford, Kent.
G3AYD, R. Harden, 14 Ferriers Way, Epsom Downs, Surrey.
G3AXS, R. A. Collins, High Elms, Julian Bower, Louth, Lincs. LN11 9QW.
G3CQA, B. J. Harding, 19 Oakwell Drive, Bingley, Bradford, W. Yorks. BD15 8UQ.
G3NHY, E. Appleby, 60 Willow Garth, Newby, Scarborough, N. Yorkshire. Y012 SHY.

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March issue due to appear on Friday, February 27th.
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TO ORDER ANY OF THE ABOVE ITEMS SIMPLY WRITE ENCLOSING A CHEQUE OR PHONE YOUR CREDIT CARD NUMBER
Multi-mode Audio Filter  
Model FL 2  
Adds variable selectivity to existing communications receivers without internal modifications. Gives extremely sharp pass-band edges for truly exceptional filtering performance on all modes but especially for SSB. Its 10 poles of full variable low and high pass filtering give sharper filter edges even than normal crystal filters. A separate manually tuned notch filter is also fitted. In "low" mode all 12 poles of filtering are combined to give exceptional skirt selectivity. Connects in series with loudspeaker.

General Coverage Converter  
Model PC1  
Model PC1 converts any good two metre SSB receiver or transceiver into a superb general coverage communications receiver. Coverage is 0 to 30 MHz in thirty synthesised bands of 1 MHz and no receiver modifications are required. Advanced parametric mixer and LSI frequency synthesiser ensure that the overall performance is limited only by that of the main receiver. Also usable with 28-29 MHz receivers via a conventional 2-metre converter.

Automatic r.f. Speech Processor  
Model ASP  
Makes your transmitted speech louder and clearer for a given transmitter power. The 'Rolls-Royce' of r.f. speech processors Model ASP adjusts itself to suit your voice level and your microphone. Simply select the degree of r.f. clipping in steps of 6 dBs from 0 to 30 dBs. Connects in series with the microphone.

Active Receiving Antennas  
Models AD270, AD370  
Ultra-compact receiving antenna systems giving wideband coverage from 200 kHz to over 30 MHz at high sensitivity. Models AD270 and AD370 give similar receive performance to large conventional antenna systems yet are only 3 metres in overall length. The balanced dipole configuration also gives good rejection of local interference. Model AD270 (an upgraded version of Model AD170) is for indoor mounting. Model AD370 is waterproofed for outdoor use. Model AD370 & AD270 head units only are also available separately for upgrading earlier AD170 systems.

Not just a pretty fascia!

Products not shown in this advertisement  
- Model FL1, Self-tuning notch/peak audio filter.  
- Model D75, R.F. Speech Processor.  
- Model MPU, Mains Power Unit.  
- Accessory Leads.

Very Low Frequency Converter  
Model VLF  
If your communications receiver gives poor results below 500 kHz Model VLF is the answer. It also adds MW and LW coverage to amateur bands-only receivers for news, time checks etc. It connects between antenna and receiver input, and converts signals from 0 to 500 kHz to the range 28 to 28.5 MHz with low noise and high sensitivity. Useable to 1 MHz with reduced sensitivity.

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Price (Excl VAT)</th>
<th>Price (Incl VAT)</th>
</tr>
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<tbody>
<tr>
<td>FL1</td>
<td>£59.00</td>
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<td>FL2</td>
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<td>D70</td>
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<tr>
<td>RFC/M</td>
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DATONG ELECTRONICS LIMITED  
Spence Mills, Mill Lane, Bramley, Leeds LS13 3HE, England. Telephone: (0532) 552461
THE NEW SENTINEL AUTO 2 METRE PRE-AMPLIFIER

In the five years since we first thought of the principle of r.f. switched automatic pre-amplifiers, we have learned a lot about them. The benefit of all this experience has been put into the Sentinel Auto Mk II. These include NEW PROTECTION circuit to give MAXIMUM LEGAL through power rating. Completely new (and unique) third generation DUAL GATE MOSFET pre-amplifier giving 1db N.F. and 20db gain with GAIN CONTROL and OFF switch (straight through when OFF). The r.f. switch has a delay for use on ANY MODE.

High Q tuned circuits for high selectivity.

12V 25mA Size 1½ ” x 2½ ” x 4” £25.00* 2 metres and 4 metres. 70cm version £28.80* All ex stock.

PA5. Same as above plus 240V A.C. supply. £30.00* ex Stock.

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Same performance as above less r.f. switch. £15.00* 2 and 4 metres. £17.50* 70cm version. £10.70 Ex stock.

NEW! SENTINEL L.F. CONVERTER. 10KHz-2MHz IN. 28-30MHz OUT. 9-12V. 5mA. £28.80 Ex stock.

SENTINEL DUAL GATE MOSFET 2 or 4 METRE CONVERTERS. IFs: 2-4, 4-6 or 28-30MHz. 1db N.F. 30db gain. £24.73 Ex stock. 4M. IF. 28-28.7 MHz.

SENTINEL X 2 or 4 METRE CONVERTER. Same as above plus mains power supply. £28.80 Ex stock.

SENTINEL TOP BAND CONVERTER. 1.8 - 2.3MHz IN. 14-14.5MHz OUT. 9-12V. 5mA. £20.80 Ex stock.

SENTINEL 70 70cm CONVERTER 432-434MHz IN. 28-30MHz OUT. 12V. 20mA. £28.80 Ex stock.

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From the inventors of combined Power/Pre-amps. ULTRA LINEAR — ALL MODES. Switch STRAIGHT THROUGH when OFF. R.F. switch operates at .1W. Fully SWR protected transistors. Provide same power gain at lower drive powers. Supply 13.8V (12-16V). Receive pre-amp. 1db N.F. 18db gain. 50239s. Three models to suit your transceiver. These units have all been re-designed to make use of the latest techniques for highest reliability and performance.

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SENTINEL 50. 5 times power gain. 10W IN 50W OUT. Maximum drive 16W 6 amps. Same size as the Sentinel 30. Ex stock.

SENTINEL 100. 10 times power gain. 10W IN 100W OUT. Max. drive 16W. Size: 6½” x 4” front panel, 3½” deep. 12 amps. Price: £126.50 Ex stock. All available less pre-amp for £8.00 less.

MAINS POWER SUPPLIES FOR SENTINEL POWER/ PRE-AMPLIFIERS.

6 amps for the 30 and 50. £34.50. 12 amps for the 100 £47.00. Both Ex stock.

SENTINEL H.F. WIDEBAND PRE-AMPLIFIERS

2-40MHz. 15db gain. Ideal for 15 and 10 metres and OSCAR or an ACTIVE AERIAL. 9-12V Size: 2½ ” x 1½ ” x 3”. Two versions.

1. SENTINEL STANDARD H.F. PRE-AMPLIFIERS Performance as above £10.00* Ex stock.

2. SENTINEL AUTO H.F. PRE-AMPLIFIERS

Same performance as above with a change over relay, r.f. operated by your transceiver for direct connection in your aerial co-ax. £16.93* Ex stock.

S.E.M. IAMBIC KEYER

Undoubtedly the best keyer circuit. It uses the CURTIS custom designed CMOS LSI chip. Sidetone, tunes, etc. As users say "I've never been able to use one before". £34.50 Ex stock.

The Worlds first CMOS Twin Paddle Morse Key Gold plated touch contact paddles with CMOS technology and no mechanical adjustments for only £15.00 Ex stock. No supply is required when used with the S.E.M. Keyer.

S.E.M. TRAN Z MATCH has had a few changes too. NOW covers 160-1OM. The most VERSATILE transmatching system. Will match from 15 to 5000 Ohms BALANCED or UNBALANCED at up to 1KW. Link coupled balun means no connection to the equipment, which can cure TVI both ways. 160-1OM TRAN Z MATCH £57.00. 80-1OM £50.00. EZITUNE built in for £19.50 extra. SO239 and 4mm connectors for co-ax or wire feed.

S.E.M. EZITUNE — JOIN THE RUSH

Makes SWR Bridges obsolete. Noise generator and 50 Ohms SWR Bridge and R.F. Switch combine to allow you to tune up your transmatch etc. without transmitting. Saves your P.A. Stops Q.R.M. £28.75* Ex stock.

S.E.M. FORWARD/REFLECTED POWER METER — £28.80 Ex stock.

12 MONTHS COMPLETE GUARANTEE.

Prices include VAT and delivery. C.W.O. or credit cards. Phone card number for same day service. Items marked * have Belling Lee sockets. Add £1.73 for SO239s or BNC. It's impossible to put everything in here but RING or WRITE for more information.
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MMC 144/28 £29.90
MMC 70/any IF £27.90
MMC 432/28S £34.90
MMC 432/144S £34.90
MMC 1296/any IF £32.20
MMC 050/500 £69.00
MMA 28preamp £14.95
MMA 144v preamp £34.90
MV 1296 £23.20
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MML 144/25linamp £58.00
MML 432/50linamp £119.00
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SX 200 Scanning Receiver £240.00
STANDARD c800 10ch + 1 low power transmit CH £79.00
AR 22 Pokcer Receiver £91.50

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Skylking SU 4000 £79.00
Emoto 520CX £136.75
KR 400 £105.00
AR 40 £59.00
KR 9502A £50.00
Rotor Bearing £12.00

*All items VAT and carriage paid.

UNADILLA/REYCO
Antenna Traps - Precision moulded coil forms stainless - hardware - Aluminium tube infilt finish - Coated aluminium wire. Fully waterproofed Available 7/14/21MHz £10.99

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Emoto 520CX £136.75
KR 400 £105.00
AR 40 £59.00
KR 9502A £50.00
Rotor Bearing £12.00

*All items VAT and carriage paid.

SHURE MICS
201 Hand ceramic omnidirectional high impedance £14.49
202 Hand ceramic noise reducing high impedance £15.18
401A Hand controlled magnetic high impedance £16.56
401B Hand controlled mag. low impedance (200 ohms) £16.56
444 Desk adjustable height controlled magnetic £32.43
526T Desk controlled response transistor preamp £39.33

DUMMY LOADS
DL20 30W DC 150MHz with PL259 connector £6.33
T-80 80W DC 500MHz with SO239 connector £22.94
T-150 150W DC 500MHz with SO239 connector £32.78

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Antenna Traps - Precision moulded coil forms stainless - hardware - Aluminium tube infilt finish - Coated aluminium wire. Fully waterproofed Available 7/14/21MHz £10.99

WX2AU BALUN
3.5/30 MHz 2.5Kw with Lightning Arrestor - Suitable Vees, Yagis, Doubles, Quad etc. £10.99

MORSE KEYS
HK 707 Straight Up/Down keyer £11.44
BK 100 Semi-automatic mechanical bug £17.88
MK 702 Up/Down keyer on marbel base £22.43
MK 702 Maniplulator £22.43
MK 704 Squeeze paddle £14.38
MK 705 Squeeze paddle on marble base £22.43
EM1A Morse code practice oscillator £9.63
MK 1024 Automatic memory keyer £135.13
EK 150 Semi / Automatic keyer £74.75

LINEAR AMPLIFIERS
2M10-90P 144MHz 10W input/80W output with 9dB preamp £138.00
2M25-150P 144MHz 25W input/150W output with 9dB preamp £184.00
2M10-150P 144MHz 10W input/150W output with 9dB preamp £209.88
2M3-150P 144MHz 3W input/150W output with 9dB preamp £209.88

G. WHIP Mobile Antennas
Trabender 10-20 Slide £24.73
L.F. Wire Telescopic £6.56
Multimobile 10-20 Auro £28.75
M/Mobile Coi 40/80/160 £6.56
M/Mobile Whip Telescopic £3.34
Flexiwhip 10M Mast £17.25
F/Whip Coils 40/80/160 £5.65
Base Standard £4.49
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Extenard £11.50

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Amtech FT 2100 £190.00
Amtech FT 707 £200.00
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We also have all the accessories and hard-to-get plugs, sockets, etc.
Suppliers and Manufacturers — Note.
**70 CM CRYSTALS**

Due to the much higher multiplication involved (3 times that on 2rn) all our stock 70cm crystals are to much higher tolerances than our standard range. We are stocking the following channels: RB0 (434.60/433.1, R82 (434.67/433.1), SU18 (433.20, RB10 (434.85/433.25), RB11 (434.85/433.25), SU1 (433.20, R86 (434.75/433.25), RB13 (434.92/433.25), RB14 (434.96/433.35), SU18 (433.46), SU20 (433.50) - TX & RX for use with:- PYE UHF Westminster (W15U), UHF Cambridge (U10B), Pockertone (IPF 1) and UHF PF0 Range, and STORNO CQL/COM 662 all at £2.92. For the U450L Base Stn we have the TX crystals for the above channels. The RX crystals for the U450L Base Stn together with TX and RX crystals for any other 70cm channel (eg 434.6/433.33, RTTY, SU16 (433.43, SU22 (433.63)) etc. for most UHF equipments are available at £4.48 for crystals up to 63MHz and £6.05 for 63 to 10MHz to amateur spec or £5.28 for up to 62MHz and £6.05 for 63 to 10MHz to the same closer spec as our crystals up to 63MHz, and £5.16 for 63 to 10MHz to amateur spec or £5.28.

**CRYSTALS MANUFACTURED TO ORDER**

**CRYSTALS FOR PROFESSIONAL USE**

Prices shown are for one off, to our amateur spec., closer tolerances are available, please send us details of your requirements.

A Low frequency fundamentals in HC13/U or HC8/U

<table>
<thead>
<tr>
<th>Adj. tol. ±50ppm. Temp. tol. ±100ppm 0 to +70°C.</th>
<th>60.0 to 99.999kHz</th>
<th>£28.12</th>
<th>80.0 to 99.999kHz</th>
<th>£10.08</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.0 to 99.999kHz</td>
<td>£17.74</td>
<td>100.0 to 159.999kHz</td>
<td>£9.25</td>
<td></td>
</tr>
<tr>
<td>40.0 to 79.999kHz</td>
<td>£12.40</td>
<td>180.0 to 250kHz</td>
<td>£6.19</td>
<td></td>
</tr>
<tr>
<td>80.0 to 300kHz</td>
<td>£5.00</td>
<td>750 to 999.999kHz</td>
<td>£7.30</td>
<td></td>
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</tbody>
</table>

B High frequency fundamentals/overtones in HC6/U, HC18/U or HC25/U

<table>
<thead>
<tr>
<th>Adj. tol. ±200pm. Temp. tol. ±300 ppm -10 to +60°C.</th>
<th>£9.75</th>
<th>£10.36</th>
<th>£10.36</th>
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<tbody>
<tr>
<td>$8000$ to $900.9$ kHz (fund)</td>
<td>$4.48$</td>
<td>$12.40$</td>
<td>$12.40$</td>
</tr>
<tr>
<td>$900.0$ to $999.999$ kHz (fund)</td>
<td>$4.30$</td>
<td>$10.36$</td>
<td>$10.36$</td>
</tr>
<tr>
<td>$4.30$ to $4.999$ MHz (fund)</td>
<td>$4.40$</td>
<td>$10.36$</td>
<td>$10.36$</td>
</tr>
<tr>
<td>$4.999$ to $5.999$ MHz (fund)</td>
<td>$4.53$</td>
<td>$10.50$</td>
<td>$10.50$</td>
</tr>
<tr>
<td>$6.0$ to $20.999$ MHz (fund)</td>
<td>$4.48$</td>
<td>$12.40$</td>
<td>$12.40$</td>
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</table>

Delivery *Normally 5/6 weeks (express available), all other frequencies 7/8 weeks. Holders: Low frequencies HC 13/’U or HC 6/’U dependent on frequency. High frequencies are available in HC 6/’U, HC 18/’U or HC 25/’U unless marked *only available in HC 18/’U and HC 25/’U, HC 17/’U (replacement for FT 243) and HC 33/’U (wire and HC 6/’U available as per HC 6/’U above at 30p extra on HC 6/’U price. Unless otherwise specified, fundamentals will be supplied to 30pf circuit conditions and overtones to series resonance.*

**CRYSTALS FOR PROFESSIONAL USE**

We can supply crystals to most commercial and MIL specifications, with an express service for that urgent order. Also for commercial use, eg TV or computer crystals, etc, we can supply at very competitive prices. Please send S.A.E. for details or telephone between 4.30-7pm and ask for Mr. Norcliffe.

**EXPRESS SERVICES**

Many types made to order crystals are available on our EXPRESS SERVICE with a delivery of three days on our class "A" service. Telephone or Telex for details.

**TERMS:** CASH WITH ORDER - MAIL ORDER ONLY - S.A.E. WITH ALL ENQUIRIES - PRICES INCLUDE P&P. (BRITISH ISLES) EXCEPT WHERE STATED - OVERSEAS CHARGED AT COST.

**PRICE LIST**

**PRICES:** (a) £1.96; (b) £2.32; (c) £2.90; (d) £4.48.

**AVAILABILITY:** (a), (b), (c) stock items, normally available by return (we have over 5000 items in stock). (a) 4/6 weeks normally but it is quite possible we could be able to supply from stock.

**ORDERING:** When ordering please quote (1) Channel; (2) Crystal frequency; (3) Holder; (4) Circuit conditions (load in pf). If you cannot quote these, please give make and model of equipment and channel or output frequency required and we will advise if we have details.

**CRYSTALS FOR 70.26 MHz - HC6/U**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>£1.96</th>
<th>£2.32</th>
<th>£2.90</th>
<th>£4.48</th>
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<tr>
<td>5MHz in HC6/U</td>
<td>£2.95</td>
<td>£3.50</td>
<td>£4.10</td>
<td>£5.65</td>
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<tr>
<td>200 KHz and 455 KHz in HC6/U</td>
<td>£3.50</td>
<td>£4.10</td>
<td>£4.70</td>
<td>£6.25</td>
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<tr>
<td>100 KHz in HC13/U and 1 MHz in HC6/U</td>
<td>£2.95</td>
<td>£3.50</td>
<td>£4.10</td>
<td>£5.65</td>
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<tr>
<td>200 KHz in HC6/U</td>
<td>£3.50</td>
<td>£4.10</td>
<td>£4.70</td>
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<td>100 KHz in HC25/U</td>
<td>£3.50</td>
<td>£4.10</td>
<td>£4.70</td>
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**TEST EQUIPMENT FREQUENCY STANDARD CRYSTALS**

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<td>5-500 MHz</td>
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<tr>
<td>10MHz in HC6/U</td>
<td>£2.95</td>
<td>£3.50</td>
<td>£4.10</td>
</tr>
<tr>
<td>10 MHz + 10.7 MHz in HC6/U + HC25/U</td>
<td>£6.95</td>
<td>£7.76</td>
<td>£8.19</td>
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**RANGES**

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<th>RANGE</th>
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<td>180 to 25 MHz</td>
<td>£25</td>
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<tr>
<td>125 to 190 MHz</td>
<td>£29.75</td>
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<tr>
<td>145.000 to 145.575 MHz</td>
<td>£7.50</td>
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<tr>
<td>145.600 to 145.675 MHz</td>
<td>£12.00</td>
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<td>145.700 to 145.775 MHz</td>
<td>£17.50</td>
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<td>145.800 to 145.875 MHz</td>
<td>£23.00</td>
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<td>145.900 to 145.975 MHz</td>
<td>£28.50</td>
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<tr>
<td>146.000 to 146.075 MHz</td>
<td>£34.00</td>
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<tr>
<td>146.100 to 146.175 MHz</td>
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<tr>
<td>146.200 to 146.275 MHz</td>
<td>£45.00</td>
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<td>146.300 to 146.375 MHz</td>
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<td>146.400 to 146.475 MHz</td>
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<td>146.500 to 146.575 MHz</td>
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<td>146.600 to 146.675 MHz</td>
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<td>146.700 to 146.775 MHz</td>
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<td>146.800 to 146.875 MHz</td>
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<td>146.900 to 146.975 MHz</td>
<td>£83.50</td>
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<tr>
<td>147.100 to 147.175 MHz</td>
<td>£94.50</td>
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</tbody>
</table>

**CONVERTER/TRANSVERSTER CRYSTALS - HC18/U**

All at £3.00, 38.6666 MHz (14/4), 42 MHz (70/28), 56 MHz (144/28), 70 MHz (144/4), 71 MHz (144/2), 36 MHz (342/52), 36 MHz (1, 296/342/144), 101 MHz (432/28), 101.50 MHz (434/28), 106.6666 MHz (1, 296/28) and 116 MHz (144/28).

**TEST EQUIPMENT FREQUENCY STANDARD CRYSTALS**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>£3.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 KHz in HC6/U</td>
<td>£3.50</td>
</tr>
<tr>
<td>100 MHz in HC13/U and 1 MHz in HC6/U</td>
<td>£2.95</td>
</tr>
<tr>
<td>5 MHz in HC6/U and 10 MHz + 10.7 MHz in HC6/U + HC25/U</td>
<td>£2.80</td>
</tr>
</tbody>
</table>

**CRYSTALS FOR MICROPROCESSOR USE**

Please let us know your requirements eg 4 MHz HC 18/U 1 off £2.00, 100 off £1.10. 1000 off 95p, 25000 off 50p.

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<thead>
<tr>
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<tr>
<td>30pF TX</td>
<td>30pF TX</td>
<td>40pF TX</td>
<td>25pF TX</td>
</tr>
<tr>
<td>RO</td>
<td>4.0272</td>
<td>0.8559</td>
<td>12.0832</td>
</tr>
<tr>
<td>R1</td>
<td>4.0284</td>
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<td>12.0854</td>
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<tr>
<td>R2</td>
<td>4.0291</td>
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<td>R4</td>
<td>4.0312</td>
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<td>R5</td>
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<td>12.0958</td>
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<tr>
<td>R7</td>
<td>4.0326</td>
<td>0.8652</td>
<td>12.0979</td>
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</table>

For other quantities frequency ranges watch and sub-carrier crystals.

Also in stock for 70.26 MHz in HC6/U at £2.25. TX B.78250 MHz.

5TH, 7TH & 11TH ORDER DISCOUNTS. 5% mixed frequency discount for 5 or more crystals at B.78250 MHz.

PRICE AND DELIVERY

- A delivery when it is available but a telephone call will confirm its availability.
- Column B 6 to 8 weeks.
- Please note that it is not always possible to provide the A delivery
- Adjustment

<table>
<thead>
<tr>
<th>Price</th>
<th>Tolerance</th>
<th>Frequency Range</th>
<th>Price and Delivery</th>
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<td>Fundamentals</td>
<td>200 (total)</td>
<td>10 to 19,999 MHz</td>
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<td>12</td>
<td>60.00 to 124,999 MHz</td>
<td>£5.00</td>
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<td>13</td>
<td>100.00 to 124,999 MHz</td>
<td>£5.15</td>
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<td>14</td>
<td>125.00 to 149,999 MHz</td>
<td>£6.00</td>
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<tr>
<td>15</td>
<td>150.00 to 225.000 MHz</td>
<td>£7.50</td>
<td></td>
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</table>

Unless otherwise requested fundamentals will be supplied with 30pF load capacity and overtones for series resonance operation.

HOLDERS - Please specify when ordering 10 to 200 kHz HC13/U, 170 kHz to 170 MHz HC6/U and HC33/U, 4 to 225 MHz, HC18 and HC25.

DELIVERY Column A 3 to 4 weeks this service is subject to availability Column B to 8 weeks.

Please note that it is not always possible to provide the delivery service but a telephone call will confirm its availability. All orders received for A delivery when it is not available will automatically be placed on B delivery and a credit note issued for the difference in price.

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AERIALS

<table>
<thead>
<tr>
<th>3 ELEMENT YAGI 15 METRES</th>
<th>3 ELEMENT YAGI 10 METRES</th>
<th>2 ELEMENT YAGI 10 METRES</th>
</tr>
</thead>
<tbody>
<tr>
<td>£4.50 p.p.</td>
<td>£4.00 p.p.</td>
<td>£3.00 p.p.</td>
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<td>£4.50 p.p.</td>
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<td>£4.50 p.p.</td>
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For descriptive leaflets please send 30p in stamps.

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Telephone: 0272 557732.
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So let’s put the offer in big print for you!

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**1 YAESU FRG 7700 + AMTECH 300ATU** £309.00

VAT included

What’s the difference between the Amtech 200 and Amtech 300? Well both will tune any random length of wire but the Amtech 300 will do a little extra — It will also tune co-axial fed antennas — Their normal selling price? The Amtech 300 £39.95 — The Amtech 200 £29.96 — What can you lose?

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READERS

Selling: Realistic DX-302 receiver, 10 kHz to 30 MHz, digital
display, switched selectivity, two months old, boxed, mint,
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For sale: FT-101E, £375. Magnum four-metre transverter,
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2761.

For sale: FDK Palm IV, with all accessories, xtal'd SU20, SU8,
RB2, RB4, RB6, RB14, only one month old (having tried
70cm. am going for something better), £130. — Ring Stanway,
Huntingdon 52451 ext. 429 evenings.

Wanted: Mizuho AP-11 audio processor, — Ring 01-5500855,
6-9 p.m.

Sale: Trio R-1000, immaculate in all respects, 8 months old,
£200. — Robson, 8 Shebster Court, Thurso, Caithness KW14
7ES.

For sale: Trio 120V with TL-120 linear, £350 or near offer. —
Ring Rochford, G5DQA, 01-856 4123.

Selling: Pye Vanguard AM radiotelephone, complete. Offers,
or exchange for oscilloscope. — Ring Forsshaw, 061-766 9218.

For sale: Magnum II high-power transverter, 10-2m.,
complete with all connecting leads, excellent condition, £95. —
Ring Dane, G8TFE, Oxted 4888.

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to £80 paid. All letters answered. — Stockwell, 45 Maple
Road, Grays, Essex RM17 6LB.

For sale: Dual beam 'scope, 10 MHz, good clean condition,
with manual, no probe, £70. — Ring Baker, 061-653 5275.

Selling: Eddystone 940 receiver, general coverage, with
handbook, mint condition, £200. — Ring Draper,
Hornchurch 43676 after 7 p.m.

Sale: AR88D receiver with instruction manual, £45. Buyer
collects. — Ring Williams, 03542-56625 (Cambs).

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of Yaesu FT-101ZD), with new WARC bands, mint condition,
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Selling: Drake R4-C receiver, £295. — Ring Carling. Lymington 73269.

Selling: Trio R.820 receiver, as new, £580. Drake SPR-4, general coverage plus three amateur bands, provision for more, excellent condition, £360. Buyers collect. — Ring Ahmed, 01-272 3437, 5-9 p.m.


For sale: Sullivan and Griffiths universal inductance meter, one micro-H to one Henry, £350. Precision Wheatstone bridge, £250. — Ring Cottrell, G3PSY, Tenterden 4531.

CRAYFORD ELECTRONICS
GRAY
FLEXIBLE HELICAL AERIALS FOR HAND PORTABLES
VHF – UHF

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Connector/Fitting</th>
<th>Price</th>
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<td>70MHz (14m)</td>
<td>2BA, BNC, PL259, Pye PF70, 2200Gx</td>
<td>£6.00</td>
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<tr>
<td>145MHz (12m)</td>
<td>2BA, BNC, PL259, Pye PF70, 2200Gx</td>
<td>£6.00</td>
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Stranded inner conductor.

UR76 50 ohms. About the same spec as UR43 and the same size but a

UR43 50 ohms. The most popular standard Coax. 5mm dia. 20p per Metre

Tx-ing models £52.50 & £59.75.

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Sell or exchange: Eddystone 680X, best offer secures. Or exchange for low band receiver, 66-512 MHz. — Ring James, 0872-820182 (Cornwall).


Selling: Heathkit SB-401 Tx, SB-303 Rx, SB-600 speaker, SB-610 monitor scope, HM-102 RF power meter, complete with manuals, £250 or near offer. — Ring Black, G8HPD, QTHR. (Tel: Wheathampstead 3307 after 6.30 p.m.).

For sale: Microwave Modules 432/144 MHz, brand new, £135. 70cm. Yagi, new. FR-DX400, £150. TC-10 Tx, £80. Complete Nikon outfit in case, with Kaiser copying stand, 5 lens, electric flash, filters, £400. — Coutey, G4KXX, Wilton, Grove Road, Hindhead, Surrey. (Tel: 042873-5947).


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