

The SHORT WAVE Magazine

50p

VOL. XXXIX

MAY 1981

NUMBER 3

JRC Japan Radio Co., Ltd.

NRD-515



receiving for the discerning few.

- NRD 515 HF Monitoring Receiver . . . £948.75 inc VAT
- NHD 515 Memory Unit £161.00 inc VAT
- NVA 515 Loudspeaker Unit £27.60 inc VAT
- CFL 260 600 Hz CW Filter £34.50 inc VAT

LOWE ELECTRONICS Ltd.

CHESTERFIELD ROAD,
MATLOCK,
DERBYSHIRE DE4 5LE. TEL. 0629 2430/2817

Frequency Band (kHz)	Area	Services	Frequency Band (kHz)	Area	Services
10-14	W.W.	R. Nav.	4,438-4,650	1	Fx.
14-70	W.W.	(a) Fx. (b) M. Mob.	4,650-4,700	W.W.	Aero. Mob. (R)
70-90	1	(a) Fx. (b) M. Mob. (c) R. Nav.	4,700-4,750	W.W.	Aero. Mob. (OR)
90-110	W.W.	(a) Fx. (b) M. Mob. (c) R. Nav.	4,750-4,850	1	(a) Aero. Mob. (OR)
110-130	1	(a) Fx.	4,850-4,995	W.W.	(b) B'cst. (c) Land Mob.
			4,995-5,005	W.W.	(a) B'cst.
			5,005-5,060	W.W.	(b) Fx.
			5,060-5,250	W.W.	Fx.
			5,250-5,430	1	(a) Fx. (b) Land Mob. (c) Aero. Mob. (OR)
			30-5,480	1	(b) Fx. (c) Land Mob. Aero. Mob. (R)
			80-5,680	W.W.	Aero. Mob. (OR)
			80-5,730	W.W.	Fx.
			730-5,950	W.W.	Fx.
			950-6,200	W.W.	B'cst.
			600-6,525	W.W.	M. Mob.
			625-6,685	W.W.	Aero. Mob. (R)
			685-6,765	W.W.	Aero. Mob. (OR)
			765-7,000	W.W.	Fx.
			700-7,100	W.W.	Amat.
			100-7,150	1	(a) Amat. (b) B'cst.
			150-7,300	1	B'cst.
			300-8,195	W.W.	Fx.
			815-8,515	W.W.	M. Mob.
			815-8,965	W.W.	Aero. Mob. (R)
			865-9,040	W.W.	Aero. Mob. (OR)
			940-9,500	W.W.	Fx.
			500-9,775	W.W.	B'cst.
			775-9,995	W.W.	Fx.
			995-10,005	W.W.	S. Freq.
			1005-10,100	W.W.	Aero. Mob. (R)
			100-11,175	W.W.	Fx.
			175-11,275	W.W.	Aero. Mob. (OR)
			275-11,400	W.W.	Aero. Mob. (R)
			1,400-11,700	W.W.	Fx.
			11,700-11,975	W.W.	B'cst.
2,000-2,045	1	(b) Mob. except Aero. Mob. (R)	11,975-12,330	W.W.	Fx.
2,045-2,065	1	Met. Aids.	12,330-13,200	W.W.	M. Mob.
2,065-2,300	1	(a) Fx. (b) Mob. except Aero. Mob. (R)	13,200-13,280	W.W.	Aero. Mob. (OR)
			13,280-13,360	W.W.	Aero. Mob. (R)
			13,360-14,000	W.W.	Fx.
2,300-2,498	1	(a) B'cst. (b) Fx. (c) Mob. except Aero. Mob. (R)	14,000-14,350	W.W.	Amat.
			14,350-14,990	W.W.	Fx.
			14,990-15,010	W.W.	S. Freq.
2,498-2,502	1	S. Freq.	15,010-15,100	W.W.	Aero. Mob. (OR)
2,502-2,625	1	(a) Fx. (b) Mob. except Aero. Mob. (R)	15,100-15,450	W.W.	B'cst.
			15,450-16,460	W.W.	Fx.
2,625-2,650	1	(a) M. Mob. (b) M. R. Nav.	16,460-17,360	W.W.	M. Mob.
2,650-2,850	1	(a) Fx. (b) Mob. except Aero. Mob. (R)	17,360-17,700	W.W.	Fx.
			17,700-17,900	W.W.	B'cst.
			17,900-17,970	W.W.	Aero. Mob. (R)
			17,970-18,030	W.W.	Aero. Mob. (OR)
			18,030-19,990	W.W.	Fx.
			19,990-20,010	W.W.	S. Freq.
2,850-3,025	W.W.	Aero. Mob. (R)	20,010-21,000	W.W.	Fx.
3,025-3,155	W.W.	Aero. Mob. (OR)	21,000-21,450	W.W.	Amat.
3,155-3,200	W.W.	(a) Fx. (b) Mob. except Aero. Mob. (R)	21,450-21,750	W.W.	B'cst.
			21,750-21,850	W.W.	Fx.
			21,850-22,000	W.W.	(a) Aero. Fx. (b) Aero. Mob. (R)
3,200-3,400	W.W.	(a) B'cst. (b) Fx. (c) Mob. except Aero. Mob. (R)	22,000-22,720	W.W.	M. Mob.
			22,720-23,200	W.W.	Fx.
			23,200-23,350	W.W.	(a) Aero. Fx. (b) Aero. Mob. (OR)
			23,350-24,990	W.W.	(a) Fx. (b) Land Mob.
3,400-3,500	W.W.	Aero. Mob. (R)	24,990-25,010	W.W.	S. Freq.
3,500-3,800	1	(a) Amat. (b) Fx. (c) Mob. except Aero. Mob. (OR)	25,010-25,600	W.W.	(a) Fx. (b) Mob. except Aero. Mob.
			25,600-26,100	W.W.	B'cst.
			26,100-27,500	W.W.	(a) Fx.
3,900-3,950	1	(a) Land Mob. Aero. Mob. (OR)			(b) Mob. except Aero. Mob.
3,950-4,000	1	(a) B'cst. (b) Fx.			Met. Aids
4,000-4,063	W.W.	Fx.	27,500-28,000	1	Amat.
4,063-4,438	W.W.	M. Mob.	28,000-29,700	W.W.	

TRIO *pacesetter in amateur radio*

TS830S *V.B.T., notch, IF shift, wide dynamic range*

The TS-830S has every conceivable operating feature built-in for 160-10 metres (including the three new bands). It combines a high dynamic range with variable bandwidth tuning (VBT). IF shift, and and IF notch filter, as well as very sharp filters in the 455kHz second IF. Its optional VFO-230 remote digital VFO provides five memories.

TS-830S FEATURES:

- LSB, USB and CW on 160-10 metres, including the new 10, 18, and 24MHz bands. Receives WWV.
- Wide receiver dynamic range. Junction FETs in the balanced mixer, MOSFET RF amplifier at low level, and dual resonator for each band.
- Variable bandwidth tuning (VBT). Varies IF filter pass-band width.
- Notch filter (high-Q active circuit in 445kHz second IF).
- IF shift (passband tuning).
- Built-in digital display (six digits, fluorescent tubes), analog subdial, and display hold (DH) switch.
- Noise-blanker threshold level control.
- 6146B final with RF negative feedback. Runs 220W PEP (SSB)/180W dc (CW) input on all bands.
- Built-in RF speech processor.
- Narrow/wide filter selection on CW.
- SSB monitor circuit to check transmitted audio quality.
- RIT (receiver incremental tuning) and XIT (transmitter incremental tuning).
- 6146B final with RF negative feedback. Runs 220W PEP (SSB)/180W dc (CW) input on all bands.
- AT 230 antenna tuner/SWR and power meter/antenna switch, 160-10 metres, including three new bands.
- YG-455C (500Hz) and YG-455CN (250Hz) CW filters for 455kHz IF.
- YK-88C (500Hz) and YK-88CN (270Hz) CW filters for 8.83MHz IF. (VFOs for TS-830S, TS-130 Series, and TS-120S are compatible with all three series of transceivers.)

OPTIONAL ACCESSORIES:

- SP-230 external speaker with selectable audio filters.
- VFO-230 external digital VFO

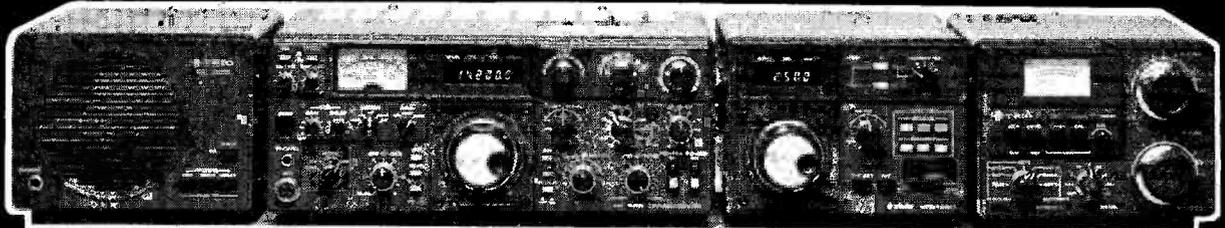
with 20Hz steps, five memories, digital display.

SP-230

TS-830S

VFO-230

AT-230



TS530S *building on success*

The all new TS-530S is firmly based on the reputation of the TS-520 series incorporating many of the features of the superb TS-830. Now included as standard are the following features:

- Single conversion receiver and transmitter.
- Super accurate digital readout.
- Single master crystal PLL system for band to band accuracy.
- IF shift (passband tuning).
- All band coverage including WARC.
- RIT and XIT.
- Speech processor.
- Wide/narrow filter switching.

Also retained are the rugged reliable 6146B PA valves and the easy to use controls. Reliability is, of course, a Trio standard provision.



TS-530S transceiver £505.00 inc VAT carriage £4.50.

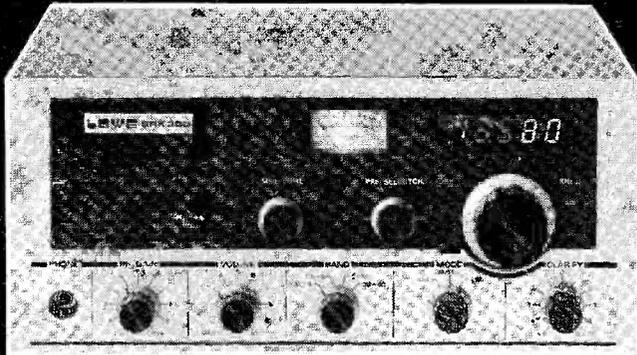


**LOWE
ELECTRONICS Ltd.**

CHESTERFIELD ROAD, MATLOCK, DERBYSHIRE. TEL. 0629/2817.

LOWE SRX30D

a familiar name, but a whole new receiver



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

- Extended coverage 200 KHz - 30 MHz.
- Digital readout in large green display units which give true unambiguous frequency information — even when you switch sidebands or use the clarifier.
- All new frequency synthesis using Plessey SL6 1641 double balanced modular ICs for a new high standard of performance.
- All new audio system which produces outstandingly good quality on the built in speaker, and is capable of driving external hi fi speaker units for even better sound.
- All new IF filters with optimum bandwidth for mode in use. Automatic filter selection from mode switch.

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

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

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

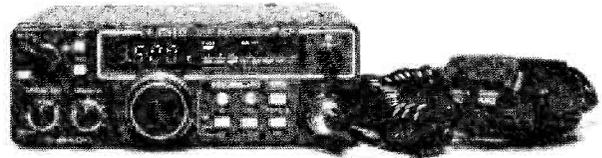
£195.00 inc VAT, Securicor carriage £4.50.

Accessories for the short wave listener.

	Inc VAT	Carr
HF5 80-10m vertical. No radials required when on ground post	48.50	4.50
EIS Small egg insulator. Glazed ceramic 40 cm long	.30	.25
EIL Large egg insulator. Glazed ceramic 50 cm long	.45	.36
SIL Ribbed strain insulator for dipole end or centre. 70cm long	.35	.36
MIZUHO		
KX2 Top quality 500 KHz-30 mhz aerial tuner. Perfect match for R1000	29.90	1.50
AX1 Aerial switching system. Handles 6 aerials & 6 receivers	27.03	1.00
APM1 Audio peak and notch filter. Variable bandwidth active filters	33.00	1.00
SR1 Mini rack for above the system	14.09	1.50
MP1 Rack mount for APM1	5.20	1.00

TRIO

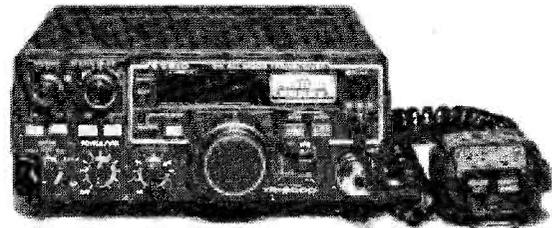
pacesetter in amateur radio



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

TR8400 ^{70 cm. FM} mobile.

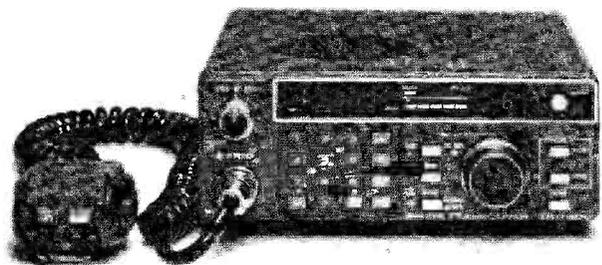
£279 inc. VAT. Securicor carriage £4.50.



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

TR9000 ^{2 metre multimode.}

£345 inc. VAT. Securicor carriage £4.50.



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

TR7800 ^{2 metre mobile FM rig.}

£268 inc. VAT. Securicor carriage £4.50.

HEAD OFFICE AND SERVICE CENTRE

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

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

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

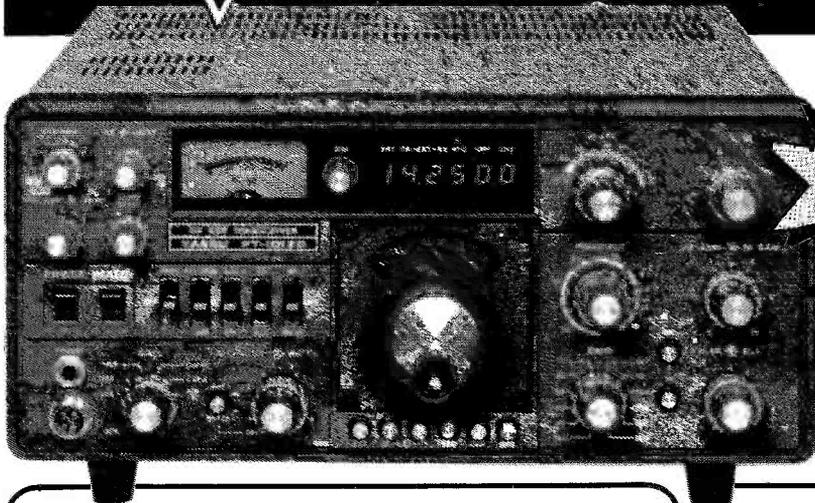
For full catalogues send 48p in stamps with your address. Mark enquiry SWM.



AMATEUR ELECTRONICS UK



Your number one source
for **YAESU MUSEN**

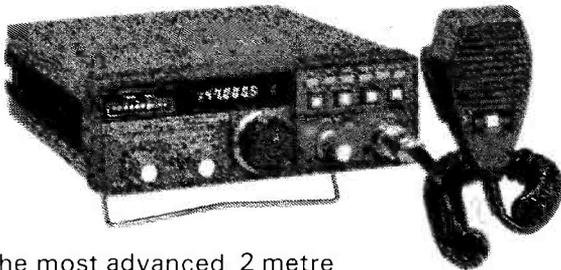


NEW

**FT-101ZD
Mk. III**

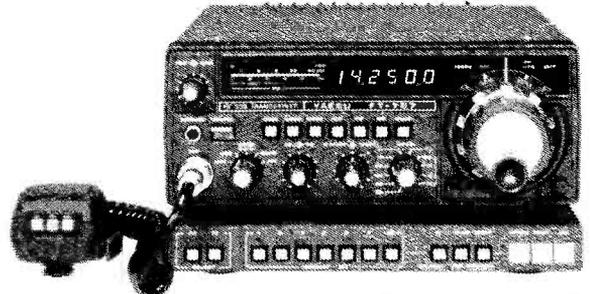
Now from YAESU comes the latest version of the renowned FT-101 - AM/ FM option, notch filter, audio peak filter, variable bandwidth - **UNBEATABLE VALUE.**

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



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

FT-707 All solid-state HF mobile transceiver



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

As factory appointed distributors we offer you - widest choice, largest stocks, quickest deal and fast sure service right through -



Access or attractive H.P. terms readily available for on-the-spot transactions. Full demonstration facilities. Free Securicor delivery.

FT-707 In base station format

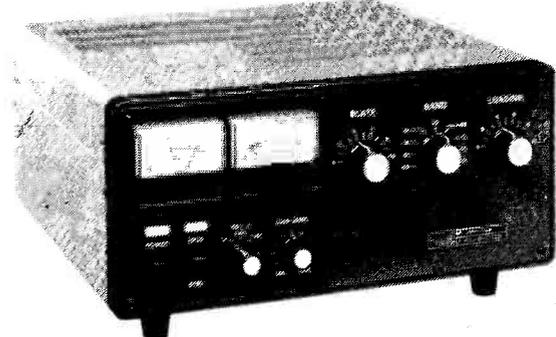


Here we show the 707 together with the matching FP-707 PSU FC-707 ATU and FV-707 DM VFO memory.



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

FL-2100Z High power all band HF linear

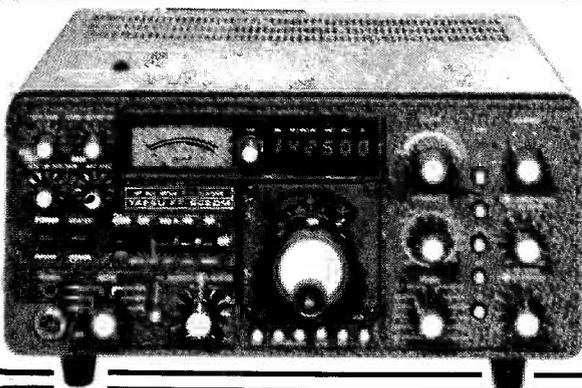


Conservatively rated at 1200W PEP input, the new WARC model incorporates all the new bands.

FRG-7700 Synthesized general coverage receiver



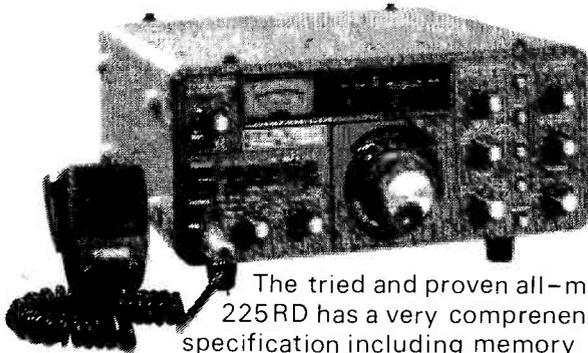
The very latest in receiver technology from YAESU. Receives USB, LSB, CW and FM—memory option with 12 channels and automatic band selection.



FT-902DM Competition grade HF transceiver

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

FT-225RD Deluxe 2 metre base station



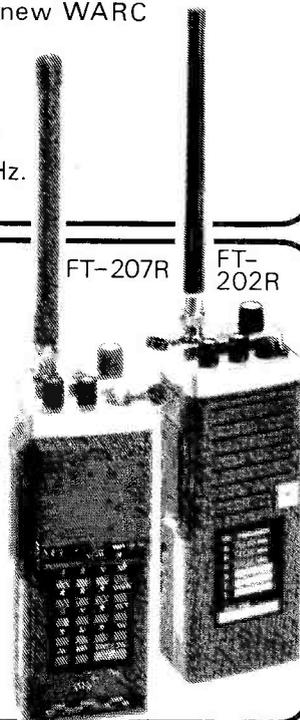
The tried and proven all-mode 225RD has a very comprehensive specification including memory option, variable power output and DC operation for portable working.

FT-202R 2metre hand-held

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

FT-207R Synthesized 2metre hand-held

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

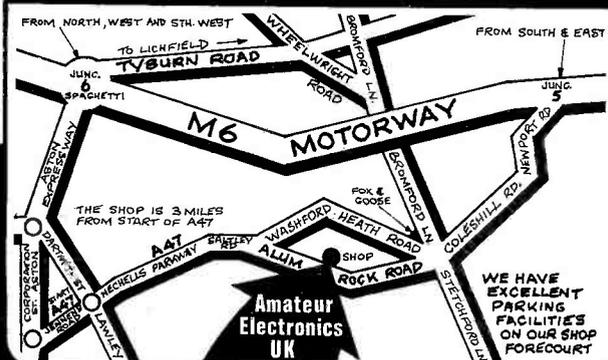


AGENTS:

- NORTH WEST — THANET ELECTRONICS LTD, GORDON, G3LEQ, KNUTSFORD (0565) 4040.
- WALES & WEST — ROSS CLARE, GW3NWS, GWENT (0633) 880 146.
- EAST ANGLIA — AMATEUR ELECTRONICS UK — EAST ANGLIA, DR T. THIRST (TIM) G4CTT, NORWICH 06925 865
- NORTH EAST — NORTH EAST AMATEUR RADIO, DARLINGTON 0325 55969
- SOUTH EAST — AMATEUR ELECTRONICS, UK — KENT KEN MCINNES, G3FTE, THANET (0843) 291297

FT-290R
?

WHERE TO FIND US

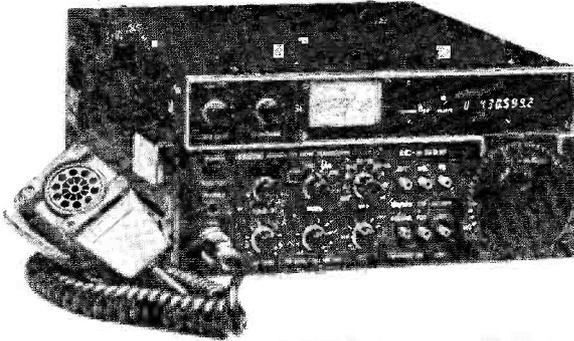


Amateur Electronics UK
508-516 Alum Rock Road · Birmingham 8
Telephone: 021-327 1497 or 021-327 6313
Telex: 337045
Opening hours: 9.30 to 5.30 Tues. to Sat.
continuous — CLOSED all day Monday.

Thanet Electronics for **ICOM** the amateur's professional friends

Buy direct from us and get two years warranty on all equipment

IC-451 UHF Base Station

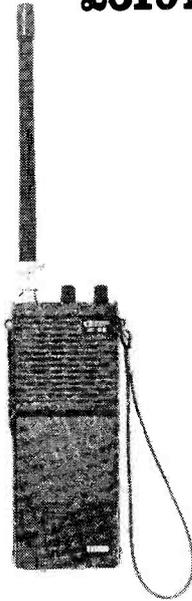


ICOM are proud to announce the introduction of the 70cm version of their famous 2m base station — the IC-251. Of course, it is engineered to the usual high ICOM standards and includes such features as:-

- * 3 memory channels
- * Automatic repeater shift on switch-on
- * Additional selectable shift for European DX
- * Selectable channel steps for FM (supplied with 25KHz — others are diode programmable)
- * Full power control on SSB/CW/FM
- * Superb receiver performance using MOSFETS
- * Multipurpose scanning
- * Covers 430-440 MHz
- * Xtal controlled Toneburst
- * Cool running chopper power supply

£579 inc. V.A.T.

As Versatile as an Egg So get cracking Now! IC-2E Handy Talky **£159** INCL.



CHECK THE FEATURES

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

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

On these, and all our other products:

- * Free delivery for all transceivers, using registered first class post
- * H.P. and Part Exchange welcome. All prices including V.A.T.

SEND FOR TECHNICAL DETAILS

Also available from our shop in Herne Bay are:

- * MICROWAVE MODULES
- * J-BEAM
- * WESTERN
- * ANTENNA SPECIALISTS
- * RSGB PUBLICATIONS
- * G-WHIP
- * BEARCAT
- * YAESU MUSEN
- * VIDEO GENIE COMPUTERS

IMPORTANT

We would like you to phone, or write to us so that we can give you as much detailed information as possible on any particular product. Use our 24 hour ansafone when calls are cheap.

Thanet for



ICOM

143 RECVLVER RD.,
BELTINGE,
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**for only
£255
INCL.**

IC-255E

An experts mobile choice

**NOW WITH
IMPROVED
FRONT-END**



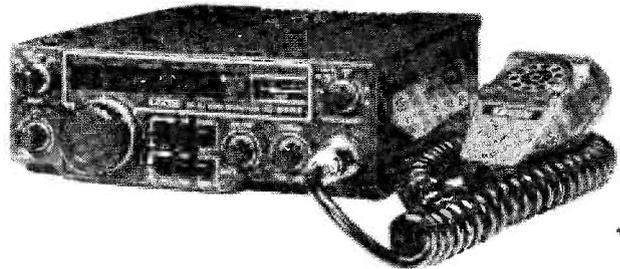
**25 Watts – 5 Memories – Scanning – 600kHz
AND User Selectable Repeater Shift – Full Coverage in 5kHz or 25kHz Steps.**

- Crystal controlled Tone Burst
- Full band coverage – extendable to 148MHz if required
- Four digit LED display
- 25 Watts output or 1W low power
- A superb receiver using grounded gate FET front end
- Scanning over a user programmable range
- Memory scan
- Stop on empty or busy channels
- Tuning in 25kHz or 5kHz steps
- 5 Memories – retained while the power is connected to the rig
- Built-in 600kHz Repeater Shift
- Alternative programmable shift
- Reverse Repeater facilities
- RIT (± 3kHz for those off channel stations)
- Scan control from the microphone (optional mic available)
- Good loud audio
- Optically coupled tuning between control knob and CPU
- Multiway 24 pin socket on back for touchpad, computer, or external control
- Rugged modular PA (Guaranteed of course!)
- Mobile mount which can be padlocked
- Up-down scanning microphone available

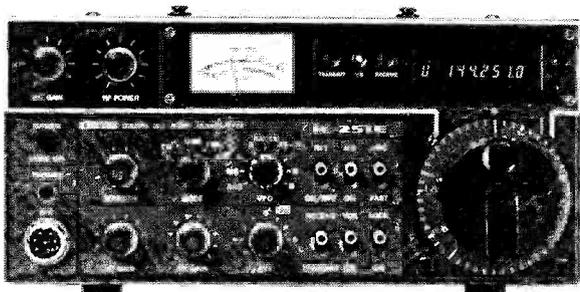
CAN YOU RESIST SUCH A TEMPTATION

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

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



£339 INCL.



ICOM IC 251E

The Latest 2M Multimode Base Station

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

only £479 INCL.

SEND FOR TECHNICAL DETAILS

AGENTS (PHONE FIRST – All evenings and weekends only)

Scotland Jack GM8GEC (031-665-2420) Midlands Tony G8AVH (021-329 2305)
Wales Tony GW3FKO (0874 2772) North West Gordon G3LEQ (Knuttsford (0565) 4040)



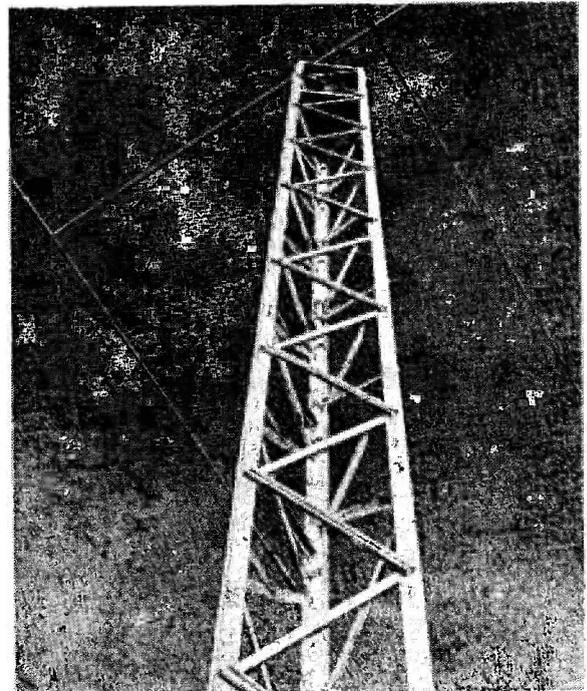
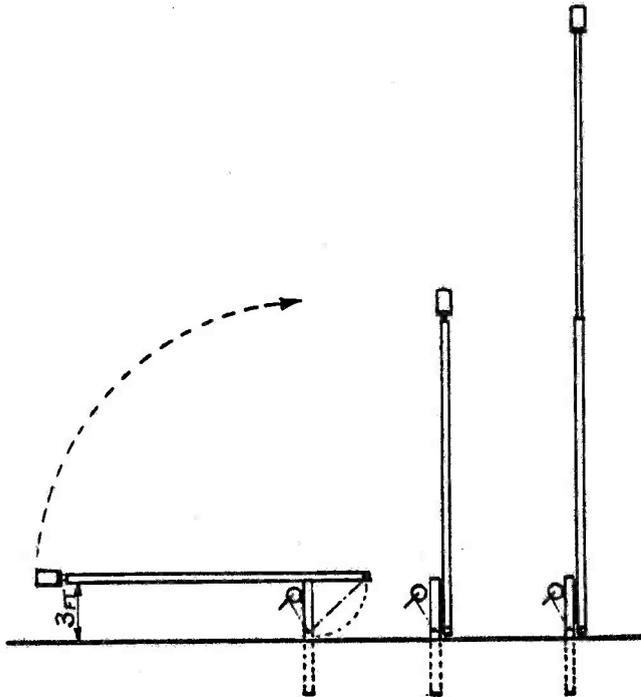


Western

LET Western the "MAST MAKERS" HELP YOU GET IT UP!

ULTIMAST

ALUMAST



The ULTIMAST is a tubular steel two-section mast which is telescopic and tilt-over. Constructed of two steel tubes — the lower square section and the upper round section — and hot-dip galvanised for corrosion resistance, the ULTIMAST telescopes up to 30ft (9m) and down to 15ft (4.5m). Secured to a square section tubular base post, the mast can be tilted over to only 3ft (1m) above ground for ease of access to antennas. Two head units allow clamping of rotor to 2" (50mm) dia. stub, or internal flat plate mounting.

The ALUMAST is a 15" (375mm) wide triangular cross section lattice sectional aluminium mast based on a 10ft (3.05m) section length. It is supplied "knocked-down" in a tubular carton for ease of transport, but can easily be assembled needing no special tools or skills. The system includes top plate with bearing sleeve, rotor plate and a choice of a fixed base frame (FB 1) or one with hinge joints (HB 1) to enable the mast to be pivoted at ground level. Guy brackets are available for use at heights above 30ft.

- ★ Slim and unobtrusive
- ★ One-winch operation
- ★ Simple ground fixing
- ★ Self-supporting
- ★ For HF and VHF antennas

- ★ Made from high strength corrosion resistant alloy using WESTERN EXCLUSIVE 'W' section leg extrusions.
- ★ Easy assembly using bolts and "Nyloc" locking nuts for security.
- ★ Free-standing to 30ft (9.15m) with a typical tri-bander plus VHF/UHF antennas.
- ★ Heights to 250ft (75m) with appropriate guy configurations (ask us for quotes).
- ★ Lightweights — only 25lb (11kg) per 10ft (3.05m) section.
- ★ 30ft (9.15m) mast is delivered in a tube only 10ft 6in (3.2m) long 6in (0.126m) dia.

A COMPLETE TELESCOPIC TILT-OVER MAST for only UM-1; UHD-2

£ 246.05

A COMPLETE 30ft (9.15m) MAST for 375/PSS/3; HB-1; RMP-1; TP-1

£ 240.35

FULL PRICE LIST

UM-1 Basic mast	£215.00
UHD-2 Reducing head adaptor	£ 13.25
UHD-2 Rotor head unit	£31.05

All prices include carriage and VAT at 15%
For Scotland — add £10 extra carriage

FULL PRICE LIST

375/PSS/3	30ft mast (3 sections)	£184.00
375/PSS/1	Additional 10ft section	£62.68
HB-1	Hinged base unit	£31.05
FB-1	Fixed base unit	£21.85
RMP-1	Rotor mounting plate	£12.08
TP-1	Top plate with sleeve	£13.23
GB-1	Guy brackets (set of 3)	£11.50

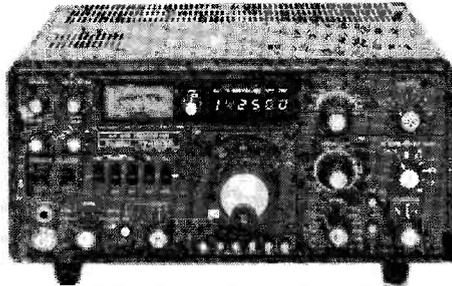
All prices include carriage and VAT at 15%
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DEALER ENQUIRIES WELCOME

Electronics (UK) Ltd

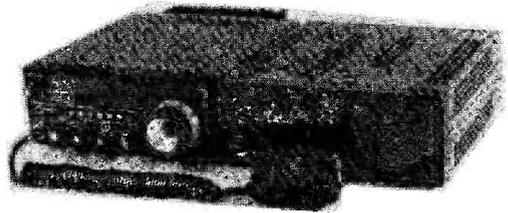
A **Western** SPRING SELECTION of HF TRANSCEIVERS ...

YAESU FT-101ZD



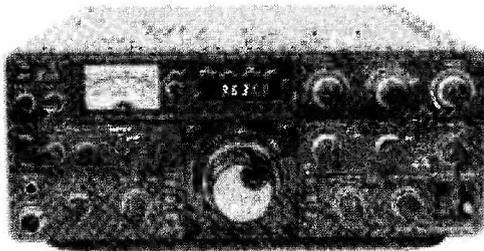
The FT-101 series needs little introduction. Suffice it to say that the latest FT-101Z (analogue) and FT-101ZD (digital) transceivers represent a first-class continuation of a fine line of HF equipment. The latest technology brings you top performance at a price you can afford. Full details of this exciting transceiver available on request. WARC bands fitted, of course!

YAESU FT-707



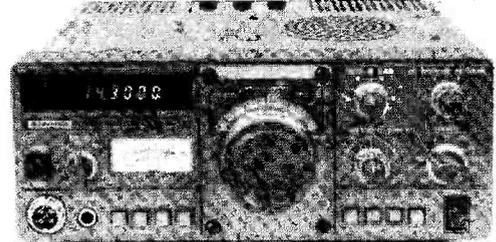
The FT-707 is in the forefront of the new generation of compact HF solid-state transceivers. Little larger than a book, the FT-707 is a full-feature transceiver with performance you might expect only in a "top-line" piece of equipment. Ideally suited for a home base station or as a mobile travelling companion. Features digital display, IF with control, LED meter system — and of course all new WARC bands!

TRIO TS-830S



The TS-830S is a high-performance, very affordable, HF SSB/CW transceiver with every conceivable operating feature built in for 160 through 10 metres (including the three new bands). The TS-830S combines a high dynamic range with variable bandwidth tuning, IF shift, and an IF notch filter, as well as very sharp filters in the 455kHz second IF.

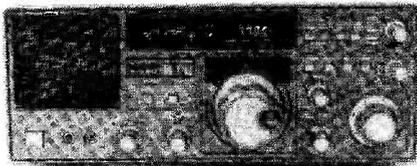
TRIO TS-130S



The TS-130S series is an incredibly compact, full-featured, all solid-state HF SSB/CW transceiver for both mobile and fixed operation. It covers 3.5 to 29.7MHz (including the three new amateur bands!) and is loaded with optimum operating features such as digital display, IF shift, speech processor, narrow/wide filter selection (for both SSB and CW modes), and optional (DFC-230) digital frequency controller.

... AND A GREAT PAIR OF GENERAL COVERAGE RECEIVERS

YAESU FRG-7700



The short-wave listener's dream is now a reality in the FRG-7700 — an advanced all-mode communications receiver featuring significant advances in circuit design and operating convenience.

TRIO R-1000



One of the best on the general coverage scene. Full coverage 200kHz to 30MHz with digital frequency readout and clock/timer. Switched selectivity for optimum performance and other features making it a joy to use and first class value for money.

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PRICE LIST — MAY 1981

	£	£		£	£		£	£	
TRIO			YM35			Up/down mic for	12.65	(0.75)	
TS830S	160-10m transceiver	639.52	YM36	500 ohm noise canclg. mic	11.90	(0.75)	MMC432/144-S70cm converter	34.90	(0.65)
VFO 230	Digital VFO	194.45	YM37	80-10m 8 band trans 10w	465.75	(n/c)	MMC435/51 70cm ATV converter	34.90	(0.65)
AT230	All band ATU	106.72	FT707S	500ohm mic for FT707/FT107	6.15	(0.75)	MMC435/600 70cm ATV converter	27.90	(0.65)
SP230	External speaker	33.14	FT707	80-10m 8 band trans 100w	499.00	(n/c)	MMC1296/28 23cm converter, 10m output	32.20	(0.65)
DS2	Dc pack for TS830S	39.90	FT707	230v AC PSU	109.25	(2.50)	MMC1296/14423cm converter, 2m output	59.80	(1.75)
DRC230	Digital frequency controller	163.13	FC707	160-10m atu	80.50	(1.50)	MMD050/500 500mhz digital frequency meter	69.00	(0.65)
YK88C	500Hz CW filter	26.45	FV707DM	Digital vfo for FT707	186.30	(n/c)	MMD600P 600 mhz prescaler	23.00	(0.65)
YK88CN	270Hz CW filter	26.45	MR7	Metal rack	14.95	(1.50)	MMNDP1 Frequency counter probe	11.50	(0.65)
TS530	160-10 metre transceiver	t.b.a.	FRB707	Mobile mount	16.10	(1.50)	MMA28 10m preamplifier	14.95	(0.65)
DV5	Digital readout	103.50	FL210CZ	160-10m 1200watt linear	385.00	(n/c)	MMA144V 2m RF switched preamplifier	34.90	(0.65)
SP520	Speaker	17.25	YP150	150w dummy load/meter	83.00	(1.75)	MMA1296 23cm preamplifier	29.90	(0.65)
YG520S	External VFO	98.90	YH55	8ohm comm. headphones	9.95	(1.25)	MMF144 2m filter	9.90	(0.65)
YG3395C	CW filter 8 pole	37.95	FF501	Low pass filter	19.95	(0.75)	MMV432 70cm filter	9.90	(0.65)
DK520	Conversion kit	10.35	FV707DM	24 hour quartz clock	25.70	(1.50)	MMV1296 70cm to 23cm varactor tripler	34.50	(0.65)
SM220	Station monitor scope	197.80	FP12	230v AC 12 amp DC	78.20	(2.50)	MMMS384 384 mhz frequency source	27.60	(0.65)
BS5	Panoramic display	48.30	FP4	230v AC 4 amp DC	41.40	(2.50)	MMR15/10 15db atten. BNC terminations	9.90	(0.65)
R820	Scan board	48.30	FSP1	0.5-30 MHz comm. receiver	189.00	(n/c)			
YG455C	Amateur band receiver	690.00	FRG7	Battery holder	5.00	(1.00)	JAYBEAM ANTENNAS		
YG455CN	500Hz CW filter	58.65	BHGR7	Frequency counter	189.75	(n/c)	TB3 HF 3 element Tribander	167.90	(4.50)
YG88A	250Hz CW filter	60.95	YC500	"	270.25	(n/c)	VR3 HF Vertical Triband	42.50	(3.00)
TS180S	6kHz AM filter	34.50	YC500S	"	345.00	(n/c)	4 metre Antennas		
VFO180	160-10m solid state trans.	679.65	YCS00E	1981 version of FRG7000	309.00	(n/c)	4Y/4M 4 element yagi	20.70	(3.00)
SP180	External VFO	96.60	FRG7700	MEM with frequency memory	380.00	(n/c)	PMH2/4M 2 way phasing harness	12.20	(1.00)
AT180	External speaker unit	36.80	FRG7700						
YK88C	Matching 200W ant. tuner	36.45	MEM						
YK88S	500Hz CW filter	26.45	FRG7700						
PS30	Second SSB filter option	85.10	FT207R	Plug in memory	83.95	(n/c)	2 metre Antennas		
TS130S	AC powersply. for TS180S	85.10	NC1A	144-146 mhz handheld 2 watt	199.00	(n/c)	DC1/VWB Wideband discone (100-470mhz)	41.40	(2.50)
TS130V	8 band 200W mobile trans.	491.35	NC2	230v AC charger	18.98	(1.50)	LR1/2M Vertical colinear	24.15	(2.50)
DFC230	8 band 20W mobile trans.	404.34	NC9	230v AC charger	38.68	(1.50)	C5/2M 5db glass fibre colinear	44.30	(3.50)
TS120S	Digital frequency controller	163.13	NBP9	230v AC charger	7.48	(0.75)	8Y/2M 5 element	11.25	(2.00)
TS130V	80-10m 200W mobile trans.	398.00	FLC2	Ni-cad battery pack	16.68	(0.75)	8E/2M 8 element	14.50	(2.50)
TL120	20W mobile trans.	404.00	FBA1	Heavy duty case	20.70	(1.00)	10Y/2M 10 element	31.00	(3.50)
MB100	20W pep linear	128.80	FT225R	12v PSU	13.39	(1.00)	10Y/2M 10 element Parabeam	36.80	(4.50)
YK88C	Mobile mount	17.25	FT225R	Ni-cad pack charging adaptor	2.59	(0.35)	PBM10/2M 10 element Parabeam	44.85	(4.50)
YK88CN	500Hz CW filter	26.45	FT225R	144-146 mhz Base station	520.00	(n/c)	PBM14/2M 14 element Parabeam	44.85	(4.50)
YK88CN	270Hz CW filter	26.45	FT225R	With digital readout	565.00	(n/c)	Crossed 5 element	22.75	(3.00)
VFO120	External VFO	89.70	MEMT225	Memory option module	57.50	(1.00)	Crossed 8 element	28.40	(3.50)
SP120	External speaker unit	25.30	DIST225	Readout for FT225R	82.00	(n/c)	Crossed 10 element	37.70	(4.00)
SP40	Mobile speaker unit	26.89	FT480R	2m 10w SSB/CW/IFM trans	359.00	(n/c)	X6/2M/X12/70cm 2 way band	36.50	(4.50)
AT130	100W antenna tuner	74.85	FP80	PSU for FT480R	59.00	(2.00)	PMH/2C Dual phasing harness	7.50	(0.75)
PS20	AC pwr. sply. for TS120/130V	74.85	FT720R	2m/4m/70cm control head	120.00	(n/c)	Q4/2M 4 element quad	23.70	(2.50)
PS30	AC pwr. sply. for TS120/130S	85.10	S72	Switching box	55.20	(n/c)	Q6/2M 6 element quad	31.40	(4.50)
MA5	5 band mobile aerial system	74.75	E72S	2m of connecting cable	23.00	(1.00)	D5/2M Double 5 slot-fed	20.15	(2.50)
TL922	160-10m 2KW linear	595.70	E72L	4m of connecting cable	47.20	(1.00)	D8/2M Double 8 slot-fed	27.15	(4.00)
MC50	Deluxe desk microphone	24.15	720RV	10W 2m module	133.00	(n/c)	SVMK/2M Kit for vertical pol.	7.25	(1.50)
MC35S	Fist mic 50k impedance	13.80	720RVH	25W 2m module	143.00	(n/c)	UGP/2M Ground plane	10.15	(1.50)
MC30S	Fist mic 500 ohm impedance	13.80	720RV	10W 70cm module	156.00	(n/c)	HO/2M Mobile 'halo' (head only)	4.50	(1.50)
LF30A	HF lowpass filter	18.40	MMB3	Mobile mounting bracket	5.00	(1.50)	HO/2M Mobile 'halo' with mast	5.40	(1.75)
RD300	1KW dummy load	48.30					PMH2/2M 2 way phasing harness	9.90	(1.00)
TS770E	2m/70m dual band trans.	730.25					PMH4/2M 4 way phasing harness	23.00	(1.75)
SP70	External speaker	18.40							
TR9000	2m multimode mobile	348.00	FDK VHF/UHF EQUIPMENT				70cm Antennas		
BO9	Base plinth for TR9000	32.20	M700EX	2m FM 25w 12 1/2/25kHz trans	199.00	(n/c)	CB/70cm 8dB colinear	50.00	(3.50)
TR7800	2m FM syntsd mobile 25W	268.00	M750E	2m FM/SSB/CW 144-146 trans	259.00	(n/c)	DB/70cm Double 8 slot-fed	20.70	(2.50)
TR2300	2m FM syntsd portable	166.75	Expander	70cm transceiver	169.00	(n/c)	PBM18/70cm 18 element Parabeam	25.30	(3.00)
VB2300	10W amplifier for TR2300	49.45	PS750	230v A.C. 6 amp. psu	69.00	(2.50)	MBM48/70cm 48 element Multibeam	28.75	(3.00)
MB2	Mobile mount	17.25	Palm II	2m FM 6 channel portable	68.00	(n/c)	MBM88/70cm 88 element Multibeam	39.30	(4.50)
RA1	Rubber flex. antenna	6.90	Palm IV	70cm FM 6 channel portable	149.00	(n/c)	8X/7/70cm Crossed 8 element	34.15	(3.50)
PS1200	AC power unit and charger	29.50	TB1	1750Hz tone burst	10.00	(n/c)	12X/7/70cm Crossed 12 element	42.32	(4.50)
TR2400	2M FM syntsd handheld	198.95	Palmizer	2m FM 40 channel handheld	149.00	(n/c)	PMH2/20cm 2 way phasing harness	8.50	(1.00)
ST1	Base stand and quick chgr.	43.70	Multi 3000	2m FM/SSB/CW 10w base stn	359.00	(n/c)	PMH4/70cm 4 way phasing harness	18.00	(1.50)
BC5	12V quick charger	17.25	M568	2m FM monitor	89.00	(n/c)			
SC3	Soft carrying case	11.50	FDM40SP	Speaker/mic for Palmizer	11.00	(0.50)	23cm Antenna		
LH1	Hard leather holster	18.50	CC2	Case for Palm II/IV	5.75	(0.50)	D15/1296 Double 15 slot-fed	34.00	(1.50)
PB24	Spare battery pack	14.25	B2	230v AC battery charger	4.50	(0.50)	PMH2/23cm 2 way phasing harness	25.40	(1.00)
TR3200	70cm FM portable	164.45	SC2	Case for Palmizer	9.75	(0.50)			
PL1	Spare power/charge lead	1.30	B2	External battery case	5.00	(0.50)	Matching Transformer		
R1000	Gen. Coverage Receiver	285.20	B2	Ni-cad battery pack	12.00	(0.50)	MT75/50 75/50 ohms	3.60	(0.50)
TR8400	70cm trans. 430-440 MHz	£279	Xtals	For Palm II and Palm IV	3.00	(0.15)			
			Xtals	For M568	2.50	(0.15)	Chimney Lashing Kit		
							DL Double lashing kit	8.25	(2.00)
YAESU NEW FM FT 101's JUST ARRIVED			MICROWAVE MODULES				Wall Brackets		
FT101Z	160-10m 9band trans.	488.75	MMT28/144	10m linear transverter	99.00	(1.75)	W6 6" wall bracket	2.65	(1.00)
DIG101Z	as above with digital	569.25	MMT144/28	2m linear transverter	99.00	(1.75)	W21 21" wall stand-off bracket	10.35	(3.00)
DC101Z	Digital kit	86.25	MMT432/28-S	70cm linear transverter	149.85	(1.75)	W24HD 24" wall stand-off bracket	14.70	(4.50)
DIG101Z	12v DC adaptor	34.50	MMT432/144-R	70cm linear transverter	164.00	(1.75)			
FV101Z	Remote VFO	121.90	MMT70/28	4m linear transverter	115.00	(1.75)	Masts (Aluminium)		
FT107M	160-10m 9 band transrv.	690.00	MMT70/144	4m linear transverter	115.00	(1.75)	SPM 16' x 1" Portable Mast	15.15	(3.00)
FV107	Remote VFO for FT107	92.30	MMT1296/144	23cm linear transverter	194.00	(2.25)	PME 4' extension	2.50	(2.00)
FC107	160-10m atu	102.00	MML144/25	2m 25 watt linear amplifier	59.00	(1.75)	A4 4'6" x 1 1/2" straight	3.80	(1.50)
FP107E	230v AC power supply	106.95	MML144/40	2m 40 watt linear amplifier	77.00	(1.75)	A5 5' x 1" straight	2.90	(1.50)
FP107	Internal model	97.75	MML144/100P	2m 100 watt linear amplifier	142.60	(2.75)	A9 9' x 1 1/2" straight	6.50	(2.50)
FTV107	Transverter main frame	110.40	MML144/100P	2m 100 watt linear amplifier	142.60	(2.75)	A10 10' x 2" straight	12.55	(2.50)
FTV107(2)	Transverter	207.00	MML432/50	70cm 50 watt linear amplifier	119.00	(2.75)	A12 12' x 2" straight	14.95	(2.50)
144V107V/901	Transverter	101.20	MML432/100	70cm 100 watt linear amplifier	228.65	(2.75)	A14 14' x 2" straight	17.40	(3.00)
50V107V/901	Transverter	69.00	MM2000	RTTY to TV converter	169.00	(1.75)			
430V107V/901	Transverter	175.95	MMC28/144	10m converter	27.90	(0.65)	Accessories		
SP107P	External speaker	57.50	MMC50/28	6m converter	27.90	(0.65)	CPL1 Cross-over plate 2" x 2"	3.35	(1.50)
SP107	External speaker	27.80	MMC70/28	4m converter	27.90	(0.65)	JBL59/15 15" jointing sleeve	6.80	(1.50)
DMST107	12 channel memory	88.15	MMC70/28LO	4m converter	29.90	(0.65)	JBL29 Universal clamp	1.60	(0.75)
CW	CW filter for FT107	23.00	MMC144/28	2m converter	27.90	(0.65)	JBL30 Universal clamp	1.60	(0.75)
AM	AM filter for FT107	23.00	MMC144/28LO	2m converter	29.90	(0.65)	JBL53 Universal clamp	1.45	(0.75)
YM34	Desk mic for FT707/FT107	18.80	MMC432/28-S	70cm converter	34.90	(0.65)	JBL58 3 hook guy wire clamp	1.50	(0.75)
							JBL63 Universal clamp	1.40	(0.75)

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JBL64 Die-cast clamp	1.20	(0.75)	DENTRON			VHF/UHF MONITORS		
JBL65 Die-cast clamp	1.30	(0.75)	MLA2500B 6band 160-10m 2Kw linear	695.00	(n/c)	TM56B FM Scanner 12v DC/230v AC	79.00	(n/c)
JBL73 Heavy duty	2.10	(1.00)	Clipperton-L 6band 160-10m 2Kw linear	459.00	(n/c)	008 8 channel FM monitor	69.00	(n/c)
MBP Mast base plate	3.60	(1.50)	DTR-1200L 5 band 80-10m 1.2Kw linear	t.b.a.	(n/c)	M161 16 channel FM monitor	59.00	(n/c)
AZDEN EQUIPMENT			GLA-1000B 5 band 80-10m 1Kw linear	295.00	(n/c)	MF083 Marine/Broadcast scanner	85.00	(n/c)
PCS3000 2m 25W transceiver	219.00	(n/c)	DTR-3KA 1.8-30MHz ATU 2Kw	t.b.a.	(n/c)	BEARCAT 220FB 66-512mHz	258.00	(n/c)
PCS2800 10m 10W transceiver	179.00	(n/c)	MT-3000A 1.8-30MHz ATU 3Kw	275.00	(n/c)	SX200 26-512mHz	240.00	(n/c)
5m remote cable kit	25.00	(n/c)	AT-1K 1.8-30MHz ATU 1Kw	99.00	(n/c)	SR9 Tuneable 144-148 or 156-162mHz	46.00	(n/c)
G-WHIP MOBILE ANTENNA RANGE			HF200A 80-10m transceiver 100w	399.00	(n/c)	AR22 2m FM synthesized handheld	83.00	(n/c)
Tribander Helical 10/15/20metres	24.75	(2.00)	Spare set of D50A tubes	24.00	(n/c)	AR22 flexible antenna	3.00	(n/c)
LF40m Coil for above	6.55	(0.50)	All band Doublet 1.8-30MHz	22.50	(2.00)			
LF80m Coil for above	6.55	(0.50)	100ft. 470 ohm semi-air spaced	12.00	(1.00)			
LF160m Coil for above	6.55	(0.50)	ADONIS MICROPHONES					
LF teleopic resonator whip	3.35	(0.75)	AM202S Mobile safety mic	20.95	(n/c)	VHF/UHF MOBILE AERIALS		
Base mount 1 hole fixg + 3m cable	4.50	(0.50)	AGM202S Mobile safety mic	20.95	(n/c)	ASP201 2m ¼ wave	3.50	(1.25)
AERIAL ROTATORS (complete with control boxes)			AM202H Mobile safety mic	29.00	(n/c)	ASP209 2m ¾	9.25	(2.00)
CDE AR30 (5 core cable)	47.00	(1.50)	AM502G Base station comp. mic	39.00	(n/c)	ASP3009 2m ¾	9.75	(2.00)
CDE AR40 (5 core cable)	59.80	(1.50)	AM502G Base station 3 outputs	59.00	(n/c)	ASP462 70cm co-linear	8.25	(1.25)
Channelmaster 9502 (3 core)	42.00	(2.00)	SEM PRODUCTS			Magnetic base adaptor	8.50	(0.75)
Sky King SU4000 (6 core)	75.00	(2.50)	2metre power amplifier 5w/30w	50.00	(1.00)	ASP677 2m ¾ wave	14.95	(2.00)
Jaybeam KR400 (6 core)	99.00	(2.00)	2metre power amplifier 16w/50w	66.70	(1.50)	ASP667 70cm co-linear	17.95	(1.25)
CDE alignment bearing	7.75	(1.00)	2metre power amplifier Rf sensing 16w in			ASPM125 27mHz ¼ wave	18.50	(2.00)
Channelmaster alignment bearing	11.75	(1.00)	- 100w out 16w/10w	126.50	(1.50)	Magnetic base adaptor for above	8.50	(0.75)
HF ANTENNAS (various manufacturers)			2metre converters 28/30, 4/6, 2/4	23.00	(0.35)	ASP boot mount adaptor	3.75	(0.50)
Mini-Prdts HQ-1 20/15/10m 2 ele.	96.50	(2.50)	2metre Auto pre-amplifier	21.73	(0.35)	2NE 2m ¾ mobile whip	13.00	(2.00)
Mini-Prdts C4 20/15/10m vertical	48.50	(2.00)	70cm Auto pre-amplifier	24.73	(0.35)	RG4M Base for above aerial	3.50	(0.75)
Mosley TD3JR 20/15/10m wire dipole	34.50	(1.50)	2metre pre-amplifier	14.95	(0.35)	GSS Gutter/boot mount	3.15	(0.50)
Mosley "Mini-Beam" 20/15/10m 2 ele. 600w	99.00	(2.00)	70cm pre-amplifier	17.73	(0.35)	MB5 Magnetic mount	7.95	(1.00)
Mosley "Mini-Beam" 20/15/10m 2 ele. 2Kw 129.00	(2.00)		2.40mHz pre-amplifier	18.66	(0.35)	10SE 28mHz whip 1.72m long	11.50	(1.25)
Mosley TA32 20/15/10m 2 ele. 600w	89.70	(2.00)	2.40mHz pre-amplifier	11.73	(0.35)	15SE 21mHz whip 1.72 long	11.50	(1.25)
Mosley TA33 20/15/10m 3 ele. 600w	33.40	(2.50)	PA3 2metre pre-amplifier	8.00	(0.35)	20SE 14mHz whip 1.72 long	13.80	(1.25)
Mosley Mustang 20/15/10m 3 ele. 2Kw	166.75	(4.00)	PA70 70cms. pre-amplifier	10.00	(0.35)	WELZ PROFESSIONAL POWER/SW METERS		
Hy-Gain 12AVQ 20/15/10m vertical	43.00	(2.00)	Z Match ATU 3.5-30MHz 500 watts	47.15	(1.50)	SP200 1.8-160mHz 20w-200w-1Kw	49.95	(n/c)
Hy-Gain 14AVQ 40-10m vertical	60.00	(2.00)	EZITUNE Aerial tuning aid	30.48	(0.75)	SP300 1.8-500mHz 20w-200w-1Kw	69.95	(n/c)
Hy-Gain 18AVT/WB 80-10m vertical	87.00	(2.50)	IAMBIC Keyer	34.50	(0.75)	SP400 130-500mHz 5w-20w-150w	49.95	(n/c)
HF5 80-10m vertical 200w	48.00	(2.00)	2 METRE PORTABLES			SHORT WAVE LISTENER AERIALS		
Radial Kit for HF5	28.00	(2.00)	SB2M 2m SSB portable	99.00	(1.50)	3-30mHz Inverted "L"	9.95	(1.00)
Sagant EL40X 80-40 dipole (79" long)	36.00	(1.50)	AR245 (previously AR240A) 2m FM 5w	178.00	(1.50)	3-30mHz Broad band dipole	29.00	(1.00)
Jaybeam TB3HF 3element 2Kw	167.90	(4.50)	AR245 carrying case	4.10	(0.50)	Mosley RD5 all-band dipole	40.00	(1.00)
Jaybeam VR3HF vertical 2Kw	42.50	(3.00)	AR245 optional helical	4.10	(0.50)	AIR BAND PORTABLE MONITORS		
			AR245 12v DC car adaptor	4.10	(0.50)	Sharp FX213 tuneable	13.50	(0.75)
						INGERSOLL MW/FM/Airband monitor	12.95	(0.75)
						R517 Professional Air Monitor	49.50	(0.75)

TRIO TS830S £639.52



A brand new model having all nine bands fitted and providing 200 watts input SSB/CW. Built-in 230V ac supply, 61468 tubes and full digital and analogue display. Plus a really comprehensive variable selectivity and notch filtering system. The DX'er's dream.

TRIO TS130S £491.05



Base or mobile this solid state HF transceiver covers eight bands SSB/CW with a genuine 10C watts output. No tune up, IF tuning and speech processing are just a few of its features. 12V dc operation with full digital display plus optional PS30 for 230V ac operation.

TRIO TR2300 £166.00



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

TRIO R1000 £285.20



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

TRIO TR9000 £345.00



An all mode 2metre transceiver that serves the dual role of mobile and base station. Features include digital readout, 12½ or 25kHz steps in FM, five memories band scanning and a lot more! Send for coloured leaflet.

TRIO TR7800 £268.00



The latest Trio 25 watt FM transceiver with a host of features that makes mobile operating a real pleasure. Built-in keypad, digital readout, 14 memories — the list of features is endless. Send a SAE for full details.

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NEW

FT708R
 £199 inc.
 432MHz 1W
 25KHz Synth

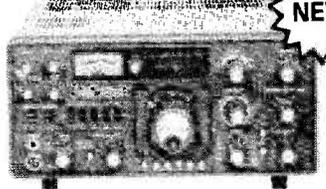
FT404R
 £179 inc.
 432MHz 3W
 6 Channel

FT207R
 £195 inc.
 144MHz 3W
 12½ kHz Synth

FT202R
 £109 inc.
 144MHz 1W
 6 Chan (3inc.)

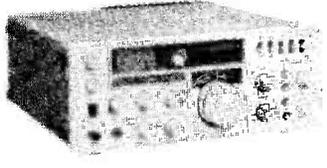


NEW



FT101ZFM £529 inc.

10-160m. Multimode Variable IF Bandwidth
 Analogue/Digital, AM/FM Versions.



*9 Band Models - 6 Banders in stock

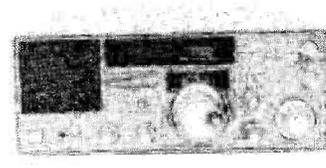
FT107M £690* inc.

160-10m, SSB, CW, FSK, AM Memory option.
 Deluxe all solid state.



FT902DM £799 inc.

10-160m, SSB, CW, AM, FM, Deluxe Digital, (DE version £713.00, D version £724.50).



FRG7700 £309 inc.

0.15-30MHz. General Coverage Receiver.
 AM, SSB, CW, FM (Memory Version £389).



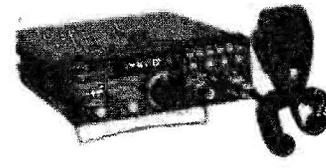
FRG7 £199 inc.

0.5 30 MHz General Coverage Receiver. 230V
 ac. 12V dc, + Battery pack. AM/SSB.



FT707 £500 inc.

10-80m. 100W PEP, SSB, AM, CW. Variable IF
 Bandwidth. Digital. 8 Bander.



FT480R £359 inc.

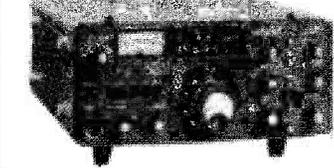
2m, Synthesised. 25, 12½, 1kHz steps FM 1kHz,
 100, 10Hz, steps SSB. 10W PEP.

NEW



FT780R £409 inc.

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



FT225RD £565 inc.

2m. SSB, CW, FM, AM, Digital readout. 25 +
 watts. (Analogue version £520).



FT7B £399 inc.

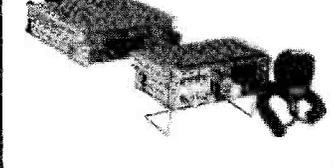
80-10m, SSB, CW, AM. Audio filter for CW.
 100W PEP 5 bands.

*** SALE ***



FT/FP200 £335 inc.

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



FT720 RV £253 inc.

FT720R £120, S72 £58, E72S £23, E724 £28,
 720RV £133, 720RVH £143, 720RV £158, MMB3.

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ANTENNAS HF MOBILE

G WHIP HF MOBILE Ant. Fibreglass stems helically wound (exc selecta)
TRIBANDER Antenna. Two sections 10-15-20m Slide switch
GWBASESTND Base standard type
LF40 Loading coil 40m
LF80 Loading coil 80m
LF160 Loading coil 160m
LFWHIP Telescopic whip

MULTIMOBILE Antenna. Mast head 10-15-20m self selecting
GWBASESTND Base standard type
MM40 Loading coil 40m
MM80 Loading coil 80m
MM180 Loading coil 180m
MMWHIP Telescopic whip

FLEXIWHIP Antenna. Mast + Whip telescopic (10m Basic section)
GWBASESTND Base standard type
FF15 Loading coil 15m
FF20 Loading coil 20m
FF40 Loading coil 40m
FF80 Loading coil 80m
FF160 Loading coil 160m

SELECTAMST Mast HT Alloy 39 ins Basic section
SELECTAEXTND Mast extension 18" Bumper or fixed use
SELECTAHEAD Self selecting coils 3, 6, 10, 15-20m
SM40 Loading coil 40m Medium power
SM80 Loading coil 80m Medium power
SM160 Loading coil 160m Medium power
SMWHIP Telescopic whip (5m)
SH10 Loading coil 10m HP (High power) c/w SS Whip
SH15 Loading coil 15m HP (High power) c/w SS Whip
SH20 Loading coil 20m HP (High power) c/w SS Whip
SH40 Loading coil 40m HP (High power) c/w SS Whip
SH80 Loading coil 80m HP (High power) c/w SS Whip
SH180 Loading coil 180m HP (High power) c/w SS Whip

THREADADAPTOR Thread adaptor 20-24 fits G whip to USA Base (Slug)
THREADCOVER Threaded base cover hexagonal chromed "nut"
HOLDALL Cloth holdall bag fits multimobile or tribander
EXTENDIAROD Mast extension 39" improves LF performance (not selecta)
SMC35 Base heavy duty. Ball type. Rec. Selecta and Multimobile

HY-GAIN MOBILE ACCS.
415 Bumper strap Stainless steel band c/w base
469 Body mount domed (hemispherical) chromed 3 5/8" D
511 Spring heavy duty barrel shape 3b 4.5" L
417 Spring medium duty barrel shape 2b 4.5" L

SMC MOBILE WHIP (Whip + coil + helical + spring + mount Bumper or body)
SMCHW/4/A Antenna (isopt fr) MHz. Additional freq. to spec above
SMCHW/4/A-1-2 Coil/Whip (isopt fr) MHz. Additional freq. to spec above

SMC-HS MOBILE (Complete antenna = Element + cable assembly)
SMC20 Element 20m 1.72m "Fold over" 100W PEP
SMC15E Element 15m 1.72m "Fold over" 130W PEP
SMC10E Element 10m 1.72m "Fold over" 100W PEP
SMC10GE Element 10m 1.72m "Fold over" 200W PEP
SMCSOCA Cable assembly 239m c/w 4m cable + PL259
SMCCGD Gutter clip deluxe adjustable angle
MX913M Dust cover. metric fits SMCSOCA (ISO239M)

ANTENNAS VHF/UHF MOBILE

ASCOT MOBILE ANTENNA (Complete unit = Base + Whip + Mount)
340 Base Stand 1/4 wave 0.8B 1/4 60-55MHz
310 Base 3/8 wave 0.8B 1/4 60-55MHz
344 Base Spring 1/4 wave 0.8B 1/4 60-120MHz

440 Base Stand 1/4 wave 3.0B 1/4 145MHz
330 Base 3/8 wave 3.0B 1/4 145MHz
341 Base Spring 1/4 wave 3.0B 1/4 145MHz

350 Base Fine tune 1/4 wave 3.0B 1/4 145MHz DC Ground
351 Base Spring 1/4 wave 3.0B 1/4 145MHz DC Ground

057 Whip, tapered SS 127cms
066 Whip, parallel SS 63cms
065 Mount cable 1/4 B 1/4 c/w 4.5m cable
065LR Mount cable 1/4 B 1/4 c/w 4.5m cable for fibreglass
062 Mount Mag. 1/4 B 1/4 c/w 4.5m cable
064 Mount cable 1/4 wave c/w 4.5m cable
068 Mount coil 1/4 wave to S0239
091 Mount Magnet 1/4 c/w 4.5m cable
069 Gutter clip adaptor screw fitting takes all base types
093 Boot lip adaptor screw fitting takes all base types
031 Blank off 1/4 B 1/4
044 Blank off cover 1/4

BANTEX MOBILE ANTENNA (Complete unit = Element + Base)

422S Element Stainless 42" 70MHz, low band, 1/4 wave
403E Element Glass/fibre 40" 70MHz, low band, 1/4 wave
20S Element Stainless 20" 144MHz, high band, 1/4 wave
16GF Element Glass/fibre 16" 144MHz, high band, 1/4 wave
BS Element 1/4 Glass/fibre 144MHz "Open spring" coil
BGASS Element 1/4 Stainless 144MHz sealed slim black coil
BGAGF Element 1/4 Glass/fibre 144MHz sealed slim black coil

BSJ Element 1/4 Stainless 432MHz
UCL Element Mid load coin 432MHz 1/4 + 1/2 wave
UDL Element Mid base load 432MHz 1/4 + 1/2 wave

BM Base standard 1/2" hole
BA Base snap-in type 1/2" hole
BC Base claw fixing 11-16mm hole
BD Base trunk lip 2 screw fitting
BMM Base Magnetic c/w 12" cable

SMC-HS VHF MOBILE ANTENNA (Complete unit = Element + Cable Assembly)

SMC118M Colinear 2m 11/8 wave with fold over 7.0B 1/4 9.7'
SMC6P27/PL Telescopic 2m PL259 fitting, 6 section 0.8B 1/4
SMC6P27/BNC Telescopic 2m BNC fitting, 6 section 0.8B 1/4
SMC2/HPL Helical 2m PL259 fitting
SMC2/HBNC Helical 2m BNC fitting
SMC4 Element 70MHz 1/4 wave 0.08B 1/4
SMC2NE Element 144MHz 1/4 wave fold over 3.08B 1/4 4.3'
SMC78F Element 144MHz 1/4 wave fold over 4.58B 1/4 5.7'
SMC78B Element 144MHz 1/4 wave ball adjust 4.58B 1/4 5.6'
SMC258 Element 432MHz 2 x 1/4 fold over 5.68B 1/4 3.1'
SMC358 Element 432MHz 3 x 1/4 fold over 6.38B 1/4 4.7'
SMCOCA Cable assembly 239m c/w 4m cable + PL259 fits above
SMCSOCA Cable assembly 239m c/w 6m cable PL259
SMCCGD Gutter clip deluxe adjustable angle (option for SMCSOCA)
SMC95D Bumper = strap deluxe stainless band
MX913M Dust cover metric fits SMCOCA

N.B. PRICES EXCLUDE VAT (15%)

CABLES, RADIO FREQUENCY

COAXIAL 50 OHM CABLE
UR435 Solid centre 2.2mm
UR43 Solid centre 5.0mm
UR43/100 Drum 100m UR43
UR76 Stranded core 5.0mm
UR76/100 Drum 100m UR76
RG58U Standard core 5.0mm
RG58U/100 Drum 100m RG58U
R213 Low loss 10.2mm
RG213/100 Drum 100m RG213
UR67 Low loss 10.2mm
UR67/100 Drum 100m UR67

COAXIAL 75 OHM CABLE
307EP Economy Typic 4.3mm
UR70EP/100 Drum 100m 307EP
UR70 Stranded light 5.7mm
UR70/100 Drum 100m UR70
UR39 Medium duty 7.8mm
UR39/100 Drum 100m UR39
UR57 Low loss 10.2mm
UR57/100 Drum 100m UR57

BALANCED TWIN CABLE
302 75 Ohms light duty
302/100 Drum 100m 302 (75)
306 300 Ohms Ribbon
306/100 Drum 100m 306 (300)
2 x 21 240 Ohms Oval foam
2 x 21/100 Drum 100m 2 x 21 (240)

BNC COAXIAL PLUG 50 OHMS
UG58 Standard type 5.5mm
UG959 Large type 11.2mm
BNC COAXIAL SOCKET 50 OHMS
UG290 Standard, 4 hole type
UG1094 Nut fixing type
UG89 Free, cable-end, 5.5mm

BNC COAXIAL COUPLER 50 OHMS
UG914 Back to back female
UG491 Back to back male
UG274 T: 2 female 1 male
SMC3/BNC SMC3/BNC
UG306 Elbow, Male-Female

BNC INTERSERIES ADAPTOR 50 OHMS
UG255 BNC plug UHF socket
UG273 BNC socket-BNC plug

BNC CABLES 50 OHMS
BNC18BNC 1.5' RG58 BNC ends
BNC36BNC 3.0' RG58 BNC ends
BNC36CROC 3.0' RG58 BNC/crps

UHF COAXIAL PLUG
PL259 Standard type 11.2mm
PL259P Push on type 11.2mm
UG175 Reducer 5.0mm
UG176 Reducer 5.6mm
PL259R Reduced type 5.0mm
PL259A De-luxe type 11.2mm
PL259B De-luxe type 5.0mm
PL259SL "Soldierless" 11.2mm
PL259SS "Soldierless" 5.0mm
PL259E Angle type 5.0mm
PL259M Mini type standard
PL259PM Panel mount 4 hole

UHF COAXIAL SOCKET
SO239F Standard 4 hole fix
SO239F31000 4 hole PTFE Au plate
SO239T 2 hole fixing type
SO239H Nut fix inside type
SO239NO Nut fix outside type
SO239E Free angle type 5.0mm
SO239F Free cable end 5.0mm
SO239M Free cable end 11mm

UHF COAXIAL COUPLER
PL258 Back to back female
PL274 Back to back chassis
PL258M Back to back male
M369 Elbow male-female
M368 T: 2 female 1 male
M358AF T: 3 female
M458 X: 3 female 1 male

UHF INTERSERIES ADAPTOR
UG255 UHF socket-BNC plug
UG273 UHF plus-BNC socket
SO27F UHF socket-F plug
SO27S UHF socket-2.5mm jack
SO35 UHF socket-3.5mm jack

UHF CABLES
PL369L 3.0' RG58 PL259 ends

N COAXIAL PLUG 50 OHMS
UG536 Small type 5.5mm
UG21 Standard type 11.2mm

N COAXIAL SOCKET 50 OHMS
UG58 Standard 4 hole fix
UG1062 Free cable end 5.5mm
UG323 Free cable end 11mm
MX913 Dust cap
MX913/C Dust cap c/w chain

N.B. PRICES EXCLUDE VAT (15%)



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KR500	Kenpro, Elevation type
RLD3	SMC, Bell type
505	Stolle, Bell type
AR30	CDE, Df1Set type
2050	Stolle, Through Rotor
9502A	Channel Master, offset
9506	Channel Master, offset
KR250	Kenpro, Bell type
AR22	CDE
AR40	CDE
KR400RC	Kenpro
BT1	CDE
CD45	CDE
KR600RC	Kenpro
Ham IV	CDE
T2X	CDE
H300	HyGain

ROTOR HARDWARE	
CO552	Support Bearing CDE
AK121	Adaptor Kit Tower CDE
50425	Clamps, U Bolts ST CDE
50463	Clamps, U Bolt HD CDE
51472	Mast Mount Kit ST CDE
51467	Mast Mount Kit HD CDE
9523	Support Bearing
9525	Rotary Bearing
KO50	Rotary Bearing
KO65	Rotary Bearing

ROTOR CONTROL CABLE	
RC3W	3 way
RC4W	4 way
RC5W	5 way
RC6W	6 way
RC9W	9 way

ANTENNA ROTATORS

Meter calib ±90°	to 50kg load	£75.00	SR	Free
Automatic controller	to 0.23sq. m.	£29.35	SR	Free
Automatic controller	to 0.23sq. m.	£29.35	SR	Free
Turn and Push control		£41.00	SR	Free
Automatic controller		£46.00	SR	Free
Secondary pointer		£46.00	SR	Free
Secondary pointer	to 0.46sq. m.	£57.00	SR	Free
Twist and Switch control	torque 200Kg/m.	£39.00	SR	Free
Solenoid control	to 0.3sq. m.	£45.00	SR	Free
Turn and Push control	to 0.3sq. m.	£52.00	SR	Free
Round meter 360°	torque 400Kg/m.	£79.00	SR	Free
4 set and manual control	to 0.5sq. m.	£79.50	SR	Free
8 x 4cm meter readout	to 0.8sq. m.	£99.00	SR	Free
Round meter 360°	torque 600Kg/m.	£115.00	SR	Free
8 x 4cm meter readout	per metre	£145.00	S	Free
8 x 4cm meter readout	to 2.8sq. m.	£199.00	S	Free
Digital readout	adequate	£329.00	S	Free

1 1/2" Stub 1 1/2" Main, for AR30 etc.	RRP £8.10	£6.75	SP	£0.85
"Bell" Rotor to flat plate		£6.00	SP	£0.65
Replacement AR22 AR40		£4.30	SP	£0.90
Replacement BT1 CD45HAM4		£6.40	SP	£1.30
Complete for HAM4 etc.		£10.50	SR	£1.90
Complete for HAM4 etc.		£21.00	SR	£1.50
Channel Master Upper type 2" mast 1 1/2" Stub		£10.20	SP	£1.50
Channel Master Guy type to 1 1/2"		£11.30	SP	£0.85
takes 1 1/2" mast		£10.65	SP	£1.00
takes 2" mast		£15.35	SP	£1.30

TOWERMAST, TELESCOPIC (10' Section, Guyed)					
TEML30	Mast 30' c/w Plates, Thrust Washers, Clamps, Pins. 32.44mmOD 16G	17kg	£27.00	R	£3.60
TEML40	Mast 40' c/w Plates, Thrust Washers, Clamps, Pins. 32.51mmOD 16G	22kg	£37.00	R	£4.55
TEML50	Mast 50' c/w Plates, Thrust Washers, Clamps, Pins. 32.57mmOD 16G	28kg	£47.00	R	£5.70
TEMR30	Rigging kit 30' (contents detailed below)	11kg	£30.00	SR	£2.25
TEMR40	Rigging kit 40' (contents detailed below)	17kg	£42.00	SR	£3.60
TEMR50	Rigging kit 50' (contents detailed below)	31kg	£51.00	R	£6.25
PR1563	Foot mount swivelling (Rigging: 30' - 1pc, 40' 1pc, 50' 1pc)		£2.95	SP	£1.00
CG6	Buildup 6mmOD 'U' (Rigging: 30' - 1pc, 40' 2pc, 50' 3pc)		£0.16	SP	£0.55
THIM30	Galvanised 30mm OA (Rigging: 30' - 9pc, 40' 12pc, 50' 15pc)		£0.13	SP	£0.35
TPR933	Turnbuckle 115 x 8mm (Rigging: 30' - 9pc, 40' 12pc, 50' 15pc)		£0.65	SP	£0.60
SMCGA	Guy Anchor Plates (Rigging: 30' - 3pc, 40' 3pc, 50' 3pc)		£0.95	SP	£0.40
FE7X18G100	Galvanised 7 x 8 (Rigging: 30' - 3pc, 40' 5pc, 50' 6pc)	100'	£4.40	SR	£1.50
TMCS50	Stand Offs, for coax		£4.20	SR	£1.50
3427	Base Plate to 55mmOD		£3.75	SR	£1.50
GS27	27" T1 section				

GUYED MASTS

TOWERS					
HT30M	Tower 30' c/w HTBG				
HT40M	Tower 40' c/w HTBG				
HT10B	Section 10' Base				
HT10E	Section 10' Extra				
HT10HD	Section 10' H.D.				
HTRM	Roof Mounting frame				
HTBG	Base Grillage				
HTTP	Top Plate				
HTCF	Cap Fitting				
HTTM	Tube mount internal				

HAMTOWER (Self-Supporting)	
HT30M	Tower 30' c/w HTBG
HT40M	Tower 40' c/w HTBG
HT10B	Section 10' Base
HT10E	Section 10' Extra
HT10HD	Section 10' H.D.
HTRM	Roof Mounting frame
HTBG	Base Grillage
HTTP	Top Plate
HTCF	Cap Fitting
HTTM	Tube mount internal

TELETOPE, Telescopic	
TT17	Tower 17m, c/w Rig
TT17	Tower 24m, c/w Rig
TT30	Tower 30m, c/w Rig

VERSATOWERS Telescopic, Tilting, Galvanised Lattice Towers	
10M10P30	30' Norm Post Mount Minitower
10M10P30	30' Norm Base Plate Minitower
13M20P25	25' Std Post Mount
13M20P40	40' Std Post Mount
13M20P60	60' Std Post Mount
13M20P80	80' Std Post Mount
13M20F25	25' Std Fixed Base
13M20F40	40' Std Fixed Base
13M20F60	60' Std Fixed Base
13M20F80	80' Std Fixed Base
13M20SP25	25' Std Socket
13M20SP40	40' Std Socket
13M20SP60	60' Std Socket
13M20SP80	80' Std Socket
13M20BP25	25' Std Base Plate
13M20BP40	40' Std Base Plate
13M20BP60	60' Std Base Plate
13M20BP80	80' Std Base Plate
13M20W25	25' Std Wall Mount
13M20W40	40' Std Wall Mount
13M20W60	60' Std Wall Mount
13M20M25	25' Std Mobile Type
13M20M40	40' Std Mobile Type
13M20M60	60' Std Mobile Type
13M20M80	80' Std Mobile Type
13M20T85	85' T Post Mount
10M10W30	30' Norm Wall Mount Minitower
10M10FB30	30' Norm Fixed Base Minitower
16M20P40	40' HD Post Mount
16M20P60	60' HD Post Mount
16M20P80	80' HD Post Mount
16M20P100	100' HD Post Mount
16M20F40	40' HD Fixed Base
16M20F60	60' HD Fixed Base
16M20F80	80' HD Fixed Base
16M20F100	100' HD Fixed Base
16M20SP40	40' HD Socket
16M20SP60	60' HD Socket
16M20SP80	80' HD Socket
16M20SP100	100' HD Socket
16M20BP40	40' HD Base Plate
16M20BP60	60' HD Base Plate
16M20BP80	80' HD Base Plate
16M20BP100	100' HD Base Plate
16M20W40	40' HD Wall Mount
16M20W60	60' HD Wall Mount
16M20M40	40' HD Mobile Type
16M20M60	60' HD Mobile Type
16M20M80	80' HD Mobile Type
16M20M100	100' HD Mobile Type
13M20T120	120' T Post Mount

75kg + Rigging	£340.00	L	DIST.
106kg + Rigging	£495.00	L	DIST.
165kg + Rigging	£600	L	DIST.
£307.00	RL	DIST.	
£325.00	RL	DIST.	
£252.00	RL	DIST.	
£265.00	RL	DIST.	
£422.00	RL	DIST.	
£905.00	RL	DIST.	
£188.00	RL	DIST.	
£290.00	RL	DIST.	
£357.00	RL	DIST.	
£739.00	RL	DIST.	
£293.00	RL	DIST.	
£386.00	RL	DIST.	
£464.00	RL	DIST.	
£847.00	RL	DIST.	
£295.00	RL	DIST.	
£389.00	RL	DIST.	
£464.00	RL	DIST.	
£847.00	RL	DIST.	
£203.00	RL	DIST.	
£286.00	RL	DIST.	
£373.00	RL	DIST.	
£1356.00	RL	DIST.	
£1484.00	RL	DIST.	
£1576.00	RL	DIST.	
£1998.00	RL	DIST.	
£1135.00	RL	DIST.	
£295.00	RL	DIST.	
£285.00	RL	DIST.	
£514.00	RL	DIST.	
£584.00	RL	DIST.	
£880.00	RL	DIST.	
£1061.00	RL	DIST.	
£404.00	RL	DIST.	
£478.00	RL	DIST.	
£412.00	RL	DIST.	
£920.00	RL	DIST.	
£558.00	RL	DIST.	
£640.00	RL	DIST.	
£937.00	RL	DIST.	
£119.00	RL	DIST.	
£524.00	RL	DIST.	
£606.00	RL	DIST.	
£902.00	RL	DIST.	
£1083.00	RL	DIST.	
£412.00	RL	DIST.	
£483.00	RL	DIST.	
£1723.00	RL	DIST.	
£1823.00	RL	DIST.	
£2241.00	RL	DIST.	
£2316.00	RL	DIST.	
£1550.00	RL	DIST.	

VERSATOWER ACCESSORIES	
LG1013W	Luffing Gear 10/13M
LG18W	Luffing Gear 18M/20
HDB110BPFB	HD Bolts (4) M24X450
HDB1316BPFB	HD Bolts (4) M24X300
T1200	Standard 1200LB
K1500	Auto-Brake 1500LB
K2500	Auto-Brake 2500LB
102A	Electric 110V/AC
AC1500	Electric 12VDC
WRL	Rope Lubricant 16ozs.

For Wall mounting 10M1C and 13M20 Towers	£3.50	£1.75	
For Wall mounting 16M20 Towers	£69.00	£4.00	
For BP and FB Minitowers (10M10 Series)	£7.50	£1.50	
For BP and FB 13M20 and 16M20 Towers	£15.50	£1.90	
	£11.00	SR	£1.50
	£37.75	SR	£1.60
	£59.50	SR	£2.85
	£181.50	SR	£3.20
	£155.00	SR	£1.80
Nominal Aerosol can	£2.40	SP	£0.80

N.B. PRICES EXCLUDE VAT (15%)

ANTENNA WIRE

CU145WG	Hard Drawn Copper Single Strand About 145WG 100lb/mile
CU145WG108	HD Copper 3mm Coil
CU145WG132	HD Copper 40m Coil
CU7029H	Hard Drawn Stranded
CU7036	CAD Copper Stranded
CU7044	CAD Copper Stranded
CUTER	CU/Terylene Braid About 3mmD
CU7029S	Soft Copper Stranded for Radials etc

BALUN TRANSFORMER

BN86	HY-Gain 1 to 1
HIG1	Van Gorden 1 to 1

DIPOLE CENTRE PIECE

CCJ2BNC	Standard C/W Fitting
CCJ2JHF	Standard C/W Fitting
CCJ1JN	HD Type C/W Fitting
CCJ1UHF	HD Type C/W Fitting
AJU	Polyprop Clamp & Lug
PARCT	Porcelain T Shaped

INSULATOR END STRAIN

SMCP2	Polypropylene 3"
PORC3	Porcelain 3"
SMCP1	Polypropylene 8.5"
EG38	Porcelain Egg 1.5"
EGG51	Porcelain Egg 2.1"

LIGHTING ARRESTOR

SMC566	Spark SO239/PL259
SMC567	Spark SO239/SO239

WIGHTRAPS ANT TRAP

IMXT	Standard White 3.5MHz Resonance 500W PIP Each 0.14kg pair
IMXHP	High Power Blue 3.5MHz Resonance 1000W PIP Each 0.185kg pair
IMXTB	Top Band Spacesaver 1.8MHz Resonance Each 0.155kg per pair

ANTENNA PARTS AND ACCESSORIES

per metre	£0.15	kg0.028
per 108'	£4.78	SP £0.65
per 132'	£5.67	SP £0.75
per metre	£0.16	kg0.026
per metre	£0.22	kg0.040
per metre	£0.29	kg0.068
per metre	£0.14	kg0.011
per metre	£0.15	kg0.026

3-30 MHz SO239 C/W Bolt for ant mount	£13.50	SP	£0.65
3-30 MHz SO239 Hang up type	£3.70	SP	£0.55

UG88 etc to mate with inbuilt BNC Socket	£4.35	SP	£0.45
PL259 etc to mate with inbuilt UHF Socket	£4.35	SP	£0.45
UG21 etc to mate with inbuilt 'N' socket	£8.25	SP	£0.55
PL259 etc to mate with inbuilt UHF socket	£6.35	SP	£0.55
per metre	£0.85	SP	£0.35
Suit Twin flat etc	£0.48	SP	£0.35

£0.37	SP	£0.35
£0.68	SP	£0.35
£1.85	SP	£0.35
£0.35	SP	£0.35
£1.85	SP	£0.45

Free in line mounting	£2.60	SP	£0.35
Free in line mounting	£2.60	SP	£0.35

£6.25	SP	£0.65
£9.40	SP	£0.75
£9.40	SP	£0.65

RIGGING AND FITTINGS

£0.14	SP	£0.35
£0.14	SP	£0.35
£0.42	SP	£0.35

£6.50	SR	£1.50
£8.50	SR	£1.50
£8.75	SR	£1.50
£10.95	SR	£1.50
£11.50	SR	£1.50

£0.24	SP	£0.35
£0.28	SP	£0.35
£0.36	SP	£0.45
£4.40	SR	£1.50
£12.50	SR	£1.65
£0.06	kg0.007	
£0.12	kg0.017	
£0.17	kg0.037	
£0.29	kg0.067	

HT Steel 3mmD 1 x 19. Approx BS 720kg	per metre	£0.19	kg0.049	
HT Steel 4mmD 1 x 19. Approx BS 1285kg	per metre	£0.24	kg0.066	
HT Steel 5mmD 1 x 19. Approx BS 2000kg	per metre	£0.28	kg0.135	
HT Steel 6mmD 1 x 19. Approx BS 2875kg	per metre	£0.36	kg0.194	
Rustproof 3mmD Multifstrand	150 metre	£16.30	SR	£1.60
Galvanised 7 by 18 Gauge	100'	£4.40	SR	

ANTENNAS HF FIXED/TRANSPORTABLE

GEM QUAD PRODUCTS			
G02E	2 Element Antenna 10-15-20m 18"x18"x5' "Boomless"	£124.00	R £3.75
G02E	3 Element Antenna 10-15-20m 6.5' Boom	£187.00	R £6.45
G04E	4 Element Antenna 10-15-20m 13' Boom	£249.00	R £7.05
G0CK1	Conversion Kit 1 Ele (2 to 3 to 4 Element)	£63.00	R £2.90
G0CK2	Conversion Kit 2 Ele (2 to 4 elements)	£125.00	R £4.70
G0SPIDER	Centre piece (spare) welded aluminium	£26.25	SP £1.25
G0SPREADER	Spreader Arm (spare) tridetic fibreglass 13.6' x 2.2lb	£9.85	R £1.50
HY GAIN HF ANTENNA (Commercial, Industrial & Military Antennas to Order)			
12AVQ	Vertical 10-20m inc. trapped self supporting	14.0'H	£37.50 SR £1.50
14AVQ/WB	Vertical 10-40m inc. trapped self supporting	18.0'H	£52.50 SR £1.50
18AVT/WB	Vertical 10-80m inc. trapped self supporting	25.0'H	£76.00 SR £1.50
14RMQ	Roof mounting Kit 12AVQ 14AVQ & 18AVT		£19.50 SR £1.50
18V	Vertical 10-80m c/w, loaded "tapped"	19.0'H	£27.80 SR £1.50
18H4T	"HY Tower" 10-80m Stub decoupler	50.0'H	£225.00 R £10.90
103BA	3 Ele Yagi 10metres	8.0'B	£51.00 SR £1.50
105BA	3 Ele Yagi 10metres	18.5'L	£24.0'B
153BA	3 Ele Yagi 15metres	23.0'L	£20.0'B
155BA	5 Ele Yagi 15metres	24.5'L	£26.0'B
203BA	3 Ele Yagi 20metres	35.0'L	£16.0'B
204BA	3 Ele Yagi 20metres	36.5'L	£26.0'B
205BA	5 Ele Yagi 20metres	36.5'L	£40.0'B
4025A	2 Ele Yagi 40metres	43.0'L	£18.0'B
DB1015A	3 Ele Yagi 10-15m	23.0'L	£13.0'B
TH3JNR	3 Ele Yagi 10-15-20m	24.2'L	£13.0'B
TH2MK3	3 Ele Yagi 10-15-20m	27.3'L	£6.0'B
TH3MK3	3 Ele Yagi 10-15-20m	27.0'L	£14.0'B
TH5DXKX	"Thunderbird" 5 Ele	31.0'L	£18.0'B
TH5DXKX	"Thunderbird" 6 Ele	31.1'L	£24.0'B
HYQUAD	2 Ele Quad 10-15-20m	13.5'TR	£8.0'B
18TD	Dipole Tape 10-80m	132'	£56.00 SP £2.00
BN86	Balun Ferrite 1:1 3-30MHz SO239 Input C/W U Bolt		£13.50 SP £1.00
LA1	Lightning Arrestor Gas filled bulkhead Mount SO239		£38.50 SP £0.65

JAYBEAM HF ANTENNA			
VR3	Vertical 10-15-20m DC Short	6b	13.5'H £37.00 R £1.50
TB3	3 Ele Yagi 10-15-20m PEP	14.6'TB	14.1'B £146.00 R £3.75

KLM HF ANTENNA (Multi purpose log periodics and long Yagis to Order)			
KT34	4 Ele 10-15-20m controlled BW 4KW	24.0'L	15.0'B

MINI BEAM ANTENNA			
C4	Vertical Miniature 10-15-20m	8LB	11.5'H £42.15 SR £1.50
HQ1	"Mini" Quad beam 10-15-20m	11.0'L	4.5'B £83.85 SR £2.80

MORGAIN DIPOLE COMPRESSED LINEAR LOADED 14AWG 40% Copperweld			
4010HD	Antenna 10-40m	Nom 50 Ohms 2.9KW PIP 1.0Kg 36'	TBA
8010HD	Antenna 10-80m	Nom 50 Ohms 2.9KW PIP 1.4Kg 69'	TBA
MGCCAP	Coax socket adaptor plate (terminals to SO239)		

MOSLEY HF ANTENNA			
TA31JR	Dipole 10-15-20m NB 1 1/2' only, 200W RMS	13.3'TR	26.7'E £50.00 B £4.50
MCK31/32JR	Conversion Kit TA31 to TA32		£45.00 B £4.50
TA32JRE	2 Ele trapped beam 10-15-20m 200W RMS	13.7'TR	6.0'B £78.00 R £2.25
MCK32/33JR	Conversion Kit TA32 to TA33		£50.00 B £4.50
TA33JRE	3 Ele trapped beam 10-15-20m 200W RMS	14.7'TR	12.0'B £116.00 R £2.40
TU33JR/HP	3 Ele C/W Balun HP (High power TA33JRE)	14.7'TR	12.0'B £132.00 R £2.60
MUSTANG1	Dipole 10-15-20m	13.3'TR	26.7'E £90.00 B £4.50
MUSTANG2	2 Ele trap beam 10-15-20m 1KW RMS	14.7'TR	6.0'B £117.00 R £2.40
MUSTANG3	3 Ele trap beam 10-15-20m 1KW RMS	15.0'TR	12.0'B £145.00 R £2.60
MCK33/MUSTANG	Conversion kit 1 Ele (Driven) only		£55.00 B £4.50
ELAN1	Dipole 10-15 metres 10-15m 200 RMS	10.1'TR	20.3'E £46.00 B £4.50
ELAN2	2 Ele trapped beam 10-15m 200W RMS	11.0'TR	6.0'B £66.00 B £4.50
ELAN3	3 Ele trapped beam 10-15m 200W RMS	12.0'TR	12.0'B £93.00 R £2.40
RD5	Trapped dipole ham bands. Wire kit SWL only		69.0'E £35.00 SP £1.25
SWL7	Trapped dipole BC Bands. Wire kit		40.0'E £35.00 SP £1.25

SMC DIPOLE ANTENNA (Made up, centre insulator, and insulators, wire)			
SMC10MD	10m	CCJ2 SMC P2 7029H	c/w PL259 max 17.5' £10.85 SP £0.65
SMC12MD	12m	CCJ2 SMC P2 7029H	c/w PL259 max 19.7' £11.00 SP £0.65
SMC15MD	15m	CCJ2 SMC P2 7029H	c/w PL259 max 23.4' £11.05 SP £0.65
SMC17MD	17m	CCJ2 SMC P2 7029H	c/w PL259 max 27.2' £11.00 SP £0.65
SMC20MD	20m	CCJ2 SMC P2 7029H	c/w PL259 max 36.2' £12.00 SP £1.00
SMC30MD	30m	CCJ2 SMC P2 7036	c/w PL259 max 48.7' £13.00 SP £1.25
SMC40MD	40m	CCJ2 SMC P2 7036	c/w PL259 max 70.3' £14.65 SP £1.50
SMC80MD	80m	CCJ2 SMC P2 7038	c/w PL259 max 140.6' £18.85 SR £1.50
SMC160MD	160m	CCJ1 SMC P1 7044	c/w PL259 max 273.3' £37.00 SR £1.50

SMC MAINPACK DIPOLE 3-30MHz. Adjustable. PVC Copper/Terylene Braid.			
LWBA	Antenna c/w 9m RG58, 90' Halyard Tails, Coax Plugs etc.		£39.50 SP £1.50

SMC TRAPPED DIPOLE 10-80m. 100' Potted Traps. Mil Spec. Centre Insulator			
SMCTD/S	Standard 14SWG white traps hard drawn copper 50W pep		£26.50 SP £1.50
SMCTD/HP	Hi power 14SWG blue traps hard drawn copper 100W pep		£29.50 SP £1.50
SMCTD/P	Portable package ant copper/terylene braid. 75' coax, plugs		£32.50 SR £1.50

SMC HS ANTENNA			
SMCHFSV	Vertical 10-80m Trapped self supporting	15.7'H	£35.00 SR £1.50
SMCHFSR	Radial kit, loaded, 5 solid rods at 45 degree	6.5'-7.3'	£28.00 SR £1.50

NB. All prices (including carriage) exclude VAT 15%. The code letters which follow the price indicate: (i) S, Securitor delivery is possible, (ii) Normal transport means (P post, R road, L lorry).

Where Securitor delivery on an item, or any number of items combined, is possible (ie, less than 55lbs and 5'6" long) it is charged at £3.50 per lot.

ANTENNAS VHF/UHF FIXED

HIDAKA VHF ANTENNA			
LT606	Log periodic 50-500 3dB%		£75.95 R £1.50
JAYBEAM 4 METRE			
4Y/4M	Yagi, 4 element length 7.5'	7.0dB	£18.00 SR £1.50
PMH2/4M	Harness, 2 way		£10.60 SP £1.25
JAYBEAM 2 METRE			
HO/2M	Halo, head only	1' square	-30dB £3.95 SP £0.55
HO/2M	Halo, with 24" mast	1' square	-30dB £4.70 SP £0.55
UGP/2M	Ground plane folded radiator	height 1.7'	0.0dB £8.80 SR £1.50
C5/2M	Collinear omni. vert	height 13.1' 7.1lb	4.8dB £38.5 SR £1.50
LR1/2M	Collinear	height 9.8' 3.3lb	4.5dB £21.00 SR £1.50
5Y/2M	Yagi, 5 element	length 5.2'	7.8dB £9.80 SR £0.50
8Y/2M	Yagi, 8 element	length 5.2'	9.5dB £12.60 SR £1.50
10Y/2M	Long Yagi 10 element	length 14.4' braced	11.4dB £27.00 SR £1.50
14Y/2M	Long Yagi 14 element	length 17.5' braced	13.0dB £31.30 SR £1.50
D5/2M	Yagi, 5 over 5 slot	length 5.2'	10.6dB £17.50 SR £1.50
DB/2M	Yagi, 8 over 8 slot	length 9.2'	12.3dB £23.80 SR £1.50
PBM10/2M	10 ele parabeam	length 12.9' braced	12.4dB £32.00 SR £1.50
PBM14/2M	14 ele parabeam	length 19.5' braced	13.7dB £38.00 SR £1.50
Q4/2M	Quad, 4 element	length 4.9'	10.0dB £20.60 SR £1.50
Q6/2M	Quad, 6 element	length 8.7'	12.0dB £27.30 SR £1.50
5XV/2M	Yagi, 5 ele crossed	length 5.5'	7.8dB £19.80 SR £1.50
8XV/2M	Yagi, 8 ele crossed	length 5.2'	9.5dB £24.70 SR £1.50
10XV/2M	Yagi, 10 ele crossed	length 11.8'	11.3dB £32.80 SR £1.50
PMH2/C	Harness, Cir. Polar.		£6.50 SP £0.45
PMH2/M	Harness, 2 way		£8.60 SP £0.75
PMH2/2M	Harness, 2 way long - for large antennas		£9.60 SP £1.00
PMH4/2M	Harness, 4 way		£20.10 SP £1.50
JAYBEAM 2M/70CMS			
X8/2M/12/70	Ant 6 ele 2, 12 ele 70	length 7.2' 12.0dB	8.5dB £33.50 SR £1.50
JAYBEAM SEVENTY CMS			
C8/70	Collinear, Omni. Vert.	height 10.5' fibreglass	7.8dB £43.50 SR £1.50
D8/70	Yagi, 8 over 8 slot	length 3.6'	12.3dB £18.00 SR £1.50
PBM18/70	Parabeam 18 element	length 3.2'	14.9dB £22.00 SR £1.50
NM48/70	Multibeam, 48 ele	length 6.0'	15.7dB £38.00 SR £1.50
MBM88/70	Multibeam, 88 ele	length 13.1'	18.5dB £34.20 SR £1.50
8XV/70	Yagi, 8 ele crossed	length 8.5'	10.0dB £29.70 SR £1.50
12XV/70	Yagi, 12 ele crossed	length 8.5' c/w H'ness, 'N' s'kt	13.0dB £36.80 SR £1.50
PMH2/70	Harness, 2 way		£7.40 SP £0.65
PMH4/70	Harness, 4 way		£15.70 SP £1.25
JAYBEAM 1296MHz			
D15/23	Yagi, 15 over 15 slot	length 2.8'	15.0dB £29.60 SR £1.50
JAYBEAM 136MHz			
8XV/S	Yagi, 8 ele crossed (satellite band)		9.0dB £25.70 SR £1.50
10XV/S	Yagi, 10 ele crossed (satellite band)		11.0dB £33.80 SR £1.50
JAYBEAM BAND 2			
SBM4	Yagi, 4 element		£14.30 SR £1.50
SBM6	Yagi, 6 element		£26.70 SR £1.50
FMS9	Yagi, 9 element multi reflector		£38.50 SR £1.50
KLM VHF ANTENNA (Special orders only - Prices to be agreed)			
KLM-130 15	Log Periodic 15 ele 35-135MHz		£190.00
KLM144-13LB	Yagi 144MHz 13 ele optimised long boom	15.5dB	21.5'B £70.00
KLM432-16LB	Yagi 432MHz 16 ele optimised long boom	15dB	12.5'B £60.00
KLM BALUN, SLEEVE (Prices to be agreed)			
144-148-50N	2m 50 50 N Type	2KW	£19.30
144-148-62N	2m 50 75 N Type	2KW	£19.30
144-148-75N	2m 50 100 N Type	2KW	£19.30
144-148-100N	2m 50 200 N Type	2KW	£19.30
420-470-50N	70cms 50 55 N Type	2KW	£19.30
420-470-62N	70cms 50 75 N Type	2KW	£19.30
420-470-75N	70cms 50 100 N Type	2KW	£19.30
420-470-100N	70cms 50-200 N Type	2KW	£19.30
KLM POWER DIVIDER (Prices to be agreed)			
140-150-2N	2m 2 way N Socket	2KW	50 ohms £21.30
140-150-4N	2m 4 way N Socket	2KW	50 ohms £21.00
400-470-2N	70cms 2 way N Socket	2KW	50 ohms £19.30
400-470-4N	70cms 4 way N Socket	2KW	50 ohms £26.95
SMC VHF ANTENNA			
GP2U	Ground Plane 0dB%	1.7'	£4.35 SP £1.00
SMC HS VHF ANTENNA			
SMCGDX1	Discone 80-480MHz 3dB% low VSWR 6.6bs		3.3' £36.00 SR £1.50
SMCGFX2	Discone 50-480MHz 3dB% Rx only		6.2' £41.70 SR £1.50
SMCVHFL	Discone 65-520MHz		5.0' £14.65 SR £1.50
SMCGGP	Collinear 2m Multi 1/2 wave 6.5dB		10.2' £21.70 SR £1.50
SMCGP432X	Collinear 70cms 3 x 1/2 wave 6.8dB		5.6' £24.35 SR £1.00
TELEWAND UHF ANTENNA (Quads to order)			
TW435D	Discone 400-1200MHz 0.3Kg		1.2' £23.00 SP £0.50
TW400C	Quad-Loop 12 ele 432MHz 15.5dB 2.0Kg		7.9'B £44.95 SR £1.50
TW400B	Quad-Loop 18 ele 432MHz 18.0dB 3.0Kg		11.5'B £58.95 SR £1.50
TW400A	Quad-Loop 25 ele 432MHz 20.5dB 3.5Kg		16.1'B £82.35 SR £1.50

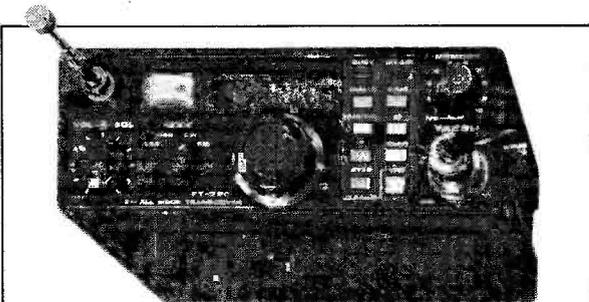
JAYBEAM SEVENTY CMS			
C8/70	Collinear, Omni. Vert.	height 10.5' fibreglass	7.8dB £43.50 SR £1.50
D8/70	Yagi, 8 over 8 slot	length 3.6'	12.3dB £18.00 SR £1.50
PBM18/70	Parabeam 18 element	length 3.2'	14.9dB £22.00 SR £1.50
NM48/70	Multibeam, 48 ele	length 6.0'	15.7dB £38.00 SR £1.50
MBM88/70	Multibeam, 88 ele	length 13.1'	18.5dB £34.20 SR £1.50
8XV/70	Yagi, 8 ele crossed	length 8.5'	10.0dB £29.70 SR £1.50
12XV/70	Yagi, 12 ele crossed	length 8.5' c/w H'ness, 'N' s'kt	13.0dB £36.80 SR £1.50
PMH2/70	Harness, 2 way		£7.40 SP £0.65
PMH4/70	Harness, 4 way		£15.70 SP £1.25
JAYBEAM 1296MHz			
D15/23	Yagi, 15 over 15 slot	length 2.8'	15.0dB £29.60 SR £1.50
JAYBEAM 136MHz			
8XV/S	Yagi, 8 ele crossed (satellite band)		9.0dB £25.70 SR £1.50
10XV/S	Yagi, 10 ele crossed (satellite band)		11.0dB £33.80 SR £1.50
JAYBEAM BAND 2			
SBM4	Yagi, 4 element		£14.30 SR £1.50
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KLM VHF ANTENNA (Special orders only - Prices to be agreed)			
KLM-130 15	Log Periodic 15 ele 35-135MHz		£190.00
KLM144-13LB	Yagi 144MHz 13 ele optimised long boom	15.5dB	21.5'B £70.00
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KLM BALUN, SLEEVE (Prices to be agreed)			
144-148-50N	2m 50 50 N Type	2KW	£19.30
144-148-62N	2m 50 75 N Type	2KW	£19.30
144-148-75N	2m 50 100 N Type	2KW	£19.30
144-148-100N	2m 50 200 N Type	2KW	£19.30
420-470-50N	70cms 50 55 N Type	2KW	£19.30
420-470-62N	70cms 50 75 N Type	2KW	£19.30
420-470-75N	70cms 50 100 N Type	2KW	£19.30
420-470-100N	70cms 50-200 N Type	2KW	£19.30
KLM POWER DIVIDER (Prices to be agreed)			
140-150-2N	2m 2 way N Socket	2KW	50 ohms £21.30
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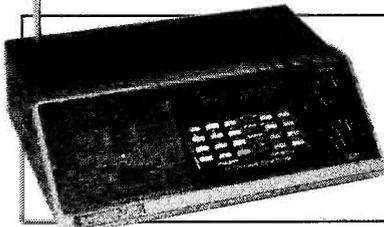
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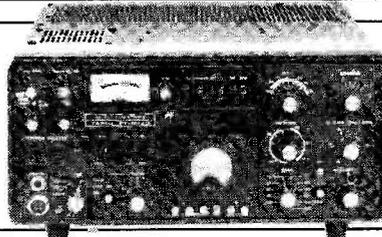


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SHORT WAVE MAGAZINE

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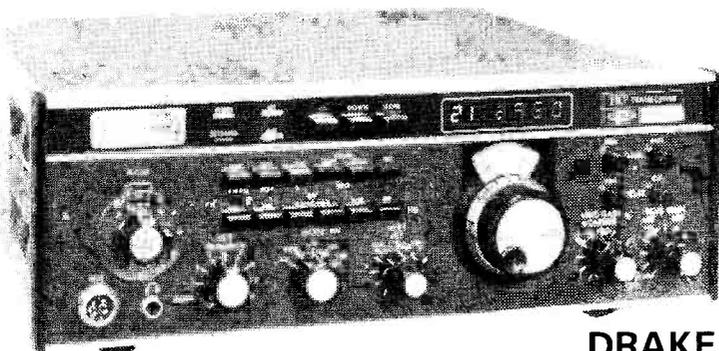
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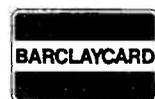
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VHF BANDS

NORMAN FITCH, G3FPK

Awards

BRYN Llewellyn, G4DEZ, becomes the first reader to win two QTH Century Club Squares certificates. His first award, no. 2 in the series, was obtained when he operated from Didcot. This latest one, no. 13 dated March 16, is for operation from his present QTH in Hullbridge, Essex. All 102 QSLs submitted were accepted and the breakdown was:— Tropo. 62; Ar 10; MS 28 and one each via E's and an MS/Tropo. mixture. Bryn's present station comprises a Yaesu FT-225RD with *muTek* board, a *Tempo* 6N2 amplifier and a single 16-ele. *Tonna Yagi*.

The 14th QTHCC award for 2m. operation goes to José M^a Gené Llagostera, EA3LL, from Reus in Spain, (AB56b) and who is the VHF Manager for the Spanish National Radio Society, the U.R.E. His confirmed total is 151 squares, the breakdown being:— Tropo. 59; MS 40 and E's 52, which latter demonstrates the advantage of operating from the more southerly latitudes. José's best DX was the memorable contact with 4X4IX on July 9, 1978, a QRB of 3,142 km. via E's double hop. All the MS QSOs were on SSB.

AMSAT — UK

Your scribe attended the A.G.M. of AMSAT-UK in London on April 4 and counted 27 members present. Dr. Arthur Gee, G2UK, was re-elected Chairman and Ron Broadbent, G3AAJ, agreed to carry on as Secretary and Editor of *Oscar News*, the quarterly journal of the Society. Ron has also inherited the job of Honorary Treasurer since no other volunteer came forward. G2UK told members that, following the failure to get the AMSAT-International meeting off the ground last autumn, due to lack of support from other countries, the IARU had agreed to put on the agenda for the Region I meeting in Brighton at the end of April an item to discuss the setting up of a Satellite Working Group. This would endeavour to co-ordinate amateur satellite activities in Region I and later, Regions II and III as well.

The Secretary said that membership has grown to 720 now but reported that 75% of the Regional Representatives never communicated with HQ, so asked if it was worthwhile keeping the scheme. Peter

Greed, G3MQD, the Education Officer, reported upon the educational aspects of satellite usage and that 17 schools were known to be using satellites for educational purposes. He said that AMSAT-UK's *UOSAT* project was getting exposure in the educational press.

Dr Martin Sweeting, G3YJO, told the meeting that his University of Surrey team building *UOSAT* were faced with a likely earlier-than-expected launch date of July 30, which meant having the bird ready for shipment by the end of June. The budget for the project was £100,000, about half that for an equivalent commercial effort, and the Science Research Council had contributed £18,000 towards the launch cost and for a three months follow-up period thereafter. Once *UOSAT* leaves Guildford, the team of some two dozen, 25% of it being radio amateurs, which has been working so hard and putting in such long hours for such a long period, will find itself with time on its hands. Accordingly, Martin suggested to the meeting that it was a matter of some urgency for AMSAT-UK to decide what, if anything, to attempt next. If such a decision were long delayed, he said the team would likely disperse, the impetus be lost and likewise vital connections with outside commercial and scientific bodies.

Your scribe suggested to G3AAJ that a questionnaire be included in the next issue of *Oscar News* to seek members' views on any future project, and this has been done. The Communications Officer Richard Limebear, G3RWL, stated that another Satellite Activity Week was proposed for October 4-10 with rules to be finalized. He said that, at the request of European satellite enthusiasts he had inaugurated a net for them on 80m. However, support was virtually nil, so he had abandoned the idea.

The new Committee consists of G2UK, G3AAJ, G3MQD, G3RWL, G3YJO, G4IQQ and G4JJ. Nick Crick resigned from his Honorary Treasurer post at the end of 1980 and G2BVN and G8TMM were unable to accept re-nomination.

On the operational scene, AMSAT reports that 0-7 is once again accepting *Codestore* messages from the Canadian command station but that subsequent playback is at a very slow rate, suggesting radiation damage to the electronics. Apart from that, both 0-7 and 0-8 are working satisfactorily.

Repeater News

A new VHF relay serving the Firth of Forth area was due to come on stream on March 14. It is on 2m. channel R4 with the callsign GB3FF and full details can be obtained from GM8LBC. For the Phase VI series of repeaters for 70cm., channel RB15 is to be used, and which is 434.975 MHz input, 433.375 MHz output. On the April 4 *GB2RS* News Bulletin it was announced that there are proposals for

23cm. band repeaters designated RM0 to RM15. RM0 is 1,291.000 MHz input and 1,297.000 MHz output with 25 kHz channel spacings.

Contests

The 144 MHz CW contest runs from 0900 to 1500 GMT on April 26. The 2nd leg of the 10 GHz *Cumulatives* happens on May 17 from 0900-2000 GMT. The next three are scheduled for the third Sundays in June, July and August with the final session on September 13. The weekend May 2/3 is a busy one with the 144 MHz and *s.w.l.* affair and the 432/1,296/2,304 MHz event all running from 1600 to 1600 GMT. The 2m. one is all-mode, four section effort for single-op. fixed; multi-op. fixed; single-op. -/P or -/A, and multi-op. -/P or -/A. The UHF/SHF event is a single-op. or multi-op. affair with multi-op. stations allowed to use a maximum of two different callsigns simultaneously. Radial ring scoring on 70cm., but one point *per km.* on the others. The rules require the QTH to be given in a different form on each band, *e.g.* in your scribe's case, 5km. south of Croydon on one band and 13km. northeast of Reigate on another.

The 144 MHz low power contest is on May 24 in which 25 watts is the maximum *p.e.p.* Tx. output. This is a two section affair for either fixed stations or all other types and runs for eight hours from 0900 GMT. The 2nd. leg of this year's Microwave Contest is on May 17 and is for the 24 GHz band only, the times being 0900-2000 GMT.

Six Metres

Jose M^a Gene, EA3LL, has sent in a 6m. report covering the period from mid-September last. The following is a summary in abbreviated form which should be self-explanatory: — Feb. 21, 1808-2010, TEP, ZS6PW, ZS6DN, ZS3E pkg. S9+20 dB with QSB. Feb. 22, 1800-1830, TEP, ZS6PW and ZS6DN pkg. S2. Feb. 28, 1420-1800, F2, ZS6DN, ZS6PW, ZS6BGQ, ZS6BMS, ZS3E and ZS6LN, the last two pkg. S9+40 dB. Then 1830-2010, TEP, ZS6PW and ZS6DN pkg. S2. Feb. 29, 1100 to 2000, F2, ZS6's LN, BMS, ZM, PW and XJ, pkg. S9. Mar. 6, 1740-1755, F2, ZS6PW and ZS6DN, pkg. S2 in QSB. Then, 2225-2245, TEP, PY2AA at S1-3 in QSB. Mar. 14, 1645-1815, F2, ZS6PW, ZS6LN and ZS3E, the latter pkg. S9+60 dB. Then, 1900-1930, TEP, ZS3E at S1. Mar. 15, 1520-1700, F2, ZS3E, ZS6LN at S1 only up to 1535, with CQs from EL2AV pkg. S9. Mar. 16, 1200-1620, F2, ZS6LN, ZS6PW and ZS3E, pkg. S8 in deep QSB. Mar. 19, 1410-1730, F2, ZS6PW, ZS6DN and ZS3E again pkg. to S9+60 dB. with ZS or ZE TV heard on ch. B2 and B3, both vision and sound. (N.B. B3 sound on 60.75 MHz). Finally, 1915-2000, ZS3E at S2 and ZS6DN at S1, either TEP or F2.

QTH LOCATOR SQUARES TABLE

Station	23 cm.	70 cm.	2 m.	Total
GJ4ICD	1	88	188	277
G3VYF	—	86	211	297
G8HVV	22	83	141	246
G3JXN	39	81	107	227
G3XDY	30	80	118	228
G3COJ	24	74	112	210
G8LEF	22	62	101	185
G4CMV	14	59	157	230
G3PBV	12	59	104	175
G8ATK	5	56	111	172
G8GXE	11	55	89	155
GJ8KNV	2	54	119	175
G2AXI	2	54	96	152
G8TFI	—	52	100	152
G8FMK	14	51	57	122
G8HHI	2	47	113	162
G4HFO	—	46	68	114
G4ERX	5	45	92	142
G2DHDZ	12	41	83	136
G8KAX	5	41	77	123
G8OPR	1	38	111	150
G4BWG	—	37	137	174
G8IFT	15	34	81	130
G8KGF	—	28	99	127
G3BW	5	27	155	187
G3FIJ	—	27	76	103
GJ3RAX	1	27	74	102
G8VLQ	—	27	65	92
I4EAT	—	25	238	263
G8LGL	—	25	121	146
G18EWM	—	25	67	92
G8MFJ	—	23	113	136
G4AWU	—	22	113	135
G8JJR	—	20	98	118
G8LFJ	—	18	107	125
G8LXY	—	18	31	49
G4ERG	—	16	186	202
EA3LL	—	15	194	209
G8WRD	—	15	19	34
9H1CD	—	13	178	191
GM4COK	—	12	172	184
G8RMA	—	12	71	83
9H1BT	—	11	163	174
G8KPL	—	7	87	94
G8JAG	—	7	79	86
G4GSA	—	6	51	57
G4FBK	—	5	105	110
G8SKG	—	5	53	58
G8VR	—	3	99	102
G8TIN	—	3	55	58
G4LDY	—	2	37	39
G6UW	—	1	89	90
G3POI	—	—	299	299
SP2DX	—	—	280	280
DK3UZ	—	—	257	257
G3IMV	—	—	250	250
G3CHN	—	—	196	196
G3SEK	—	—	182	182
G4IJE	—	—	171	171
G3FPK	—	—	168	168
G3KEQ	—	—	166	166
G4IGO	—	—	165	165
G4DEZ	—	—	147	147
G8IXG	—	—	115	115
G8CXQ	—	—	96	96
G4GHA	—	—	86	86
G4JZF	—	—	85	85
G8TGM	—	—	79	79
G8RWG	—	—	63	63
G8JGK	—	—	62	62
G8SVG	—	—	58	58
G8VFG	—	—	45	45
G4GXL	—	—	44	44

Starting Date January 1, 1975. No satellite or repeater QSOs. "Bands of the Month," 70cm.

John Baker, GW3MHW, (Dyfed) reports that 24 inches of the director of his newly made 3-ele. Yagi at 40ft. a.g.l. has broken off, possibly due to some buzzards using it as a perch and taking off "out of phase!" John is keen to compile information on the evolution of the old 56 MHz band, so would welcome hearing from anybody who operated in those days.

Peter Turner, G4IIL, (Brighton) has written to say that it was he, as GW4IIL/A, referred to in our March

column and not GW4UL/A, operating from his alternative QTH in Tregarow (YM61j). The site is 1,000ft. a.s.l. with a convenient gap in the mountains to the north and west. Peter is another recipient of the "Cycle 21 Crossband Award" issued by Region 2 operators.

Four Metres

Jack Kay, G3CO, (Essex) mentions the March 5 *Aurora* which was in full swing when he returned from work. Unfortunately he had to go out that evening so only managed to make four QSOs, the best being GM4IGS (XP37c) on SSB and G6WR (YO33g) on CW. Len Dixon, G3XXQ, (Newcastle-upon-Tyne) caught the Feb. 6 and Mar. 8 *Ar's*, the latter yielding GM4DIJ (YP04C). His station comprises a *Trio* TS-520S and home made transverter capable of 200 watts p.e.p. input, the aerial being a 3-ele. Yagi at 27ft. Len's QTH is 150ft. a.s.l. in the Tyne Valley.

G4IIL operates from his GW4IIL/A station most weekends and would be happy to make skeds. with anyone. He is often to be found in QSO with GW3MHW from 0830 on 3,718 kHz but warns, "... my CW is very slow!"

Looking ahead to August, Chris Tran, GM3WOJ, has sent details of his proposed 4m. DX-pedition from Aug. 10 to 16 incl. 80m. talk-back on 3,725 kHz is envisaged at 1700-1715 GMT, with Ken Willis, G8VR, acting as S.E. England net control. The plan is to operate from XS square on the 10/11/12th and from YS on the 14/15/16th. Chris is hoping that stations will want to attempt MS QSOs on CW or SSB as the trip coincides with the *Perseids* shower. Further details from GM3WOJ at 21 Richmond Avenue, Dumfries, DG2 7JS.

GM3MHW writes:—"I am pleased with the general state of 4m. Greater activity, QSOs conducted in an orderly manner; matters discussed appertain to amateur radio. So different from 70cm. to 160m.!" John would appreciate s.w.l. reports on his signals. He had a nice QSO at midday on March 16 with G4KZW in Bradford and mentions G3OHH as being QRV on the band. G3UVR is back on from a new QTH in the Wirral and John has arranged to transmit, "Test de GM3MHW QRA XM60d," beaming north at 2015 to 2020 local time, thereafter listening for replies. G3LLS (Warks.) has rebuilt his VFO and is contemplating stacking a pair of 4-ele. Yagis.

Two Metres

EA3LL confirms that SSB activity on 2m. in Spain is increasing but only on the Mediterranean and Atlantic coast regions. Elsewhere there is little VHF operation apart from FM through repeaters. José advises that the only way we are likely to work some of the rarer squares is to listen on 144.500 MHz FM during E's openings

in the summer. He says that EA5HM and EA5NY are sometimes active from ZZ square, but the other stations listed are well-known ones. The German trip to Spain mentioned in the March feature was not very successful due to failure of the amplifier. Only a few QSOs were made from AA square before the team moved to BC56j where they struggled along with 20 watts.

Mike Lee, G3VYF, mentions that I1TJQ, who operates -/1 from a holiday cottage in DE27h, has gone off to do his military service. This locator is the same as that of the I1A beacon on 144.830 Mhz. Mike continues to add to his squares total steadily but suggests that many of the old hands in the MS game from Scandanavia seem to have lost enthusiasm, probably because they have worked nearly everything. During the March 5 *Ar*, he worked EI7VB (VL12g), EI4AVB (VN40c) on SSB, GM3JFG (XR30b) and SP9MM (JK65b) for new ones. He also heard H6s in KG and JH squares and reports FG6JG (BF) as copying weak *Ar* signals. At 1630, OH0JN (KU) heard GM4COK via *Ar* by beaming southwest.

VHF CENTURY CLUB MEMBERS

70 Centimetres			
Cert. No.	Station	QTH	Date Issued
1	G3DAH	Herne Bay, Kent	15/4/68
2	G8AAZ	London, S.W.19	16/8/68
3	G8AEJ	London, S.E.20	8/11/68
4	G8AWO	Welwyn Garden City	14/1/69
5	G8AUE	Abergate, Derby	14/1/69
6	G8ARM	London, S.E.3	13/4/69
7	G8AYM	Dartford, Kent	1/10/69
8	G3MCS	Aylesbury, Bucks.	13/10/69
9	G8ART	Leamington Spa	20/3/70
10	G8BYV	Dereham, Norfolk	19/10/70
11	G8APZ	Hounslow, Middex.	7/7/71
12	G3UBX	Wolverhampton	10/11/71
13	G8ABP	Paignton, Devon	31/12/71
14	G8CKX	Ambergate, Derby	31/12/71
15	G8CIT	Hampton, Middx.	6/11/72
16	G8EOP	Dewsbury, Yorks.	1/2/73
17	G4AGE	Bolsover, Derby	16/5/74
18	G3NHE	Sheffield, Yorks.	15/8/74
19	G8FMK	Thame, Oxon.	29/10/75
20	G8BKR	Bristol	29/12/75
21	G8GED	Southall, Middx.	13/1/76
22	G3FIJ	Colchester, Essex	3/12/76
23	G8HBQ	Leeds, Yorks.	13/6/77
24	G3OHC	Sutton Coldfield	19/5/78
25	G8IWA	Beverley, Humberside	1/4/79
26	G8BXJ	Bristol	3/9/79
27	G4ERT	Brentwood, Essex	6/9/79
28	G8IFT	Birmingham	22/6/80
29	G8LEF	Huddersfield, Yorks.	12/11/80
30	G8GXE	Langley, Berks.	17/11/80

Four Metres

Cert. No.	Station	QTH	Date Issued
1	G3IMV	Bletchley, Bucks.	6/11/68
2	G3EKP	Blackburn, Lancs.	6/11/68
3	G3UUT	Acornb, Yorks.	7/2/69
4	G3FDW	Retford, Notts.	30/12/69
5	G3GSA	Manchester	9/11/70
6	GC3OBM	Guernsey	7/10/71
7	G3HBG	Godstone, Surrey	30/10/71
8	G13HXV	Finaghy, Belfast	3/3/75
9	G3OHC	Sutton Coldfield	9/11/76
10	G3FIJ	Colchester, Essex	11/12/76
11	G3CO	Colchester, Essex	13/4/78
12	G3BTO	Tadley, Hants.	3/9/79
13	G4FKI	Hainault, Essex	26/2/81

In the "wet squares" department, both Mike and G4DEZ have recently worked BM in the guise of SM7LES/MM.

Tony Brown, G4CCB (Notts.) has now returned to SSB and CW after a seven year gap, running a new *Liner 2* and an 8-ele. *Yagi* at 16ft. a.g.l., for the present. He was in on the March 5 *Ar* from about 1500 and noticed some weak signals when swinging the beam north to work G8UCN in Sheffield. After a tropo. QSO, the G8 beamed northeast and they completed an *Ar* contact, too. With CW coverage limited to 144.100, up, Tony nevertheless worked F6DWG (BJ41j); G4DSC (ZO63e); PE1FNX (CL48j); PE1COP (CM16h); G5BM (YL08c); GW2HIY (XN57j); G3CHN (YK61b); G4JJB (ZO34d) and G4INP (AM68c) the last QSO at 1838. Tony also heard others on CW from GM, DL, OZ and some brief snatches of a UR2 and an SM7 swamped by heavy QRM.

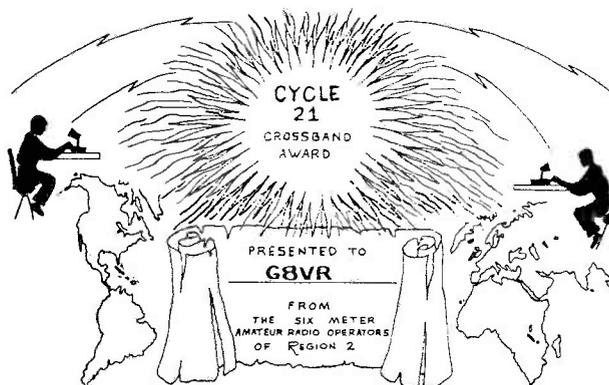
Paul Turner, G4IJE, (Essex) has been trying some long distance tropo. skeds and, on March 28, worked F8OP (CG36f) at 684km. with signals peaking 539, and DK6AS on April 1 in FM44d, a QRB of 722km. with 519/529 reports exchanged. This again proves the point that stations with good receiving systems, running modest *e.r.p.* can make long distance QSOs under flat conditions by prior skeds. Congratulations to Tony Haas, ex-G8VJJ, who is now G4LDY. His present 2m. station comprises a *Ten-Tec* Argonaut transceiver, *Microwave Modules* transverter and home built, 40 watts PA. The aerial is a 9-ele. *Tonna Yagi* at 50ft. He also uses a home-brewed variable gain and "Q", tunable audio filter. A new transverter is on the stocks using a 3SK88 RF amp. to an SBL-1 diode ring mixer, followed by a BF961 IF amplifier stage.

Ray Cox, G8FMK, (Oxon.) found the March conditions uninteresting with the 8th pretty awful for the contest when the best DX was G3AMW in Hull. Tony Collett, G8GXE, (Berks.) operated for eight hours overnight in the contest but only made 20 contacts on 2m. for 76 pts. However, GW8WDC/P (Clwyd); GW4GMO/P (Powys) and G4FSG (Suffolk) were new 1981 countries. He took part in the Barking Club's contest on March 29 making 90 contacts in 27 counties in rather poor conditions. Even so, another five counties were added.

John Pilags, G8HHI, (Hants.) has a *muTek* front-end board on order for his Yaesu FT-221R. He was on for the Barking affair with GM8YJU (Dumf. & Gall.) the best DX. Also heard was a GI in Antrim. Jackie and John Brakespear, G8RZO and G8RZP, will be operating portable from the Isle of Wight, at the Needles, for the low power contest. They will be there for a week from May 23, in a Coastguard cottage, operating on 2m. and 70cm. G8TFI and G8WAQ will also be going on this mini-DX-pedition. Notwith-

IN RECOGNITION OF THE FACT THAT AMATEUR 50 MHz. TWO-WAY COMMUNICATION IS GENERALLY NOT PERMITTED IN REGION 1, AND IN FURTHER RECOGNITION THAT MANY REGION 2, 50 MHz. OPERATORS HAVE BEEN FRUSTRATED BY THEIR LIMITED ABILITY TO TAKE ADVANTAGE OF THE REGION 1 DX POTENTIAL OFFERED BY RECENT SOLAR ACTIVITY,

THE ATTACHED AWARD IS PRESENTED IN APPRECIATION OF YOUR UNSELFISH CONTRIBUTION TO THE ADVANCEMENT OF COMMUNICATIONS KNOWLEDGE WITHOUT PERSONAL GAIN IN KEEPING WITH THE FINEST GOALS OF AMATEUR RADIO.



Regular "VHF Bands" contributor Ken Willis, G8VR, received this certificate which says it all. A nice gesture from a Pennsylvania 6m. operator in Phoenixville.

standing the demands of the new baby, Jackie has managed to put in some time on the bands and enters the annual table with 71 pts.

Chris Easton's (G8TFI) interference problems have been largely overcome. As the weather was too bad to go out portable, he operated from the home QTH in Ruislip for the 144/432 MHz contest on March 7/8. Best DX were GM3PXX (YP) in Strathclyde and GM8YJU (YO) in "D and G," the latter always a good signal into London with his 25 watts and two 9-ele. *Tonnas*. Other counties added for the 1981 tally included Dyfed, Clwyd, Powys, W. Glam., Durham, N. Yorks. and Northumberland.

Kevin Piper, G8TGM, has not had too much time to operate recently due to a short move of QTH to Pagham (W. Sussex). He has traded in his *Icom* IC-260E for the simpler, SSB/CW only, IC-202S, as he found he was not using the costly scanning and memory gimmicks. A new *Sentinel* PA/Preamp. has been acquired. At the time of writing, Kevin was waiting for a dry spell to put up his 9-ele. *Tonna Yagi*.

Neil Clarke, G8VFF, (W. Yorks.) was on for the March 5 *Ar* which he discovered at 1410. it yielded three all-time new countries in EI, GI and OZ, and six new squares, VN, WO, WP, YQ, YS and EQ. The event lasted till 1823 with QTFs 30° - 45° and GJ4ICD the strongest signal with the beam at 50°. Beacons copied were

GB3CTC, GB3VHF, GB3GI, DL0PR and ON4VHF. Arthur Breese, GD2HDZ, also caught this event but reckons he could not match G3BW's performance. Eight more counties were added in the Barking contest session on March 29.

George Szymanski, GM4COK, (Edinburgh) has a good station comprising an *Icom* IC-211E with *Nag* amplifier and a 16-ele. *Tonna Yagi* up at 80ft. with a mast head preamp. The feeder is *LDF4-50*. In the *Ar* on March 5, he made 112 contacts in 11 countries and 50 squares. The countries were DL, F, G, LA, ON, OZ, PA, OK, SM, SP and Y, best contacts being F3AT in BH18c and DF1CF in FH23j. The QTFs were 70° - 80° and the best DX to the east was to JO and JT squares. No OH or Russian stations were heard, but an HB9 was. George was QRV from 1300 till 1820. Other weak *Ar*'s were on the 7th and 10th, the former providing 8 QSOs with ZO, DL, DN, GQ and IT squares, the latter 4 contacts with WS, ZO, DX and HT squares. On March 18 a weak *Ar* was detected at 48 MHz but nothing was heard on 2m. Welcome to D. Dhuglas, GM4ELV (Strathclyde) who says he is fairly new to 2m. He refers back to the *Ar* last December 19 and asks, "How come repeater GB3HH had a net controller!" He is QRV on SSB and FM, with CW to come, from locator XQ71c.

Eddi Ramm, DK3UZ, tipped off your scribe about an *Ar* on March 26 at 1620. At 1630, GM3JFG was heard working G4IJE

and at 1644 GM3JIJ in Stornoway was heard calling CQ, but both signals were very weak in London.

Seventy Centimetres

G8FMK found conditions in the March 7/8 contest even worse than those in the 70cm. event in February. Ray's best DX was GW8AAP/P in Clwyd. G8GXE made 64 QSOs in his all-night session but only 229 pts. were accrued, which just about sums it up. Tony's best DX was DC6MV (DK11b), the only other Continentals being PE0MAR/P and F6KBF/P. G8JVM (Wilts.), G4KCT (N. Yorks.) and GW3OXD/P (Powys) were new 1981 counties. The only other SSB QSO on the band was with G4BPY (Staffs.) on the afternoon of the 25th.

G8TFI has recently acquired a *Belcom* LS-707 to replace the previous transverter system. Chris reckons this to provide better sensitivity and strong signal handling. During the Two-band contest on March 7/8, GW4BRA/P gave a new all-time county, Dyfed, and square, XL, for the collection. Other GDY was G4JTY/P (Dorset), G8IZR/P (Gtr. Mchstr.) GW3OXD/P and G8BWR (Warks.). Chris will be in the Isle of Wight, May 20-27 with high power from a good site. He is *QTHR* in the 1981 *Call Book* for arranging skeds, or can be reached by telephone up to May 19, most evenings from 6.00 to 7.30 p.m. on Ruislip 34690.

GD2HDZ has not been able to work much lately on the band due to severe *Syledis* QRM. Apart from locals G3BW and GD3EIG, Arthur has not heard a single station. GM4COK is hoping to mount two 21-ele. *Tonna Yagis* on an AZ-EL mount. This could be interesting for Auroral research on 70cm.

Twenty-three Centimetres

G8FMK and G8GXE took a few minutes off from the Two-band contest on March 7 to make the QSO they missed out on in January. G8HHI is patiently waiting for an opening and is presently just working the locals. John welcomes the inclusion of 23cm. in the annual table. And that is the sum total of 23cm. input this month!

Sporadic E

It is common knowledge that there is *Sporadic E* propagation which peaks in the winter months but it usually only affects the lower VHF's, like 10m. However, Dave Crisp, G8IXG, reports that an East

ANNUAL VHF/UHF TABLE									
January to December 1981									
Station	FOUR METRES		TWO METRES		70 CENTIMETRES		23 CENTIMETRES		TOTAL
	Counties	Countries	Counties	Countries	Counties	Countries	Counties	Countries	
G2AXI	28	4	49	10	36	7	—	—	134
G8GXE	—	—	43	9	41	8	8	4	113
G8FMK	—	—	51	10	37	4	10	1	113
G8TFI	—	—	54	11	31	8	—	—	104
G3PBV	—	—	44	9	35	5	5	1	99
G8RZP	—	—	52	8	30	6	—	—	96
G3CO	14	3	39	8	22	5	—	—	91
G8HHI	—	—	30	8	37	8	2	1	86
G3FPK	—	—	68	16	—	—	—	—	84
G4ARI	17	2	52	10	—	—	—	—	81
G3FIJ	11	2	37	9	15	1	—	—	75
GD2HDZ	7	1	29	9	21	7	1	2	74
G8RZO	—	—	39	8	18	6	—	—	71
G4DEZ	—	—	54	15	—	—	—	—	69
G8VVF	—	—	53	12	—	—	—	—	65
GW3CBY	7	2	31	7	9	5	—	—	61
G8VR	30	3	20	6	—	—	—	—	59
G8KAX	—	—	28	5	20	3	—	—	56
G8SKG	—	—	39	10	2	1	—	—	52
G8WRD	—	—	24	7	13	7	—	—	51
G4FKI	20	3	6	2	16	4	—	—	51
G8TIN	—	—	32	6	6	2	—	—	46
G8WUU	—	—	39	6	—	—	—	—	45
G8TRW	—	—	35	8	—	—	—	—	43
G8RMA	—	—	25	9	4	4	—	—	42
G8LXY	—	—	14	3	16	5	—	—	38
G4LDY	—	—	29	5	—	—	—	—	34
GM4COK	—	—	21	12	—	—	—	—	33
G4GXL	—	—	24	9	—	—	—	—	33
G8RWG	—	—	26	4	—	—	—	—	30
GM4ELV	—	—	10	3	—	—	—	—	13

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

German station on the 20m. VHF net, in HM square, mentioned working into Sicily in January on 2m. On April 1, Dave noticed some strong *E*'s signals on Band I TV around 1300 and found a lot of East European BC stuff on 4m. too. Mike Gaskin, G8KYU, also telephoned your scribe at the same time about this event. However, nothing was heard on 2m.

Solar Matters

It seems that the peak of Sunspot Cycle No. 21 occurred in December 1979, the smoothed sunspot no. being 165.3. The forecast for the next minimum is currently January 1987. In the past, the period following maximum has been characterized by a rise in geomagnetic activity. This is now definitely under way. Sudden Ionospheric Disturbances — *s.i.d.*'s — were occurring almost daily on the HF bands in the period prior to editing this month's column, so we can expect more *Ar*'s than we had last year, some of which could be quite intense.

Final Miscellany

It is some time since lists of the holders of the 4m. and 70cm. VHF Century Club Certificates were published so, as there is space this month, these are being included. Some of the Club Members have since moved from their original QTHs and now have different callsigns.

John Hunter, G3IMV, reports that the long-awaited QSLs from last year's Irish operation by ON5FF, ON6UG and G8RNM have now been despatched. These are for EI2VAH/P from UN square, of course.

Deadlines

That's it for a rather uneventful month. Next year there will be a report on the VHF Convention, along with the usual items. Deadline for the June feature is May 6, and for the July issue June 3. All your contributions to:— "VHF Bands," SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ. 73 de G3FPK.

PIPTONE GENERATORS

I. H. Moth, B.Sc., G8SOH
R. W. Musto, B.Sc., G8WCR

SOME people like to hear a ‘beep’ or piptone after a transmission period, others find it infuriating. There can be no doubt that when copy is poor, and when words and whole phrases are being lost, a piptone signals the end of one’s message most effectively. When conditions are rather better however, one tends to hear comments such as, ‘Are you speaking to me, or to Mission Control Houston?’

The following article presents two circuits to provide an automatic ‘end of message’ signal, to help, amuse or irritate one’s radio friends, as the case may be.

Theory of Operation

Both circuits use CMOS Logic integrated circuits. Fig. 1a is for the benefit of beginners and shows the basic NAND gate (i.e., Not AND) with its associated ‘truth table’; ‘L’ indicates low voltage, 0 volts, and ‘H’ indicates high or almost supply voltage. Fig. 1b, showing where the gates are on a 4011 IC, will assist in the build phase. Fig. 2 is the circuit diagram of a ‘T’ generator. When it is in its latent or quiescent state point ‘B’ is at supply potential; this holds Q1 off and therefore its emitter is similarly high. IC1a inverts this logic state, holding the base of Q2 low and therefore Q2 is off. There is no path from point ‘A’ to earth. Skipping ahead to Fig. 5, point ‘A’ is seen to be the radio’s p.t.t. control, so the radio is on ‘receive’ as expected.

Nevertheless, the oscillator made up of IC1b and IC1c is oscillating, as careful working round the loop will reveal. Its output is blocked by IC1d, whose output is constantly high regardless of the oscillator’s output, because IC1d’s other input is held low. If point ‘B’ is taken low, Q1 switches on, C2 charges virtually instantly (but that’s by the way at this stage), Q1’s emitter goes low, IC1a’s output goes high, which turns on Q2, connecting point ‘A’ to ground and therefore the radio on to ‘transmit’. Simultaneously the lock on IC1d is released, which would allow the oscillator’s output to proceed to point ‘C’, except that point ‘B’ going low disables IC1b and stops the oscillator.

When point ‘B’ is taken high again, IC1b is enabled and the oscillator starts, this time its output goes through to ‘C’, because although Q1 switches off its emitter does not go high immediately. First, C2 must discharge through R8. Thus after a delay set by R8C2, IC1a output goes low and switches off Q2. The circuit is then back in its quiescent (receive) state.

Fig. 3 is the circuit diagram of a ‘K’ generator; note that each diagram has a separate parts list. The ‘K’ is only slightly more complicated than the ‘T’. The most important part is IC1, which

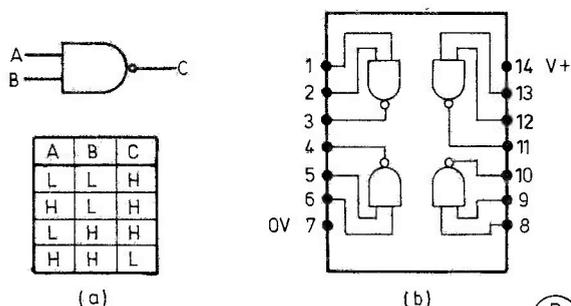


Fig.1

Basic NAND gate with truth table is shown at (a), while (b) shows pinout diagram of 4011 CMOS quad NAND gate.

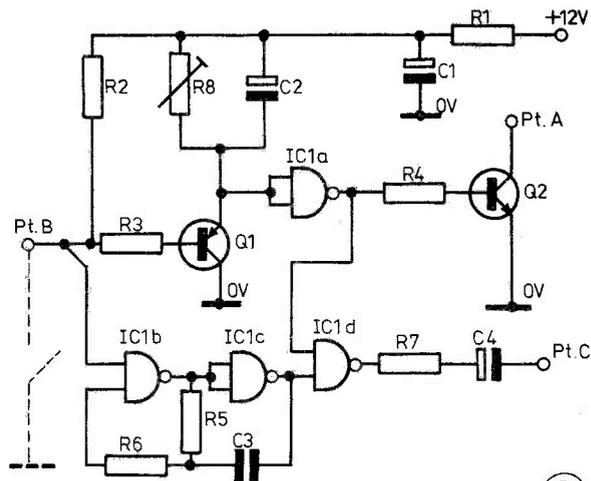


Fig. 2

‘T’ generator circuit diagram. IC1 pin 14 goes to +V, pin 7 goes to zero volts.

is a decoded decimal counter, the 4017. See Fig. 4. If its ‘inhibit’ is held low it switches on the ‘up’ transition of the clock pulses, advancing through the outputs making each go high in turn. The carry output is high if any of outputs 0 to 4 are high, and low otherwise. The reset going high forces output 0 and the carry high, regardless of clock or inhibit inputs. On this application neither reset nor carry is used.

The clock, constructed of IC2a and IC2b, runs continuously at around 9 Hz. IC1 stays in a quiescent state with output 0 high, since Q2 is normally off and therefore both inputs to IC3b are high, its output is therefore low, and IC3a inverts this to hold the inhibit high and prevent the counter from operating.

When point ‘B’ is taken low, C2 discharges, and at the same time IC3c’s output goes high to switch on Q1. Point ‘A’ goes low and enables the radio to go into transmit mode.

When point ‘B’ goes high again, C2 charges, a pulse appears across R4 and Q2 is switched on momentarily. This charges C3, which then starts to discharge, but this time much more slowly through R2. This downward going pulse on IC3b’s input changes the states of IC3b and IC3a and unlocks the inhibit. At the same time IC3a’s output going low ensures IC3c’s output remains high, keeping Q1 on and ensuring that the radio remains on ‘transmit’. It will be noticed that there will be a very short time delay between the switch on point ‘B’ opening and IC3c being reactivated, which will amount to about 50 nanoseconds; this is completely covered by C7 which delays Q1’s switch-off. The reason for extending the pulse with R2 and C3 is that the inhibit must be held low long enough for the next upward going clock transition to switch the counter into the next state, i.e. output 1 high. When this happens output 0 goes low, which maintains IC3b and IC3a in the required state.

Table of Values

Fig. 2

- R1 = 47R
- R2 = 68K
- R3, R4 = 100K
- R5 = 4K7
- R6 = 1M
- R7 = 10K
- R8 = 100K preset
- C1 = 10 μF, elec. or tant.
- C2 = 2.2 μF, elec or tant.
- C3 = 0.1 μF ceramic
- C4 = 1 μF, elec. or tant.
- IC1 = 4011 CMOS
- Q1 = BC178
- Q2 = BC108

Note: R1 to R7 are 1/3-watt, 5%.

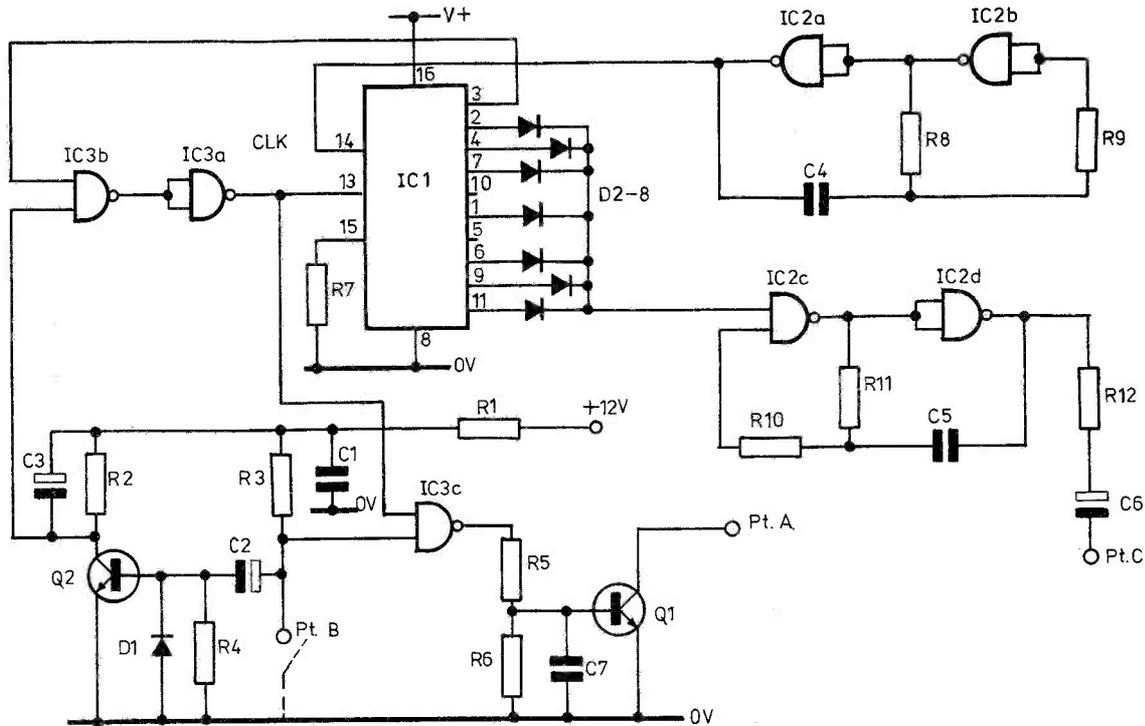


Fig. 3

'K' generator circuit diagram. Pin 14 of IC2 and IC3 goes to +V, pin 7 to zero volts. IC3d, unused gate, tie inputs together and connect to +V via a 10K resistor.

D 646

**Table of Values
Fig. 3**

R1 = 47R	C2 = 2.2 μ F, elec. or tant.
R2 = 390K	C3, C6 = 1 μ F, elec. or tant.
R3, R5, R7, R12 = 10K	C4 = 1 μ F non-polarised
R4 = 820R	C5 = 0.1 μ F ceramic
R6 = 680R	C7 = 1 nF ceramic
R8 = 47K	IC1 = 4017 CMOS
R9, R10 = 1M	IC2, IC3 = 4011 CMOS
R11 = 4K7	D1 to D8 = 1N914
C1 = 10 μ F, elec. or tant.	Q1, Q2 = BC108

Note: all resistors are 1/3-watt, 5%.

IC2c and IC2d are connected as an audio frequency oscillator, which is enabled by the successive outputs of the counter. As the clock causes the counter to cycle, the oscillator will be: on, on, on, off, on, off, on, on, on. In other words, a perfectly formed K. On the next pulse, output 0 will go high, and put the inhibit on via IC3b and IC3a. When the inhibit goes high IC3a goes low, Q1 switches off, and the radio is returned to receive mode.

Construction

The circuit may be constructed on *Veroboard* or, more satisfactorily, *Vero* DIP breadboard which is specifically designed for integrated circuits. IC sockets are strongly recommended for two reasons. They enable very quick maintenance and trouble shooting checks and secondly there is less chance of damaging the CMOS. Leave the ICs in their conductive foam until the moment they are to be inserted. Layout is not critical and the details are left to the individual constructor. With care, high packing densities are possible, the 'T' generator can be easily built on a 1 x 1 1-in. board and the 'K' generator not much bigger. By all means use plenty of flux, but clean the board thoroughly afterwards. The circuits use high resistances which may be affected by spurious resistance paths through dirty PCBs.

It is suggested that each circuit be installed in a box, with an input socket for the microphone and an output to the microphone socket on the radio. More intricate constructors may care to squeeze the circuit into the microphone casing. Fig. 5 shows the interconnections with the radio's Tx/Rx control. If one is lucky one will find an extra terminal in the microphone socket, by which means the circuit could be supplied with the +12 volts nominal. The power consumed is virtually negligible.

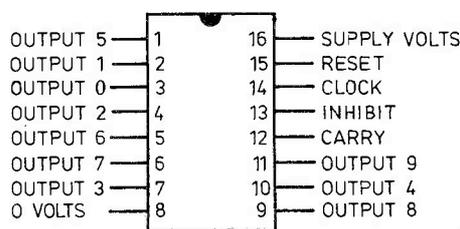


Fig. 4

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Pinout diagram of 4017 CMOS, decoded decimal counter.

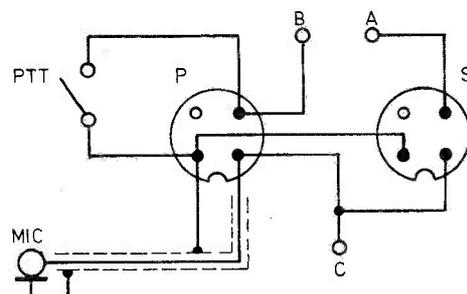


Fig. 5

D 648

Tx/Rx control switching diagram. P = mic. plug, S = mic. socket.

Adjustment

Adjusting should be done on the bench, not on the air, or you could start irritating people prematurely. The 'T' generator is adjusted by trimming R8 until the length of pulse, monitored at point C with either an earpiece or a microphone, is judged about right. The tone of the audio can be altered by changing the time constant of the oscillator, R2C3. *Increasing* either R2 or C3 or both will *decrease* the pitch of the sound. On the 'K' generator the Morse speed has been designed at about 12 wpm, with a tone just under 1 kHz. The pulse stretcher components have been chosen to match by holding on for 270 msec; the circuit should work from switch on. Some problems may be encountered if low tolerance or high temperature drift components are chosen for the timing circuits. In this case it is suggested that extra components be added by trial and error to make the necessary compensation. The

frequency of the clock generator and audio generator will be

$$f_{\text{clock}} = \frac{1}{2.2 R8 C4}$$

and

$$f_{\text{audio}} = \frac{1}{2.2 R11 C5}$$

Note also that R9 and R10 should be at least twice the value of R8 and R11 respectively.

If the R2C3 time constant is wrong then the problem may only show up intermittently. The time for which IC3b's gate needs to be held down depends on the state of the clock pulse at the instant the microphone PTT is released. If R2C3 is too small then some Ks may fail to go off, too big and some Ks will be sent twice. However, the range is so wide that one is most unlikely to hit trouble. If in doubt go for a 'T' of about 3 clock cycles, where $T = 0.693 \times R2 \times C3$.

• • • SWL • • •

SHORT WAVE LISTENER FEATURE

By Justin Cooper

FIVE marks out of five to the SWL who realises that he is part of a 'system' when he is listening. Apart from himself, there is the receiver with all its characteristics, the logging system, the recording system (not of the sounds but of prefixes, countries or whatever it is you collect), and of course the aerial system. This lot is usually put in a watertight box, known to hams and SWLs alike as "the shack" and the shack itself has a bearing on whether you get the best out of your hobby or not. Heat, ventilation, and comfort are the primes; and if comfort means packing up the front of the receiver so the dial of the tuning can be seen directly, while the hand falls easily to the tuning knob, so be it. As for the position of the receiver on the operating table, for most of us writing is a right-handed business, so the receiver needs to be to the left rather than central, and so forth.

By the same sort of token, one can look upon the aerial as the most important part of the electronics by far, and one can easily fool oneself into thinking about limitations which just aren't there. For example, a beam brings to mind for many amateurs a mental picture of a large tower, a triband Yagi array of commercial origin with, maybe, the odd wire aerial strung from the tower for the LF Bands. Now, a tower immediately brings to mind questions of planning permission and, if one is to be blunt about it, the darned thing is an eyesore to the locals and a bit of a status symbol anyway. One thinks of two people who understand the sense or otherwise of the view; G4BUE, who admittedly has a tower, but who makes a habit of stringing up a temporary aerial for whatever band or contest he is thinking about. In the second place, the Old Man is leaving the peace of his editorial chair shortly to give a talk to a club about aeriels; we will lay a small bet that on the night, he will produce, probably from a jacket pocket, at least one, and maybe two, beam aeriels for 21 MHz, and show how they can "do things" for a signal, in comparison with a piece of wire.

An aerial should be defined as a system in itself, comprising the aerial (the bit that collects the signal), a feeder (to transfer the collected signal from the aerial), and an ATU (to match the feeder impedance and the receiver input such that a maximum amount of the collected signal is injected into the front-end of the receiver). A system can be made such that one or more parts of the system are

absent, but if we do so, then we must be sure that the function in question is properly catered for, or one may not get the hoped-for results.

On another tack, take a look at the Great Circle map. One needs to be able to put a fat lobe at 045° True for the Russians and out to short-path ZL, and another at 225° True will cover the same areas in the mornings by long-path, while taking in South America at other times. For North America a beam heading of about 300° True would do nicely, while its reciprocal bearing, round about 120°, would fill in those parts of Asia and Africa not otherwise well plastered. If one talks of a bi-directional beam, this means two headings, at 045 and 120 degrees, and a 21 MHz aerial would be about 22 feet long and, say five feet across, to a first approximation. Now take a look at your garden and house, compass in hand. Allow for variation, which can be regarded for most of the UK as about 8 degrees West, and reduce Deviation to zero by turning out your pockets and taking off your watch! Now at 0° True, your compass says 352°, so 0° Magnetic is 8° True: so, you are looking for headings of 053 degrees and 128 degrees — if possible from some spot to which one end of the aerial is attached (and we'll bet you can find a way of getting it in). Note where the far ends will land, find a pole of suitable height so the flap-top looks fairly flat. Imagine a screw-hook in the barge-board at the house end, and a mast of aluminium for the far end: bury a *Coke* bottle at each of the two places, and knock in a couple of guy pegs for each location (you'll probably get away with only three pegs if you think about it, one being common). Make the guys the same length, or even adjustable like a tent guyline. Make an 8JK beam, or the variant known as the ZL Special. The former is bidirectional, so you have it all covered, but the ZL Special is unidirectional and would therefore have to be turned over to reverse its direction. *Note:* turned over, like rolling a log, not rotated as in aeriels! This can be done with the aid of a couple of bits of string. Hey Presto! You've joined the elite!

But of course, having done so, Murphy enters the picture — if the band is open to DX at the time you can be on, it will almost certainly be sleepy-byes time for the DX! Oh, well!

Our Mail

D. J. F. Gordon (Chepstow) has first shout this time; he seems to have been finding good DX, mainly on Twenty but with some other interesting and unusual ones on 3.5 MHz. He has claimed 1A0, which raises an interesting question. Although it has not been particularly visible, it seems to this writer that the "Sovereign Military Order of Malta" (the twentieth century rump of what was once the "Knights of St. John of Jerusalem, Rhodes and Malta" — partly caring for the sick in their hospices, and partly a military order of Knights who did much to keep Christianity alive in the Dark Ages) will have to be accepted as a "country" for DXCC purposes on the criteria which are used today.

Now to *F. C. D. Barnes (Cardiff)* who heard lots of folk working the JAs on Eighty but couldn't hear them himself. Therefore, a preselector is on the stocks, but this writer is willing to lay a month's beer-and-baccy money that an attenuator will be more effective. After all, on 3.5 MHz, even natural noise is far higher than any reasonable receiver's sensitivity, even assuming the brute is a bit deaf: *ergo*, we can be pretty sure that we don't need more RF Gain, but less, because the noise is all occurring from mixer overload. The simple test to prove the point goes like this. First run up all the gain controls to maximum. Now, pull the aerial plug out, and the noise will disappear save for the residue which is the noise which is inescapably present in the receiver. Next, tweak the preselector control, or the "aerial trim" on an older receiver, and the noise from the receiver should go through a peak. If it won't, mend the receiver; if it will, you don't want a preselector!

The "gang of three" at *Bury St. Edmunds* have lost one member, who has become G6BJP — congratulations to *R. Middleton* on succeeding at the age of 66, and on his firm intent to press on for the Morse. About the only advice we can offer is that the exercise should be daily, and at first only in about ten-minute sessions, as the mind normally tires after this until trained. One can make up 30 minutes by doing it in three bites; and one must *always* have the Morse coming out just a bit too fast — if you have 100% copy you boost your ego but you don't learn to go faster. And, of course there is the infamous "hump" to get over — it afflicts some people more than others, and old G3KFE had it very badly. But you must realise this is a definite part of the learning, and occurs at each of the stages in which the brain reorganises itself to do the required tasks more efficiently. In the beginning everything is done in series as it were, and with too many stages to boot. Eventually the mind does everything in parallel, and to a large extent drops redundant bits of the 'program' by which the brain receives a noise input and outputs a wiggle on a bit of paper, and later dumps all the output into a brain store so that one only writes down the important bits on a scratch-pad. But the internal computer analyst in the mind seems to need to get stuck for a while before it accepts that the program is wrong, and a new one must be written.

A. Rowland has left Mansfield and re-surfaced in the area of *Bude* in Cornwall, so he goes back to Square One on the HPX Ladder; our distance of 250 miles for a move, maximum, is fairly handsomely breached. However, much can be written off to experience! On a different tack, reader Rowland wants to know where he can get the Mullard FX1588 ferrite rings, and the

ANNUAL HPX LADDER Starting date, January 1, 1981

SWL	PREFIXES	
M. N. W. Thornton	M. Hill (Bedworth)	207
	(Romford)	370
Mrs. T. Parry (Blackpool)		239

200 Prefixes to have been heard since January 1, 1981, before an entry can be made. Entries in accordance with HPX Rules (see January 1981 issue).

HPX LADDER (All Time Post War)

SWL	PREFIXES	
PHONE ONLY		
K. Kyezor (Brandon)	2508	D. J. S. Williams
B. Hughes (Worcester)	2308	(Wednesbury)
S. Foster (Lincoln)	2039	G. A. Davey
E. W. Robinson		(Bury St. Edmunds)
(Bury St. Edmunds)	1837	A. Twelves (Rhos-on-Sea)
M. J. Quintin		J. Worthing (Shrewsbury)
(Wotton-u-Edge)	1517	P. Eggeman (Borehamwood)
H. A. Londesborough		J. A. Darby (London SE16)
(Swanland)	1450	F. C. D. Barnes (Cardiff)
H. M. Graham (Moulton)	1342	B. L. Henderson
M. Cuckoo (Herne Bay)	1262	(Laverstock)
M. Rodgers (Harwood)	1218	J. M. Short (Thornbury)
Mrs. R. Smith (Nuneaton)	1214	B. Shepherd (Staines)
M. Law (Chesterfield)	1201	R. Baker (North Walsham)
P. Ford (Longlevens)	1055	A. Stevens (Crowthorne)
N. Askew (Coventry)	1042	P. J. Boyce (Coventry)
R. Middleton		
(Bury St. Edmunds)	1022	CW ONLY
J. F. Hobson (Ely)	969	H. A. Londesborough
D. C. Casson (Reading)	927	(Swanland)
J. Doughty (Bloxwich)	915	D. W. Waddell (Herne Bay)
L. Stockwell (Grays)	844	J. Goodrick
B. A. Payne (Leeds 18)	841	(Bognor Regis)
D. J. F. Gordon		A. Rowland (Mansfield)
(Chepstow)	833	524

Minimum Score for an entry: 200 for CW, 500 for Phone. Listings include only recent claims and are in accordance with HPX Rules (see p. 702, January 1981 issue). A 'Nil' return is permissible in order to hold a place.

enamelled tape to make a balun as described in *RSGB Handbook*. We believe that this particular one is obsolete, but every maker of ferrite toroid cores has an equivalent. TMP Electronics are regular advertisers, and the Editor reckons that their *Amidon* cores are quite good. As for tape rather than wire, you really need to find a transformer maker and get him to supply you with an off-cut length. However, blowed if we can see why tape anyway! We suggest you do a little sum to find the cross-sectional area of the tape, and then look in the wire tables for an equivalent s.w.g.; but of course, if you are only receiving, you don't need as big a ferrite ring, and you don't need the size of wire either!

Another *Bury St. Edmunds* character is *G. A. Davey*, who talks about the operation of the 'hot line' that the local trio operate between themselves when DX is about. He has also joined the local club, and had the good fortune to hear G3XAP talking on aials.

Now we have the third letter from *Bury St. Edmunds*, from the chap who started it all, *E. W. Robinson*. This time Ted has now to say for himself, but we observe his list is the 59th entry to HPX.

D. Casson (Reading) is another of those who passed the RAE, and he is now pressing on with the Morse. Just as encouragement to those who say they are "too old to learn" — Derek's pass was the first time he had taken any sort of examination for over 30 years.

P. Ford (Longlevens) has been a night-worker for some 14 years, but has now had to return to normal day work; this is taking a bit of adjusting to, and so Phil has not been so active of late.

B. Shepherd (Staines) is one of those thrown on the labour market by the recession, but the time so used has been well spent in HPX. However a character calling CQ on 28.531 MHz was almost certainly another strayed CB-er. This is something about which we will have to do things. Already CB chaps, who know nothing of Amateur Radio, remember, are looking at the clear area between 28 and 28.5 MHz and in true pirate fashion, taking it over. About all we can do is to D/F the blighter, and once located report him to the Police and the Home Office; then make quite

sure he is harried out of those bands where he encroaches on our patch. CB is *illegal* at the time of writing and even when the thing has been legalised, it'll *still be illegal* to poach in our bands. Thus, we are not acting out of our licence conditions in sitting on them.

M. J. *Quintin (Wotton-Under-Edge)* has been slack of late and puts in a 'Nil' return to hold his place.

Just a list, this time, from D. W. *Waddell (Herne Bay)*, which takes him up to 1252.

Another neglectful type is H. A. *Londesborough (Swanland)* who doesn't say why, albeit we seem to recall he used to write from a different address in the same locale; which would suggest that the paintpots and things are due for a field-day, and indeed that it has already started!

It seems only yesterday when we last heard from M. *Cuckoo (Herne Bay)*, who has in fact been absent for some five years; now he has a Trio R-1000 plus an ATU into either a Jaybeam three-band vertical and a 60-foot piece of wire. So he must make something of a record, coming back in with a "first" claim of 1262!

K. *Kyezor (Brandon)* has a fine crop of bums in his list; Z1DE in the contest, GD7DSL, and G9EBH (being some 9kHz outside the band in any case!). Just like Barnum said, there's one of them born every minute!

We press on now to a contest-loving SWL, J. P. *Goodrick (Bognor Regis)*, who tackles quite a few subject to his firm rule of no night-work! One he did miss was BERU (shame!), largely because of what John sees as the inadequacy of his rig. On the other hand, he did have a play in the RSGB 7 MHz affair, digging up the DX from under the Gs. It is a problem coping with strong contest-type G signals on a ground-plane, but John says that's the only aerial he can run.

B. L. *Henderson (Laverstock)* seems to be well settled in his new berth, and he is cheered by hearing of an RAE class to be started in April, given enough interest is there. However Brian, who was trained an electrical engineer, has a 15-year old son who is also keen to they are starting studies in competition, which should keep them both well up to the mark.

Another move is in prospect for H. M. *Graham*; he has found that *Moulton* is too far away from the families, so that a move back to Chesham is settled. Regardless of location, though, Maurice still seems to be able to find the DX, and the time on the air to hunt; he has been specialising on Ten of late, but with occasional forays on to the lower bands, Forty in particular.

J. F. *Hobson (Ely)* has some rueful words to the effect that the more you hear the harder it gets. Not quite true, of course, if only because one gains steadily in skill all the time. In SWL-ing, as with anything, the difference between expert and beginner is very marked!

On we go to A. R. *Darby (London SE16)* who, having got his 500 up, was able to add some earlier ones which he had kept tucked away for this purpose. Old logs are interesting things too, when you come to look at them.

B. F. *Hughes (Worcester)* philosophises over the fate of the present B-licences — will they and their successors opt out of our licence altogether and just play CB, without a test or a licence? Well, who cares? After all, the vast majority come on the air, either with A or B licences, and have never been SWLs as such. Indeed the ex-SWL sticks out like a boil on a bald head, just because at his first QSO he knows more about operating than most of the others — he heard the bad ops and models himself on the savvy ones he has heard as a listener.

Congratulations are due to B. A. *Payne (Leeds 18)* for his RAE pass; no wonder he has not been too active as an SWL, if he was swotting it all up. However, Brian is continuing to listen around, and so we should expect to see him passing the morse test next.

It is unusual for us to have two YLs active in SWL at one time, perhaps even unique. The first list comes from Mrs. *Parry of Blackpool*, who has an EC-10 Mark 1, and a husband who used to be in the lists; so she is out to beat him! Of course, she has some advantages, in that Ten is much more lively now than it was some years ago, and the DK20C net on Ten comes at a time when hardly

anyone over here would be at lunch and so able to listen.

Mrs. R. *Smith (Nuneaton)* has altered the aerial system, with some help from the OM, and seems to have been rewarded by a large influx of new prefixes; we have a hunch that Ruth will be chasing after K. *Kyezor's* spot at the top soon — and why ever not?

A kindly thought from P. *Eggeman (Borehamwood)* who corrects his list from last time, for a couple of mis-typings, one of which we spotted and corrected, but t'other missed us altogether! However, it's not often that happens, and when it does, we feel fairly safe that someone will pick it up along the way.

"Where on earth is J88?", asks J. *Worthing (Shrewsbury)*. Once upon a time, Echo says, it was known as VP2S, St. Vincent, in the Caribbean. On a different tack there is the question of the Datong Active Aerial, and Jeff wants to know whether to connect it through his ATU. One would not think so — what Datong say is what they mean, in our experience.

A very quick line comes in from S. *Foster (Metheringham)* with an up-date to his score. Stew says he hasn't been all that active of late, but he intends to redress the balance during the CQ WW WPX contest weekend.

And, the bottom of the pile this time, N. *Askew (Coventry)* who reports in after a longish gap with two lists, which together claw his score up into the four-figure bracket. On a different tack SWL Askew remarks that he recently had a chat with G2WK, who started in 1907 not knowing a licence was required, and got his first "ticket" in 1909. It's a very long time since your J.C. had the pleasure of a QSO with G2WK, back in the days of AM, when home-brew rigs could put out signals of BBC quality, and the writer's version was suffering from some malady which Bill diagnosed over the air and in doing so ended a long search for a fault. That rig, as we recall it, could make just about ten watts input to an 807 on Top Band, and by fiddling with a knob at the back it would go on Eighty quite well too — but an attempt to put it on Forty was beyond feasibility and was abandoned.

QRT

That's it for another month. The deadline for the July piece is May 21st, your letters to arrive by that date, and addressed to "SWL", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.



"The side-swiper here is quite unusual . . ."

FOR THOSE WHO HAVE FIELDS

SAMUEL POLSON, GM3RFR

IREGRET this is not an antenna for town flats or small gardens. It is an antenna for open spaces and places where the winds blow.

That's how it came about: large beams and the Shetland Isles do not agree. When the winds pipe at 100 m.p.h., one is likely to get one's all-band quad around one's neck on a dark night — not appetising and certainly very expensive.

Yagi and quad beams are certainly very expensive to buy and very time consuming if you make them. Wire beams on the other hand, are relatively cheap to make and should they tumble down not very expensive to replace.

The writer for years has been a QRP addict, and a high-gain antenna is not necessity but is certainly a useful adjunct to QRP-ing. In recent years a number of gainful antennae have been tried — single element loops, phased verticals, short vee-beams, etc. None had the gain capabilities of the commercial quads or yagis. What to do? The obvious answer was to go for larger size wire vees or rhombics. Rhombics need four masts for correct operation: up goes costs plus time usage. Therefore large wire Vees seemed a logical choice, all the more so as several can be strung maypole-fashion from the same mast. The idea was to use down-slopers to avoid mast problems at the far end.

The main problem was how long should they be and could a Vee be produced using coax or twin-feeder which would cover more than one band.

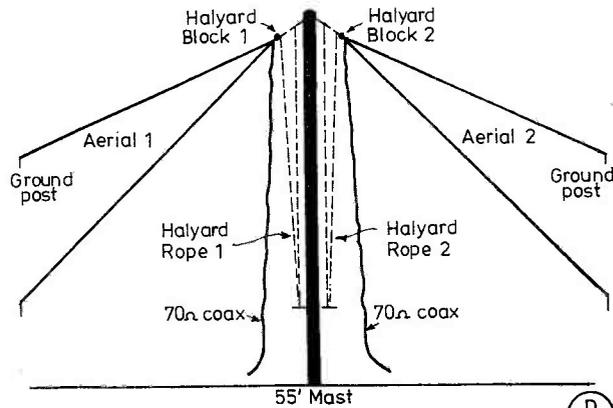


Fig.1 VEE-BEAM ARRANGEMENT AT GM3RFR

are approaching the gain of the coveted Quad/Yagi type antenna. The angle between the legs must be a compromise, of course, and probably should favour the HF bands.

An additional boon is the fact that this size of vee beam almost suits 20 metres: $2706/14.2$ gives a leg length of 190.6 ft., not far short of the measurements already given. The antenna will work on 20 metres, though SWR may be a bit high.

It is unfortunately a no-go antenna on 40 metres. However as is well-known there is a 40/15 metre relationship, and in consequence it is possible to use three figures for a 40/15 combine. A very good arrangement is a $9/4$ wave leg length for 15 metres *i.e.* $2214/21.2 = 104.4$ ft. This gives a useful 4.75dB gain over a dipole; $738/7.07$ will give the same length. So this antenna will perform well on both bands.

Finally the diagram shows the arrangement of the antennae. Mast height can be 30-50ft. The antennae are down-slopers, thus

Wave-Length, 1 Leg	Calculation for Length in Feet
1/4	234/F
3/4	738/F
5/4	1230/F
7/4	1722/F
9/4	2214/F
11/4	2706/F
13/4	3198/F
15/4	3690/F
17/4	4182/F
19/4	4674/F
21/4	5166/F
23/4	5658/F
25/4	6150/F
27/4	6642/F

Table 1. Vee-beam single leg lengths in feet.

Wave-Length	Apex Angle	Gain dB
3/4	100°	2.5
5/4	86°	3.3
7/4	76°	4.0
9/4	67°	4.75
11/4	60°	5.3
13/4	56°	5.8
15/4	52°	6.3
17/4	48°	6.8
19/4	46°	7.2
21/4	44°	7.6
23/4	42°	8.0
25/4	40°	8.4
27/4	48°	8.8

Table 2. Vee-beam antenna: gain and optimum angle between legs for a given wave-length.

I began juggling with the figures shown in Table 1 to derive information which might be useful for vee-beam construction. Using a pocket calculator for speed reasons it was found that a certain size of leg could produce an antenna common to 3 bands, *e.g.* 80 metres, 15 metres and 10 metres. The 10, 15 combine is especially providential for a QRP DX-er; the 80 metre version is a useful addendum for closer range contacts. The size was as follows:— $5658/28.6 = 197.8$ ft., $4182/21.2 = 197.3$ ft., $738/3.73 = 197.8$ ft.

In other words an antenna of leg length approximately 197.5 ft. will operate on 28.6 MHz, 21.2 MHz and 3.75 MHz. On the two HF bands gains should be 8dB and 6.8dB over a dipole. Thus we

enhancing low angle directivity, and are attached to convenient fencing posts at the far ends. Ordinary cheap insulated wire is used in construction with 70-ohm twin feeder, and matching is pretty good despite their considerable length. Results have been very good using these vees: North America is easy with 2 watts out SSB, while South America is fairly probable if direction is right, and Australia and Far East is distinctly possible.

Remember that these antennae are bi-directional and if you mount two of them from a chimney or a mast and site one with the 'V' towards the North West and the other with the 'V' towards the South West you will get pretty good coverage of the best DX directions.

THE S.C. DELUXE, PART I

IMPROVING THE S.C.D., THE LOW COST, LOW TECHNOLOGY, TRANSCEIVER

REV. G. C. DOBBS, G3RJV

The author is joint winner of the 1981 "Short Wave Magazine" article competition, awarded for his original three-part article, "The S.C.D." — Ed.

IN January, March and April, 1980, *Short Wave Magazine* published a series of articles called "The S.C.D." The original article described the S.C.D. as "... a complete simple amateur radio station that can be built on a kitchen table with simple handtools, requiring no other test equipment than the average station multimeter". Little did I suspect at that time what those articles would stir up: since then I have filled a file with letters of enquiry about the project, seeking advice and offering suggestions for modifications. I have also had the pleasure of working several S.C.D. rigs on the 40 metre band. Okay fellows, you can stop writing now! I have gone back to the S.C.D. armed with those queries and suggestions, and what follows are some simple improvements to enhance the usefulness of the transceiver. This article suggests some transmitter improvements, to be followed later by receiver and ancillary equipment improvements.

As with the original article, these improvements embody the amateur tradition of experimentation and compromise. Do not buy anything unless you have to, substitute if it's cheaper, use what you already have, or if you can, get hold of it for nothing. The S.C. Deluxe will not look as good as the latest Far Eastern Grey Box, but you will be able to look your wife straight in the eye when you complain about her spending, and you might even be able to afford to buy her that new coat... dress... secondhand Mini.

VFO

One of the main disadvantages of the S.C.D. is that it is crystal controlled. A simple VXO was used in the original articles, but this extends the tuning range very little, and the basic VFO arrangement suggested was experimental and only really suitable for bands below 7MHz. It can be quite frustrating hanging around a channel with low power transmitting capabilities only to find a fat QRO station parking himself right on your frequency. So the first, and most obvious, improvement is the addition of a good quality external VFO.

Variable Frequency Oscillators can be something of a problem for we lesser mortals: the one that seems to work for the man who wrote the article in the magazine so often happily drifts up and down the band when we build it. So as the basis of the VFO for this application I have chosen a well known, well tried, circuit. The circuit is shown in Fig. 1. It is an often repeated design, and although I have tried many circuits for VFO's, I always seem to return to this one; not least of all because it has been extensively used in articles by such well known amateur radio authors as Doug DeMaw and Wes Hayward, the laces of whose shoes. . . . A full explanation of the design criteria can be found in the ARRL book "Solid State Design For The Radio Amateur", a book well worth owning from *S.W.M.'s Publications Dept.*

The circuit, based on a design by George Hachett, W2YM, in *QST* of December 1966, uses a JFET transistor in a Sieler-type oscillator followed by two stages of buffering. L1 is the tuned circuit inductance and VC1 is the main tuning capacitor. The diode, D1, acts as a gate clamp by reducing the positive going peaks on the gate signal. This limits the transconductance of the FET and the lower capacitive effects in TR1 reduce the harmonic content of the output from the oscillator; ZD1 provides voltage stabilisation for TR1. TR2 and TR3 form a two stage buffer amplifier using shunt feedback, which delivers up to 3 volts peak to peak sinusoidal output across R7. In an area fraught with dangers, this circuit arrangement has always given me a reliable reproducible VFO.

Equally important with the choice of circuit for a stable VFO is the choice of components and the method of construction: the best VFO circuit will be badly behaved if carelessly constructed. The VFO must be stoutly constructed in a good screen box, using the shortest leads possible. I used a simple printed circuit board layout in the prototype, this is shown in Fig. 3. It is possible, and some even suggest preferable, to use point-to-point wiring for such a VFO. The same layout could be followed by mounting the components on plain (without the copper strips) perforated board; however I find making PCB's is such a simple process that

Table of Values

Fig. 1

R1 = 100K	C6, C7, C9 = 0.01 μ F
R2, R5 = 10K	C8 = 0.1 μ F
R3 = 56R	VC1 = 10 pF variable
R4 = 1K	RFC = 100 turns, 30 s.w.g., on 1 watt resistor
R6 = 27K	L1 = 12 turns, 26 s.w.g., on 5 mm. former with core
R7 = 470R	TR1 = 2N3819 or HPF102
R8 = 100R	TR2, TR3 = BC109
C1 = 120 pF	D1 = 1N914 or similar
C2 = 47 pF	ZD1 = 9.1v. zener diode
C3 = 400 pF	
C4, C5 = 680 pF	

Note: all pF values are silver-mica except C1-C5 (see text)

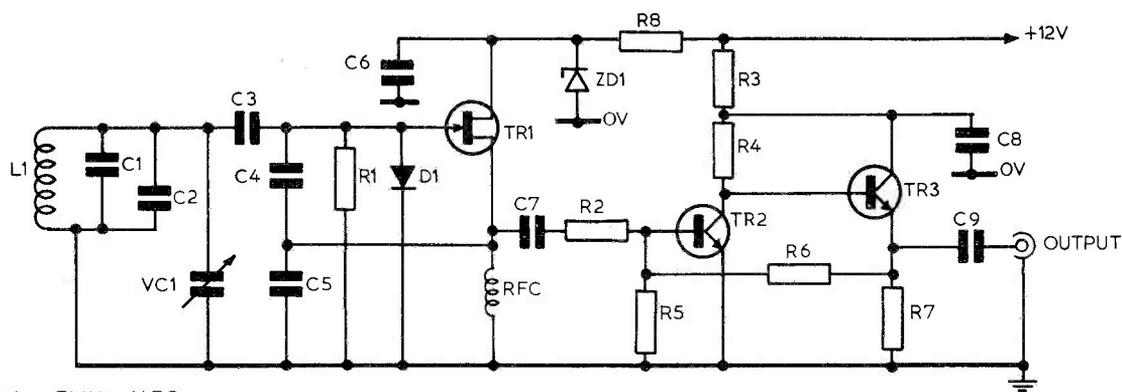


Fig.1. 7MHz VFO.

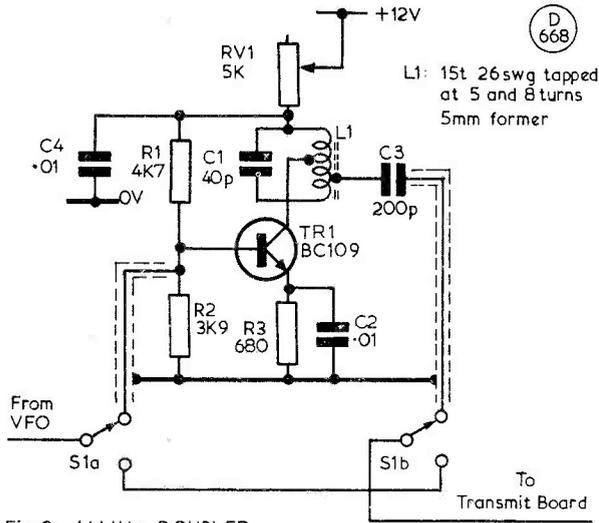


Fig. 2. 14MHz DOUBLER

it seems the natural technique. Whatever the method adopted try to ensure that capacitances formed between the connection pads and the screen are avoided. Do not use double sided PCB and mount the board on standoffs so it is not close to the screened container. All the components must be rigidly mounted and incapable of movement. A mechanically unstable VFO does not stand an earthly chance. *Note: Fig. 3 appears in Part II.*

The tuned circuit and its associated components is the most critical part of the VFO and it is here that most problems will arise. The coil L1, with C1, C2 and VC1 determine the frequency, and the variable capacitor VC1 tunes the required range. Most instability problems are due to temperature effects within the

tuned circuit, so components with low temperature coefficients are required. Inductors can be prone to such problems and this is usually associated with iron dust cores; many constructors steer clear of toroidal cores, although others claim good results with tightly wound coils on such cores. Most experienced VFO builders seem to stick with conventional coil formers, using tightly wound turns held by cement. The drawback here is that cores are so useful in adjusting the inductance to give the exact required frequencies.

My experience has been that coils with iron dust cores will produce stable VFO's, if the cores are firmly held in the coil former and the required inductance is attained with the core just entering the windings. This approach was used to give the values for the coil quoted in the Table of Values. Cores can be held firmly in the former by inserting a piece of thin elastic, cut from a rubber band, in the thread between the core and the inside of the former; *Blutack* will also serve this purpose. Polystyrene cement, used in plastic modelling can be used to hold the windings in place.

The choice of capacitors is also important in the tuned circuit; such capacitors should have the lowest temperature coefficient possible. The ideal capacitors are NPO ceramic types, the problem is that I find that they are almost unobtainable. Use them if you are lucky enough to find suitable ones, the commonest are shaped like dogbones and have a black painted tip. Polystyrene capacitors are usually used by most amateur constructors, being obtainable and inexpensive. These have a small negative temperature coefficient, and in some cases it appears that this cancels out the positive coefficient of an inductor. Professional engineers would probably throw up their hands in horror at the thought of two electronic 'wrongs' making an electronic 'right', but in practice I have found that polystyrene capacitors and coils with a "touch of core" work well in home made VFO's. Good silver mica capacitors in the VFO which require this special choice of type are C1, C2, C3, C4 and C5. VC1 should be a good quality airspaced variable capacitor, ex-government military types serve very well if they can be obtained.

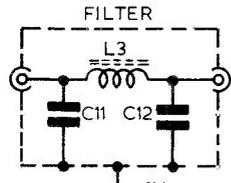
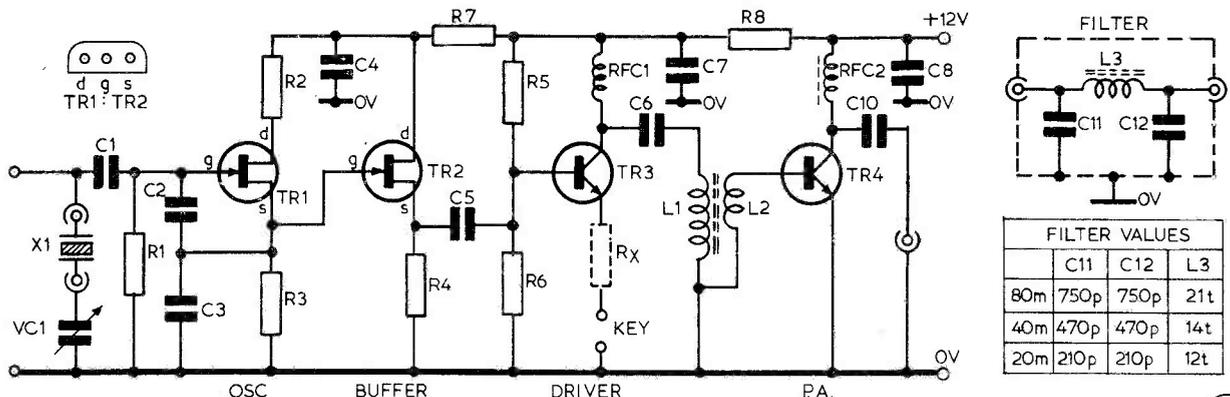
It may seem from the above that VFO building is difficult. That is far from true. Most amateurs can build stable VFO's with a little care in choice of components and a fair amount of care in the actual construction of the oscillator. The simplest way to check the frequency and the oscillator is to listen for it on a receiver. I set up the tuned circuit with a grid dip oscillator and checked the output with a frequency counter, but these are latter-day luxuries in the G3RJV shack and all my early VFO's were checked only using the station receiver and a simple RF probe; the probe is shown in Fig. 8 and was used in the original SCD project. It is simple to build on a piece of scrap PCB or a small tagstrip. The range required on the multimeter will depend upon the amount of RF to be measured and the multimeter used. Low DC voltage ranges usually give a good indication of the RF output, but if the reading is low, a low DC current range can be used.

Even if more sophisticated equipment is available, listening to the output of the VFO on a receiver is a good test. Identify the signal and give it time after switch on to settle down, some initial

Table of Values
Fig. 4

- R1 = 82K
- R2, R8 = 100R
- R3, R4 = 1K
- R5 = 27K
- R6 = 1K2
- R7 = 680R
- Rx = see text
- C1 = 150 pF
- C2, C3 = 47 pF
- C4, C6, C7, C9, C10 = 0.1 µF
- C5 = 500 pF
- C8 = 50 µF, 16 v.w.
- VC1 = 100 pF
- RFC1 = 25-50 µH
- RFC2 = 7-8 turns 30 s.w.g. wire on ferrite bead.
- L1 = 22 turns 22 s.w.g. enamel on Amidon T-50-2 former
- L2 = 10 turns 22 s.w.g. over L1, see drawing
- X1 = crystal for band
- TR1, TR2 = 2N3819
- TR3, TR4 = BFY51, 2N3053, or see text

Also suitable crystal holders, and phono plugs and sockets.
Note: all pF values are silver-mica.



FILTER VALUES			
	C11	C12	L3
80m	750p	750p	21t
40m	470p	470p	14t
20m	210p	210p	12t

Fig.4 ORIGINAL S.C.D. TRANSMITTER

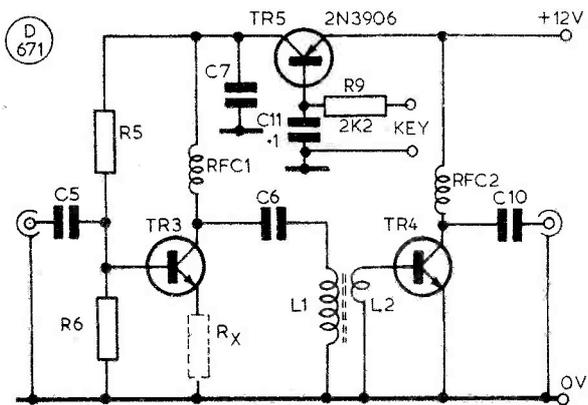


Fig. 5. MODIFIED S.C.D. CIRCUIT

drift is to be expected, long term stability is the aim. A good test is to zero beat the VFO signal with the receiver's BFO and leave it on for several hours to check drift. Also try tuning either side of the signal to see if it sounds clean. These tests must be done with the VFO board in its final housing. A slow motion drive will be required to give a smooth tuning range with VC1: the common 8:1 epicyclic drives are ideal for this purpose, and a circular scale can be affixed to the geared down spindle on the outside of the case.

14 MHz Doubler

Armed with the VFO the freedom of the whole CW sector of the 40 metre band is now open to the S.C.D. user and many good CW QSOs should now be possible. Another good band for CW QRP operation is the 20 metre band. If I were restricted to only two bands for QRP operation they would be 40 and 20 to allow the variety of inter-UK and international contacts. The natural progression from building the VFO is to use it with the S.C.D. transmit board on 40 metres then add a doubler for 20 metres. But for the purposes of this article I will describe a suitable doubler circuit, before describing how to use the VFO with the doubler, or alone, in the transmitter.

The doubler is a simple bipolar transistor tuned doubler circuit as shown in Fig. 2. The output from the VFO at 7 MHz is fed to the base of TR1 and the output at the collector is tuned for the 14 MHz band. A switching arrangement allows the VFO signal to pass either through the doubler circuit, or direct, to the transmitter board. Purists who own spectrum analysers and read the best textbooks frown on this type of circuit on the grounds of its relatively unclean output and poor attenuation of the fundamental frequency. However it is possible to produce a good doubled signal, with a little care, and further filtering later in the transmitter will reduce the harmonic content to reasonable, and legal, levels. The great merit of the circuit is that it is simple, cheap and it works.

L1 is core tuned with C1, and tapings provide suitable matchings for the transistor collector and the output. Such a circuit has gain and this can be a disadvantage as we really require similar levels of drive to the transmit board from the doubler and the VFO alone; a simple drive control is provided with VR1 which controls the line voltage to the transistor. Screened leads must be used between the VFO, the doubler and the transmit board. A suitable PCB layout is shown in Fig. 3. Like the VFO the circuit could be built on plain perforated board using the same layout.

The doubler can be tested using a receiver and the RF probe. The VFO is connected via a screen lead to the input and the RF probe is connected to the output. Screwing the core should produce a peak in the reading from the RF probe. Listen on the receiver to check that the signal is on 14 MHz, and is clean. Avoid any minor peaks that could appear when tuning with the coil core. The 14 MHz signal should be a large peak and quite sharp. Lucky constructors with a frequency counter will be able to find the 14 MHz signal by direct reading.

The Transmitter

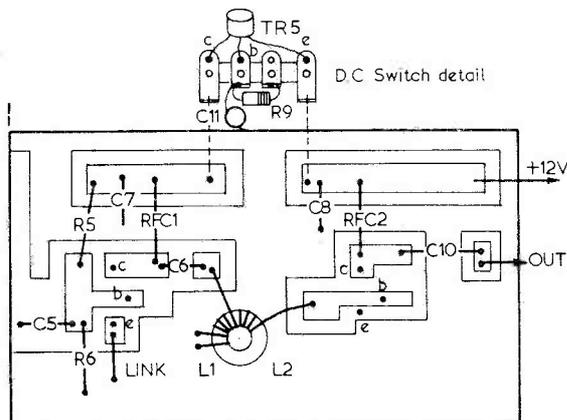
The VFO and doubler can now be used with the S.C.D. transmit board, but first some modifications have to be made to this board. Fig. 4 shows the original S.C.D. transmitter. TR1 is the crystal oscillator, TR2 an FET buffer and TR3 is the driver to the PA transistor TR4. The output is taken from the collector of TR4, with an impedance of roughly 50 ohms. Individual 50-ohm in and output impedance fixed pi-network filters tune the RF signal from the PA for each band. TR4 is run with a DC input of 2 watts which is attained by altering the drive level from TR3 by adjustment of Rx in the emitter circuit.

Before the VFO of Fig. 1 was tried, attempts were made to utilise the FET crystal oscillator section of the S.C.D. as a buffer to follow a single transistor oscillator. The results were not encouraging and the VFO as described was then built: this has two buffer stages and a relatively high RF output. This means that neither TR1 nor TR2 of the original S.C.D. transmitter are required. So of the transmitter in Fig. 4 only the driver and PA stage are used. The modified transmit board uses a more sophisticated method of keying the driver stage.

A wide variety of transistors may be used for the PA stage and the driver stage. The prototype worked well with the common 2N30 and the BFY51, although some of the BFY51's in my surplus-priced stock gave quite low outputs. Almost any suitable transistors capable of dissipating a few watts at the required frequency will work. (Some of the best results in the prototype were obtained from some unknown computer switching transistors, with short leads, coded 00652.) A reasonable heat-sink is required for the PA transistor of the 'star' or clip-on kind; it is common for some transistors, even with heat sinks, to run quite hot in this circuit.

Fig. 5 shows the modified S.C.D. transmitter circuit. The two stages TR1 and TR2 have been completely removed, and what remains is the driver stage, from C5 onwards, and the PA stage. The keying point in the emitter of TR3 is shorted out and the driver is now keyed with a switching transistor TR5. The keying transistor TR5 acts as a DC switch to turn the driver stage on and off via the line voltage. It is a p-n-p device, the 2N3906 was used in the prototype, but any high speed device would serve the purpose. When the key is open the transistor does not conduct, so no voltage reaches the collector of TR3; with the key down TR5 is forward biased into saturation and current flows through its junction supplying TR3. Such a switch has two advantages: the first being that the line voltage can be keyed with one side of the key connected to earth, and the other being that the keying can be "shaped" to avoid key clicks in the final transmission.

The circuit in Fig. 5 uses a 0.1µF capacitor between the base and earth and 2.2K ohms in series with the key lead. This series resistor must be maintained if the transistor is to survive, but variations in the keying circuit can produce various shaped keying



Cut original pcb

Fig. 6 MODIFIED SCD BOARD LAYOUT

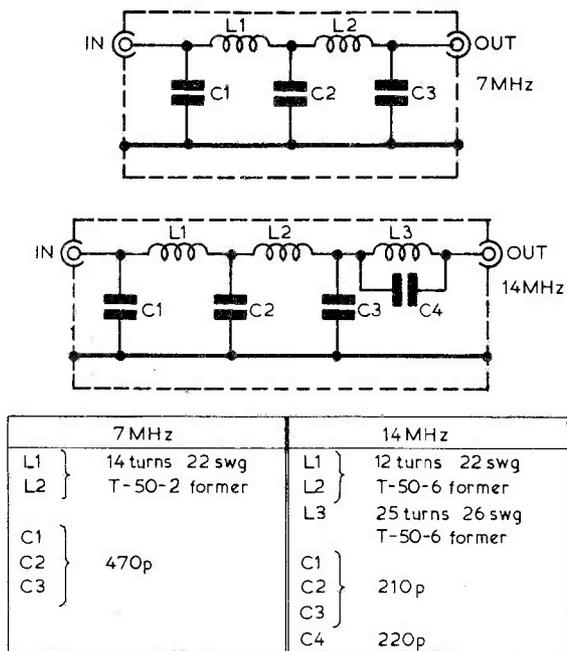


Fig. 7. TRANSMITTER FILTERS

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characteristics. Try using two 1K ohm resistors in place of R9, and placing 0.1 μ F capacitors from the base of TR5, the junction of the two resistors and the key — all three capacitors going to earth. This will soften the keying, although it will still be quite sharp. It is possible to experiment with higher values of capacitance to obtain other keying characteristics. Too much capacitance will, however, produce a rather “mushy” note. If a keyer is to be used in this keying circuit it should have a relay contact output or be capable of positive keying.

A suitable layout for the modified transmitter is shown in Fig. 6. This board is etched in an unusual way, with the copper on the component side of the board; this type of board requires no drilling and the leads are soldered direct to the copper. (This method was fully described in the original S.C.D. article of January 1980 and allows for simple experimentation and component changing.) Those who already have the original S.C.D. board may cut it, as shown in the drawing, to retain only the driver and PA stages. The DC switch transistor will not fit the original board and can be built on a tagstrip as shown. I found a very convenient tagstrip, which just fitted, to bridge the circuit board line voltage strips for the PA and driver. The DC switch could also be built on a small piece of PCB and mounted above the transmitter board.

The Transmitter Filters

The S.C.D. used an individual broadband pi-network filter for each band. These are shown in Fig. 1 and were built into 1oz. tobacco tins with a phono plug and socket on each end; the plug fitted a socket from the output of the transmitter at C10. As bands were changed — so were tobacco tins! The filters for the S.C. Deluxe are double pi-networks and are shown in Fig. 7. Additional filtering is required with the VFO to remove unwanted harmonic content in the transmitted signal. The 14 MHz filter has an additional tuned circuit L3/C4: this is a wave trap to remove unwanted 7 MHz VFO fundamental signal from the doubled signal, and the values are shown in the Table. The coils are wound on Amidon toroid formers. The capacitors should be as close to the desired value as possible, but more than one capacitor can be used to make up each value. Avoid using the very small ceramic types as these may get hot, silver mica or polystyrene types are suitable.

Once again the filters can be mounted in tobacco tins. I used the square 2oz. tin (I guess the Philistines call them 100gm. tins now)

but it may be possible to use other suitable small tins; the filters are plugged into the back of the transmitter for each band. They could also be switched, but this can have problems. If switching the filters they ought to be screened and the inputs and outputs must both be switched; screened leads must also be used. One method is to use two double-pole changeover slide switches mounted at either end of the filters and gang the switching action with a homemade actuating bar. (Band switching is perhaps one of the most complex problems in multiband transceivers and I suspect that when an amateur buys an expensive commercial rig, he is really buying £500 worth of complex switching.)

Using The Transmitter

Once the transmitter board is completed, it can be tested with the VFO and doubler. The first operation is to set it up with the VFO alone on 7 MHz. The VFO with, or without, the doubler should be connected to the transmit board with screen lead. In my prototype the transmit board was mounted inside an aluminium case, with the VFO in its own box mounted to one side; the doubler came between the VFO box and the transmit board. When using or testing the transmitter the PA should have a load on its output at all times. The output of the filter has a termination of 50 ohms and for tests a dummy load is used; this should be carbon resistance of some 50 ohms, capable of dissipating a few watts, which may be made up from higher value, lower wattage, carbon resistors in series or parallel combinations.

A DC input of some 2 watts is required for the PA stage. This is measured by monitoring the current flow in TR4, in the line between RFC2 and the 12 volt line supply. Just lift the top end of RFC2 from the positive pad on the board and insert a millimeter — a multimeter on a 250 mA. or similar range is suitable. The RF probe can be connected across the dummy load to check that an RF output is present if the constructor has a spare meter to use with the probe. The task in hand is to adjust the driver emitter resistor, Rx, to give a DC input of about 2 watts to the PA.

To give a DC input of 2 watts with a 12 volt supply, 166 mA. is required; for 1.5 watts the current is 125 mA, and so on, according to Ohms Law. The value of Rx is altered to give the required input; in the prototype 33 ohms was required. This will depend upon the output from the VFO the gain of the driver and the PA transistor. I suggest the constructor begins with a higher value and reduces to obtain the required reading. Overdriving the PA could result in once again proving that the transistor can be “the fastest fuse on three legs”. The transmitter is further tested by listening to the signal on a receiver. Transistor PA stages are not unknown for parasitic oscillations. Key the signal to check if it sounds clean, and tune around each sideband to listen for “nasties”. But remember that the transmitter, even into a dummy load, may be overloading the receiver front-end. So ensure that any poor note is not the fault of the receiver. Listen with no aerial, or with just a short wire; the keying should also sound clean. Some constructors swear by using little ferrite beads on the input legs to PA transistors to cure parasitics. I have never done this but if you have a poor signal it might be worth trying.

The transmitter must now be tried with the doubler on 14 MHz. The value for Rx remains the same, but since the doubler will have some gain, the input to the driver must be reduced; this is done using the drive control, VR1, in Fig. 2. The doubler is switched into circuit with VR1 set to give the minimum voltage to TR1. The current to the PA is once again checked and VR1 is increased until the required current reading is obtained. In the prototype, VR1

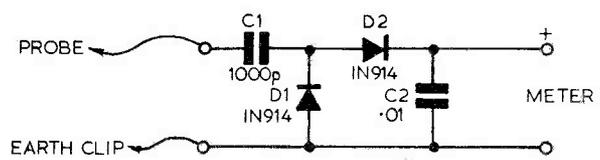


Fig. 8. RF PROBE

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was a preset control inside the case of the transmitter. The same checks can be repeated with the transmitter on 14 MHz.

The transmitter is now completed and can be air tested. The output must be matched in as near a 50-ohm load as possible, so a simple dipole for the band in question is quite suitable; long wires and many other aerials will require an ATU (an L-Match is usually enough), see the original S.C.D. article, Part 3, March 1980 *Short Wave Magazine*. Because the oscillator is on all the time, even with the key up, the receiver used will require muting.

The transmitter only runs a DC input of 2 watts, but QRP operating is great fun, as more than a thousand members of the G-QRP club will testify. Techniques for low power operation have been discussed elsewhere — in the original S.C.D. article, the RSGB "Amateur Radio Operating Manual", etc. Remember you will only be about two or three 'S' points down on the usual QRO signal, but call other stations rather than call CQ. With a fair aerial the transmitter should work into Europe with ease on 40 metres and two stations in the USA were worked with the prototype S.C. Deluxe on the first night of operation. So build it up and enjoy it. We will look at the receiver section in the next part of this article.

Component Sources

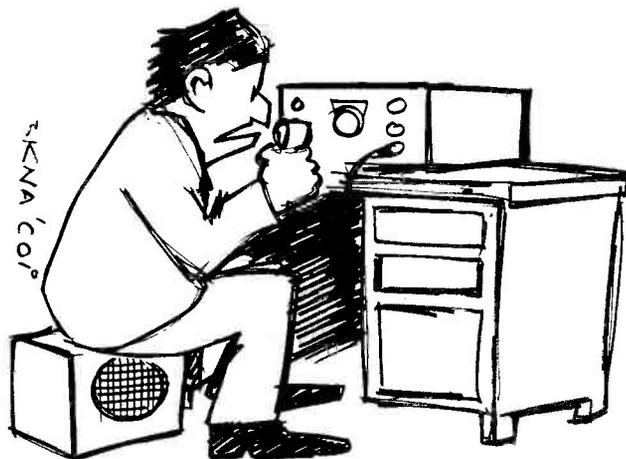
J. Birkett, 25 The Strait, Lincoln is a good source of most components.

The Amidon toroidal cores can be obtained from **TMP Electronic Supplies**, Britannia Stores, Leeswood, Mold, Clwyd, or **Ambit International**.

References

"The S.C.D.", *Short Wave Magazine*, Jan., March and April 1980.

"Solid State Design for the Radio Amateur", published by ARRL.



"I'm taking you comfortably on the speaker"

Correction

There is an omission in the circuit diagram of Fig. 2 in "Simple Memory Keyers for Meteor Scatter, Part I" which appeared in the April issue: R3 is not shown, and should be connected between pin 11 of U2 (the 4040 chip) and earth. Also, in the Table of Values on p. 93, C2 should be 0.01 μF , not 0.001 μF as shown.

BOOK REVIEW

"AMATEUR RADIO TECHNIQUES" 7th EDITION

THIS book is the logical compilation of many of the more interesting items that have appeared in Pat Hawker's, G3VA, monthly feature "Technical Topics" in *Radio Communication* over the last 23 years. "Amateur Radio Techniques" was first published in 1965 and this latest, seventh edition contains some fifty pages of new material over the previous one. The aim of this publication is to supplement the information contained in the standard amateur radio handbooks. As such, it does tend to be a little disjointed in parts; however, the comprehensive four page index should enable the reader to find items of any particular interest.

The nine chapters are entitled:— Semiconductors, Components and Construction, Receiver Topics, Oscillator Topics, Transmitter Topics, Audio and Modulation, Power Supplies, Aerial Topics, and Fault-finding and Test Units. Obviously a reviewer cannot read each one of over 300,000 words or carefully study some 800 diagrams, so this appraisal is of a general nature.

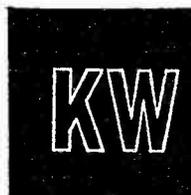
This book still contains many circuits featuring valves and the first impression is that it is rather "old hat". However, as there must be thousands of pieces of gear of all kinds around using valves, the inclusion of such material is relevant. For example, in the Receiver Topics section, there is a circuit showing how to improve the local oscillator stability of an old Eddystone S-640 receiver by replacing the frequency changer valve by three 2N3819 transistors.

What does seem more questionable is the inclusion of so much valve circuitry which dates back to the 1960s. After all, to mention some examples, who would contemplate building a VFO using a 12AT7, a double balanced modulator using a couple of 6AU6s, or a three-valve speech compressor? Or yet again, use valves in a small, regulated power supply? Such stuff may have been state-of-the-art twenty years ago but it is hardly relevant today.

One of the better chapters is that dealing with aerials and one cannot escape the feeling that this could be a topic very dear to the editor's heart. In this section will be found suggestions to suit everyone, from the amateur with no back yard at all, to the lucky chap with acres of real estate for aerial farming.

Since the first edition of *ART* appeared, amateur radio has exploded into many, highly specialised facets, with microprocessor-controlled transceivers with memories and scanning facilities, for example. Is it practical to even try to cover all this diversification in one volume now? The reviewer feels that the publisher — RSGB — should seriously consider a drastically pruned and revised edition of this book. Indeed, it might be more logical to split it into more, thinner booklets, so that those covering the most rapidly changing and developing techniques could be up-dated more frequently, and those dealing with slower-moving topics, such as aerials, could be revised at longer intervals.

Amateur Radio Techniques is in 243 x 148mm. format and would be a useful addition to the library of the experimentally-minded amateur. It is available from S.W.M. Publications Department at £6.00 including postage and packing.



RETURNS!

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CLUBS ROUNDUP

By "Club Secretary"

ONE of the areas which is particularly booming is, with no doubt at all, this clubs feature. We are now getting to the point where we shall either have to be very hard in weeding out clubs who don't update in time, or go to a simple listing. Frankly, a listing would use up much less space, but of course would do nothing to show an intending visitor or potential new member what the gang are like. In other words updates on time, or OUT you go until we get one!

So — let's get started immediately, with **Acton, Brentford & Chiswick**. Chiswick Town Hall is their place, on May 19, and the talk will be by G4HMC, who will be talking about his experiences with QRP on Forty.

Ashford — the Kentish one, that is — have their Hq up at the top of Hart Hill, which is near Charing, where they are to be found on Tuesdays each week. However, *they* owe us an update, so best check with the Hon. Sec. at the address in the Panel.

Our next port of call is **Barking**, where the locals foregather at Westbury Recreation Centre, Westbury School, Ripple Road, Barking, where they have four evenings each week: on Mondays they usually have a rig clinic, Tuesdays is morse night both for beginners and advanced, Wednesdays are constructional, while Thursdays are the "main" sessions when they usually have a speaker or films, etc. May 14 is down for "Professional Radio Communications" by G4FKI.

Over to **Bournemouth** and here we have a "stop press" follow-up to the newsletter which indicates that there is a likelihood of a change of club meeting-place by the time this gets to print. This being the case, we feel it best that you should contact the Hon. Sec. — see Panel — before making any attempt to visit this very large and successful group. The new place will probably be the Conference Rooms at the Coach House Motel, Tricketts Cross, Ferndown, if all goes to plan.

If you have an interest in RTTY, then you should be a member of **B.A.R.T.G.** This group caters for all those interested in the mode, whether by "old-fashioned" Creed machines or the electronic versions. Details from the Hon. Sec. — see Panel.

At **Bury** they have the problem of a large club; over 100 members tends to be a bit of a handful for the programme organiser, if he is to look at all their interests when putting the programme together. They are at Hq every Tuesday — Mosses Community Centre, Cecil Street, Bury — but they make the second one in each month the main one. Thus May 12 will see them listening to the RSGB's RR, and doubtless putting their questions.

We seem to have gone a bit out of order and forgotten **Bishops Stortford**; the routine here is fairly simple, with a Hq at the British Legion in Windhill, on the third Monday each month. Details of whatever's new from the Hon. Sec. — see Panel.

On to **Cannock Chase**, who are to be found at the Bridgtown War Memorial Club, Union Street, Bridgtown, near Cannock, every Thursday.

Cheltenham have May 7 and 15 booked at the Old Bakery, Chester Walk, Clarence Street, the first date being set aside for G8JXS to come along and talk about RAEN, while the other one is a natter evening.

The chaps at **Cheshunt** are still meeting at the Church Rooms, Church Lane, Wormley, near Cheshunt on Wednesday evenings. Details from the Hon. Sec. May 6 is down for RAE revision, and on 13th they have a natter night; May 20 is an illustrated talk by G8DJU on Sierra Leone, and on 27th another natter night. And

we mustn't forget the club magazine — one of the best we have seen lately. It will be of interest to both members and other locals who hope to pass the morse test that from the end of April they will be running a twelve-week course at Turnford branch of the East Herts. College; details from G3OJI QTHR. It should be noted that if there is enough support and it is maintained, they may be able to get a morse class running in September to go through the winter.

Chichester is one of many clubs we know to have gained membership through this feature; they are to be found on the first Tuesday and the third Thursday evenings of each month at the Lancastrian wing of Chichester High School for Boys, Basin Road, Chichester. On May 5, Cdr. H. Hatfield will be talking of the spectrohelioscope and how to drive it. May 21 is down to G3WPO, subject not specified, but we suspect not unconnected with his Mark 2 RX80.

Chiltern have a place at the John Hawkins factory canteen, in Victoria Street, High Wycombe, where they recently had an AGM, and elected a new Hon. Sec.; we aren't given his name and address, so for this time we'll put the old name and address in the panel and hope for the best. We don't think he'll refuse to give you the gen!

Deadline for "Clubs" for the next three months—

June issue — April 24th
 July issue — May 29th
 August issue — June 26th
 September issue — July 31st

Please be sure to note these dates!

Wednesdays at **Chesham** come next, and we are told the place to head for is Whitehill Community Centre, Chesham. On the second Wednesday they have a formal meeting to deal with business, suggestions and so forth, while the other Wednesdays are devoted to nattering, construction or whatever. However, note that the club are on the lookout for a new Hq so perhaps it would be as well to ask the Hon. Sec. — see Panel.

Now to **Clifton**, who we reported last time as having moved; it seems this may have been only temporary, and they may well be based in yet a third spot by the time this reaches you. We recommend, therefore a contact with the Hon. Sec. — see Panel for his address and phone number.

Colchester next; at Colchester Institute, Sheepen Road; May 14 is down for the NFD and Anglian Rally final details.



The handsome lads of York A.R.S. Founder member Arthur Horner, G3FTS, is sitting (with hands clasped) in the front row; he is now a honorary life member.

Another group who will be making their last appearance unless we get an up-date is **Congleton**; the venue is the local library, where they have been "promoted" to using the lecture theatre. All the latest from the Hon. Sec. — see Panel.

May for **Cornish** is a surplus equipment sale, and the venue for this is the SWEB Clubroom, Pool, Camborne on May 7.

Another gang who are in need of an update are the **Coventry** crowd — they are at Baden Powell House, Radford, Coventry. Details of the rest from the Hon. Sec.

Still in Coventry, there is a group at the **Coventry Technical College**; they have Monday evenings in the Winfray Annexe normally, but we note that there is a "provisional" down against May 4 for a visit to Mercia sound studios.

Now to **Crawley** which just has to be the most consistently successful club in a New Town; for the dates look at the second and fourth Wednesday. The first is the main one, at Trinity United Reformed Church Hall, Ifield, but the latter is an informal at a member's home, so for this it would be courtesy to check with the Hon. Sec. — see Panel.

As the current issue of the **Cray Valley** newsletter is mainly about the AGM, it doesn't give any programme details; for that we must refer you to the Hon. Sec. — see Panel.

No errors at **Crystal Palace** where the Hon. Sec. notes them for us — May 16 is down for "Valves: An Historical Survey" by G6JP — and we reckon he is maybe the best qualified person in the country to do so. As for the venue, Emmanuel Church Hall, at 2000 clock, and the third Saturday in the month.

Dartford Heath D/F is a pretty clear sort of title for a club specialising in D/F, and is based at the Scout House, Bromhill Road, Dartford. Normally they are there on the first and third Fridays, but when the weather is nice in summer, check with the Hon. Sec. first — see Panel.

Every Wednesday at 119 Green Lane, **Derby** the top floor will be full of radio amateurs doing such things as: May 6, a junk sale; May 13, a talk on railway radio systems; May 20 a night on the air with the club station, and on 27th G3VGW will talk and demonstrate the use and misuse of coaxial cable. There is also a plan to visit the Open Day at RAF Waddington — details from the Hon. Sec.

"Test your equipment" is the theme for the **Dumfries & Galloway** group at the Cargenholm Hotel on May 18. This follows the general pattern of having the first Monday for a natter and the third for the formal session.

East Antrim are still looking for new members, to appear on the second Tuesday of each month at Carrntall Hall, near Mossley — details from the Hon. Sec.; and if you catch him let him know we need an update! May 12 is down for a VHF D/F event.

East Kent seem to have their main meetings at the Dominican Hall in Canterbury, but we have to look at the files to discover it is usually the first Thursday. Update please!!

At **East London RSGB Group** the newsletter is very well filled with details of the more interesting dates of *other* local clubs — and it is surprising to realise just how many there are! Anyway, back to East London, at Wanstead House, 21 The Green, Wanstead, not two minutes walk away from Wanstead Tube station. Unusually, they have Sunday dates — the third Sunday at 3 p.m.

Edware the dates are May 7 and 21. The former is provisionally down for the RSGB's "Open Door" programme on amateur radio, while the 21st is down for an informal natter and debate. As ever the venue is the Watling Community Centre, 145 Orange Hill Road, Burnt Oak.

Down to **Exeter** the P.R.O. has left us a bit puzzled; he speaks of informals on the first, third and fourth Mondays of the month at the Scout Hut, Emmanuel Road, Exeter. He then goes on to talk of an inter-club quiz on a second Monday; and the letter head says the Hq is at the Community Centre, St. Davids Hill, Exeter. Perhaps the Community Centre is just used for the main evening each month and the rest for a natter? Details from the Hon. Sec. — see Panel.



Verulam A.R.C. have raised nearly £400 towards an appeal on behalf of the maternity unit at St. Albans City Hospital. On February 7th. the club operated two special activity stations, G8VER and G3VER: sponsorship was sought for a total of 200 contacts during the day, and G8VER on 2m. sideband and FM, aided by the HF station mainly on 80m., reached the target with an hour to spare. Pictured here, left to right, are David Bathurst G8TVL, Derek Turner G8LDR (operating), Paul Read G8XBE, Hilary Clayton-Smith G4JKS, Gerald Howe, G8XDU, and Frank Clayton-Smith G3JKS (club chairman).

Fareham have May 6 for a talk on transmitters and TVI, and on May 20 they have a talk on power supplies; the venue is at Portchester Community Centre, in Room 12. The members may be interested to know that once when we were in the area we were told the club could be found by following the feeder run!

Grafton are at the "Five Bells" pub in East End Road, Finchley, on the second and fourth Fridays in the month throughout the year. Programme details from the Hon. Sec.

For **Guildford** the last meeting of April was the AGM, so doubtless when this comes to be read the new committee will have sorted something out for the May evenings at the Model Engineers Hq, Stoke Park — the second and fourth Fridays. If you see steam about and hear chuffing noises, you've probably got the wrong club or the wrong night!

Hereford have the County Control, Civil Defence Hq, Gaol Street as their Hq, and despite its rather forbidding venue the club continues to grow. We can tell you that the meetings are on the first and third Fridays, but lack of an up-date means we can't tell you what's on!

Ipswich have a frustrated journalist somewhere among them; what with the advertising and the distribution to other clubs, he must have a fair old task on his hands.

The club is now based on the "Rose and Crown", 77 Norwich Road, Ipswich, where they foregather on the second and last Wednesdays of each month. May 13 covers HF Contest Operating by G4GVW, and on 20th the last details for the East Suffolk Wireless Revival will be settled — this is May 24, by the way.

It's nice to see an **IRTS** newsletter in the pile again — it almost seemed to be going to cease for want of an editor. Having got that back on the rails, they go on to indicate concern that the regular Monday evenings at 91 Lower Baggot Street, Dublin, seem to be falling away a bit. So — get in there and join!

Over on the **Isle of Wight** the locals are to be found from around eight on Friday evenings in the Unity Hall, Wootton Bridge, I.o.W.

It's nice to see club news from GM-land, as they seem very reluctant to send their details to us. Not so **Kilmarnock and Loudoun**, who have the first and third Tuesdays in the month at the Buchanan Centre, Riccarton, Kilmarnock; we understand this month sees the AGM and then we shall be receiving detailed updates — good!

Names and Addresses of Club Secretaries reporting in this issue:

BARKING: A. Sammons, G8IZN, 80 Lyndhurst Gardens, Barking, Essex IG11 5BZ. (01-594 2471)

CHESHUNT: M. Bragg, 2 Elm Drive, Cheshunt, Herts. (Waltham Cross 32114)

CHICHESTER: S. Talbot, G8FCX, 31 Pier Road, Littlehampton, W. Sussex BH17 5LW. (Littlehampton 5082)

CONGLETON: N. R. Clayton, G8UYT, 2 Moorfields, Leek, Staffs. (Leek 385992)

E. ANTRIM: J. Welch, G14JXM, 20 Bryantang Brae, Doagh, Ballyclare, Co. Antrim BT39 0R.J. (Ballyclare 40384)

E. KENT: N. Gerolemou, G8PFE, 63 Cobblers Bridge Road, Herne Bay, Kent.

EXETER: G. Draper, 1 Carlyon Close, Exeter EX1 3AZ. (Exeter 37170)

LEEDS: Hon. Sec.'s name and address wanted..

LIVERPOOL: R. Simmons, G3PNS, 62 Daneville Road, Liverpool L4 9RG.

MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 2AN. (021-422 9787)

NORTH DEVON: H. G. Hughes, G4CG, Crinnis, High Wall, Sticklepath, Barnstaple, Devon EX31 2DP.

PONTEFRACT: N. Whittingham, G4ISU, 7 Ridgedale Mount, Pontefract, W. Yorks. WF8 1SB.

R.A.I.B.C.: Mrs. F. Woolley, G3LWY, 9 Rannoch Court, Adelaide Road, Surbiton, KT6 4TE.

REIGATE: Dr. J. S. Roberts, G4FDJ, 15 Bakehouse Road, off Horley Row, Horley, Surrey.

SEFTON: L. Gurney, G4LBJ, 1 Endbourne Road, Orrell Park, Liverpool L9 8DP. (051-523 6077)

STEVENAGE: E. Godfrey, 94 Common View, Letchworth, Herts. (Letchworth 72184)

TAMWORTH: C. Kirby, G4FZN, 35 Fontenaye Road, Tamworth, Staffs. (Tamworth (0582) 69708)

WACRAL: L. Colley, G3AGX, Micasa, 13 Ferry Road, Wawne, Nr. Hull, Yorks. HU7 5XU.

See April issue 'Panel' for names and addresses not appearing here.

The **Leeds** gang are having a week-end Hamfest, all-same mid-1960s, in response to popular desire. This one is slated for June 26-27-28, and tickets for the various events will be available from the Leeds Amateur Radio Shop; and while you're at it see if you can get someone to send us some data on the club and the Hon. Sec.'s name!

Liverpool have a place in the Conservative Rooms, Church Road, Wavertree, where they have something organised for every Thursday evening.

Now to **Medway**, which means St. Luke's Church Hall, King William Road, Gillingham, every Friday evening.

Meirion means the first Thursday evening of each month at the Ship Hotel in Dolgellau at 7.30; we need an update here too!

Melton Mowbray have the Annual Construction Trophy, to be won on Friday, May 15, at the St. John Ambulance Hall, Asfordby Hill, Melton Mowbray.

Mexborough don't tell us much about their programme, but they seem a happy group based, on Friday evenings, at Dolcliff Hall, Dolcliff Road, Mexborough.

At **Midland** we have a problem: we have the number of the new QTH over which they have been slaving for some months — 294A. However, although we believe this to be in Broad Street, we aren't certain — so please refer to the Hon. Sec. This important as we have it that they have no further bookings at the University of Aston.

A familiar handwriting comes out of the past, to let us know that **North Devon** have some changes in their arrangements. In the even months they are at Bideford Community College, Abbottsham Road, Bideford, and on the odd months they go to Pilton Community Centre, Barnstaple. August is left blank; we understand this has been done so that the reduced meeting rate will leave room for other activities such as RAEN.

May up in the **Northern Heights** sees them on May 13 listening to G3NXM talking about HF aerials, and on 27th they will have a demonstration of Tandy computers. We hope someone has an HF rig with them to hear how much QRM has to be suppressed before they can be used alongside the rig! The gang are there (Bradshaw Tavern, Bradshaw, Halifax) every Wednesday, the remaining meetings being down for nattering.

Peterborough are still steadily pressing on; they meet on the third Friday of the month in the Scout Hut, Lincoln Road, Peterborough.

Pontefract is a club we've not heard from for years; however they are happy and well at Carleton Community Centre, Pontefract, where the routine is to get together on alternative Thursdays. May 14 is film night, while on May 28, G8VFF will be talking about QTH squares. The club are up on the top floor of the Hq, and the bar on the ground floor — they say it's safer that way!

R.A.I.B.C. needs to hear of possible new invalid or blind members on the one hand, and that they need supporters and representatives on the other. Details from the Hon. Sec.

Now to the **Reading** programme; firstly the home base is the club room of the "White Horse" pub in Emmer Green, off the B481 Reading-Nettlebed road. They will be in residence on May 12 for last details on HF NFD and an "alignment evening", with a junk sale on 26th.

It looks as though the **Reigate** group have lost their newsletter. However the gang will continue to exist on the third Tuesday in each month at the upstairs meeting room of the Constitutional and Conservative Centre, Warwick Road; this gives us May 19.

The **Royal Navy** group is one of world-wide membership, covering RN, Merchant Navy, and members of foreign navies, present and retired — the membership (if you are eligible) is worth it for the newsletter alone! Details from the Hon. Sec. — see Panel.

St. Helens appear next — always a welcome sight, the first "S", as it means we've put a big dent in the pile! Anyway, they live in the Conservative Club, Boundary Road, St. Helens. May 7 is a night-on-the-air, and against 14th appear the magic letters TBA. On May 21 there is a surplus sale, and on 28th G4LHL will talk about the history of British television.

On to **Salisbury** where the Hon. Sec. tells us they have a place at the Activity Centre in Wilton Road, every Tuesday.

At **Saltash** the first and third Fridays are the ones, at Burraton Toc H hall, which lies on the junction of Warraton Road, and Oaklands Drive, Saltash.

Like Saltash, **Scunthorpe** owe us an update; their venue is in the Shack, Grange Farm Hobbies Centre, Franklin Crescent, Scunthorpe. They get together every Tuesday.

Next we head back to Liverpool to **Sefton**; the group have Hq at the Prison Officers' Social Club, in Hornby Place, off Hornby Road, on alternate Wednesdays from May 6.

Silverthorn are about the only group we know of based in a "stately home", namely Friday Hill House, Simmons Lane, Chingford, London E4, where they are to be found every Friday.

A new Hq is noted by the **Southampton** crowd, they having now moved to the Toc H building, Little Oak Road, Bassett, Southampton, where they have every Wednesday.

Now **Southdown**, and here the form is to head for the Chaseley Home for Disabled Ex-Servicemen, Southcliff, Eastbourne, on the first Monday of each month.

Southgate's new P.R.O. forgot to tell us about the May meetings or the venue (shame!). However, our files tell us the venue is the Scout Hut in Wilson Street, Winchmore Hill Green, where they are to be found on the second Thursday of each month.

On now to **Spalding** where, on May 1, the group will foregather at the Teacher's Centre, Knight Street, Pinchbeck, for a discussion about the forthcoming Tulip-Time Rally.

Stevenage is still using the Senior Staff Canteen at British Aerospace Site B, Gunnells Wood Road, on the first and third Thursdays of each month.

Stourbridge always meet at Longlands School, Brook Street, Stourbridge, but we haven't had an update for some time so we must refer you to the Hon. Sec. for the latest details.

Sunderland have a radio club, based on the Brewery Yard, Westbourne Road, Sunderland, on Monday evenings; we have it that extra evenings will be used to take in morse and RAE classes. Details from the Hon. Sec. — see Panel.

On we go to **Surrey** and *TS Terra Nova*, 34 The Waldrons, South Croydon, first and third Mondays, but an update would tell us a bit more — so we have to refer you to the Hon. Sec. for the latest details.

Sutton & Cheam have two venues, and as we don't have a May programme list we can't give you either with any confidence. Hence we refer you to the Hon. Sec. — see Panel.

We have a new reporting from **Tamworth**; the group is to be found at the "White Lion", Lichfield Street, on the second and fourth Mondays, but on the remaining Mondays in each month they have their own shack to fall back on. Thus, May 4 they have a D/F Hunt, May 11 is a talk on Air Traffic Control by G8AIR, May 25 is missed as it is Spring Bank Holiday, and that's it for the month!

Thurrock next, in the rarefied atmosphere of the top floor of Grays Park Hall, Orsett Road, Grays, Essex, every Tuesday evening — visitors especially welcomed.

The **Vale of the White Horse** gang have produced a newsletter bearing a version of the famous chalk horse on the front page. They have a formal meeting on the first Tuesday in the month, with the others being informal sessions in the "White Hart" in Harwell Village. Details on the May doings can be obtained from the chap in the box — he's a "temporary" until the AGM, we guess!

Verulam's May meeting, on May 26 will be given by G3OHX, his topic being the old favourite of BCI/TVI. The venue is the Charles Morris Memorial Hall, Tyttenhanger Green, Tyttenhanger, near St. Albans.

Most regular readers will know that the letters **WACRAL** refer to the group of committed Christian radio amateurs and SWLs throughout the world. Details from the Hon. Sec.

At **Wakefield** May 5 is down for a talk on inland waterways by G4IKH, and on 19th they have a junk sale. The Hq is at Room 2, Holmfield House, Denby Dale Road, Wakefield.

A fat newsletter from **West Kent** tells us that on May 8 they have a Constructional Contest, the venue being the Adult Education Centre, Monson Road, Tunbridge Wells.

Wirral use the Sportscentre in Grange Road West on the first and third Wednesdays of each month for their meetings; May 6 for G3UJX to talk about amateur licence conditions and their interpretation, and on 20th they will be hearing G4KPY and "More Simple Circuits".

Yeovil have May 7 for "Measuring Aerial Input Impedance", and on 14th they tackle SWR; May 21 is down for making tuned circuits with G3MYM, and on May 28 they have a natter session.

Finally, **York** where the recent junk sale produced of all things of pair of *bath taps*, not to mention a rogue halfpenny in the hands of G8PXB which added to the entertainment! The venue is the United Services Club, 61 Micklegate, York, every Friday except the third

Finis

To a big pile of mail. Will all those who have been mentioned (and the rest, come to think of it!) please let us have their latest information, and in particular any *changes*. The deadline is in the 'box', and the address "Club Secretary", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts AL6 9EQ.

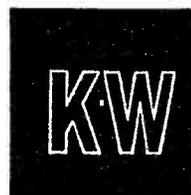
Mobile Rallies — 1981

May 3, Maidstone YMCA A.R.S. Rally at the 'Y' Sportscentre, Melrose Close, Cripple Street, Maidstone, 10 a.m. to 5 p.m., trade stands and licensed bar. **May 17**, Northern Mobile Rally, Victoria Park Hall, Keighley, 11 a.m. to 4.30 p.m. (10.45 a.m. opening for wheelchair and blind visitors), talk-in on 2m. FM S22, and 70cm. FM SU8 and RB14, trade stands, licensed bar, children's attractions. **May 24**, Plymouth Rally, Tamar Secondary School, all the usual attractions; details from G4KXZ, QTHR. **May 24**, East Suffolk Wireless Revival, IACSSA sportsground, Bucklesham, Ipswich, from 11 a.m., trade stands, transceiver clinic, aerial testing range, licensed bar, excellent family attractions, GB4SWR talk-in on 2m. Further details from Jack Toothill, G4IFF, QTHR, tel: 0473-44047. **June 7**, Hull Mobile Rally, at the University of Hull Students Union Building, Cottingham Road, Hull, opens 12 noon, talk-in by GB3HS on S22 FM, trade stands and family attractions. Details from G8EAH, QTHR. **June 14**, HMS Mercury Mobile Rally, 10 a.m. to 5.30 p.m., details from G4DIU, QTHR. **June 14**, Elvaston Castle Mobile Rally, Elvaston Castle Country Park (5 miles S.E. of Derby), opens 10 a.m., talk-in on 144 and 432 MHz from 9.30 a.m. by GB2ECR, trade stands and several special family attractions. Full details from G4CTZ, tel: 0332-71875/799452. **June 21**, Denby Dale and District A.R.S. Mobile Rally, Shelley High School (on B6116), doors open 11 a.m., talk-in by GB8CDD on SU8 and GB4CDD on S22, trade stands, licensed bar, parking and refreshments. Full details from G3FQH, QTHR. **June 28**, Longleaf Mobile Rally, Longleaf Park, Nr. Warminster, Wilts. Details from G4FRG, QTHR, tel: 0272-848140. **July 12**, Worcester and District Mobile Rally, Droitwich High School, Droitwich (3 miles from M5, Junction 5). Further information from G8NSL, QTHR, tel: Worcester 620507; or G4EKG, QTHR, tel: Evesham 41105. **July 19**, Sussex Mobile Rally, Brighton Race Course, 10.30 a.m. to 6 p.m., trade stands, entertainments for all the family, restaurant and bar, parking for 4,000 cars. Full details from A. K. Baker, 07912-5327. **July 19**, Cornish Mobile Rally, Cornwall Technical School, Pool, Camborne. Details from G2ABC, QTHR, tel: Truro 78393. **July 26**, Scarborough A.R.S. Mobile Rally, at the Spa Ocean Room on the sea-front, starts 10.45 a.m., talk-in on S22 and GB3NY on RB0, licensed bar, refreshments, bring and buy, free admission, help for RAIBC members. Information from G4JAQ, 0723-862638, or QTHR. **July 26**, Anglian Mobile Rally, Stanway School, Colchester, 10 a.m. to 5 p.m., talk-in on 144 MHz. Details from G3YAJ, tel: 020639-3938. **August 9**, Derby and District A.R.S. Mobile Rally, Lower Bemrose School, Littleover, Derby. Details from G4EYM, QTHR, tel: Derby 556875. **August 30**, Torbay A.R.S. Mobile Rally, at the I.T.T. Social Centre, Paignton. Details from G4DZH, QTHR.

We shall publish information on other Rallies as we receive it.

Special Event Stations

To mark its Golden Jubilee, the **Midland** Amateur Radio Society, GB4MAR, will be running a multi-station operation throughout **June**, and issuing a special QSL card; they are also issuing an award for this event open to any radio amateur or SWL, worldwide. Full details are obtainable from J. K. Harvey, G4IVJ, QTHR. **August 1**, RNARS will be operating a station on Yeovilton Air Day. Details from G4DEP, QTHR.



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“ENHANCE YOUR Q-QUOTIENT” HE SAID

JACK HUM, G5UM

ANOTHER ineffable club-night moment was nigh. The lecturer had long since departed in his swish company car. Most to the members, blinded by his science (the subject had been microcircuits) had straggled off down the hill after him. A final few of them remained standing in the doorway gazing at the city lights below.

“How about a final-final brew-up?” murmured Old Fangler. No second bidding was needed: in minutes the old tin tray was on the table by the door where two hours before Mister Treasurer had been collecting tenpee pieces, and the effulgence of warm tea rose upon the air.

“One of the delights of British civilisation, tea” observed Mister Maths “. . . and the more so when it’s out of proper cups like these and not from horrible metal mugs”.

There was a ripple of assent from the others: there would have been, any way, for club members regarded Mister Maths with a respect verging upon awe. He being a school teacher possessed the rare gift of rendering the innumerate capable of passing the Radio Amateurs’ Examination.

“The Yanks have never been the same since they threw it into Boston Harbour in 1776” observed young Virginibus Puerisque: “and what’s more the French helped ’em do it . . . they were their allies at the time”.

Old Fangler turned slowly round to young VP: “That’s all past history, my young friend . . . I know the Americans have not taken to tea like the British have, and I know that the French have got a lot to answer for, including these darned kilometres and kilograms and metric what-nots, but never forget, lad, they are all brothers with us under the skin”.

Warming to his dissertation he added, perhaps a little unkindly: “And if you got yourself a Class A licence instead of talking around town with that silly little omni aerial sticking out of your chimney you’d soon find out”.

Young Virginibus being a well brought-up lad who had been taught (unlike some of today’s young) that you don’t often argue with your elders because elders are generally better for the simple reason that they have been around longer, allowed himself the politely phrased observation that a lot of the Class B licensees knew a great deal more about electronic art than the oldsters, and at least they didn’t go drooling on for hours on 80m. nets.

Always magnanimous, Old Fangler laughed and said “Points taken, lad” as he raised his tea cup.

“You really enjoyed that” said burly Ethelbald as he too drank up: “. . . there ought to be a Q-signal for ‘quaff’”.

Virginibus observed that as a phone-only operator he thought Q-signals not only superfluous but — dare he say it? — a wee bit exhibitionist when after all you could use plain language to say the same thing. From this view Old Fangler dissented strongly: he declared that to him Q-signals represented much in little and thus had great value in keeping overs concise and to the point, be they *via* key or larynx. It made him wince, he went on, to hear people yarning repetitiously away when they could encapsulate much of what they wanted to say by using the appropriate Q-codes, even on voice, without appearing to be discourteously terse. It made him, he said, especially ill humoured to hear phrases like “Negative on that one” or “That’s an affirmative” when all that was meant was “No” and “Yes”.

Not to be entirely suppressed, Virginibus Puerisque essayed the thought that over-use of Q-signals on voice approached some of the mindless baby-talk the CB-ers used. Perhaps he said it for

devilry, knowing that even the tolerant Mister Maths would not agree.

Indeed, he didn’t: “The Q-code is official, it’s been used for decades and decades and carries a wealth of meaning to operators who bother to mug it up . . . and don’t ever mention CB again in my hearing, young man, because what *they* say is entirely artificial and rooted in exhibitionist one-upmanship”. Having delivered himself of this homily Mister Maths drew in his breath deeply and added: “It’s getting late . . . better quaff the last coppers and off down the hill . . . we can discuss the Q-code a bit more on our way home”.

They did. They agreed it had great potential — but then it always did (“Especially for talking with those Yanks and French and all those other foreign bodies” chimed in Virginibus).

As Old Fangler turned the lock of the clubroom door Mister Maths said: “Yes, let’s talk a bit more about it . . . you know, there are many more Q-signals we could use but don’t. What about QRB, meaning the distance between stations? It’s a lot more important than that stupid phrase ‘the handle’”.

This gave club-member Ethelbald the opportunity to fulminate on the folly of using artificial terms like “the handle”, for he indeed had had great difficulty in putting over his first name to the importunate who insisted on knowing it before they would continue the QSO.

“When I say ‘Ethelbald’ they wonder whether I’m male or female” he complained, as the four of them walked briskly down the hill.

That’s because of your rotten SSB quality” gibed Old Fangler: “Tell ’em they ought to try some slow scan television to see that ugly mug of yours and that rugby jersey; *then* they’d be in no doubt”.

“Next bloke who asks me for the handle will be told it’s in the smallest room in the house” growled Ethelbald.

There was not far to go now before the four of them would take their separate routes home. “Quick, before we part, shout out some of the Q-signals we don’t often use but ought to” puffed Old Fangler, trying to keep in step with the younger ones.

“Well, if you are a morse man you can’t do without QRQ, QRS and QSZ” replied Mister Maths.

“I like QUA, meaning Have You News of So-and-So” added Ethelbald: “. . . no need to mention QSP: we often use it, don’t we? But I rather care for the next one, QSR, to ask for a repeat of a call. Could be used a lot on 144.3 when you get those pile-ups. It would be a change from QRZ”.

To the surprise of the older three Virginibus then piped up with QTR, which he said he often used because his wrist watch never kept time and he couldn’t yet afford a digital clock for the shack. Sadly, he added, few people on “Two” knew what he meant when he said “QTR please” and he had to go through it all again in longhand.

It was now almost the parting of the ways. “I remember” said Old Fangler, the ruminative look in his eyes barely visible to the others under the street lights: “I remember when we were in the habit of making up self-evident Q-signals of our own. There was QLF, meaning ‘Send with your left foot now’ if you met a rotten CW operator. And there were QMH and QHL, meaning tuning medium-to-high or high-to-low . . . you never use ’em now . . . everyone’s co-channel”.

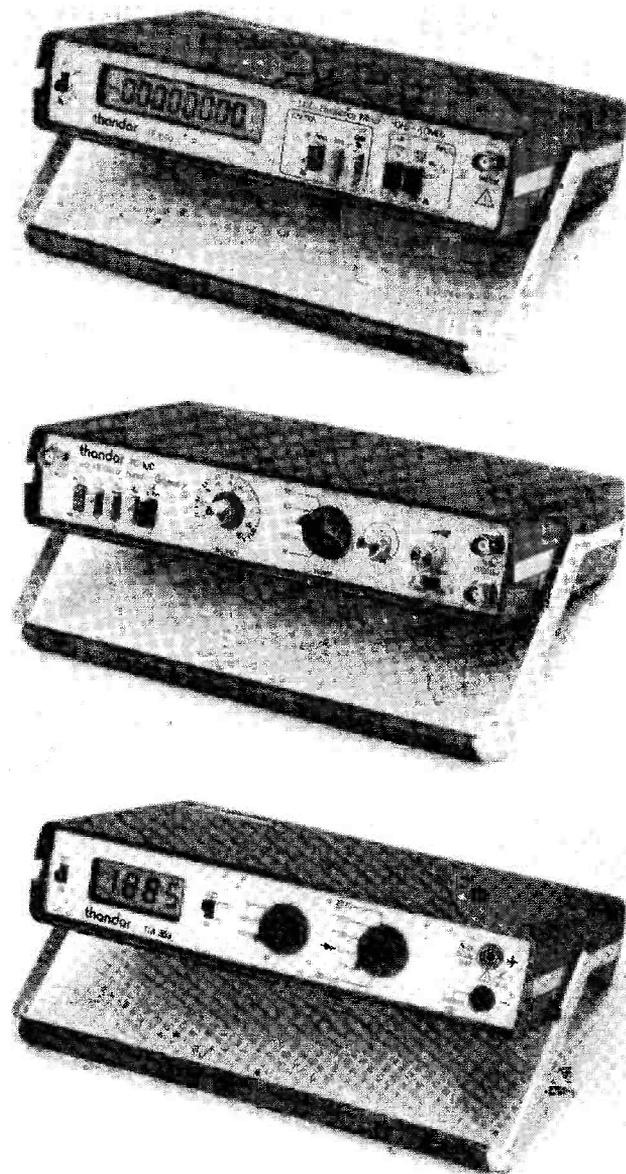
Mister Maths felt constrained to say that you had to be very careful in inventing new self-evident Q-signals or you might run into trouble. “I once wrote a letter to a mag saying we should adopt QWU for contests to signify ‘Have Worked U’ when a station calls you whom you’ve worked already. I may tell you that I was quickly smacked down the next month by a letter which said ‘Sir, the man cannot be allowed to suggest this. The group QWU is already allocated. It means ‘I am towing a glider.’ And it does!”

“So much for your flights of fancy” said Old Fangler (“What a rotten pun!” quipped Virginibus).

“But what a subject of the next club meeting!” exclaimed Ethelbald: “Let’s bill it as ‘Enhance your Q-quotient’”.

To this suggestion Mister Maths said that as a pedantic sort of chap he objected to the use of the mathematical term "quotient" . . . it stood for the result given by dividing one quantity by another, he said.

"Now isn't that exactly what the Q-code does!" said O-F: "Yes, a good subject for the next meeting. Now I'm off before we start on a final-final-final". And he disappeared into the darkness.



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"A Word in Edgeways"

Letters to the Editor

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

Dear Sir — We felt we should say how amusing we found Mr. Kirk's letter in the April issue about the G4 who was trying to work the beacon on 160 metres. It's possible, one supposes, he was so sick of listening to the old-timers working this particular band that he thought working the beacon might be a little more stimulating. It's a pity he had trouble copying the call sign, though.

Mr. Kirk is obviously a gentleman who appreciates amusing incidents, and we would suggest that he listens from time to time on 10, 15 and 20 metres, where he will find equally amusing stories to relate. On a number of occasions recently we have been just a little amused, and at times extremely frustrated, when we have been waiting to work one of the rarer DX stations — who was very clearly just exchanging reports and trying to work as many of the world's amateurs as possible — only to have one of the G3's of about 1952 vintage attempt to explain in very great detail his entire life history, and that of his family, while the poor unfortunate DX man slowly disappeared into the noise. On two occasions recently, the DX station has broken in to say he would QSY 5 kHz higher, where he continued giving his reports, leaving the old G3 (possibly a refugee from Top Band) talking to anyone not fortunate enough to hear the DX station say he was moving.

Incidentally, in case you are wondering, myself and my wife have neither the antenna nor the inclination to work Top Band.

Lloyd (G4JQO) and Olivia (G4KQX) Hobson

Dear Sir — I read with astonishment, pity and compassion the *cri de coeur* from the lady amateur, G4FID, in your March issue.

Overcome with curiosity, I had to find out in what portion of our sceptred isle the unfortunate lady resided. I therefore consulted the great volume of amateur call signs to find that this person, who wastes a page-and-a-half of valuable space bleating that no one recognises her, has the impertinence to withhold her particulars.

Let her be informed in her unfortunate condition that there are those who recognise and know personally many lady amateurs, and who are proud to do so and are cognisant of their ability.

Perhaps if this lady would emerge from the convenience of her anonymity we could offer some more concrete consolation.

John Acton, M.Sc., FRSC, G8UXT

Dear Sir — Your somewhat loud-mouthed leader in April's *S.W.M.* encourages me to speak up and speak out for potential Open Channel operators — when autumn comes.

I write this as a one-time 'ham' (ex-G3EEE, ex-VP2GAY) whose heavy professional broadcasting activities unfortunately allowed me to let my licence lapse too long to pick up the traces (and my licence) later when I had more time for this great hobby. I was a member of the BBC for over 30 years, ending my service as the first Manager of BBC Radio Humberside.

Not for me illegal CB activities! But I was looking forward to encouragement and help to legitimate new boys and girls on 27 MHz FM from the *Magazine*, which I have read regularly for very many years with enjoyment.

From your April Editorial, it could seem we may have to look elsewhere for advice. I am a member of RSGB and also hope the society will be prepared still to welcome my own membership and that of other Open Channel "learners". Incidentally, my own short-wave enthusiasm as a listener began when, at the age of 11, I first picked up Melbourne on a Sunday afternoon — with a home-made two-valve receiver.

So: why not be prepared to be friendly and helpful to us good boys and girls when we open up our channel? We shall need you.

As an extra earnest of my own *utter* respectability, in my retirement I am currently producing, editorially and operationally, and introducing a half-hour programme of hymns and hymnsongs every week on our local radio station.

John Cordeaux, Southwold

Dear Sir — I am a regular subscriber to your fine magazine, and currently studying for my Class B licence. I am also chairman of the local CB club, formed a little over a month ago.

The purpose of this letter is to express support for any action that may be taken by Amateurs to rid themselves of CB operators on the 10 metre band. Along with a number of other serious CB operators, I have been concerned for some time about the number of rigs which are capable of entering the 28 MHz CW segment, and am fully aware that irresponsible CB-ers have at times used this band for copy.

CB is a very useful communication system when used correctly, but sadly I have to agree that there are many occasions when it is grossly misused — by people who do not care about TVI or interference in general, and it is these people who have got CB the name it has.

My aim as a CB operator, along with many others, is to try to work towards a better relationship between the Amateur and CB fraternities, and this I feel can only be done by showing a responsible attitude to the hobby, and *certainly not* by working out of band. Furthermore, I believe that 5 watts output maximum for CB is plenty.

Finally, may I ask that you do not tar all CB operators with the same brush, many of us enjoy the hobby, are eager to learn, and in many cases look to the Amateur operator for help and advice.

May I therefore offer the hand of friendship from the world of CB to the world of Amateur Radio.

Chairman, "Abingdon CB Club"

Dear Sir — Recently I had recourse to read some short wave listener reports, and was struck by the very low standard of reporting. Too many of these reports were of very little interest to the operator. It would be interesting to find out the percentage of SWL QSL return, experienced by our listeners; I should imagine that in many cases it would be very low. It should be noted that to the average operator an SWL report is only of academic interest. However this should not deter the SWL from reporting, but perhaps the following points may be of help:

(1) Do not send an operator a report who is located within a radius of 100 miles. Of course there are times when the SWL has to send out a report, such as requesting a QSL for a particular award, or for a contest report.

(2) Please put as much information as possible in your report: some of the reports I have received have been worthless in this respect.

(3) Try to be constructive in your comments regarding a transmission.

(4) Remember that not all operators are members of QSL Bureaux, so do not expect 100% return; also remember that not every operator seeks reports, or even QSL's.

The writer has sent out around 3,500 QSL cards as a listener, and had a return of 84%. No doubt the ones that got away were of no value whatsoever.

In case any listener may feel aggrieved about my comments, I must in all fairness point out that there are some listeners who do send out really valuable reports. I may also say that I always QSL

100%, but where necessary I advise the sender how to improve his report and thus enhance his return. Any listener who has sent the writer a report on transmissions made after August 1st, 1980 will not receive a confirmation as I have not been active on any band other than two-metres.

Best wishes in your hobby.

Dave Dhuglas, GM4ELV

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

AN END-FED AERIAL TUNER

F. G. RAYER, T.Eng (CED), G3OGR

DURING many years of operating, an end-fed aerial has usually been kept available, as offering a ready means of working any band from 160m. to 10m. The tuner described here is for 80m. to 10m., and has been in use for some time.

After using various home-built ATU's over the years, it was felt that clear dials for each control would be well worth while. These allow re-setting for minimum reflected power from a chart, in a few moments, when changing bands. It was also noted that series tuning could be dispensed with in circumstances where the ATU would be used, provided the aerial could be tapped down the coil; also, that separate link windings need not be used, input being to taps, as with an autotransformer.

Fig. 1 is the circuit of the ATU. Power is fed to VC1 by a 75-ohm or similar co-axial cable, a standing-wave indicator being placed between transmitter and ATU. VC1 allows tuning out or compensating for link reactance; S1 selects 2, 4, 6, or 9 turns as the 'primary'.

The whole coil has 27 turns, and S2 selects 2, 3, 4, 6, 8, 10, 13, 17, 20, 23 or 27 turns as connecting point for the tuning capacitor VC2; S3 makes use of the same tapplings, to allow separate selection of 2 to 27 turns, as aerial feed point.

It would not be essential to use the exact numbers of turns shown, as tuning tends to overlap somewhat. When making the taps on the coil, they are actually staggered to avoid all coming near each other, especially at the earthed end of the coil, and to allow short and convenient leads to the switch tags.

Construction

A 12 x 7½ x 5½-in. metal case is used. The coil former is 5-in. long and 2½-in. in diameter, wound with 7/26 stranded wire; single 16 s.w.g. or other stout wire could be used.

The general layout will be seen from the photographs. S1 is centrally placed near the bottom of the coil, which stands back from the panel on brackets made for the purpose; S2 and S3 are as near as capacitors reasonably allow.

VC2 is earthed to the metal panel, as well as by stout leads; VC1 is insulated from the panel. This was done by cutting four pillars about ¾-in. long from insulated rod, tapping 6 BA each end, and using short 6 BA screws to secure the capacitor to the pillars, and pillars to panel. The capacitor spindle is extended with a ¼-in. shaft coupler and piece of insulated ¼-in. rod, passing through a ½-in. hole in the panel. An alternative would be to mount VC1 on a paxolin panel, then to fit the paxolin panel behind the metal panel by means of long bolts with extra nuts, or spacers.

VC1 is a 2-gang, 500pF each section; VC2 is wide spaced, 200pF. Somewhat similar capacitors, if to hand, could be used.

The co-axial lead was soldered directly to earth and VC1, no socket being used. An insulated lead from S3 is attached to an insulated terminal at the back when the tuner is in its case. The three switches were single wafer non-miniature types, and connections from them to the coil are of stout insulated flex.

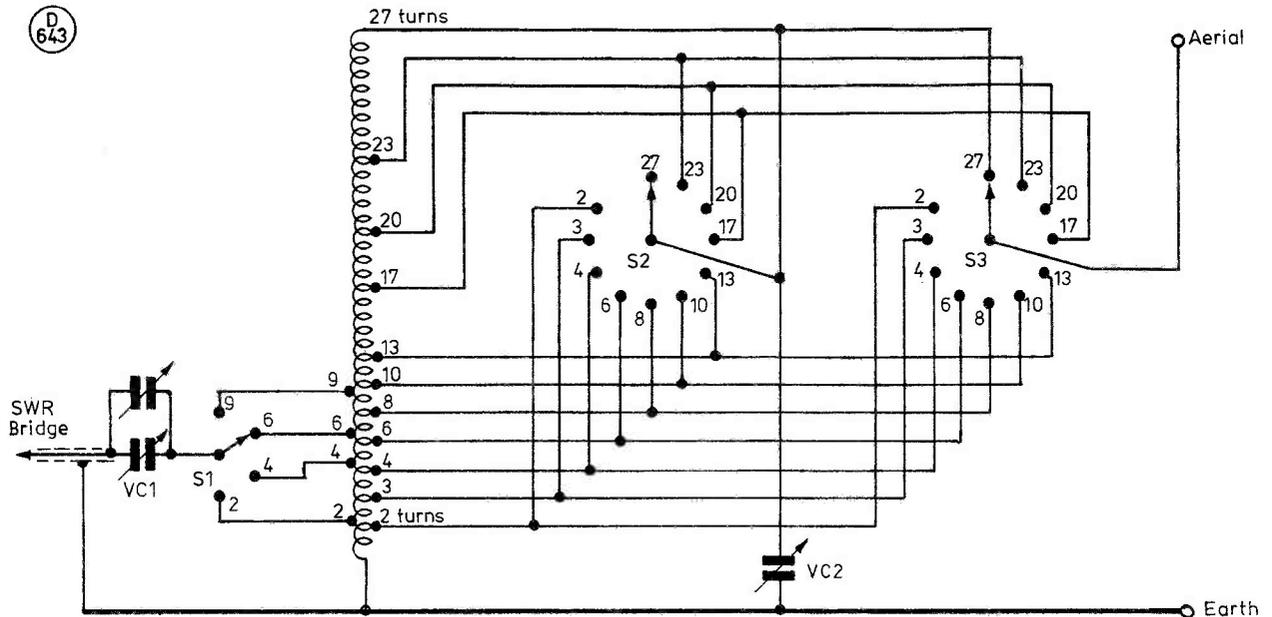


Fig. 1 A.T.U. CIRCUIT

Method of Use

S2 selects a number of turns which allows resonance within the band by VC2. Alternative switch positions can be tried for S2, to find the most suitable LC ratio available.

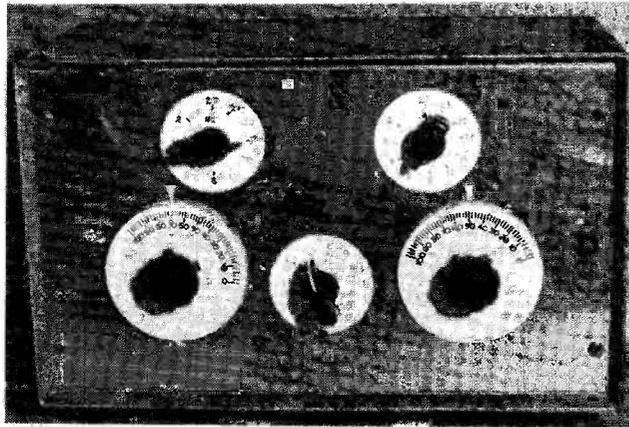
S1 selects taps allowing the Tx to be loaded — probably around 2 turns for the HF bands, and 4 to 6 turns for the LF bands.

S3 can usually be at the same settings as S2 where the aerial is a half-wave or multiple of half-waves (high impedance). For other lengths, it is tapped down suitably, as necessary to (a) allow tuning by VC2 and (b) allow loading the Tx.

Adjustment can begin with VC1 closed, but this can be opened as required to reduce reflected power.

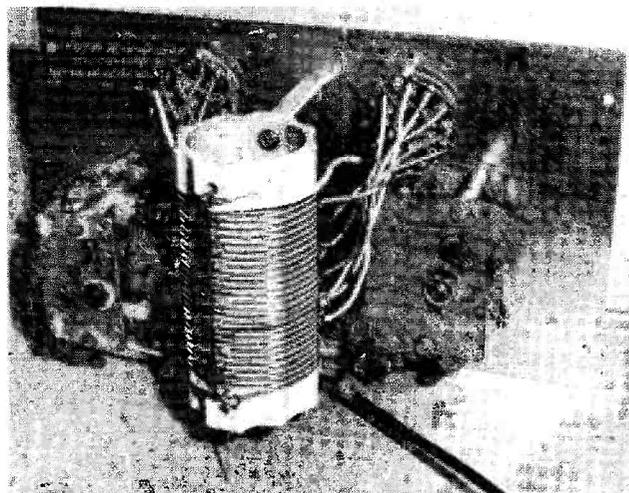
Tune the Tx for best forward power, at reduced power, then switch to reflected power, and find switch and capacitor settings which reduce this to the lowest level. Check forward power, and touch up Tx tuning if needed, re-checking reflected power. It should be found possible to arrive at settings which give a zero or almost zero reflected power indication, with full-scale forward power reading.

With an aerial of 175-ft., the table shows S1, S2, S3, VC1 and VC2 dial settings used, but these are only of course a guide. In particular, an aerial intended to have a high impedance feed point would not be tapped down to this extent.



Above, an outside view and, below, an inside view of the front panel.

	S1	S2	S3	VC1	VC2
80m.	4	20	4	62	92
40m.	4	13	4	16	10
20m.	2	4	3	5	15
15m.	2	3	3	50	10
10m.	2	3	2	30	7



The table is best made for favourite frequencies. Moving either way from these can result in slight touching up of VC1 or VC2 being in order. Very small changes in actual length of aerial can have considerable effect on 10m. or 15m. in particular; longish wires are more easily dealt with than rather short aerials. Many lengths very considerably less than the 175-ft. mentioned have been used. Power limitation seems most likely with rather short and half-wave aerials, resulting in a very high voltage across VC2, but except when using a 10-ft. indoor wire sparking-over has not been observed, using 280w. The surplus capacitor, VC2, has 8 plates per inch.

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

The Bands

AS always, part of the fascination lies in the unexpected things that happen — Top Band dead and Ten open, at one and the same midnight, for instance.

Top Band

Perhaps we should first mention WIWY. Frank, apart from writing that invaluable "Contest Calendar" in *CQ*, and passing on copies of his galleys for our benefit, is a very keen Top Band addict, and he writes about the *CQ* 160 affair as seen from Stamford, Connecticut. Conditions, he reckons were phenomenal; the DX Window was crawling with DX, and Frank found the Europeans stepping all over each other, but still managed to raise 25 stations in 13 countries on this side. The Europeans who indicated where they were listening were racking up good scores; but, as always, there were a few who didn't indicate where to call and were wasting their time. Mind, one has to take issue mildly on this, insofar as it does seem to be the case that a quick listen around one's own frequency before swinging down to the bottom five kHz seems to pay off sometimes. No doubt about it, the phasing out of Lorán-A has made the character of the band change yet again. The writer recalls when he first took on this piece everyone had 405-line TV and found it difficult to work the HF and VHF bands without TVI, resulting in lots of nattering, and lots of GDY reports, plus the Transatlantics each winter. Then the VHF black boxes and repeaters sent all the nets up to VHF, and the commercial rigs that superseded the KW-2000 series all lacked Top Band, so it became desert. Over the past two or three years it has become a DXer's dream, with all the new countries that have appeared, which in turn resulted in Top Band again being available on the new rigs, but the band continues to lack the local traffic. This is a good thing in some ways, as many countries only have limited allocations, so that the old division of CW one end and Phone at t'other has gone by the board, and both modes learn to live in harmony.

G3PKS (Wells) has a long and interesting letter this time, but while he kept his skeds he regrets he hasn't had enough time to spare on the band for DX'-ing.

Not so G4AKY (Harlow); albeit Dave and your scribe have been having all sorts of arguments as to *why* he gets out so well on an apparently impossible aerial! However, work it most certainly does: on CW some 37 European Russians, to

include Estonia, Latvia, Lithuania, Byelo-Russia, Kaliningradsk, Moldavia and UA6, not to mention all the small-fry to make up with; then Russia in Asia to include RG6GBX (Armenia), EZ6DEX (Azerbaijan), a couple of UL7s for Kazakhstan, EZ9ABB, UA9AIK, UA9CJA, RA9AKM, EZ9CAA, EZ9CAD and UA9YEN, plus OK/OLEs and SPs, VO1HP, GM3TMK and GM3HBT, EA6BH (Balearic Is., QSL via DL7FT), PA0HIP, EI0CF, G3PQA/5N0 who is back in UK and sent his card, OZ1W, OZ1UF, DM2AFA, ZD8TC for a nice surprise, and HB9FR. Turning the switch to SSB there was UP2BAW, UQ2GDQ, UQ2GBU, RA3DKE, UA3DQS, UB5WF, UA6LJV, EA2JG, EG5HM, EA3RF, EA9EU (Ceuta, Spanish Morocco), YT0R and 4N3EF (both these two in Yugoslavia), OH2TI, DL1YD, DJ8UV, DJ6TK, DJ8WL, PA3BFM, OK3KFF, SP5INQ, and GM4DTH. Not a bad month when you realise Dave also eats, sleeps and works! Aerial changes are being organised, in the hopes of on the one hand reducing TVI on the home set, not to mention reducing timebase QRM from the darned TV as well! But, 2300 to 0100z as only operating hours help keep those two snags at bay.

G4GMZ is, as it were, transiting from Greenford up to Congleton. He appears to have found temporary haven in Congleton while the "proper place" is organised, and is running some 40 metres of wire around the loft, and a Top-Band helical comprising some 80 metres of wire on 2" x 1"; these two are fed in parallel with coax, and a water-pipe earth is used, the matching being done by 20 turns of 1¼ inch (plus a capacitor on Eighty) and a switch to turn from one band to another. Coverage is 1.82 to 1.9 and 3.5-3.6 MHz. The whole works sits some 15 feet above ground level in the Dene valley with hills and houses all over the show. This unpromising all-indoor set-up, fed with a KW-2000B just back from a sole-and-heel at Decca-KW (and a good job too, apparently; quiet receiver and good RF out) started by hearing GI4KHZ and G3LQI, the latter being in Lancing on the South Coast. Then came QSOs with G4HSF in Liverpool, PA0CMP, G3YMC, G3SNX, DK5AD; better reports here than were obtained from G3HZM in Manchester twenty minutes later! The final try on Top Band was with G3ZHR in Dorchester on February 6, on which night he and several other stations on the band had a peculiar "echo" effect on them.

Top Band for G2HKU (Sheppey) meant

some little time working PA0PN, PA0INA and PA0UV, while CW found UA1CIN, UA3CH, RA9AKM, EZ5WAB, UT5AB, UK2PRC, SP5IXI, OK1KSO, and UP2BAW.

News

We have a letter from VK9NS, who was sparkplugging away for the cancelled (as reported here last month) Heard Island expedition during the past winter. Jim says there were, apart from large donations, quite a lot of small offerings; he is now beavering away at a trip during the coming season. As he says, all is not lost in any case; he will be renewing the VK0JS licence in May, but if nothing else is achieved by himself, the way has been opened for any well-meaning and well equipped and organised party to tackle Heard with governmental blessing — and that alone can't be bad!

On a different tack and at the opposite end of the world, long-time readers will recall the efforts of Willy de Roos to activate some rare DX, and to sail the North-West Passage, back when the sunspot count was at an all-time low and DX was at a premium. We note that he has written a book, entitled, not surprisingly *North-West Passage* detailing his feat. We have not yet seen the book, but would imagine it to be quite a good read.

G2HKU passes on as a post-script on the outside of the envelope to his letter, a mention of the passing of G6VC, a keen CW operator on the HF bands for many years. He will be missed by his friends around the bands.

From GM4ELV (Arrochar) we have a note that although he has been QRT on the HF bands since July last year, and is unlikely to be able to operate in the foreseeable future due to university studies and a loss of interest in HF, he has been receiving cards and reports clearly resulting from the work of a pirate. Should he return to the HF Bands, David says, it will be almost certainly 100% CW and QRP.

Eighty

Not much reporting from this chunk again. Naturally, much of the activity is QRP; G2HKU for instance runs three watts to his Argonaut, with which he managed to work EA1TR, PA0WLN, G6AB, and G3VTT.

G4GMZ, with the odd pair of aerials already mentioned, can get the SWR down to 1.1 to 1, and 30 watts of CW got out to G4BWP and G8VF — but subsequent stations called didn't reply, and CQs also

have not yielded any contacts to the time of writing. However, at the time your conductor is putting "CDXN" together John will be in the throes of moving to the new place, at which it is hoped aeriels will be somewhat better.

G3ZPF (Dudley) is still madly in love with his home computer; however, that didn't stop him working W/VEs at will, not to mention UA9 and the Mittel-Europa orchestra. The best was MIC, found wandering in the CW end, but on the other hand OY7ML remains a gotaway despite all the wiles David could bring to bear.

Very good at times but unstable during the day is the feeling of G3PKS, who heard little DX and didn't call any of it, being at the moment more interested in his latest wonder-working all-band ATU, Top Band to Ten, with orchestration and keyboard obligato by G3EIW. The object of this machine is to enable the occasional bout of "RF in the shack" to be stopped by the use of a balun at the ATU end — something which seems to have worked well for G4ITL in Harlow too. Another activity was to build a little FET audio pre-amp to boost the mike output into the HW-101; and the third an exercise in braid-breaking which was primarily intended to shut up the TV timebase noises, but seems to have had side effects like a slightly improved picture and reduction in the key-thump being heard by the TV when Jack went on Ten.

Now we turn to G2NJ (Peterborough) who mentions that G6FU, a familiar call on the band was in Frimley Park Hospital at the time of his letter, and wished to thank all those who passed on good wishes for his recovery. It is understood that G4PS was in the next ward — must be something in the local air! Our best wishes to both. On the operating front, Nick mentions a QSO with G5NX/M (CW both ways) while the latter was on his way to Southwell, Notts.; it was a pleasant surprise to be called by G2DFH down in Saltash, a wartime colleague who was copying both ends of the QSO. A new line for G2NJ is working YL stations around midnight — LA4YW in Trondheim runs 300 watts is collecting counties, and G2NJ added Cambs. to her collection. Then there was UB5MNK, Helena, Kirovsk, using fast morse and good operating.

Forty

One feels sure that a rude limerick could — and maybe should! — be composed to cover the topic of the odd noises on the band which sit on our poor amateur signals.

G3ZPF mentioned one foray on Forty to work a PA0, who worked for the JET project (Joint European Torus if you didn't know!) as an astrophysicist. Sounds to have been a nice chat.

G3PKS found the band in excellent shape, both to DX and to locals; Jack picked up KG4W, and VE3GCE, but after waiting ten minutes to get the full call of a VK2, he went back to G3PDL. There was a sked on Eighty waiting so that was that.

G2HKU stuck to CW; with the QRP, he raised UB5LI, UQ2GFM, UA9CAL, YU2SAE, while on the FT-101 UL7TBI and VP2EV were collected.

"CDXN" dealines for the next three months—

June issue — May 1st

July issue — June 4th

August issue — July 2nd

Please be sure to note these dates.

Here and — Where?

A Good Question at times. So many of the DX-peditions don't pass the word out until the last minute, when they have it all nailed down, or, if they do give advance word, by the time we have mentioned it something has come adrift — perhaps we should do a *weekly* "CDXN"! On a more serious note, there is of course just such a thing, called Geoff Watts' *DX News Sheet*, and another called the *DX Bulletin* which comes from KITN in Vernon, Ct., to name only two from many. No doubt about it, these are a great help when late changes are made, although if you are active enough and not too high in the scoring, you can usually keep ticking over.

On the awards front, we have here a copy of the *Canadaward* from the Canadian Amateur Radio Federation Inc. For this one you have to work all Canadian Provinces and Territories on a single band (twelve in all) to cover VO1/VO2, VE1-8, and VY1. Details from PO Box 2172, Station D, Ottawa, Ont., Canada K1P 5W4. We notice they have a five band version too — some sixty cards in all.

The same outfit mention their Canada Contest, running through the 24 hours GMT of July 1. All contacts count, all bands 1.8 to 144 MHz. Ten points for Canadians, one point for others, with ten bonus points for working any CARP official news station using suffix TCA or VCA. You can work each station twice on

each band, and the multiplier will be the number of provinces/territories on each band summed — a maximum of 192. For the rest, write to CARF at 203-1946 York Avenue, Vancouver V6J 1E3.

On a completely different tack, your scribe was listening on March 16, while occupied with other things, and between 1500 and around 1900z on 21 MHz there was a "thing" just sending the letter 'C' with a T4 note and chirp. Eventually, I found a moment to tune down 21.1 to the bottom, and to my surprise it had "brothers" all down the band. At the club over a pint, others had noted it and wondered what it was and whence it came; it certainly wasn't local, and we reckon not even in Europe. So anyone with ideas?

Ten

Like everything else it has its ups and downs, but it has on occasion been superb.

First a new reporter in G4LDS (Chelmsford), who steps up from G8JGK; during that period one guesses he was well occupied with a tower and TA33 to be organised, not forgetting the shack which contains an FT-101 Mk 2 plus the G3LLL trimmings. Once the start was made, with a QSO with W7IAA, some 26 countries were worked on the band, to include a quite handsome WAC — W, VE, VK, ZL, JA, UA3, EA3, DF, G(!), PY, UR2, SM, 9Y4, XE, HS, UB5, 8P6, HM, AP, VS, 5N6, FM7 and ZE.

G4BUE (Upper Beeding) is determined not to wear out his QRO valves, by the expedient of sticking to all-QRP and solid-state with the Argonaut. Chris has been somewhat busy at work also, which cut back on the activity, but the cards continue to roll in and so do the sheepskins. On the band, five watts CW was enough for him to get to PY1VOY and KL7PJ.

Another QRP merchant on Ten is G2HKU, who raised K7LR, W6ISQ, a character signing AFKI and claiming to be in Algeria (wanting Ted to give his full QTH to QSL to!), SV0AA, and PY2CQM.

The analytical mind of G3NOF (Yeovil) says the long path to VK/ZL has been open from around 0800 to 0930z, followed by the short path opening at 1100 till lunch, sometimes including some Pacific stations heard over the North Pole route. As for the Americans, they've been in from 1000 till as late as 2200z, but not a lot has been heard from Africa. SSB QSOs were made with A4XIQ, AH2E, AI7B, FK8DH, H44BH, HP1XAT, JAs, JT1AN, K6LPL/CE0 (Juan Fernandez), KB7IJ/KH2, KL7JC, KL7Y, P29NCM,

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SV0AW/SV9, TI9GI, TL8RC, UG6GAF, UH8HCM, UJ8ZAC, UK9MAA, VE7s, VKs, VK9ZD, VP10A (Yes, VP Ten A!), VP2EV, VP2EZ, VP2MCL, VP2MGQ, VP5RFS, VP5TCL, W5JMM/SU, W6s, W7s, WB9TIY/VP2A, WD0CHC (N. Dakota), ZS6FU, ZL1AAS, ZL2AFG, XT2AU, 4U1UN, 8P6OR, 8P6PF, 9K2DR, and 9VITK.

G2ADZ (Chessington) sticks to Ten, and notes it as good overall, with very good patches, such as the times when the beacons VP8ADE, VE8AA, and VK2WI have all been audible at once. His CW worked HS5AID, FM0FOL, VK4AIN, VK6NLU, ZS6BUU, OA4IU, 9K2AH, DL2VK/ST3, VP8AGY, HC4WA, and TAIUA. Gotaways included 9J2KO, 4S7MX, YC0BRT, EM6FAV from Georgia in Russia, W4PRO/CE0 who just kept on working W4s; and the W/PY/LU hordes, which just aren't worth it when time on the air is at such a premium for Bill.

"Cheers!", says G4HZW (Knutsford) who has for the first time for many moons been able to keep his FT-75 on the air for a full month without a breakdown! He runs it at 20 watts p.e.p. into a two-element quad at 24 feet. Tony found the conditions very reasonable, with the odd dead time offset by some periods when things were superb. He worked CX4BW, WA6SOV who was running three watts, N0CFJ in Iowa, HM0U, F0FGI/FC, followed by 200 W/VE during the ARRL DX Contest which was one way of progressing towards the WAS on Ten; KA6ITW, N6RZ, JA8EKE, KH3AB (Johnston Is.), JM1AQF, W7KSK/M in Washington, VE5YO, XT2AU, VP8PP, 9J2KO, WA2JRC/P/YV1, P29NCM who had an FT-7 at ten watts out, HL4XM, TU2JD, JA1JWP/P/JD1 (Ogasawara Is.), VKs, VS6, assorted W/VE, VP2VGR, a gaggle of VP9s, 8R1J, KH6SB and KH6SP, then at 2125z on 21st, VKs and ZLs by the tinful. On 28th there was another session, with ZZ5EG, ZD8RH, UA9s and UA0s, JAs, UM8, EA9IB, HZ1AB, K7LR in Idaho, TF3DC/OX, VP2MCL, HP1XAT, LUs, CP6, PP2ZDD, CX7BY, PY6AAZ and LU8ECD. The night of the 21st was really 'A1', with beacons from VK, ZL, VE8, stations from W1-7, all of South America, JAs, Easter Island and Ascension, all at one spin of the dial around 2125z.

G3PKS not only ran his QRO, but on occasion dropped to one watt during the ATU-and-balun experiments. The ten-metre loggings include an assortment of W and variants, UK5TK/5, VK4SS, J6SO, VK1FT at 0740 beaming over the South Pole, and DJ6SI/TZ in Zone 35.

Now Fifteen

A favourite band for many including your scribe, in particular at the equinoctial

peaks, and a nice compromise when thinking about wire beams.

G4LDS is pleased to note that there is still some evidence of the "ham spirit" around when he was asked this or that station to QSL; many have been happy to take his address for a direct QSL. But Chris has the wisdom to know there is more to this hobby than chasing countries, and he values the long ragchew as much as any. On 21 MHz, so far the following countries have been worked: W, VE, VP2S, EA, SP, VP5, DU, HS, A9X, ZE, YV5, and CR9.

Again QRP for G2HKU on this band, with three watts of CW to WB1ESN, VO1AW, VE1CDX, and VE3HD. On a different line, Ted notes the grass is growing again, but has made a cunning move this season — bought an air-cushion mower that the XYL *likes* to drive!

G3NOF says things on 21 MHz have been rather like Ten only more so, save that the short path to VK has been in until as late as 1500z; around 1000z several KL7s were heard over the North Pole, with Africans to be heard at around 0900 and 1700z. Pacific stations were to be noted on occasion around 1100 but KH6s were heard from 1700 to 1800z. The latter points up something one often forgets — the Pacific Islands are spread over an enormous sea and an enormous spread of beam headings. SSB was used to work A7XD, DJ5RT/6W8, DU6GEN, EL2AV, EP2TY, F08DF, FP8HL, J3AH, J88AM, HC9A, HH5CB, HM1AQ, JAs, K6LPL/CE0, HI8JSB, HK0FBF, K0RF (Colorado), KE6D, OH0XX/OJ0, T30AC, PY, UA0WAY, UF6CA, UI8FAI, UK9AAA, UM8MAZ, VE7s, VKs, VK9CCT/VK9Y, VP2MCL, VP8PP, VP9KB, VP9IX, W3QP/KH6, WB0BNR (N. Dakota), YC2BJR, ZL1AZV, 4U1UN, 5H3FW, 6Y5DA, and 6W6IC.

Not a lot of activity on this band from G3PKS; CW to UA1TW, W2PV, G2FMJ in Potters Bar, W2YMJ, YU7JDE/7, VK2ZC, and W9II. It is of interest to note that the VK2ZC contact was, like VK1FT on Ten already mentioned, in the same opening and firing at the VK end over the South Pole.

The same might also be said for G4BUE this time, with 21 MHz CW and QRP to work PY1BVY, VP1RY, and PU8BI.

Twenty

A noisy old band, and rather neglected while things have been going so well on 21 and 28 MHz, but in the long-term it is the place for most of the DX traffic.

G2NJ, with the Uniden rig in the back of the car, operated /M while G5NX/M conducted the car and two metres, out to Eye in the Fens, where the latter was born. They headed for the parish church where the organ has just been re-sited, and

G5NX was very soon QRL on the keys. A pity we could not have been there to listen. Back to the /M, and Nick says it is quite surprising how many show interest in a /M call on CW.

G4KKI (Swinton) writes in for the first time; he has until now been on Two, but now has a 14 MHz dipole and a Frontier Electric 600GTB covering 80-10 metres. On Twenty SSB there was 1AOKM, most of the Europeans, WA2HHC, W4JP, K1AWH, KA8FOC, VE1AZR, UF6DZ, W3WGX, W2SLF, KB5HG, W8LRC, C6ANU, WIBFA, KB2VM, VK2QT, and VK2LX. On the CW front we note lots of EUs, D6XS, UK6DAJ, PS8RC, KL7MF, W7LNE, WA2AXC/P, and a 20-minute ragchew with ZL4FT, and a 579 signal report inwards.

Just the one QSO mentioned by G4BUE, who raised the Market Reef group as OH0XZ/OJ0.

G3PKS had quite a run in BERU, but found there were other G3P types about. Back in February he worked VE2BPT and K2TR, then PA3AFD and G4GKQ in March while the one-watt output exercise was on, W7MB with an Auroral note while he was firing over the long path, VK4XA and VO1HP; then it was PY7EMQ, ZB2EO, VE3JKZ, VE1ASJ, ZL1HY, VE4MF, VE7CC, VE4IY, VE2YU, VE5RA, VE6OU, VP2VJ, VK3XB, VK7BC, and VE1CDX. Again on March 18, W7QK was worked with an Auroral note when the latter was "firing at the Pole", then G3DLH/W4, JA2AT, EA7EJ, EA3CGK, UD6DFO, and AU0KCL.

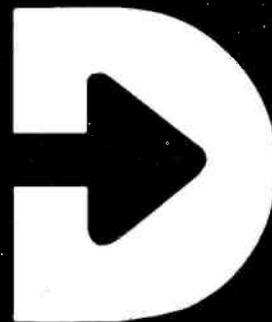
Now we turn to G4LDS, who, in his first period of activity managed 15 countries, including W, SM, SP, 5B4, KP4, 8P6, LA, DL, UV, HB9, IT9, YU, VP9, VE, and VP2A. Thus the overall total so far is some 45 countries.

From the new chum to the OT; G2HKU kept up his skeds with ZL1VN, ZL3SE, and ZL3FV on SSB, while the CW went out to KH6IJ, N7EB, VK3MR, JA1JAN, KD6BF, plus QRP CW to VO1AW, and VO1HP.

Last but by no means least G3NOF; Don says he didn't spend a lot of time on the band, although it seemed to be open to some place day and night. He passed SSB reports to and from CE0CJA (Juan Fernandez) KL7H, VK3PR, VK6AJW, ZL1AAS, ZL1AZV and ZL1BSF.

Finale

So, there you have the story of another DX month — which to this writer is notable for the number of just-past and just-coming DX which has been too close for us to mention. The dates for your letters to arrive are in the 'box', addressed to your scribe, SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. And — the more reports the merrier!

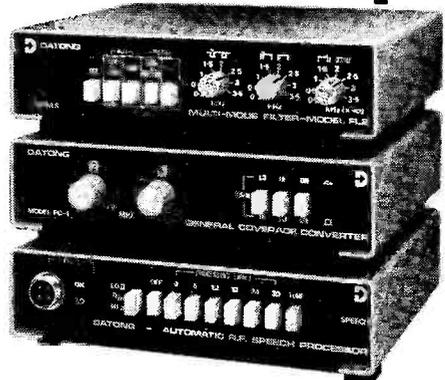


DATONG ELECTRONICS LIMITED

...and the beauty isn't just skin deep!

Multi-mode Audio Filter

Model FL2
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 fully 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 "cw" mode all 12 poles of filtering are combined to give exceptional skirt selectivity.
Connects in series with loudspeaker.



General Coverage Converter

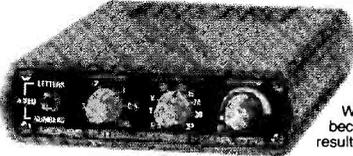
Model PC1
Model PC1 converts any good two metre SSB receiver or transceiver into a superb general coverage communications receiver. Coverage is 0 to 30 MHz in thirty synthesised bands of 1 MHz and no receiver modifications are required. Advanced parametric mixer and LS1 frequency synthesiser ensure that 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. Connects in series with microphone.

The Answer to the Morse Test. Model D70

The Datong Morse Tutor (Model D70) is your passport to a full licence. Compact, with internal battery and speaker plus personal earphone it provides unlimited random morse for practice. With Model D70 you can practice morse anywhere, anytime, and at your own pace. With the Morse Tutor practice becomes a pleasure because you get results quickly.



Active Receiving Antennas

Ultra-compact receiving antenna systems giving wideband coverage from 200kHz to over 30MHz 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.



Model D75 RF Speech Processor

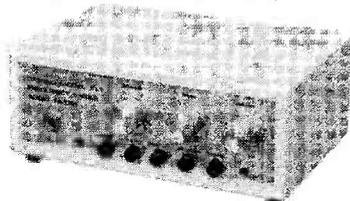
Model D75 uses the same method of r.f. clipping as in Model ASP but features manual adjustment of input level rather than the automatic system used in Model ASP.



Like all our r.f. clippers the unit helps your speech signals stand out from the next under DX conditions. Many users consider the use of our r.f. clippers more effective than a linear.

MODEL FL1 Frequency-agile Audio Filter

As unique now as when we first invented it, model FL1 is still the only audio filter which is able to automatically notch out an interfering heterodyne from SSB speech signals. This ability provides the perfect answer to those who "tune up" on occupied channels. As a cw filter it is surpassed only by our new Model FL2. Independent control of bandwidth and centre frequency gives beautifully smooth adaptability to varying conditions.



INGENIEURBÜRO ULRICH HANSEN

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

A range of high quality in-line preamplifiers for 2 metres or 70 cms, featuring ultra-low noise figures and state-of-the-art design. The range includes R.F. switching capability from 60 watts P.E.P. to 500 watts P.E.P. and choice of silicon low noise devices or the latest gallium arsenide MESFETs for best possible noise figure. Indoor or mast mounted options are also included.

Full details free on request. These units represent a cost-effective way of improving your DX receiving capability.

Products not shown in this advertisement

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

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

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

NEW PRODUCT **NOW AVAILABLE**

TWO METRE CONVERTER MODEL DC144/28

A high performance two metre to 28 MHz converter designed both for use with Model PC1 to give general coverage with ten metre receivers or as a stand-alone converter where low noise and high signal handling capability are important. It features a 3SK68 low noise MOSFET into a high level hot carrier diode mixer followed by a J310 post amplifier. Variable attenuators at input and output allow optimum gain distribution in all applications. Other features include plated through PCB interstage screening S0239 connectors. Appearance is like Model VLF.

VERY LOW FREQUENCY CONVERTER MODEL VLF

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

NEW PRODUCT **MORSE KEYBOARD (PREVIEW)**

MODEL MK

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

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STEPHENS-JAMES LTD.

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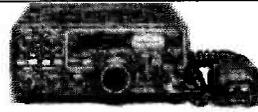
£258.75

BEARCAT 220 FB

Specifications:

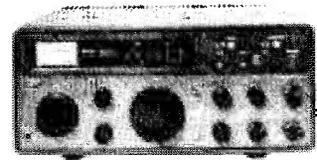
Frequency range:

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



TR9000

The TR9000 is a compact lightweight 2 mtr. FM USB/LSB/CW Transceiver with an outstanding array of functions. FM1 for 25 KHz steps (for mobile use) FM2 for precise 100 Hz steps (for base station use). Microcomputer control giving many advanced features. Built in 5-channel memory. New type microphone with UP/DOWN switching. Built in high performance. N. Blanker. Side tone for CW.
ALL THIS PLUS MUCH MORE FOR £345.00 inc. VAT.



J.R.C. NRD515D

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

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

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

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

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

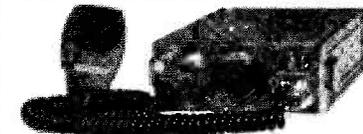
No parking problems. Turn at the Greyhound Motel on the A580 (East Lancs. J Road, S.A.E. with all enquiries. 25p will bring you latest information and prices. Postage carriage extra.

ALL OUR PRICES INCLUDE VAT
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DRAKE

TR7 Digital Transceiver.....	£1,035.00
PS7 Power Supply.....	£207.00
RV7 Remote VFO.....	£138.00
MS7 Speaker.....	£29.90
R7 Digital Receiver.....	£969.00
Filters for TR7.....	£39.10
FA7 Fan for TR7.....	£20.70
MN7 ATU/RF Meter 250 Watts.....	£124.20
MN2700 ATU 2 KW.....	£207.00
DL 300 Dummy Load 300Watts.....	£20.70
DL 1000 Dummy Load 1KW.....	£37.95
TV 3300 Low Pass Filter.....	£18.40
AK75 Doublett Antenna 132' top with 470 ohm Feeder.....	£23.00

WE HAVE A WIDE RANGE OF EQUIPMENT ALSO BY MICROWAVE MODULES - FDK - STANDARD - ETC.



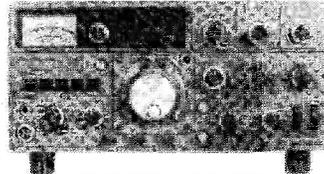
TR2300

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

JAYBEAM

5Y/2M 5 element yagi.....	£11.27
8Y/2M element yagi.....	£14.49
10Y/2m 10 element.....	£31.05
PBM/14/2m. 14 element Parabeam.....	£44.80
5XY/2m. 5 element crossed yagi.....	£22.77
8XY/2m. 8 element crossed yagi.....	£28.40
10XY/2m. 10 element crossed yagi.....	£37.72
Q4/2m. 4 element Quad.....	£23.69
Q6/2m. element Quad.....	£31.39
D5/2m. 5 over 5 slot fed yagi.....	£20.12
D8/2m. 8 over 8 slot fed yagi.....	£27.40
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MBM48/70cms. Multibeam.....	£28.75
MBM88/70cms. Multibeam.....	£39.33
TAS 1/2m. Whip mobile.....	£15.29
C5/m. Colinear.....	£44.27
C8/70cm. Colinear.....	£50.00
D15/1296 23cm. Antenna.....	£34.04

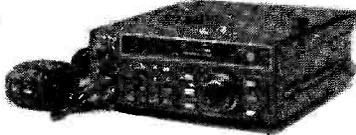
Carriage on Antennas £3.00.



R820 RECEIVER

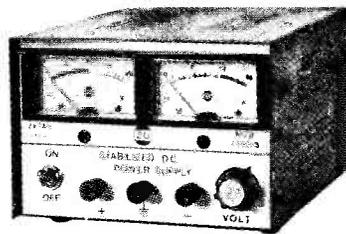
THE ULTIMATE IN RECEIVERS

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



TR7800

Continuing TRIO's policy of presenting the Radio Amateur with the finest equipment available, we were pleased to announce the NEW TR7800 2m FM Mobile Transceiver. 15 memory channels - Priority channels with simplex ±600 KHz or non-standard operation - "Priority alert" beeps when signal on M14 priority channel. Frequency coverage 144.00, 145.955 in switchable 5 KHz or 25 KHz steps. Front keyboard for selecting frequencies, programming memories and controlling scan function. **ALL THIS and MORE for £288.50.**



MOD. 1210 S

SOLID STATE STABILISED POWER SUPPLIES

Maximum ratings quoted. Prices include postage.

Model 125 10-15V 5amp.....	£29.50
Model 156S 4-15V 5amp Twin Meter.....	£40.00
Model 1210S 4-20V 10amp Twin Meter.....	£85.00
Model 1210/1 10 amp 13V.....	£68.00
Model 1220/1 13.5V 20amp.....	£90.00
Model 1220/2 13.5V amp.....	£80.00

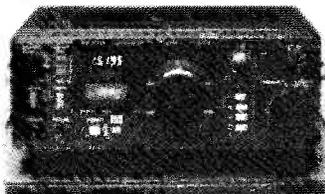


TS830S

HF SSB TRANSCEIVER AROUND £640 inc VAT

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

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



TRIO R1000

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

RECEIVERS AND TRANSCEIVERS

(inc. VAT and Postage)

SR9 Tunable 144-146MHz Receiver.....	£46.00
AMR217B Scanner Receiver, AC or DC operation.....	£113.50
R512 Aircraft Band Scanning Receiver.....	£135.00
Regency Digital Flight Scan Synthesised Aircraft Band Receiver.....	£215.00
Yaesu FRG7 Receiver.....	£199.00
"Sky ACE" Hand Held Aircraft Band Receiver.....	£49.50
SX200 Scanning Receiver.....	£241.00
"Argonaut" Solid State Transceiver.....	£276.00
Bearcat 220 Scanning Receiver.....	£258.75
AR22 2m Hand Hold Receiver.....	£83.00

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Bredhurst electronics

April 1981

BREDHURST NEWS

Page 1

TRIO

TS 830S	160 10m transceiver 9 bands	639.00	-
VFO 230	Digital VFO with memories	194.00	(2.00)
AT 230	All band ATU power meter	106.00	(1.50)
SP 230	External speaker unit	33.00	(1.50)
DFC 230	Dig. frequency remote controller	163.00	(1.50)
YK 88C	500 Hz CW filter	26.45	(0.50)
YK 88CN	270 Hz CW filter	28.75	(0.50)
TS 130S	8 band 200 W pep	491.00	-
TS 130V	8 band 20 W pep	404.00	-
VFO 120	External VFO	89.70	(1.50)
TL 120	200 W pep linear for TS 130V	128.80	(1.50)
MB 100	Mobile mount for TS 120/130	17.25	(1.00)
SP 120	Base station external speaker	25.30	(1.00)
AT 130	100 W antenna tuner	72.89	(1.00)
PS 20	A.C. power supply TS 120V/130V	44.85	(2.00)
PS 30	A.C. power supply TS 120S/130S	85.00	(3.00)
MA5	5 band mobile aerial system	74.75	(3.00)
MC 50	dual impedance desk microphone	24.15	(1.50)
MC 35S	Fist microphone 50K impedance	13.80	(0.75)
MC 30S	Fist microphone 500 ohm impedance	13.80	(0.75)
LF 30A	H. F. low pass filter 1 kW	18.40	(0.75)
TS 770E	2m/70cm all mode transceiver	730.00	-
SP 70	External speaker unit	18.40	(1.00)
TR 9000	2m synthesised multimode	345.00	(1.50)
BO 9	2m plinth for TR 9000	32.20	-
TR 7800	2m F.M. synthesised mobile 2.5W	265.00	-
TR 2300	2m F.M. synthesised portable	166.00	(1.00)
VB 2300	1 QW amplifier for TR 2300	49.45	(1.00)
MB 2	Mobile mount for TS 2300/VB 2300	17.25	(0.50)
RA 1	Rubber flexible antenna	6.90	-
TR 2400	2m F.M. synthesised handheld	198.00	(1.50)
ST 1	Base stand and quick charger	43.70	(1.00)
BC 5	12v quick charger	17.25	(1.00)
SC 3	Soft carrying case	11.50	(0.50)
PB 24	Spare battery pack/charger lead	14.26	(1.00)
R 1000	Gen coverage receiver	285.00	-
SP 100	External speaker unit	26.45	(1.50)
HS 4	Economy speaker unit	10.35	(0.75)
HS 5	Deluxe headphones	21.85	(0.75)
HC 10	Digital station world time clock	55.00	(0.75)

FDK VHF UHF EQUIPMENT

M 700EX	2m F.M. synthesised mobile 2.5W	199.00	-
M 750E	2m synthesised multimode - mobile	299.00	-
Expander	70 cm transverter for M 750E	p.o.a.	-
Palm II	A.C. power supply for M 750E	89.00	-
Palm IV	2m F.M. 6 channel portable	149.00	-
TB 1	70cm F.M. 6 channel portable	10.00	(0.30)
CC 2	1750 Hz toneburst for Palm II/IV	5.75	(0.50)
BC 2	Leather case for Palm II/IV	4.50	-
	A.C. battery charger for Palm II/IV	10.50	(0.50)

MORSE EQUIPMENT

HK 707	Up/Down Key	10.50	(0.50)
MK 704	Squeeze paddle	10.50	(0.50)
EK 121	Elbug	29.95	(0.50)
EKM 12	Matching side tone monitor	10.95	(0.50)
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POWER SUPPLIES - Overvolts current limit protection

4 Amp	Continuous 4 amp 12v P.S.U.	27.95	(1.50)
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SWR - POWER METERS

YW 3	Twin Meter	11.50	(0.50)
T 435	Toyo twin meter (144-435 MHz)	34.45	(0.75)
SW 110A	Daiwa (1.8 - 150 MHz)	35.00	(0.75)
SP 200	Welz (1.8 - 150 MHz)	49.95	(0.75)
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CN 620A	Welz (1.8 - 150 MHz) cross-pointers	52.80	-
SP 300	Daiwa (1.8 - 500 MHz)	69.95	-
CN 630	Welz (1.8 - 500 MHz) cross-pointers	71.00	-

MICROPHONES

MM 202S	Adonis clip on safety mic	20.95	(0.50)
MM 202HD	Adonis head band safety mic + Up/Down	29.00	(0.50)
MM 202FU	Adonis swan kneck safety mic + Up/Down	30.00	(0.50)
AM 502	Adonis compressor mic - 1 O/P	39.00	(0.75)
RM 940	Daiwa infra red link safety mic	45.00	(0.50)

YAESU

FT 101Z	160 - 10m 9 band transceiver	488.00	-
DCT 101Z	160 - 10m 9 band transceiver	569.00	-
FV 101Z	12 v d.c. adaptor	34.50	(1.00)
FT 107M	remote VFO for FT 101Z/ZD	121.90	(1.00)
FC 107	160 - 10m 9 band transceiver	690.00	-
FP 107	remote VFO for FT 107M	92.00	(1.00)
FP 107E	160 - 10m atu aerial switch p/meter	102.00	(2.00)
FP 107	230v a.c. power supply for FT 107	106.00	(2.00)
FTV 107(2)	power supply for internal fitting	97.75	-
430 V107V901	transverter main frame with 2 metres	207.00	-
SP 107P	70cm transverter card	175.00	-
DMST 107	external speaker in cabinet	57.50	(1.50)
CW	external speaker in cabinet	27.60	(1.50)
AM	external speaker in cabinet	188.00	(1.00)
YM 34	12 channel memory for FT 107	23.00	(0.50)
YM 35	AM filter for FT 107	18.80	(1.50)
YM 36	12 channel memory for FT 107	12.65	(0.75)
YM 37	AM filter for FT 107	11.90	(0.75)
FT 707S	desk mic for FT 707/107 dual imp.	6.15	-
FT 707	500 ohm up/down mic FT 707/107	454.00	-
FP 707	500 ohm noise cancelling FT 707/107	529.00	-
FP 707	500 ohm manual mic FT 707/107	109.00	(2.00)
FC 707	80-10m 8 band transceiver - low pwr	80.00	(1.00)
FV 707DM	80 - 10m 8 band transceiver - high pwr	186.00	(1.00)
MR 7	80 - 10m a.t.u. for FT 707	14.95	-
MMB 2	Ext. digital V.F.O. for FT 707	16.10	(1.00)
	Metal rack for FT 707	385.00	(5.00)
	Mobile mounting bracket for FT 707	9.95	(0.50)
FL 2100Z	160 - 10m 1200 watt linear	22.25	(0.75)
YH 55	8 ohm headphones	25.70	(0.75)
FF 501	Low pass filter 1 kW	78.00	(2.00)
QTR 24D	World clock (quartz)	41.00	(1.50)
FP 12	230v a.c. 12 amp D.C. power supply	9.60	-
FP 4	230v a.c. 4 amp D.C. power supply	189.00	-
FSP 1	Mobile speaker 8 ohm 6 watt	309.00	-
FRG 7	0.5 - 30 MHz communication receiver	389.00	-
FRG 7700	Latest gen cv receiver from Yaesu	195.00	-
FRG 7700M	as above but with memories	39.60	(1.00)
NC 2	2m F.M. synthesised handheld	7.50	(0.50)
NC 9	2m F.M. synthesised handheld	16.85	(0.50)
NBP 9	Nicad fast charger/rhod for FT 207	13.39	(0.75)
PA 2	Nicad 230v charger for FT 207	2.70	-
FBA 1	Spare nicad battery pack	359.00	(0.50)
FT 480R	12v P.S.U. for FT 207	59.00	(1.50)
FP 80	Nicad pack charging adaptor	-	-
	2M synthesised multimode	-	-
	Matching 230v a.c. power supply	-	-

ICOM

IC 2E	2M F.M. synthesised handheld	159.00	-
IC L3	Soft case	3.00	(0.50)
ICM 9	Speaker - microphone	9.00	(0.50)
ICBC 30	230v a.c. base charger and hod	34.00	(1.00)
ICBC 25	230v a.c. charger	3.70	(0.50)
ICBP 1	Car charging head	2.75	(0.50)
ICBP 2	6v Nicad pack for IC 2E	22.00	(0.75)
ICBP 3	9v Nicad pack for IC 2E	15.50	(0.75)
ICBP 4	Empty battery case for IC 2E	5.00	(0.75)
ICBP 5	*11.5v Nicad pack for IC 2E	169.00	-
IC 255E	2M F.M. synthesised mobile (10w)	255.00	-
IC 260E	2M F.M. synthesised mobile (25w)	339.00	-
IC 251E	2M synthesised multimode (10w)	479.00	-
IC 202S	2M multimode base station	169.00	-
IC 720	2M SSB portable	699.00	-
IC PS 15	H.F. Transceiver, gen. cv. receiver	99.00	(2.00)
IC HM 10	20 amp power supply for IC 720	20.00	(0.75)
	Scanning Mic for IC 255/260	-	-

STATION ACCESSORIES

BL 40X	1:1 balun - 1 kW	11.25	(0.50)
DM 81	Trio grid dip meter	51.00	(0.75)
FX 1	Wave meter	28.00	(0.75)
HP 3A	High pass filter - TV down lead	3.50	(0.30)
DL 20	30 w Dummy Load (500MHz)	6.00	(0.30)
T 100	100 w Dummy Load (500MHz)	35.00	(0.30)
T 200	200 w Dummy Load (500MHz)	33.00	(1.00)
APM 1	Audio peak and notch filter	29.90	(1.50)
KX 2	SWL aerial tuner 0.5 - 30 MHz	9.95	(1.00)
L-3	SWL inverted 'L' 3-30 MHz antenna	0.28	(0.05)
	SWL (price per metre)	0.80	(0.20)
	10 core rotator cable (per pair)	0.20	(0.02)
	Ferrite rings 1 1/2" dia. per pair	0.14	(0.02)
	75 ohm light duty twin feeder (per mtr)	1.00	(0.10)
	300 ohm ribbon (per mtr)	-	-
	T piece polyprop.	-	-

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Adj. tol. ± 50 ppm. Temp. tol. ± 100 ppm 0 to 70°C.
6.0 to 19.999kHz £28.12 100 to 159.99kHz £9.25
20 to 39.999kHz £17.74 160 to 499.99kHz £6.19
40 to 79.999kHz £12.40 500 to 799.99kHz £7.30
80 to 99.999kHz £10.60

B High frequency fundamentals/overtones
Adj. tol. ± 20 ppm. Temp. tol. ± 30 ppm 10 to 60°C.
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* 1.0 to 1.499MHz (fund) HC6/U £10.35
* 1.5 to 2.599MHz (fund) HC6/U £4.93
* 2.6 to 20.99MHz (fund) HC6/U £4.48
* 3.4 to 3.999MHz (fund) HC 18 & 25/U £6.21
* 4.0 to 5.999MHz (fund) HC 18 & 25/U £4.93
* 6.0 to 20.99MHz (fund) All holders £4.48
* 21 to 24.99MHz (fund) " £6.73
* 25 to 30MHz (fund) " £8.28
* 21 to 62.99MHz (30/T) " £4.48
* 60 to 105MHz (50/T) " £5.16
* 105 to 125MHz (50/T) HC 18 & 25/U £7.76
125 to 180MHz (O/T) " £7.50
180 to 25MHz (O/T) " £12.49

* Delivery Normally 5/6 weeks (express available), all other frequencies 7/8 weeks.

Holders: Low frequencies HC13/U or HC6/U dependent on frequency.

Mid and High frequencies are available in HC6/U, HC18/U or HC25/U unless otherwise shown.
 HC17/U (replacement for FT243) and HC33/U (wire end HC6/U) available as per HC6/U above at 30p extra on HC6/U price

Unless otherwise specified, fundamentals will be supplied to 30pf circuit conditions and overtones to series resonance.

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CRYSTAL FREQUENCY RANGE USE (TX or and HOLDER)	4MHz-TX-HC6/U	6MHz-TX-HC25/U	8MHz-TX-HC6/U	10MHz-RX-HC6/U	11MHz-RX-HC6/U	12MHz-TX-HC25/U	14MHz-RX-HC25/U	18MHz-TX-HC25/U	44MHz-RX-HC6/U	44MHz-RX-HC25/U	52MHz-RX-HC25/U
OUTPUT FREQUENCY											
144.4 (433.2)	b	e	b	e	e	b	e	e	e	e	e
144.480	e	e	e	e	e	e	e	e	e	e	e
144.800	e	e	e	e	e	e	e	e	e	e	e
144.850	e	e	e	e	e	e	e	e	e	e	e
145.000/ROT	e	e	e	e	e	e	e	e	e	e	e
145.025/R1T	e	e	e	e	e	e	e	e	e	e	e
145.055/R2T	e	e	e	e	e	e	e	e	e	e	e
145.975/R3T	e	e	e	e	e	e	e	e	e	e	e
145.100/R4T	e	e	e	e	e	e	e	e	e	e	e
145.125/R5T	e	e	e	e	e	e	e	e	e	e	e
145.150/R6T	e	e	e	e	e	e	e	e	e	e	e
145.175/R7T	e	e	e	e	e	e	e	e	e	e	e
145.200/R8T	e	e	e	e	e	e	e	e	e	e	e
145.300/S12	e	e	e	e	e	e	e	e	e	e	e
145.350/S14	e	e	e	e	e	e	e	e	e	e	e
145.400/S16	e	e	e	e	e	e	e	e	e	e	e
145.425/S17	e	e	e	e	e	e	e	e	e	e	e
145.450/S18	e	e	e	e	e	e	e	e	e	e	e
145.475/S19	e	e	e	e	e	e	e	e	e	e	e
145.500/S20	e	e	e	e	e	e	e	e	e	e	e
145.525/S21	e	e	e	e	e	e	e	e	e	e	e
145.550/S22	e	e	e	e	e	e	e	e	e	e	e
145.575/S23	e	e	e	e	e	e	e	e	e	e	e
145.600/ROR	e	e	e	e	e	e	e	e	e	e	e
145.625/R1R	e	e	e	e	e	e	e	e	e	e	e
145.650/R2R	e	e	e	e	e	e	e	e	e	e	e
145.675/R3R	e	e	e	e	e	e	e	e	e	e	e
145.700/R4R	e	e	e	e	e	e	e	e	e	e	e
145.725/R5R	e	e	e	e	e	e	e	e	e	e	e
145.750/R6R	e	e	e	e	e	e	e	e	e	e	e
145.775/R7R	e	e	e	e	e	e	e	e	e	e	e
145.800/R8R	e	e	e	e	e	e	e	e	e	e	e
145.950/S38	e	e	e	e	e	e	e	e	e	e	e

PRICES: (a) £1.95, (b) £2.32, (c) £2.50, and (e) £4.48.

AVAILABILITY: (a), (b), (c) stock items, normally available by return (we have over 5000 items in stock). (e) 4/6 weeks normally but it is quite possible we could be able to supply from stock. N.B. Frequencies as listed above but in alternative holders and/or non stock loadings are available as per code (e).

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

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Drayton Manor 26/4/81
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Due to the much higher multiplication involved (3 times that on 2m) all our stock 70cm crystals are to much higher tolerances than our standard range.

We are stocking the following channels: RB0 (434.60/433.00), RB2 (434.65/433.05), RB4 (434.70/433.10), RB6 (434.75/433.15), SU8 (433.20), RB10 (434.85/433.25), RB11 (434.875/433.275), RB13 (434.925/433.325), RB14 (434.95/433.35), SU18 (433.45), SU20 (433.50) - TX & RX for use with: - PYE UHF Westminster (W15U), UHF Cambridge (U10B), Pocketfone (PF1) AND UHF PF70 Range, and STORNO COL/COM 662 all at £2.32. 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 RB/SU12 (434.90/433.30) RTTY, SU16 (433.40), SU22 (433.55) etc.) for most UHF equipments are available at £4.48 for crystals up to 63MHz, and £5.16 for 63 to 105MHz to amateur spec or £5.26 for up to 63MHz and £6.06 for 63 to 105MHz to the same closer spec as our stock items. Delivery approx. 5/6 weeks.

4m CRYSTALS FOR 70.25MHz - HC6/U

TX8.7825MHz and RX6.7466MHz or 29.7800MHz £2.32

10.245MHz "ALTERNATIVE" I.F. CRYSTALS - £2.32
For use in Pye and other equipment with 10.7MHz and 455kHz I.F.s to get rid of the "birdy" just above 145.0MHz. In HC6/U, HC18/U and HC25/U.

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CONVERTER/TRANSVERTER CRYSTALS - HC18/U

All at £3.30, 38.6666MHz (144/28), 42MHz (70/28), 58MHz (144/28), 70MHz (144/4), 71MHz (144/2), 96MHz (1.296/432/144), 101MHz (432/28), 101.50MHz (434/28), 105.6666MHz (1.296/28) and 116MHz (144/28).

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200kHz and 455MHz in HC6/U £3.50
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5MHz in HC6/U and 10MHz and 10.7MHz in HC6/U and HC25/U £2.80.

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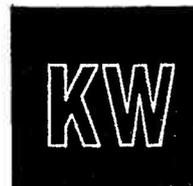
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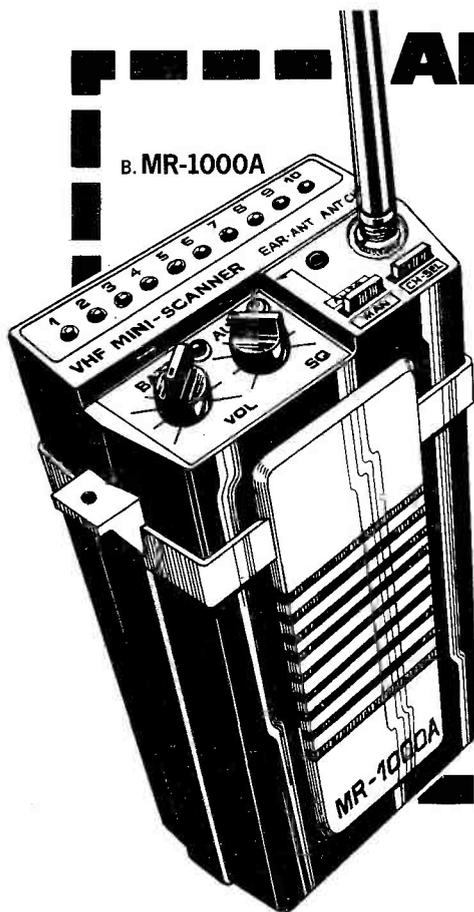


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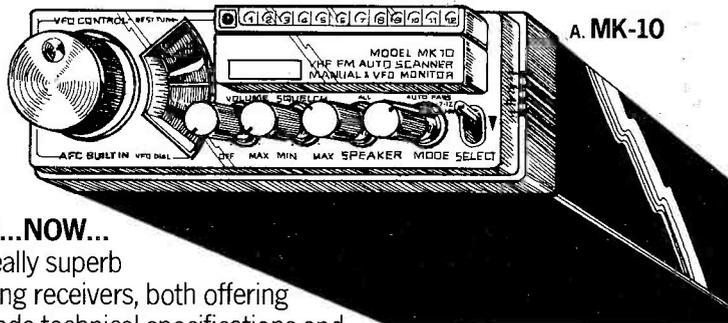
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2 METRE STOCK CRYSTALS. Price £1.83 for one crystal. £1.74/crystal when two or more purchased.

	HC6/U	HC6/U	HC25/U	HC25/U	HC25/U	HC6 & 25/U
	30pF TX	30pF TX	40pF TX	30pF RX	20pF TX	SR RX
R0	4.0277	8.0555	12.0833	14.9888	18.1250	44.9666
R1	4.0284	8.0569	12.0854	14.9916	18.1281	44.9750
R2	4.0291	8.0583	12.0875	14.9944	18.1312	44.9833
R3	4.0298	8.0597	12.0895	14.9972	18.1343	44.9916
R4	4.0305	8.0611	12.0916	15.0000	18.1375	45.0000
R5	4.0312	8.0625	12.0937	15.0027	18.1406	44.0083
R6	4.0319	8.0638	12.0958	15.0055	18.1437	45.0166
R7	4.0326	8.0652	12.0979	15.0083	18.1468	45.0250
S8	—	—	12.1000	14.9444	18.1500	44.8333*
S9	—	—	12.1020	14.9472	18.1531	44.8416*
S10	—	—	12.1041	14.9500	18.1562	44.8500*
S11	—	—	12.1062	14.9527	18.1593	44.8583*
S12	—	—	12.1083	14.9555	18.1625	44.8666*
S13	—	—	12.1104	14.9583	18.1656	44.8750*
S14	—	—	12.1125	14.9611	18.1687	44.8833*
S15	—	—	12.1145	14.9638	18.1718	44.8916*
S16	—	—	12.1167	14.9667	18.1750	44.9000*
S17	—	—	12.1187	14.9694	18.1781	44.9083*
S18	—	—	12.1208	14.9722	18.1812	44.9166*
S19	—	—	12.1229	14.9750	18.1843	44.9250*
S20	4.0416	8.0833	12.1250	14.9777	18.1875	44.9333
S21	4.0423	8.0847	12.1270	14.9805	18.1906	44.9416
S22	4.0430	8.0861	12.1291	14.9833	18.1937	44.9500
S23	4.0437	8.0875	12.1312	14.9861	18.1968	44.9583

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

Also in stock 4 and 8MHz TX in HC6/U at 145.8MHz. Icom crystals TX for 145.6MHz (R0). 44MHz RX crystals in HC6/U for 145.8 and 145 (R0). All at above price.

4 METRE CRYSTALS for 70.26MHz in HC6/U at £2.25. TX 8.78250MHz. RX 6.7466 or 29.78MHz in stock.

70cm CRYSTALS in stock 8.0222 and 12.0333 in HC6 £1.85. Pye Pocketfone PF1, PF2, PF70 and Wood and Douglas £4.50 a pair or TX £2.25, RX £2.50, SU8 (433.2) R0, RB2, RB4, RB6, RB10, RB11, RB13 and RB14.

CONVERTER CRYSTALS in HC18/U at £2.85. In stock 38.666, 42.000, 70.000, 96.000, 101.000, 101.500, 105.666 and 116.000MHz.

TONE BURST AND I.F. CRYSTALS in HC18/U at £2.25 in stock. 7.168MHz for 1750kHz and 10.245MHz for 10.7MHz IF's.

FREQUENCY STANDARDS in stock £2.75. HC6 200kHz, 455kHz, 1000kHz, 5.000MHz and 10.000MHz. HC13 100kHz, HC18 1000kHz, 7.000MHz, 10.700MHz, 48.000MHz and 100.000MHz.

SUMMER HOLIDAYS. Please note we shall be closed for annual holidays from 8th August to 29th August. Any inconvenience to our customers is regretted.

MADE TO ORDER CRYSTALS SINGLE UNIT PRICING

	Price Group	Adjustment Tolerance ppm	Frequency Ranges	Price and Delivery	
				A	B
Fundamentals	1	200 (total)	10 to 19.999kHz	—	£23.00
	2	200 (total)	20 to 29.999kHz	—	£16.50
	3	200 (total)	30 to 99.999kHz	—	£10.50
	4	200 (total)	100 to 999.999kHz	—	£6.00
3rd OVT	5	50	1.00 to 1.499MHz	£9.00	£6.00
	6	10	1.50 to 1.999MHz	£4.75	£4.20
	7	10	2.00 to 2.599MHz	£4.75	£4.00
	8	10	2.60 to 3.999MHz	£4.55	£3.70
	9	10	4.00 to 20.999MHz	£4.55	£3.60
	10	10	21.00 to 24.000MHz	£6.00	£5.40
	11	10	21.00 to 59.999MHz	£4.55	£3.60
5th OVT	12	10	60.00 to 99.999MHz	£5.00	£4.00
5th, 7th & 9th OVT	13	10	100.00 to 124.999MHz	£6.15	£5.20
	14	20	125.00 to 149.999MHz	—	£6.00
	15	20	150.00 to 225.000MHz	—	£7.50

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

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

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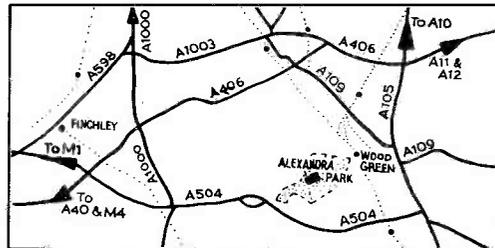
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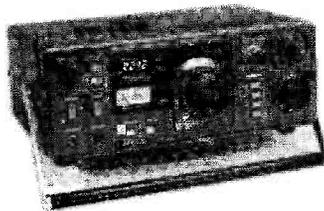
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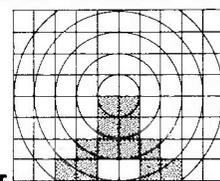
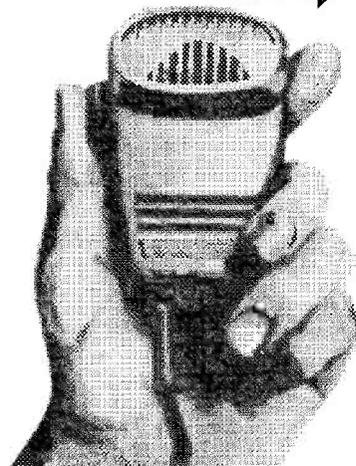
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