

The SHORT WAVE Magazine

VOL. XXXVI

MARCH 1978

NUMBER 1



SRX-30

For the advanced, keen short wave listener, the choice of receiver has usually been between cheap and nasty or very good but very expensive equipment. We think that the SRX-30 will provide that listener with excellent performance at a reasonable cost and is the answer to this eternal problem.

The SRX-30 provides AM, CW, USB and LSB reception on all frequencies from 500 kHz to 30 MHz. All right, so does your Scooper Blooper Mk. 3 but you can't set the Scooper Blooper dial to the frequency you want and be sure that it's correct!

The SRX-30 tuning system is so simple to operate. You have a dial reading in MHz from 0-29 and a main tuning dial reading 0-1000 kHz. So—if you know that Radio Slobovia is broadcasting on 10-295 MHz, you set the MHz dial to 10, the kHz dial to 295 and there you are. The MHz dial setting is not critical, as stability is guaranteed by a triple mixing drift cancelling system, thereby overcoming another problem in your Scooper Blooper Mk. 3; drift.

A further drawback to cheap receivers is massive image interference on the higher frequencies due to the use of a low IF, typically 455 kHz. The cure for this problem is the use of a high IF and the SRX-30 employs a first IF of around 40 MHz—so goodbye to first IF images. You could of course find the same system as this in the Racal RA17

series receivers; after all, the SRX-30 has copied the basic idea from this very receiver. The big drawback to the RA17 (apart from the price!!) is that unless you have the muscles of a prize fighter, lifting the RA17 may send you for a holiday at Hernia Bay (staying at the Truss House?).

To summarise, the SRX-30 covers 500 kHz to 30 MHz with excellent dial readout and reset accuracy; it has all mode (AM, CW, SSB) reception and is equally at home in broadcast or amateur bands; it has all the facilities of a top class communications receiver, RF gain, fine tuning, selectable sidebands, built in loudspeaker, operation from ac mains or 12v. Dc, rugged construction and super styling and all at an attractive price—£146.25 inc. VAT.

See it soon at your nearest stockist, you will be agreeable impressed.

SRX-30—£146.25 inc. VAT.

Carriage £3

LOWE ELECTRONICS
Cavendish Road,
Matlock,
Derbyshire

TS520S

Setting new standards in 6 band transceivers



TS520S

The TS520 from Trio was, as we expected, an outstanding success and many thousands are now in use around the world. Following the Trio practice of listening to suggestions and comments from users of the equipment, the TS520 was updated and appears as the TS520S. All accessories such as the TV502, VFO520 and SP520 are fully compatible with both models so there is no obsolescence. Major new features in the TS520S are:

Full band coverage from 160-10 metres with WWV at 15 MHz and a most important uncommitted band which will be used following any expansion or modification of amateur HF bands at WARC in 1979. This provision is typical of Trio advanced planning. Now that LORAN has finally gone from 160 metres, a whole new area of operation has opened up for the amateur and the TS520S gives you top performance for top band.

New speech processor using the latest audio compression techniques to give you extra signal punch when in the pile up but without introducing any clipping or distortion. The compressor can be put into use instantly by front panel switching.

Advanced noise blanker is built into the TS520S for virtual elimination of impulse interference such as ignition noise. The TS520S also incorporates the 3SK35 dual gate MOSFET in the RF amplifier for outstanding cross modulation and spurious response characteristics. The 3SK35 has a low noise figure (3.5 dB typ) and high gain (18dB typ) which contributes to the excellent receiver performance—less than 0.2µV required for 10dB S/N ratio on all bands. When the signal levels are exceptionally high, a 20dB attenuator can be inserted at the touch of a push button.

Razor sharp selectivity resulting from the use of an 8 pole HF crystal filter with 2.4 kHz bandwidth and better than 2:1 shape factor. Skirt selectivity and ultimate stop band rejection are outstanding. Dual gate MOSFET devices in all receiver IF stages give first class AGC characteristics with no overloading or popping on speech peaks. The AGC has switchable time constant and can also be turned off for the keen CW operator.

A matching 8 pole 500 Hz CW filter is available and can be fitted by the set owner in a few minutes. This filter gives the CW operator really excellent selectivity with stop band rejection of a very high order. Multi function metering of signal strength, ALC level, PA input current, RF output and HT voltage to the PA not only keeps the operator informed about the performance of the rig, but also allows instant calculation of power input. A built in low noise cooling fan keeps cabinet temperatures very low even over extended operating periods. Break in CW with keyed sidetone and an advanced VOX system give easy control at all times.

Tuning up the TS520S is simple and fuss free due to the provision of a low power tune up facility. No need to worry about the crackling noises which are often apparent in transmitters using line output tubes; rugged 6146B tetrodes in the 520S give high power output with very low intermod products—in fact, the Trio TS520 series transceivers have always sounded outstandingly good on the air due to this fact.

The TS520S has all the features desirable in a high quality transceiver—RIT control, 25 kHz calibrator; separate mic gain and carrier level controls; built in speaker; power saving heater switch; provision for up to 4 fixed channels; all connector provision for linear and transverter control and many, many more.

Ask anyone about the TS520S, all reports are the same—it's the best around.



DG-5

The luxury of digital readout is available on your TS520S by connecting the new DG-5 readout unit. More than just the average readout system, the DG-5 mixes the carrier, VFO and heterodyne oscillator outputs to show your exact frequency at all times in all modes. This handsome accessory can sit on the TS520S for in-shack use... or on the dashboard during mobile operation for safety and convenience. Six bold digits display your operating frequency, and the digital hold switch serves as a memory.

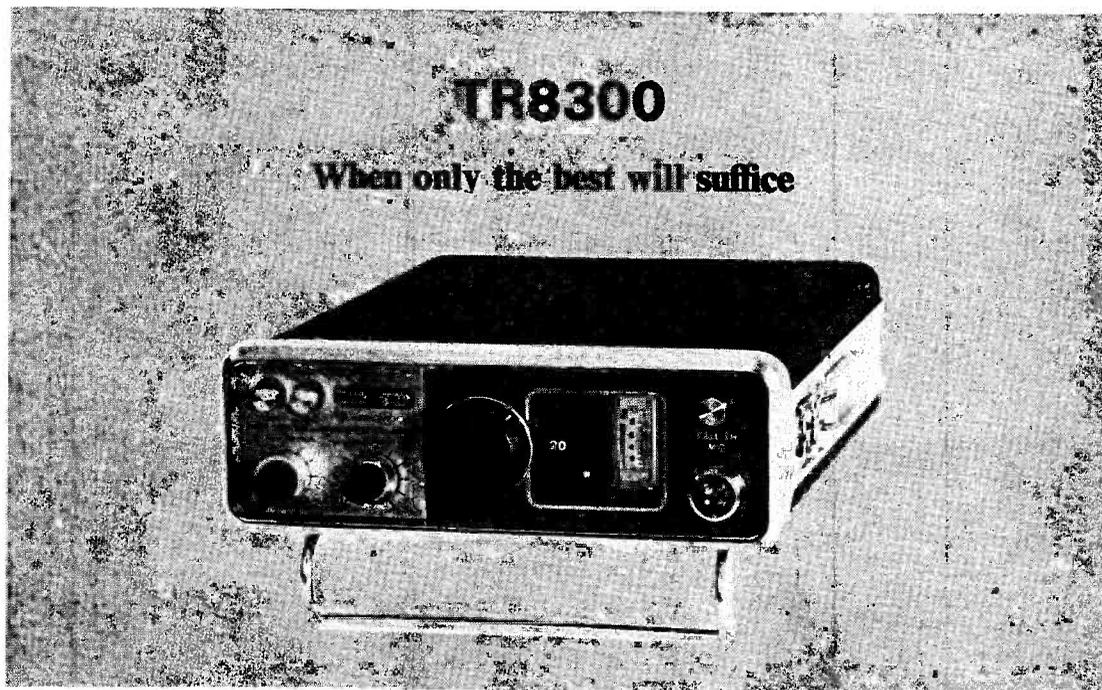
Unique feature—the DG-5 can be used as a general purpose counter reading signals from 100 Hz to over 50 MHz so it's more than just a readout system.

N.B.—The DG-5 can be fitted to earlier TS520 models by using the adaptor kit DK-520.

TS520S £489 inc. VAT

DG-5 £132

LOWE ELECTRONICS
119 Cavendish Road,
Matlock,
Derbyshire DE4 3HE



TR8300

This is the all new 70cm. high power mobile FM rig that is turning heads and making a real impact on the 70cm. scene. Using the same proven mechanical design as the all time favourite the TR7200G and TR7010, the B300 uses all new techniques of circuit design to give the FM user the very best performance available today.

The TR8300 transmitter section uses rugged Motorola PA transistors to guarantee power output in excess of 10 watts at all times and a combined power regulator and variable SVVR protection system provide complete safety for the PA. The transmit audio system is quite remarkably good, and all users so far are receiving most favourable remarks on their speech quality. High/low power switching is by front panel push button and a monitor push button allows the operator to check his own speech quality.

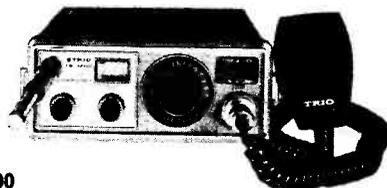
Repeater operation is straightforward and access guaranteed by the Trio exclusive 1750 Hz tuning fork controlled oscillator.

The TR8300 receiver employs a five section helical resonator at signal frequency and a two pole crystal filter at 10.7 MHz to give optimum out of band rejection and in band selectivity characteristics. Specially developed UHF transistors are used in the high gain RF stage and low noise mixer to give the TR8300 the capability to dig out weak signals without introducing high noise levels. Solid brass screen compartments surround the RF stage and final oscillator chain sections to prevent unwanted radiation and feedback. The TR8300 receiver is exceptionally stable in operation at all temperatures from -20°C . to $+60^{\circ}\text{C}$.

The audio output of more than 1.5 watts to the built-in speaker is more than enough to overcome the noisiest vehicle surrounds (maybe not inside a Chieftain tank!) and provision is made for quick connection of an external loudspeaker.

A total of 40 transistors, 26 diodes and 2 integrated circuits are used in the TR8300 and its up to the minute design makes it the best 70cm. mobile obtainable today. A total of 23 channels can be fitted and the usual Trio design feature of an LED to show which channels are equipped with crystals is included. The TR8300 comes to you fitted with any four channels of your choice and extra channels can be installed at low cost. All the standard accessories such as stand off legs, mobile mount, microphone power lead, spare. uses, manual, etc., are supplied with the equipment.

For the man who can appreciate real top quality, the TR8300 has no competition.



TR3200

TRIO have always set the pace in the handy portable field starting with the TR 2200 2 metre powerhouse. Following the success on 2 metres, the TRIO TR3200 gives the radio amateur the lead on 70 cm. as well, with all the quality engineering for which TRIO are famous.

The transmitter section of the TR 3200 features the latest semiconductor devices to give a high power output in excess of 2 watts, with switched reduction to 400 mW for local contacts. The audio section has a tailored speech response and an integrated circuit limiting amplifier which, together with a new style miniature microphone, gives that first class speech quality you like.

The sensitive (less than 1 microvolt for 20dB quieting) double conversion receiver provides an output of more than 0.7 watts into either the built-in speaker or an external speaker or earphone. Multiple filtering a 10.7 MHz and 455 kHz, together with no less than five 455 kHz limiters, guarantees top performance, noise free reception.

A noise detection squelch system allows optimum sensitivity so that you do not miss those weak signals.

Multi function metering provides 5 meter, RF output meter and battery check facilities at any time.

The TR 3200 has space for 12 channels and is fitted at the factory with crystals for 5U8, 5U18 and 5U20. Most repeater channels are available ex stock. The TR 3200 is fitted with the TRIO exclusive tuning fork controlled tone generator which ensures access first time every time.

The TR3200 comes complete with microphone, carrying case and shoulder strap, removable high gain 5/8 wave antenna, battery charger for the optional Nicad pack and three factory fitted channels. Contact us now for further details of the best portable rig around.

TR8300 £227 inc. VAT

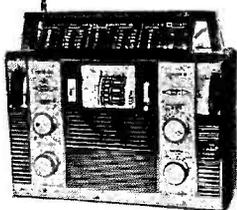
TR3200 £182 inc. VAT

LOWE ELECTRONICS,
119 Cavendish Road,
Matlock,
Derbyshire DE4 3HE

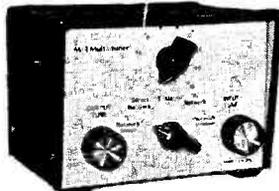
STEPHENS-JAMES LTD.

47 WARRINGTON ROAD, TELEPHONE
LEIGH, LANCS WN7 3EA (0942) 676790

G3MCN



Midland and North West distributors for the XCR30 unique crystal controlled receiver. This receiver is designed to provide precision frequency tuning over the full short wave spectrum up to 30 MHz with exceptional frequency stability for both AM and SSB. Separate tuned whip antenna.
£130.00 inc. VAT
XCR-30 FM Receiver with FM band 87-5 to 101 MHz. £170.00 inc. VAT



Mk. 1 MULTI TUNER. Designed and manufactured by us. 50 tunable switched positions for antenna lengths over 5 metres in the 2-30 MHz range. Five different circuits to give an excellent match between your receiver and antenna. Now in use in over 35 countries.

Price £17.50 including VAT and Postage
Mk. 2 VERSION, £23.00. Covering 550 kHz to 30 MHz. Send S.A.E. for full information and Test Report.

See Test Report in February "Short Wave Magazine".



YAESU FRG-7 RECEIVER. Mains and battery operated receiver 0.5 to 30 MHz. Solid state. Advance circuitry offers excellent performance for the DX listener at a moderate price. Price £162.00

Also in stock now the new SRX-30 Solid state receiver 500 kHz to 30 MHz AM, USB, LSB, CW, AC and DC operation. Price £152.00

TRIO	
TS820 Transceiver	£645.00
VFO820 External VFO	£112.00
DG1 Digital Readout	£127.00
DS1A 12v DC converter	£40.00
YG88C 8 pole CW Filter	£36.00
SP820 Speaker	£19.00
TS520 Transceiver	£432.00
TS520S Transceiver	£489.00
VFO520 External VFO	£72.00
DG5 Digital Display	£132.00
E559D Receiver	£401.00
TS700G VHF Transceiver	£426.00
TS700S VHF Transceiver	£542.00
SP70 Speaker	£18.00
TR7010 VHF SSB Transceiver	£189.00
P55 Power Unit Clock	£58.00
TR7200G VHF Transceiver	£189.00
TR7500 VHF Transceiver	£225.00
TR2200GX portable 3 channels	£159.00
TR200GX portable 12 channels	£169.00
MB1A Mobile mount	£9.70
VB2200 GX 10 watt mobile PA	£45.00
TR8300 UHF Transceiver	£227.00
R300 General Coverage Receiver	£184.50
MC50 Desk Microphone	£35.00
Crystals and accessories.	

YAESU	
FRG7 Solid State Receiver	£162.00
FR101D Receiver	£439.00
FR100B Linear Amplifier	£207.62
YO-100 Monitor Scope	£146.00
YD844 Desk Microphone	£22.00
YD846 Hand Microphone	£8.95
FC301 Antenna Tuner	£96.00
24 Hour World Clock	£15.00

DRAKE	
R4C Receiver	£495.00
T4XC Transmitter	£495.00
TR4CW Transceiver	£562.00
AC-4 AC psu	£108.00
SR-1 Receiver	£150.00
MS4 Speaker	£24.75
Filters, crystals, etc.	

HY-GAIN	
12AVQ Vertical 10-15-20m.	£39.93
14AVT/WB Vertical 10-15-20-40m.	£56.19
18AVT/WB Vertical 10-15-20-40-80m.	£81.45
TH2MK2 2 element Tribander	£117.56
TH3MK3 Element Tribander	£167.72

DIGITEX	
D110 Visual Display Unit	£347.34

MICROWAVE MODULES	
MMC70 4m. Converter	£20.25
MMC144/28 LO 2m. Converter	£22.50
MMC32/28 70cm. Converter	£27.00
MMC1296/28 23cm. Converter	£31.50
MMC1296/144 23cm. Converter	£31.50
MHV1296 23cm. Tripler	£33.75
MMD050 50 MHz Counter	£44.96
MMDS00P Prescaler	£27.00
MMDS00P 500 MHz Counter	£85.32
MMT432/28 70cm. Transverter	£133.88
MMT432/144 70cm. Transverter	£169.88
MMT144/28 2m. Transverter	£88.87

G-WHIP	
Tribander Helical 10-15-20m.	£19.68
LF Coils for Tribander	£5.62
LF Telescopic Whip Section	£2.25
Base-mount standard type	£3.37
Multimobile 78, 10-15-20m.	£21.08
MM Coils	£5.91
MM Telescopic whip section	£2.25
Flexiwhip basic 10 metre section	£11.24
Base-mount standard	£3.37
Ball type Base-mount	£5.00
Coils for Flexiwhip	£5.91
Base throat adaptor USA/G Whip	68p
Extendarod 40"	£9.56

OMEGA	
TE-701 Antenna noise bridge to 30 MHz	£23.76
TE-702 Antenna noise bridge to 300 MHz	£29.70

ROTATORS	
AR30	£46.13
AR40	£51.75
CD44	£106.87
AR22	£48.38
KR400	£96.00

CABLE	
UR43 18p metre	
UR67 50p metre	
300 ohm Ribbon	
1p metre	
75 ohm low loss 18p	

JAYBEAM	
5Y/M 5 element yagi	£7.70
8Y/2M 8 element yagi	£10.00
10Y/2M 10 element	£21.31
PBM/14/2m. 14 element Parabeam	£31.16
5XY/2m. 5 element crossed yagi	£15.97
8XY/2m. 8 element crossed yagi	£19.91
10XY/2m. 10 element crossed yagi	£26.32
Q4/2m. 4 element Quad	£16.31
Q6/2m. element Quad	£21.71
D5/2m. 5 over 5 slot fed yagi	£13.61
D8/2m. 8 over 8 slot fed yagi	£18.22
UGP/2m. ground plane	£7.03
MBM48/70cms. Multibeam	£21.65
MBM88/70cms. Multibeam	£28.96
TAS 1/2m. Whip mobile	£13.05
CS/m. Colinear	£30.93
CS/70cm. Colinear	£39.37
D15/1296 23cm. Antenna	£23.06

ATLAS	
210X Transceiver	£445.00
215X Transceiver	£445.00
220-CS Console and AC Power Supply	£118.12

BARLOW WADLEY	
XCR30 Solid State Receiver	£150.00
XCR30FM Solid State Receiver	£170.00

TECHNICAL ASSOCIATES	
Audio Compressor	£25.31
RX Peak and Notch Filter	£27.56
RX Band Pass Filter	£27.56
PR2 Preselector	£23.00
Crystal Calibrator	£23.00

BANTEX	
Bantex Magnetic Base Mount	£10.40
1/2" glass fibre Whip	£8.44
1" stainless steel Whip	£9.40
UHF stainless steel Whip	£8.63
Standard base mount	£2.70

COMTEK	
144 MHz Linear Amplifier	£141.50

MARC	
NR56 2m. FM Receiver	£54.00

ACCESSORIES	
Single Meter SWR wall mounting	£9.50
Single Meter SWR desk type	£9.50
Twin Meter SWR desk type	£10.50
EK150 Katsumi Electronic Keyer	£60.75
Hymound Morse Keys	£8.10
Nye King 312-001 Morse Keys	£6.75
Nye King 312-002 Morse Keys	£7.85
Nye King 312-003 Morse Keys	£8.45
Standard Type Morse Keys	£3.00
Junkens Heavy Duty Morse Keys	£29.75
Samson ETM-3C Electronic Keyer	£63.88
Bauer single keying paddle	£10.85
Twin keying paddle	£15.95
3 way antenna switch	£5.75
6 way antenna switch	£16.85
Drake TV3300 Low Pass Filter	£18.00
TRIO LF30A Low Pass Filter	£17.00
HP3A High Pass Filter	£2.95
Yaesu Headphones	£9.00
TRIO HS5 Headphones	£22.00
TRIO DM800 G.D.O. Absorption Meter	£48.60
TRIO HC2 World Clock	£15.50
Plastic Antenna Insulators	18p
PL259	51p
PL289	75p
SO339	45p
Cable reducers 15p	

SECONDHAND EQUIPMENT	
Atlas 180 Transceiver	£285.00
Collins F455 FA-05 CW Filter	£65.00
Collins FA455 FA-15 RTTY Filter	£45.00
Comtek 2m. Linear Amplifier	£100.00
Drake R4C with filters	£450.00
Drake TX4 with AC psu	£425.00
Eddystone EC10MK1	£60.00
Drake FL250 Filter	£25.00
Heatkit SB230 Linear Amplifier	£325.00
KW201 Receiver	£95.00
Eddystone EC10 Mk. 2 Receiver	£120.00
Yaesu FTD401 Transceiver	£300.00
Eddystone 840C Receiver	£65.00
TRIO QR66 Receiver	£110.00
Realistic DX Receiver & Speaker	£65.00
Eddystone EC10 Mk. 2 with AC P50	£120.00
TRIO TR7010 Transceiver	£130.00
Magnum 2 Transverter	£400.00
Uniden 2020 Transceiver and Speaker	£400.00
Icom IC22A Transceiver	£130.00
STE AK20 FM Transceiver	£130.00
Drake 55R-1 Receiver	£115.00
Yaesu FL101 Transmitter	£260.00
Yaesu FR50B Receiver	£85.00
Yaesu FR101D Digital Receiver	£435.00

ACCESS and BARCLAYCARD facilities.
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Part exchanges 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.

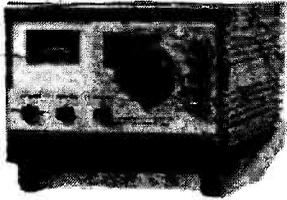
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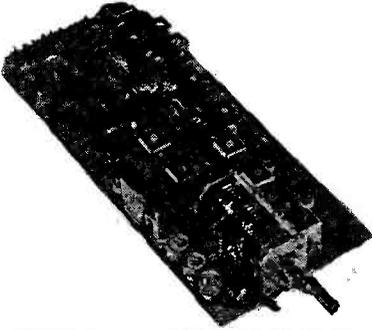
ALL OUR PRICES INCLUDE VAT

S.T.E. MILAN VHF EQUIPMENT

As sole distributors for the STE range of equipment for four years despite rising prices, we have maintained prices stable for over two years. Surely the finest value for money on the market. With the opening of the 28 MHz band the AR10 Receiver module is now one of our fastest selling lines. Demand for these is growing every month.



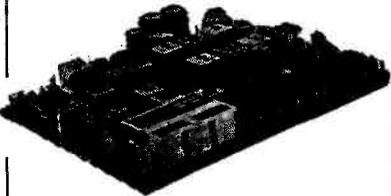
ARAC 102 receiver, 28-30 MHz. 144-146 MHz. AM-SSB-FM-CW Price £100.00



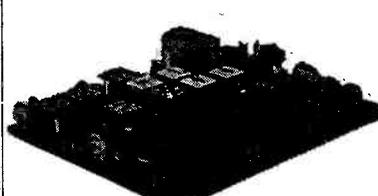
AR10 Mosfet receiver. 28-30 MHz Double conversion superhet. RF and amplifier stages are gate protected mosfets for good sensitivity and low intermodulation. Noise limiter and squelch circuit. AM, SSB and CW reception. 12v. DC.

PRICE LIST including VAT and postage

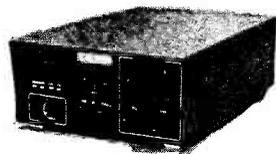
AK20 FM Transceiver	... ..	£165.00
AK20 FM Transceiver Kit	... ..	£105.00
ARAC102 Receiver	... ..	£100.00
ARAC170 Receiver	... ..	£127.50
ATAL 228 Transmitter	... ..	£127.50
ASAP 154 AC PSU	... ..	£37.50
AR10 Receiver Module	... ..	£39.50
AA1 Audio Amplifier	... ..	£4.10
AD4 FM Discriminator	... ..	£5.00
AT22 Transmitter	... ..	£50.00
AG10 Tone Generator	... ..	£4.50
AR20 C.C. Receiver	... ..	£45.00
AT23 C.C. Transmitter	... ..	£50.00
AS15 Stabilised DC PSU board	... ..	£10.00
AL8 Linear Amplifier	... ..	£27.00
AB40 Mobile 40 Watt FM Amplifier	... ..	£55.00



AR20. 12 channel FM receiver 144-146 MHz. Input impedance 50-75 ohm. AM-FM modes. Sensitivity 0.2uV AF output 3 watts. 12v. DC operation.



AT23. 12 Channel PM Transmitter. 3 watts. 144-146 MHz. Frequency deviation 3-10 kHz adjustable. 12v. DC operated AF input sensitivity 2mV adjustable to 50 mV.



AK20 STE. Latest model from the famous STE Milan range of equipment. 12 channel operation in the 144-146 MHz range. 11-15v. DC operation. 3 watts output. Sensitivity 0.2 uv R.I.T. tone burst. Complete with microphone, and mobile bracket.

We are also acting now as distributors for another Milan manufacturer—Novel. This company is now producing one of the finest range of SWR power meters we have seen. All built to professional specifications but sold at an Amateur price. All units are built in solid diecast boxes and the finish is in a "Commando Green."

SWR200B. Switched 50 and 75 ohm. 3 to 200 MHz. 2000 watts at HF. 2-200 watts at VHF. £36.25

SWR 400B. Impedence 50 ohm. 144 and 432 MHz. 20 and 200 watt range. Insertion loss 0.2dB. £55.90

PW120B. Dummy Load Wattmeter. Impedence 50 ohm. 5-20-120 watt. Frequency 3-500 MHz. £38.25

DL120. 50 ohm Dummy Load. 50 ohm to 500 MHz £20.48

CRS 110-B. 4-way Co-axial switch £37.91



POWER METER SWR400B

VHF ANTENNA RANGE CALETTI (Milan)

3/4" Gutter Mount 2m. Whip	... ..	£12.00
5" Standard Mount 2m. Whip	... ..	£12.00
Ground Plane, 4 Radials, 2m.	... ..	£13.89



455 kHz FM Discriminator Amplifier. Limiting threshold 100uV. Amplitude modulation rejection 40dB. Audio output voltage at 1 kHz 200-300mV frequency deviation + or - 3 kHz.



NEW MODEL ELECTRONIC KEYS

Jambic operation—Weighted transmission—Three memory lengths up to 1024 bits. Internal monitor. Transmitter keyed through internal relay. Silver plated contacts. 220v. AC operation. Price £106.00

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YAESU MUSEN 2-YEAR GUARANTEE "24 HOUR" SECURICOR SERVICE



THE FRG7. DIGITAL OR ANALOGUE

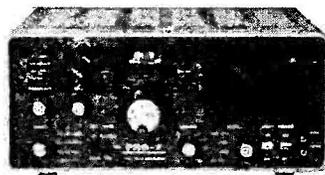
The FRG7 is a general coverage solid state receiver with specifications unparalleled in its price range. It uses a Barlow Wadley Triple-mix, drift cancelling loop for continuous, spin-tuned inclusive coverage of 0.5 to 30 MHz.

The receiver is sensitive (0.5µV for 10dB, S + N/N(SSB) and stable with AM, SSB and CW modes catered for. A 3 position audio filter, RF attenuator, dial lamp conservation switch, recorder and phone sockets are fitted. It is mains powered, but should the supply fail, or portable operation be required, 8 dry cells are automatically switched in.

FRG-7 Analogue Readout £145 + VAT COUNTER £50 + VAT

FRG-7 Digital Readout £199 + VAT YH55 Headphones £8 + VAT

YAESU for HF from SMC



The SMC, full specification, internally mounted counter (easily installed in existing receivers) provides: a 100Hz readout (100 fold improvement), flashing ± digit (to indicate VFO over-range) and adjustable gate time.



THE FT901 — SIMPLY UNBELIEVABLE PERFORMANCE

160-10m. (+ WWV Rx). 12 and 234v. (PSU Built-in). SSB, AM, CW, FSK and FM (TX & RX). 180W. PIP. 80V. Fl. Analogue 1 kHz and Digital to 100 Hz. Sensitive, ± µV with AGC controlled Mosfet RF to push pull FET RF. Balance active mixer, push pull IF amp. to crystal filter then noise blanker. Overlapping filters give continuously variable selectivity 300 Hz to 2.4 kHz and fixed 600 Hz, 2.4 kHz, 6 kHz and 12 kHz (at 6dB). 80 dB cross mod. rejection, 90 dB desensitisation immunity (at 20 kHz off at 14 MHz). Audio Peak and separate notch tuning. Negative RF feedback on 6146B toroidal tuned output stage (-31 dB 3rd order). RF processor, VOX, Curtis electronic keyer, tune button (10 sec. on full power). PLL VFO with memory for any TX, RX or T/RX frequency. Modular plug-in construction, permeability tuning (for possible new band allocations) 25 kHz calibrator, 20 dB switchable attenuator, sidetone, clarifier, advance noise blanker are all features of the FT901—The 1980's Transceiver available from SMC next month. Coming shortly are the Matching VHF transvertors and phase lock loop synthesised external VFO with scanning facility.

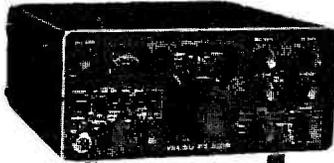
THE FT101E COMPLETE — THE MOST POPULAR RIG IN THE WORLD

The FT-101E a complete mains or 12v. DC station contained in a compact 30 lb. package, 260W. P.I.P. of SSB (with in-built R.F. speech processor) 180W., CW and 80W. of AM 10 to 160m. (incl) 10 MHz RX). The sensitive and selective (permeability tuned RF stages and 8 pole crystal filter, receiver offers: threshold adjustable noise blanker, switchable 25 and 100 kHz calibrator, ± 5k clarifier (with separate on/off switch), etc., etc.

The VFO is stable and linear (readout to 1 kHz) external VFO or crystal control can be selected with LED indicators illuminated accordingly. Carrier level is adjustable for: tune up, AM and for CW operation, whose performance with the semi break in keying, with side tone, and the optional filter installed in a high order. Linear and transverter provisions are made with sockets for: relay contacts, ALC output, all internal HT supplies, low level RF heater links and switches, etc., etc.



FT101E



THE FT301 RANGE OF SOLID STATE TRANSCEIVERS

The new FT301 transceiver range (with options installed) offers: Full solid-state 12v. DC working, external matching mains power supplies with speaker, and an external VFO are available. Plug in boards, 160-10m. in 500 kHz segments, MSF and CB receive, RF speech processor, noise blanker, front panel controlled VOX (with MOX) and P.P.T., semi break in keying with side tone, clarifier with separate switch, 11" x 5" x 131", 25 kHz crystal calibrator, internal VFO or 11 crystal per band (on external VFO with same facility) 3W audio to internal or external speaker.

The FRI01 series of Receivers

The FRI01D (de luxe) wide coverage (23 (from 1.5 MHz) 500 kHz bands ± 4 and 2 metres) receiver. Analysis of the signal path shows: 0-20dB switchable attenuator, two section permeability tuned input filter, Mosfet R.F. stage and mixer (crystal controlled), 3 section top coupled bandpass filter, no gain at first I.F., IC balanced mixer, 20 kHz wide crystal filter, shunt diode noise blanker, single FET buffer stage, AM, CW or SSB (RTTY) filter, appropriate detector and audio stage. Add to this, two excellent VHF converters, squelch, FM detector, 1 kHz readout, excellent stability, Tx monitor control, crystal control facility, switchable AGC transceive capability (FT or FL 101) and that digital readout options are available of this (de luxe) or the standard (less the plug-in options of converters, broadcast band crystals, filters etc.) version truly an "apparatus communications sine fills" extraordinary.

THE FT7 MOBILE TRANSCEIVER



This is a 10-80m. transceiver, VFO controlled to 1 kHz accuracy) plus crystal control facility. Selectable sidebands. CW, crystal calibrator, clarifier and an advanced noise blanker are some of the features packed into a cabinet only a few inches high, but through careful design the front panel remains remarkably uncluttered. Designed for a linear 10W, output consuming only a few Amps it eliminates: 30A cables from the passenger compartment and the cooling problems of a massive heat sink. Need more power? Flick in a FL110 (a 200W. PIP linear) installed in any suitable place in your car.



FRI01D



FL110
ALL BAND
LINEAR
AMP.

10-160m. Switched L.P.F. 15W → 200W. PIP A1(A3), 4W → 75W. Fl. Negative feedback with ALC to exciter. RF sensing (Adjustable hang time) with override.

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FT221R

VHF — SSB? — FM? — CW? — AM?
SMC — FOR CHOICE

THE FT221R MULTI MODE FROM YAESU

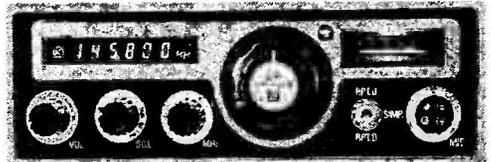
The FT221R. The multimode USB, LSB, AM, FM, CW (with semi-break in and side tone), 2m. transceiver offering the choice of phase locked VFO or 44 crystal channels, simplex or repeater (600Hz up and down shifts), with unique "double push" auto tone burst, mains or 12v. (3A) operation, excellent selectivity SSB 2.4 kHz (1.7 : S.F.) or FM 12 kHz. Front panel adjustable VOX and mic gain, a calibrator (1 MHz \pm 10), 1 kHz readout and linearity, sensitive squelch, clarifier with IRT and IRT with ITT (makes F.S.K. easy), switchable "S" and centre zero tuning meter, noise blanker, serviceable plug in boards all contained in 1 1/2" (14") x 5" x 1 1/2", 22 lb. rigid package. 600 kHz and 1.6 MHz shifts over 4 MHz.

FT221R £357 + VAT
MANUAL £9.00

YC221 £72.50 + VAT

SCANNING DIGITAL II from KYOKUTO

The Digital II offers complete 5 kHz step coverage across 2 metres and now with the Scanner 33, 25 kHz channels from 145 MHz upwards covered in around 10 seconds. It offers full lock and lockout on all channels. The scanner stops on a required channel for 10 seconds, then unless locked moves on. The bright digital readout comes from 6 seven segment LEDs. Selectable 10 or 1 watt output for simplex or duplex (up and down shifts), across 144-146 (rx to 149 MHz) from a tiny 6 1/2" x 2 1/2" x 7 1/2". Easily underdash mounted with the supplied mounting bracket, or slipped in place of the broadcast wireless. For strong handling, and low noise the R.F. mixer, first I.F. (16.9 MHz) second mixer (and LO) are all PET's. The output of the P.L.L. with superb selectivity provided by a 15 pole (\pm 8 kHz at -5dB \pm 15 kHz at -70dB). In unlocked or the squelch open. The V.C.O. is directly modulated (for exceedingly linear deviation). serviceability and screening). Selective calling socket.



DIGITAL II £35 **SCANNER £49.50 (+VAT 12 1/2%)**
The front end is tuned by varicap by the DC Ceramic filter. LED lamps indicate if the Unitary 6 circuit block construction (for

FOR VHF MOBILE THE FT227R FROM YAESU EX STOCK

The new FT227R uses a "single knob" tuned digital synthesizer employing a photoelectric sensor or an optical coupled system which eliminates both noisy, unreliable rotary switches, and crystal banks. Full coverage of 2 metres in 5 kHz divisions with a \pm 600 kHz shift plus a memory feature which permits recall of any entered frequency or particular offset. Bright large, digital readout gives unequivocal readout of the frequency in use. The receiver offers 0.3 μ V (for 20dB S/N) sensitivity into \pm 6 kHz (at 6dB) bandwidth whilst maintaining a remarkable immunity to overload and image problems. The 20W. DC input transmitter features Hi/low power outputs, AFP tone burst or repeaters and an out of band inhibition trip, etc.



FT227R



KYOKUTO DENSHI SCANNING FM2015R



The 2015 transceives across 144-146 (Rx to 149) MHz in 5 kHz steps tuned by coaxial switch stopped at 0 and 9.

A major feature is the 4 channel RAM memory (with an internal Ni Cad back up) which may be programmed direct from the front panel by simply dialling in a frequency, no screw drivers, no soldering irons, no fuss. Frequencies can be recalled from the memory instantly or they may be scanned in either of two modes :- searching for a vacant or an occupied channel. 5 split (including + and - 600 kHz) for repeater or transverter (even tripleverter) use. Multipurpose tone burst, RIT (centre off with "click"), modular constructions, centre zero meter, accessory socket, mounting bracket, microphone etc., are all provided. The sensitive receiver is varicap tuned by the DC level of the P.L.L. IF's of 16.9 MHz and 455 kHz provide high image rejection and good shape factor 2 : 1 at 70dB (12 kHz BW). In the transmitter, modulation is applied directly to the V.C.O. (for the ultimate in fidelity), auto power control and varicap tuning keeps power output constant at band edges and spurs! way down. **EX-STOCK. £245 + VAT (12 1/2%)**.

WATTMETER REMOTE RF HEAD

50-150 MHz ideal for mobile use. Separate directional coupler 3" x 2 1/2" x 1 1/2" and illuminated indicator 5" x 2 1/2" x 1 1/2" c/w brackets, etc. Power 20 and 200W FSD (\pm 10%) SWR to 3 : 1 (\pm 3%). **FS711 V P & P 85p + 8% VAT £23.50**



WATTMETER AND LOAD

Flat 50-150 MHz SWR \pm 3% (to 3 : 1) 20 & 200W FSD (\pm 10%) 6 1/2" x 2 1/2" x (4 1/2") **FS302M P & P 85p + 8% VAT £22.50**
30W peak 15W cont. 50 ohms PL259 SWR 1:2 : 1 at 150 MHz. **DL20 P & P 25p + 8% VAT £4.75**

VHF HANDHELD

KEN KP202 TRANSCIVER (+ VAT Price)
144 MHz, FM, 2W of RF and 1/2W of audio. Immunity to image and IF breakthrough and performance to rival all walkie-talkies and many a mobile set.

C/w F plug, leather handle/whip case and telescopic whip.

Fitted 6 channels S20 & S21 + choice of S (21, 23, 24, 0) R (3, 4, 5, 6, 7) ...

R channel only crystal tone burst ... **£10.00**

Flexible stubby ant. **£5.80** Case F to UHF adaptor **£1.65** N Cads Base charger KCP2 ... **£12.95**

VHF Monitor Receiver

SEIWA MR2 AND MS2 (+ VAT prices)
Ideal for the SWL, the YL or even the XYL as the monitor receiver to keep you in touch. Tiny (2 1/2" x 1 1/2" x 4 1/2") and light (8 ozs.) slip into your pocket or onto your belt with the optional case. Sensitive double conversion superhet with 12 kHz band width, auto squelch, and generous audio output c/w Nicads, Mains Charger, Earpiece, Antenna.

MR2(4) 70 MHz 12 switched channels **£53.00**

MRS 144 MHz 12 switched channels **£53.00**

MS2 144 MHz 4 scanning channels **£62.00**
Leather Case **£1.90** Crystals each **£2.00**

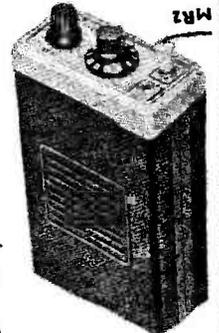
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5500W P.I.P. 14 SWG	£19.60	P500W. P.I.P. Cu/Terylene	
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8XY/2M	£17.70	Q4/2M	£14.50
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		PB110/2M	£22.35
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		PB18/70	£16.50
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85' 145 MHz	£7.20	70' ± 70 MHz	£4.00
BGA f.g. ½ 2m. fibreglass	£8.75	Trunk Lip Mount	£5.75
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BSU ½ 432 MHz	£5.00	Stan'd b. unwanted deduct	£0.50
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COAX (Cable and Connectors) — Insulators — Wire — Rigging — Fittings, etc.

COAX PLUGS

	(Post and Packing extra)	VAT 8%	
PL259 Standard UHF plug	£0.48	SO239 2 hole socket	£0.37
UG175 Reducer UR43/76	£0.12	SO239 4 hole socket	£0.50
UG176 Reducer UR70	£0.12	25B Back to back female	£0.80
PL259R Reducer plug	£0.56	Back to back male	£1.20
PL259S "Soldierless" UR76	£0.51	"IT" Adapt (2FM)	£1.20
PL259S "Soldierless" UR67	£0.51	"IT" Adapt (3F)	£1.48
PL259R Push fit UHF	£0.69	Angle 90° (1M + 1F)	£0.90
239 Socket to Phone/cf	£0.60	239 Socket to 3.5mm. jk	£0.70

CABLES RF FEEDERS (Carr. extra) VAT 8% per yard

UR67 50 ohm Heavy	39p	UR39 75 ohm Medium	24p
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MOSLEY TRI-BAND BEAMS (Carriage £3.50) VAT 12½%

TA33 3 ele. 200W R.M.S. £	TA32 2 ele. 300W. A.M. £
MUSTANG 3 ele. £	MUSTANG 2 ele. 1kW. £

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GQ2E 2 element	£119.00	GQ4E 4 element	£238.00
GQ3E 3 element	£178.00	CK1Q 1 ele. Conv. kit	£66.00

G WHIP HF MOBILE (Carriage 90p) VAT 12½%

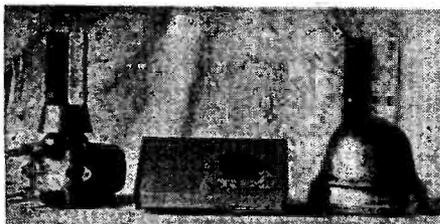
Tribander 10—20m. (+LF)	£17.50	LF40, 80 or 160	£5.25
Multimile 10/20 + MM	£20.52	MM40, 80 or 160	£5.25
Flexiwhip 10, (+FF)	£10.00	FF15, 20, 40, 80 or 160	£5.25
Basemount ¼" hole mount	£3.00	Telescopic whip for coils	£2.00

SMC-HS VHF Antennas

(VAT 12½% Carr. 95p)	
250-29 or 145 MHz only	£11.75
¼ effective DC short snap mount	
matching transformer shock spring, tapered whip, c/w 12ft. cable and PL259, 260, 70 or 145 MHz	£11.75
High gain, gutter mount. Tapered coil and whip, 90° spring fold over joint	£17.15
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25, Trunk lip mount for snap bases	£3.95
265, Gutter clip adj. angle	£4.95
111, Gutter clip base c/w shock spring, 10ft. cable, PL259, etc.	£4.95



ANTENNA ROTATORS CDE & STOLLE



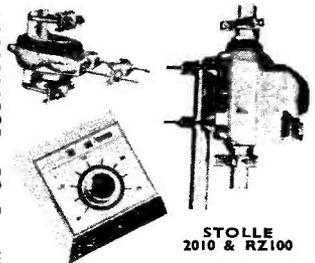
AR20/30 AR30/40 AR22/40/33

VAT—Rotators 12½% Cable and delivery 8%.

ROTORS

AR20 Light VHF/UHF	£34.00
AR30 Light VHF/UHF	£41.00
AR22 VHF Light HF	£43.00
AR40 VHF Light HF	£47.50
AR33 Deluxe control '40	£59.00
BTI Medium duty	£79.50
CD44 Medium duty	£95.00
HAI11 Heavy duty	£129.00
2010/220 Automatic	£43.50
2030 Memomatic	£48.00

BEARINGS	
CD562 CDE (up to 2" and 1½")	£5.00
RZ100 Scalle (ballrace)	£10.00
MOUNTING KIT	
AK121 CDE to Versatower	£3.60
CABLE	
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10' telescope heavily galvanised steel mast supplied with guy rings etc., or c/w full rigging kit. Carriage £2—£7 ex-stock VAT 8%. 30' £25.00 or £43.86 c/w rigging 40' £32.50 or £56.85 c/w rigging 50' £42.00 or £74.50 c/w rigging

HAMTOWERS

Galvanised lattice 10' sections. Free standing with climbing steps. Carriage £3—£28 ex-stock VAT 8%. 30' c/w base grillage £192.35 40' c/w base grillage, P.O.A.

To determine the mast or tower most suited for a particular application one must consider the following factors:—

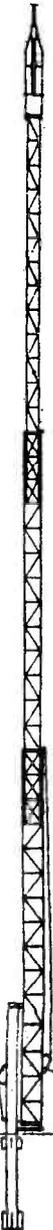
1. Antenna wind load/weight.
2. Guest or self-supporting.
3. Fixed or telescopic.
4. Initial costs.
5. Cost of installation.
6. Maintenance costs.

TELETOWERS

Telescope but not tilting. Light unit weight unobtrusive. Carriage and rigging (RK) extra. 42' mast £121.00 (RK £28) 57' mast £174.00 (RK £28) 79' mast £225.50 (RK £49) 101' mast £303.50 (RK £76)

VERSATOWERS

20' sections—Telescopic—Tiltover. Easy for antenna maintenance, etc. Large range of models, e.g.: Standard P40 ... £ Standard P60 ... £ Heavy Duty P40 ... £ Heavy Duty P60 ... £



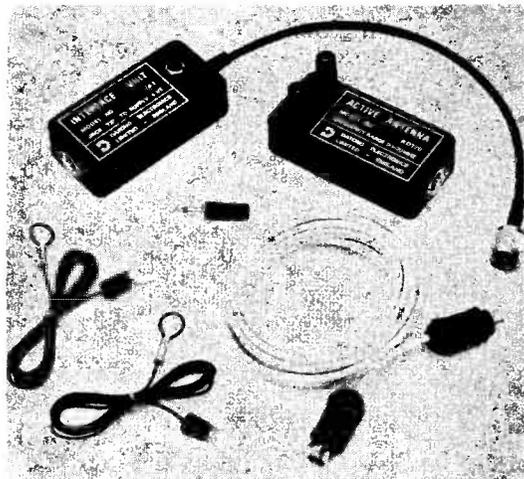
NEW : ACTIVE RECEIVING ANTENNA

A COMPACT INDOOR ACTIVE DIPOLE FOR 60 kHz to 70 MHz

MODEL AD170 Continuing our policy of constructive innovation we are proud to introduce what we think is the first broadband active dipole antenna at a price which puts it within easy reach of the Radio Amateur or short wave listener.

The Datong Active Antenna is designed for indoor mounting only but in all electrical respects it is in the same league as the active antennas the professionals use, and for which they pay prices comparable to a complete amateur bands transceiver.

The same performance advantages which make active antennas attractive to professionals make Model AD170 especially attractive to the amateur. They include :



- ★ Ultra broadband coverage from 60 kHz to 70 MHz.
- ★ Ideal for remote mounting (e.g. loft or attic) since no tuning adjustments are required.
- ★ Only 3 metres long yet signal-to-noise ratios in the LF and HF ranges are comparable to those from much larger conventional antennas.
- ★ Uniform sensitivity over the full frequency range minimises receiver intermodulation effects.
- ★ Balanced dipole configuration gives choice of polarisation plus useful directivity and eliminates dependence on ground plane or earth connection.
- ★ No need for expensive accessories such as antenna tuner units or matching units.

Although active antennas give lower signal strengths than conventional antennas, received noise levels are also lower and therefore signal-to-noise ratios are comparable when used with modern sensitive receivers.

Model AD170 is supplied fitted with PL259 coaxial output plug and complete with the accessories shown in the illustration, i.e. interface unit, head unit, 4 metre coaxial connecting cable (extendable if necessary), two 1.5 metre dipole elements, spare jack plug. A separate DC power supply is required (12v. at 80 mA) and this plugs into the interface box and feeds the antenna via the coaxial cable. A suitable mains power unit is our new Model MPU (see special package price below).

FREQUENCY-AGILE AUDIO FILTER MODEL FL1



A versatile bandpass or band-reject filter with fully variable bandwidth and centre frequency plus unique search/lock/track capability for automatic removal of heterodyne whistles. Improves reception of CW, RTTY, and SSB. Connects between receiver and loudspeaker.

R.F. SPEECH CLIPPER MODEL RFC



Processes speech as a SSB signal at 60 kHz to increase its ratio of average to peak levels without adding harmonic distortion. Improves talk power of SSB, FM, and AM transmitters without increasing the peak transmitted power. Connects between microphone and transmitter. (See articles by Dr. D. A. Tong, Wireless World Feb. 1975, 79-82 and Oct. 1976, 77-81).

UP-CONVERTER MODEL UC/1



Adds full receiving coverage from 90 kHz to 30 MHz to existing receivers or transceivers tuning 28-29 MHz or 144-145 MHz. The full range is covered in thirty 1 MHz wide synthesiser controlled segments. Also works as a two-metre converter. Connects between receiver and antenna.

MAINS POWER UNITS MODELS MPU & MPU/1

Good quality mains adaptors designed and made in the U.K. specifically for use with our products. The unbalanced output is suitable for Models FL1, AD170, and UC/1 when using 240v. AC mains, and for FL1 and AD170 when using 220v. AC mains. MPU has a built-in 13 amp fused mains plug while MPU/1 has an 18 inch long mains lead. When ordering please specify whether output plug is required to suit FL1, AD170, or UC/1.

PRICES : (NOT INCLUDING VAT) : AD170 £29.50, MPU and MPU/1 £5.50, AD170 + MPU or MPU/1 special package price £33.00, FL1 £53.00, UC/1 £105.00, RFC £40.00, RFC/M £21.50 (PCB version of RFC).

All prices are subject to VAT at 12½%. Prices include delivery within U.K. {More data on any product plus complete price list showing accessory leads, etc., available on request.



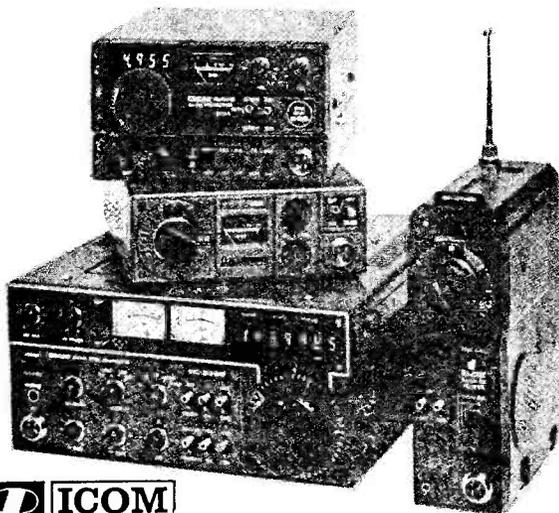
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ADD TO THIS THE OFT' PRAISED SERVICE OF THANET WITH OUR WELL QUALIFIED TECHNICAL STAFF AND RANGE OF TEST EQUIPMENT AND YOU NEED HAVE NO WORRIES IN BUYING



FOR MOBILES :

IC-240 The well tried and high popular FM synthesised rig. If you know a friend with one you will know we have every right to boast about the excellent quality of the signal it puts out. (Perhaps that is why we have sold so many !) Now available with Super-Scan as an extra. By the way this is the same size as the SSB unit on the IC-245E.

£179

IC-245E The leader in multi-mode mobiles. Fully synthesised to give full band coverage in 100Hz or 5 kHz steps. LED readout of frequency to the nearest kHz. FM, USB, CW, Normal or Reverse Repeat or split frequency working with any spacing, automatic tone burst etc. An excellent bit of engineering which can also serve as a base station.

£396

FOR PORTABLES with a decent power output and large battery capacity :

IC-202 The 3W SSB portable which is tunable over all the sideband patch and can be used, when fitted with extra crystals, to cover 144-145 and 145.8 to 146 MHz. Used by many as a prime mover for something bigger because of its excellent clean signal. By far the most popular VHF SSB only set on the market. There are a lot about !

£162

IC-215E The big boy in FM portables, with Rx sensitivity and transmission quality every bit as good as a base station (and better than many !). A healthy 3W of FM and sensible batteries with four times the capacity of those used in most other portables—so that they don't run flat on you in the middle of a QSO quite as often. Despite this and its rugged construction it is still easy to carry around. Lots of these about also !

£149

*We have a limited number of IC-215s fitted with 9 Channels at the special price of £149 inc. VAT.

FOR BASE STATIONS :

IC-211E The leader of them all. Fully synthesised VFO with 7 digit LED readout to the nearest 100 Hz. FM, CW, LSB, USB. There's nothing quite like it. Most would make this their choice if it wasn't for the problem that you have to pay more for the best ! (With these days of inflation it isn't silly to think about HP.) See October's add for more details.

£529

ALL PRICES INCLUDE VAT, AND DELIVERY IS FREE ON MAIL ORDERS FOR TRANSCIVERS WHY NOT POP A NOTE ON THE ANSAFONE FOR A PRETTY COLOURED BROCHURE AND DETAILS ?

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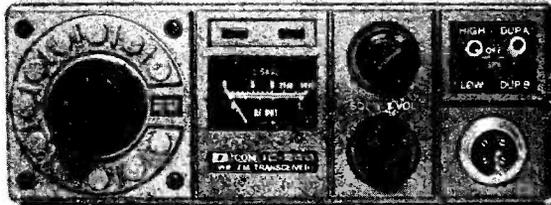
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HERNE BAY
(02273 63859)



IC-240

Still your best choice in mobiles

Are you going around in circles trying to choose which synthesised mobile to buy?

About twelve months ago there was no problem in choosing as there was only the 240 and one other which was much more expensive and difficult to tune when driving. Now it's a bit different, with two others on the market—and all claiming to be the best. Before you choose just sit down and think about what you really want from a mobile. For instance, do you really want 400 channels and do you understand the complex mathematics which enables you to fit these into two megahertz of bandwidth when each channel requires some 16 kHz? How many channels do you actually need to have available? Well, there could well be up to ten repeater channels in time in the UK and in a really busy area such as London you could well need 8 simplex. Another requirement is that you want to be able to listen on the input frequency of the repeaters to check whether a simplex QSO is possible. You want to be able to do this instantly at the flick of a switch and don't want to have to do a bit of computer programming in order to tell your rig which channel the input is on. Most important though is that you want an ABSOLUTE MINIMUM of knob twiddling and button pressing when driving and your tone burst should work automatically as and when required. Just think how complicated it will be when the rig offering some 800 channels is required to operate on the frequency Joe has suggested:—"QSY to 23" he says to you on R4 "QSY" you reply—and then your problems start when you have to do the following (perhaps while also driving at 70 m.p.h. on a busy motorway):—

1. What frequency is S23 — 145.575 MHz.
 2. Can I manage to QSY without looking at the dial for more than about $\frac{1}{2}$ sec.—NO, unless you work out in your head how many 10 kHz steps you need to click the switch round, i.e. 145.575-145.100=475 kHz=47 $\frac{1}{2}$ steps. (You need to memorise the repeater input frequencies of course).
 3. Do I have to press the 5 kHz button? Well, as S23 is odd and R4 is even the answer is YES.
 4. OH! QRX for a moment. . . . Sorry officer I didn't see him as I was tuning my radio.
- . . . so that really leaves you with a choice of excellent rigs to choose from which both have 25 kHz tuning steps and are easy to operate, providing easy channel selection and reverse repeat at the flick of a switch. No doubt the respective importers will both try to tell you their's is best—so let us list the advantages of the IC-240:—

1. Its solidly built and the several hundred already sold have shown an excellent reliability rate.
2. You can reduce switching down to an absolute minimum as you can arrange the channels exactly where you want them. 22 is plenty when mobile and it's easy to arrange, up to 80 if you wish, for home use (you can also get up to 148 MHz if you are going to the USA!) Also you can have a scanner if you wish.
3. It has that superb, clear and crisp modulation which is so very characteristic of ICOM.
4. The receivers are very sensitive—we measured 0.1 uV pd for 10dB SINAD (which for comparison is better than 0.14uV for 12 dB SINAD!)
5. Its cheaper in price but not in quality.

YOU CAN'T GO WRONG WITH AN IC-240!



IC-701

IC-701 The HF rig to beat them all which will be available in the spring to those who have their names on the list. *All solid state including the finals *100W RF output, Continuous Duty on All Bands, All Modes. *All bands 1.8-30 MHz. *USB, LSB, CW, CW (narrow), RTTY. *Double balanced Schottky Diode mixer used in both Tx and Rx. *Fully synthesised with Digital readout to 100 Hz and two stores to enable split frequency operation. *ICOM's unique band-pass tune. *VOX, Semi-break-in CW, RIT, AGC, Noise Blanker. *Built-in RF speech processor. *Extremely compact. *All filters built in. *12v. or mains operation. *Electret desk mic.

After having used this rig for several weeks on the air we think that it is definitely the nicest HF rig we have ever used.

During the evenings and at weekends (when calls are cheap) why not use our Ansafone to record your request for data, etc. (02273 63850)



WATERS & STANTON

TELEPHONE HOCKLEY (03 704) 6835 (2 LINES)

**GREAT VALUE - - -
GREAT PERFORMANCE!**



QUARTZ-16

NOW £149.75 inc. VAT !

THE FASTEST SELLING 2 METRE VHF FM MOBILE CAR TRANSCIVER

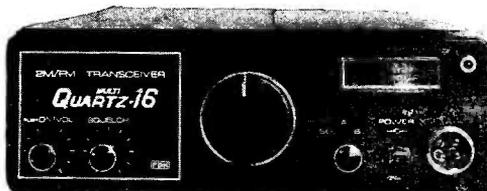
**EASY PAYMENT PLAN
DEPOSIT: £30.75**

Balance:

12 monthly payments of £11.31

18 monthly payments of £8.02

24 monthly payments of £6.33



Here it is, the no-nonsense car mobile transceiver that enables you to keep in touch with all your friends whilst driving around town or across country. The Quartz-16 is a compact single packaged transmitter-receiver that only requires 12v. DC from your car battery plus a suitable aerial (priced from £2.95) for you to enjoy the true thrills of VHF FM mobile operation.

The front illuminated panel control selects the channel required. For example, "S20" is the main calling and monitoring channel. "S22" is the mobile calling frequency. Once you have established contact you simply change frequency to one of the other channels that are not in use or continuation of your private contact.

With the Quartz 16 you will also be able to work through any of the dozen or so repeater stations dotted around the major cities in the U.K. Included in the Quartz 16 is a special in-built tone that automatically switches on your local repeater station thus enabling you to make contact with other fixed or mobile stations up to 100 miles away or more. Yes, whichever way you look at it, the Quartz-16 is a powerful package at a price that makes sense. If you simply want to communicate why pay more—we can quote for a complete packaged mobile station including transceiver, aerial cable, etc. at a price lower than any other model! and that includes a 12 month guarantee with off-the-shelf spare parts—we import direct from our factory in Japan—you save! It's as simple as that.

For the technically minded, here's a few additional pieces of information. The transmitter is 12 watts output switchable to 1 watt for local or private contacts. A squelch control enables you to set the receiver so that any station operating on the channel you are tuned to automatically switches your receiver on. If there are no signals then there is no noise! A large slide-rule meter indicates the strength of the received station and the power output of your transmitter. The transceiver is capable of operating on up to 25 different channels selected by the front panel switch including 2 priority channels that over-ride the main dial setting. The transceiver comes supplied with simplex channels S0, S22 and repeaters R3, R4, R5, R6 and R7. The price includes microphone, connecting cables, quick release mobile brackets and all hardware.

Additional accessories: 3 extra channels S21/22/23—£7.50

Standard aerial £2.55

High gain aerial £7.95

Aerial (no-hole boot mount) £3.50

MOTORWAY OR COUNTRY LANE — YOU'RE NEVER ALONE WITH THE Q-16!

LISTEN IN ON THE ACTION! — — THE FUN & THRILLS

**SIGNALS FROM DARKEST AFRICA TO THE NORTH POLE
OR KEEP IN TOUCH ON THE ROAD OR AT YOUR FIRESIDE WITH YOUR LOCAL AMATEURS
WE'VE GOT THE ANSWER BELOW:**

YAESU FRG7 SHORT WAVE RECEIVER



**GREAT VALUE — GREAT PERFORMANCE
STILL £162 inc. VAT delivered UK**

Whether your interest is in amateur band listening or short wave broadcast monitoring, this receiver must be your first choice. Rarely does one find a low cost receiver that embodies the advantages of general coverage whilst retaining first class band-spread—but the FRG7 is the exception. None of the weaknesses manifest in similar models such as drift, cross modulation, image problems or poor calibration are evident in the FRG7. We have sold many of these receivers to customers throughout the U.K.—and all agree the FRG7 is a winner.

If you're thinking of buying one, why not give us a visit, telephone call or drop us a line. We'll be glad to give you any additional information you may require. And remember, we have our own fully trained service personnel to give you the back-up service that has made us one of the U.K.'s leading communications retail outlets.

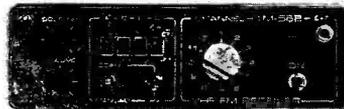
TM56B AMATEUR VHF MONITOR RECEIVER

230 volts AC 12v. DC 10 Channels fitted

12 CHANNELS

+

4 AUTOSCAN



NEW STOCKS ARRIVING END OF MARCH

Tune into the exciting World of Amateur Radio with this advanced monitor receiver. Listen to your local amateur radio stations both fixed and mobile, direct or through your local repeater. From the comfort of your fireside chair using the built-in 230 volt AC power supply, this receiver will open up the whole new World of VHF Amateur Radio for you. . . Alternatively the necessary hardware supplied enables you to power the TM56B from your car radio battery for true mobile operation.

GREAT VALUE

Little wonder that the first shipments of these beautifully engineered receivers were sold out within weeks of the advertisements appearing. We really are amazed at their superb performance at such a low price.

SOUND DESIGN

The design is well and truly tried and tested, and the circuitry is almost identical to the receiver section of the FDK mobile transceivers. Both sensitivity and selectivity leave nothing to be desired and the auto-scan enables the popular calling channels to be continually monitored for activity.

NO HIDDEN EXTRAS

The receiver is supplied complete with all leads, circuit diagram crystals for channels S0, 20, 21, 22, 23, R3, 4, 5, 6, and 7 plus space for a further 6 channels making 16 in all. An additional matching desk top aerial is also available at £2.50 extra.

£85 including delivery and VAT.

ELECTRONICS

TELEX 897406

**FAST
MAIL ORDER
SERVICE
& EXPORT**

SPECIAL OFFER !

23 CHANNELS - - - - + 4 AUTO SCAN

LIST £209 DURING MARCH £179!

It's not often these days that we have the opportunity of announcing price reductions, but this month we are doing just that. Owing to a special purchase deal with our factory in Japan, we are offering the FDK Multi-II transceiver at £30 below normal price, whilst the latest shipment lasts. If ever you wanted an excuse to purchase the best, here it is. Almost two years ago the Multi-II heralded a new era in 2 metre mobile design. Its auto-scan feature has since been copied and offered as add-on units for other models, but with the Multi-II it is built-in for compactness and it costs nothing extra! So let's see what £179 will buy you.

The Multi-II has 12 watts of true RF output from its rugged P.A. protected against high SWR, open or short circuit. The FM modulator, renowned for its high quality penetrating audio, employs hard clipping so there's no fear of over deviating. Xtal control of the transmitter ensures complete freedom of spurious outputs.

On the receiver side there is a built-in RF pre-amplifier that picks out even the weakest of signals and cuts out a lot of the QSB normally associated with mobile units. From the RF pre-amplifier, the signal passes through the main RF amp, 4 helical resonators and on to the first IF crystal filter. A further conversion to 455 kHz and you have a choice of switchable wide or narrow IF filters controlled from beneath the front panel. Audio output is a full bodied 3 watts; enough to do battle against even the noisiest of cars.

How does it perform in operation? Well it is sheer delight. You have a choice of 23 switched channels (S0, 20, 21, 22, 23, R3, R4, R5, R6, R7 are fitted) and a further 4 priority auto-scan channels. Just think how many more contacts the auto-scan facility will give you! Hands firmly on the wheel while the transceiver hunts out the signals.

Tone-burst is automatic, but can be switched off via front panel

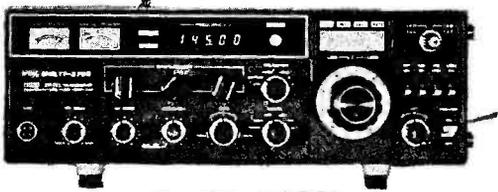
**FDK MULTI-II
2M FM MOBILE**



selector. And there's another front panel control you won't find on other rigs — receiver incremental tuning to ensure perfect copy at all times. And we haven't finished yet. Another control enables the transmitter driver stages to be switched on for monitoring of the FM modulation—and in conjunction with a rear panel switch, the S meter can be made to read centre zero for netting your Tx crystal onto the Rx frequency. For added versatility an external accessory socket enables the use of VFO or synthesiser. And, of course, the price includes mic, DC leads, handbook, mobile mounting bracket, desk stand, etc. Send today with S.A.E. and get the full details on today's best buy!

Credit Terms : Deposit £36 + 12 months at £13.59, 18 months at £9.63, 24 months at £7.62.

FDK MULTI-2700 Mk II



2m ALL MODES

There are two types of all-mode 2-metre rigs on the market—the budget rig with its no nonsense bare essentials and the deluxe rig with its many extras that make operating that much more pleasurable. Without doubts the Multi-2700 falls into the latter classification but at a price that is remarkably low compared with its competitors—in fact it is true to say that if we charged you for all the extras the price would be prohibitive. If you want the full story on the Multi-2700 simply send a 7p stamp for the 4 page brochure. But here listed are just a few of its features: 141-143 MHz (143-149 MHz on Receive) 16 watts output, vox, IRT, APC, speech compressor, dual VFO control, VCO, synthesized channel switching or analogue vfo, high/low power, FM/SSB/CW/AM/ noise blanker, variable AGC, pre-amp, OSCAR receiver converter, 230 volts AC/12 volts DC LED readout, RF gain control, separate FM/SSB microphone gains, ALC, variable compression, antivoix, variable delay, 100 kHz calibrator, squelch, plus or minus 600 kHz repeater shift, 1.6 MHz repeater shift, microphone, cables, English manual and even a log-book!

In the past 12 months the Yen has risen by no less than 23% against Sterling and yet the price of the Multi-2700 still remains at £489. The moral must be buy now—there are some price increases around the corner!

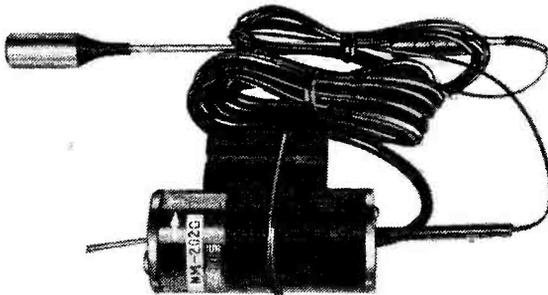
MARCH DISCOUNTS

ANTENNA SPECIALISTS	List	Discount	Carriage
ASP 201 1/2 wave	£3.03	£2.55	(£0.50)
ASP 2009 1/2 wave	£7.95	£7.10	(£1.00)
ASP 677 de luxe 1/2 wave	£15.75	£14.20	(£1.00)
ASP No hole boot mount	£3.50	£2.60	(£0.50)
K220 Magnetic mount	£9.50	£6.50	(£0.75)

STOP PRESS! NEW STOCKS JUST ARRIVED

MOBILE SAFETY MICROPHONE

Clips on lapel, sun visor, safety belt, etc. Weighs 5 grams and complete with gear lever Tx/Rx control box—keep both hands on the wheel in future! Suits most transceivers except IC240.



ONLY £19.95 inc. VAT (50p)

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ALL PRICES INCLUDE VAT CARRIAGE IN BRACKETS**



AGENTS : G3XTX J.R. Electronics, 198 Collier Row Lane, Romford, Essex.
Tel.: Romford (0708) 68956
GM3GRX Eric Simpson, 6 Drossie Road, Falkirk, Stirlingshire. Tel.: 0324 24428
Monday to Saturday 9 a.m.-5.30 p.m. Early closing Wednesday





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If you really can't manage the **FT901DM** at **£842.62 (inc. VAT)** then why not treat yourself to the . . .

**FT101E THE WORLD'S NUMBER ONE TRANSCEIVER
TRIED AND TESTED WORLD-WIDE**



Value and performance in one compact thirty pound package. Effective RF speech processor to realise the extra "talk power" to cut through the pile-ups without the need for a linear. All solid-state except for driver and final valves. Plug-in modules for ease of servicing—on the rare occasions it needs it! 12 volt DC or AC mains operation built-in. Just add antenna and volts to be on the air—all bands 160 to 10 metres. Accessories available: CW filter; matching speaker; remote VFO.

Western PRICES: FT101 £482.63 SPI01B Speaker CW Filter
INC. VAT. FV101B VFO SPI01PB Speaker/Phone Patch

**OR IF YOU'RE VHF MINDED . . .
... THE MULTI-MODE 2m TRANSCEIVER**

FT221R

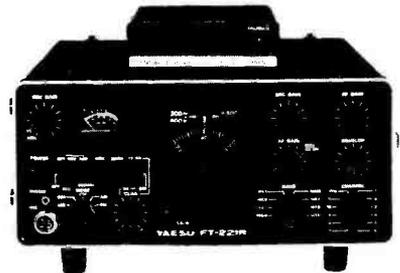
All-mode operation—SSB (USB, LSB), CW, AM, FM. All solid-state reliability with plug-in modules. Rugged 70-watt dissipation PA transistor for stability and reliability. VHF local oscillator (133-137 MHz VCO) in PLL system minimises spurious responses. 12 volt DC or AC mains operation built-in. Full 4 MHz (144-148) coverage with 600 kHz repeater shift and access tone generator.

ALSO YC221 Digital readout adaptor for FT221 and FT221R. Mod. kit needed for FT221 and "R" models without "D" suffix to serial number.

Details on request.

Western PRICES: FT221R £392.63
INC. VAT.

YC221 £75.38



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Electronics (UK) Ltd

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- ★ MODELS FROM 25-119'. ALL TELESCOPE DOWN AND TILT OVER
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A **Heavy Duty** is well worth the extra . . . **Compare**

Size	Head Load at 75 mph	Price (inc. VAT)
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Head Loads are for unguyed towers. Prices are for framed-post models (FP) and are carriage paid except to Scotland, Devon and Cornwall Over-water deliveries also extra.

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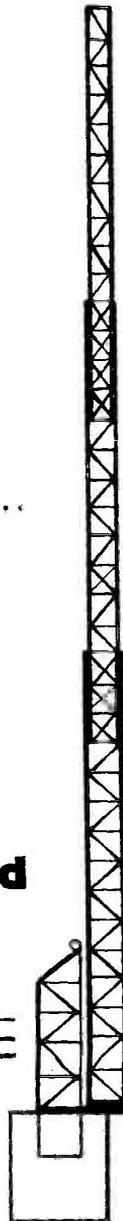
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FT301 T/RX 1.8-30, 100W, 12v ... £485.00	FRG7 Digital ... £180.00	FR101SD Digital Readout "S" ... £387.00	YC5001500 MHz Counter 10 PPM ... £155.00
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FV301 External VFO ... £62.00	FT227 10V, 400ch, mobile, digital ... £169.00	FT101E Transceiver ... £429.00	YC301 Monitor scope ... £123.50
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ALL + VAT 12½% except Monitor Scope, Clock, Counter, Wattmeter + 8%

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MMT432/285 with Oscar shift ... £119.00	MMD 050, 50 MHz counter ... £62.00	MCC70/LO, 4m, converter ... £20.00	70cm. models with IF outputs of 28-14-18- or 144 MHz.
MMT432/144 Transverter ... £133.00	MMD 050/500MHz counter Divide by 10 prescaler, 500p. ... £25.00	MCC144, 2m, converter ... £18.00	
MMT432/144R with 1.6 MHz shift ... £151.00	VARIABLES	MCC144/LO 2m, converter ... £20.00	
MMP 12/3 Power supply	MMV 1296, 23 cm, varactor ... £33.00	MCC432, 70cm, converter ... £24.00	
		ATV435/51 converter ... £24.00	

ALL MICROWAVE-MODULES SUBJECT TO VAT IN U.K. — 8% ON FREQUENCY COUNTERS, ALL OTHER MODELS + 12½%

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Asp2009, 3 3dB 2m, mobile ... £5.95	Asp no hole boot mount ... £3.70	Asp E667 70cm, 5dB mobile ... £16.90	Specia offer ... £41.50
Asp629 4w, 3dB 2m, mobile ... £7.60	Asp magnetic mount ... £8.95	Asp A659 UK 70cm, 5dB, base antenna ... £15.45	
Asp677 3dB 2m, mobile... £13.50	Asp cutter clip less cable ... £3.85		

ICOM RANGE

IC215, 2m, 8ch, ...	£132.40
IC215, 2m, 10ch, ...	£144.00
IC202, 2m, 5SB, ...	£152.90
IC22A, 10W, Mobile ...	£145.00
IC240, 10W, Mobile ...	£164.40
IC245E, 10W, FM/SSB ...	£352.00
IC211E, 10W, FM/SSB ...	£470.00
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10W mobile 400CH Tx/rx £235.00

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2m, for IC215, TRIO 2200GX, standard C146A	£3.25
ALL + post 25p + 12½% VAT	

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EXTALS, S21 or S22, pr.	£4.50
ER Case, 202/215	£6.67
Mobile Bracket, 202/215	£10.23
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D.C. grounded low angle radiation pattern fully adjustable for max. gain and min. S.W.R. (+P/P £1.50) £29.00
ALL ABOVE ITEMS +12½% VAT

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NEW . . . Exclusively for the ICOM IC240 SUPER - SCAN



- ★ Scans 40 channels in 25 kHz steps from 145-000 when scan mode is selected.
- ★ Locks out unwanted occupied channels at a touch of a button.
- ★ Adjustable scan rate.
- ★ Adjustable pause period.
- ★ Manual mode feature lets you tune 144-000-147-975 MHz in 25 kHz steps and manually select a desired channel.
- ★ Automatic safeguard on out of band transmission.
- ★ Automatic ±600 kHz shift of transmit frequency when repeater mode is selected.
- ★ Large six digit display shows frequency to 5 kHz.
- ★ Display always shows frequency in use including transmit frequency when PTY is operated. £69.00 + 12½% VAT

SPECIAL OFFER—IC240, complete with super-scan ready-wired and tested £232 + 12½% VAT

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The SHORT-WAVE Magazine

EDITORIAL

MOBILE RALLY SEASON—1978

The following lists the information we have received to date. **March 19**, White Rose Rally, Lawnswood School, Leeds, junction A660/A6110. Details from G4DZI, QTHR. **April 2**, University College of Swansea Radio Rally, University campus, 1½ miles west of City Centre on Mumbles road, talk-in on 2m. S22 by GW3UWS. **April 23**, North Midlands Mobile Rally, Drayton Manor Park, Tamworth, talk-in on 160m., 2m. and 70cm. Details from G8BHE, QTHR. **June 10**, Scottish Amateur Radio Rally, The Palace of Art, Bellahouston, Glasgow. Contact GM4FDM, QTHR. **June 17**, RNARS Mobile Rally, *H.M.S. Mercury*, Leydene, Petersfield, Hants. Details from G4DIU, QTHR (Tel.: Havant 79464). **June 25**, Longleat Mobile Rally. Details from G4FRG, QTHR (Tel.: Bristol 848140). **July 9**, Upton Radio Rally. Contact M. Monro, 127 Monarch Drive, Worcester (Tel.: Worcester 423276). **July 15**, BARTG Convention, Harpenden Public Hall, Harpenden, Herts., starting 11 a.m., everyone welcome. **July 23** (provisional date), Anglian Mobile Rally, Stanway School, Colchester. **August 13** (provisional date), Derby and District ARS Mobile Rally.

We would be glad to have reports and pictures covering these events—address to Editor, 'Mobile Scene,' Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ. This is also the address to which all details of other Rally events should be sent.

POINTS

Following the article 'Towards Tomorrow's Beacon' in the January issue, we received a letter from the Coventry Microwave Group indicating that they have a proposal for an experimental 23cm. microwave repeater/beacon with output on 3cm. Readers who wish to know

more of this should get in touch with G. A. Trickey, G4CDW, University of Warwick Amateur Radio Society, University of Warwick, Coventry CV4 7AL.

* * * * *

This year the title of the Northern Radio Societies Association's very successful annual exhibition is being changed to 'Radio and Electronics Exhibition,' and is to be held at Belle Vue, Manchester, on April 2nd . . . Exeter Amateur Radio Society is mounting a stand showing different kinds of amateur radio stations, at the 'Hobby's Exhibition,' The Pavilion, Sea Front, Exmouth, Devon, to be held March 13-16th . . . The Verulam Amateur Radio Club 'G3PAO Memorial Lecture' will be given at the Market Hall, St. Peter's Street, St. Albans, on March 23rd at 7.30 p.m. The Lecture will be delivered by P. J. Gowan, JP, AIST, G3IOR, Chairman of AMSAT-UK, and entitled 'The Oscar-Amsat Programme' . . . Maurice Pyle, G2BLA, was recently installed as Master of Radio Fraternity Lodge No. 8040. . . . This issue marks the start of Volume 36 of *Short Wave Magazine*.

SILENT KEYS

Arthur C. Edwards, G6XJ, a director until his retirement of the Eddystone Radio Company, died recently following an emergency abdominal operation.

Maynard Cornish ('Bill') Locks, G3NKE, died on January 2nd after a long and painful illness. He was Founder Member of the Cornish Radio Club, and at different times had held the positions of President, Chairman, Vice-Chairman and PRO of that club.

Ralph Blackburn, G3PYR, Honorary Secretary of Solihull Amateur Radio Society and well-known Top Band operator, died on December 21st. As a conscientious instructor, he helped many to their R.A.E. and Morse passes.

Bill Locks
G3NKE.

VHF BANDS

NORMAN FITCH, G3FPC

Satellite News

EVERYTHING seems ready for the launch of *AMSAT-OSCAR-D* on March 6. The latest information from AMSAT as we go to press is that the launch 'window' is between 1710 and 1805 GMT with a target time for lift off of 1725. The prime reason for the mission is to launch the NASA *LANDSAT-C* earth resources satellite and *PIX* or Plasma Interaction Experiment. *A-O-D* will be ejected from the second stage of a two-stage *Thor-Delta 2910* launch vehicle after a 'piggyback' ride from NASA's Western Test Range, over northern Greenland.

Keen *Oscarphiles* should tune to 14280 kHz in the 20m. band prior to launch time for the latest information. It is also hoped to activate the usual AMSAT nets on 3780 kHz in the 80m. band and perhaps the 2m. net on 144-28 MHz.

If all goes to plan, as soon as the satellite is powered up in its planned orbit, it will be known as *OSCAR 8*. It is possible that it will remain in Mode J for ten or more days as it will not be safe to deploy the fragile 10m. aerial until the spin rate has dropped sufficiently to prevent any damage. Once deployed, the dipole elements cannot be retracted.

Probably *O-8* will not be available for communication for a couple of days during which the telemetry will be very carefully monitored. It would be a great help to AMSAT if listeners would take down the telemetry making a note of the date and precise GMT time of any 'frame' recorded. It would be appreciated if TLM reports could be airmailed to AMSAT at P.O. Box 27, Washington D.C., 20044, U.S.A.

O-7 is in Mode B most of the time for the present. It is in 100%

sunlight and the batteries are receiving a very full charge from the solar cells, getting quite hot in the process. For example on Feb. 5, TLM channel 3D indicated a battery temperature of 47°C. One way to get rid of the charge is to use the Mode B transponder as that consumes more power than the Mode A one. As the Earth progresses in its annual orbit of the Sun, the satellite will begin to be in the Earth's shadow for part of each orbit so the temperature problem will diminish and it will be possible to revert to the *B-B-A* schedule mentioned last month.

New stations on, or soon to be on, on *O-7* include CN8CC (QSL via F6CVE); 9L1NT on Mode B SSB, an all-time new country via satellite; HK3ANV on CW; 4U1ITU and J3AAG on Mode A CW from Grenada.

Satellite buffs in the north east should note that an AMSAT VHF net is held in the Durham area on Wednesday evenings from 2100 local on 144-28 MHz, net control being Laurie Hunton, G3ILD, who starts the proceedings by calling G4FUT.

Beacons

Brian Bower, G3COJ, sent along the latest U.K. Beacon Status list in mid-January from which it appears that GB3WRN (YM28g) on 1291.91 MHz is not operating due to a Tx fault. The Crowborough beacons GB3SX (AL71d) on 28-215 and 70-685 MHz now give their calls every minute on F1 as before but every fifth minute burst into 850 Hz shift RTTY giving longitude, latitude, QTH locator and callsign in five unit code.

Within days of compiling last month's feature, the Lannion beacon FX3THF (YI13d) was heard at good strength so a new PA valve must have been installed.

The Repeater Scene

An open meeting of the Repeater Working Group took place near Manchester on Jan. 28. A new RWG was elected comprising representatives from the following repeater groups: GB3BC, GB3BM, GB3CC, GB3KR, GB3HU, GB3MP, GB3NS, GB3PY and GB3SN. There were no votes for Area B. According to notes by Mark Newton, G3UKW, the meeting spent much time dis-

cussing the jamming of repeaters, one conclusion being that the more active a repeater was, the greater the jamming.

Gordon Adams, G3LEQ, tabled a two page document suggesting reasons why non-licensed people became pirate operators on the amateur bands and on repeaters. His suggestions for 'overcoming' the problem include a proposal for a citizens' band—he calls it a "Class Z" licence—in the 70 cm. amateur band between 430 and 432 MHz. He does not suggest such a CB system allows business use, but advocates that Class Z licensees be allowed to work radio amateurs. G3LEQ concludes his paper by asking, "What do you think? Would this destroy amateur radio or protect our bands for future generations . . . ?"

Perhaps readers with views on these ideas would contact G3LEQ at 2 Ash Grove, Knutsford, Cheshire. WA16 8BB to obtain a copy of his group's 'Talkthrough' No. 11. Your comments could be aired in later features.

Scandinavian Notes

Your scribe has just received a letter from Hakan Berg, SM6CEN, one of the operators of SK6AB, dated Oct. 4 which he sent to the rather ancient Victoria St. address. Hakan says that activity on the west coast of Sweden on 2m., 70 cm. and 23 cm. is quite good.

SM6CEN mentions the tropo. opening on Sept. 19. On 2m. no G's at all were heard from SK6AB but quite a lot of GM's with those in XP square easier to work than those in YP and YQ. Later came the GI's, then GD2HDZ for a new country. EI6AS and EIØCL—QRB about 1400 km.—were very nice signals. The tally from the club station was 25 GM, 6 GI, 1 GD, 1 GW and 2 EI with the GB3GI beacon heard. From his home station, Hakan worked GI5AJ using his 4 watts QRP station.

On 70 cm., SK6AB started by working GM3JFG (XR) for a new square, followed by GD2HDZ and EI6AS for two new countries. No G's or GI's were copied. SM6HYG (FS58f) also worked EI6AS and those were the first SM/EI QSO's

on 432 MHz. Hakan mentions that when both 2m. and 70 cm. were open to the same area at the same time, signals on 70 cm. were stronger, he says: "It is worthwhile to note that this was the first time during the 1970's it has been possible to work GI from SM6 on tropo." He thinks this was quite a rare opening as no English stations came through.

Mediterranean News

Henry Souchet, 9H1CD, writes: "Right now at my place is preparation time. I have nearly completed my 4CX250B linear . . ." He is building the one in the RSGB *VHF-UHF Handbook* but was stuck for the two 1000 pF, 3.5 kV working anode capacitors in Figure 5.119. Henry is now into the MS scene and was daily awaiting a memory keyer at the end of December. His first real MS test was successful as he made it with SM7AED on SSB during the *Perseids* last August 12. He says: "It was great but it was also very punishing since I really felt exhausted after spending nearly two hours at it. It was there and then that I firmly decided on CW!"

9H1CD is now up to 126 squares on 2m. and 13 on 70 cm. on which band he has found paths to GB, GC, LX, FC, JZ and FW squares but the best one of the lot was EA3XF (AB60d) on SSB, using 10 watts to 48-ele. whilst the EA was using 5 watts to an 18-ele. beam. Henry's total of 'firsts' on 70 cm. is getting quite impressive including mainland Italy and Sicily, Greece, Corfu and Spain. This year he hopes to add IS0, 4X4 and perhaps Crete. It seems that the EA6's are becoming quite interested in DX, too.

Contests

Following the remarks last month concerning the difficulty of getting contest information from the RSGB, arrangements have been initiated which should enable better publicity to be afforded these events in the future.

The next contest is the weekend of March 4/5 and is the 144/432 MHz and *s.w.l.* affair with rules quite different from any previous ones. Roger Taylor, G4BEL, sent

THREE BAND ANNUAL VHF TABLE

January to December 1978

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	
G3FPK	—	—	51	11	—	—	62
G4DEZ	—	—	48	13	—	—	61
G8APZ	—	—	32	8	—	—	40
G8NYS	—	—	35	5	—	—	40
G8BKR	—	—	26	7	3	3	39
G8MKW	—	—	34	4	—	—	38
G4ERX	13	1	4	6	1	3	23
GJ8AAZ	—	—	10	4	5	4	23

a copy of the rules which reveal four sections:

1. 144 MHz single operator,
2. 144 MHz multi-operator,
2. 144/432 MHz single operator,
4. 144/432 MHz multi-operator.

In events 1 and 3, the operator must take a compulsory six hours break between 0100 and 0700 GMT on the 5th. In events 2 and 4, operators can be on for the full 24 hours from the usual 1600—1600 GMT. Note that only one call sign is to be used so that concurrent working in 4 is not permitted. Thus there is no distinction between fixed and portable which seems to suggest that the portable stations are almost bound to sweep the board. Cross-band QSO's in 3 and 4 will not count and scoring is based upon the radial ring system with a multiplier of one for 144 MHz and five for 432 MHz. Entries to G4BEL at 12 The Rampart, Haddenham, Cambs. Your comments on these new rules welcomed!

Les Hawkyard, G5HD, has sent a list of all the 1978 RSGB contest dates. On March 19, there is the 70 MHz Open Contest from 0900-1500 GMT and entries for it should go to, G4CUT at 59 Harewood Road, Chelmsford, Essex, CM1 3DH. On April 1 from 1600 to 2359 GMT there is the 1296 MHz Open, followed the next day by the 432 MHz Open and *s.w.l.* event from 0900 to 1700 GMT. The adjudicator for these two is G2HIF, 20 Harcourt Road, Charlton House Estate, Wantage, Oxon., OX12 7DQ.

Twenty-three Centimetres

Mike Dormer, G3DAH (Kent), now has about 30 watts of SSB on 23 cm. and is busy building pre-amplifiers, the most successful of which to date uses a stripline transistor from Messrs. *J. Birkett*. He lost his aerial in a recent gale but has now got it back up again.

G3COJ (Bucks.) was pleased to find that he had never counted HB9AMH/P in DH66c, worked a couple of years ago, which accounts for Brian's extra score in the table. The tropo. opening on the afternoon of Jan. 15 produced nothing for G3COJ although he thinks G3AUS may have heard OZ7IS.

Lawrence Woolf, GJ8AAZ, claims his first square on the band thanks to a QSO with GJ8EZA using *varactor* triplers, with a promise of SSB and video to follow. Both he and Syd have been heard in Guernsey by GU8IRF but so far, no two-way contacts GJ/GU.

Seventy Centimetres

G3COJ caught the opening on the afternoon of Jan. 15 and between 1718 and 1739 worked OZ7LX (FP49c); OZ7IS (GP22j) and OZ9TM (GP22b). Brian found the opening very short-lived and localised, much more so than on 2m. Ray Elliott, G4ERX (Essex), enjoyed the Jan. 6 tropo. opening which produced PA0UNT and DK0VL both on SSB. John Woodham, G8BKR (Bristol), remarks on the consistent signals from DF5GX/P and DK0VL in EH11h on Jan. 6.

He heard them at 2240 GMT peaking S7 but was unable to raise them.

Two Metres

Ladies first! Since moving into their present QTH last May, Sheila Williams, G8KPL, and her husband Dave, G8JAG, have accumulated 64 and 63 QTH squares respectively. The Dalton-in-Furness (Cumbria) location seems to be a good one as exemplified by Sheila's working DKØVL on Jan. 6 with the *Trio* TS-700S in the one watt position inadvertently. As she says, "I worked over 1000 kms on one watt — not bad, eh?"

And now a plea for regular skeds from Roger Thomas, GW4BCD, from Porthcawl (Mid-Glam.). He runs a 100% home brew station and has 100 watts of CW and SSB to a 4-ele. *Quad*. His QTH is 30ft. *a.s.l.* with a reasonable take off except to the north. Roger is looking for CW skeds over 200 kms and can be contacted at 13 Northways, Porthcawl, Mid-Glamorgan.

Owing to work, G4ERX missed most of the action but caught the Jan. 6 event. Ray worked HB9MY on the key and for the first time, heard the HB9HB beacon on 144.125 MHz very strongly in the early hours of the 7th. He reports a candidate for this issue's, 'Lid of the Month' award: an Old Timer patiently calling HB9HB on CW! Ray was one of many who worked DKØVL on the 6th, as was G8BKR with whom they were S4 to S9-plus from 1630 to 2300 GMT. John mentions working EI9Q on Jan. 4 who mentioned having lost his two 6-ele. *Quads* in the October gales.

Martin Green, G8MKW (W. Midlands) was amazed to have a 'CQ' call answered by PAØWMD when coming in from work on Jan. 6. Using his *Belcom* Liner 2, he got an S6 report from DF5GX/P. The 'Marconi' station GB3MSA was up to S3 on Jan. 14 but seemed to have a deaf receiver, a point mentioned by others over the air.

G8NYS is the call of Glen Sweeney (Notts.) who contributed to this feature in his recent *s.w.l.* days, which ended last September. On FM, he runs a *Pye* 'Ranger' Tx at 20 watts to a vertical dipole, an *Eddystone* receiver being used. On SSB mode, he uses the popular *Icom* IC-202 into an 8-ele. *Yagi*. The Jan. 6 lift gave Glen his first continentals including, DF5GX/P; F1CRP/P (YI34j); ON6IZ/P (BK25h) and ON7HP (CL62d). Although several OZ and SM stations were heard on Jan. 15, the furthest distance worked was Somerset. Well, Glen, you can't win 'em all and you are not doing too badly for 3 watts with 35 counties and five countries in one month!

From the Kingdom of Fife, Alistair Simpson, GM8NCM, mentions the *Aurora* of Jan. 4 first noticed when switching on at 1324 GMT with GB3LER RST 54a at azimuth 20°. He then found all the U.K. 2m. beacons being received aurorally as well as SK7VHF (GP38c) on 144-920 MHz, which was S2 at 45° plus OH6VHF (KW59f) on 144-900 at S3, same bearing, and DLØPR (EO54d) on 144-910 MHz at S3 bearing 40°. Alistair proceeded to work about 30 stations on SSB. The best DX were:

1401 GW3ZBB YL15b 020° 54a
1410 G4DEZ ZL34a 020° 57a
1441 G3FPK ZL60j 045° 52a
1506 G8ILO AL34d 030° 53a
1527 GW8FEA YL25d 030° 51a
1635 G8NEY YL63j 030° 52a

DC20C (EM60a) was heard at 1603 at 57a QTF 045° but after 1600, conditions appeared to deteriorate rapidly all signals becoming very weak. GM8NCM reports the tropo. opening of Jan. 6 to central Europe and was another reader who contacted DF5GX/P at a QRB of 1180 kms. Others worked were DKØHH (DK45g) and DLØET/P (EI13f). A return to University meant his missing the *Auroras* of Jan. 7, 9, 13, 16, 18 and 18.

At G3FPK, in spite of being laid low with some 'lurgi' and missing the events of the 6th, nevertheless the first week of the year had produced 37 counties and 9 countries. The *Aurora* of the 4th was discovered at 1400 and the last signal heard was EI6AS at 1940 GMT. Probably the best DX in terms of the round trip was G4DEZ in Didcot worked truly via the *Aurora* on both CW and SSB. Most signals were quite weak with many, like LA6HL, only S1. The evening of Jan. 14 produced an SSB contact with G13WFA (WO49a) in Co. Armagh, a county not worked at all in 1977.

TWENTY-THREE CENTIMETRE ALL-TIME TABLE

Station	Counties	Countries	Total
G4BEL	44	12	56
G3JXN	35	9	44
G3DAH	30	8	38
G3NHE	24	5	29
G6NB	22	6	28
G3COJ	19	8	27
G4ALN	20	5	25
G3JVL	21	4	25
G3OBD	20	3	23
G8ARM	20	2	22
GD2HDZ	12	5	17
G8GML	14	3	17
G8EOP	11	5	16
G5DF	13	1	14
G8AOD	11	2	13
G8FMK	12	1	13
G8IFT	8	4	12
G8AII	7	2	9
G4DKX	7	2	9
G3OHC	8	1	9
G8ABH	7	1	8
G8FJG	7	1	8
G3BW	3	3	6
G8GNZ	4	2	6
G2AXI	4	1	5

The tropo. opening on the 15th was to limited areas favouring the east in the morning, swinging up to the north east in the evening. The SM and OZ stations worked on SSB and CW were in either GP square or EP. No ON or PA stations were heard in this period and it seems there was very selective ducting.

Probably the best DX in the Jan. 4 *Aurora* was UR2RQT (MS80e) worked by G3ZIG (Norfolk) who also contacted OK1IDK

QTH LOCATOR SQUARES TABLE

Station	23 cm.	70 cm.	2 m.	Total
G3JXN	26	63	82	171
G3COJ	17	61	72	150
GD2HDZ	10	32	59	101
G8GML	8	50	89	147
G8EOP	8	36	38	82
G8IFT	7	18	49	74
G4DKX	5	30	68	103
G3OHC	4	31	98	133
G8LEF	4	39	86	129
G8FUF	2	84	207	293
G4AEZ	2	22	57	81
G2AXI	1	47	80	128
G8BKR	1	19	93	113
GJ8AAZ	1	22	66	89
G4ERX	1	21	54	76
G3BW	1	21	47	69
I4EAT	—	25	196	221
G3POI	—	—	213	213
G3SEK	—	—	152	152
GM4CXP	—	25	125	150
G3CHN	—	—	148	148
G8HVY	—	48	96	144
G3FPK	—	—	140	140
9H1CD	—	13	126	139
G4BWG	—	25	110	135
G3XCS	—	21	110	131
G4BAH	—	32	92	124
G4CMV	—	3	109	112
G4FCD	—	22	89	111
G8HHI	—	27	82	109
G8IWA	—	29	77	106
G4DEZ	—	—	103	103
9H1BT	—	—	94	94

G3FIJ	—	27	62	89
G8GII	—	22	63	85
G6UW	—	—	85	85
9H1C	—	—	83	83
G4AWU	—	—	80	80
G8JJR	—	—	79	79
G4FBK	—	5	72	77
G8JHX	—	—	74	74
G8LHT	—	1	70	71
G4GET	—	—	69	69
G8KUC	—	7	60	67
GD3YEO	—	8	59	67
G4GEE	—	23	41	64
G8KPL	—	—	64	64
GM8NCM	—	4	59	63
G8KLN	—	1	62	63
G8JAG	—	—	63	63
G4CIK	—	—	62	62
G8KGF	—	—	62	62
G8ITS	—	11	50	61
G4GCQ	—	—	61	61
G3KPU	—	—	60	60
G8KSP	—	—	60	60
G8JEF	—	—	58	58
G8KSS	—	—	58	58
GW4FJK	—	—	57	57
OZ9IY	—	—	53	53
G4EYL	—	—	41	41
G8LLG	—	1	38	39
G8JAH	—	1	35	36
G8JGK	—	—	34	34
G8JAJ	—	—	24	24
G8JKA	—	—	21	21

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

(GK45e) at 1115 GMT on the 15th in the tropo. event. Ray mentioned that G2FT (Lincs.) had worked on CW that day SP1AAY in IO62.

Four Metres

G4ERX took part in his first 4m. contest on Jan. 22 and notched up 12 counties in the process in rather poor conditions. No other correspondents mentioned the band and it will be interesting later on to see how many participated in the contest.

Moonbounce Contests

Chris Bartram, G4DGU, mentioned the ARRL *E-M-E* contests over the weekends of April 15/16 and May 20/21. Any band may be used. Short Wave Listener reports will be recognised in the final results. More details on the scoring system next month. Chris also revealed that UB5WN, UT5DL and YU2CBM are all working on 432 MHz *E-M-E* systems and that F1CF and F2KX are QRV on Moon Bounce.

DX Notes

Bryn Llewellyn, G4DEZ, passed on the news from Ken Corry, EI5Q, that he is now QRV from Donegal on 2m., the present gear being a multimode 10 watts set up with a 10-ele. beam but with a promise of QRO later.

Looking forward to the summer, Richard Staples, G8MME, writes that he has now finalised plans for a visit to the Shetland Islands accompanied by PE1AVU. They promise full legal power on 2m. and 70 cm. from both ZT and ZU squares from June 4 through 16 inclusive . . . Murphy permitting! Anyone seeking skeds should contact G8MME at 3 Willow Close, Lymm, Cheshire, WA13 9DL. MS skeds will be entertained but at about 1000 kms, it is a bit on the short side even to south coast stations.

Several of your scribe's friends who are keen DX, including MS, types have expressed disappointment that the GM expedition to OY and TF seems to favour satellite operation. They hope that, in view of the great success of the Swedish activity from OY last year, this British team will reconsider this apparent preference and really put TF on the VHF bands *via* tropo. and MS. Your conductor's view is that both OY and TF have 'native' satellite users and so the GM's could well keep that activity to a minimum.

Sign Off

That's all for this time. All your reports, news and comments, plus claims for the various tables for the April issue by March 9, and for the May feature by April 6, to: 'VHF Bands,' Short Wave Magazine, 34 High St., Welwyn, Herts., AL6 9EQ. 73 de G3FPK.

• • • SWL • • •

SHORT WAVE LISTENER FEATURE

By Justin Cooper

IT is rather odd that prior to the "maincrop" letters we should have had a brace of "first-earlies" both in effect saying "we have a valve receiver, we want to improve it, what can we do?"

Initially, get a circuit diagram at least, and prepare a voltage table for each pin of each valve with your meter (note the setting of all controls at the top of the table, as several of them will change the load current, and so voltage, to other stages). Now, either note which valve-goes-where by reference to the "map" in the handbook, or mark the chassis and the valve at each spot; now you can take all your valves to the local trader and get them tested, and returned to the correct holes. If for example there are three 6BA6 types, each one is to go back into the place whence it came, even though they are all of the same type. At this stage you have some idea both as to how well the set has been performing and how badly it is ailing. When the valves are being tested, don't forget to tap them while they are hot on the tester (and indeed in the receiver) to locate any microphonic or otherwise intermittent ones. If you do this in the receiver, make sure you are on the right valve before condemning it as the tap will shake the whole set slightly.

The improvements you want to make must be clear in the mind, so it is as well to list them all up. Don't confuse bandspread (a "slow" tuning rate) with selectivity (the ability to *separate* stations which are transmitting on adjacent frequencies); don't confuse long-term drift (dial calibration staying put for years without need for realignment) with short-term stability (the ability to listen to a QSO of several overs without the hand continually being on the tuning control). Above all don't forget that if one is going to look at sensitivity to small signals, the ability of the receiver to go on listening to them after Joe Blow at the other end of the road has opened up to full-puff chasing some DX which you've already logged but he wants to work, is rather important; if you are in a very noisy area it may be necessary to consider fitting or improving a noise limiter. Anyway, get your design goals clearly defined and written down on a piece of paper. If writing it down seems a bit fatuous to you—then don't start modifications lest you get lost halfway! The object of setting it all down on paper is to remind oneself *what* one is aiming at.

If your receiver is of the "normal" broadcast-type superhet, with local oscillator ganged to the aerial and fixed IF, the best you can hope for in the way of improving short-term stability is to make it at least tolerable and live with it. If it's all bipolar transistors and your shack is surrounded by active operators on your favourite band, there isn't much point in trying for more sensitivity without also (and more importantly) making sure you still have a sporting chance when they are active; and so on, and so on. Most important, your solution is yours alone—one man's meat is another man's poison!

Something which most definitely should be written down is all the steps to be taken in the embodiment of any modification, before you start work: partly so you

notice any snags, partly so you can reverse things if it turns out to be a bad modification, and partly so that when you get a fault on the receiver in two year's time you will know *precisely* what the deviations from normal are (possibly the most important reason!).

As to what one's priorities should be, old J.C. would look at an order something like this: short-term stability after a reasonable warm-up time (especially in terms of mains-voltage changes and control movements) as a very first objective. Secondly, but carried out as part of the previous activity, to check on and replace as necessary all the 0.1 and 0.1 μ F capacitors. Thirdly, a thorough and careful re-alignment after checking all valves and replacing any which the tester rejects. After this, one can begin to think about moulding it nearer the heart's desire—some way of accurately measuring the frequency of a station heard, more selectivity, a vernier of some sort to give the receiver an easier tuning characteristic, maybe audio filters for CW and SSB, a noise limiter: the list is endless.

The Letters

Oddly enough, our first letter is from *S. Donnelly* (25 Church Street, Adlington, near Chorley, Lancs. PR7 4EX) who wonders whether it is worth adding such things, mentioning specifically a pre-amp, Q-multiplier and audio notch filter; he goes on to remark that he hears fewer BC stations around the bands than he did a couple of years ago when logging them on a domestic BC receiver. Here we have a case in point—it's a near-certainty that the stations were each heard twice on the domestic receiver, once in the proper place and once on the image frequency: this effect would be more noticeable as one goes higher in frequency. One would suggest that a good start would be to try and improve stability in this situation, so that a Q-multiplier and an audio notch filter could be used without the receiver needing three hands to hold a station. One can do this initially by improving the ventilation: a few holes in the top and bottom of the case (if there aren't already such) and then a few holes in the chassis to let the heat out of that inverted box in which it was trapped. If you can organise things so that these holes cause the hot air to rise and leave the receiver above the hottest parts, such as the power-pack, you will also tend to stabilise the temperature elsewhere. Meantime, our friend stands in need of a circuit or manual of the *National NC-105*—any offers to him at the address above.

Aerials next: and *J. Waters* (Allestree, Derby) wants to build one to improve the performance of his FR-50B. The snag is that a search of the local libraries has not yielded any suitable information. We suggest that, in addition to reading and inwardly digesting the several articles on the subject of aerials which have appeared in *SHORT WAVE MAGAZINE* over, say, the past couple of years or so, a copy of the *ARRL Antenna Book* is bought, in which will be found practical designs and plenty of sugar-coated aerial theory. *The theory side of aerials, for some*

reason, is an area in which the majority of both SWL's and licensed amateurs are somewhat lost—which puts them on a level with all but a few professional electronic engineers! Seriously, to grab a few principles first is a great help in deciding what to do.

J. Thompson (*Swallowfield*) brings a case in point: he is lucky enough to have space, so he hung up a rhombic. The only snag was that he couldn't get all the angles right, and so it was a disappointment; the more so as it was used on the LF bands where it wouldn't have been long enough for proper rhombic action. The upshot is that he turned it into a triangle having two sides of 231 feet and one of 132 feet; treating it as a long-wire seems to get the best out of it against an admittedly good earth connection. The whole point of this is that the present aerial is probably more or less omni-directional on all bands. However, it is interesting that there are dipoles against which to compare it: we would be very interested to see what happens when the dipoles are all earthed or detuned while the triangle is in use.

H. Bithell (*Blacon*) has built himself a new ATU which could be aptly described as a sort of "super-Squance" design, arising from the possession of some three-way switches which can be made to interlock in certain configurations and release in others—it all sounds like the work of a skilled model-engineer, the more so when he offers to help anyone who is after nylon insulating shaft spindles provided they will give him *all* the dimensions on a sketch. This offer is, of course, for SWL and licensed amateur chaps only. On a different tack, Harold says he is "nearer 60 than 16, which puts a ticket out of court." That's pessimism if you like—to judge by the letter, he could tackle RAE with confidence. We suggest that, before attacking an RAE class, he gets a copy of the book by Tony Buzan called "Use Your Head" published by the BBC Publications set-up, and available from good bookshops. Finding out how your brain works first—none of us were taught that at school!—leads on to the ways of measuring ability to learn, and some startling results. Then one comes to the practical bit—*how* to learn, how to revise to obtain the best retention of what has been learned, and methods of taking notes to ensure maximum recall when the notes are re-studied. It is an interesting side-light to realise that in normal notes, some 90% of the words are just there to connect the important ones together—hence in both the writing and the reading one can lose the key words among the verbiage. This paragraph has taken about a page in the typewriter, but the key word-groups are: Aerials, nylon shafts, R.A.E., "Use Your Head, learning-process. Just one line of type!

K. Kniveton (*Kingswinford*) seems to have been applying himself—there are dark hints of a possible CW entry in a short time. Good.

M. Turner (*Luton*) offers us a fine specimen of the genus *phoney*, this one called himself BL8UL—and if

HPX RULES

- (1) The object is to hear and log as many *prefixes* as possible; a prefix can only count once for any list, whatever band it is heard on.
- (2) The /M and /MM suffixes create a new series; thus G3SWM, G3SWM/M and G3SWM/MM all count as prefixes, and where it is known to be legal, /AM also.
- (3) Where a suffix determines a *location* the suffix shall be the deciding factor, thus W1ZZZ/W4 counts as W4. Where the suffix has no number attached, e.g. VE1AED/P/SU, VE2UJ/P/SU, they are arbitrarily counted as SU1 and SU2 respectively, and the same holds good for similar call signs.
- (4) When the prefix is changed both the old and the new may be counted; thus VQ4 and 5Z4 both count.
- (5) The object is to hear *prefixes* not countries, thus there is no discrimination between say MP4B and MP4K which count as one prefix.
- (6) Only calls issued for Amateur Radio operation may be included. Undercover and pirate call signs will not be credited, nor may any MARS stations be claimed.
- (7) G2, G3, G4, etc., all count separately, as do GW2, GW3, GW4, etc., and in the same way K2, W2, WA2, WB2, WC2, WN2, all count separately, even though they may be in the same street.
- (8) Send your HPX list, in alphabetical and numerical order showing the total claimed score. With subsequent lists, it is sufficient to quote the last claimed score, the new list of prefixes, and the new total. Give your name and address on each sheet, and send to "SWL," SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts., AL6 9EQ, if possible to arrive before the SWL deadline for that particular month.
- (9) Failure to report for two consecutive listings, i.e. four months, will result in deletion from the Table, although there is no objection to a "Nil" report to hold your place.
- (10) Starting score 200. Phone Table is mixed AM/SSB, with a separate CW Table. No mixed Phone/CW Table, nor will AM-only or SSB-only entries be accepted.
- (11) Lists will be based on those shown in the current "Radio Amateur Prefix-Country-Zone List," published by Geoff. Watts (*see Advertiser's Index* in any recent issue of SHORT WAVE MAGAZINE).

it isn't a mis-hearing, then the prefix block from which it came is China. An escapee member of the "Gang of Four"? On the question of SPØPRK/5Ø, Mark puts Katowice into Sweden, which must be a surprise for the good citizens of that Polish city!

E. W. Robinson (Bury St. Edmunds) sent along with his own list that of his son—the latter none too active with the receiver but deep into a two-metre project. As for the OM, he has some helpful comments on the CG6 prefix, which is being used by stations in Edmonton, Alberta for 1978, the year of the Commonwealth Games there; there will be a station on the Games site, with—hopefully—the call CG6A when the time comes.

A. Glass (Plymouth) reacted to being toppled from his throne on the CW ladder by treating himself to a JR599; so there is some 144 MHz listening for a change, plus a few mornings on Eighty, digging the VK/ZL and W stuff from under the local QSO's—why do these chaps sit on top of DX, asks Bert, to which your scribe can only answer that either they have cloth ears or no courtesy!

M. C. P. Bennett (Datchet) mentions, like most others that CT50/IAL is a 50th anniversary celebration; but he adds that the anniversary is that of REP, the Portuguese national society.

A bit of construction at *P. L. Shakespeare's* shack in *Foulness*—an audio limiter to go between the headphones and receiver, and a Morse practice oscillator, with a BFO to be used outboard next on the list.

H. M. Graham (Harefield) has his usual long and interesting letter; it seems that he has managed to get in on some of the ten-metre openings with strong signals from at least four continents, plus profitable hours on Fifteen and Twenty—on the latter band he turned up KH6BB, last logged eight years and one day earlier!

K. Kyezor (Irchester) has firm views on the period in review—"Conditions here lousy!" Never mind, the law of averages means that you'll trip over some DX ere long!

J. Grice (Castleford) writes to say that *K. Whiteley* will soon be listening again; Jim says Ken is now out of hospital which can't be bad. For himself, there are a goodly crop of prefixes to note, among whom the signal of VK3MO is noted as being remarkably strong.

Having reached the top of the CW Ladder, *N. A. Phelps (Devizes)* is pulling away from the opposition. His list this time is all *exotica*, among whom the *IX1* is noted as being in use by stations in the Aosta Valley during January.

J. Fitzgerald (Gt. Missenden) asks us to please say G3KFE was off his rocker when he set the date for MCC 1978 to clash with the CQ WW Contest (John's trying to get your scribe the sack, we reckon!). Agreed that this will mean the odd SSB contest station wandering around when we tend to call the CW portion of the band, looking for DX from Europe which is stuck down there; but the alternative seemed to be a direct clash with two U.K. contests which are popular with clubs and CW operators. There just isn't a single week-end around that time of year which isn't adorned with a major contest. John found conditions on the LF bands were he usually hides out to be not bad at all, though the greatest improvement is the absence of *Loran-A* from Top Band. *Loran-C* which supersedes it uses a much lower frequency.

The QSL Manager for VP8PL was asked for last time round and Mick Puttick, G3LIK, hastens to assure *P. Ramsay* that indeed G3LIK is the very man to contact—21 Sandyfield Crescent, Cowplain Portsmouth,

Hants. PO8 8SQ. Mick adds that VP8PL will be operational on Top Band and Ten soon, when the bits to mend the rig have been fitted.

Having heard about *Ken Whiteley (Castleford)* from Jim Grice, it was even more pleasant to receive a letter from Ken, albeit the hand still a bit shaky and the vision not too good; but Ken has been told that in maybe three months he should be returned to full fitness. Meantime, from us all, best wishes for a complete recovery.

K. Burch (Plymouth) almost fell off the list, but he read the Rules just in time!

ANNUAL HPX LADDER

Starting date, January 1, 1977

SWL	PREFIXES	SWL	PREFIXES
D. W. Waddell (Herne Bay)	499	L. Stockwell (Grays)	422
K. Linge (Willington)	499	K. Piper (Bognor Regis)	386
K. Kniveton (Kingswinford)	499	M. Turner (Luton)	369
D. Hill (Crawley)	499	G. Brazil (Dublin)	341
R. Elwyn Thomas (Corwen)	484	B. Shepherd (Staines)	305
J. W. Grice (Castleford)	460	R. Evans	
K. M. Rogers (Lutterworth)	454	(Bangor, Co. Down)	280
D. L. Mallet (Maidenhead)	451	S. W. Allsopp (Banbury)	270
G. A. Passmore (Pembroke)	445	P. Djali (Kingswinford)	227
Dr. H. Squance		P. Q. Armitage (Amersham)	205
(Bangor, Co. Down)	445		

This is the final listing for the 1977 Table. Next issue will show the first of the 1978 listings, from January 1, 1978. Note that 200 prefixes must have been logged before an entry can be accepted. See HPX Rules, this issue.

It's an ill wind that blows nobody any good; *Bob Griffiths (Ventnor, I.o.W.)* had lost interest in the hobby until an illness followed by Christmas holidays put some time into his hands—an EA-12 for the HF bands, an AR88 fed from converters for the VHF bands, not to mention a Mohican and a repeater receiver. Up aloft groundplanes for 80 and 20, a 132-foot wire for "general use"—complete with same-length counterpoise—and of course the VHF aerials. Each receiver has direct feed to a tape recorder as well. Small wonder with this set-up that Top Band is a major interest!

In making his transition from 1977 to the All-Time, *M. Law (Chesterfield)* was adding in the 1970-1976 accumulation when he happened across "KF0MEX" and wonders if it was genuine or no. There seems a faint recollection of such, deep in the weedgrown recesses of your scribes fuddled old brain—but nothing else. Any offers from a reader with a good filing system or memory?

Next we have a "new boy" to announce himself in the person of *P. Lee (Solihull)* who has fallen for that old one of assuming that the 200 starting score was a credit rather than a requirement to hear 200 prefixes before one can register a score on the Ladder. After all, 200 is by no means difficult over a couple of weekends and possible in one. A single band DXCC has been made in one weekend, in 1976, from Virginia—and working 'em is a sight harder than hearing the blighters!

K. Rogers (Lutterworth) didn't manage to get the 500 up for the end of 1977, but there has been consolation by way of the general uplift in conditions, particularly on 21 and 28 MHz.

R. Evans (Bangor, Co. Down) has been helped to get coverage of 21 MHz thanks to G13MBB, and he has hopes of himself getting on to 28 MHz to complete the

HF coverage: all he wants for 1978 is *time*—but we seem to have met that particular bogey before!

A particularly neat handwriting comes next, from *S. Hammond (Solihull)* who has had a bright idea to keep the temperature down in his 9R59D—one of the little battery operated fans aimed at the receiver.

R. E. Thomas (Corwen) sends in his list—going straight into the All-Time. He would like to know if anyone has used the combination of FRG-7 receiver and Joystick—there must be dozens of them among the readers of this column and all would give different accounts, depending on their local noise level, the nature of the ground under the site, the ability of the user and umpteen other things. The writer does not use a Joystick all the time, or even keep one ready for use, but he has used it and reckons that for reception the difference between a Joystick and a beam is less than the difference between two operators using the set-up in any given

HPX LADDER

(All-Time Post War)

SWL	PREFIXES	SWL	PREFIXES
<i>PHONE ONLY</i>		R. Towlson (Nottingham)	722
K. Kyezor (Irchester)	1896	P. L. Shakespeare	(Foulness) 653
S. Foster (Lincoln)	1657	S. T. Bowen (Kippax)	641
R. Shilvoek (Kingswinford)	1621	I. Wilkinson	(Llandudno Junction) 636
B. Hughes (Worcester)	1578	M. Shaw (Huddersfield)	574
J. Fitzgerald		S. M. Phillips (Dukinfield)	573
(Gt. Missenden)	1519	S. Hammond (Solihull)	572
R. Carter (Blackburn)	1510	D. A. Robinson	(Felixstowe) 550
K. A. Whiteley (Castleford)	1380	K. A. Burch (Plymouth)	545
M. J. Quintin		J. G. Ollis (Solihull)	522
(Wotton-u-Edge)	1373	P. Ramsey (Stevenon)	503
P. C. Jane (East Looe)	1360		
H. A. Londesborough	1264		
(Swanland)			
E. W. Robinson	1235	<i>CW ONLY</i>	
(Bury St. Edmunds)		N. A. Phelps (Devizs)	1410
M. C. P. Bennett (Datchet)	1224	A. Glass (Plymouth)	1354
J. H. Sparkes (Trowbridge)	1141	H. A. Londesborough	(Swanland) 1058
Mrs. J. B. Jane (East Looe)	1091	J. H. Rosling (Bakewell)	583
H. M. Graham (Harefield)	1024	A. F. Roberts	(Kidderminster) 465
M. Rodgers (Harwood)	954	P. L. Shakespeare	(Foulness) 378
W. H. Smyth (Hartlepool)	912		
B. T. Macnes (Dagenham)	876		
D. Taylor (Hastborne)	825		
M. Law (Chesterfield)	783		
P. Rooney (Chester)	764		

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

left completely alone until the stuff can be copied at above 12 w.p.m. because to indulge in sending at this early stage is a sure way of ending up as an amateur with a "bad fist"—the easiest (and most unpleasantly revealing!) way to prove this is to tape some of one's Morse, and then listen to it a week later. However, it is a very pleasant change to hear of a newcomer giving Morse a whirl to find out for himself, rather than just adopting the fashionable view of the non-thinkers that "CW is out-of-date." As Peter is also considering the question of an R.A.E. course and hence a licence he seems to be well hooked! For a newcomer to tackle Morse at such an early stage of his career is a very rare thing indeed, and promises much for the future.

Finale—An Appeal

Before we conclude, we must mention the letter from *R. Wilson (Cramlington, Northumberland)*, who is heading rapidly in the direction of a licence, he being an ex-Marconi sea-going operator; but his big question is "Is there a club within striking distance, and if so where and when?" Anyone having information could write to Ray at 34 Allerhope, Cramlington, Northumberland.

The Rest

Those who just sent lists, or a brief note are all acknowledged and thanked here. They are: *Mr. and Mrs. Jane, East Looe; K. Linge, Willington; J. H. Sparkes, Trowbridge; R. Shilvoek, Kingswinford; R. Towlson, Nottingham; D. Taylor, Harborn; B. F. Hughes, Worcester; N. A. Phelps, Devizes; L. Stockwell, Grays; W. H. Smyth, Hartlepool; J. H. Rosling, Bakewell and M. Rogers of Harwood.*

Exit Line

Which is to thank you all for your letters and good wishes, and to give you a deadline of Friday March 17 to arrive; the address of course is "SWL," SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ.

spot. As for the receiver, that also depends on many factors, not least among them being the trade-off of interests between BC listening which requires an IF capable of taking both sidebands, and amateur listening which in general requires either SSB or CW bandwidths for optimum operation. About all one can say is that in such a competitive market-place you get what you pay for!

A small score, a heavy work-load, and too much time with the soldering-iron about sums up the situation for *M. Shaw (Huddersfield)*; he is well pleased with the Joystick in the loft, and intends to mount it up on the chimney-stack as soon as the weather gets a bit better.

Now to *P. Djali (Kingswinford)* who blames his downfall on to K. Kniverton, who got him hooked on to SWL! Peter finds that although he can send at 12 w.p.m., he has great difficulty in receiving at the same rate. We would strongly recommend that the key be



The new TE8 direct reading capacitance meter from All-M Products Ltd., Highworth, Wilts. The instrument, which costs £29.63, allows accurate measurement of capacitors from 1_μF to 1_μF; current consumption is 3 mA., mains/battery operation.

ANTENNAS—'THE WEAK LINK' PART 1: PROPAGATION

A. P. ASHTON, G3XAP

This important series of articles, by a well-known exponent of the subject, firmly grasps the 'nettle' of antennas from first-principles onwards, and will be of great value to both novice and expert alike.

RADIO Communication is a chain of events starting at the transmitter of one station then progressing to the transmitting antenna, the ether, the receiving antenna and finally to the receiver of the receiving station. In the vast majority of Amateur Radio contacts the weak link in this chain is the antenna—the receiver and transmitter surpassing this 'poor relation' in terms of both the care and attention that they receive and their overall efficiency. In many cases this state of affairs exists because the operator (and this includes SWL's) does not recognise the true importance of the antenna, and hence does not spend enough time considering how it works and how to get the best results from it. In short, the antenna is something of a mystery to them. Proof of this comment can be heard every day on the amateur bands—a typical remark being "my 80m. dipole is about 20 feet from the ground and the SWR on the feeder is 1 : 1" It is unlikely that a system so low would have such a low SWR, but if the bridge shows 1 : 1, then it is unlikely that the antenna is resonant!

Many amateurs buy linear amplifiers in order to increase their signal strength and hence get more contacts—true, increased power output does give rise to increased signal strength, but it does nothing to improve reception of weak signals or to reduce QRM. It can be argued that not only can an improvement to the antenna system provide both of these qualities, but that the increased signal strength can surpass that obtained by even quadrupling output power. How many of us would build a receiver and put it into use without performing even the simplest alignment task on it? Very few, but this happens all the time with *antennas*—we cut them to the theoretical dimensions, put them up in the air, and then buy a linear to increase signal strength! We don't expect our receiver to work until we have aligned it, so why should we expect any better from our antenna? The author is convinced that the antenna is by far the most important part of any radio station—transmitting or receiving—and therefore deserves more attention than any other single item.

The purpose of this series is to progress, in a logical manner, through a fairly broad spectrum of antenna theory, and to attempt to create the state of mind that views the antenna system as a complete electrical circuit—in the same way that we view our receiver circuit: in other words, as a well thought-out device whose efficiency is known to be good and whose separate parts have been both matched and 'aligned.'

The Ground Wave

Transmitted radio waves travel in two distinct ways—either they pass directly to the receiving antenna in

close proximity to, or actually within, the earth or they travel upwards and are bent back to earth by the ionised layers that exist around the earth. Waves travelling by means of the first method are known as 'Ground Waves,' whilst the latter are termed 'Sky Waves.' The ground wave is rapidly attenuated as it progresses from the transmitting antenna (especially at the higher frequencies) and is, therefore, useful for local or semi-local contacts only. Practically all amateur communication below 30 MHz is by means of the sky wave, so we will concentrate on this mode of propagation.

The Sky Wave

Many readers doubtless tire of the fact that a description of the ionised layers precedes most works on antennas, but the author makes no apologies for its inclusion in this series. Since it is these layers that make sky wave communication possible, a thorough understanding of their properties is imperative if we are to get the best out of our antennas.



Fig. 1

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The heights of the ionised layers.

Ionisation

Before considering the individual layers let us consider what is meant by 'ionisation' and of what an ionised layer actually consists.

We should, from our study of transistors, realise that an atom consists of a positively charged nucleus with a number of negatively charged electrons 'in orbit' around it, the positive charge of the nucleus equalling the combined negative charge of the electrons—giving rise to an electrically neutral system. If other electrons are added to this system, a negatively charged 'ion' is formed. Conversely, if one or more electrons are removed from an atom, the resultant system is a positively charged ion. For example if we remove the single electron that is present in a hydrogen atom we are left with a positively charged hydrogen ion: radiation from the sun has the effect of liberating electrons from the atoms that make up the Earth's atmosphere—thus forming ions and releasing free electrons. It is the ultra-violet content of Solar rays which causes this ionisation. However, ions are not stable systems, and when the source of ionisation is removed they re-combine with the free electrons to form neutral atoms once more. So when the Sun's rays cease striking the Earth's atmosphere after sunset, the level of ionisation decreases until a normal stable atmosphere is formed.

It is important to realise, however, that some layers lose their ionisation more quickly than others—the main reason being that as we move from the lowest to the highest layer, the concentration of particles present decreases which results in a decrease of the possibility of collision between electrons and ions, and therefore the time taken to reach electrical neutrality increases. Let us now consider the individual layers.

The D-Layer

From Fig. 1 it can be seen that the D-Layer is the lowest of the ionised layers and it usually forms at heights of 30-50 miles above the Earth's surface. As the atmosphere is relatively dense at these heights, the ionisation decays very rapidly after sunset and normally exists only when the Sun is above the horizon. Because the D-Layer tends to be so dense, radio waves striking it meet so many free electrons that much of the wave's energy is converted to heat by causing numerous collisions between particles: the D-Layer is thus an absorber of energy—this absorption increasing as our frequency is decreased. This is the reason that DX contacts on the 1.8, 3.5 and 7 MHz bands are rare during daylight hours, and why these three bands are of less use in daylight during summer than winter—when the Sun's rays are present for a shorter time and the level of ionisation consequently lower. The D-Layer therefore contributes nothing towards long distance communication, and in fact impedes it.

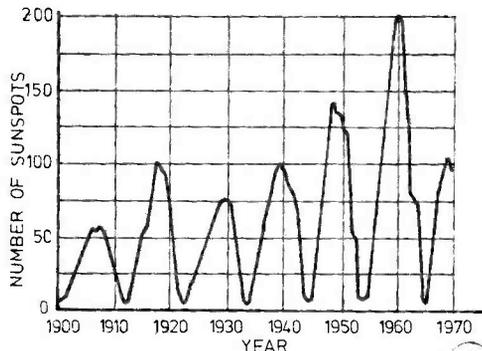


Fig 2

Sunspot activity, from 1900.

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The E-Layer

Occurring at about 55-80 miles above the Earth, this layer is less dense than the D-Layer, and so recombines more slowly after sunset; in fact, during periods of very high ionisation levels, this layer may persist until well into the night. Unlike the D-Layer, this layer has the property of 'bending' radio waves back to Earth and therefore plays a part in long distance communication. However, during periods of intense ultra-violet radiation from the Sun, this layer becomes very dense and can also absorb appreciable amounts of energy—helping to account for the falling off in DX on the higher frequency bands during summer daylight hours. The E-Layer influences the MF spectrum to a

greater extent than the HF spectrum and is normally responsible for sky wave communication from 1.8-7, and perhaps 14 MHz.

The F-Layers

The F2 Layer forms at about 150—200 miles above the Earth, and for HF communication is the most useful of all the layers; at these heights the density of the atmosphere is low and the ionisation is therefore slow to decay after the Sun sets, and persists well into the night. In fact, during periods of high sunspot activity, the F2 Layer will be active until sunrise and can give 24 hour openings on bands such as 14 and even 21 MHz. During daylight the F2 Layer may split and a new layer—the F1 Layer—is formed. This will separate to about 40 miles below the F2 Layer and is of little interest except for the fact that it tends to act as an additional absorber of energy. The F2 Layer is the main 'reflector' of energy in the region 14—28 MHz.

Influencing Factors

As stated earlier, the ionisation in the Earth's atmosphere is caused by the presence of ultra-violet energy in the Sun's rays. The level of ultra-violet radiation present is dependent upon Sunspot activity—the more sunspots present on the Sun's surface, the more ultra-violet its rays contain. Hence the dramatic effect that the 11 year sunspot cycle has on radio communication. The growth and decline in the number of sunspots follows an 11 year cycle and Fig. 2 shows how the number of sunspots has varied during the past few cycles. Sunspots are not always uniformly distributed over the Sun's surface; in addition to the 11 year cycle there is another cycle of 28 days—this being the time taken for the Sun to rotate completely on its axis. Although it has far less effect than the 11 year cycle, it is worth noting dates when propagation is above average for the time of year or stage of the sunspot cycle, and monitoring the DX bands after a period of about 27-28 days; much success in DX communication can be achieved by recognising this 'minor cycle.'

In addition to these two cycles, the angle at which the Sun's rays strike the Earth's atmosphere affects the degree of ionisation since, as the incident ray becomes more oblique to the atmosphere, the ray 'illuminates' a much larger surface area and the intensity of radiation is therefore lower, see Fig. 3. This is the reason why the

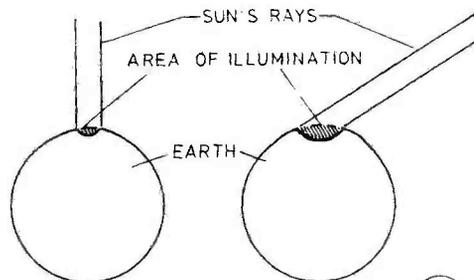


Fig. 3

The area of illumination of Sun's rays at different angles.

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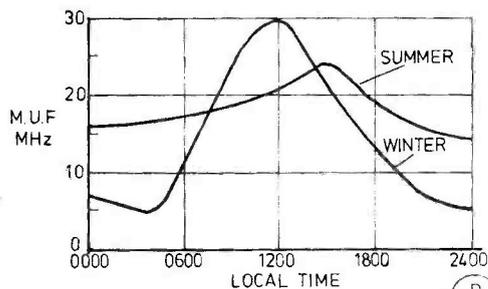


Fig. 4

Variation of 'MUF' during Summer and Winter.

ionisation levels in the D-Layer are stronger at noon than just prior to sunset. The final influencing factor which we will consider is the difference between summer and winter: in winter the Earth is closer to the Sun and the ultra-violet radiation is therefore more intense, and the ionisation in the layers is more concentrated than in summer. However, owing to the fact that the period of daylight is shorter in winter than in summer, the ionisation does not persist for so long and falls to much lower levels at night during winter than during the summer months, see Fig. 4. This is the reason why the DX bands may stay open all night during summer, but close soon after sunset during winter.

Critical Frequency

If we direct a beam of low-frequency radio energy straight up at right angles to the Earth's surface, it will bounce back off one or more of the ionised layers and return to earth. If we now raise the frequency of our energy—i.e. decrease the wavelength—the amount of energy that returns to earth will decrease because some of the energy will either be absorbed by the ionised layers or will pass straight through them and be lost into space. We will eventually reach a frequency at which *no* energy at all is returned to earth—this frequency being known as the 'Critical Frequency.' This frequency varies with the degree of ionisation of the layers—the higher the degree of ionisation, the higher the Critical Frequency. The E-Layer Critical Frequency varies from about 1–4 MHz, while for the F2 Layer the range is much greater, usually falling between 2 and 13 MHz. Remember that these frequencies apply to signals which are directed straight upwards, whereas we normally consider much lower 'wave angles' and are therefore able to use frequencies much higher than these for 'sky-wave' communication.

Critical Angle

Let us now consider a signal which is directed straight upwards at a frequency much higher than the Critical Frequency. It will, of course, pass through the ionised layers and be lost into space. However, if we gradually

lower our 'angle of radiation' (the angle between our transmitted beam and the Earth's surface), we will arrive at an angle at which some of our energy is returned to Earth by the ionised layers. The angle at which this occurs is known as the 'Critical Angle' for that particular frequency, and is the angle below which we must radiate energy in order to communicate by means of the sky-wave. The higher the frequency we are using, the lower is the Critical Angle.

Note, however, that if we are using a frequency which is lower than the Critical Frequency, there is *no* Critical Angle, since radiation at any angle will be returned to Earth. Reference to Fig. 5 will show that between the point at which signals transmitted at the Critical Angle return to Earth, and the point to which our ground-wave extends, there is an area in which our signals can not be heard—this area is known as the 'Silent Zone.' The distance between the transmitter and the nearest point at which the sky-wave returns to Earth is known as the 'Skip Distance.'

There are two other important points which can be seen from Fig. 5: firstly, the lower the angle of radiation, the further from the transmitter the wave returns to Earth, and secondly, the lower the angle of radiation, the further the distance travelled within the ionised layer itself. Both of these points are highly significant and will be discussed in a later article.

Maximum Usable Frequency

If we operate on too low a frequency for a given 'path,' we lose energy from our transmission due to absorption: as stated earlier, the lower the frequency, the higher the absorption. It has also been said that if the frequency is too high, radiation is lost into space because large amounts of radio wave will pass straight through the layers. The highest frequency which we can use between any two points is known as the 'Maximum Usable Frequency' (MUF) for that given path. However, as ionisation levels are continually changing, it is good practice to use a frequency about 15% below the MUF; this is often called the 'Optimum Traffic Frequency' (OTF).

In amateur operation we cannot pick our frequencies quite that accurately as we are confined to certain bands, but we can use each band at the time of day when it is at the MUF or the OTF: in practice, as dawn breaks the MUF rises and the bands come to life. For example, all serious 14 MHz DX-ers know when to get the best results from that particular band—what they are doing, in effect, is picking the time of day that the MUF passes through 14 MHz. During multi-band contests it is possible to follow the better known DX stations from 3.5 or 7 MHz up through 14 and 21 to 28 MHz (if the MUF gets that high) and then back down again as ionisation levels and the MUF decrease.

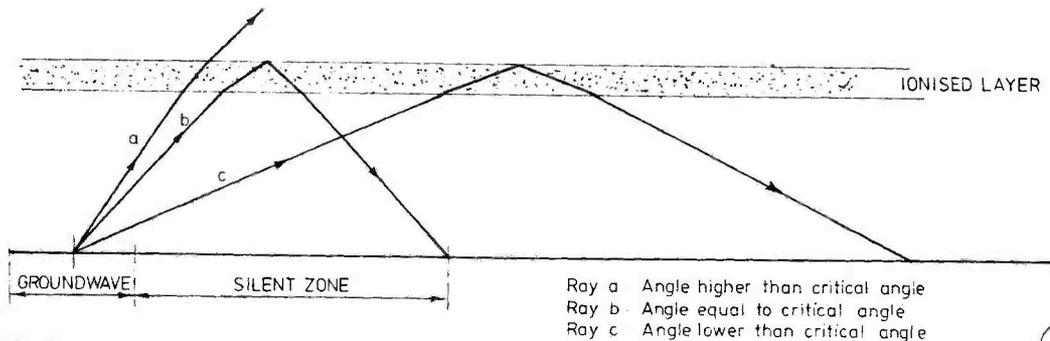


Fig. 5

The effect of the angle of radiation on sky-waves.

Ray a Angle higher than critical angle
 Ray b Angle equal to critical angle
 Ray c Angle lower than critical angle

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'Chordal Hop' Propagation

In recent years it has been accepted that signal strengths of distant stations are often far in excess of the level which can be explained by normal propagation theory, and it is thought that a process of 'Chordal Hop' propagation may in fact occur.

Consider Fig. 6, where two alternative routes for a radio signal are shown. In the case of the conventional wave there have been three bounces from the ionised layers, two Earth bounces and six passages through any D-Layer ionisation that may be present. In the case of the chordal hop route, however, there have been no Earth bounces (which can dissipate large amounts of energy), two bounces from the ionised layers and only two passages through any D-Layer ionisation. In other words there have been far fewer 'energy absorbing' encounters with the Earth and the ionised layers, and higher than average signal levels will result at the receiving antenna. It should be noted that the chordal hop route shown in Fig. 6 is only one of a number of possible routes which may include bouncing between the E and F Layers, or ducting within a single layer, etc.; in fact the true mechanics of this form of propagation are far from being fully understood.

Signals arriving in this manner are subject to the vagaries of the ionised layers and tend to be very unpredictable: certainly we are unable to set up a system that takes this mode of communication into account, although it is thought that this phenomenon only occurs when radiation angles are very low, as the radiated ray must strike the ionised layers at very oblique angles.

Summary

It is important, therefore, to be aware of the ionised layers, to understand which of them are of value to us, and how to make the best possible use of them. By means of this knowledge it is possible to understand why some bands are open on some occasions and not others and, further, why a band will appear 'dead' when using one antenna and quite lively with an antenna which is better suited to the prevailing ionospheric conditions. Most important of all, however, an understanding of the effect of the layers on propagation enables us to choose an antenna which is suitable for the type of communication required.

The next few articles will be devoted to the properties which we require from our antenna and, hopefully, how to achieve these properties.

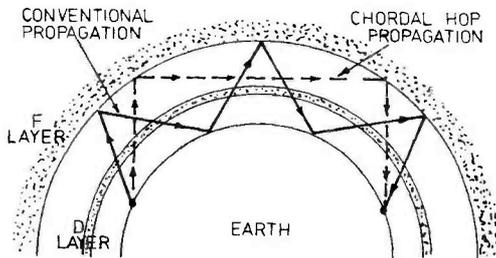


Fig. 6

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Comparison of 'Chordal Hop' and Conventional Propagation (not to scale). For clarity, the E-Layer is not shown.

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AMATEUR RADIO— COMMUNICATION OR TECHNOLOGY, OR BOTH?

PART II

N. H. SEDGWICK, G8WV

IT is not just the inexperienced would-be technician who is deterred from constructing his own gear. At the other end of the scale is the professional technician or scientist who is so used to having a complete array of complex and very expensive test equipment at his disposal that he cannot contemplate working at home without such facilities. Provided one is prepared to do a little arithmetic, the test equipment which is really necessary for the home constructor can be pretty basic. For example, if one can measure volts (albeit with a voltmeter whose internal resistance is high enough to permit its shunting effect on the circuit in question to be ignored) one can usually work out current in a circuit by measuring the voltage dropped across a known resistor in that circuit, for volts divided by ohms give amps.

In advocating a return to home-brew it is not suggested that each amateur builds his gear to completely detailed specifications and drawings produced by somebody else: there is not much fun or satisfaction in that as the sense of achievement is rather limited. More that every radio amateur should have the skill and will to design, construct and adjust his own rig, and take pride in adapting his design to use the components and materials readily available to him, rather than culling some trick circuit from a radio periodical which requires a highly specialised valve or transistor which he does not have amongst the hundred or so ordinary ones he does have!

It has already been said that small is not necessarily beautiful in amateur radio, for miniaturisation requires much forward planning of the layout, and results in a device that is difficult to get at when it needs repair. Miniaturisation is adaptable to mass production and modular construction (where one replaces and throws away the module which goes wrong) but is neither economical nor reasonably practicable for one-off production for the shack. There is also no validity in the inhibition that home-brew gear must look professional with properly engraved labels and printed calibration dials; a piece of card inscribed in indian ink with reasonable neatness is quite as legible as an engraved *Traffolyte* label, and the printed calibration dial will be less accurate than one marked up directly on calibrating. Time is also an inhibiting factor in home-brew activity, and playing at being professional wastes this commodity.

When embarking on a design project in radio one can generally obtain many of the circuit component values from manufacturers' data and the various amateur handbooks; things like bias resistor values have been calculated so often for the valves and modes that need them that there is little point in doing the calculations again, so waste no time in pedantry! However, if an RF device is to be tuned the variables are infinite and one must have the capability to design from the operational specification desired. One must know the frequency range

to be covered, and appoint a minimum capacity for the tuned circuit according to the practicalities and strays; the tuning ratio will then determine the maximum capacity required, and knowledge of either capacity will enable coil inductance to be calculated. One has to design and make a coil having that inductance, and then measure it to check the accuracy of the design and work: This can be done by "trial and error," trying coils with a variety of turns in the actual circuit under construction, but it is a time-wasting business and often results in spoiling the wiring or breaking a tag. Single layer RF coils can be calculated and this will be dealt with later on.

Long experience of dabbling in HF home-brew has persuaded the writer that absolutely basic requirements in the test equipment line are:

- (a) A high resistance voltmeter capable of reading from a fraction of a volt to several hundreds of volts.
- (b) An RF voltmeter using a low capacity diode probe, and capable of reading from a fraction of a volt to a hundred volts or so.
- (c) A signal generator capable of providing an RF signal at low source resistance from 1.6 to 30 MHz at levels adjustable from 1 or 2 microvolts to half a volt or so.
- (d) A resonance meter of some kind which can be coupled to a tuned circuit to measure the frequency at which it is resonant. Some sort of "dip meter" in fact.

It became apparent that the addition of a diode probe to (a) produced (b), and that (b) could be used to check the level of (c), and given (b) and (c) one also had (d). Hence all four instruments became one multi-purpose instrument of which the home-brew version is shown in Figs. 1 and 2, and the circuit of it in Fig. 3. The device is built into a die-cast box measuring 8.6in. x 5.8in. x 2in., fitted with an aluminium screen across the middle. The upper half contains the electronic voltmeter (EVM) and the lower half the signal generator (SSG); two *PP6* batteries in series are mounted in the box lid in such a way that they drop into the box cavity without interference to components or wiring when the lid is screwed on. The diode probe is shown in Figs. 4 and 5, and plugs into a break jack on the front panel. It is not, in fact, used in monitoring the SSG output as this would be physically inconvenient, and a similar circuit built internally around D1 is switched-in to perform this function when S1 is in position "3."

In the voltmeter two FET's, TR1 and TR2, are arranged as two arms in a bridge with R1 and R2 as the other two arms; potentiometer R3 is used to adjust out imbalance arising from differences between the two FET's, and some selection of the latter may be necessary. Rheostat R4 is used to set full scale deflection on the meter correctly, and this needs doing on only one scale and voltage to make all the ranges correct. If an accurate voltmeter is available it can be checked on that, but it will not be badly out if set up on the 2 volts range using a new 1.5 volts cell such as an *SP11* as a standard. The meter used in the G8WV version had an FSD of 100 micro-amps and was calibrated 0-100.

It will be noted that the voltage-divider chain of resistors associated with the range switch S2 totals 2.4 Megohms, from 0.5 to 200 volts ranges, and as this is the resistance seen by any circuit under test its shunting effect is slight; the instrument resistance is still higher

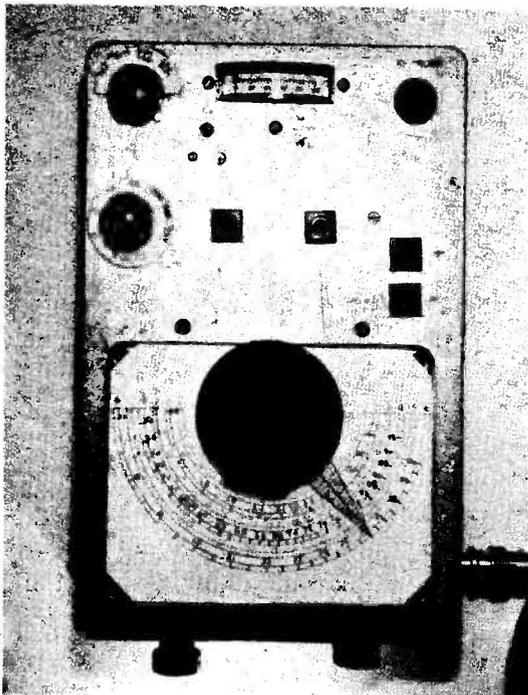


Fig. 1. Multi-purpose Test Instrument, viewed from the top.

on the 500 and 2000 volts ranges, which have separate terminals and are wired with suitable insulation. The tighter the tolerance of the resistors used in the divider chain, the more accurate will be the meter, but 5% tolerance is adequate for most amateur purposes. Application of a DC voltage to the top of the divider chain from the test circuit biases the gate of TR1 and unbalances the bridge, causing a deflection of the meter which is linear within the set ranges. When the RF diode probe is plugged into the break jack it disconnects the DC+ terminal and acts as a rectifying and smoothing circuit, sending DC voltage equal to the RF voltage under test to the divider chain.

The FET's and associated circuitry, and the divider chain resistors, are mounted on a piece of plain *Vero-board* visible along the upper left-hand side of the unit shown in Fig. 2. The board is attached to the side of the die-cast box by two small screws and spacers, and all the external wiring connections to the board are fed in from one end so that the board may be lifted clear of the box when dealing with faults. The non-standard values amongst the resistors of the divider chain are made up of two resistors, either in series or parallel, except in the case of the 7.2 Megohms resistor used on the 2000 volts range, which should be made up of at least four resistors in series to reduce the danger of high voltage flashover between the ends of the component resistors. All the resistors on the board are half-watt 5% high stability miniature carbon type.

TR3 circuit is a Hartley type oscillator having approximately 2 : 1 frequency tuning ratio on each range,

and gives quite a flat output of about 0.3 volts over the whole spectrum it provides. C1 and C2 are chosen to set the minimum capacity across the tuned circuit (including that of the tuning condenser and circuit strays) to be one-quarter of the maximum capacity when the tuning condenser is fully meshed, so as to provide the 2:1 ratio of tuning. The oscillator is isolated from the output circuitry by TR4, a source follower whose output is measured by the EVM set to its 0.5 volts range when S1 is in position '3'; S1c arranges that power is only switched to the SSG in its positions '3' and '4'. S4 is the attenuator switch and should add about 20 dB progressively on each switch step, but in fact there is bound to be some leakage by stray capacity coupling between the resistors making up the attenuator; this should be kept as low as possible by using very small resistors and so placing them that the low-level ones are not very near to high-level ones. In the unit discussed a ten-way switch was used although only seven positions are needed, and the spare contacts were wired to earth, so that maximum and minimum level contacts of the switch were not directly adjacent and there was earthed metal between them. The switch, attenuator resistors, and the BNC coaxial socket are covered by a soldered copper screen seen in the lower left-hand corner of Fig. 2. Just to the right of the ganged tuning condenser in Fig. 2 can be seen a 455 kHz IF coil (taken from an old transformer) which enables peaking of IF strips working around this frequency, but the tuning range is limited because of the large fixed parallel condenser it needs across it to give resonance at its design frequency. The other tuning ranges give coverage from 1.6 to 30 MHz in five bands. Details of the coils will be given when the subjects of coil design and construction are dealt with in a later article.

An epicyclic slow-motion drive is used on the ganged condenser and the condenser itself is fixed directly to the box with its spindle projecting through. It is desirable to maintain the metallic screening at the point of this projection so that RF from the oscillator will not leak out and bypass the attenuator and output lead into the device under test. For that reason the epicyclic drive

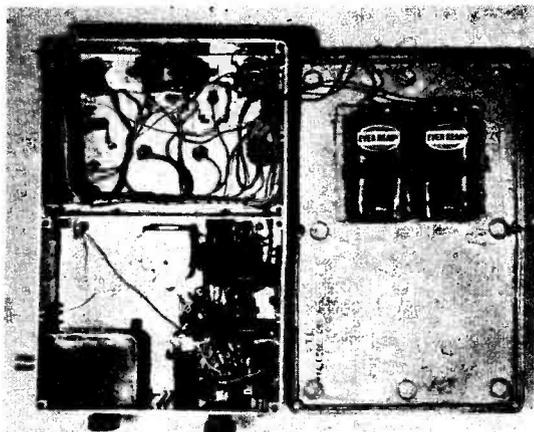


Fig. 2. Multi-purpose Test Instrument, underside view with bottom plate removed.

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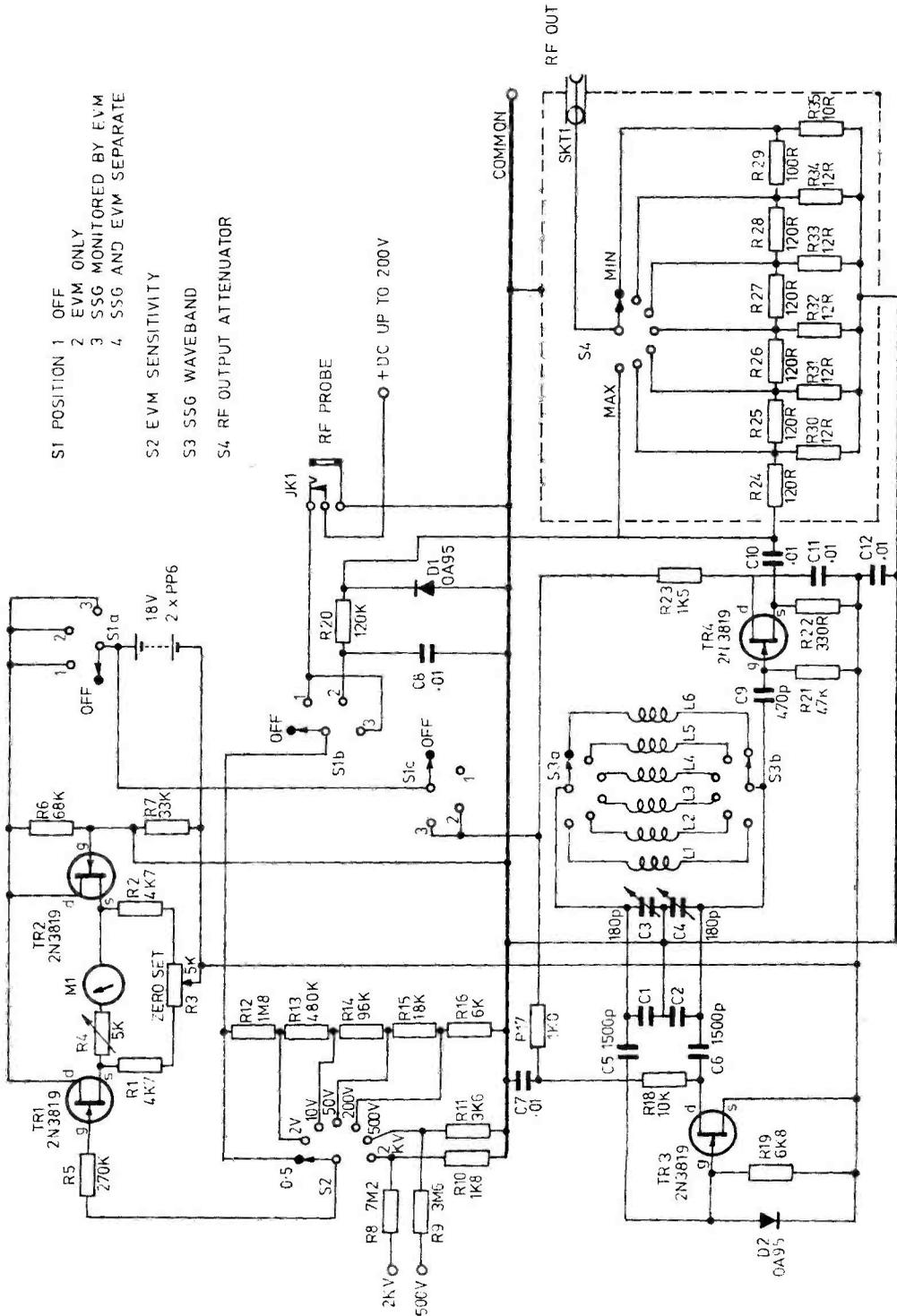


Fig 3 COMBINED ELECTRONIC VOLTMETER (EVM) AND SIGNAL GENERATOR (SSG)

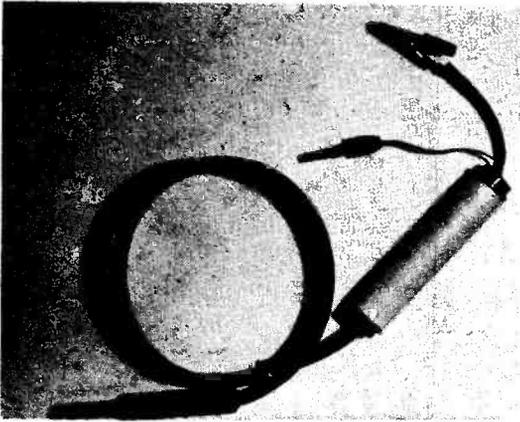


Fig. 4. The RF Diode Probe.

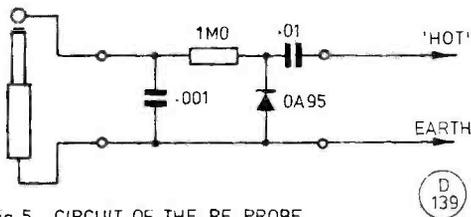


Fig 5 CIRCUIT OF THE RF PROBE

is put on the spindle of the condenser outside the die-cast box and an additional metal panel is set above it on four corner spacers to accommodate the dial and the mechanism. In the case of the unit shown in Fig. 1, the panel is a spare bottom plate from a 4.8in. x 3.8in. die-cast box with a piece of white card stuck on it with impact adhesive to serve as the dial; the pointer is cut with tin snips from a piece of celluloid sheet. The range scales of the calibration are necessarily rather close together, so they were coloured alternately black and red.

The RF diode probe shown in Fig. 4 has the circuit of Fig. 5. A strip of plain *Veroboard* was cut to push-fit into a 3in. length of $\frac{3}{4}$ in. PVC pipe, and the circuit components were mounted and wired on it. The output lead was made from a 2ft. length of UR70 coaxial cable, which terminates nicely into a PO No. 201 jack plug; test leads with crocodile clips are kept short to avoid introducing reactive effects, as they are at RF potential when in use. The ends of the tube were closed with two inserts through which the input and output connecting leads passed. In the probe shown in Fig. 4 the inserts were made from two moulded bakelite pieces which were part of some rather ornate top cap connectors for valves, but they could equally well have been cut and filed from a scrap of $\frac{1}{4}$ in. thick bakelite. The crocodile clip leads are made from UR70 screening—stripped off the coaxial cable and stretched out flat, so that they are very flexible but quite strong: input and output connections are tied onto the *Veroboard* strip with strong thread. The use of coaxial cable for the output was purely for convenience because it went well with the PO plug, and the connection is for DC service only, following the probe,

and could be treated accordingly.

The signal generator output lead (Fig. 6) is also made from a 2ft. length of UR70 cable; it is shown terminated with a BNC plug to mate with the socket on the instrument. However, they could be any type of mating coaxial connectors suited to the cable used. The other end of the cable has the outer PVC sheath stripped back about $3\frac{1}{2}$ in.: the screen mesh is then pushed back along the centre core and the strands separated with the point of a scribe as near to the end of the PVC outer sheath as possible, to expose the centre core through the hole thus made in the screening without breaking any of the strands of the mesh. The centre core is then pulled carefully through the hole, and the screening mesh stretched out and flattened, thus forming the earth lead when terminated with a crocodile clip. Another crocodile clip is connected to the centre core conductor, and the polythene insulation securely gripped by, or bound to, the crocodile clip to remove any strain from the fragile centre conductor during use.

To use the device as a dip meter for discovering the resonant frequency of a tuned circuit, a single turn of small hook-up wire should first be wound onto the coil under test and connected to the signal generator output lead. S1 should be set to position "3," and S4 to "MAX"; S2 should be on the 0.5 volts range and read the signal generator output. The signal generator should then be tuned through its range until a dip is observed on the meter reading: this is caused by absorption by the tuned circuit, and the coupling of the single turn loop with the coil should be reduced until the dip is just noticeable as the signal generator is tuned through resonance. The resonant frequency of the tuned circuit under test may then be read directly from the signal generator calibration. If it is required to measure the inductance of a coil a known capacity may be placed in parallel with it—say 100 pF—and the resonant frequency found. The inductance can then be calculated by putting the known C and f_0 quantities into the formula for resonance, but more on that later!

to be continued

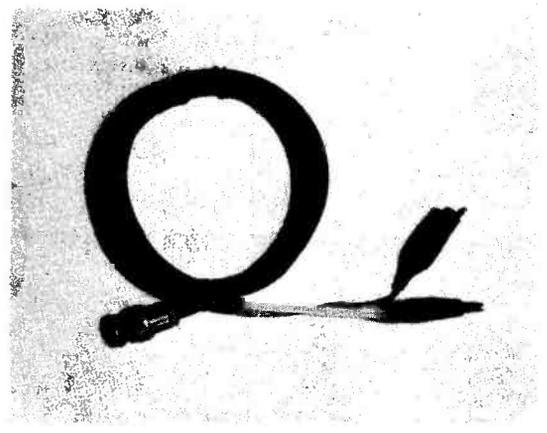


Fig. 6. The Signal Generator output lead.

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

SLOWLY but surely the solar flux is rising; but the time you come to read this, it may well have finally left the Nasty Nineties and settled for a period in the three-figure region, to the benefit of the deserving who have waited for DX for so long. As a kind of contrast, we hear that in the wake of the Citizens Band collapse in the U.S.A., the *Hy-Gain* people, who were heavily into CB, have gone bust to the tune of around 31 million dollars, after some 97 million dollars of sales in 1976. Thus another name leaves the Amateur Radio scene after a brush with Citizens Band, following such as Gladding and Johnson to disaster. This, of course will be the signal for Murphy's well-known adage to come into operation and every *Hy-Gain* owner will have a trap blown up or leaking—or something wrong, anyway!

On the home front we hear mutterings of more power cuts through industrial action, and with that, of course, comes the need to generate 240 volts 50 Hz from a twelve-volt battery. Easy: we had a gash PSU which looked to be the right size, and the circuit said lots of centre-tapped heater windings were there for the asking. We stripped the PSU down, and what should we find but a fine transformer with *no* centre-tapped windings and lots of wrong voltage ones. Someone did a modification while we weren't looking; sad . . . However, we proceed, though at a dismally slow pace. The '240-volt' output desired has so far struggled up to around 100 at 16 Hz; it managed to bite quite effectively, which led to someone asking "What's black and crispy and hangs from the ceiling?" Guess the rest yourself!

However, in the end we have to come back to DX, and to communication with faraway places and strange-sounding names—and that must mean rumours and reports of new countries or rare existing ones being activated, and other rare ones being deleted. Clipperton is probably the most wanted at the

moment unless one yearns for mainland China, and Clipperton is likely to be activated ere long; keep an ear to the grapevine as this one may burst forth during the month of March, with two, possibly three stations, ten operators, and a goal of some 25,000 QSO's. Even before this gets to print, a completely new one may have come and gone, over the weekend of the ARRL Phone go-round, the indications being that the place has passed all the desired DXCC criteria. On the other side, out goes Geyser Reef, while Kingman and Spratly were both considered for the thumbs-down signal—but we hear that *VR3* may be heard again before long: there are cautious noises being made about Aves, and we hear that Fred Laun, LU5AFH, who was shot up and severely injured by terrorists, is headed out to *HS*-land, with hopes that *HS1AB* will be his lot. Summing up, one could say that things are stirring a little.

Eighty

It may be recalled that last time round, G2NJ (Peterborough) was hearing the Scandinavian countries in QSO with *JA*'s; they were again noted at the low end of the CW portion with times around 1445 to 1505z, with OH1VQ about the most consistently successful between December 22 and January 9. The exercise for Nick came to an abrupt end over that night when the gales and floods arrived, and downed the G2NJ aerial. As to other contacts, G5NX was worked, both /M and /A around the Bowness area, and G2CAS, who had the misfortune to get his kite aerial into a tree—the kite was not badly damaged but it put paid to the activity. OZ1DZW in Esbjerg was worked when the latter was running just two watts, G4FAI had three, G3DRN with five, G4FJF five, and G4CQK in Walton-on-Thames who had three—all input powers.

A quick note from G3CED (Broadstairs) indicates he is still

off the air, and he remarks that humping FRG-7's about is a good way to keep fit at seventy!

G3GIE (Great Moulton) offers his QRP contacts with G3AID, DJ8IQ, G3LAI, SP3KTC, DM5NI, HB9BNB, DL1KS (five watts), DL1BU, GM3OXX/A (two watts), DJ2KX (nine watts), ON5GK (five watts), PA3ABA (with three watts), OZ7UC, and DLOWH. All John's QSO's were with his HW-8 and a Joystick; Denmark in this last month now brings his QRP total to 32 countries worked. On a different tack, the QSO's during the last ten days of the period were all made with a new home-brew ATU, and John comments that this project was finished off with the aid of G3CED getting some of the bits.

G4FJU (Bloxwich) didn't spend much time on Eighty, but 7½ watts of his CW reached out to DF1KF and SP1GR, plus a few *G* stations in the afternoons.

G2BJY (Walsall) reckons he's been banging his head against a brick wall, having had no success either on Ten or Eighty; as far as the latter goes he was out for some more for his DLD300 award, but only managed to raise the parts of the world already worked.

A return to the fold from G3WUD (Bramhall) who has been QRT for several years largely, he says, through the impoverishment of being at university; however, on December 23 a visit was made to Matlock for a KW-2000A; the aerial was made by way of the 'invisible' technique using some 350 feet of 30-gauge cable, fifty feet up at the highest point, and raised by the use of a fishing-line lead weight and some nylon monofilament of 20 lbs. breaking-strain projected with a trusty catapult. Using a directly-linked coupler, a ground stake and a couple of radials plus buried wires, the VSWR came down to 1:1 on all bands for a 'look-see.' Eighty was found to be quite interesting, all over Europe at night at 59+, and *W1* and *VE1* at around 55. On CW, some *W4* signals.

Reading G3WUD's letter brought to mind the odd coincidence that only the evening before it arrived your scribe was chatting with G5VT (Bishops Stortford) who recalled his method of getting the string up the tree, which comprised the use of a tennis ball with the end of the line carefully attached (and then run out so it could take off cleanly) followed by a suitably QRO swipe in the desired direction with a tennis racket.

Now to G2HKU (Sheppey) who remarked how the heavy weather took his mind back to the East Coast floods of 1953, when he lost most of his gear and a lot of his house in the flood. Now he has moved up to a bungalow 40 feet *a.s.l.* from which point of vantage he was able to see it all over again; to watch the waves throwing chunks of concrete twenty feet wide around the scenery was an incredible sight. Ted lost his mast, and the aerials suffered subsequent storm damage, although the 14AVQ remains erect. To return to the QSO's the HW-8 was used to work GW3COI and YU1NFR.

'CDXN' deadlines for the next three months—

April issue—March 2nd

May issue—April 6th

June issue—May 4th

Please be sure to note these dates:

We nearly missed the letter from G4DMN (Parkgate) who has been playing with phased verticals; initially the existing inverted-vee was absorbing most of the power put out by the verticals—which wasn't a great help, so the inverted-vee had to come down. The present arrangement is that one element is the pole which supports the TA-33 (the latter serving as top-loading), while the other is of forty-foot height pieced out as an inverted-L, the house being in the middle. Odd though this configuration may seem, it demonstrates up to 25 dB of front-to-back ratio, which must be a help in getting through the European QRM. All these were on SSB:

A4XGY, AP2KS, C6AM, CR9AJ, D4CBS, EL2AK, JA4CIB, JX9WT, KP4RF, OH0NA, OX3FG, OY5J, TA1ZB, TF3SE, UA0AFK, UD6DFV, UF6HE, UF6RB, UH8HBZ, UI8LAG, UI8ACA, UI8AEK, UL7JCA, VE7IG, VE7VP, VP2KG, VP2LDB, VP2VEH, VP5EE, VP9IH, VP9HP, W6EA, W6PVB, ZB2DV, 5T5CJ, 8P6BT, 9K2DR and 9M2XK.

Forty

G4GMZ (Greenford) makes a first report, and it sounds as though he had about the ultimate in ill-luck; he had just got into his *very first* QSO (on Forty, with YV4FST) when the telephone rang—the XYL wanting to be collected from the station, because of the rain and cold! However, he compromised with a very brief QSO and QRT. The 7 MHz dipole has one end at 7 feet above ground level, the feed at 11 feet and the highest point at 22 feet, with which many QSO's were made round Europe, highlights being noted as 9H1CE, ISOWSS and IT9AGA, and Gotaways being KV4CI and 4X4MR. Another odd one was the QSO with G2PT about five miles away and with QSB on the signal!

Forty for G4GIE was largely a matter of the DL AGCW QRP contest, and it showed with various Europeans, mainly DL/DJ, a couple of YU's and GM4DKO.

G3WUD reckons the band was 'terrific' during the day, with 59 reports all round U.K. by day and Europe at night; despite all the BC QRM, the break out of Europe was made, to YV4BMV.

Forty CW it was for G2HKU, who worked out to KV4CI, UF6FAL and UH8HBX.

Vale

Elsewhere in this issue will be found an obituary notice of G6XJ; it was probably only since his retirement that one realised the full impact he made, as an Eddystone director, on the amateur radio scene in this country, when one sees receivers which in his time were priced at below fifty pounds now being sold for over five times that sum. There can be little doubt that the price of the Eddystone amateur-bands receivers was for a very long time

subsidised by the other aspects of the business, so many of us were able to buy a receiver otherwise beyond our pockets. And, of course G6XJ was a DX operator of no mean ability; a good signal and well driven. We shall miss him.

Odd Points

At *Short Wave Magazine* we have long felt that any country which sees fit to prohibit such a hobby as amateur radio from its inhabitants is either repressing something irrationally, or scared of its own lack of stability to the point where its international loss-of-face makes no impact upon it. One supposes the most obvious case is China; but we have a letter here from 5Z4DW, who finds he can only operate when he gets leave from Malawi and travels to one of the other spots for which he holds a call. It sure sharpens up his sense of loss at having no call!

At the time of writing we notice that there is another WARC going on right now, dealing with aeronautical ground-to-air and air-to-ground bands and turning them all over to a SSB basis. That sounds simple, but in fact the amount of data collection to be done is enormous, which means a similar-sized problem in reducing that data into conclusions.

On the contest front, we can point out several in March. The Commonwealth Contest—old-timers still think of it as BERU—is on March 11-12, and the activity is to be in the bottom 30 kHz of the band—a 'good mark' to RSGB's Contest Committee for such a sensible idea, to give the non-contesters a bit of room for operating. It clashes, sadly, with the Trieste DX Contest, although the latter being a 48-hour affair may in fact put a bit of zest into the 24 hours of the Commonwealth event.

The weekend March 25-26 sees the playing-off of the CQ WW WPX SSB contest. The rules are unchanged save that a new, special, award is being made to QRP entrants, and there will be an award for a separate Club section, all-same the CQ WW contests. The mailing deadline is May 10, addressed to: CQ WPX SSB Contest Committee,

14 Vanderventer Avenue, Port Washington, N.Y. 11050, U.S.A.

Yet a third one on that weekend is the BARTG Spring RTTY Contest—all the details from Ted Double, G8CDW, 89 Linden Gardens, Enfield, Middx. EN1 4DX.

On a different tack altogether, we note from *DXNS* that VK5NO, Tubby Vale, has joined the ranks of the Silent Keys. His call appeared in many a list of DX to cross this desk, usually associated with LF band reports.

We have a buzz—believe it if you will—that there may be some activity coming out of Iraq, allegedly between February 17 and April 25. All we can offer is our usual advice, namely work 'em first and worry afterwards! Who knows, it *could* be the true-blue stuff to get the adrenalin pumping—and if it isn't, you've not wasted all that much electricity!

Talking about doubtful ones, we hear that the ZK2AU type often heard is located in W6—although there have been ZK2AU reports in these pages before and *no* doubts, so maybe there are two ZK2AU stations, the real and the imaginary.

That 'new one' indicated earlier in this piece has run into trouble through a bereavement, and at the time of writing it is not known whether the existing time-table will hold, or if the expedition will be re-scheduled for about a fortnight later.

The ranks of the non-amateur countries include North Korea—and *West Coast DX Bulletin* notes in passing that one of the competitors at the Region 1 D/F event at Skopje was Dok Sik, representing the Amateur Radio Association of the Democratic People's Republic of Korea—so if a P5 surfaces, there might be a sporting chance of it being a good one!

Ten Metres

Has almost been good enough to justify taking the rig to work, with ionospheric propagation of some sort on most days of last month.

G2ADZ (Chessington) stuck to the CW end of Ten, and found that the third week of January was pretty quiet, but the remainder of the period was quite good and interesting, with the band opening in the morning and closing in the after-

noon, with some very good days. He worked CW with all the W call areas (bar W6 and W7) at strengths between S8 and S9-plus, ZE, ZS, UA9, UL7, VE2, VE3, VK20I, VK6WT, VK3RJ, J28AO, YV1NX, TI2PZ, not to mention a QSL for copying the ten-metre output from W1AW on 28080 kHz. Among the Gotaways we note FM7, FG7, YV, PY, 5T5ZR, VK's, OX3AB and ZL3GQ. One of the most interesting contacts was with W4GBB calling CQ QRP. Bill went back to him with 150 watts (they call that QRP over there!); W4GBB was in fact on five watts, so G2ADZ progressively turned the power down from twelve watts to five watts, and finally down to the point where he couldn't measure the RF output at all—and still he was 100% copy over there. But—when he called CQ QRP nobody wanted to know!

G4BHE (Basingstoke) next, and we find that all except two of his QSO's have been on 28 MHz, the latter band yielding some 36 countries and 16 states worked; and in that countries score there were in fact no less than seven all-time new ones for the G4BHE score (a particularly good evening was noted on January 28 and 29). The gales didn't fetch the aerials down, luckily, although G4BHE says he'll have to drop them for an overhaul as soon as the weather becomes a bit more civilised. Stations worked included CE5BOJ, EA8BS, EP2TW, HK4DF, HP1XRW, KV4CF, KZ5RV, OE6DK/YK, OD5AQ, ON4NC, P21AE, RA9FMC, SV1IW, TA1MB, UD6DFD, VE1BLR, VE7CQX/SU, VK7AE, VK7AK, VP2AZB, VP8NX, WA0BOE, WB0PTB, W0FXL (respectively Missouri, Minnesota and Kansas), ZS6OQ, 5N2NAS, 7P8BE, 9H1BT.

All this, and yet poor old G2BJY found only an EU opening on January 2, with a few W's also, and an EU opening on January 14, all of which seems to indicate that Geoff was either listening at the wrong time, or his receiver is a bit dead.

G3WUD found Ten by far the most interesting band, having expected to find the area deserted and lifeless. One afternoon some W's were heard and, perhaps of more

interest, a local net was found, the members of which were able to welcome him to a much quieter gathering than the ones he recalled on Top Band! His next activity would seem to be to bring the rig down to his sixth-floor flat in Bayswater and to apply the 'invisible wire' technique again, to string over to the steeple of a nearby church. Sounds quite intriguing.

Doctor Dave, G14FUM (Lisburn) is totally absorbed in Ten, and only goes down as far as 21 MHz if he is really pushed for a contact. The month has seen SSB to 9H1BT, 9H1CD, YO's, an assortment of Russians, 5B4DC, various Italian stations, SV1KB and SV1IW, IT9UWM, 9H1EU, VO1JN, VO1NS, W0SF (Iowa), and several other W's in call-area numbers 1, 2, 3, 5, 8 and 0, KP4DX, VE3IUR, U18, ZS5NZ, VP2AZB, RA9CAS, 5N2NAS, RA9CIU, FG7BA, HI8EJH, SV1DX and shoals of lesser fry, to the tune of QSO's on twenty days in the month of January, 23 countries and 23 states.

Top Band

This time it is Doctor John first, otherwise G4GMZ. The aerial for Top Band is of some interest: he has a 'helical' quarter-wave of wire of 20 gauge wrapped round a piece of 6½ft. 2 x 1in. timber, vertical in the loft, with some half-dozen 'radials' each about seven feet long. Tuning is done by removing groups of turns for a coarse adjustment, the fine tuning being done by a coil sitting next to the SWR meter—he draws it as a roller-coaster type. With this, an SWR of unity at 1825 kHz rises to 1.5 : 1 at 1805 and 1850 kHz. This is 'it' until the planned tilt-over tower can be built! The CW QSO's generated with the help of this beast include such as G, GI, GM, GJ, GU, DJ, HB9 and OK1JDX, with of course the usual supporting cast. Stout work for the first few Top Band QSO's.

G4GIE uses his HW-8 on all possible bands, and his AT5 on Top Band CW; this resulted in QSO's with GM3KMG and GW5TW.

G4AEJ (Solihull) puts in his final score for the Ladder, commenting a

little ruefully that it just shows where he didn't spend much time! His final score goes up from the 98 points shown in the February issue to: AM 53, CW 40, SSB 12, Countries 6, total score thus becoming 111.

On to G4FJU who complains that we haven't up-dated him in the Table to read AM 39, CW 80, AM/SSB 80, Countries 17 and total 216 points on Top Band, which ought to modify the order a little. What a pity we printed the final table last time out!

G3WUD summarises things as mainly G's all over the country and right down to Lands End—not quite as far as G4FJU who worked G3RPC at St. Mary's Isle of Scilly!—plus the GM's also at 59, and OK/OL on CW in the evenings.

That leaves us with G2HKU, who used SSB to work his regular PAØPN sked, and CW for his QSO's with GW5TW, DL6KK, DJ6RE, DJ5BV, OL5AWG, GI3JEX, GU3HFN, OH6DX and GD4BEG.

As for your conductor, he has been meditating on ways and means of getting another, and preferably all-round, radiator up for the band, so far without all that much success. Trials of a *Hitachi Navigator Mark 2* receiver resulted in the observation that its 'marine band' covered 1.6 to 4.5 MHz, and that its calibration in frequency was pretty fair. It was rather interesting to be using a receiver fitted with BFO and ferrite rod aerial on Top Band, and to compare results with one's recollections of old times with the big aerial. It certainly seems to indicate that directivity on Top Band would be well worth the trouble of construction. Maybe we'll run a review of this interesting box in due course—we can see it as being useful, not just as an RDF receiver or the receive-half of a portable rig, but by the addition of no more than one switch we think it would make a very fine receiver for the D/F enthusiast on Top Band.

14 & 21 MHz

Things seem to have conspired to divert attention as far as these two bands go, even though they carry the bulk of the global DX working

almost always—and it is an interesting commentary on the effect of sunspots that to have lumped Fifteen and Twenty together in the *CDXN* of, say, a year ago would have been quite unthinkable, either to your scribe or to readers.

As this piece is being written, around 2145z, the CW end of 14 MHz is well plastered with CW signals, and all the rumpus of a major contest at the SSB end. One can't help feeling that, despite what many people say, 'conditions' are very much a thing of the mind—if one expects the band to be dead, and it sounds so, one does not bother with a CQ; but there may be some chap at DX having just the same reaction! From which we deduce a reasonable rule is to try the odd CQ on an apparently dead band, just to see what will turn up.

G14FUM, as has already been said, only came down to this band when Ten let him down, but he seems to have made good use of his time, with YBØACH, EP2LI, JX9WT, 9K2FO, OD5HU, UA9MX, VK5CHL, JW4EJ, CN8CW, ZB2DW, EP2TW, PY2ZDC, VK2NCG and JF1NZM/MM, all 21 MHz.

G2HKU kept up his regular sked contacts with ZL3RS, ZL3SE and ZL1VN on SSB and did nothing on the key on 14 MHz. He reserved his QRP efforts for 21 MHz CW with the HW-8, working W2BA and W3LPL—the latter passed G2HKU a report of 599, but maybe the *W*'s six-element beam at 120 feet was *some* factor in this!

G3WUD's reaction after a few years lay-off is to note his typical RS57 reports into the States and Russia; but he reckons far too many of the 'beam and linear' types are around. On 21 MHz, chats with several of the locals on this band(!) indicated plenty of groundwave, and lots of Europeans were raised on the key. ZS and *W* worked also demonstrated that there was some skywave coming out as well.

G4BHE stuck very much to Ten, but his old SWL 'look at 'em all' outlook is still there, and one quick look at 21 MHz revealed VP2VEH for an all-time new country.

Another one who regarded 21 MHz as a bit of an anti-climax was G2ADZ who came down during the quietest period of the month on

Ten, to snap up PY7AAI/O who was working stations at a great rate of knots. This PY7 is Fernando do Noronha (QSL via PY7AZQ).

G4GIE (Great Moulton) seems to have spent quite a lot of time on Twenty with the HW-8: OK2PBG, OH6HC, UQ2IC, WB4CLE, UK5SAX, SM1IUX, SP6MJ, OK2BJQ, YU2RSF, UK5EDJ, IO1FG, HB9BEG, ISØLMN, OH6OA, I1THC, OH3DH, EA1MV, EA4BV, OH2BOE who is crystal-controlled with just 9 watts, OK3KAG, EA3ALV and OK2PEQ. Turning to 21 MHz, we see a shorter list, with WB9UBT, WB4BUI, LZ1AG, UY5UG, UV3DN, UB5SR, UB5EM, UA3FT and LZ2MO. All, as noted, with the HW-8, home-brew ATU of the 'transmatch' type and Joystick at 13 feet.

It's of interest that so many lists of DX don't show anything to *W*7—after all, there are some heavily-populated areas in that call area. G4AEJ managed all the others, plus KP4EAJ, KP4FM, ZS6I, KZ5ED, JA8RCM, JA8GU and VE1-3 all on CW, and 21 MHz.

After his disappointments on 80 and 10, G2BJY knocked up a crystal/mixer VFO with output on 10.5 MHz and so got up on to 21 MHz, which enabled him to work some DX, mainly *W* and *VE* stations.

D4DMN is QRT on these bands, having lost a trap on his TA-33 beam—which accounts for him appearing on rather different bands than usual.

73

Once more we are at the bottom of the pile. Thanks to all those who give up their time to write the letters without which this piece could never be written, and of course to the weekly 'bulletins' which provide the forward look (and fill-in for the writer so many of the details which come and go too fast for a monthly piece such as this) like *WCDXB* and the Geoff Watts' *DXNS*. That being said, we wouldn't complain if more letters came in—after all this column is about Communication as well as DX, and one man's DX may be another man's QRM!

Deadlines, as usual, are in the 'box'—send the letters to 'CDXN', SHORT WAVE MAGAZINE, 34 HIGH STREET, WELWYN, HERTS. AL6 9EQ.

THE MONTH WITH THE CLUBS

BY "Club Secretary"

WE never cease to be amazed at the way some club secretaries are dedicated to the job, and are willing to continue office regardless of domestic upheaval, job assignments and all the rest of it. There are many groups around the country which are thriving thanks to such unsung heroes, which without them would face rapid descent into oblivion.

Elsewhere in this issue will be found three 'Silent Key' notices and two of them concern people who were dedicated club members; even if a club is lucky enough to have another dedicated member available for co-opting or electing into the office for the remainder of the year, they are bound to feel a "wind of change." However, change is something which is praised outwardly but often resisted, and in such distressing circumstances it is important to the future of the club that for a few months at least, the wind of change be disregarded so that the new chap can get past his first gropings and show some sign of his powers, or lack of them; his confidence, or otherwise, is the key to the future.

Run Through

At the moment of starting for this month the deadline has not been reached, but already we have quite a pile on which to begin. New Year resolutions? We hope so, for the club's sake.

Last out of the envelope puts it top of the pile—**Peterborough** who have a Junk Sale on Friday March 17, at the Scout Hut, Occupation Road, starting at 7.30.

At **Verulam**, 7.30 p.m. on March 23 will be noted as the G3PAO Memorial Lecture, to be given by G3IOR, his subject being the AMSAT *Oscar* Programme. This one is very definitely a special event, and visitors are invited. The informal sessions during the winter are at the R.A.F.A. Hq. in Victoria Street, St. Albans on the second Thursday of each month, which gives us 7th for March. The G3PAO Memorial lecture will be at the Market Hall, St. Albans, which is where the formal dates are always held.

Crystal Palace is next in the pile, and we note they meet at Emmanuel Church Hall, Barry Road, East Dulwich, SE22; on March 18 it is the Annual General Meeting. A nice thought in their *Newsletter* is to mention that some of the older members would appreciate transport to enable them to get to and from the club—an idea that could be taken up by others.

Bishops Stortford have their place at the British Legion, Windhill, Bishops Stortford, on March 21. As they have just had an Annual General Meeting, the programme has yet to be finalised.

It is pleasant indeed to hear again from a club that has been missing from this piece for a long time, and so we welcome the letter from **Dunstable Downs**. They still have their Hq. at Chews House, High Street, Dunstable, opposite the police station. For March they have a "between week" on March 3, followed on 10th by a talk by Jack Hum, G5UM, back in his old stamping-

grounds to give them a talk on "Four Metres and Down." March 17 is St. Patrick's Day and is celebrated with a Junk Sale, while the Good Friday date is missed. Finally March 31: this is set aside for the discussion of the club plans for the 1296/432 MHz contest and the summer programme in general.

Brummagem next, in the shape of the **South Birmingham** crowd, who are to be found at Hampstead House, Fairfax Road, West Heath, Birmingham 31. Every Thursday evening they have an HF night operating in the shack, and every Friday evening there is a construction class and a Morse class, and in addition to all this there is the "main" meeting on March 1, when G3NFX will talk about "Mobile Interference."

At **Northern Heights** the *Newsletter* says that the venue is the Peat Pitts Inn, Ogden, Halifax, on alternate Wednesdays—nothing said as to which ones or what happens, but for the "regulars" this is catered for by simply making their membership card into a programme for the year between AGM and AGM. Some organisation, to do that! On a rather different tack, the back page has an interesting tri-band groundplane aerial for the enormous sum of 50 pence plus the feeder cable, used; good SWR on all three bands, using either radials or a steel garage roof in their stead.

For **West Kent** the dates are March 3 and 17; the former is for G8CIU to discuss the North Kent Repeater and how it was put into service, while the latter sees G2BT talking about the early days in Amateur Radio. Looking on to April 14, they have the AGM. Hq. address is the Adult Education Centre, Monson Road, Tunbridge Wells. There are, besides these, informal evenings on the Tuesdays following the Friday meetings which are held at the Drill Hall, Victoria Road.

It seems quite a while since we heard from a club in **Northampton** (we recall this because our old ears were pinned back for mixing-up two clubs in the same area!); the one reporting this time is G3GWB, and the Hon. Sec. says they are now at Kingsthorpe Community Centre, Thornton Park, Kingsthorpe, Northampton every Thursday evening. The plan is to try for two "formal" events each month, by way of talks, film shows and such, while the other dates are left open for a natter. March 9 is down for a Test Equipment evening, and on March 20 there is a wine and cheese party with a talk on Pompeii, wives and girl-friends invited of course.

That familiar handwriting tells us that G8BHE is now **Midland's** Hon. Secretary.—he also sends us the South Birmingham gen each month, so he must be a busy chap. On March 7, they are in for a Construction and Club Station evening at the Brasshouse Centre, Broad Street, and on March 21 there is a lecture on Radio Astronomy by Dr. D. Sears at the University of Aston, Gosta Green, in Room 110.

Another familiar note for your scribe comes up now, in the shape of the **Acton, Brentford & Chiswick** report; Chiswick Trades and Social Club, 66 High Road, Chiswick, London W4; March 21 is the date and they have a tape and slide lecture arranged.

New Ones

Haywards Heath has a brand new group, who foregathered at the Liverpool Hotel; but we understand they are hoping to be safely installed at Oathall School by

the time this reaches print. The group have a bias towards VHF and contesting, and it is hoped that there will be a rig available at the new Hq. when they move in. Any more in the way of details, contact the Hon. Sec.—see Panel.

Our other new one is in fact the result of the amalgamation of the old Cheltenham A.R.S. and Cheltenham RSGB Group, the new title being **Cheltenham Amateur Radio Association**, the inaugural general meeting saw some 35 people present and it is hoped to obtain more support still in due course. The Hq. is The Old Bakery, Chester Walk, off Clarence Street, and we understand they will be in session on the first Thursday and the third Friday—details of the programme can be obtained from the new Hon. Sec.—see Panel.

Turning back to the regulars, we next have **Coventry**, who are in Baden Powell House, 121 St. Nicholas Street, Radford, Coventry, every Friday—except March 24, Good Friday. Thus we see “Night on the Air” down for March 3, 17, and 31, and a cheese and wine party on March 10, which means that for this one month they have lost the normal balance of two informals and two lectures.

Wessex A.R.G. is the name, **Bournemouth** the area they serve, the Dolphin Hotel, Holdenhurst Road, the Hq. This must surely be one of the fastest-growing clubs in the whole country. March 3 sees them entertaining G4CLF of Plessey, who will discuss their Integrated Circuits—an interesting talk, this one, and by a keen chap too. On March 17, the talk turns to two-metre D/F, with G8MCQ talking about and demonstrating the gear he himself uses.

Where **Derby** are concerned, the writer has to admit that he finds it somewhat difficult not to write G2CVV into the Panel—but time marches on and in this month it will be AGM time again! March 1 is a bring-and-buy sale, and there is a film show on March 8. March 15 sees a talk on QRP operation, and that AGM is down for 22nd. That leaves March 29, set aside for a tape-and-slide lecture while the new committee get everything arranged.

We must press on to the west-country now, to reach **Yeovil**; they are based on Building 101, Houndstone Camp, and can be found each Thursday evening. The “specials” for March are slated for 16th, by way of the WIWDQ tape-and-slide lectures on VHF Propagation.

Kidderminster are at home in the Committee Room, the Youth Centre, Bromsgrove Street, Kidderminster, on March 1, 15, and 29. The first one is a demonstration of Printed Circuit Construction, and on March 15 the *QM 70* people are coming along to demonstrate their wares. That leaves March 29 for the On-the-Air night.

Blackwood is near Newport, Gwent, and apparently boasts a Bierkeller, into which the members will pour on the evening of March 8—disco and Bavarian dress all thrown in! However, should that not be enough, you can find the gang at Oakdale Community Centre, near Blackwood, every Friday evening.

The versatility of the direct-conversion route to the building of a simple and cheap 3.5 MHz transceiver will be the topic at **South Manchester** on March 10, the speaker being G3JIS. March 3 is down to a Surplus Equipment sale, and on March 17 the group have their first D/F practice—Brrrr! Good Friday has no meeting, but on 31st they have a discussion and planning session

Deadlines for “Clubs” for the next three months—

(For April issue—February 24th)

For May issue—March 31st

For June issue—April 28th

For July issue—May 26th

Please be sure to note these dates!

for the Belle Vue Convention. In addition to all the Friday dates just mentioned, they have Mondays at the club shack, “Greeba,” Shady Lane, Baguley—but as there is a hint of doubt about how long the club will be able to continue there it would be perhaps best to contact the Hon. Sec.—see Panel—just in case things “have moved.”

One of the most useful things a club could do is to set up an “Alignment” evening, with generator, counter, output indicator and whatever, and a few members’ receivers to be checked-out. Indeed, such an exercise might well fill more than one evening; the “practicals” often get a lot more interest than expected from chaps who have never done much beyond studying for R.A.E., and who simply lack confidence to “have a go” on their own—this is their chance to try, knowing that someone is at hand to avoid any problems. Just such a session was set up by **Chichester** last month at their Hq. at Lancasterian Boys School, Basin Road, Chichester. On March 7 they have a talk on Basic Radio Astronomy by Chris Barker, while 16th is left to be an informal for once.

City of Bristol RSGB have a conscientious Hon. Sec. who, realising he had forgotten the date in his earlier letter, sent a second one post-haste to rectify—good on yer, cobber! March 20 it is, at Queens Building, University Walk, Bristol, at which Frank Crofts will address the assembled multitude on the matter of “Microwatts, Milliwatts and Megawatts” which gives the game away that he is talking about the controlling of *CEGB*’s power.

March 6 will see the ubiquitous G3RWL, doubtless still puffing at his pipe while he talks to **Southdown** about “Present Amateur Practice in Space Communication.” Venue, as usual, Chaseley Home, South Cliff, Eastbourne. On March 12, they take to the water for a day-trip to Dieppe, the rendezvous being Newhaven Marine Terminal at 0945. All the gen on both events from the Hon. Sec.—see Panel.

It’s the first and third Wednesdays at **Bolton**, at the Recreation Club, Kensington Place, Bolton. Basically, the first date each month is an informal: natter, fire up the rig, etc., etc., and the second one—in this case March 15—is the one set aside for a talk or whatever. This particular date is to be filled by the Hon. Sec., who will talk about CW operating, practices and procedures.

Amateur TV

We have in front of us the 101st edition of *CQ-TV* the **BATC** journal and, quite apart from the fact that this signifies 25 years of activity, we note that they have instituted an award as a means of stirring up further activity and interest in amateur television. Essentially you have to score 1000 points, which you do at the rate of two per kilometre; if it is a successful two-way, then ten bonus points are added, regardless of distance. If

the contact is on 23 centimetres or above, double the points. Tx stations claim the points for each transmission they put out which is identified by the chap at the receiving end; but only once per day may the same path be claimed, although repeated hearings/contacts on various days are acceptable, as the object is to arouse activity on the air.

For **Cornish** the first Thursday in March will be 3rd, and on that date they will as usual foregather at the *SWEB* Clubroom, Pool, Camborne, but at this time we have no details of the activity, all their efforts at the time the *Newsletter* was being written being devoted to the Marconi celebration at Poldhu Hotel. So—for more and later information, contact the Hon. Sec.—see Panel.

On to **Spalding**, they of the super *Newsletter*. Looking at the bit devoted to the club and its programme we see that for 1978 they have settled on the first Friday in each month. However, they make no mention of the venue, for which we must refer you to the Hon. Sec.—see Panel.

Some time now since we last heard of **White Rose**; they have their place at 83 Town Street, Armley, Leeds, and can be found there every Wednesday. In addition, there is the Mobile Rally—March 19 at Lawnswood High School, North Leeds from 11 a.m. onwards. We understand there will be some 30 Trade Stands.

On we go again, and the next one is **Sussex Repeater Group**; we have a most interesting *Newsletter* from them but no details of any meetings later than the AGM for which we must refer you to the Hon. Sec.—see Panel. However, we understand Chris is not at home during the week, so a letter is the indicated way of making contact.

At **Reigate** they have a Natter Night on March 7, for which the venue is the Marquis of Granby; and the main meeting is on 21st, at the Constitutional Centre, Warwick Road, Redhill, when G3LFK will be talking about Waveform Synthesis.

Sutton & Cheam have a place at Sutton College of Liberal Arts, and another at Ray's Social Club, London Road, North Cheam. March 16 is the date for the main meeting, at which the speaker will be G5XD, his subject being "The Intruder Watch." It rather looks as though the second meeting of the month has been replaced by the club Dinner on March 18 at "The Woodstock." Full details from the Hon. Sec.

March 3 and 17 are the dates quoted for **Hereford**, and the place is as usual the County Control, Civil Defence Hq., Goal Street, Hereford. The first date at the time of writing was still to be finalised, but on 17th they have a tape and slide lecture on Propagation booked.

Over to Ireland now, and our congratulations to the Hon. Sec. of **I.R.T.S.** on achieving the call EI6DG. The group covers all the *EF* activities, and we were interested to note that they are still very definitely interested in HF—a little note indicates the *Newsletter* editor knows of some QRP stations who have worked over 200 countries through the sunspot minimum with five watts or less. Details on the group and their doings from the Hon. Sec.—see Panel.

Nice to hear again from **Bury St. Edmunds** who are now on a solid footing. They have Hq. at the Red Cross, Mustow House, Bury St. Edmunds on the third Tuesday

of each month and new members are very welcome.

United Services Club, 61 Micklegate, is "home" to the **York** outfit, every Friday except for the third one in each month. On March 7 they have an extra treat in the form of a conducted tour of the Mansion House in York, and on March 10 they have a visit from *Low Electronics*. They have two new licensees to congratulate: G4GOY in particular as he is just 14 years old, and G4GRP.

A familiar fist not seen for quite a long time turns up next, from the **North Devon**. By the time this comes to be read they will have passed their eighth AGM, yet it seems but yesterday your scribe was visiting them. Business is booming these days, and so they meet at Barnstaple on the second Wednesday in each month, and Bideford on the fourth Wednesday. The address at Barnstaple is *chez* G4CG—see Hon. Sec's. panel—while the Bideford venue is 38 Clovelly Road.

A new Hq. address has been found by the **Milton Keynes** crowd, they now being based on the Globe Inn, 50 Hartwell Road, Hanslope, Milton Keynes; for details as to dates etc., we suggest you get in touch with the Hon. Sec. (see Panel) although it looks to us as though they are working a routine of second and fourth Mondays.

In this issue is the "Silent Key" notice of G3PYR, who at the time of his death in December was the Hon. Sec. at **Solihull**; thus we have his predecessor writing in this month, and in G4AEJ's letter we can see clearly just how much of the club was G3PYR and how much more he added to it in other ways. However, the show must go on, and we are advised that they foregather at the Manor House, High Street, Solihull, on the third Tuesday in each month, which would give us March 21.

Surrey are still based on *T.S. Terra Nova*, 34 The Waldrons, South Croydon, on the first and third Wednesdays. All the latest details from the Hon. Sec.—see Panel—or why not just turn up?

Crawley are booked for March 8 and March 22; the first date is not at the time of writing finalised, but the 22nd sees a Constructional Contest and Members' evening. As for the venue, the United Reformed Church Hall, Ifield.

Disaster has struck the **Nottingham** chaps; the *Versatower* is now horizontally polarised, and the HF Quad plus VHF beam are, to put it mildly, randomly polarised! All due to the winds that blew over the Christmas break. On they go with the programme nonetheless, March 2 being one of their popular "Forum" evenings and 9th a Brains Trust on frequency measurement and harmonic detection. March 23 is a Social Evening with a buffet and film of VHF Field Day. Details were not finalised at the time of writing as regards the meeting on March 30.

They seem to have had a change of Hq. at **Cheshunt** since last we heard, to the Church Room, Church Lane, Wormley, where they have a weekly booking. March 1 is down for a talk on TV Receivers by G4FCD, and on 8th there is a Natter Night with Morse practice thrown in. On March 15 there is an Equipment night, entitled "Rig Clinic"; on March 22 it is a Surplus Equipment sale, and on 29th G4DCP will talk about Computing.

A new Hon. Sec. takes over for **Farnborough**—see Panel. He writes to say they have not yet had time to

sort out a programme, but hope to have one soon. Meantime, if anyone wants to get in touch, they can write to the Panel address, which is also the club Hq.

Changes at **Harrogate & Knaresborough**, where G2CAS of QRP fame is now Hon. Sec., and the routine of meetings has been changed from weekly to monthly, on the first Monday of each month, except that should this fall on a Bank Holiday they would postpone it for one week. As for the place, that is the College of Adult Education, Victoria Avenue, Harrogate, starting at 7 p.m.

Another change of Hq.: this one is **Plymouth** who now have a place in the **TAVR** Building, Lambhay Hill, The Hoe, Plymouth, which is near the Citadel. As for dates and doings all we can say is that they will be in session on January 9 and every alternate Monday evening after that. Latest details from the Hon. Sec.—see Panel.

One always likes to hear that a club is booming, and the Hon. Sec. of **Bury** reckons that's what is happening to them. Although they book every Tuesday evening at the Mosses Community Centre, Cecil Street, they keep the second one in each month for a formal lecture or similar; the remainder are given over to such items as Morse, operating the club station, and many other things. In March we notice they have an "extra" on 30th, by way of a visit to Granada's studios.

We seem to have a bit of a hang-up with **Blackburn**; at the AGM they appointed a new Hon. Sec., and the old one in sending the *Newsletter* points this out, adding "note my new QTH, *not* as per Call Book"—but no note of the new address! However, all will be well if you recall that the group foregather at the Blackburn YMCA on the first Thursday in each month.

A reminder for the future comes from **B.A.R.T.G.**, who have shifted their Annual Convention to Harpenden Public Hall, Harpenden, Herts., on July 15. This is the event of the year for the group, which brings together the RTTY enthusiasts. We understand there will be Trade Stalls, Bring and Buy, Picture Tape Factory, Lectures, Demonstrations. A particular attraction should be the G3PLX lecture on Microprocessors. For more details of the group, please contact the Hon. Sec.—see Panel.

Wind-Up

Now we are at the bottom of the pile it remains for us to ask you to look at the deadline dates in the bold-bordered "box" in the body of the piece—if you didn't look at these dates in last month's issue before you came to read this, then you will be sending in your reports for May. Either way, the address is as ever, "Club Secretary," **SHORT WAVE MAGAZINE**, 34 HIGH STREET, WELWYN, Herts. AL6 9EQ.

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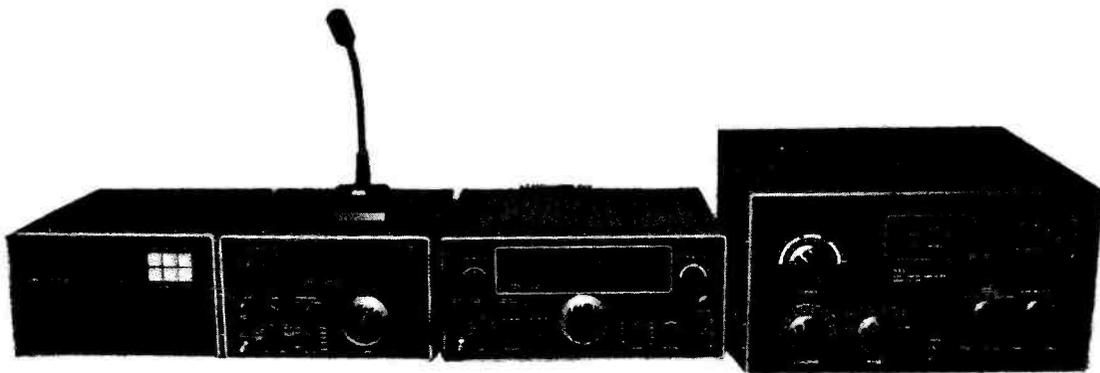
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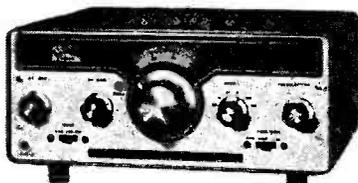
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CRYSTAL FREQUENCY RANGE USE (Tx or Rx) and HOLDER	2M TX & RX CRYSTAL AVAILABILITY & PRICE CHART													
	4 MHz-TX-HC6/U	6 MHz-TX-HC25/U	8 MHz-TX-HC6/U	10 MHz-RX-HC6/U	11 MHz-RX-HC6/U	12 MHz-TX-HC25/U	14 MHz-RX-HC25/U	18 MHz-TX-HC25/U	36 MHz-TX-HC6 & 25/U	44 MHz-RX-HC6/U	44 MHz-RX-HC25/U	48 MHz-TX-HC6 & 25/U	52 MHz-RX-HC25/U	72 MHz-TX-HC25/U
OUTPUT FREQUENCY														
144-030	...	b												
144-4/433-2	...	b	b	b	b	b	b	b	b	b	b	b	b	b
144-480	...	b	b	b	b	b	b	b	b	b	b	b	b	b
144-800	...	b	b	b	b	b	b	b	b	b	b	b	b	b
144-850	...	b	b	b	b	b	b	b	b	b	b	b	b	b
145-000/SO	...	a												
145-050/R2T	...	a	a	a	a	a	a	a	a	a	a	a	a	a
145-075/R3T	...	a	a	a	a	a	a	a	a	a	a	a	a	a
145-100/R4T	...	a	a	a	a	a	a	a	a	a	a	a	a	a
145-125/R5T	...	a	a	a	a	a	a	a	a	a	a	a	a	a
145-150/R6T	...	a	a	a	a	a	a	a	a	a	a	a	a	a
145-175/R7T	...	a	a	a	a	a	a	a	a	a	a	a	a	a
145-200/R8T	...	a	a	a	a	a	a	a	a	a	a	a	a	a
145-300/S12	...	b	b	b	b	b	b	b	b	b	b	b	b	b
145-350/S14	...	b	b	b	b	b	b	b	b	b	b	b	b	b
145-400/S16	...	b	b	b	b	b	b	b	b	b	b	b	b	b
145-500/S20	...	b	b	b	b	b	b	b	b	b	b	b	b	b
145-525/S21	...	a	a	a	a	a	a	a	a	a	a	a	a	a
145-550/S22	...	a	a	a	a	a	a	a	a	a	a	a	a	a
145-575/S23	...	a	a	a	a	a	a	a	a	a	a	a	a	a
145-600/S24	...	a	a	a	a	a	a	a	a	a	a	a	a	a
145-650/R2R	...	b	b	b	b	b	b	b	b	b	b	b	b	b
145-675/R3R	...	b	b	b	b	b	b	b	b	b	b	b	b	b
145-700/R4R	...	b	b	b	b	b	b	b	b	b	b	b	b	b
145-725/R5R	...	b	b	b	b	b	b	b	b	b	b	b	b	b
145-750/R6R	...	b	b	b	b	b	b	b	b	b	b	b	b	b
145-775/R7R	...	b	b	b	b	b	b	b	b	b	b	b	b	b
145-800/R8R	...	b	b	b	b	b	b	b	b	b	b	b	b	b
145-950/S38	...	a	a	a	a	a	a	a	a	a	a	a	a	a

PRICES : (a) £2.36 (b) and (c) £2.90 + VAT (H).

AVAILABILITY : (a) and (c) Stock items, normally available by return (we have over 4,000 items in stock). (b) Four 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 loads are available as per code (b).

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With the ever increasing popularity of Japanese equipments we have further expanded our range of stock crystals. We can now supply for YAESU (FT2E, FT2F, FT2 Auto, FT224), most of the ICOM range and the TRIO-KENWOOD range.

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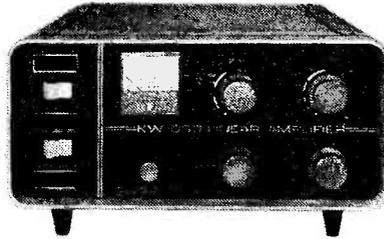
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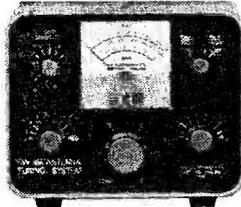


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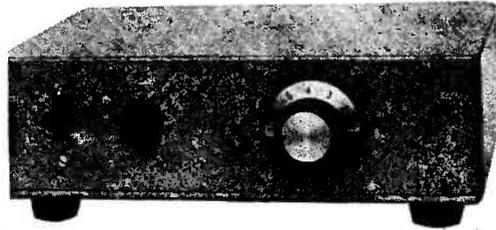
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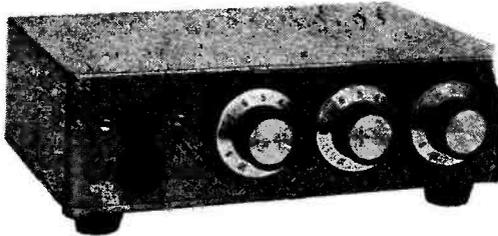
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PRINTED CIRCUIT MODULE including rotary switch, £15.00 + VAT (12½%) + 25p P. & P. (Type B.P.11).



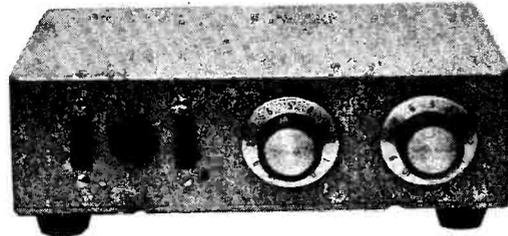
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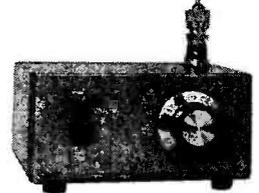


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For sale: Admiralty receiver Type AP.100035, 60 kHz to 30 MHz, £65.—Ring Burnham (06286) 64689, Berks.

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Complete clearance, all must go: FR-DX400S, 160-2m., all extras fitted (CB, WWV, calibrator, filters), with matching speaker, spare valves and manual, very good condition, £175 or near offer. S.T.E. Tx, VFO-controlled, AM/FM/CW, in case, with mic., key, 15w. linear and PSU, £75 or near offer. Storno 2m. FM base station, 10w., xtals for 144.48, 144.6 and 144.8 MHz, £25 or near offer. Many bargains in equipment and components.—Ring Mackie, G4FAX, Harpenden 2630 after 6 p.m.

Selling: B.40C, excellent, £45. Eddystone 659 Rx, £35. Redifon Tx/Rx, 160/80m., £25. R.109, unused, with spares, £15. No. 19 Set, mint, £10. ATU, £2. Icom SSB transceiver, £160.—Ring Cain, G3DVF, Alnwick 2487.

Wanted: IC-22A in good and working condition, must have mobile mount, manual and at least 10 channels as original. Details and price please. (Lancs).—Box No. 5628, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

Wanted: 'M' and 'G' Tx/Rx for SSB on 20/80/160m., 90 watts output, with mains PSU, no circuit mods., and circuit diagram if possible, good condition.—Hurst, G3JJU, 31 Avondale Road, Fleet (5831), Hants.

Sale: Collins receivers: 51J4, £230; R390A/URR digital, £300. Heathkit HW-32A with PSU, £60. HP-13A DC supply, £25. Redifon 6288/R ATU, £35. Collins 70E-15 PTO, unused, £35. Collins 354A-1 mechanical filter conversion kit (51J2 to 51J4), unused, £10. Collins audio trans., 6000 ohms, 1-0/1-0, unused, £6. Modern gear taken in part exchange.—Aird, G3MFE, 53 Falcutt Way, Northampton. (Tel: Northampton 846203.)

Free: 'G3HTA' receiver: Main parts and construction information free to good cause.—Marshall, N.C.A.E., Silsoe, Bedford.

Wanted: Digital readout SW receiver. Also Partridge or active antenna for SWL. Details and price please. **For sale:** National Panasonic RF-3000A, £45; B.41, coverage 15-320 kHz. Both excellent.—Shaw, Springwood House, Godalming, Surrey.

For sale: Collings 75-S3B, serial no. 16685, £275. K.W. Atlanta transceiver, 500-watt, £235. Trio JR-310, £75. Pye 'Cambridge,' 2-metres, SO and S21, £45.—Ring Wilson, G4AZM, Bolton 54165.

Selling: Trio QR-666 full-coverage Rx, new condition, bargain, £90. Carriage paid.—Warrick, 122 Barnhorn Road, Bexhill, Sussex.

Sale: 'Gunnplexer' 3cm. transceiver, requires 10v. DC and AF input, gives IF (your choice) output, with tuning varactor, Schottky mixer, ferrite circulator and 17 dB horn, new; Microwave Associates, with individual test report sheet £69 inclusive.—Jarvis, G8APX, Salewheel, Ribchester, Preston, Lancs.

Selling: IC-240, mint condition, £150. Variable voltage PSU, 12v. 12A., fully metered, £40. LM-7 frequency meter, with mains PSU and charts, £25. Drake TV-3300 LP filter, £14. KW-1000 linear, mint condition, £185. KW-107 Super Match, as new, £65.—Ring McIntyre, G13YDH, Belfast 643913.

Sale: Creed 7 teleprinter spares. Far too many items to list, send Creed Part/No. with s.a.e. for quotation.—Cooper, 9 Cavendish Drive, Kidderminster, Worcs.

Sale: Panda Cub Tx, AM/CW, 160-10m., £25. Unica Rx, 1.5-30 MHz continuous, boxed, £25.—Ring Bellwood, Broadstone (0202) 692474.

Selling: FT-2 auto, £140. IC-20, £98. Lowe monitor Rx, £25.—Ellison, G3LZN, QTHR.

For sale: Collins KWM-2A transceiver, SSB/CW, four years old, needs some attention, £500. PM-2 integral AC/PSU, £90. 516F-2 AC/PSU, £75. 312B-5 external VFO, wattmeter, etc., £150. DL-1 dummy load, £50. SM-3 mic., £10. If one person purchases all these items, CM-2 and CM-3 carrying cases will be offered to him or her, free of charge. Buyer to arrange carriage. (Devon).—Box No. 5629, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

Wanted: R.1155(N), details and price please.—Francl, 184 Dalton Lane, Rotherham, South Yorks.

Bargain: Stolle automatic rotator, £23. Mini Products C4 vertical antenna, £19. Both new.—Hately, GM4EQY, QTHR.

Wanted: Five low-band FM transceivers in operating condition, preference for Pye equipment but others considered.—Ring Gorman, 0352-57498 after 4.30 p.m.

Sale: Trio 9R-59DS communications receiver, with speaker and headphones, excellent, £38 or near offer.—Ring Browning, Derby 700476.

Wanted: Eddystone 640C or EC-958; also tuner for 740, or whole set. Details and price please. **Sale:** Teleton 8-band. Offers?—Davey, 31 Gordon Road, Shoreham-by-Sea (62086), Sussex.

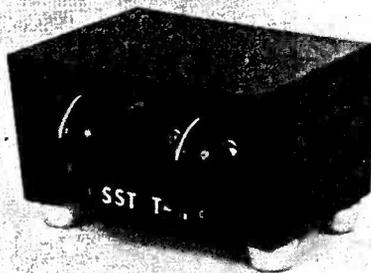
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Wanted: Trio 9R-59DS or similar, for O.A.P. Details and price please.—Richardson, 26 Pelham Road, Gosport, Hants.



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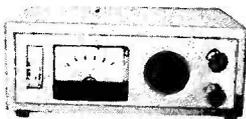
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Sale: Spares available for AR88D/LF receivers, send s.a.e. for list.—Reynolds, 5 Headland Way, Lingfield, Surrey RH7 6DH.

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Wanted: Codar AT-5 transmitter in good condition, with mains PSU; also T.28 receiver. Details and price please. (Gwent).—Box No. 5630, Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ.

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