

35p

The
SHORT WAVE
Magazine

VOL. XXXIV

JUNE, 1976

NUMBER 4



WORLD WIDE COMMUNICATION

NEW

The DXpert

An all-new big brother for the TS520
TS820 from TRIO

Multi-colour LED
mode indication
panel

Digital readout
available as option. 6
digit indication from
sum of VFO +
carrier frequencies
with 100Hz
resolution. Memory
switch retains initial
dial setting for
reference

Highly sensitive RX
with dual gate
mosfet. RF and buffer
stages gives SSB
sensitivity of 0.25 μ V
or 10dB S/N

200 W PEP input
TX with RF negative
feedback between
driver and PA for low
intermod products.
Amplified ALC for
superb speech
quality

Five function
metering for
complete station
monitoring

AF signal shaper
improves received
signal by automatic
response limiting in
SSB and CW modes

IF shift system
allows operator to
move IF bandpass
without retuning
main dial. Beats the
nearby QRM and
matches bandwidth
to signal

FSK operation with
switchable 170Hz or
850Hz shift.
Automatic TX power
regulation system for
continuous operation

RF speech processor
with fully variable,
metered compression
level

Precision dial drive
with direct
unambiguous
readout system. No
need to add together
two dial readings

All band operation
160-10m (10m in
4 bands) plus
auxiliary band and
15MHz WWV

The all new TS820 from Trio completes their HF transceiver range. This is the top-of-the-line transceiver which offers a significant advance in design and construction over all others. This is the "DXpert" from Trio.

- Full transceiver operation on all amateur bands from 160-10 metres (28-30MHz) on SSB, CW and RTTY; optional 2 metre transverter; optional external VFO for full split Tx/Rx operation.
- Outstanding performance on both transmitter and receiver due to fully balanced mixing combined with latest PLL techniques.
- First class frequency stability and large signal handling characteristics.
- All new precision dial drive mechanism with unambiguous mechanical readout. Optional digital frequency readout with memory facility.
- Fixed station or mobile operation with a complete line of matched system accessories for building the best possible complete station.
- RF speech processor with fully metered adjustable compression is built-in.



SP-520

TS-820

VFO-820

TV-502

- IF pass band tuning allows the IF to be tuned across a signal without resetting the main dial.
- Five function metering system together with LED monitoring of all important functions gives unparalleled operator control.

This brief advertisement can only touch upon the main details of the TS820. You have to handle it to appreciate its performance. See it soon at your local branch of Lowe Electronics.

Sole Importers
LOWE ELECTRONICS
Cavendish Road
Matlock Derbyshire
Tel: Matlock 2817/2430

 **TRIO**

LOWE ELECTRONICS



NR-56 2 metre MONITOR

- ★ Double Filters at 10.7 MHz and 455 kHz.
- ★ Dual Conversion 10.7 MHz/455 kHz.
- ★ Narrow filter fitted for European Market.
- ★ FET RF stage for high sensitivity.
- ★ 12v. operation.
- ★ Built in loudspeaker.
- ★ Small size 6½" x 6½" x 2".
- ★ Mobile mount and personal earpiece supplied.
- ★ Full coverage VFO built-in.
- ★ 11 crystal positions (optional crystals ex stock).
- ★ 22 transistors, 1 integrated circuit, 16 diodes.
- ★ NR56, £54.00 including VAT. Postage 48p
- ★ Crystals, £2.61 including VAT.

This remarkable little receiver gives the 2m. FM listener everything he wants a very reasonable price. Excellent sensitivity, stability and selectivity coupled with a built in V.F.O. and very effective squelch make it the ideal receiver for both beginner and keen listener. Although the built-in V.F.O. more than covers the entire 2m. band, crystal control of FM channels offers many advantages (particularly in mobile operation), so crystals, which are ex stock, may be fitted for the popular channels and repeaters. It requires 12v. DC for operation and is thus an excellent mobile receiver for mounting in the car, boat or caravan as well as for home use.

SHINWA FILTERS

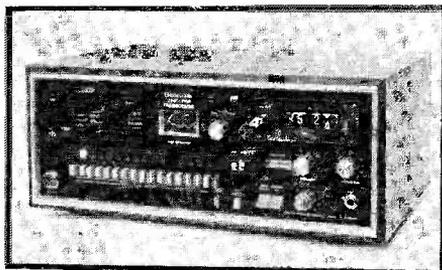
Lowe Electronics present a range of HF and VHF filters suitable (indeed most desirable) for the discerning radio amateur. From the very wide range of filters manufactured by SHINWA, we have selected those which we feel are the most useful in this country.

MODEL	FREQUENCY	INSERTION LOSS	MAX. ATT.	MAX. POWER
1110	144-146 MHz Band Pass	1dB	50dB	20W. RMS
1110G	135-165 MHz 2 MHz Band Pass Tunable	1dB	70dB	100W. RMS
1140	28-30 MHz Band Pass	1dB	60dB	100W. PEP
1006	146 MHz Cut Off Low Pass	1dB	50dB	50W RMS
1005	30 MHz Cut Off Low Pass	0.7dB	50dB	500W. PEP

All the filters are exceptionally well made in high quality housings 30 x 50 x 180mm. (1110G is 160 x 310 x 55mm.) and are terminated in SO239 sockets. They are suitable for a wide range of applications, the 1140 28-30 MHz. BPF being particularly attractive to transverter users

The 1110G is the big daddy filter having adjustable bandwidth up to 2 MHz wide at any frequency in the range 135-165 MHz.

All filters are supplied with an individual calibration curve so that you can see exactly what you are getting, and prices are most reasonable as you can see from our latest list.



FS1007P

£176 +VAT

The home station FM transceiver with everything. *Mains or 12 volt operation. *16 channel scanning * channel skipping facility * priority channel with front panel crystal sockets * manual or auto scan * switched high/low power * switched wide/narrow deviation * 5 meter * RF output meter * centre zero tuning meter * RX fine tuning control * built in SWR bridge * built-in digital clock with alarm and auto switch on * built-in loudspeaker * 10 watt TX * 0.3 microvolt sensitivity * superb styling and finish.

All this and supplied fitted receive crystals for 145, 145.25, S20, S21, S22, 145.6, 145.8, R3, R4, R5, R6, R7 together with transmit crystals for 145, S21, R6 make the FS1007P the most incredible bargain on the FM market. Backed by the combined reputations of Belcom and Lowe Electronics.

SILLY SONNET

There was a young dealer who lived in a shoe,
Had so many agents he didn't know what to do,
"HELP" said his partner, "since business has grown,
our agent's appointing sub-agents of his own!"

73 to D & P
G3PCY

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119 Cavendish Road, Matlock, Derbyshire. Tel. 2817 or 2430 9 a.m. to 9 p.m.

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Soho House, 362-4 Soho Road, Handsworth, Birmingham Tel. 021-554 0708
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AGENTS

Alan GW3YSA, 35 Pen-Y-Waun, Efail Isaf, Nr. Pontypridd. Tel. Newton Llantwit 3809
John G3JYG, 16 Harvard Road, Ringmer, Lewes, Sussex. Tel. Ringmer 812071
Sim GM3SAN, 19 Ellismuir Road, Baillieston, Nr. Glasgow. Tel. 041-771 0364

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LEICESTER SHOW 1976. OCTOBER 28-29-30

LOWE ELECTRONICS

PRICE LIST — JUNE 1976

CARRIAGE: The amounts shown under this heading are for carriage either by Securicor 24 hours service, first class mail, or, in the case of heavier items (over 2 lbs.) parcel post. The Securicor charge is £2.50, other items are charged at the current postal rates.

	Net price	Price to include VAT	Carr.		Net price	Price to include VAT	Carr.
TRIO EQUIPMENT				CATRONICS PRODUCTS			
TS900 transceiver & AC P.S.U.	£480.00	£540.00	£2.50	DFM 5V. 180 MHz digital frequency meter	£120.37	£130.00	£2.50
VFO900 external VFO for TS900	£90.00	£101.25	£2.50	500 MHz prescaler for above	£25.00	£27.00	24p
CW900 CW filter for TS900	£29.00	£32.63	50p	MICROWAVE MODULES EQUIPMENT			
TS820 HF transceiver	£448.00	£504.00	£2.50	MMC 70/28 4m. converter	£16.00	£18.00	Post
VFO820 external VFO	£84.00	£94.50	£2.50	MMC 144/28 LO 2m. converter	£17.60	£19.80	Paid
DG1 digital readout	£88.00	£99.00	£2.50	MMC 432/28 70 cm. converter	£17.60	£19.80	
DSI 12v. inverter	£28.00	£31.50	62p*	MMC 432/144 70 cm. converter	£17.60	£19.80	
YG88 CW filter	£24.00	£27.00	21p	MMC 1296/28 23 cm. converter	£21.60	£24.30	
TS520 transceiver 12v. DC/240v. AC	£336.00	£378.00	£2.50	MMC 1296/144 23 cm. converter	£21.60	£24.30	
SP520 matching loudspeaker	£14.00	£15.75	*62p	MMV 432 70 cm. tripler	£17.60	£19.80	
VFO520 external VFO	£64.00	£72.00	£2.50	MMV 1296 23 cm. tripler	£24.00	£27.00	
TV502 matching 2m. transverter	£120.00	£135.00	£2.50	MMDO 50 50 MHz counter	£61.11	£66.00	
CW520 CW filter	£24.00	£27.00	21p	MMD 500P 500 MHz prescaler	£25.00	£27.00	
TS700G 2m. all mode transceiver	£340.00	£382.50	£2.50	MMT 432/28 70 cm. transverter	£84.00	£94.50	
VOX-3 matching VOX unit	£16.00	£18.00	66p	UNIDEN EQUIPMENT			
TR7200G 10W car transceiver	£144.00	£162.00	£2.50	2020 transceiver	£428.00	£481.50	£2.50
VFO30G remote VFO with repeater shift	£68.00	£76.50	£2.50	8010 external VFO	£96.00	£108.00	£2.50
PS5 mains power supply/digital clock unit	£44.00	£49.50	£2.50	8120 matching loudspeaker	£28.00	£31.50	*62p
TR2200 GX 2W 2m. handy transceiver	£104.00	£117.00	£2.50	FILTERS			
VB2200 10W. amplifier	£36.00	£40.50	*62p	Seiwa 9 MHz SSB crystal filter	£12.43	£13.98	15p
Ni-cad battery pack	£9.00	£9.72	30p	Carrier crystals for the above filter, each	£1.70	£1.91	15p
RS99D de-luxe amateur band receiver	£272.00	£306.00	£2.50	TRIO LF30A low pass filter	£13.56	£15.25	51p
S599 matching loudspeaker	£12.80	£14.40	62p	TRIO BPF2A 2m. band pass filter	£22.60	£25.42	51p
TS99S de-luxe transmitter	£272.00	£306.00	£2.50	SHINWA 1110 2m. band pass filter	£12.20	£13.72	51p
QR666 general coverage receiver	£145.00	£163.13	£2.50	SHINWA 1110G 2m. band pass filter	£42.00	£47.25	51p
QR6FM F.M. tuner supplied separately	£24.00	£27.00	66p	SHINWA 1006 2m. low pass filter	£10.20	£11.48	51p
Extra charge for fitting and alignment	£5.00	£5.63		SHINWA 28 MHz transverter band pass filter	£12.20	£13.72	51p
QR6MK 500 kHz crystal marker	£10.00	£11.25	36p	SHINWA 1005 H.F. low pass filter	£9.60	£10.80	51p
Extra charge for fitting	£2.00	£2.25		OSCILLOSCOPES			
TR7010 2m. SSB transceiver	£176.00	£198.00	£2.50	SCOPEX 456 6 MHz single trace	£88.00	£95.04	£2.50
PS5 mains power supply/digital clock	£44.00	£49.50	£2.50	Scopex 4DIO 10 MHz double trace	£125.00	£135.00	£2.50
HC2 ham clock	£12.00	£13.50	*48p	MARINE MOBILE WHIPS			
MC10 hand microphone	£8.00	£9.00	21p	"J" Beam 2m. 5/8 whip type TAS	£7.65	£8.61	£2.50
MC50 table microphone	£18.00	£20.25	*48p	V.H.F./U.H.F. MOBILE WHIPS			
LF30A low pass filter	£12.00	£13.50	51p	"J" Beam 2m. 5/8 whip type TAS	£7.65	£8.61	£2.50
BPF2A 2m. band pass filter	£20.00	£22.50	51p	70 cms. 5/8 whip type U3	£4.75	£5.34	51p
TR3200 70cm. handy transceiver	£132.00	£148.50	£2.50	70 cms. colinear type U4	£7.10	£7.99	51p
Ni cad battery pack	£9.00	£9.72	30p	70 cms. colinear type U5	£12.30	£13.84	51p
NIHON DENGYO				Luso 5/8 2m. gutter mount	£20.00	£22.50	£2.50
Liner 430 70 cm. SSB transceiver	£258.00	£290.25	£2.50	V.H.F./U.H.F. ANTENNAS			
Liner 2 Mk. II 2m. SSB transceiver	£164.00	£184.50	£2.50	"J" BEAMS			
LA-106 2m. linear amplifier	£178.00	£200.25	£2.50	5Y/2M	£4.90	£5.51	£2.50
R115E regulated PSU for Liner 2 and Liner 430	£28.00	£31.50	£2.50	8Y/2M	£6.40	£7.20	£2.50
VENUS SLOW SCAN TV				10Y/2M	£12.60	£14.18	£2.50
SSB Slow Scan station monitor	£258.00	£290.25	£2.50	PBM14/2M	£19.20	£21.60	£2.50
SS2 Slow Scan station monitor kit	£176.00	£198.00	£2.50	5XY/2M	£9.40	£10.58	£2.50
C-1 camera	£288.00	£324.00	£2.50	8XY/2M	£11.70	£13.16	£2.50
CRYSTALS				10XY/2M	£16.15	£18.17	£2.50
We stock I.A.R.U. channels for the equipment which we sell.				Q4/2M	£9.60	£10.80	£2.50
Price per single crystal	£2.14	£2.40	15p	Q6/2M	£12.80	£14.40	£2.50
Where 2 crystals per channel are required	£4.27	£4.80	15p	D5/2M	£9.00	£10.13	£2.50
V.H.F. MARINE RECEIVERS				D8/2M	£12.00	£13.50	£2.50
ASV 1515 less crystals	£36.00	£40.50	*48p	XD/2M	£6.60	£7.43	£2.50
Belcom AMR104H scanner less crystal	£72.00	£81.00	75p	UGP/2M	£4.75	£5.34	£2.50
Seiwa MR-2 pocket monitor less crystals	£44.00	£49.50	51p	MMB48/70 cms.	£13.90	£15.64	£2.50
Seiwa MS-2 pocket scanner less crystals	£48.00	£54.00	51p	MBM88/70 cms.	£18.50	£20.81	£2.50
Crystals for the above receivers	£2.40	£2.70	15p	12XY/70 cms.	£19.00	£21.38	£2.50
V.H.F. AMATEUR RECEIVERS							
ASV 1515 les crystals	£36.00	£40.50	*48p				
NR-56 tunable 2m. FM receiver	£48.00	£54.00	*48p				
Seiwa MR-2 pocket monitor less crystals	£44.00	£49.50	51p				
Seiwa MS-2 pocket scanner less crystals	£48.00	£54.00	51p				
Belcom AMR104H scanner less crystals	£72.00	£81.00	*75p				
Crystals for the above receivers	£2.14	£2.40	15p				

SEND FOR FULL CATALOGUE COVERING ALL MODELS

LOWE ELECTRONICS

	Net Price	Price to Include VAT	Carr.		Net price	Price to include VAT	Carr.
PHASING HARNESES				Kuranishi wattmeter/dummy load			
PMH/2C 2m. for circular polarisation ...	£3.25	£3.66	51p	RW15D	£28.00	£30.24	*62p
PMH2/70 2 way for 70 cms.	£3.75	£4.22	51p	Kuranishi wattmeter/dummy load			
PMH4/70 4 way for 70 cms.	£7.80	£8.78	51p	RW120D	£64.00	£69.12	*75
H.F. MOBILE ANTENNAS				TRIO ham clock HC-2			
"G" Whip tribander helical	£13.53	£15.22	£1.00	Microphone plugs as fitted to TRIO			
"G" Whip multimobile	£16.73	£18.82	£1.00	and YAESU equipment (4-pin) ...	54p	61p	12p
L.F. coils for the above whips ...	£4.51	£5.07	45p	Matching sockets for the above ...	54p	61p	12p
Telescopic whips for the above ...	£1.22	£1.37	45p	Maeden speakers	£2.24	£2.52	36p
Basemount for all "G" Whips ...	£1.81	£2.04	45p	ANTENNA ACCESSORIES			
RAK ANTENNAS				Coaxial cable 50 ohms UR43, per metre			
A-8XL 80m. dipole	£10.80	£12.15	*62p	Coaxial cable 50 ohms UR67, per metre	14p	15p	2p
AL-48DXN 80/40m. trap dipole ...	£22.60	£25.45	.75p	Twin feeder 300 ohms, per metre ...	35p	38p	4p
Midy VN 80m. to 10m. trap dipole ...	£36.00	£40.50	*87p	Twin feeder 75 ohms, per metre ...	6p	pro rata	2p
Listener III SWL antenna	£22.60	£25.43	*62p	Twin feeder 75 ohms high power rating,	6p	J at 8%	2p
Listener I SWL antenna	£8.48	£9.54	*48p	per metre	18p	19p	3p
HD-26A extendable dipole	£6.00	£6.75	33p	Rotator cable 5-core, per metre ...	18p	19p	3p
ANTENNAS				Rotator cable 8-core, per metre ...			
H.F. BEAMS				Rotator cable 12-core heavy duty,			
Hy-Gain TH2Mk3	£85.60	£96.30	£2.50	per metre	22p	24p	4p
TH3Inr	£87.60	£98.55	£2.50	PL259 plugs	40p	43p	12p
TH3Mk3	£124.60	£140.18	£2.50	Reducers for PL259 plugs	14p	15p	12p
TH6DXX (carriage by BRS)	£149.60	£168.30	£2.50	SO239 sockets	40p	43p	12p
H.F. QUAD				PL259 in-line connectors			
Hy-Gain Hyquad 2 element	£138.00	£155.25	£2.50	PL259 angle connectors	86p	92p	12p
H.F. VERTICALS				SWR Meters, single meter			
Hy-Gain 12AVQ	£29.60	£33.30	£2.50	SWR Meters, twin meter	£11.30	£12.20	51p
14AVQ/WB	£42.00	£47.25	£2.50	Hy-Gain C1 centre dipole	£3.40	£3.82	30p
18AVT/WB	£58.60	£65.93	£2.50	Hy-Gain BN86 Balun	£11.85	£13.33	51p
ROTATORS				Diamond BU7 ohm Balun			
CDE AR40	£32.10	£36.11	£2.50	RAK CX2(A) coaxial switch	£10.00	£11.25	27p
CD44	£67.25	£75.66	£2.50	VALVES			
Ham-2	£103.00	£115.88	£2.50	For the common valves it pays to shop at one of the large importers			
Rotator cable 5-core per metre ...	18p	19p	3p	who buy in such enormous quantities that they can sell retail			
8-core " "	31p	33p	3p	at a lower price than we can buy wholesale. We do, however,			
12-core " "	22p	24p	4p	maintain stocks of the more unusual valves which are used in			
STATION ACCESSORIES				the equipment we sell, and which you may find some difficulty			
Morse keys	£6.80	£7.65	51p	in obtaining.			
Katsumi keyers EX108A	£36.00	£40.50	*48p	6AH6, 6BZ6, 6CB6A, 6CL6, 6U8A,			
Low impedance padded headsets ...	£4.16	£4.68	51p	6BM8, 12BY7A, 6EW6	75p	84p	21p
TRIO MC10 hand microphone	£9.00	£10.12	24p	6GK5, 12GN7A, 6AW8	£2.00	£2.25	21p
TRIO MC50 dual impedance table				6JS6C, 6KD6 matched pairs, per pair	£4.75	£5.34	51p
microphone	£20.50	£23.06	*48p	6146B/S2001 each	£4.00	£4.50	36p
				6LQ6 matched pairs, per pair ...	£6.24	£7.02	51p

Our terms are cash or cheque with order—despatch of stock items is by return. If any item is out of stock, your money is immediately refunded.

PART EXCHANGES WELCOME

EASY TERMS

PRICES, UNFORTUNATELY, ARE SUBJECT TO CHANGE WITHOUT NOTICE

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John G3JYG, 16 Havard Road, Ringmere, Lewes Sussex. Tel. Ringmere 812071
Sim GM3SAN, 19 Elismuir Road, Bailieston, Nr. Glasgow. Tel. 041-771 0364

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73 from BILL G3UBO/VE8DP, ALAN G3MME, JOHN G3PCY/5N2AAC, IAN G3ZYC



SOUTH MIDLANDS

YAESU MUSEN UK

NOW OFFER 2 YEAR GUARANTEE
LOWER PRICES



SAVE UP TO £100

S.M.C.'s guarantee, confident in Yaesu quality is, after over five years experience, until further notice, extended to two years covering both labour and free components (excluding valves, semi-conductors and carriage).

With VAT down to 12½% on most electronic equipment and aerials, Buy now! from S.M.C. We have a few ex-demonstration models of Yaesu. All in excellent condition, prices upon application.

We also believe with the pound falling against other major currencies that the price of Yaesu, Hygain, Rotator and other good imported equipment will have to rise soon. We respectfully suggest you purchase now from S.M.C. and save money. From looking at the second hand prices of equipment purchased even year ago we are sure you will agree that most items of Yaesu have been a good investment.

Ask S.M.C. for a **FREE YAESU CATALOGUE** and our **22 page STOCK/PRICE LIST.**



FT200B EX STOCK

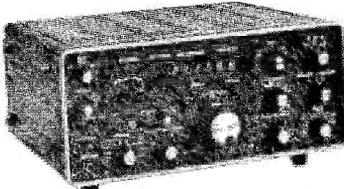
FT200 FOR LOW COST VALUE TRANSCIVER

The FT200B. The "Best Buy"—260W. PIP (A3), A1) 75W (A3), 80 to 10m. (28-5-29 MHz, 3 other crystals optional). Sensitive and selective 2.3 kHz at 6 dB (1-75 : ISF). Solid state, stable, linear (readout to 1 kHz), gear driven VFO. 100 kHz calibrator, VOX/PT, clarifier (±5 kHz). Semi break in CW with sidetone, etc., etc. The pre mix oscillator system used, yields: low spuri outputs on transmit, and the good signal handling and low noise capability of a single conversion superhet (whilst retaining a 9 MHz IF with high image rejection) and single range VFO stability.

FREE 24 HOUR DELIVERY

By Securicor for Yaesu items over £55.00
48 hours N. Scotland. N. Ireland £2.00 extra

After, of course, your equipment has been thoroughly tested in our fully equipped Service Department



FR101SD EX STOCK

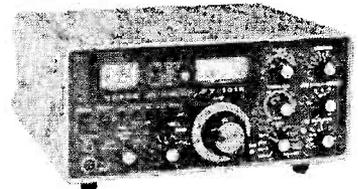
Also FR101S/SD/DD

In the de luxe version —Coverage from 1.5 kHz including all short wave bands, 23 in all, to 144 MHz AM, FM, SSB, CW are all catered for, each with separate crystal filter. Transceiver operation with the FL-101, or FT-101. Digital versions, and the matching FL2100B linear amplifier are available ex-stock from S.M.C.



FT221 EX STOCK

The FT-221 the COMPLETE 2m. station transceiver AM, FM, USB, LSB, CW, P.L.L., V.F.O., mic supplied. Noise banker, 240v. AC or 12v. DC, side tone on CW. Front panel VOX. High sensitivity, 12 kHz FM bandwidth. ALC external socket. Dual speed VFO drive plus many more facilities. Undoubtedly the best 2m. set yet produced. New supplies allows ex-stock from S.M.C. of this most sought after equipment.



FT101E EX STOCK

The FT-101E/EE/EX. The latest versions of the renowned FT-101 series. The best buy transceiver in the U.K., no other sold in such quantities, yet there are so few FT-101 available secondhand. 160 to 10 metres with built-in AC and DC PSU 260 watts p.e.p. SSB, 180 watts CW and 80 watts AM. All versions ex-stock from S.M.C.

NEW DIGITAL 2 FMI44-10 SXR11



The digitally synthesised, digital read out, 10W, FM transceiver covering 2 metres in 5 kHz steps. Six bright seven segment LED's indicate the receive frequency, a front panel toggle switch offers simplex operation, or for repeaters, 600 kHz movement of the transmitter either up or down. A further two LED lamps show the lock condition of the PLL and if the squelch is open. The case measures a mere 6½" (W) x 2" (H) x 7½" (D) fitting fitting conveniently under the dash or installed in place of the standard broadcast receiver. Send to SMC, the sole distributor for full details. Price about £225.

K L M—144 LINEAR AMPS



Solid State Linears.
SSB/CW/FM —
12v. DC, 10W drive

80W ... price about £105.00 (+ VAT)
160W ... price about £155.00 (+ VAT)

SAE FOR FURTHER DETAILS

TWS — COAX SLIDE SWITCHES



Up to 1 kW, 1:2 :
1 VSWR 50dB isolation.
Ex-stock
P. & P. 30p. VAT 8%

TWS 120G 1 in 2 out Nickle SO239 £4.45
TWS 150G 1 in 5 out Gold SO239 £9.50

ROTATORS — BE WARNED

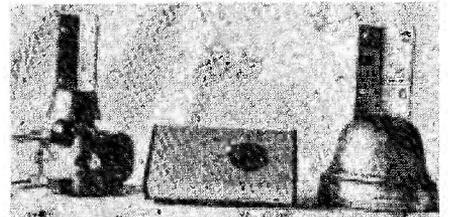
Do not use rotators with the mains feed to the head unit —
THESE CAN BE LETHAL. ALL CDE rotators use low voltage supply to head unit.



Carriage (B.R.S.) Free. Securicor 24-hr. delivery £1 extra
All rotators supplied complete with appropriate control box and instructions.

- AR30 (illus. centre and immediate right) £26.60
- AR40 (illus. centre and far right) £34.60
- AR33 De-Luxe control AR40 £41.25
- CD44 (C.B. illus. left) £69.75
- Ham II (C.B. illus. left) £105.50
- 2010/220 Stolle £37.50

Control cable 5 core 18p/yard, 8 core 27p/yard.



COMMUNICATIONS LTD.

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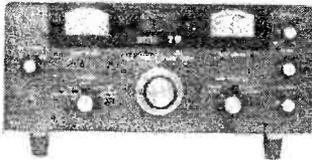
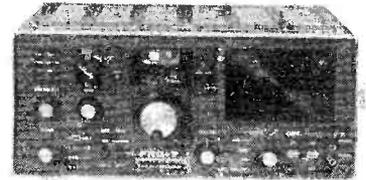
IAN McKECHNIE, GM8DX
Bride of Allan (078683) 3223
HOWARTH JONES, GW3TMP
Pontybodkin (035287) 846

MERVYN ANDERSON, G13WWY,
Tandragee 840656



NEW FRG7 Ex stock from SMC

The FRG7, the NEW YAESU general coverage solid state receiver with specifications unparalleled in its price range. A spin tuned, phase locked synthesiser provides complete coverage from 500 kHz to 30 MHz to an accuracy better than 5 kHz. Frequency selection is accomplished by setting the RF (pre-selector and range switch), dialling up the required number of Megahertz, then tuning the VFO knob as normal. The receiver is sensitive 10-5uV for 10dB, S + N/N (SSB) and stable (within 500 Hz for any 30 minutes after warm up) 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.



THE SMC 73 available this month

The SMC73 is an all Solid State, Mains and 12 volt, communications receiver covering 550 kHz to 30 MHz (without gaps) in four ranges. Frequency readout is by two silk screened illuminated aluminium dials tuned by coaxial spun aluminium knobs, the larger for general coverage, the inner for amateur band (10-80m.) band spread (set by use of internal 3.5 MHz crystal calibrator). R.F. and BFO (these latter two stages being fed from independent stabilised supplies) ensuring good sensitivity, stability (electrical and mechanical), dynamic range (helped by adjustable RF attenuation), and marked freedom from "pulling," of both the local and illuminated signal meter, SO239 (UHF) coax socket and binding posts for antenna, switcheable envelope (AM) and product detectors (SSB/CW) (provision on switch for possible fitting of FM demodulator), are all features of our exciting new low price receiver available this month.

MORE 2m dB's for the £

exclusive to SMC the low wind resistant Jaybeam 14 element 13dB d14Y/2m. at only £16.25 (Carriage 95p. VAT 12.5%) and the 6dB omni-directional ringo ranger

HIGH QUALITY EX STOCK FROM CUSHCRAFT

VHF OMNIDIRECTIONAL (Car 90p) VAT 12½%

RINGO RANGER-ARX2 = 6 dB gain over ½ ground plane. Uses 3 x ¼ in phase and 1/8 stub, ultra low angle radiation, approx. 96" high (illustrated right). 135 — 175MHz.

ARX2 6dB Ringo Ranger ...	£19.50	ABW133 2m. Big Wheel ...	£14.50
AR2 3dB Ringo Vert. ...	£12.00	ABW125 ABV harness ...	£7.30
AR25 QRO AR2 ...	£14.20	ASQ1 2m. Squale ...	£11.75
CX1000 29MHz Ringo ...	£23.20	ASQ22 Stacked ASQ1 ...	£24.15

JAYBEAM 70 (4m) 144 (2m) 432 (70) (Car. about 95p) 12½% VAT

D5/2M, 5 over 5 slot ...	£9.00	D8/70 8 over 8 slot ...	£12.00
D8/2M 8 over 8 slot ...	£12.00	PBM18/70 18 ele. Para ...	£12.50
5X/2M 5 ele. cross ...	£9.40	MBM48/70 46 ele. Multi ...	£13.90
8X/2M 8 ele. cross ...	£11.70	MBM88/70 88 ele. Multi ...	£18.50
10XY/2M 10 ele. cross ...	£16.15	12XY/70 12 ele. cross ...	£19.00
5Y/2M 5 ele. yagi ...	£4.90	4Y/4M 4 ele. yagi ...	£7.75
8Y/2M 8 ele. yagi ...	£6.40	PMH2/70 2 way harness ...	£3.75
10Y/2M 10 ele. long yagi ...	£12.60	PMH2/4M 2 way harness ...	£6.00
14Y/2M 14 ele. long yagi ...	£16.25	PMH2/C Circ. phasing ...	£3.25
Q4/2M 4 ele. quad ...	£9.60	PMH2/2M 2 way harness ...	£4.50
Q6/2M 6 ele. quad ...	£12.80	2010 Rotator ...	£37.50
PBM10/2M 10 ele. Para ...	£16.95	RZ100 bearing ...	£9.17
PBM14/2M 14 ele. Para ...	£19.20	JBL15/59 2" sleeve ...	£2.50

SMC TRAPPED DIPOLES (Carriage Paid) VAT 12½%

S500W P.I.P. 14 SWG ...	£17.85	P 600W P.I.P. Cu/Terylene	
HP 1K P.I.P. 14 SWG ...	£19.75	braid c/w 75' feeder, etc.	£19.75

BANTEX VHF WHIPS (Carriage 75p) VAT 12½%

B5 145 MHz ...	£6.35	70 ½ 70 MHz ...	£4.00
BGA f.g. ½ 2m. fibreglass ...	£8.75	Trunk Lip Mount ...	£5.25
BGA s.s. ½ 2m. stainless ...	£8.50	Magnetic Base Mount ...	£8.50
BSU ½ 432 MHz ...	£5.00	In lieu of standard base less 50p	

HY GAIN HF RANGE (Car. £1.00-£2.50) VAT 12½%

18AVT/WB - 10-20m - wide band, 50 ohm, 1 KW. Self supporting, 25' trapped ¼", roof or ground mounted, low radiation angle vertical.		TH2M11 10-20m, 2 ele.	£85.60
BN86 1 : 1 Balun ...	£11.00	TH3JNR 10-20m, 3 ele.	£87.60
103BA 10m, 3 element ...	£39.60	TH3MK11 10-20m, 3 ele.	£124.60
153BA 15m, 3 element ...	£49.60	TH6DX 10-20m, 6 ele.	£149.60
203BA 20m, 4 element ...	£94.00	HY QUAD 10-20 2 ele.	£138.00
402BA 40m, 2 element ...	£133.00	DB1015A 10-15m, 3 ele.	£90.00
18V 10-80 Load Vert. ...	£22.00	LA1 Lghtn. Arrs.	£18.50
12AVQ 10-20m. Trap Vert.	£29.60	LA2 Lghtn. Arrs.	£3.00
14AVQ 10-40m. Trap Vert.	£42.00	Hy Tower 10-80m. Vert.	£149.00
18AVT 10-80m. Vert. ...	£58.60		

GEM QUAD FIBREGLASS QUAD (Car. £2.00) VAT 12½%

GQ2E 2 element ...	£95.00	GQ4E 4 element ...	£198.00
GQ3E 3 element ...	£147.00	CK1Q 1 ele. Conv.	£55.00

G WHIP HF MOBILE (Carriage 80p) VAT 12½%

Tribander 10-20m. (+LF) ...	£13.53	LF40, 80 or 160 ...	£4.51
Multimobile 10-20m. ...	£15.73	MM40, 80 or 160 ...	£4.51
Flexiwhip 10m. c/w base ...	£11.50	FF15, 20, 40, 80 or 160 ...	£4.67
Basemount ¼" hole mount ...	£2.20	Telescopic whip for coils ...	£1.22

MOSLEY TRI-BAND BEAMS (Carriage £2.50) VAT 12½%

TA333 ele. 200W, R.M.S. ...	£58.00	TA322 ele. 300W A.M. ...	£40.00
MUSTANG 3 ele. ...	£75.00	MUSTANG 2 ele. ...	£60.00

CABLES RF FEEDERS (Carriage extra) VAT 8%

RGB/U 50 ohm Heavy ...	yd. 33p	UR39 75 ohm Medium ...	yd. 23p
UR57 75 ohm Heavy ...	yd. 34p	T3278 75 ohm Distribu'n ...	yd. 20p
75 ohm Flat twin ...	yd. 6p	UR43 50 ohm Solid Cent. ...	yd. 14p
300 ohm Ribbon ...	yd. 6p	UR76 50 ohm Strand Ct. ...	yd. 14p

PLUGS COAX (Car. extra) VAT 8%

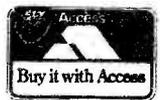
P259 U.H.F. Plug ...	48p	SO237 2 hole socket ...	37p
P258 Back to back ...	80p	UHF T adaptor ...	£1.20
N Type plug 50 ohms ...	82p	N sockets ...	76p

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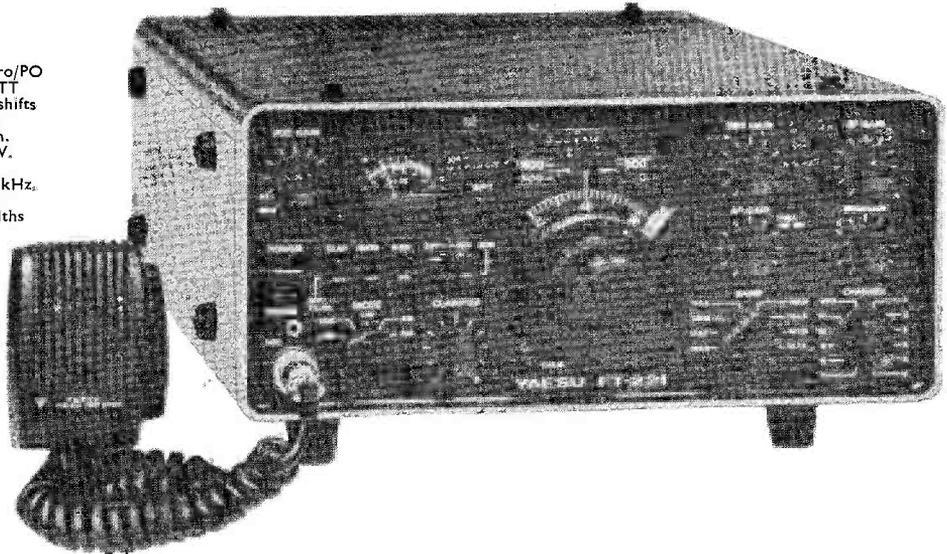
YAESU MUSEN

FT221 MULTI MODE TRANSCEIVER

100 kHz calibrator
(1 MHz \div 10)

"S" meter/FM centre zero/PO
Clarifier IRT and IRT/ITT
600 kHz up and down shifts
44 FIX channels (4 x 11)
Fully adjustable squelch.
AM, FM, USB, LSB, CW.
Dual speed VFO drive
Readout Better than 1 kHz.

2-4 and 12 kHz bandwidths
PLL VFO
Clean Output
Mic. supplied
Noise Blanker
AC or 12v. DC
CW sidetone
Semi Break-in
Sensitive
ALC socket
RLY Socket
Plug in boards
1 1/4", 5", 1 1/4"
Rigid 22lbs.
Tone burst
Adjustable VOX
Mic Gain Control.



The FT221 design offers an unparalleled level of technical sophistication, whilst pertinaciously following the precepts of practicality, ergonomics, economy and reliability.

One look at the construction: plug in boards throughout (with presets positioned for easy access) one glance at the circuitry and you will be convinced that the FT221 may have rivals but no peers.

The final frequency is derived via single signal frequency mix from 10.7 MHz. The tunable component is produced by a 133 MHz voltage controlled oscillator (VCO), phased locked to the sum of; the temperature compensated 8 MHz VFO (or one of the 11 fix crystals) and the nonupled 14 MHz band (or repeater shift) crystals. The DC control voltage from the VCO is applied to 8 varicap diodes in both the transmitter and the receiver effectively electrically ganging the RF tuned circuits to the VFO and Band crystals, thus both the transmitted and receiver are always fully on resonance even when using the repeater facility. This narrow band technique further improves the transmitter output spectrum and the receiver's immunity to overload, rendering continual tweaking of pre-selectors obsolete.

If for any reason, the VCO should not lock, an indicator light flashes, the transmitter, and the receiver audio, being disabled.

The transmitter employs; a balanced FET mixer, RF derived ALC (which is fed to the two first mosfet TX I.F. amplifiers) preventing over driving and allowing operation at full rated output on low DC supply voltage and ends by using a BAM 20 (series modulated for true A.M.) to drive (a 40W P.E.P.) BAM 40 PA, rated by its manufacturer to withstand any VSWR irrespective of phase angle.

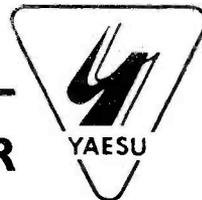
The sensitive receiver offers a remarkable immunity to overload, the mosfet RF stage is AGC controlled, the FET mixer feeds a transfilter then an I.F. amplifier. This band limited signal, of the correct level, is presented to the noise blanker gate (before any serious pulse stretching occurs) and hence to either the quality crystal filter on SSB, or the 455 kHz mixer for FM.

Designed for the serious amateur, it also offers a unique double push tone burst, selcal socket, and linear amplifier provisions (relay make and break and ALC sockets) with the spectral purity that allows you to use one with a clear conscience.

"The rig here is a FT221 need one say more?"

YAESU MUSEN

FT-101E/EE/EX H.F. TRANSCEIVER

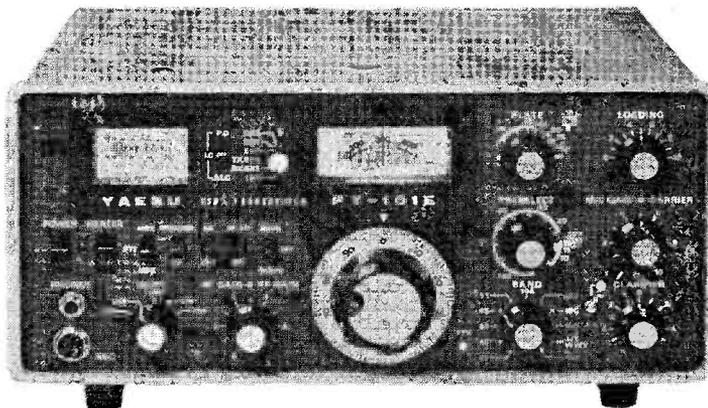


FT-101E/EE

● Solid State 160 thru 10 Metre Transceiver

The world's number one transceiver now offers even more value and performance in one, compact, thirty pound package. An effective, RF Speech Processor is a built-in integral part of this exciting transceiver. Now you can realize that extra talk power to cut through the pile ups—without the addition of a linear amplifier. Except for the final and driver stages, the FT-101E/EE features the latest in solid state technology, incorporating time proven,

plug-in "computer type" modules for unparalleled reliability and serviceability. New lever type switches offer easier operation. Here is a complete radio station designed to go anywhere—ideal for today's active amateur. Just add an antenna and 12v. DC or 100-234v. AC for instant operation on 160 thru 10 metres. The FT-101E/EE is another step forward in amateur communications from the world's leader in communications equipment. YAESU—The Radio Company.



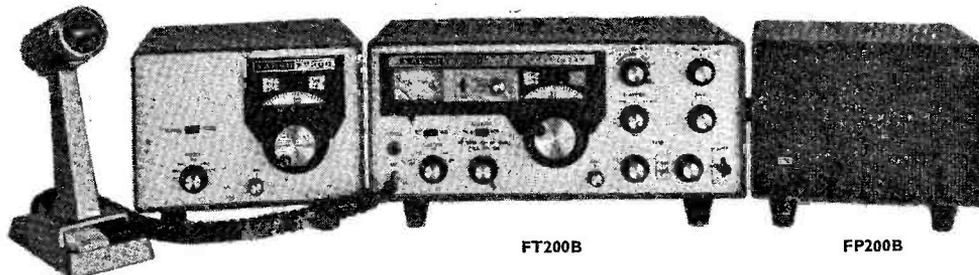
E MODEL WITH R.F. PROCESSOR
EE MODELS LESS R.F. PROCESSOR
EX MODEL BASIC MODEL

Features

- * Built-in AC and DC power supplies
- * Built-in RF-speech Processor for increased talk power (E model only)
- * 260 Watts PEP, SSB, 180 Watts CW, and 80 Watts AM.
- * Factory sealed, solid state VFO for optimum stability and accurate 1 kHz readout
- * Effective Noise Blanker, threshold adjustable, for elimination of noise spikes
- * Built-in, fully adjustable VOX
- * Automatic break-in CW operation with sidetone
- * Selectable 25 kHz and 100 kHz calibrator
- * ± 5 kHz receiver clarifier w/separate ON/OFF switch
- * Built-in WWW/JJY reception
- * Heater switch to shut off final tubes for conservation of current drain
- * Reliable easy to operate level switch
- * Adjustable carrier level for tune-up and novice operation
- * Built-in speaker
- * High-Q, permeability tuned, RF stages to provide the performance required even in base station operation
- * Includes dynamic, hand-held type microphone.
- * Indicator lights for internal VFO and clarifier operation
- * Eight pole SSB filter for unparalleled selectivity on today's crowded bands
- * All mode operation—SSB, CW and AM
- * Built-in internal crystal control provision and Dual VFO adaptor
- * Complete line of compatible accessories for flexible station design



YAESU MUSEN



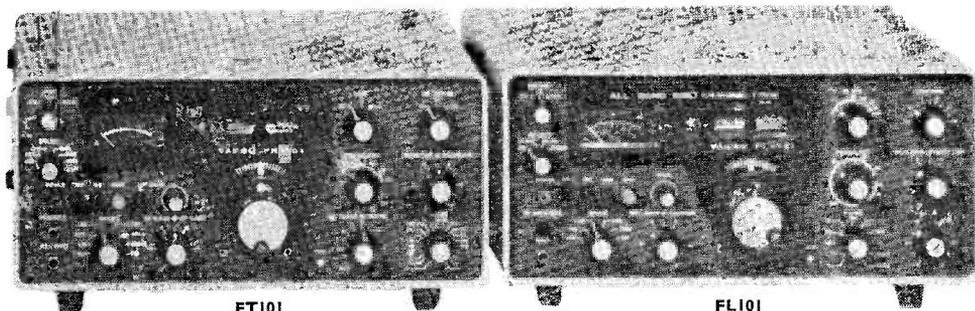
YD844
FV200
FT200B
FP200B

FT200B

FP200B

The FT200B is one of today's "best buys." Its features compare favourably with markedly more expensive units. 260W PIP (SSB/CW), 75W (AM), 1 kHz read out on all bands, 3.5-4 to 28.5-29 MHz (3 optional 10m. crystals available), sensitivity 0.5 μ V for 10dB $s/(s + n)$, selectivity 2.3 kHz (6dB), 4 kHz (60 dB), 1.75 : 1 shape factor, solid state gear driven FET VFO with excellent linearity,

100 kHz calibrator, VOX/PTT, clarifier (± 5 kHz) break in CW keying and sidetone monitor. The pre-mix oscillator gives superb signal handling and low noise capability of a single superhet whilst at the same time retaining a 9 MHz IF, with high image rejection and single range VFO stability.



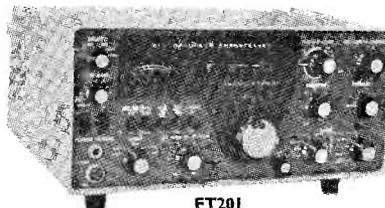
FR-101

FL-101

The FR-101 is an advanced receiver offering in the de luxe version coverage from 1.5 MHz, including all major SW broadcast and HF amateur bands (23 in all), 4m., to 144 MHz, AM, FM, SSB, and CW are all catered for each with a separate crystal filter. Transceiver operation with the FL or FT-101 is possible and digital versions of both the standard or de luxe model are now available.

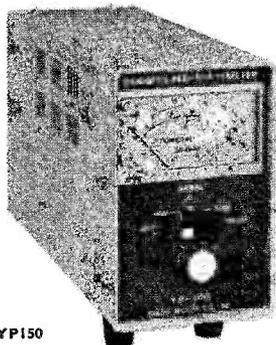
The FL-101 is the ideal companion to the FR-101 itself forming a superb base station. Operation on 160 through to 10m. (and on two ancillary bands) using SSB, AM, CW or FSK is possible, with the added bonus of an optional in-built processor (RFP101) being available at a moderate cost.

The FR201 features 10-80m. operation with the ability to run from in-built mains or 12v. supplies. It is constructed using plug-in modules as made famous in the FT-101. Of special interest to those contemplating the use of an FT201 with a VHF transverter is the use of 9 MHz as the IF frequency and that full AM operation is possible (optional AM filter XF90B). For the CW enthusiast a 600 MHz filter (XF90C) is available and AGC is switchable to suit this mode.



FR201

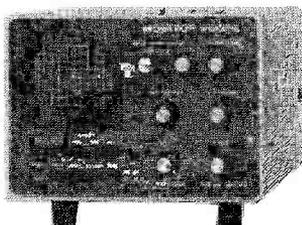
YAESU MUSEN TEST EQUIPMENT



YP150

POWER METER/DUMMY LOAD

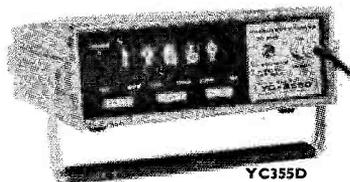
The YP150 is a fan cooled 50 ohm dummy load (using a large carbon resistor which maintains impedance (V.S.W.R. less than 1.2 : 1 at 145 MHz) by the use of a "Tapering Trough") and a power meter, for use between 1.8 to 200 MHz. Calibrated 6, 30 and 150W. FSD on a large 3½" x 2" meter with a maximum error of 10% FSD. Size 6" (7") x 4½" x 11" (12"). Weight 6 lbs.



YO100

MONITOR SCOPE

The YO100. The Multi purpose monitor offers :—through line display, 1.8 to 60 MHz of transmitted signals, of 10 to 500V, monitoring of the IF of a receiver (3.18 MHz standard 445 kHz and 9 MHz options), trapezoidal exhibition, audio and R.T.T.Y. portrayal. Built in 1.5 and 1.8 kHz oscillators permit the measurement of power, in accord with statutory two tone P.E.P. measurement requisites.



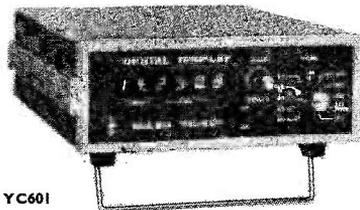
YC355D

DIGITAL FREQUENCY METER

The YC355D counts from 5Hz to 35 MHz. The D model's prescaler extends this range to over 200 MHz. The ingenious design offers: a dual range system (providing eight digit readout but using only five cold cathode tubes) and operation from mains, or 12v. DC, at the flick of a switch. The accuracy offered is time base (1 MHz crystal (±0.0005% at 25°C, ±0.0025%, 0 to 40°C)) + 1 count. Input impedance is switchable 1 Mohm or 50 ohm (B.N.C. socket), construction is on double sided epoxy board. Size 8½" x 3" x 11" (12½"), weight 7 lbs.

DIGITAL DISPLAY

The YC601 digital display unit (for 101 and 401 series (3.18 MHz IF)) indicates transmit and received frequencies to 100Hz on six bright green, 9 segment gas discharge tubes. Built in mains P.S.U. (consumes only 10W), gate time of 100mS., size 3" x 8½" x 9" (10½") and weight 5½ lbs. Supplied complete with connecting cables, etc.



YC601



Yaesu Musen Authorised UK Distributors

Western Electronics (UK) Ltd



AMATEUR ELECTRONICS UK



SOUTH MIDLANDS COMMUNICATIONS LTD.



Western

IT'S "WESTERN" FOR YAESU "WESTERN" FOR STANDARD AND "WESTERN" FOR VALUE



Standard's superb '3-in-1' Transceiver
for the serious FM Repeater operator—
the **STANDARD C828** ! £135 only plus VAT
There's no other choice ! 10 Channels fitted

BASE STATION — MOBILE — PORTABLE

We're so fascinated by this little beauty that we think it makes every-

thing else "obsolete" (or expensive). The Price ! £151.88 inc. VAT.

* 10 watts (Hi), 1w. (Lo) output.

* 12 channels SIMPLEX or REPEATER, 10 Ch. fitted.

* Single crystal control means you only have to buy 1 CRYSTAL PER CHANNEL.

* Fitted S, S, R, R, R and R.

* LED (BUSY) indicates whether you have accessed the repeater or not.

* LED's to indicate EXTERNAL VFO, TRANSMITTER ON REPEATER OPERATION.

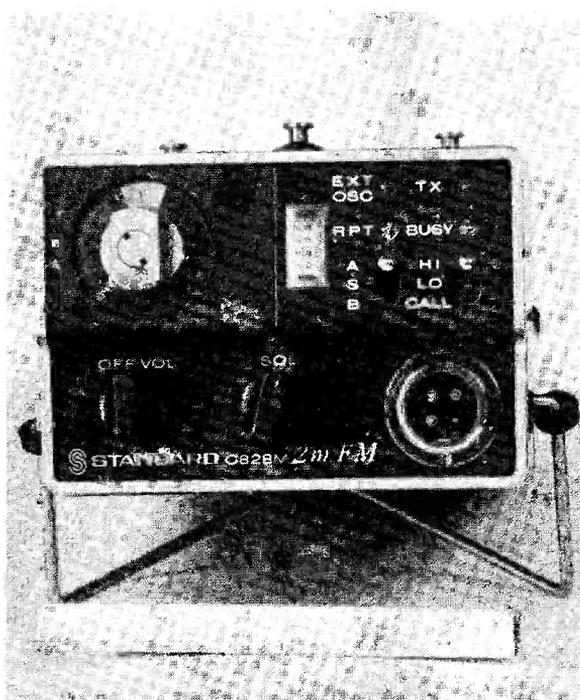
* SPEAKER/MIC gives PRIVATE LISTENING and has switch to override the channel selector enabling a changeover to be made to an external VFO (Type CV110).

* TONEBURST is built in (Automatic on "Repeater")

* NEW LEATHER CARRYING CASE/ANTENNA TYPE FCB-OIJ (available later) makes the C828 into a 12 Ch. 1/10w. portable unit.

FOR DETAILS OF YAESU EQUIPMENT
SEE MAIN YAESU ADVERT IN THIS
ISSUE

SPECIAL OFFERS STILL CURRENT
—WHILE STOCKS LAST !!



- ★ FT/FP200 Only £240
- ★ FT201 Only £270
- ★ FLI0IRF Only £295
- ★ FT10IE Only £375
- ★ AR30 ... £24 AR40 ... £29

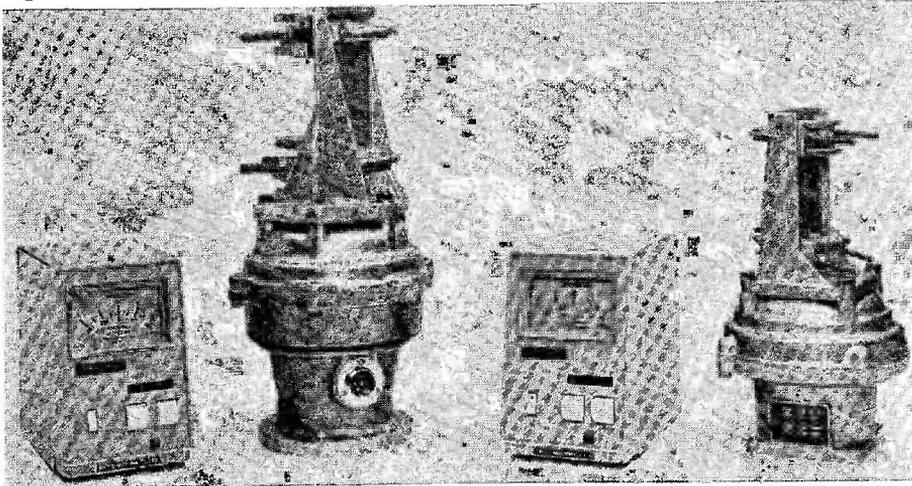
For all other Yaesu items send S.A.E. for
Price List or 25p for latest Yaesu Catalogue.

ALL PRICES ARE EX-VAT

SEND 50p FOR FULL CATALOGUE

Electronics (UK) Ltd

We are pleased to announce . . .
 . . . an exciting new range of **ANTENNA ROTORS**
 by **EMOTO ANTENNA CO.**



COMPARISON OF ROTOR BRAKE TORQUE FIGURES (kg. cm.)

CDE	
Model	Torque
AR30	575
AR40	920
CD44	1,152
HAM-2	4,025
EMOTO	
Model	Torque
102LBX	1,500
1100MXX	10,000

1100MXX £115 plus VAT 102LBX £55 plus VAT
**DOES YOUR ANTENNA TURN IN THE WIND?
 DOES YOUR CONTROL UNIT "CUT-OUT" AFTER ONLY A FEW REVOLUTIONS?
 . . . THEN STEP-UP TO A RELIABLE EMOTO ROTOR**

We have been in the business long enough to know your requirements for a first-class antenna rotor, and we have gone "over-board" for the EMOTO range. There are many brands of antenna rotors, some of them complete unsuitable for the majority of amateur applications, and for this reason we do not stock them. Most likely your present antenna rotor will turn your antenna and hold satisfactorily, but it just will not hold it stationary under strong wind conditions, i.e. YOUR ROTOR LACKS SUFFICIENT BRAKE TORQUE, the ability to hold the antenna still whilst a gale is blowing.

HERE IS WHERE THE EMOTO SCORES—Take a close look at the comparison figures above. Then compare the prices of all the rotors and you will have to agree that the EMOTO 102 LBX and EMOTO 1100 MXX are the best value. Furthermore, because the EMOTO uses a 100v. isolated feed to the motor unit one does not get the voltage (and power) loss along the control cable that occurs in units using 24v. only. More efficient and remote operation is therefore possible with EMOTO.

Finally EMOTO ANTENNA CO. is not a new company. They have been making rotors for many years. So have no fears about this being a new and untried product.

Having obtained samples (all rotors are individually tested by EMOTO before despatch) and had them tested by an independent authority, SOUTHAMPTON UNIVERSITY, we are now confident to recommend them as THE FINEST ROTORS AVAILABLE. The 1100 MXX received the following comment from the University: "Very rigid. NO SLACK, WELL MADE, GOOD DESIGN." NEED WE SAY MORE!

WESTERN FOR TEST EQUIPMENT

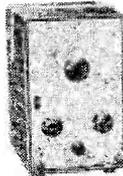
VALVE VOLTMETER, TE-65

*With new 6" full-view meter
 *Compare it to any peak-to-peak V.T.V.M. made by any other manufacturer at any price.
 Specification: DC V: 0-1.5-5-15-50-150-500-1500v. (using HV Probe, up to 3kV.). AC V: 0-1.5-5-15-50-150-500-1500v. RMS. 0-1-4-4-14-40-140-400-1400-4000P-P. Resistance: Rx 10-100-1K-10K-100K-1M-10M (0-2Ω-1000MΩ). Decibel: -10dB to +65dB. Power source: 105-125, 220-240v. AC, 50/60 Hz. Tube Complement: 12AU7, 6AL5.



RF SIGNAL GENERATOR, TE-20D

*Factory calibrated and tested
 *Dual output RF terminals
 *Separate Variable Audio Output
 Specification: Freq. range: 120 kHz-500 MHz (7 bands). Freq. accuracy: ±2%. Audio output: to 8 volt. Internal modulation: 400Hz approx. Tube: 12BH7A, 6AR5. Power source: 105-125v., 220-240v. AC, 50/60 Hz. 12 watts. Employs a Xtal socket and can be used as below: (a) Self-calibration. (b) Marker generator.



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SE-250B Injector	£3-24
SE-350A Tracer	£16-96
SE-360 Tracer/Injector	£19-17
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TE-20D R.F. Generator	£27-00
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We normally have the full range of this equipment available. Check with us for prices and details.

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The new Uniden 2020 Transceiver proving to be very popular indeed, this proved to be a real good seller in May.

We can also supply equipment by Icom, Decca Communications, Belcom, Swan and the new Atlas range. Along with accessories, antenna's by Hy-Gain, G-Whip, Jaybeam, Microwave Modules, Barlow Wadley, CDR Tech, Space-mark, Technical Associates, etc. Send large S.A.E. and we will send any information you require.

Please note all equipment is air tested before sale. We do not employ any part time employees for sale of equipment all sales made from the above premises and we do not supply to any individual for re-sale from private accommodation.

ACCESSORIES

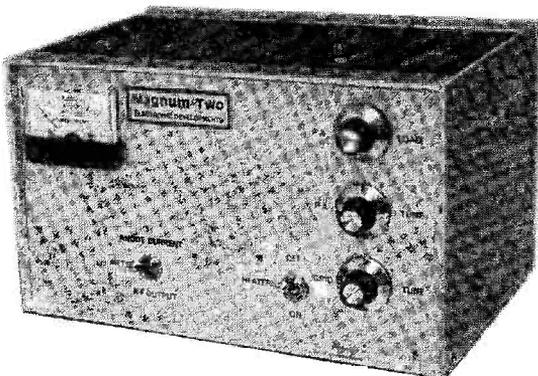
Tech 15 G.D.O.	(post 48p)	£21-00
Morse Keys	(post 35p)	£6-75
Katsumi Electronic Keyer	(post 48p)	£38-00
Spacemark ETM-3b Keyer	(post 48p)	£47-00
Buair Keying Paddle unit	(post 25p)	£6-97
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UR67 per metre	45p
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Osker SWR Power Meter (B)	(post 48p)	£26-00

For the caller we have a wide range of cabinets, chassis etc.

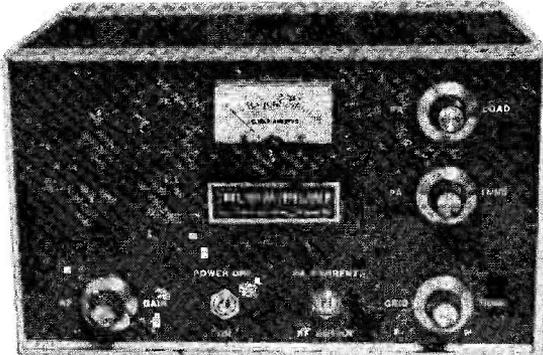
SECONDHAND EQUIPMENT

Eddystone 840c Receiver ...	£60-00
Eddystone EC10 Receiver ...	£70-00
Barlow Wadley XCR30 Receiver ...	£110-00
FT250 Transceiver ...	£250-00
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FL400 Transmitter ...	£125-00
Belcom 2M Linear ...	£135-00
Trio JR500 Receiver ...	£60-00
Trio 9R59DS Receiver ...	£50-00

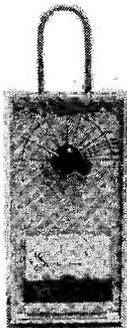
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Electronic Developments MAGNUM 2 and 4 Metre Converters. 28 MHz low drive input, CW, SSB, AM and FM. Inclusive of relays and power lead, size 10" x 6" x 7". £100

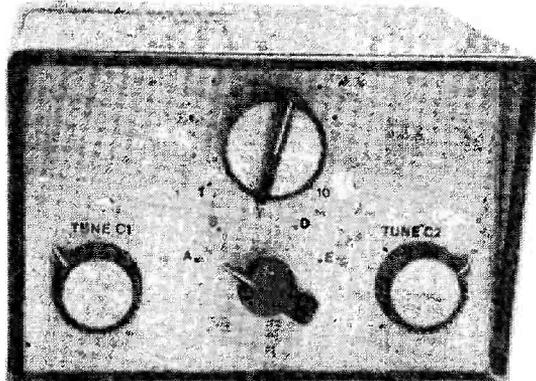


Electronic Developments MAGNUM 2 metre LINEAR AMPLIFIER. MICROWAVE MODULES, Rx Pre-amp, RF switched. Self contained power supply. Full input and output relay switching. Up to 100 watts SSB output. £100



VHF Absorption Wavemeter. 65-230 MHz. Post free. £16-00

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SWL Tuning Unit Mk. 1. 50 switchable tunable positions. Two inputs single feed or co-ax. Suitable for any antenna over 15ft. long on 2-30 MHz. Produced in demand to many requests, post free. Now in use in over 25 Countries in 5 Continents. £15-50

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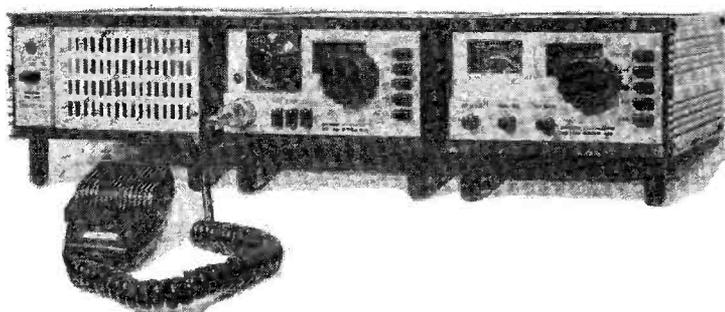
S.T.E. MILAN VHF EQUIPMENT

During the last two years the popularity of the range of equipment by S.T.E. has been growing. The ARAC 102 receiver has been a "Best Seller" (have you seen any second-hand?). Later in the year the Atal Transmitter came into stock and all reports have been good. Now we are offering the complete range of modules for the D.I.Y. enthusiasts. Transmitters, receivers, etc. The construction of these modules are first class — the P.C.B's are the finest we have ever seen.

Price List (includes postage)

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- Atal 228 Transmitter ... £126.00
- ASAP 154 AC PSU with speaker £35.00
- AR10 Receiver Module ... £35.00
- AA1 Audio Amplifier ... £4.10
- AD4 FM Discriminator ... £4.75
- AL8 Linear Amplifier ... £27.00
- AT22 Transmitter ... £50.00
- AR20 C.C. Receiver ... £50.00
- AT23 C.C. Transmitter ... £36.00
- AS 15 Stabilised psu D.C. ... £10.00
- AG 10 Tone Generator ... £4.50
- AC2A Converter 28-30 MHz £20.00

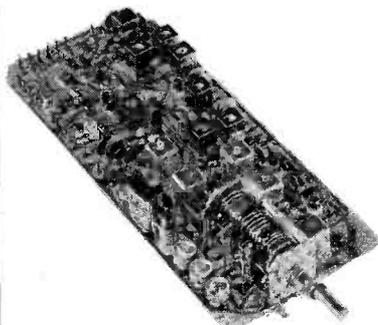
ASP 154
ATAL 228
ARAC 102



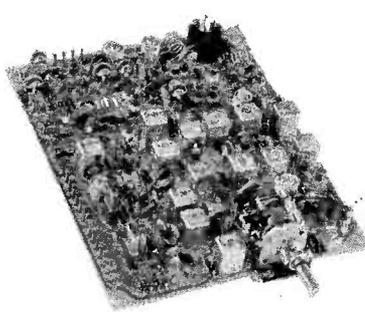
SPEAKER
AC POWER SUPPLY UNIT

144 - 146 MHz
AM FM TRANSMITTER
with Microphone

28-30 MHz 144-146 MHz
AM-FM-SSB RECEIVER



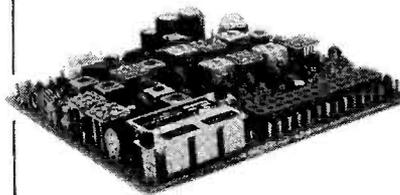
AR10 Mosfet receiver. 28-30 MHz Double conversion superhet. RF and amplifiers stages are gate protected mosfets for good sensitivity and low intermodulation. Noise limiter and squelch circuit. AM, SSB and CW reception. 12v. DC.



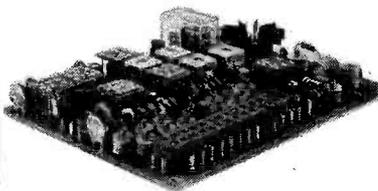
AT 222. A complete transmitter exciter unit for 144-146 MHz on AM or FM. VFO controlled or fixed channel operation. Complete with microphone pre-amp., speech processor including active audio filter. 1 watt output. FM. 25 watt AM. Output impedance 50-75 ohm adjustable. Frequency deviation 3-10 kHz adjustable.



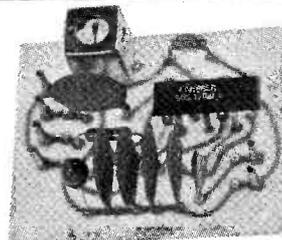
Audio Frequency Amplifier. Output power 1.5 watt at 12v. Output impedance 8 ohm. Frequency response 100-15,000 Hz within 3 dB. Sensitivity 12mV.



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



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.



Linear Amplifier. Frequency 144-146 MHz output 10 watts FM, 8 watt PEP SSB, 8 watt AM. Input power 1 watt FM. 25 watt AM-SSB. Input impedance 50 ohm output impedance 50-75 ohm. 12v. DC.

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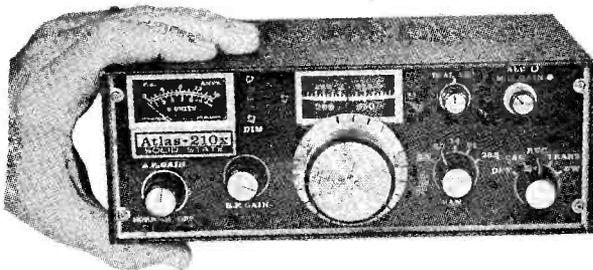
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* **120 WATTS
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DON'T LET ITS SMALL SIZE FOOL YOU. The Atlas transceiver is packed full of the most advanced, state-of-the-art engineering, and provides unequalled performance in both transmit and receive modes. There is no other transceiver on the market with as many outstanding superior features, regardless of size.

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FREQUENCY COVERAGE: 1800-2000* Model 215x only), 3500-4000 kHz, 7000-7500 kHz, 14,000-14,500 kHz, 21,000-21,500 kHz, 28,400-29,400 kHz (Model 210x only). The 10 metre band may be easily owner adjusted on the 210x to cover any 1000 kHz portion of the band. Tuning rate is 22 kHz per revolution, with 1 kHz increments on the dial skirt, (2 kHz on 10 metres).

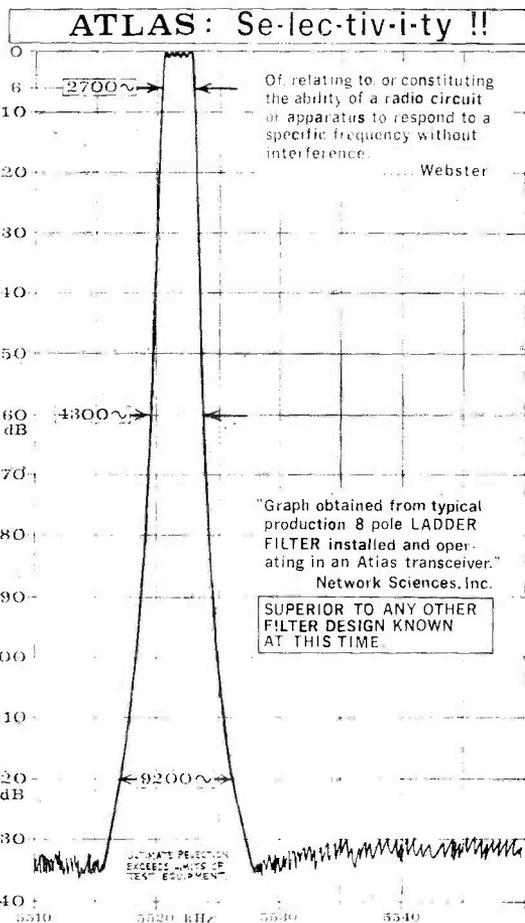
THE RECEIVER FRONT END DESIGN results in spectacular performance. Antenna signals are coupled through tuned transformers directly into a double balanced diode mixer, where they are immediately converted to the I.F. frequency. Only one stage of I.F. amplification is employed before signals reach the crystal filter. As a result, intermodulation between strong signals is suppressed to unprecedented low levels; better than 70 dB down with 5000 microvolt signals! Overload from adjacent channel signals is practically non-existent. *If you have not yet operated an Atlas transceiver in a crowded band and compared it with others, you have a real thrill coming!* Ordinary solid state receivers have always been rated as "practically as good as tube designs," even though they usually fall short. Now Atlas finally provides you with a receiver that is truly superior to tube designs.

RECEIVER SENSITIVITY. The old fashioned R.F. amplifier is no longer necessary. With a low noise figure mixer, followed by a low noise I.F. amplifier, sensitivity specs. on the Atlas are as good as the best and better than most receivers having an R.F. amp. (½ microvolt or better on all bands). This will be a little difficult for many to understand and accept, particularly old timers, but it is a proven fact: The Atlas truly has exceptional sensitivity.

MAXIMUM OPERATING PLEASURE. The front panel design of the Atlas has full size knobs and tuning dial, in spite of its small overall size. Small size should not sacrifice operating pleasure. Our fingers and hands do not become smaller. You'll find operating the Atlas transceiver a delightful experience.

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CUSTOMER SERVICE SECOND TO NONE.



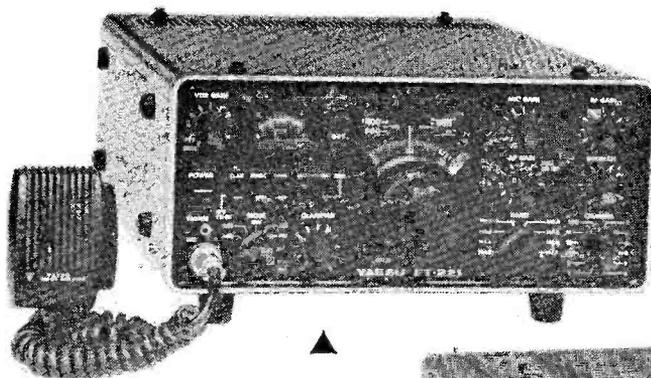
**508-514 ALUM ROCK ROAD
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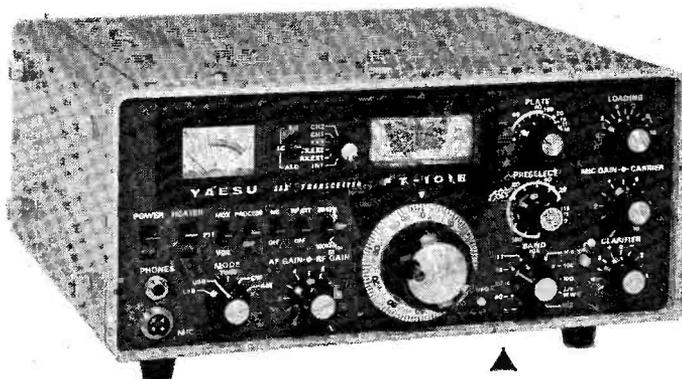
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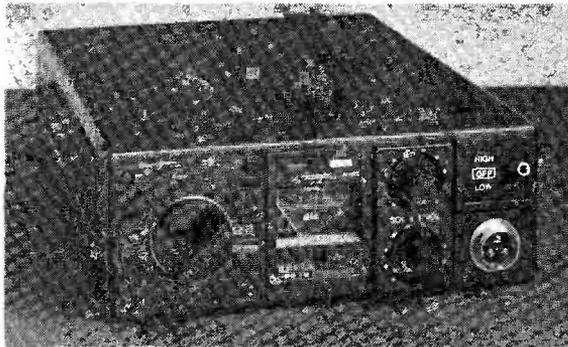
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Versions with
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There is no doubt about it, the IC-22A is fast becoming the fastest selling 2 metre mobile rig in the world. With the considerable increase in two metre repeater applications being processed by the Home Office, this little black box, already supplied with crystals for ALL the UK repeater channels PLUS another 5 simplex channels, is going to be very much in demand this summer. Send or phone for our handout, giving detailed specification—and be ready to get your cheque book out when you've read all about it. If several of you in your local club of VHF group want one, then get your club Secretary to contact us and we will see if we can do a little to alleviate the pains of VAT by bringing the price down a bit for bulk orders.

ICOM IC-201 £357.75 inc. VAT

The luxury multi-mode rig which was described in full in our advertisement in May, providing full 2 metre coverage on FM, SSB and CW using its ultra stable VFO. Full facilities for Repeater and reverse repeater use at the flick of a switch, built in automatic crystal controlled one burst fitted by us, full break-in facilities on CW and VOX are but a few of the excellent facilities found on the increasingly popular IC-201. Send for further details or leave a message on our ansafone during the evenings.

ICOM IC-202 £161.10 inc. VAT (rechargeable batteries £16 extra)

This new rig from the ICOM stable is going to be another winner. You have a hand-held portable, giving 3 watts output on SSB or CW, with VXO tuning giving you continuous coverage from 144.0 to 144.4 and the option of other frequencies if you use crystals in its spare sockets. Add a linear and you have a beefy base station. To introduce this excellent transceiver it is offered at a price of £161.10 INCLUDING VAT. Send for a data sheet for further details—just the thing for going portable this summer! SEE RADCOM FOR REVIEW.

ICOM IC-30A £225.00 inc. VAT

The IC-30A is the perfect companion to the IC-22A for the man who wants to be able to make the best use of the many UHF repeaters which threaten to sprout up all over the country this summer. Many groups are already well ahead with the technical work and once those licences are issued (if not already) they will be sprouting up like mushrooms. It looks like the IC-22A and also takes 22 channels. You get it with 5 fitted plus, of course, a tone burst. You can get a long way with 10 watts on UHF. Again send or phone for further details!

ICOM IC-3PA £42.18 inc. VAT

The perfect companion to convert your ICOM mobile into a base station. Provides 13.6v at 3.5A. Well regulated, with automatic electronic overload.

ICOM IC-225 £225.00 inc. VAT

The ultimate luxury in 2 Metre mobiles. Comes FITTED with 80 channels to suit the 2 metre band-plan, complete with crystal controlled tone burst and repeater facility. Nothing else to buy unless you want reverse repeater which can be obtained by adding ONE extra crystal. Covers all the UK simplex and repeater channels and provides a very clean signal by virtue of its excellent PLL circuitry. Send for further details of this and the rest of the excellent range of ICOM equipment.

We have greatly increased the number of points at which you can see and buy ICOM equipment. In addition to the list below for DEVON contact G3PQH and Peter Avill our Northern agents has outlets in DONCASTER, N. HUMBERSIDE and MANCHESTER.

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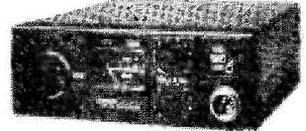
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Many of you will already have benefited from our low interest credit scheme. For those of you still considering a new rig or part exchange, why not let us quote you our attractive credit terms. Our special credit scheme has been designed with the amateur in mind. Our advice is completely free and the interest rates are far lower than inflation. With the Pound having fallen dramatically over the past few months, price increases on imported products are inevitable. Act now, telephone, call or write enclosing a stamp for immediate quotation on any piece of amateur radio equipment. Tel 03-704 6835

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IC22A



CASH £158.62 DEPOSIT £32.62
AND ... LESS THAN £1.75 A WEEK !!

	Cash	Deposit	12 mths.	18 mths.	24 mths.
ICOM IC22A	£158.62	£32.62	£12.18	£8.68	£6.93
ICOM IC225	£225	£45	£17.40	£12.40	£9.90
ICOM IC21A	£198	£37	£15.56	£11.09	£8.86
ICOM DV21	£223.87	£44.87	£17.30	£12.33	£9.85
ICOM IC201	£354.37	£71.37	£27.36	£19.50	£15.57
ICOM IC202	£161.10	£33.10	£12.37	£8.82	£7.04

+ FREE DURING JUNE: ASP201 mobile antenna with every ICOM transceiver.



CREDIT

And now you can buy YAESU through our credit scheme.

YAESU FT101E this famous transceiver in its latest version complete with speech clipper (a completely separate module employing its own Yaesu IF filter) is surely the most potent and complete station ever offered. Yours for less than £5 per week and a deposit of £89.

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YAESU FRI01D	£393	£79	£30.35	£21.63	£17.27
YAESU FRI01S	£303	£61	£23.39	£16.67	£13.31
YAESU FL101	£309	£62	£23.88	£17.04	£13.59
YAESU YC355D	£146	£30	£11.21	£7.99	£6.38
YAESU YU100	£113	£23	£8.70	£6.20	£4.95



TRIO CREDIT

QR666 This delightful little receiver covers 5 to 30 MHz and has optional bandspread for amateur or short wave broadcast bands. Powered by 230V. AC or 12V. DC it is the ideal SWL receiver or general coverage "shack" receiver. For those of you with transceivers here is a chance to listen to your own signal! It will cost you less than £2 per week through our credit scheme.

+ FREE "Q-TRAP" AERIAL with every receiver purchased during June.

	Cash	Deposit	12 mths.	18 mths.	24 mths.
TRIO QR666	£163	£33	£12.86	£9.16	£7.32

OUR TESTED TRADE-INS—A CHANCE TO MAKE A REAL SAVING!

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ANTENNAE GALORE! HY-GAIN — JAYBEAM — MINIPRODUCTS — Q-TRAPS — G-WHIPS—ASP

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"Q-Traps" high-Q traps only, per set	£7.98

JAYBEAMS			
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D8/70 slot fed	£11.59		
PBM18/70 18 el.	£14.06		
MBM48/70 48 el.	£15.64		
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12XY/70 12 el. xd.	£21.38		
4Y/4M 4 el.	£8.72		
H2/2M halo	£2.36		
HM/2M halo/mast	£2.81		
ROTATORS			
AR30	£29.92		
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Stolle 2030	£47.81	C4 vertical 20-10m.	£40.50
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18AVT 80-10m.	£65.92	Multimobile	£11.76
CABLE		Flexiwhip	£5.07
5 core	per m.	LF 40, 80, 160	£4.61
UR43 50 ohm	21p	MM40, 40, 80, 160	£5.25
UR67 50 ohm	36p	FF15, 20, 40, 80, 160	£1.37
75 ohm	14p	Resonator whip...	

NEC CQ110 DIGITAL TRANSCEIVER — 160.10M Ex stock £625

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Tel.: Romford (0708) 68956
G3OQT Bredhurst Electronics, Willowbrook, School Lane, Bunbury, Cheshire. Tel.: (Bunbury) 0829 260708

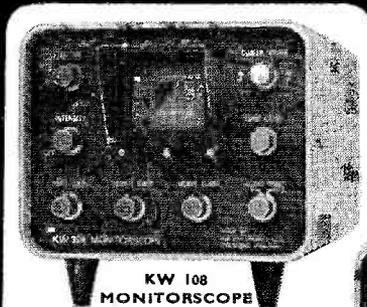


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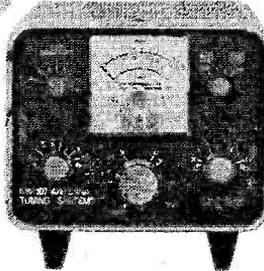


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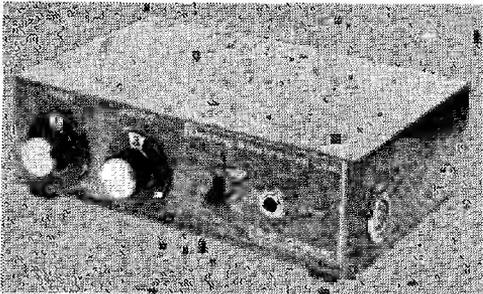


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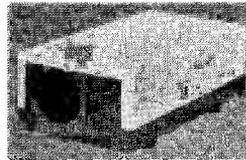


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SHORT WAVE MAGAZINE

(GB3SWM)

Vol. XXXIV

JUNE, 1976

No. 392

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Managing Editor: AUSTIN FORSYTH, O.B.E. (G6FO/G3SWM)

Advertising: Charles Forsyth

Published at 34 High Street, Welwyn, Herts., AL6 9EQ, on the last Friday of the month, dated the month following. Telephone: 04-3871 5206 & 5207

Annual Subscription: Home: £4.80, 12 issues, post paid
Overseas: £4.80 (\$10.00 U.S.), post free surface mail

Editorial Address; Short Wave Magazine, Buckingham, MK18 1RQ, England

Prices shown in advertising in this issue do not necessarily constitute a contract and may be subject to change.

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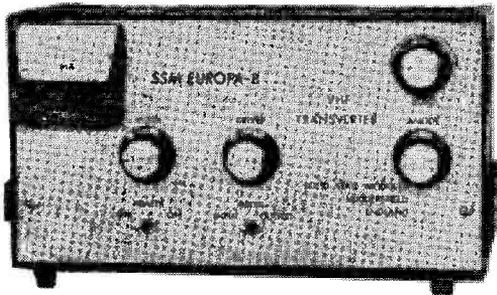
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COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

WELL, we hear the correspondents muttering, what the blank-blank happened to my offering last time? Simply, a combination of the change in style upsetting your scribe's idea of his space allowance on the one hand, plus loads of news at the last minute. We ended up with enough coverage for a complete extra piece! That which remains current, and can be got in this time, is included here—always provided we aren't bombarded with more late news to excess!

Turning to the matter of conditions, one has to admit that the question of when the new sunspot cycle will have got under way to a sufficient degree actually to be noted by those-who-know is becoming somewhat of an obsession—informed opinion of these matters in effect says it knows of no single sign which will say the turn has been reached, and all of us are guessing; and that means old G9BF (who claims the new cycles *always* start with a touch of gout in his left big toe) might as well be watched as the other arbiters!

However, for those who subscribe to Geoff Watts' *DX News Sheet*, *West Coast DX Bulletin*, or other weekly epistles of this nature that carry the forecasts of W4UMF right from the banks of the Potomac will know just how uncannily right he is. Part of the excised copy mentioned that Ted predicted a whole week of good conditions, which duly happened; and this month he offers May 13-19 as having been worth watching.

Ten Metres

The Ten-Metre Activity Day, reports SWL Whitaker (Harrogate), was a much greater success than previously; some 400 G's are known to have been active at some time or other during the period. Ground-wave contacts up to 40 miles seemed to be the normal thing, but some G's were working quite good GDX for example, G3HCU (Guildford) getting up into Yorkshire, and a Leeds SWL hearing a station in Sussex. There was also the odd DX opening during the morning and early afternoon, with ZE, ZS, 9J2 being worked, while later in the

afternoon a couple of PY's got through, plus VP9HZ/MM, ZD8TM and 5T5ZR. The idea of serial numbers—even though this was in no wise a contest—certainly gave a tang to the game, as it was noted G3OZF made no less than 103 QSO's, while G3HCU made 67, of which 22 were over the 70-mile mark. Overseas logs came in from 9H1CH, DA2WN, JA9BOH, W1MMV; that from the JA was of special interest, containing as it did so much which to us in the U.K. comes into the category of rare and exotic DX! All in all, it was a highly successful event and it certainly showed how much we are losing by not putting our local nets on the band; there is one regularly on from Devon on Sunday mornings (28-550 at 1100), and in Bristol there is a CW one (28011, 1900z) and an SSB group on Sunday mornings at 1000z on 28-550 MHz; the CW gang reconvene on Sundays also, at 0930z—then of course there is the G1 one already mentioned in past months. So . . . how about some more? Maybe it would be no bad thing for calling to be concentrated on one frequency for each mode—say, 28025 kHz CW, 28.5 MHz SSB, with the QSY to follow once contact has been made.

No matter what period of the sunspot cycle we happen to be in, Ten will always be showing with openings *à la VHF*, which makes it a good band for filling in some of those EU prefixes which would otherwise be classed as QRM—and even at this point in the cycle the alert may still note the odd DX signals, as did G3NOF (Yeovil) who heard the odd weak Italian and even a "thin" ZS, as well as getting the buzz from elsewhere that the band opened to North America during the March 26 Aurora. Interesting, this last—it seems a bit more than coincidence that Ten opens East-West frequently when Aurora events are happening, and it makes one wonder.

In those years long ago when one's "demob group" was a matter of some importance to we naturally-civilian soldiers, there was, writing in *SHORT WAVE MAGAZINE*, a chap

who was, through his work for the "VHF Bands" piece of the day, quite an influence on the embryo 'KFE in weaning him away from electrics to electronics and AT activity; what a shock it was for you may imagine, to receive, all but thirty years later, a letter bearing questions and then a report from that same ex-G2XC, now returning to his old interest, and demonstrating that once you *learn* about it, you never forget. Ted spent time on 21 and 28 MHz; for the latter, he notes from his home in Hordean that on March 26, from 1500 to 1815, there was activity on the band from Europeans on CW, plus auroral-flutter type SSB signals from G3GTW, G4CQH, G4DYO, G4DTK, GW5YI and EI9DC, these last mostly during the period 1500-1600z. March 31 at 1805z an SSB signal on 28.6 at S5, possibly a PY, the beacon from 5B4CY on April 2 at 0930, and on the 3rd, G3HCU with flutter calling CQ Ten in the morning and PY5CEG (CW) working a G14, and within moments CE7BAL working a G3, plus a fluttery signal from G4BYO in Reading. On April 4, between 0840 and 0921 some assorted Italians working G's and 9H1CH who raised G3VCT after a CQ call and then went QSB down to zero.

The report from G4DMN (Wirral) indicates that Richard tried the Ten-Metre Activity Day, and was not very pleased at the result—the furthest station heard and worked being in Anglesey.

GW4BLE's monster tower and beam is not visible from the M4, your scribe concludes, having passed that way with distressing haste earlier in the period. Nonetheless, it is obviously visible to incoming RF signals, as Steve reports from Newport, Gwent, that he worked one or two in the WPX contest, and Reunion Is. earlier in the month for a brand new one. It all added up to contacts on SSB with CE6EZ, EL7F, FR7BB, G3FUT, PY1ZAE, ZE1FG, ZV6AM, 5B4CB and 5B4DA, while ST2SA and 4J6A were heard but not raised.

GM3YOR (Kirkcaldy) found the

opening on Ten of March 28, two days after the Aurora event, in an odd way—he was tuning over four metres when he heard a DJ on CW—smartly de-activate the transverter, and there he was on Ten as large as life!

The GI boys, for whom GI4EIZ is the spokesman from Newtown-abbey, found conditions were of occasional openings with deep fades; these last are somewhat similar to those noted on 21 MHz but much slower, so that a wait of a minute on a given frequency seems to be needed before you can say no one is there. The big day for Bill was March 29, when the band showed signs of life from the time of switching on at 1100-ish through to about 1430 clock; signals peaked to S8 and dropped to S2. SSB was used to work DL6SC, DL6AI, DL9WM, OK1IQ, DK5BO, DK3VD, SP6PZB (“calling CQ Contest”), DK7RT, DK9ZQ and DJ5OI. GI4EIZ uses a ten-metre dipole attached to his VHF beam-mast at a height of five metres, the rotation system being of the good old “Armstrong” method.

G2BJY (Walsall) found conditions during the Activity Day pretty punk from the European and DX aspect, but plenty of local activity with 17 stations worked on CW, those over 25 miles having the characteristic flutter. Best DX was G3JJQ, G3EHA, G4DYP and G3GJL, while G4CLX said he had worked an I6, and Fred, G3AVE, had heard ZD8TM working a DL; however, had there been some SSB . . . which gives a clear indication of the bent of Geoff's thoughts!

SS/TV

Perhaps the best pointer as to when a mode of operation may be said to have “arrived” is when the first user of that mode makes DXCC. For SS/TV, this has happened, and in fact G3IAD (Nottingham) has now done it for the first time outside U.S.A. and the third in the world; it was completed on March 26 by a QSO with TA2MM, and took Neville a total of twenty-six months to complete. Congratulations, G3IAD.

21 MHz

A good band, when it's open—and that is quite often.

G2HLU (Reading) seems to have used both modes with his TS-520, mainly playing in the contests, not with a view to an entry but rather to give the boys a point or two; it seems the main SSB activity was on Fifteen, and it was pleasing to receive some spontaneous compliments on the quality of the signal from the rig from other stations.

G8PG (Wirral) ran QRP to a transistor Tx during the *ARRL DX Test* weekends; in the first he found Fifteen half-open around 1600 and raised W4, and deduced rightly that his best bet would be a QSY to Twenty; but on the Sunday UL7 and VO1 were raised, this with 2.5 or three watts *input*.

Another QRP buff is GM3RFR (Baltasound, Shetland) who has the choice of SSB or CW at a maximum input of five watts; on Fifteen it was all the SSB mode, with QSO's to 9H1EW, 9H1ED, IT9PMU and SV0WX.

For G2XC at his listening-post at Horndean, 21 MHz has been open to the Middle East from around 0800 to late afternoon, to Africa from 0900 to mid-evening, South America from 1000 to 2000 or even later, and VU, VQ9 and YB/YC also heard pretty frequently. Some other signals of note included KC4AAC in the Antarctic, and, during the good period of March 23-25, UW0AJ and VK4TL heard in the morning, YB0ACG (S9 around 1400) and HP1GN still audible at 2200. Like most other commentators, Ted remarks on the drop-out on All Fools Day—specially for DX-chasers!

G4BHE (Basingstoke) returned to the fray recently after a change of QTH some months ago; he has a HW-100, plus TA processor, into a DB3 Yagi for which the planning permission has been obtained at 42 feet, though for the moment it is only at the 35-foot level. One of the first QSO's was with the stereo a couple of doors away—for 21 MHz stereo-QRM try having an aerial on the stereo just 11-feet long! *Proper* aerial-plus-Faraday loop, end of BCI! Then it was all 21 MHz, with the following SSB stations worked: A9XBL, CE3RC, EL2FR, FY7YE, HK3BGN, H18MOG, KC4AAC, KV4FC, LU9NA, LU9DVA, OA8AH, PY's, VQ9HCS, VS6DO, VS9MB, ZD7FT, ZE1EA,

ZS2ND, ZS4MZ. WB9AJF/6Y5, 5T5ZR, 5Z4NH and 9J2GJ—eight new countries during the month to bring the total to 143 had a *good* effect on morale!

G3CED/G3VFA at Broadstairs are now running QRO—two watts to the Ten-Tec “Argonaut”; also the skywire situation has been improved, the Joystick outside on its 35-foot mast is back aloft, while the other one indoors is being used horizontally—the outside one yielded just one contact on Fifteen, with a UB5, pretty obviously during the testing-out phase, and one notes also a local contact on Ten, which must constitute some kind of a record—it's the first five-band log from G3CED, and it contains, in the ten-metre QSO, his first noted logging of a *phone* contact—did the knob fall off the key??

By way of comparison we have the log of G4DJY (St. Annes-on-Sea) who uses a Joystick and 120 watts of CW; on Fifteen, during the odd session when the band was open (he spent much more time on Twenty) Peter seems to have hooked on to a veritable string of W's, reaching right into the heartlands on occasion—at a tangent to this, doesn't it seem odd to us greybeards to be hearing AC4 prefixes quite common on the band—one still instinctively seems to think “Ah, Tibet—I want him!” before being jerked back to normal.

G2BY (Wroxall, I.o.W.) seems to have had a little play on every band, and in addition has taken pleasure in reconditioning an old *Eddystone* 888A receiver and comparing it with the modern FT-101B receive section. Bert finds the old'un hears things like, for example, VK3XB on Forty quite happily at times when he needs 20 dB of attenuation to hear anything with the FT-101B. As he says, his only regret is that he can't control the “transmit” frequency from the 888A! Of course, this point rubs home the amateur's idiotic quest for *excessive* gain in a receiver, a quest which the '888 did not pander to; hence, it outperforms most modern receivers, as its front-end performance is pretty fair as well. Valves are still the ticket for receiver front-ends, unless one is ready to go to very expensive ring mixers for a very slight improvement. On 21 MHz, G2BY

reckons he found *nothing* worth a comment, and it looks as if he spent most of his time on Twenty.

G3NOF (Yeovil) found the band generally poor. Gotaways were A9XV, ST2SA and VK9XX, though the SSB did connect with A9XBC, A9XBD, TA1ZB, UA9WS, VQ9HCS, W7WST/MM in the Eastern Med., 5Z4NH, 9X5PT and ZS5BH.

GM3YOR (Kirkcaldy) checked Fifteen at odd times, both morning and afternoons as shifts permitted, and came out with EL2EG, LU1HDC, PY2FXH, PY4BVL, PY6AUC, UA9CES and ZD8TM.

Top Band

Essentially, our first stop has to be with PY1RO and EI9J. Rolf and Paddy are once again the guys spark-plugging the Transequatorial Tests on Top Band. Here, throughout June and well into July, the aim is to listen out between midnight and 0030z, and indeed beyond 0030z if conditions look "likely." However the thirty-minute stint is enough to make a decision without too much lost sleep. Europeans will be using their usual frequencies, U.S. stations theirs; thus, the other countries will transmit on one or the other segment, depending on who they are after. Point: This means that it is good practice after a CQ to listen on your own frequency for a caller before scanning the other segment. And, to be noted, ZS's are one exception, they having to transmit between 1930-1935 kHz, while the ZL's are now able to use the low end of the band, not that there is much chance of a path to ZL at this time of the year. And, Rolf says "Pse publish, to increase U.K. activity this year!" So you know what is needed, men, *application*. Get stuck in, in other words!

G4EAX (Nottingham), knowing the writer is not, at the moment, operational on Top Band, remarks on the ripples which went round the band when it was realised we had finally got the Table out—Good, now what about some competitive entries and good old-fashioned cut-and-thrust DX-chasing on the band?

That invaluable "bulletin" from WIBB: This one, of course, is essentially the report on the 1975/76

Top Band Transatlantics, and so we can keep most of it over for next month. However, Stew comments on the gradual rise in the feeling that the Tests as such should be discontinued as it is so easy nowadays to "get over"; and on the fall in the European representation. Probably the shortage of EU interest is simply reflecting the drop in Top Band usage with the swing to VHF and HF operation; and it is for precisely this reason that your scribe feels most strongly in favour of continuing some sort of "organised" Transatlantic effort, simply to encourage people to take part. Opinions wanted though, for onward transmission to WIBB.

Continuing on the Top Band theme, GM3YOR says he is sorting out his scores for the Table ready for an up-date next time round; and meantime he has some very wise words to say about the new NFD rules; summed up, if you have enough CW operators to put in a station, you're "in," but if you haven't, then tinkering with power levels won't persuade the phone chaps into enthusiasm enough to make up a team. Drew, luckily, is in an area where there is enough in the way of CW operation to produce a team for *any* contest (lucky chap!). Try and get a contest interest, phone CW, in this one's home area, and all you get is a raspberry!

A new reporter to this piece is G4AEJ (Birmingham 25). Len covers all bands, from Top to Two, between an AT5 with RA1 receiver on Top Band, TS-510 for the HF ranges, and 2200G for Two-metre work. However, it is of Top Band that G4AEJ writes, and he can claim an even smaller bit of garden than that of G2BJY, of which we have previously talked, which means problems where Top Band operation is concerned. However, on *calm* days, a sixty-foot top-loaded vertical is "un-telescoped" from its hide-away, and son G4AEK is "persuaded" to give up his Sphinx, and battle is joined, with the results indicated in the Table.

Twenty Metres

Got the "works" last time, so we will just be indicating in briefest terms that went on.

GM3YOR found things surprisingly good till late at night and even into the small hours; and it was very noticeable how, just before closing down the EU QRM would subside, leaving things just nice for a quick DX contact or two. Perhaps the most interesting QSO was with HC1XG, talking about his trip to HC8, which caused Drew to stick at it until the time to go to his night-shift work; no joy, but lots of GM8's boasting how *they* got through while GM3YOR was at the salt-mine!

G2BY mentioned the blackout on April 1, as did so many others; but on the other hand he remarks that 20m. has been "opening a wee bit"—cautious comment, that. KL7PI, 5U7BA, ZS6ARS, DU6RH, HH9DL, and the "usual collection" of W6 and W7 OT's all booked in prove that G2BY hasn't lost the knack acquired through 53 years of Amateur Radio.

April for G3NOF looked like rather better conditions on Twenty, at least in the early morning periods, with VK, ZL, JA, KL7 all good signals; Africans have been noted during the early evenings, and W's from 1100 to after midnight on some evenings. Contacts were made to AH3FF, AH3FG, A35AF, HR1SO, JA5IMH/MM (in the South Atlantic), KL7DZH, OE6DK/YK, VK1ST, VK2DT, VK2AMD, VK3NF, VK5BC, VP9BK, VP9GD, W4EV/VP9, ZE1DP, ZF1MA, ZL1BLR, 5Z4FB, 5Z4OT, 5Z4PG, 8P6CC, 9G1LZ, 9J2DA and 9G1JZ.

G2BJY (Walsall) is at the time of writing up to his knees in gardening, so the question of why his aerial won't work W's is as yet unsolved, although the few he does knock off give out 599 reports! Geoff enclosed a sketch map of the fine collection of public-utility and telephone wires within striking distance of his aerial, which must give the sparrows quite a problem in navigation! However, Geoff does get out much more easily to the East, and makes comparison in this respect with GW4CXM, who seems to radiate well to the West but not to the East which in Newport could be a problem of the terrain, which is pretty hilly.

GW4CXM (Newport, Gwent) by chance is next in the pile, and seems

to have stuck to CW and SSB on Twenty, where on occasion he has been around to see the band close after midnight-zulu. Thus, CW came up with AJ3AA, EP2EA, G3TZL/MM, HC1XG/HC8, JA6AGS, K6VFN, KV4CI/MM, LU5DON, LU9CV, PY6AOV, PJ2HT, VE7DFO, VE7CHK, VP2MB, W6BS, W7KHD (Arizona), W7WN (Montana), WB0QBT, YV4AMG, ZS1PH, ZS1EO, ZS5EL, ZS6KT, ZP9AY; while the SSB accounted for C5AH, D2AZV, EL1K, EL7E, EL80, FC9UC, HZ1AB, OE6DK/YK, TU2EG, TU2GO, VU2ACD, ZS1WW, ZS1DH/M, ZS3KC, ZS4PB, ZS6's, 5Z4NG, 6Y5GB, ZD7FT, ZD7SS and 7P8AC.

GW4BLE (Newport, Gwent), and GW4CXM seem to be well and truly in competition nowadays. However, it is all nice and gentlemanly, and GW4BLE merely reports his list as: CW to AC6ID, N8MI, K5BZ, 4X4HQ, and an assortment of calls in the Bermuda contest, plus SSB to HI8XJD, HK3COC, HP1SH, KL7IFM, PY0UG, PZ1AR, PZ1BG, TI2MEF, TI2FT, VP1AW, VP2AB, VP2KA, VP2KF, VP2VBK, VP80K, VR8A, YV5CEZ, ZS3KC, 4Z4PR, 6Y5PM, 8P6FU, 8P6FW and 9Y4VP—not to mention all W call areas and about twenty VP9's during the contest. Rather interesting in that the GW4BLE rotator decided this was the time to give up, so the VP9's were worked on a beam heading of about 350°.

G2HKU (Sheppey) had CW talks with UA9HD, UK0LAB, UL7NAN and VE1CD, but his regular sked with ZL seems for the moment to be *kaput*.

DX Doings

G3AOS reports that once again he will be over in the States during June, July and early August, signing G3AOS/W4, fixed, portable, and so on, particularly during the ARRL Field Day, when he will be trying to work G's on Twenty and Fifteen from the most southerly point in U.S.A., near Key West. All U.K. contacts will be QSL'ed.

I2CBM writes to let us know he is going to Ustica Is., May 27 to June 5, signing IE9CBM in the IOTA interest; look for him around 3780, 7080, 14190-14240, 21290, and 28590 kHz SSB, the latter band being checked regularly every couple

of hours. QSL's go to I2YDX, Box 4, 21100 Varese, Italy, and there will be a special one for those who are after IOTA.

Bill, WB7ABK did not make it from Cocos-Keeling, and was later heard briefly from Thailand before he moved to Nepal, where he was signing 9N1MM from Fr. Moran's station, almost exclusively on CW so as to give the key-bashers a chance. His next moves were to have been to A6X and then on to A4X, although the threatened liaison with Gus Browning seems to be becoming rather unlikely as Bill heads towards Africa in his travels—they were to have met up in Bhutan around May 20.

As for Lloyd and Iris Colvin, they did finally make it to New Hebrides, and our latest information has it they are signing YJ8KG and staying there for, relatively, quite a while.

Baja Nueva activity is on the cards—maybe, indeed, over by the time this reaches you, or on the other hand maybe not till mid-June; the vagueness, masters, not of *our* doing, but of our news.

Looking onwards a little, we hear that a Mellish Reef show might be on the cards, by VK3JW who did the previous one; this, however, will not be until mid-summer 1977, which is mid-winter down there of course. Another one for 1977 is Malpelo; Colombian independence anniversary year is 1977, and the activity may be connected.

What's it worth for a genuine BY contact? BY5TT, giving name Li, and W7VB as QSL manager, has been reported by stations in various parts of the world, and there are

even rumours of QSL cards in European hands. The story we have is of operation being only permissible between 1200 and 1330z and on 14017 kHz, though other rumours indicate hearing them on 14026 and 14004 kHz. The station is said to be in Peking. If all this is true and the station is genuine, then we are seeing a breakthrough at last, China being the biggest country in every way which has barred genuine Amateur Radio operation. Since amateurs are normally only prohibited in those countries where the government is unstable and worried, surely the absence of amateur activity by Chinese nationals has meant a serious loss of face to the Chinese Government?

And of course, the "other" Chinese government, in Taiwan, has at least one licensed amateur in BV2A, who of late has been authorised to operate SSB as well as CW; the problem here, it would seem, was largely the difficulty of getting a licence.

GB2MT will be on between July 24 and August 1, 80-40-20 metres from the City of London as a Marconi commemoration—the first demonstration of wireless was given to the Post Office in St.-Martins-le-Grand on July 27, 1896. QSL's for this one to G8ITS, QTHR.

Sign-Off

Which is where the space does run out! However, next month, if you all keep the letters rolling, we shall be back to normal; deadline date is June 8 to arrive, latest, addressed as always to "CDXN," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

TOP BAND COUNTIES/COUNTRIES

Starting date, November 1, 1975

Call	AM	CW	SSB	Countries	Total
G4CBQ	23	86	71	13	193
G4EAX	50	25	80	10	165
GW3WMY	71	80	0	10	161
G4EPL	17	46	78	10	151
G4AEJ	36	48	14	5	103
G4AYS	18	58	—	6	82
GM3YOR	—	—	—	27	27

Scoring is on the following basis: one point for a county on SSB, two per county on CW, and three per county on AM. In the case of an AM/SSB contact, claim two points, scored in the AM column by the AM station, and in the SSB column by the SSB station. No other cross-mode contacts permissible.

THE IC-202 SSB/CW TWO-METRE TRANSCEIVER

NOTES ON DESIGN, CIRCUITRY AND PERFORMANCE

IN the past few months the *Icom* IC-202, two-metre SSB/CW transceiver, has been available in the U.K. This review is that of a typical purchaser who has judged the performance in comparison with other equipment in regular use.

Packaging

The equipment was supplied for review by Waters & Stanton Electronics of Hockley, Essex and arrived safely and well packed, the transceiver and accessories being neatly fitted into an expanded polystyrene box. The nine, U-11 size dry cells are packed separately and fit in half of one side of the transceiver—see picture.

The Manual

The instruction manual is a quality production with very clear photographs, drawings and block diagrams. These are self explanatory—which is just as well since the text is in Japanese! The circuit diagram is in English and is one of the best seen lately. It measures $27\frac{1}{2} \times 18\frac{1}{2}$ inches and is separate from the manual which excludes a circuit diagram.

Description

The IC-202 has provision for tuning four 200 kHz segments of the two-metre band, coverage supplied being 144.0-144.4 MHz. The "works" are housed in a neat case $7\frac{1}{4}$ inches high, $2\frac{1}{2}$ inches wide and $6\frac{1}{4}$ inches deep plus knobs, based upon a very robust, one piece, U-shaped diecasting forming the bottom, rear and top. The front panel is a solid, matt satin black "camera style" casting, the main feature of which is the very smooth tuning dial, one revolution of which covers 70 kHz.

Above the dial are the rectangular Relative Power/

S-Meter and red LED indicator, whilst immediately below are the RIT control and four-way band switch. Below the band switch is the four position function switch—Off/On/On-plus-Dial Light/External VFO—and the microphone socket. Below the RIT knob are two toggle switches—Receive/CW and Noise Blanker On/Off—and the audio volume control. At the very bottom are two miniature jack sockets for the key and external loud-speaker. Both jack plugs are provided together with a small earphone for private listening.

On one side there is a rubber bung, removal of which gives access to the external VFO socket and on the rear panel is an SO-239 socket for an external aerial and a jack socket for an external power supply of 13.8 volts DC. A plug for the latter is supplied but not for the VFO and aerial. Access to the battery compartment and VXO board on one side and the main printed circuit board on the other is gained by removing the vinyl covered, aluminium side panels secured by nylon press studs. Brackets are provided for attaching the adjustable shoulder strap with zip-up microphone pouch. The microphone supplied has a coiled lead which can be stretched out to about five feet without pulling the 4 lb. transceiver along.

The hundreds of components are crammed on to good quality PCB's with adequate component identification. An idea of the packaging can be gleaned from the photographs. It really is a masterpiece of design to have produced such a complex piece of equipment, using so many discrete components and which works so reliably. For the statisticians, there are 26 transistors, 33 diodes and even integrated circuits.

Receiver Circuitry

The recipe for success in coping with very strong signals is a single-conversion system possessing good RF and mixer linearity, followed by a highly selective IF strip and this is the concept adopted by the Inoue Communications Equipment Corporation's engineers. A somewhat simplified block diagram is shown in Fig. 1. As is usual with this category of transceiver, the VXO, crystal oscillator and IF crystal filter are common to the

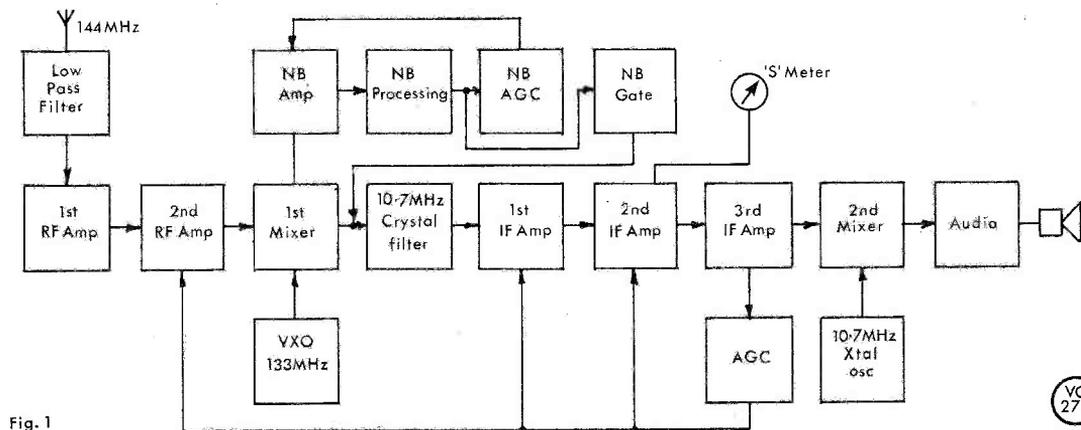


Fig. 1

Block diagram, receiver section IC-202

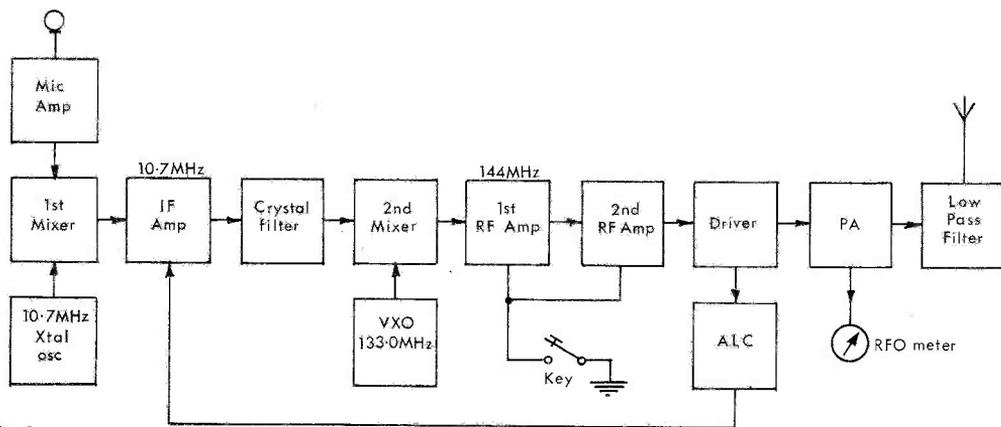


Fig. 2

VO
280

The transmitter section layout, IC-202

receiver and transmitter section. All function switching between Tx and Rx is done by diodes, there being no mechanical relays.

The 144 MHz signal passes through a two-section, *m*-derived low-pass filter into the first RF stage, then the second RF amplifier, a dual gate MOSFET. For the first mixer, a simple J-FET is used, the 133 MHz VXO mixing to produce a DSB signal fed into the FEC-103-1 crystal filter. Three 10.7 MHz IF stages follow, amplified AGC being derived from the last one to control the second RF and first and second IF amplifiers. The 10.7 MHz SSB signal is demodulated by the carrier oscillator in the four-diode second mixer, all AF functions being achieved by a single IC package giving one watt into 8 ohms. The noise blanker operates at IF and the signal is derived from the first mixer after which it is fed to a separate IF strip of its own. Here, the pulse-type interference is processed to enable the spikes to cut off the main IF signal for the duration of a pulse. The gating signal is fed to the crystal filter input.

The handbook states the sensitivity to be 0.5 microvolt for a signal-plus-noise to noise ratio of 10 dB and the aerial impedance, 50 ohms. From this data, one can calculate that the equivalent dBm is -119. With the 10 dB S+N/N ratio, this infers a receiver "noise floor" of -129 dBm. The -6 dB bandwidth is specified as 2.4 kHz (4.8 kHz at -60 dB) from which we derive a noise figure of 11.2 dB or a noise factor of 13.2.

Transmitter Circuitry

The basic block diagram of the "transmit" path is shown in Fig. 2. The microphone amplifier is an IC feeding directly into the IC first mixer, to which the carrier oscillator frequency of 10.6985 MHz is introduced. The DSB signal at 10.7 MHz is amplified by a J-FET, ALC controlled stage, then fed through the crystal filter, to remove the LSB signal, into the second mixer, another IC. Here, the 133 MHz signal from the VXO heterodynes the signal to 144 MHz. The following, two amplifier, stages are ALC controlled from a voltage derived from the driver stage, which is a 2SC998. The

two amplifiers are keyed in CW mode. The PA transistor is a 2SC1947 and some RF is picked up from the output coil, rectified and used to operate the RF output function of the meter. CW operation is presumed to be achieved by unbalancing the first mixer, which is a SN76514N, with which we are unfamiliar.

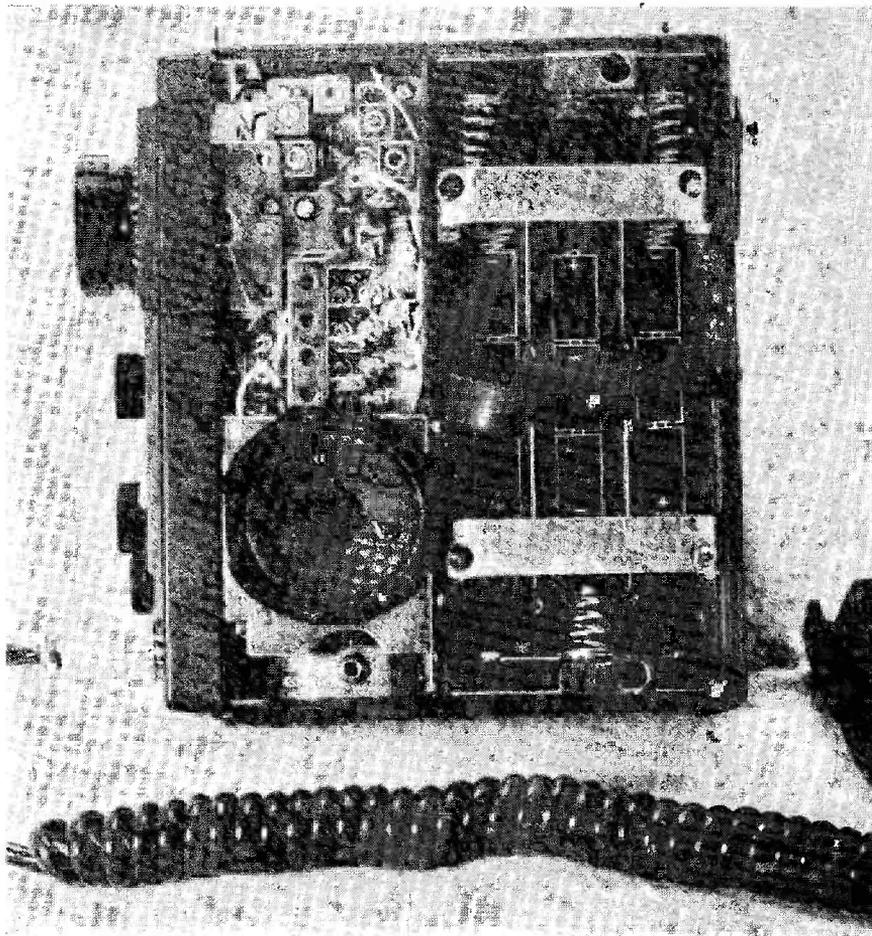
The VXO

Space does not permit a detailed analysis of the several, ingenious design features in the IC-202 but it is felt that the VXO is worthy of special mention. It was a pleasure for this reviewer to note that the Inoue folk had opted for a straight VXO rather than the synthesizer approach which has proved to be a big headache for some other manufacturers. Its block diagram is shown in Fig. 3 and the essentials of the circuit in Fig. 4. The supply rail is a well regulated 6.1 volts. Fundamental crystal oscillator range is 14.8 to 15 MHz in round figures and the handbook gives the precise frequencies for the bands 144-145 MHz and 145.8-146 MHz, the latter for satellite use. With their circuit, the designers have achieved an extremely linear tuning range of 200 kHz after two tripler stages. Alternatively, the user can plug in his own, out-board VFO tuning 133.3015-135.3015 MHz for complete two-metre coverage. Plugging-in will disable the VXO, of course.

Performance

At first glance at the figures derived from the specification, it might seem that the receiver performance would not be all that good. Whilst the sensitivity was somewhat down on that of the standard G3FPG system, on no occasion was a weak signal readable on the main receiver but not on the IC-202. The writer has a good VHF QTH on the southern outskirts of London, overlooking the Metropolis. Consequently some really potent signals hammer the receiver. It must be confessed that the 144/28.9 MHz set-up does leave something to be desired at times but by contrast, the IC-202 handled paralysing signals incredibly well.

A test was carried out with G8GGK—dubbed by



The IC-202 battery compartment. The VXO board is above the two-inch speaker, the socket below it being for an external VFO.

some the "Selsdon Beacon" due to his excellent, clean, strong signal—who ran at least one kilowatt e.r.p. directed at the G3FPK 10-element long Yagi from two miles away, line of sight. No cross modulation of adjacent channel signals was noted, nor any desensitisation. In tuning either side of G8GGK's enormous signal, a very weak mobile in London was quite comfortably copied only 7 kHz higher, a quite remarkable performance.

The noise blanker is very effective in dealing with ignition interference received at reasonable strength but seemed to be slightly less effective at weaker levels. However, unless one is trying to hear an extremely weak signal of marginal readability anyway, this is of no consequence. Only one small in-band spurious beat was discovered on 144-071 MHz and that tuned "backwards" at a greater rate than wanted signals. No images whatever from out-of-band private, commercial, public service, broadcast or television services were found.

Stability was excellent with no discernible drift.

Dropping the transceiver from a few inches on to the bench had no effect on the tuning whatever, proving it to be a very sound mechanical design.

Some Results

Some quite surprising contacts have been made with the hand-held IC-202 using its internal batteries and 19-inch whip, including two into Wales from Riddledown Common. A more bizarre contact was with G3OSS across London who was in bed at the time, with G3FPK in the bathroom! With the 10-element beam, G8JHL in Manchester was worked under flat conditions—QRB 280 km. Speech quality reports have been uniformly flattering with unsolicited comments upon the crisp, clean and very narrow signal. Undoubtedly, the crystal filter is very good and the ALC system first-class as no degradation was mentioned when shouting into the microphone as opposed to normal level talk.

A test was carried out with G3OUF in Amersham

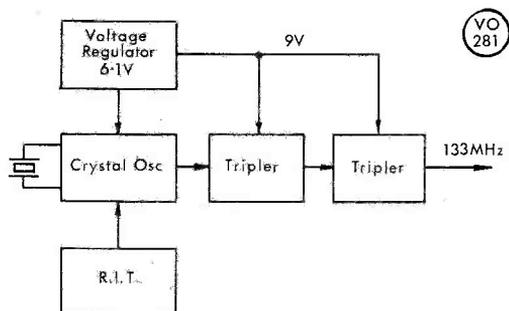


Fig. 3

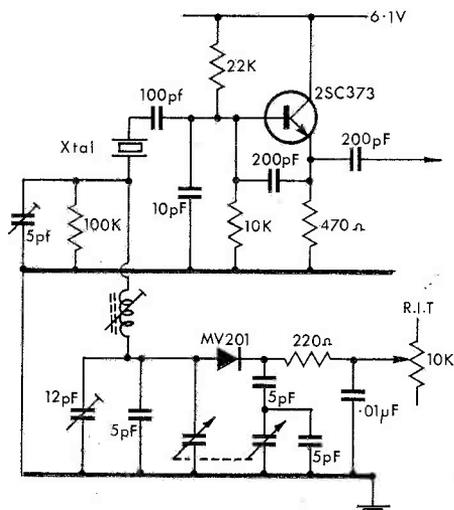


Fig. 4

VXO circuitry, IC-202

on CW, both using IC-202's. We concluded the keying to be a little hard and agree that attention should be paid to shaping if it is intended to drive a Class-C amplifier to greater output. Otherwise, T9, chirp-free keying was achieved. The RIT is a very useful feature when transceiving with CW, otherwise one is quite likely to miss a station calling at zero-beat or on the "wrong" side of the IF pass band.

Conclusions

The writer rates this a very sound electronic and mechanical design capable of a very superior performance, and has no hesitation in recommending its use to drive a high power, linear amplifier. Measurements made by G3OSS indicated that in-band *spurious* were -70 dB, whilst second and third harmonics were -60 dB below rated output. The claimed output of three watts p.e.p. was obtained on a Bird *ThruLine* wattmeter. The tuning rate of the VXO is a little too fast for those accustomed to good bandsread, but the RIT can be used as a very fine tuning control or "clarifier." One cannot pretend that

ordinary, dry batteries will last very long and intending purchasers contemplating a lot of portable work might wish to acquire a set of re-chargeable "Ni-Cads" available from Messrs. Waters and Stanton Electronics. The handbook states the following current consumptions at 13.8 volts, DC: On receive, 90 mA; unmodulated transmitter, 250 mA; SSB speech, 540 mA; key down CW, 750 mA. After a few hours' intermittent use, the no-load battery voltage was 12.5 and the corresponding current consumptions were 83 (12.0v.); 139 (11.6v.); 380 (10.6v.) and 425mA (10.5v.), the figures in parentheses being the battery voltage under load.

N.A.S.F.

HOW TO RAISE A VERSATOWER

OR, GETTING THE
PLANNING PERMISSION

A. J. HOLMES (G4CRW)

IT lay in the garden for several months. It had to be moved each time the grass needed cutting. The children kept falling over it. Their balls were always getting lodged in it. My Wife fell over it. There was no doubt, something had to be done about it. I pondered, with some dismay, at the thought of digging the hole to accommodate the butt end of this monster.

Several ideas were bandied about. "Get rid of it," said my Wife. "Perhaps I should get someone in to dig the hole," said I. "Why not get in a barrel of beer and invite the Students from the local College to come and drink while digging." "Why not get rid of it?" said my Wife.

Whilst all this pondering was going on, another job reared its ugly head. My Wife had decided on a major re-organisation of the garden, and part of this re-organisation entailed moving a sizeable piece of ground. It was when I had just about finished this removal job that it struck me I had dug enough holes to accommodate about four Versatowers, and the job had not been all that difficult. With fresh heart I decided to take another look at the mast.

The next problem was to find it. I knew it was in the garden somewhere. After all, I remembered having seen it some months previously, and a thing that size just couldn't walk away by itself, surely. Isn't it surprising how quickly the weeds and undergrowth grow?

Two or three days after sending my children out on safari, the message came back,—"All is well, mast is safe and sound," "What a pity," said my Wife.

I glossed over the formality of obtaining planning permission and went ahead and dug the hole. For the benefit of anyone who contemplates a Versatower, this part of the work took my sedentary person about eight hours, at the rate of, dig for five minutes, rest for fifteen minutes, and at this rate I reckon a fit man would probably do the job in two to three hours.

Fitting the groundpost was simplicity itself. I wedged a piece of wood across the top and from this suspended a plumb bob on a piece of string. This enabled me to keep a check on the "verticality" of the groundpost as

the hole was back-filled. At this moment I decided to accept the manufacturer's recommendation that mass concrete would not be necessary in the sort of conditions that I could expect in my area. The backfilling took much longer than digging the hole as I wanted to be sure that the earth was properly consolidated. Each shovelful of earth was thoroughly tamped down with a heavy chunk of timber before another shovelful was added.

A constant check on the plumbline was kept, and, in fact, the back-filling was by far the longest part of the heavy work, taking about a week, doing a little each day. For anyone contemplating mounting one of these masts straight in the ground I would recommend the greatest patience at this and the next stage, which in my case, was to wait about three months for the ground to subside further.

One should remember that when you have dug a hole six feet deep, the soil takes time to settle back to the same density that it was originally. When I was satisfied that the groundpost was properly firm the next problem became obvious. How was I, with my bad back, going to lift the end of the mast approximately nine feet into the air in order to fit the pivot pin? The first person I thought of was my Wife, but I was afraid she would only grumble if I hoisted it upon her back. No, it had to be at least one other man. Now, most of my neighbours are elderly, and I felt I would not like to be responsible for the early and unexpected demise of any of them. This left me with but one other choice. With the assistance of the son and prospective son-in-law of the house the mast was soon standing, but minus the antenna, of course.

Neighbourhood Reaction

In order to test neighbour reaction the mast was left in this state, and about three months later it was decided to start assembling the beam—a Gem Quad. This was my undoing. A very happy week-end was spent in putting together the reflector, and with the week-end drawing to a close the mast was raised to the vertical. It was whilst I was winding the mast up to the vertical position that I became aware of a neighbour whose help I had sought leaning over the fence with a rather irate and agitated expression and saying rude things about my mast and Quad. "What's that, Fred?" I said. "I hope that ugly great thing isn't going to stay there for long. It's bad enough having a great dockyard crane in your back garden without that thing on top of it," said he. I stepped back to admire the delicate waif-like structure, then turned and said "Well Fred, you know beauty is in the eye of the beholder,"—and carried on winding.

Council Encounter

One week later I received a letter from the local Council inviting me to apply for planning permission for the radio mast. In anticipation of this, I had obtained a reprint of an article "Aerials and Planning Permission," by J. A. Crux, G3JAG. This article was extremely useful, although at the same time rather depressing. My Wife and I both had the feeling after reading it, that it really was not worth the effort, but having been forced into the application and in spite of everything, I felt I had nothing to lose but a little spare time. I started to collect together

all the relevant information (in triplicate, of course) plus one copy for my own reference. G3JAG's article contained the following two suggestions:—"Canvass the neighbours," and "Canvass the Planning Committee."

At this moment it was clear that there was at least one objector. Probably two, if we counted the one who didn't talk to us anyway. So, with much trepidation and great caution, I sounded out one neighbour. "Well, Alan," he said, "the trouble is that everyone thinks you are going to cause a lot of TV interference." This was an interesting comment as I had been working most of the HF bands for several months, and only now was there any concern over the possibility of TVI. However, the general tone of the conversation heartened me. And so, on to the next stop—a young couple. Again a favourable reaction, but again the concern over TVI, followed by a remark that the elderly family next door had been having some television trouble. It was clear that the next visit had to be to these people and that it would be better for me to broach the subject of TVI rather than leaving it to the people I was visiting. So from this moment I made a habit of asking everyone I spoke to whether or not they were suffering from TVI. Now this may seem like sticking your neck out, but I found that the question paid off, and digressing for just one moment, it appeared that at the time the unadorned mast appeared, three people in the immediate vicinity did have TV troubles. Two of them were assured by two independent TV Repair Companies that there was no connection between my activities and their TV troubles. The third was a rental set served by a young man who, when asked the inevitable question, declared "I'll check on whether he's got a licence for it." "It" presumably being the mast. It would seem that this district is blessed (in the main) with some very intelligent TV service engineers.

Progress

Each visit I made encouraged me more, and of the sixteen houses I visited I received not a single objection. (Needless to say I did not approach the householder who had made the initial objection). Whilst on these travels a visit was made to the local representative on the County Planning Committee and this one visit was, of all, the most valuable. To anyone contemplating an application of this kind it is essential to get the approval and support of at least one member of the Planning Committee and the importance of the personal contact cannot be too strongly emphasised.

In my case the Local Planning Representative (L.P.R.) was also the Chairman of the local Parish Council. (The Parish Council, incidentally, also have a say in local planning matters). Now this one man gave me representation on two bodies and thus was a great asset.

Having, by now put some degree of effort into this application, I sat back for a breather. But this was not to be allowed. The local Council had decided that they were going to press me as hard as possible, and very soon I got a letter which can only be described as threatening. "If I didn't jolly soon get my finger out and get this application into the council offices they would obtain an enforcement order to get this thing taken down *toute de suite*, if not sooner." This attitude was a little worrying as it now seemed that there may be forces at

work more powerful than my allies and so far all I had was a set of drawings and the approval of the L.P.R. During a QSO with another amateur, who had had a similar problem, it was suggested that it would be advantageous to get the neighbours to sign a letter showing support for the application, as, in any case, the local Council may well write to any affected neighbours informing them of the application and inviting comment. It would clearly be of value to have a few letters of support going to the committee as well as objections, if any. This meant another visit to the friendly neighbours armed with an optimistically large pile of duplicated letters each bearing a similar message differing only by one sentence and reading as follows:—

“Dear Sir,

I understand that Mr. A. J. Holmes of 4 Castle Avenue, Datchet, is applying for permission to erect an aerial mast for the reception and transmission of Amateur Radio signals. I understand that the mast is normally approximately 25 feet high and that it is extendable to approximately 60 feet high and that it may carry at the top either a rotary beam aerial, a rotary Quad aerial or a wire aerial.” The final sentence was either “I would like to take the opportunity to support Mr. Holmes with his application for planning permission,” or “I would like to say that I have *no objection* to planning permission being granted.”

Neighbour Support

I proceeded to hawk these letters round the neighbourhood, and this was where the fun really started. At each house I visited I was welcomed in as if an old friend. Getting people to sign the letters became a mere formality and the conversation rapidly passed to other things. In fact, so sociable did I find my neighbours that it was not possible to visit more than two households in any one evening. Some neighbours were so enthusiastic that they insisted on signing *both* letters and at many houses I collected more than one signature on each letter. On one notable occasion when I left home immediately after lunch on a Saturday afternoon, I managed with difficulty to visit four houses and arrived home around 8 o'clock in the evening and had some difficulty in finding my own front door! In total, signatures were obtained from 22 separate houses and when reproduced in triplicate made quite a formidable pile of paper. Added to the pile were, of course, the drawings. Having collected all the necessary documentation it was presented at the Council offices with just one day to spare.

Council Reaction

Then came a wait of about four weeks before receiving an acknowledgement and an instruction that in the event of not receiving any notification from the Planning Committee within a further four weeks, I would be at liberty to appeal to the Minister for a hearing. Being a patient (lazy) man I allowed about eight weeks to elapse before attempting to chase the application. Unfortunately, in the interim period the County boundaries had been shifted and a new authority now had to consider the application! Fortunately, my L.P.R. had not been changed. On pressing the new Council a slightly different

reaction was forthcoming. The council representative was open enough to inform me that the official council recommendation would be initially to allow the mast for three years, and that if no objection remained at the end of that period permission would become permanent.

Further telephone calls revealed that the application had been heard and that the Chairman's comment when picking it up was “We usually put these straight into the dustbin.” At this point my L.P.R. objected and made it clear that this application was not to be treated so lightly. The upshot of his intervention was that I now have permission to use the mast and aerial for three years, at the end of which time “... the mast must be removed and the ground reinstated to the satisfaction of the local authority.” The reason given for the time limitation was that “this Committee does not wish to perpetuate a structure of this type without regard to its effect on the amenities of the district.” However, the way is obviously clear to make a second application in due course and I see no reason, (assuming that I still have the same L.P.R.) why it should not receive a favourable hearing.

It may have been noticed that all through this article, except in the title and product description, I have not used the word “Tower.” Some years ago I happened to mention the word “Tower” (in respect of aeriels) to the, then, Chairman of the Parish Council. The reaction was one of total hostility. Since then the word “Tower” has been a dirty word in this household and it is suggested that anyone contemplating a similar structure should avoid the use of this word like the plague. The term ‘Aerial Mast’ is clearly less offensive to the uninitiated.



“... suggest you stop using press-to-talk ...”

SIMPLE ACTIVE FILTER

FOR AUDIO APPLICATION

G. C. DOBBS (G3RJV)

THIS simple circuit which uses one Op. Amp. IC and six filter components and provides a bandwidth of around 150 Hz at 750 Hz.

A major problem with old, inexpensive or home-built receivers is obtaining a high degree of selectivity. It is essential to have a relatively narrow bandwidth to resolve CW, or SSB, signals on today's crowded amateur bands. In superhet receivers it is possible to obtain excellent selectivity using a crystal or mechanical filter in the IF stages. However, such filters are somewhat too sophisticated to build and expensive to buy and, if a direct-conversion receiver is being used, impossible to fit. An obvious way around such problems is to use a bandpass filter in the audio stages.

Many older receivers employ a passive L-C audio filter with carefully matched inductance and capacity values but, apart from the difficulty of obtaining the correct inductors, such filters are bulky, frequently produce an annoying "ringing" and exhibit an insertion loss. A more satisfactory method is to use an "active filter." Such a filter has an amplifier, or amplifiers, as an integral part of the filter circuit. Active filters have become very popular in recent times, and several commercial units can be bought, but active filters are well within the range of a modest home constructor.

Circuit

During the last couple of years the writer has used both commercial and home-built active filters and found them to be valuable aids to receiver selectivity. The early active filters were designed around transistor audio stages, but most recent designs use integrated circuit operational amplifiers. As one might expect the more stages of filtering included in the circuit, the better the selectivity. Each stage incorporates simple R-C filter legs, but the problem in multi-stage filters is to match the R-C values in each stage to obtain the same centre frequency throughout the unit. A natural solution is to employ high-tolerance components, but in practice the values of such components were not accurate enough to produce identical centre-frequencies in each stage—one really has to measure the values of the components to obtain a good match throughout the stages. This has been done a number of times and excellent results obtained with up to four filter stages. Recently, a single filter stage was tried with a single 741 Op. Amp. as a basic active filter.

The circuit is shown in Fig. 1. No originality can be claimed for the arrangement, which is a simple single-stage based upon several active filters built in the past. Its obvious merit is that it is very easy to build and requires no inter-stage component matching. Its simplicity makes it a suitable circuit for the most hesitant home constructor. The filter circuit provides a feedback loop which controls the gain of the Op. Amp., giving the circuit a very high "Q" at the resonant frequency. The result is high gain at the required frequency and attenuation of the unwanted audio frequencies. In this circuit, the

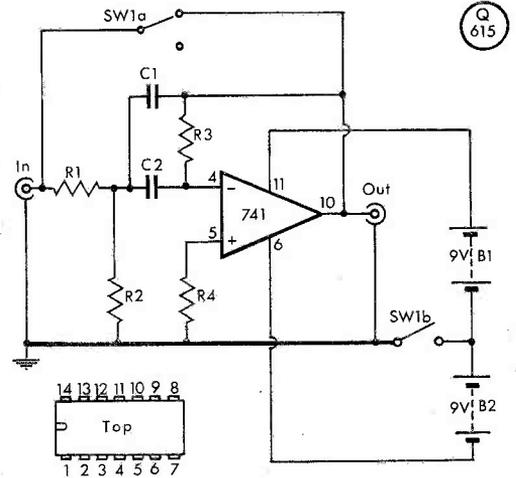


Fig. 1

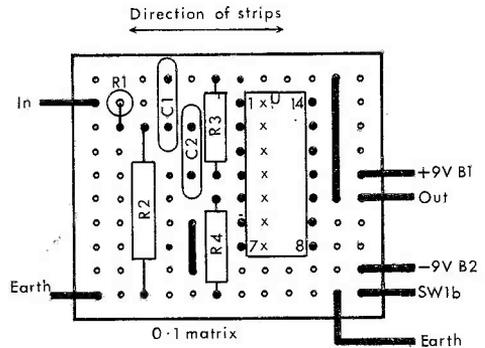


Fig. 2 Veroboard layout

Circuit of the Filter. Fig. 1. Values can be: C1, C2, .001 μ F; R1, 680K; R2, 24K; R3, 1.8 meg.; R4, 27K; IC, 741 Op-Amp; B1, B2, PP3 batteries; Veroboard, 0.1in. x 1 x 1 1/2in. Fig. 2. Shows general layout arrangement, using the slip of Veroboard.

centre frequency is around 750 Hz, which is suitable for comfortable listening to CW signals. The bandwidth has not been accurately measured but at a guess it is well within 150 Hz—which is most useful in a receiver lacking other selectivity aids.

Construction

The circuit is based upon a 741 Op. Amp. which is commonly available in a 14-pin Dual-In-Line package. A little care must be taken in selection of the IC as the 741 series is available in 8 pin D.I.L. form and the circular TO type package. It is also possible to obtain the 741 series IC's in 14-pin D.I.L. with connections which differ from those shown in the diagrams. If a different pin configuration is used the layout must be modified accordingly.

The circuit may be built up on a small piece of Veroboard, as shown in Fig. 2. The board requires

12 holes in the direction of the strips and 10 holes across the strips. It is always a good idea to have an IC holder when using integrated circuits for home construction as they can be damaged by heat and are almost impossible to remove from the board once soldered. Seven gaps have to be cut in the copper track to break the connection between opposing pins on the IC. In the interests of small space the mounting of the components on the board is very compact and care must be taken to avoid accidental short circuits. The capacitors C1 and C2 are both mounted in a confined space, so very small components are required; miniature silver mica type M1500 were used in the prototype.

The layout should follow Fig. 2, but a few points are worthy of mention. Some interconnecting of components is done along the copper strips which connect to pins 1 and 2. This does not affect the circuit since these two pins have no internal IC connections. SW.1A is not shown on the layout diagram, but simply goes across the input and output—that is, between the input end of R1

and the output from IC pin 10. The lead to SW.1B continues from the other side of the switch contacts to B1— and B2+.

Application

Headphones with an impedance of several hundred ohms or more can be connected directly to the output point, but low impedance headphones or loudspeakers, in the 3, 8 or 16 ohm range, are better connected through a matching transformer, such as the transistor output transformer type LT700. The filter can be mounted directly into a receiver or in a one oz. square tobacco tin. The *Veroboard* can be held in place with a blob of adhesive putty.

The filter has been used in the headphone output line of receivers, but it could be better placed between two early audio stages in a receiver. It is possible to overload the filter in the final audio stages of a receiver, but in practice it has been found not to happen at normal headphone listening levels.

MULTI-RANGE DC MILLIVOLTMETER

EIGHT SWITCHED RANGES

— DESIGN AND CONSTRUCTION

WHILE in amateur practice the need for millivolt measurements does not often arise, a sensitive and reliable instrument capable of making them will be found very useful once it has been built—especially if it is transistorised, with high-stability internal resistors of good quality and has a sensitive wide-scale panel meter.

The circuit is shown herewith. It works from a 9v. —HT line (battery), consuming about 0.7 mA; has an input resistance of 1000 ohms per millivolt; eight switched ranges, from 10 mV to 32v., full scale deflection; a calibration circuit, from an internal 1½v. cell; and is designed for an 0-100 microamp. panel meter, for indication.

Circuit and Adjustment

In the collector-balance configuration, the first two transistors Tr1, Tr2 take individual collector currents of 50 microamps. Since voltage gain is a function of transistor current, a variable resistor RV5 is included in the HT line to enable setting to a given level (in this case, about 7.2 volts). In use, the switch SA is put to posn. 1 (set HT) and RV5 adjusted so that the meter reads full scale. After this is done, the instrument is switched to the 10 mV range and the open-circuit (RV1) and short-circuit (RV2) balance controls are adjusted for zero meter reading with the instrument switched either to SA4 or SA5. Usually, adjustment of RV2 will be neces-

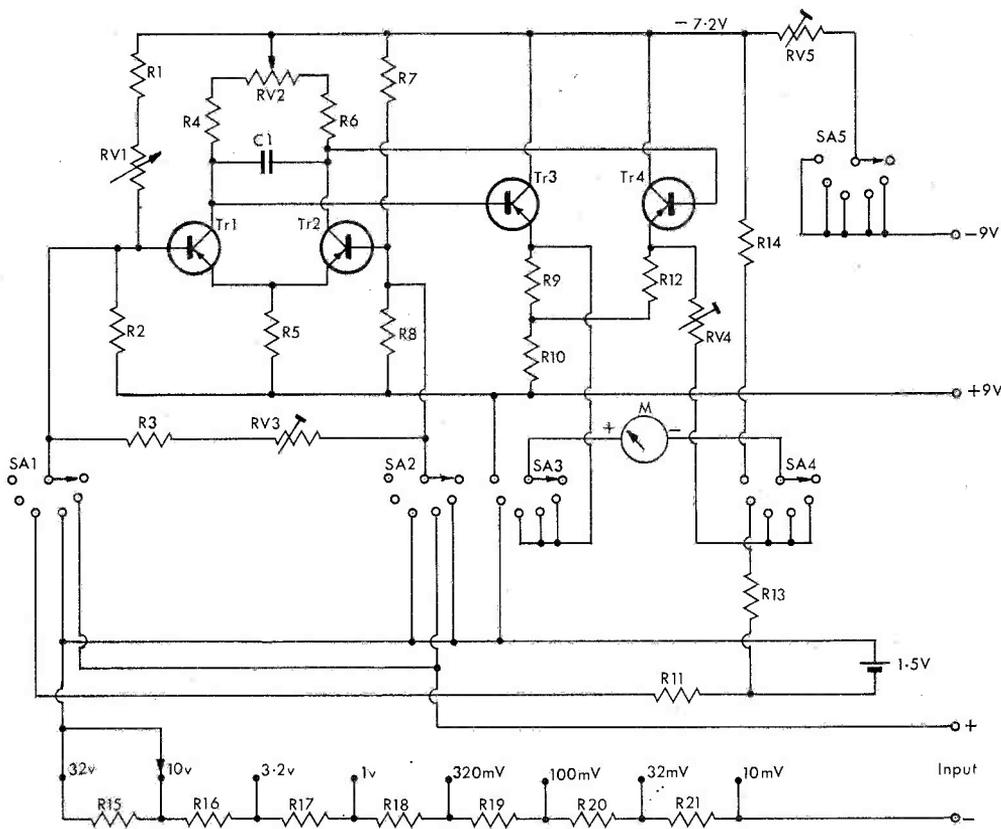
sary only at the beginning of a series of measurements, any subsequent slight zero-drift being corrected by RV1 on the range in use and with the input terminals open-circuit.

The variable resistor RV4 is used to calibrate the instrument immediately on completion and is preset so that the meter reads correctly on the 10 mV range when the input terminals are connected to an external 10 mV source having self-resistance not greater than 100 ohms. RV4 need not be accessible from the front panel because it should not normally require any re-adjustment once the instrument has been set up initially.

A 1½-volt cell is included to provide a means of calibration which is independent of the cell voltage, provided this is large enough to give a reasonable meter reading. In SA switch posn. 2 (*Ref.*), current is fed to the meter *via* the high-stability resistor R13. This current is the amplifier gain times the current fed to the amplifier through another resistance R3 on the calibration range, switch posn. 3. The amplifier gain is calibrated by making the two meter readings (in posns. 2 and 3) coincide, using RV3 after first checking that there is no open-circuit zero error on one of the operating ranges. The actual range selected for this check is not important, and may conveniently be the one to be used for actual measurement. Once calibration is complete, and given that standard 1% high-stability resistors are used, the error on any range should not be more than 3.5%. Scale linearity is adequate for most practical purposes, and the zero-error stability with temperature is better than 5% of full scale under the fairly extreme condition of a 20°C. rise in temperature.

Construction

This will be very much a matter of individual taste, and will depend to some extent on what may be available



D
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The circuit for a transistorised and highly sensitive multi-range DC millivoltmeter, covering 10 mV to 32v. in eight switched ranges, and using Mullard BCZ11 transistors throughout. Indication is on a 0-100 microamp. meter, which should be a moving-coil panel instrument of good quality. For accuracy and consistency, the resistors should be 1% high stability. The SA1-5 switch positions give: 1, check HT; 2, reference voltage; 3, calibrate; 4, read HT plus; 5, read HT negative; and 6, off. The power supply is a 9v. battery and the total current drain less than 1 mA. See text for details.

in the way of boxes. To make the best of this instrument, obviously a good-quality 0-100 microamp. moving-coil panel meter, with an open scale, is a necessity; it should not be less than 2in., and could be 3in. with advantage.

Panel space and box dimensions will be determined mainly by this meter, allowing also for the switch assembly SA1-5; the knobs for controls RV1-RV3 and RV5 (RV4 being internal preset); the range selector switch, and the input and battery terminals.

The resistors can be arranged in clusters and the four BCZ11 transistors will take up very little space. By making the box large enough, the 9v. HT battery as well as the 1½v. calibration cell could be accommodated internally. With a suitable carrying handle, a neat, practical and sensitive test instrument would be the result.

Table of Values

Circuit of the 8-range DC Millivoltmetre

C1 = 0.25 μ F	R16 = 6.8 megohms
R1 = 250,000 ohms	R17 = 2.2 megohms
R2, R8 = 100,000 ohms	R18 = 680,000 ohms
R3, R5 = 10,000 ohms	R19 = 220,000 ohms
R4, R6 = 33,000 ohms	R20 = 68,000 ohms
R7 = 300,000 ohms	R21 = 22,000 ohms
R9, R12 = 3,300 ohms	RV1 = 100,000 ohms, var.
R10 = 4,700 ohms	RV2 = 25,000 ohms, var.
R11 = 2.2 megohms	RV3 = 50,000 ohms, var.
R13 = 22,000 ohms (incl. meter resistance)	RV4, RV5 = 5,000 ohms, var.
R14 = 72,000 ohms (incl. meter resistance)	TR1, TR4 = Mullard BCZ11
R15 = 22 megohms	

Note: All fixed resistors standard 1% high stability ½-watt

INDOOR QUAD FOR TWO METRES

SIMPLE PRACTICAL DESIGN

I. D. POOLE, B.Sc. (G3YW X)

It is a fact well known that in any station, whether Tx or Rx, it is the aerial which counts. However, it is equally true that not everybody can have the aerial they want, and it was in this situation the writer found himself when setting up a two-metre station. On the HF bands an indoor bent dipole had done exceedingly well, but an indoor dipole for Two left a great deal to be desired. Therefore, a more efficient aerial was a necessity. The normal Yagi array was said to be greatly affected by nearby objects, and accordingly would not perform to its best in a loft, besides which everybody else was using one and a "break from tradition" would be no bad thing. The Quad was seldom heard of on two metres, although very good reports were given of it on the HF bands, the main disadvantages being connected with their size and wind resistance which, of course, would not be important in an average-size loft. The great advantage of them in this rôle was their relative immunity to detuning by proximity effects. This settled it! A Quad was constructed—first, a two-element version but later two more elements were added.

Theory of the Quad

The development of the Quad can be seen from Fig. 1. The basic idea was to start with two driven dipoles spaced by a quarter-wave, which those readers who have braved the wise books on the subject will realise gives a low angle of radiation. The next step is to bend the two ends, as shown in Fig. 1(B), whilst still retaining the separate identity of the two driven elements. The final stage in its development is to join the two ends of the dipoles, and in effect drive the second dipole from these points, hence eliminating the necessity for feeder drive for the second dipole.

Having obtained the basic driven element, one can then apply the same principle as is used in the common Yagi array. Like in the Yagi the reflector is larger and the director is smaller than the driven element by about 5% in each case. The same result can be obtained by the use of stubbs, which will be either open or short circuit depending on the use.

Practical Version

Theory is of very little use unless it can be put into practice and hence the next step was actually to make the aerial. In order to keep the woodwork simple (a necessity at G3YW X) it was decided to use the stubb approach so that all the elements were the same size. This entailed making four crosses (Fig. 2) out of $\frac{1}{2} \times \frac{1}{2}$ inch wood batten. Each corner had a slot cut in it to accommodate the wire, which should not be too thin otherwise the bandwidth of the system would be reduced.

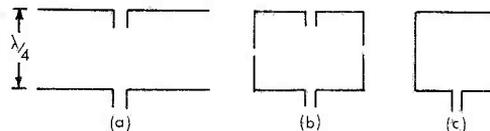


Fig. 1

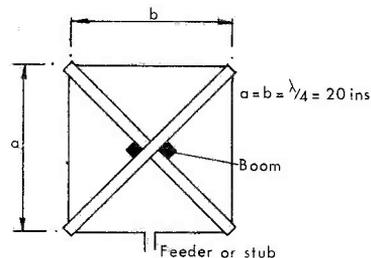


Fig. 2

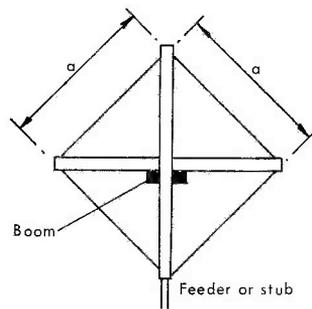


Fig. 3

The stubbs should be about 3 inches long to begin with but to be altered if necessary. In practice, the aerial was found to be very tolerant of reflector/director stubb lengths and of element spacing. The reflector should have a short circuit stub and the director open circuited.

As it is a little difficult to mount the boom on to a mast the design of the aerial can be altered to overcome this (Fig. 3). This method does, however, have the disadvantage that the voltage points in the aerial are not suspended in air but are in line with the horizontal bar.

In practice this aerial as illustrated has worked well in the loft. Good reports have also been heard of more robustly constructed ones used externally. The author's aerial has given reliable local coverage and also, in good conditions, has enabled QSO's over 200 miles to be made. The sketches herewith will be self-explanatory—and keen SWL's unable to erect an outdoor beam might also find it worth trying.

THE CONTEST POWER UNIT

NOTES ON MAINTENANCE

J. KING (G4EMC)

THE outdoor-event season is once again approaching, and numerous Clubs, Societies and individuals will be using portable generators to power their rigs. Reliability over the period of the event (and of the whole season) is highly desirable, to say the least.

Now is the time to purchase a new one, or to look to the maintenance of the old one.

Should you (or your Club) be contemplating the purchase of a new "genny," however, some thought must be given to its suitability. It must be capable not only of supplying the power to the rig, but it must also have sufficient reserves to power such lights as may be needed, and probably a kettle, too! Some power units will deliver 240 volts AC, and 12 volts DC, but not always at the same time! The choice of a petrol, or a diesel, engine is another factor in your choice. The type selected, will mainly depend upon the amount of use it will get. On the whole, petrol units are cheaper to buy, but more expensive to run. Unit life is another consideration, where the diesel will score, on longevity, reliability and lower fuel costs.

Maintenance

Petrol: The engine should be decarbonised at least once during the year if it is used frequently, the valves reground and set to the recommended clearances. This is achieved by a simple shim adjustment, or by a screw-and-locknut on the rocker arm. *Always* change the cylinder-head gasket, as the re-use of an old one is false economy, and will lead to blown head joints. (Embarrassing, in the middle of a contest). While the cylinder-head is off, check the amount of wear present just below the top of the cylinder bore. Generally, if it is less than 3 to 5 thou., new piston rings will suffice. More than this will probably qualify the cylinder for a re-bore. Change the engine oil at least twice during the year, as these small engines do not have such accessories as oil-pumps, or oil filters, relying on splash-lubrication to keep things oiled. Ignition contact-breaker points should be checked for wear on both the points, and the pivot bearing, whilst the cam, or cam ring, should also be examined and lubricated by the application of a spot of high-melting point grease to it, or by placing a couple of drops of thick oil on to the felt pad, if one is used. Points wear is usually only slight, as there are many fewer volts or amps. passing through than in your car. It is, however, important to check the contacts, as what can happen is that if the engine is left over the winter, with the points open, surface corrosion may occur on them, making for difficult, or non-starting. With an older unit, it may be a good idea to change the points, anyway, as the spring can lose quite a lot of its tension over the years, and this can lead to problems with misfiring when the engine is hot, and under load, as the points do not faithfully follow the profile of the cam.

The sparking plug gets quite a hammering in these small power units, so it is a good idea to renew it with

another of the recommended type, and also to have a spare. After the engine has been in use for some time, on the day, it may be found that the engine begins to lack power. One possible cause may be that the plug is overheating. A change to another of a higher heat rating is to be recommended.

Diesel Engines: Decarbonising is not so often required with this type of power unit, as they tend to run at a higher temperature than a petrol engine, and the carbon is burnt off, rather than deposited. The valves, too, have an easier time, and require less attention, or adjustment. On the other hand, it is vital that the fuel-injector and the fuel pump are serviced by no-one other than a specialist, as these are very difficult to set up without the special tools and equipment needed to do the job properly.

Your diesel fuel is also the lubricant of the pump and injector, therefore it must be kept clean, and free from dirt and other pollutants. To prevent expensive damage, use only clean cans and funnels. These engines must not be allowed to run out of fuel, as this will permit air to enter the fuel system, which will have to be bled out before the engine can be run again.

The main lubrication of these engines is more sophisticated than the petrol driven type, and is put round the engine by an oil pump, and is usually filtered as well. It is as well to change the oil and filter at least once during the year, or more often still if the unit is often used.

General

Make absolutely certain that the unit is oil tight, and that it will give you all the power you need. Output can be tested by running it into a load, typical of the output to be used. (An electric fire is quite suitable for this purpose). A run of about an hour should discover if all is well. During this test, keep a check on the fuel consumption, as this will be a guide for whoever is made responsible for keeping the unit going during the event. Check that all the nuts and bolts are there, and suitably tight, also that the electrical connections are sound. Look out for your machine and it will serve you well.

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USEFUL TIMING CIRCUIT FOR BLEEPER MONITORING

J. S. CUSHING (G3KHC)

REPEATERS at present in use in the Two-Metre Band have two features among others intended to promote correct usage. One is the need to modulate the input carrier at the start of every transmission with an audio tone and if this is done correctly the repeater will stay open and retransmit a frequency modulated signal received at its input.

The second feature is that having retransmitted an input signal for about one minute the repeater closes down, doing much towards promoting business-like "overs" as well as actively deterring any station from hogging the frequency.

The matter of providing an audio tone is not considered here. Many factory-made transceivers include a suitable oscillator and plenty of data has been published on oscillators suitable for inclusion in gear lacking a tone-burst (which can also be obtained as a separate unit).

Less attention has been given to ideas for restricting the length of overs to less than a minute. Perhaps this is because it does not matter too much if a transmission does run over the minute, but as this is so easily done, leading to requests for repeats and some confusion, and as it is quite easily avoided with the aid of a simple timer, such a circuit is well worth considering.

There must be a vast number of circuits which can be used in timing circuits and the one shown here is based on discrete components. It provides at the end of about 60 secs. a short audio tone, or *bleep*, and can include a light-emitting diode which flashes briefly to give a visual signal.

The circuit as shown in the diagram is in two parts. On the left circuitry around FET1 and UJT1 is the timing circuit and a flash from the LED indicates the end of the timing period, though if an audio signal is required the coil of a small loud speaker may be wired in series with the LED.

When the ambient noise level is high, e.g., operating mobile, a sharp click from a speaker wired in with the LED can pass unnoticed, hence the remaining circuitry around UJT2. This is a simple relaxation oscillator to provide a momentary audio pulse at enough volume to be heard in most vehicles.

Almost all timer circuits are based on a capacitor being charged or discharged through a resistor, in this instance corresponding with C1 and the combined value of R1 and VR1.

Functioning

In more detail the circuit functions as follows: When S1 is in the position shown C1 is shorted, hence no charge or voltage is present across it. At the same time all the circuit is turned off so no current is taken from the supply. If S1 is thrown to "Time," C1 is now charged by current flowing through R1 and RV1 and after a period the field-effect transistor passes enough current also to charge C1 to a voltage sufficient for UJT1 to fire.

When the unijunction transistor is activated, current momentarily passes through the LED giving a flash of light, clearly showing the required time interval has elapsed.

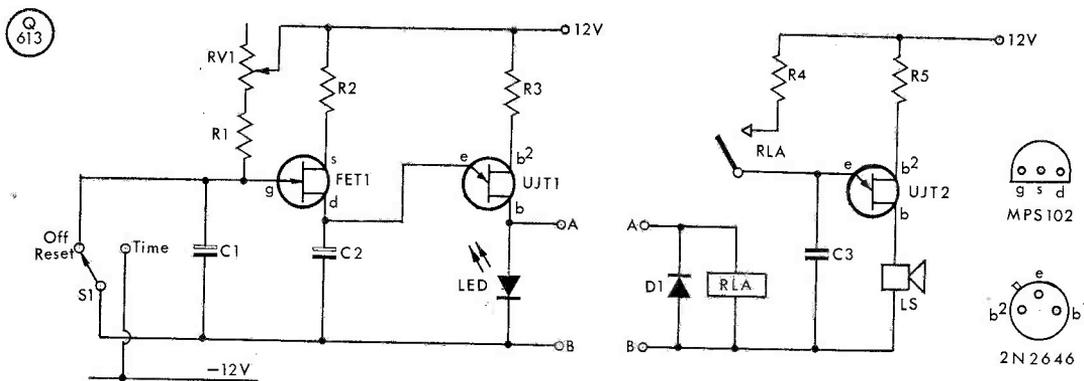
If a *high* impedance voltmeter (a valve voltmeter, for example) is connected across C1 or C2 the build-up

Table of Values

Circuit of the Timing Device

C1	= 100 μ F, 25v.
C2	= 50 μ F, 25v.
C3	= 0.1 μ F
R1	= 47,000 ohms
R2	= 10,000 ohms
R3	= 1,000 ohms
R4	= 12,000 ohms
R5	= 470 ohms
RV1	= 1 megohm
FET1	= MPS-102
UJT1,	
UJT2	= 2N2646
D1	= Small-signal diode
RLA	= Reed-relay 6-9v. coil
LS	= 3-30 ohm voice coil
S1	= SPDT

Circuit of device discussed by G3KHC.



Circuit of device discussed by G3KHC.

of voltage can be monitored and the point at which UJT1 fires noted.

After the LED has signalled the end of the cycle S1 should be thrown so C1 is discharged, so allowing a fresh cycle to be initiated which may be at once or after an interval.

If S1 is not thrown a new cycle will start but the time of this cycle and any subsequent ones will be rather shorter and may serve to act as a reminder to change S1.

Should the remainder of the circuit be added, the relay will close briefly every time UJT1 fires and as the relay contacts close, current is applied to the emitter of UJT2, allowing this part of the circuit to oscillate. The LED can remain in circuit to give a visual indication.

This type of circuit does not seem to be particularly critical so very probably alternative or a similar FET or UJT would do. One or two components are, though, to some degree critical. The two electrolytic capacitors (C1 and C2) will be satisfactory if they have a normal very slight leakage, but should the leakage be greater the voltage rise might not be enough to allow correct operation.

The relay must obviously be a sensitive fast acting type. A reed-relay with a six to nine volt coil proved

satisfactory and should certainly be used if one is to hand.

Variation of the audio frequency produced by UJT2 can be achieved by altering C3, or increasing R4 in-value.

One shortcoming of this timing circuit is that variations of supply voltage have an effect on the timing period. This is not too great and on the bench with VR1 set to an intermediate position a time of 45 secs. was noted with 12 volts applied. Increasing the voltage to 14 gave a time of 47 secs. but it is felt this degree of variation is not enough to cause any problems.

Construction

Construction of this timer is very much an individual matter. The simplest approach is to use a small case and to include a dry cell 12-volt battery, thus making it a self contained unit, as only a few mA of current is taken and then only when timing. This allows use in a car or indoors, as required.

A more elaborate approach would be to couple S1 into the transceiver, so switching to "transmit" would also initiate a timing cycle, and perhaps ideally a timer could be built into the gear, though scheming out how to do this might pose one or two problems.

LIST OF COUNTRIES BY PREFIX, ALSO SHOWING ZONE

Current Prefixes, with Zones in brackets

after Country names

(Continued from p.110, April)

FO	French Polynesia (31), (32)	HC8	Galapagos Is. (10)
FO	Clipperton Island (7)	HD	(see HC)
FP	St. Pierre and Miquelon (5)	HG	(see HA)
FR	Reunion (39)	HH	Haiti (8)
FR---/G	Glorieuses Is. (39)	HI	Dominican Republic (8)
FR---/J, /B, /E	M o z a m b i q u e Channel Islets (Juan de Nova, Bassas da India, and Europa) (39)	HK	Colombia (9)
FR---/T	Tromelin (39)	HKØ	San Andres and Providencia (7)
FS	St. Martin (8)	HKØ	Bajo Nuevo (8)
FW	Wallis and Futuna Is. (32)	HKØ	Malpelo (9)
FY	French Guiana (9)	HL, HM	Korea (25)
G	England (14)	HP, HO	Panama (7)
GB	Great Britain (special stations)	HR, HQ	Honduras (7)
GC	Jersey (14)	HS	Thailand (26)
GC	Channel Is. (excluding Jersey) (14)	HT	(see YN)
GD	Isle of Man (14)	HU	(see YS)
GI	Northern Ireland (14)	HV	Vatican (15)
GM	Scotland (14)	HW	(see F)
GW	Wales (14)	HZ	Saudi Arabia (21)
HA	Hungary (15)	I	(also any prefix in the I series not listed below)
HB	Switzerland (14)	IA	Italy (15)
HBØ	Liechtenstein (14)	IB	Tuscan Archipelago (15)
HC	Ecuador (10)	IC	Ponziane Is. (15)
		ID	Napoli Is. (15)
		IE	Eolie Is. (15)
		IF	Ustica (15)
		IG	Egadi Is. (15)
		IH	Pelagian Is. (33)
			Pantelleria (33)

IL	Tremiti Is. (15)	M1	(see 9A)
IM	Italian islands off Sardinia (15)	MP4B	Bahrain Is. (21)
IS	Sardinia (15)	OA, OB	Peru (10)
IT	Sicily (15)	OD	Lebanon (20)
JA	Japan (25)	OE	Austria (15)
JD	Kazan Is. (Volcano Is.) (27)	OH, OF, OG	Finland (15)
JD	Minami Torishima (Marcus Island) (27)	OHØ	Aland Is. (15)
JD	Ogasawara Is. (Bonin Is.) (27)	OI	(see OH)
JE, JF, JG, JH, JR	(see JA)	OJ	Market Reef (15)
JT	Mongolia (23)	OK, OL, OM	Czechoslovakia (15)
JW	Bear Island (40)	ON	Belgium (14)
JW	Spitzbergen (40)	OR	Belgian bases in Antarctica (38) and Belgian Expeditions
JX	Jan Mayen (40)	OX	Greenland (40)
JY	Jordan (20)	OY	Faroe Is. (14)
K (also any prefix in the R series not listed below)	(see W)	OZ	Denmark (14)
KA	(see JA)	P2	New Guinea (28)
KB6	Baker, Howland, and American Phoenix Is. (31)	P2	Papua (28)
KC4	Navassa Island (8)	PA, PE, PI	Netherlands (14)
KC4	U.S.A. bases in Antarctica (12), (13), (29), (30), (32)	PJ2, PJ3, PJ4, PJ9	Neth. Antilles (Curacao, Aruba, Bonaire) (9)
KC6	Eastern Caroline Is. (27)	PJ5, PJ6, PJ7, PJ8	Neth. Antilles (Sint Maarten, St. Eustatius, Saba) (8)
KC6	Western Caroline Is. (27)	PY, PQ, PR, PS, PT, PU, PV, PW, PX	Brazil (11)
KG4	Guantanamo Bay (8)	PYØ	Fernando de Noronha (11)
KG6	Guam (27)	PYØ	St. Peter and St. Paul Rocks (11)
KG6	Mariana Is. (excluding Guam) (27)	PYØ	Trinidad and Martin Vaz Is. (11)
KH6	Hawaiian Is. (31)	PZ	Surinam (9)
KH6	Kure Island (31)	RA, RB, etc.	(see U.A., U.B., etc.)
KJ6	Johnston Island (31)	S2, S3	Bangladesh (22)
KL7	Alaska (1)	S6	(see 9V)
KM6	Midway Is. (31)	SM, SJ, SK, SL	Sweden (14)
KP4	Puerto Rico (8)	SM1, SK1, SL1	Gotland (14)
KP6	Jarvis Is. and Palmyra Group (31)	SP, SQ	Poland (15)
KS4	Serrana Bank (7)	ST	Sudan (34)
KS6	American Samoa (32)	SU	United Arab Republic (34)
KV4	U.S. Virgin Is. (8)	SV, SX, SY, SZ	Greece (20)
KW6	Wake Island (31)	SV	Crete (20)
KX6	Marshall Is. (31)	SV, SY	Dodecanese Is. (20)
KZ5	Canal Zone (7)	TA, TC	Mount Athos (20)
L2	(see LU)	TE	Turkey (20)
LA, LB, LF, LG, LJ	Norway (14)	TF	(see TI)
LU	Argentina (13)	TG	Iceland (40)
LU-Z	Argentine bases in Antarctica, South Orkney Is., South Shetland Is. and South Sandwich Is. (13)	TI	Guatemala (7)
LX	Luxembourg (14)	TI9	Costa Rica (7)
LZ	Bulgaria (50)	TJ	Cocos Island (7)
		TL	Republic of Cameroon (36)
		TN	Central African Republic (36)
		TR	Congo Republic (36)
		TT	Republic of Gabon (36)
		TU	Tchad Republic (36)
			Ivory Coast Republic (35)

TY	Republic of Dahomey (35)	VK7	Tasmania (30)
TZ	Mali Republic (35)	VK9	Mellish Reef (30)
U	U.S.S.R. (<i>special stations</i>)	VK9N	Norfolk Island (32)
UA1 (UAIKED)	Franz Josef Land (40)	VK9X	Christmas Island (29)
UA1, 3, 4, 6, 9	U.S.S.R. (Europe) (16)	VK9Y	Cocos-Keeling Is. (29)
UA2	Kaliningradsk (15)	VK9Z	Willis Is. (30)
UA9, UA0	U.S.S.R. (Asia) (17), (18), (19), (23)	VK0	Heard Island (39)
UB5	Ukraine (16)	VK0	Macquarie Island (30)
UC2	White Russia (16)	VK0	Australian bases in Antarctica (29), (30), (39)
UD6	Azerbaijan (21)	VO1	Newfoundland (5)
UF6	Georgia (21)	VO2	Labrador (2)
UG6	Armenia (21)	VP1	Belize (7)
UH8	Turkoman (17)	VP2A	Antigua and Barbuda (8)
U18	Uzbek (17)	VP2D	Dominica (8)
UJ8	Tadzhik (17)	VP2E	Anguilla (8)
UK	U.S.S.R. (<i>Club stations</i>)	VP2G	Grenada (8)
UK1 (except UK1N)	(see UA1)	VP2K	St. Kitts and Nevis (8)
UK1N	(see UN1)	VP2L	St. Lucia (8)
UK2A, C, I, L, O, S, W	(see UC2)	VP2M	Montserrat (8)
UK2B, P	(see UP2)	VP2S	St. Vincent (8)
UK2F	(see UA2)	VP2V	British Virgin Is. (8)
UK2G, Q	(see UQ2)	VP5	Turks and Caicos Is. (8)
UK2R, T	(see UR2)	VP7	Bahama Is. (8)
UK3	(see UA3)	VP8	Falkland Is. (13)
UK4	(see UA4)	VP8	South Georgia (13)
UK5 (except UK50)	(see UB5)	VP8	South Orkney Is. (13)
UK50	(see UO5)	VP8	South Sandwich Is. (13)
UK6A, E, H, I, J, L, P, U, W, X, Y	(see UA6)	VP8	South Shetland Is. (13)
UK6C, D, K	(see UD6)	VP8	British bases in Antarctica (13), (12), (38)
UK6F, O, Q, V	(see UF6)	VP9	Bermuda (5)
UK6G	(see UG6)	VQ9	Seychelles (39)
UK7	(see UL7)	VQ9--/A	Aldabra Is. (39)
UK8A, C, D, F, G, I, L, O, T, U, V, Z	(see U18)	VQ9--/C	Chagos Is. (39)
UK8B, E, H, W, Y	(see UH8)	VQ9--/D	Desroches Island (39)
UK8J, K, R, S	(see UJ8)	VQ9--/F	Farquhar Group (39)
UK8M, N, P, Q	(see UM8)	VR1A	Gilbert and Ellice Is. (31)
UK9	(see UA9)	VRIP	British Phoenix Is. (31)
UK0	(see UA0)	VR3	Fanning and Christmas Island (31)
UL7	Kazakh (17)	VR4	Solomon Is. (28)
UM8	Kirghiz (17)	VR6	Pitcairn (32)
UN1	Karelo - Finnish Republic (16)	VS5	Brunei (28)
UO5	Moldavia (16)	VS6	Hong Kong (24)
UP2	Lithuania (15)	VS9M	(see 8 Q)
UP0L	U.S.S.R. Arctic floating stations	VU	India (22)
UQ2	Latvia (15)	VU	Andaman and Nicobar Is. (26)
UR2	Estonia (15)	VU	Laccadive Is. (22) f
UT5	(see UB5)	VX	(see VO)
UV, UW	(see UA)		
UX	(see U)		
UY5	(see UB5)		
UZ	(see UA)		
VE, VA, VB	Canada (1), (2), (3), (4), (5)		
VK	Australia (29), (30)		
VK	Lord Howe Is. (30)		

W (also any prefix in the W series not listed below) U.S.A. (3), (4), (5)
(to be continued)

Brunel Convention

BRUNEL University, Uxbridge, was the new venue for the annual VHF/UHF Convention, the twenty-second in the series, coinciding with a somewhat uncharacteristic heatwave. An estimated 1,000 devotees attended on the Saturday. The Convention followed the established pattern of trade stands, lectures and dinner, but in far more spacious surroundings than at Twickenham. Even so, the trade stands were grouped in the ground-floor entrance foyer, in several, small rooms, and in a first-floor concourse. As usual, items for sale ranged from expensive, Oriental equipment to ferrite beads, but it was encouraging to see a good amount of British designed and built gear from companies such as Axial Products Ltd., Microwave Modules Ltd., Modular Electronics, QM70 Products, Stephens-James Ltd. and Telford Communications. Three of these now market successful 28/432 MHz transverters. Who will be first with a similar device for 1296 MHz?

Trade apart, organisations such as AMSAT, BARTG and both the London and Southern sections of the U.K. FM Group were represented. A particularly interesting exhibit was that of Charlie Newton, G2FKZ, devoted to Auroral matters and which showed the working of the auroral early warning system. What G2FKZ suggests may be the first, professional recording of auroral SSB amateur contacts were on tape, these made by Angus McKenzie, G3OSS, in his excellent laboratory. For many visitors, this was their first chance of hearing such weird and ghostly speech.

The Saturday evening dinner was attended by 200 amateurs and their guests. In introducing the guests, Dr. John Allaway, G3FKM, suggested he was probably the only RSGB president who had never been on VHF—cries of “shame!” and discrete hisses—but said he *did* know how to deliver a baby. Notable guests included Lord and Lady Wallace, Dr. J. A. Saxton, the Director of the Appleton Laboratory and Mr. C. E. Godsmark (G3IWL) of the Home Office and his wife. During his speech, Dr. Allaway paid tribute to Roy Stevens, G2BVN,

VHF BANDS

NORMAN FITCH, G3FPK

the secretary of IARU Region 1. Your scribe is well aware of the vast amount of unpublicised work undertaken by G2BVN so was very pleased to learn from him of the complete accord in their approach to policy at the 1979 WARC of the three IARU Regions and of the genuine backing of the Amateur Radio movements by the many governments involved.

The presentation of trophies rounded off the dinner. The John Rouse Memorial Trophy was awarded to P. G. Lea, G8DLZ for his home constructed, microwave equipment; the Surrey Trophy went to the March & District Amateur Radio Society; The Mitchell Milling Trophy to the University College of North Wales Amateur Radio Society (GW3UCB), the VHF Manager's Trophy to the Golden Valley VHF Contest Group (GW4ABR/P) and the Fraser Shepherd Prize was awarded to Gordon Lean, G3WJG, for his state-of-the-art work on 5.75 GHz.

The main lectures were divided into three streams and took place in proper theatres with all “mod cons.” As so often the case, one had to choose between equally interesting topics. The 1.3 GHz SSB talk was started by G3WDG who described various mixing systems and their advantages, disadvantages and problems. Summing up his points, for successful operation he suggested that one must be quite sure that the output cavity—for preference—*can* be tuned to 1296 MHz, that the valves, such as the popular 2C39, be well cooled, *i.e.* if the blue paint turns brown it is too hot! And that the signal be monitored continuously, as 2C39's are very prone to drift. In the 144 MHz drive, plus 1152 MHz local oscillator system,

G3WDG stressed several watts at 1152 MHz to be essential with the minimum of 144 MHz drive and that for the most linear signal, lots of HT, such as 850 volts, be used. The speaker then dealt with the generation at 1152 MHz, expressing a preference for valve-type tripling from 384 MHz as being more sure-fire than a varactor system which often proves somewhat tricky. To avoid FM problems, G3WDG revealed that he uses a 12-volt battery as the power source for the 1152 MHz oscillator and stressed the need for a very well stabilised power supply. When considering crystal frequencies and frequency multiplication, he felt it to be advantageous to use a rock with an harmonic in an amateur band to simplify accurate measurement. Finally, he mentioned the potential radiation hazard from, say, 40 watts of 23 cm. RF from a small aerial.

The second speaker was G4ALN who described his method of achieving SSB on the band from a 28 MHz source. This has the advantage of eliminating double conversion by heterodyning a 28 MHz SSB signal with 1268 MHz to arrive on 1296 MHz. His system for generating the required 1268 MHz signal started off at 52.833 MHz but he reckoned that 105.666 MHz would have been preferable. Naturally, some reliable band-pass filtering is necessary and a reprint of a graphical design of interdigital BPF's from the February 1967 issue of “Microwaves” was available, for round rod type, multicavity, Butterworth IDF's. An unscheduled speaker was G4DGU and it is hoped to cover Chris's approach to 23 cm. SSB in a future issue.

Your conductor is at the moment very interested in satellite communication, so attended several of the AMSAT sessions, chaired by Pat Gowan, G3IOR. It was not surprising to discover that for everyone who had actually communicated through *Oscar VI* or *VII* there were many others who were keen so to do, but who were very uncertain how to go about it. Consequently, the first lectures were aimed at the beginners, the later ones at practising “Oscar-philites”. The requirements for reasonable tracking of the satellites were spelled out by David Walland. He produces predictions in tabular

THREE BAND ANNUAL VHF TABLE

January to December 1976

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Countries	Countries	Countries	Countries	Countries	Countries	
G5DF	33	3	57	13	13	1	120
GM4CXP	11	3	69	19	8	3	113
G3BW	23	5	46	14	17	5	110
G4BWG	26	3	50	14	8	3	104
G2AXI	23	2	39	9	19	3	95
G8HBQ	—	—	59	10	20	3	92
G4AEZ	20	2	35	8	13	1	79
G3FPK	—	—	62	16	—	—	78
G3BOC	26	3	37	9	—	—	75
G8GML	—	—	46	9	9	1	65
G8BKR	—	—	50	8	5	2	65
G4CZP	—	—	51	7	—	—	58
G4BYP	13	4	32	6	—	—	55
G8KLN	—	—	40	10	—	—	50
G4DKX	14	2	23	11	—	—	50
G8HHI	—	—	37	10	—	—	47
G3FIJ	14	2	15	4	8	4	47
GD3YEO	—	—	35	7	—	—	42
G8ITS	—	—	31	5	—	—	36
G8IFT	—	—	19	2	11	2	34
GC8AAZ	—	—	15	7	5	3	30
G8KSP	—	—	24	6	—	—	30
G8GLS	—	—	18	4	—	—	22
GD2HDZ	1	1	1	1	2	1	7

form and anyone interested can write to him at 2 London Road, Harleston, Norfolk, IP20 9BW for details of cost, etc. Arthur Gee, G2UK, showed slides of his aerial system for 2m. and 10m., designed to be unobtrusive so as not to upset a certain local busybody, yet capable of permitting him to make many rewarding contacts. He also showed some slides of the Canadian AMSAT Command Station, VE3SAT, and its ambitious aerial arrays.

On Sunday, Joe Kasser, G3ZCZ/W3, of AMSAT-USA, gave a very comprehensive account of North American activity in the satellite programme but admitted that their lines of communication often leave much to be desired. In fact, AMSAT-USA is a nucleus of about ten enthusiasts in Washington D.C. who have their own, private 2m. repeater. Of immediate interest is Phase 3 of the Oscar programme which is planned to provide a 2m./70 cm. or 70 cm./2m. transponder in a highly elliptical orbit of 11-hour period. Initially, this would provide coverage for Northern hemisphere stations for hours at a time. This poses problems so far not encountered in amateur-band communication, e.g. no skip dead spots. Just imagine, the band full of G, DL, W, VE, UA and JA stations simultaneously! Joe mentioned the subject of band planning for this unique situation. Your suggestions for carving up this 150 kHz band would be welcomed and will be passed on to AMSAT.

This Phase 3 satellite will be a two-stage launch, first being placed in a circular orbit, higher than *Oscar VII*, with a 2½-hour period realising useful passes of up to 40 minutes. This will last for 42 days after which the second stage will be to fire an apogee kick motor at the appropriate time to put the satellite into its final, working orbit. When functioning, the *Oscar VIII*, as it will then become, will be controlled by a microprocessor. It is understood that the structure for this satellite is complete, as are all the "bits and pieces" and all outstanding problems resolved. It is now a matter of arranging for the ground control systems for the launch. The launch vehicle could be a Delta rocket or a European Space Agency one in

which latter case, due to the equatorial orbit, a launch control in Greece would be necessary, indicating a mobile station.

G8IEF then described the University of Surrey, Oscar Telecommand setup at Guildford in Surrey. The slide of the 8ft. paraboloid aerial on its Admiralty 4½ tons, AZ-EL steerable mount was most impressive. The new control transmitter is nearing completion now that the latest control tapes have been received from America. It is hoped to have it completed by the end of this academic year. It is obvious that this amateur satellite project is the most ambitious effort yet by radio amateurs and it is a sobering thought that the two *commercial* satellites which were launched with *Oscars VI* and *VII* both failed! If everything goes to plan, there can be little doubt that

it will be a very prestigious achievement deserving of the widest publicity.

The AMSAT-UK Construction Group's current project was described by G8JHC. This is a 21/29 MHz transponder based upon the 145/29 MHz design. It is hoped to have this ready for ground testing by mid-summer, to be flown as soon as suitable launch opportunity arises.

To sum up the Convention, this commentator feels the Brunel University to be a good venue but hopes that next time the trade exhibits can be accommodated in one area. The chief complaint is the difficulty of finding the site when approaching from the South. There is a remarkable lack of signposts, which leads one to conclude that the local authority wishes to keep its very existence quiet. over

Beacons

From Brian Bower, G3COJ, comes a letter with information on the status of the various beacons. When the Home Office agrees, it is planned to move all the 2m., 70 cm. and 23 cm. beacons to around the 144.9, 432.9 and 1296.9 MHz regions respectively, except that GB3VHF is to remain on 144.15 MHz. (At the time of writing, the Wrotham beacon is putting out some rubbish again so may be off the air any time for investigation. G8HAL, whilst in the North of Scotland during the weekend May 8/9, heard some "sprogies" on some extremely sophisticated gear.) Brian advises; "GB3GI is on 144.137 MHz and unlikely to move—the beacon keeper does not reply to correspondence!" The following beacons are operational and will stay on the QRG's in MHz in parentheses:—GB3SU (70-695); GB3SX (70-685); GB3GI (144-137); GB3VHF (144-150—see above); GB3EM (432-91). GB3CTC, currently on 144.130 MHz, will shift to 144.915; GB3ANG on 145-950 will QSY to 144-975 and, as reported last month, GB3DM is now out of service and will re-appear on 144-935.

As for 70 cm. GB3SC on 432-025 will go to 432-89. GB3GEC is not operational and resumption is uncertain. If it is resurrected, most likely QRG is 432-85. On 23 cm. GB3LDN has been dismantled and removed. Regarding GB3DD, its aerial was damaged in the January gales and its tower is being dismantled anyway. The Dunstable Downs Club are in dire need of at least 200 feet of 50-ohm, very low loss coaxial cable and just have not the funds to buy this themselves. If any reader could help in any way, please contact G3XWS (QTHR). As soon as this problem is overcome, GB3DD could resume its operation from another mast. GB3WR has been licensed for 1296.91 but has yet to be built. It is understood that G4ALN has sponsored a beacon, GB3LBH, on 10.1 GHz and further details are awaited. G3COJ did not mention the Isle of Wight beacon, GB3IOW, on 10.1 GHz.

Contests

Only two correspondents mentioned the 23 cm. contest on April

24/25. G8AII (Chepstow) found conditions very poor only working three stations, none of them new. Walter wrote that GW8ADP/P (YL25a) had seven QSO's and GW8BXJ/P (YL25j) six contacts. G4DKX (Ipswich) tells that G4BPO/P used G3XDY's 60-watt gear very effectively to four Yagis in a box at 75ft. a.g.l. They worked 11 stations and were disappointed with the activity and feel the low level to be due to the date being one week before a major European 144/432/1296 MHz contest. In a 2m. QSO later, G3DAH (Herne Bay) said that conditions were so bad that some stations were asking, "Has the contest been cancelled?" GC8AAZ (Jersey) was the only reader to mention the 432 MHz Open on May 1/2 and found conditions poor with no F stations heard. During a QSO subsequently, G8GGK (Selsdon) said he thought conditions rather poor, with GB3EM below average strength. Three GW portables were heard and a couple of fixed Welshmen, but nothing was copied from the Devon direction. Ken reckons there to have been fewer stations active than he expected, those that were on having to struggle for points. A couple of ON's and one PAØ were logged.

The next contest is the *Microwave* event on June 19/20, 1600-1600Z with any amateur band above 1 GHz as your happy hunting ground for points. The usual RS(T)-plus-serial number and a code word of one's choice. The 20th also sees the *RSGB Region 1 VHF Contest* from 0900-1700 GMT on 4m., 2m. and 70 cm. plus the 23 cm. section, coinciding with the above. This contest is for single and multi-operator stations, fixed and portable. Usual radial ring scoring for 4/2/70 with a 1.5 multiplier for 4m. and 4 on 70 cm. Also a further multiplier depending upon one's height a.s.l. The big one will be *VHF NFD* the weekend of July 3/4. This year, the band multipliers for 4m., 2m., and 70 cm. are 3, 1 and 6 respectively, based on the radial ring scoring system, whilst on 23 cm. it will be one point per kilometre. Don't forget that single station entries on 144 MHz will not be accepted although such entries for any other band will be welcomed. Your

reports for the May 22/23, 2m. events for the July issue please. And so to some band reports.

Four Metres

Highlight of the month for G4BYP (Liverpool) was Alan's first EI contact, with EI4CB in Dublin on CW, after a 2m. QSO. The problem with these contacts is that the EI's use vertical polarisation and FM/AM, and not CW/SSB with horizontal beams. G4DKX usually runs a home-built Tx with 2N918's driving a 6-40 to about 10-15 watts RF output. Unfortunately, Ned's rig had died, and this with NFD so near.

Two Metres

Best contact of the month for G8BKR (Bristol) was G4DMY/P on the Scilly Isles for a new county and QTH square, WJ. John remarks how good is EI9Q's signal now that Dick has the 6-ele. Quad up to 70ft. GC8AAZ also caught G4DMY/P. Unfortunately, nothing at all was heard of them in the London area as their power was quite inadequate for the unexceptional conditions. A welcome letter from the far North of Scotland from GM3ZDH confirms CW QSO's in the April 1 Aurora with G3BHW, G3POI, G3SCP, G4CDF and GM3JFG, plus an SSB brush with GM8CMV. This was Robert's first Aurora and he spent much time just listening. The main activity is with the Moray Firth net which meets each evening from 2130/2200 local time till about 2300. Participants include GM3JFG, GM3PIB, GM3PIL and GM8CFL soon to have a go at the Morse test. He refers to G3ZSS's recent trip to Orkney as GM3ZSS/P from a 500ft. hill from whence Richard worked into Edinburgh, Berwick and Carlisle. GM3ZDH hopes to have 2m. FM in house and car soon, so will be ready for any visiting mobiles on 145.5 MHz. By prior arrangement he can be on SSB.

GM4CXP (Borders) reckons April to have been a rather poor month, apart from the April 1 and 3rd Auroras and a few minor lifts. On the 18/19th, conditions towards EI/GI were up. In that period, Derrick had 2½ QSO's with GM3JIJ/M in the Outer Hebrides, and on the 22nd made it with GM3BOC/A in Brora. The April 3

Aurora, last month mentioned as a rather mini-event in the South, nevertheless produced DL, ON, PA, SM5 plus G and GM for GM4CXP and it lasted from 1458 till 1850 GMT. At G3FPK, at first glance, it seemed to have been a poor period—even so, eleven countries were worked and closer inspection shows that the band has opened up several times for short periods to various directions. One

thing is certain, though: The level of SSB activity has markedly declined on a day-to-day basis, with CW operation at a low ebb, too. Perhaps we should not assume conditions are lousy just because we do not hear much. Maybe everybody is listening! Surely VHF amateur operation hasn't sunk to the level of local, radio-telephone communication?

Seventy Centimetres

Very little from readers this month from which one deduces activity to be low. GM4CXP worked GI8HXY (Co. Down) on April 18. GC8AAZ has replaced his 46-ele. *Multibeam* with an 18-ele. *Parabeam* and discovered that the feeder to the previous aerial had been half cut through. Lawrence says that in Jersey, he and GC8EZA run SSB, whilst in Guernsey there is a lot of Pye *Pocketfone*, FM activity on 433.2 MHz and that GC8IRF has FM on 432.3 MHz. The Corby Technical College Amateur Radio Group's repeater GB3CI, went on the air at 0900 on April 24 on RB2 and runs 15 watts e.r.p. from two, vertical colinears, each with 6 dB gain. Transmit/receive isolation is by a four cavity duplexer.

Gigahertz Bands

G4DKX is now QRV on 23 cm. SSB/CW with G3WDG/G3LTF designed gear which gives 15-20 watts of RF. At the moment, one G3JVL *Quad Loop Yagi* is used with plans for a second one. Ned tells us that G3XDY is also on the band with 60 watts RF to a Q-L Yagi. G8AII has not worked anything new on 23 cm. lately and mentions G3FYX as his "local" some 12 miles away and who is also on 13 cm. Walter remarks that G8ADP (Bristol) is now active on 3, 6, 9, 13 and 23 cm. portable but has TVI troubles on 23 cm. at home. From the Cray Valley Radio Society's *QUA* for April/May comes an account of the first Essex/Surrey QSO on 3 cm. At the Essex end, on the Laindon Hills, the team was G8CIU, G8GGP, G8FJG, G8CTT and G5MBF (PAOKKZ) with G4ALN/P at Tatsfield. The 5-and-9 signals on 10 GHz were stronger than those on the 2m. talk back. This event was on February 14 in

very cold weather over a 45 km. optical path.

DX-Peditions

G8CIU writes concerning Channel Islands operation in June, in the company of G4FAM, G8GGP and G8CTT. Mainly 2m. and 70 cm. SSB from Alderney on the 8th and 9th and from Sark over the 10th-13th. No skeds and all QSL's direct or via the bureau. Via G3DAH comes news of another Scottish affair by GM3JFG and G8AGU from June 7-16. The proposed schedule is 2m. SSB/CW on a casual basis each evening 1900-2030, followed by 70 cm. SSB on 432.22 MHz, 2030-2115, and 70 cm. CW on 432.05 MHz 2115-2200. From 2200-2300 there will be skeds on 23 cm. and 70 cm. (QRG on 23 cm. is 1296.2 MHz). Skeds will be welcomed preferably *after* 2200, but hurry! Suggestions for activating Northern English counties sought. Don't forget the Cambridge University Wireless Society's Scottish trip during June 11-20 incl. as chronicled last month. G3BA/G3BHT are planning another Irish trip and G3SCP is getting things lined up for a crack at Luxembourg this summer; more of each later.

Final Round Up

Some very interesting information on meteor scatter techniques and achievements has been received from G3CCH, which it is hoped to feature next month. Too late for last issue came news of further E-M-E tests from the Stanford Research Institute scheduled for May 23 on 432.95 MHz. Apologies for the transposition of the 23 cm. and 70 cm. columns in the May QTH squares table. G8ITS is the fellow behind the idea to activate GB2MT, a special station to operate from a tower block in the Barbican in the City of London to commemorate the 80th anniversary of Marconi's first, public wireless demonstration, on July 27, 1896.

Deadlines

June 4 please for the July issue and July 9 for the August edition. Everything to:— "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. 73 de G3FPK.

QTH LOCATOR SQUARES TABLE

Station	23 cm.	70 cm.	2 m.	Total
G8FUF	—	63	138	201
G3POI	—	—	132	132
G4BWG	—	17	102	119
G3CHN	—	—	112	112
G3COJ	10	45	54	109
G3FPK	—	—	109	109
G4CDF	—	—	109	109
GM4CXP	—	41	91	102
G4DGU	—	30	64	94
G8HVV	—	—	86	86
G8BKR	1	6	73	80
G6UW	—	—	80	80
G8GML	—	4	68	72
G3BW	—	21	47	68
GD2HDZ	6	19	41	66
G8HHI	—	—	66	66
G4DKX	2	—	61	63
G2AXI	—	29	33	62
G4CIK	—	—	61	61
G4AEZ	—	15	44	59
GC8AAZ	—	5	51	56
G8KLN	—	—	53	53
OZ9LY	—	—	53	53
G8KSP	—	—	52	52
G8KKX	—	—	48	48
GD3YEO	—	—	48	48
GW8HVP	—	—	48	48
G8JJR	—	—	44	44
G8IFT	3	11	29	43
G4EYL	—	—	41	41
G3FIJ	—	6	34	40
G8JEF/A	—	—	38	38
G8ITS	—	1	31	32
G8JEF	—	—	25	25
G8JAJ	—	—	23	23
G8JKA	—	—	21	21

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for July issue: June 4)

LAST month, circumstances forced a heavy cut in this piece, owing to space considerations, due in turn to the larger type-face now being used. However, many reports that had to be left out then have been taken in here.

Recently, we were taken to task by a Club scribe who claimed we were, in effect, favouring one of the groups in the town as compared with another. Any such "bias" lies in the mis-interpretation of a phrase banged out on your scribe's typewriter with one eye on the clock—the writer tries always to report just what he is given in the way of information, and having himself been in Clubs where "local politics" have been rife and seen the damage caused, he is convinced that invariably Truth lies, as the old Persian philosopher put it, on Both sides and yet on Neither. What we *won't* do in this piece is take sides as between one Club and another.

Reports

Cheltenham (RSGB) were looking for a new Hq. on account of a steep rent-rise; happily we can now up-date the story and say that their meetings are transferred to the Old Bakery, Chester Walk, behind the Library, thanks to some quick work and thinking by G3JFH. As for the "when," it is reckoned as the first Thursday in each month, and the starting time 8.0 p.m.

Cirencester are at the Phoenix Centre, in Beeches Road, where they have Room 22 every Thursday evening. More details from the secretary—or why not just pay a visit?

At **Hereford** there was the sad case of the club-room they couldn't get into, and then just to keep 'em alert, a warning that the electricity had been cut off! However it seems their Hq. room is next door to the Court Room, and fed from the same supply; doubtless words of disapproval from the Beak caused matters to be resolved in a flash, as it were. To find them, you have to find the Civil Defence Headquarters, Gaol Street, Hereford; and the dates are June 4 and 18.

Cornish have an update to our lost paragraph last month—and what an update! It takes us clean through to April 1977, and most noticeable is that there is not a single item by a "foreign" speaker; in other words, Cornish are supplying their own entertainment and technical talks for the year from their own resources—something which could well be considered by the rest of the country at Club committee meetings, when the secretary says "we can't attract outside speakers." June 3 is the date, and the venue the usual SWEB Clubroom, Pool, Camborne; as for the subject, G3XC and John Birkbeck combine forces to talk about Repeaters, their function and use.

Torbay are at Bath Lane, Belgrave Road, and recently had an AGM at which they re-elected the last year's committee *en bloc*, adding a couple more committee members to take into account their membership which

now stands at 90. Saturday, June 26 is their formal date, when they will look back at HF/NFD and on to VHF/NFD; but they have some other activities as well—contact G3UIQ.

Pembroke are at the Defensible Barracks, Pembroke Dock, on June 25, when GW8GKU will have the stand for the second month running; his subject this time is to be Colour Television. On a different tack, we understand the Club now holds the call of the late president, George Courtenay-Price, GW2OP.

Now we must mention a new group, which is known as **South Wight Contest**; naturally enough, located on the Isle of Wight. This group meets in each other's homes, and so if you would like to get into touch with them, it is essential you make first contact through G4EKZ, as Panel.

Grafton have recently celebrated the thirty years of their existence. You can meet the present members on any Friday evening by turning up at Hq., Whittington School, Highgate Hill, London N.19.

At **Mid-Sussex** there is a new layout to the *Newsletter* and a new cover. As for the group itself, they have Hq. at Marle Place Further Education Centre, Leylands Road, Burgess Hill, where they have G5RV as speaker on June 3, and on the 17th are "away" for a Social Evening at Jack and Jill Windmills.

On now to **Silverthorn**, who are to be found each week at their suite of rooms at Friday Hill House, Simmons Lane, Chingford. In addition, this group have a field week-end which this year is over June 18-21 at Carrols Farm, Chingford, on the hill top at map ref. TQ392 970, where they will operate on as many bands as they can get gear for. (Please leave your car at the bottom of the lane leading to the site, as the farmer has asked specifically that this be done).

Into the frozen north now, well past Watford, and eventually we come to **Mid-Cheshire**, who foregather at the Technical Activities Centre, rear of Verdin Comprehensive School, Grange Lane, Winsford, each Wednesday. The talk on June 9 is about a *home-built* colour TV receiver. R.A.E. and CW practice start at 7.0 p.m., while the main meeting is an hour later.

A change of venue is to be mentioned now, as there are some **Surrey** members who still turn up on the old day and at the old venue! Please then note that they now meet at the Croydon Sea Cadets, *T.S. Terra Nova*, The Waldrons, Croydon; the main meeting on the first Wednesday and the informal on the third Wednesday.

At **Derby** they seem to be quite set in their ways, as neither Hq. nor Hon. Sec. have changed since we took over this piece. They can be found on Wednesdays at 7.30, at 119 Green Lane, unless they are "going out," as occurs on June 9, when they have a Barbecue at Drum Hill. June 2 is the Surplus Sale, while on the 16th they have a D/F exercise. June 23 is down for "Technical Topics."

The **Milton Keynes** group meet at Loyal Hall, Newport Pagnell, and they make the booking for the second Monday in every month. In the June meeting, they have a special session for new members; visitors are invited.

They certainly have an Hq. at **Waite Rose**, equipped as it is with a shack, lecture room, lounge, library and workshop/canteen, and—at 83 Town Street, Armley,

The committee of the Torbay Amateur Radio Society had this picture taken on the occasion of the Club's annual dinner recently. Front row, left to right: G3UIQ (secretary), G3VTQ (chairman), G2CWR (president) and G3MEP (treasurer).



Leeds—right next door to the local pub as well, with whom they are on very good terms. This super Hq. is open every Wednesday evening; and also on the first Sunday morning in every month from 10.30 to 1.00 p.m.

Still the same Hq. serves at **Bishops Stortford**, the committee room of the British Legion Club, at the top of Windhill. The third Monday in every month it is, unless this would bring them into a Bank Holiday Monday, when a decision is made in the previous month.

The Junk Sale at **York** was a complete sell-out, and the lots as "packaged" by G3XFM all contained several of those items nobody wants but with one attractive item. Turning to the gatherings, we find they are weekly on Fridays, excepting the *third Friday* in every month.

Northern Heights Newsletter claims the construction competition was dominated by a full-size model of an Avro Vulcan . . . and this was not the *April* issue. However, he does tell us that they meet at the Peat Pitts Inn, Ogden, on Wednesdays.

Surplus Equipment is for sale at **Reigate** on June 22, the new place being at the Constitutional Hall upstairs room, Warwick Road, Redhill. In addition to this there are informals on the first Tuesday in every month, in the saloon bar of the Marquis of Granby, Hooley Lane, Redhill.

Now to South Wales, where **Newport** have Hq. at Brynglas House, Brynglas Road, and seem to have most of the desirable facilities of a Hq., plus a very good hill-top location and lots of space for aerials. For more details and dates, we refer you to GW3YKZ, as Panel.

On the fourth Thursday in every month, **Verulam** can be found in the Market Hall, St. Albans, and during the summer they have informals on the second Thursdays Salisbury Hall, London Colney. For June 24, the topic is VHF/NFD, and the gear to be used will be on display.

Another group to be celebrating a thirtieth anniversary is at **Peterborough**, who are having a party on June

18, at the Fitzwilliam Arms, Marholm (ladies invited). For more details both on this one and on the Club itself, get in touch with G3EEL.

The major occasion for the **Bangor** crowd in Northern Ireland is the Mobile Rally at Castlewellan Forest Park on June 20; and in June, July and August they don't reckon to spend much time in the Redcliff Hotel Hq.

At **Echelford**, the routine is to foregather at St. Martins Court, Kingston Crescent, Ashford, Middx., on the second Monday and the *last* Thursday of each month, at 7.30 for 8 p.m. However, as the *Echelford Newsletter* is a bit "out of sync" with our deadlines, the section on Future Activities stops dead just short of the June dates. So for that we must refer you to secretary G3TDR.

Then there is **North Kent**, with a booking at St. Mary's Institute, 2 North Cray Road, Bexley, on the second and fourth Thursdays in each month; the *Newsletter* does not give more details on the programme.

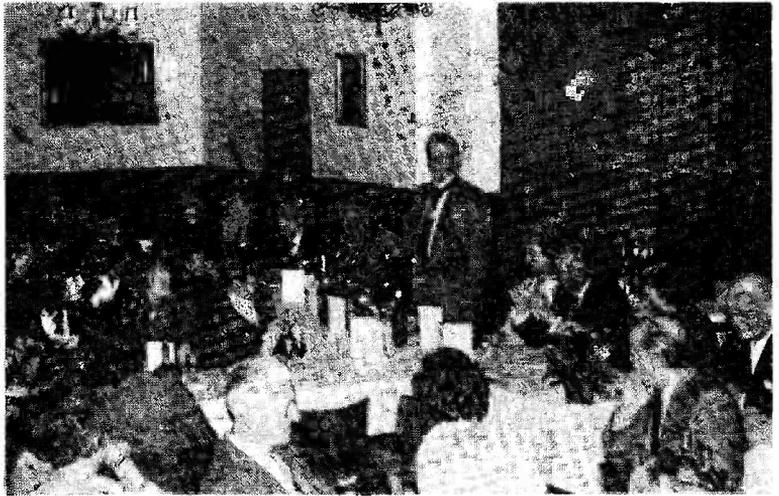
There seem to have been a change-round at **Maidenhead**, since the last AGM, and the new secretary forgot to tell us where! However, we think it is the Red Cross Hall, The Crescent, Maidenhead, on the first Thursday and the third Tuesday, resulting in: June 3 for a Junk Sale, and June 15 for an informal ragchew.

What a lot they are at **Clifton**! It seems they made their worst-ever MCC entry last year, and have now pinned the blame on the fifteen-year-old transmitter used! The gang have a place at 225 New Cross Road, London S.E.14, where they are open every Friday for operating the two stations, construction, or just plain ragchewing.

A change of secretary is notified for **West Kent** by the outgoing chap, so the new details appear in the Panel. This group get together at the K.E.C. Adult Education Centre, Monson Road, Tunbridge Wells.

The constructional Contest is the Thing at **South-down** on June 7, at the Victoria Hotel, Latimer Road,

About 100 people, members and their guests, attended the 28th annual dinner of the Sutton & Cheam Radio Society. In this picture G3MES, president, is addressing the company.



Eastbourne. Members will bring along and then describe their latest brainchildren. They will also be on in NFD, their chosen site being at Hailsham.

G3OJX will be talking about his VK visit on June 15, to the Acton, Brentford and Chiswick lads; this one is as always, held at the Chiswick Trades and Social Club, 66 High Road, Chiswick.

There seems to have been plenty of prizes to be dished out at the recent Cray Valley AGM, but of course as a result we can't give you the June details because

the new committee just won't have had time to finalise them. However, there will be a formal on June 3, and the Natter on June 17, both at Eltham United Reformed Church Hall, 1 Court Road, London S.E.9.

It looks like Wednesday, June 23 for the Chiltern crew, although at the time of producing their *Newsletter* the final details had not been settled. As usual, this meeting will be at 42 Castle Street, High Wycombe.

Sutton College of Liberal Arts is "home" to the Sutton & Cheam Group, after some wanderings; they may

Names and addresses of Club Secretaries reporting in this issue:

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W3 8LB.
 A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2 1EZ.
 BANGOR: D. Steele, G14EMS, 59 Donaghadee Road, Millisle (418), Newtownards, N. Ireland.
 BISHOPS STORTFORD: M. G. Long, 17 Lea Close, Bishops Stortford, Herts.
 CHELTENHAM (RSGB): G. D. Lively, G3KII, 26 Priors Road, Cheltenham (34785), Glos.
 CHILTERN: M. Connell, G8HDL, 38 White Close, High Wycombe (31314), Bucks., HP13 5NG.
 CIRENCESTER: N. M. Bird, 43 Victoria Road, Cirencester, Glos., GL7 1ES.
 CLIFTON: R. A. Hinton, 58 Camilla Road, Bermondsey, London, S.E.16.
 CORNISH: R. Ledger, G2ABC, Westlea, Hugus Road, Threemilestone, Truro, Cornwall. (Threewaters 393.)
 CRAY VALLEY: M. Tripp, G3YWO, 57 Cathcart Drive, Orpington (38199), Kent.
 DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby (21937), DE3 7GE.
 ECHELDFORD: R. S. Hewes, G3TDR, 34 Brightside Avenue, Laleham, Staines, Middlesex.
 GRAFTON: B. C. Bond, G3ZKE, 86 Agar Grove, Camden Town, London, N.W.1.
 HEREFORD: S. Jesson, G4CNY, 181 Kings Acre Road, Hereford (3237).
 MAIDENHEAD: S. A. Rawlings, G4ALG, 7 Winchcombe Road, Twyford (345046), Reading, Berks.
 MID-CESHIRE: P. Fox, G8HAV, 15 Llandoverly Close, Over, Winsford, Cheshire.
 MID-SUSSEX: J. Brooker, G3JMB, 20 Farnham Avenue, Hassocks, Sussex.
 MILTON KEYNES: M. Probart, G8YUV, 29 Agnes Road, Semilong, Northampton, NN2 6EU.
 NEWPORT (Gwent): M. Biddiscombe, GW3YKZ, 10 Davy Close, Newport (58314), Gwent, NPT 6FN.
 NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogdan, Halifax (44329).

NORTH KENT: R. Wells, G4ARQ, 12 Bulbank Road, Belvedere, Kent.
 PEMBROKE: M. Shelley, GW3XJQ, Woodview, St. Florence, Tenby, Dyfed, SA70 8LS. (Manorbier 544/319.)
 PETERBOROUGH: L. Critchley, G3EEL, 36 Waterloo Road, Peterborough, Cambs.
 QRP: Rev. G. C. Dobbs, G3RJV, 8 Redgates Court, Main Street, Calverton, Notts.
 REIGATE: R. H. Mundy, G3XSZ, 2 Conifer Close, Reigate (43130), Surrey.
 ROYAL NAVY: FCRS, M. Matthews, G3JFF, c/o Royal Navy A.R.S., H.M.S. Mercury, Leydene, Hants.
 ROYAL NAVY (H.M.S. Daedalus): J. M. Gale, G3JMG, 22 Northfield Farm, Upper Cornaway Lane, Portchester, Fareham, Hants.
 SILVERTHORN: C. J. Hoare, G4AJA, 41 Lynton Road, South Chingford, London, E4 9EA. (01-529 2282.)
 SOUTHDOWN: B. Chuter, G8CVV, 15 Copper Hill, Willingdon, Eastbourne, East Sussex, BN20 9JG.
 SOUTH WIGHT CONTEST: D. Saul, G4EKZ, Brookside, Bonchurch Village Road, Ventnor (853168), I.O.W., PO38 1RE.
 SPALDING: R. Harrison, G3VPR, 38 Park Avenue, Spalding, Lincolnshire, PE11 1QX.
 SURREY: S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon, CR2 8PB. (01-657 32580.)
 SUTTON & CHEAM: A. Keech, G4BOX, 26 St. Albans Road, Cheam, Sutton, Surrey. (01-644 4157.)
 TORBAY: M. Yates, G3UIQ, Top Flat, 23 Waverley Road, Newton Abbot (3025), Devon.
 VERULAM: B. H. Pickford, G4DUS, 130 The Drive, Rickmansworth, Herts.
 WAMRAC: L. Colley, G3AGX, Micasa, 13 Ferry Road, Wawne, Nr. Hull, Yorks., HU7 5XU.
 WEST KENT: P. Reeve, G8LMV, 2 Court Road, Tunbridge Wells, Kent.
 WHITE ROSE: R. R. Hughes, G4DZI, 3 Primley Park Crescent, Leeds, LS17 7HY.
 WIRELESS PRESERVATION SOCIETY: D. Byrne, G3KPO, Alverstone Manor, Luccombe Road, Shanklin, I.O.W.
 YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

be found there normally on the third Tuesday of the month starting at 7.30, there being Morse tuition going in the first few minutes.

The Spalding group has now a total of no less than 200 members on the books. From the *Newsletter* we can find that the June 4 meeting is held at the Teachers Centre, Knight Street, Pinchbeck, where there will first be a demonstration of aerial radiation patterns by G8DOD, the remainder of the evening being devoted to test equipment, gadgets and gimmicks brought along by the membership.

National

We have to say that the R.N. group at *H.M.S. Daedalus*, Lee-on-Solent, are active regularly as a Top Band station, from 1145 to 1300 on Tuesdays and Thursdays, using G3JMG's call. The opening session on the air was timed, quite deliberately, to coincide with the opening of the new RNARS set-up at *H.M.S. Mercury*,

Leydene some pictures of which appeared in the April issue.

A.R.M.S. is the one if you are a mobile operator or listener; the current copy of their *Mobile News* shows several changes of format, but still manages to keep up a high standard. Details from G3FPK.

WAMRAC is a group of radio amateurs and SWL's world-wide who share, or are sympathetic with, the Methodist persuasion. They keep in touch by way of their regular *Newsletters*, and by various nets, the band and mode being different to suit local tastes and conditions. More gen on this one from the Secretary.

The National Wireless Museum is now open and active, at Arreton Manor, Isle of Wight. This is near Newport, at the home of Count and Countess Slade de Pomeroy. The collection there is under the auspices of the *Wireless Preservation Society*, which group is a non-profit making set-up who collect, restore and preserve old items in the line of radio, TV or sound

The U.K. FM Group (Northern) had a stand at the Leeds Rally, with G8IWA and G3WQA in view when this was taken. A lot of the Group's activities are concerned with fund raising for repeaters GB3NA/GB3HU. They offer a neat log-book for mobiles, at 50p, proceeds to the Repeater Fund.



reproduction." Possibly their prize exhibit is the working 30-line Televisor by J. L. Baird, circa 1929!

We must not forget the **QRP Club**—if you like any form of low-power operation, either transmitting or SWL, then this is the one for you; indeed, even if you aren't, the technical stuff in their *Sprat* Newsletter is still worth a subscription. Over 200 members can't be wrong!

NEW QTH'S

This space is for the publication of the addresses of holders of new call signs, or changes of address, in EI, G, GC, GD, GI, GM and GW of stations not already listed. All addresses published here will appear in the U.K. section of the American "CALL BOOK" in preparation. Please write clearly and address on a separate slip to QTH Section. Be sure to give correct County designation and post-code. In the case of direct subscribers needing Change of Address, please state for card index adjustment. Address items for this space to: "New QTH Page," *SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.*

G3DPJ, A. E. Smith, West Lodge, Effingham Hill, Nr. Dorking, Surrey. (Tel. *Bookham 58389.*) (Re-issue.)

G4EJW, N. Perkins, 30 Standards Road, Westonzoyleland (494), Bridgewater, Somerset, TA7 0EJ.

GI4EPK, E. J. Coyle, 13 Nicholson Square, Londonderry (61316), Co. Londonderry BT48 7LN, Northern Ireland.

G4EPL, L. Ward, 11 Victoria Street, Hucknall, Nottinghamshire, NG15 7EB.

G4EPW, L. H. Goulding, 24 Lancaster Drive, Primrose Hill, Lydney (2156), Glos., GL15 5SL.

G4ESJ, M. Stephenson, 3 Silverdale Road, Beverley High Road, Hull (857171), North Humberside, HU6 7HE.

G4ETD, A. Firth, 15 Manor Close, Burbage, Hinckley (39969), Leicestershire, LE10 2NL.

G4ETP, T. Pinch, 46 Priory Close, Ivybridge, Devon, PL21 9JG.

G4EVI, J. W. Howard, 127 Goldcroft, Yeovil, Somerset, BA21 4DD.

G4EVW, G. W. Sutton (ex-G8KUU), 51 Belfield Road, Etwell (2561), Derby.

G4EYV, P. J. Poole (ex-G8EPT), 5 River Drive, Strood, Rochester, Kent, ME2 3JW.

G4EWK, D. R. Mellor (ex-G8JKK), 325 Blackpool Street, Burton-on-Trent (46270), Staffs.

G4EWP, D. C. Henry, 50 Strand Close, Meopham, Kent, DA13 0EQ.

G4EYC, P. A. Radford, 25 Sandpiper Drive, Weston-super-Mare, Avon, BS22 8UH. (Tel. 0934 27243.)

G4EYD, J. O. Bailey (ex-G8KXS), 15 The Morelands, West Heath, Birmingham, B31 3HA.

GW4EYG, Rev. D. I. Edwards, St. Lawrence Rectory, Wolfcastle, Haverfordwest, Dyfed, SA62 5NR.

G4EYL, Mrs. Ann Buckby (ex-G8KMB-ZB2YL), 23 Hazel Drive, Spondon, Derby, DE2 7DS.

G4EYM, Mrs. Jennifer Shardlow (ex-G8KMC), 19 Portreath Drive, Darley Abbey, Derby.

G4EYN, K. H. Wright (ex-G8ISF), 6 Limerick Road, Chaddesden, Derby, DE2 6TP.

G4FAD, R. J. Langford, The Parsonage, Wellington, Hereford, HR4 8AZ.

G4FAE, S. J. Hodgetts (ex-G8JJW), 14 Windsor Avenue, Littleover, Derby, DE3 7ER.

G4FAP, R. J. Painting, 51 Calstock Road, Short Heath, Willenhall, West Midlands, WV12 4TQ. (Tel. 825 2481.)

G4EYX, P. J. Davies (ex-G8JLN), 14 Saville Road, Blackpool, Lancs., FY1 6JP.

G4EZQ, C. G. Doman, 3 Park Court, Grosvenor Park Road, Walthamstow, London, E17 9PE.

G4EZS, H. C. Foster (ex-G8KRR), 23 Ghyllroyd Drive, Birkenshaw, Bradford, West Yorks., BD11 2ET. (Tel. *Cleckheaton 873738.*)

G4FAQ, D. P. Jones (ex-G8HMF), 275 Griffiths Drive, Ashmore Park Estate, Wolverhampton, West Midlands, WV11 2JT. (Tel. 0902 730300.)

GM8KOF, D. McNaughton, B.Sc., M.P.S., 69A High Street, Tranent, East Lothian, EH33 1LN.

GI8LET, M. C. Westwater, 5 Duncira Park, Larne (4919), Co. Antrim, Northern Ireland.

G8LFY, R. A. Penn, 46 Ladbrooke Drive, Potters Bar, Herts., EN6 1QR.

G8LGJ, J. B. Rayner, 9 Bungalow, Station Road, Whitacre Heath, Nr. Coleshill, Birmingham, B46 2EH.

GW8LHL, C. J. Lewis, Cedar Ridge, 3 Somerset Close, Cefn Coed, Merthyr Tydfil, Mid-Glam., CF48 2NY.

G8LLG, P. Milsom, Stable Cottage, 9 East Street, Chickereil, Weymouth, Dorset, DT3 4DR.

G8LLW, W. H. Etheridge, L.D.S., 78 Manor Road, Streethord, Manchester, M32 9JB, (Tel. 061-865 3873.)

Sign-Off

Which is where we have reached the bottom of the clip for another month. The next lot of news you send in should contain the July details—dates, venues, secretary's name, address (and phone number if possible), and be posted so as to arrive first post **June 4**—a tight one this month! The address, as always, should be "Club Secretary," *SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.*

GM8LNH, R. A. Pascal, Donmarec, Springhill Road, Peebles, EH45 9ER.

G8LNZ, I. C. Williams, 85 Burwell Road, Exning, Newmarket, Suffolk.

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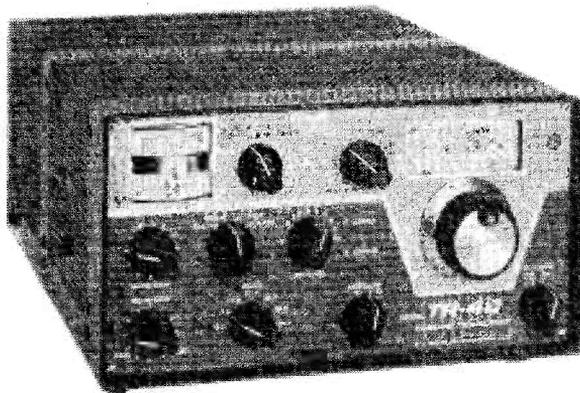
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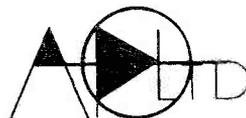
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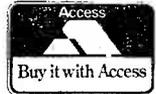
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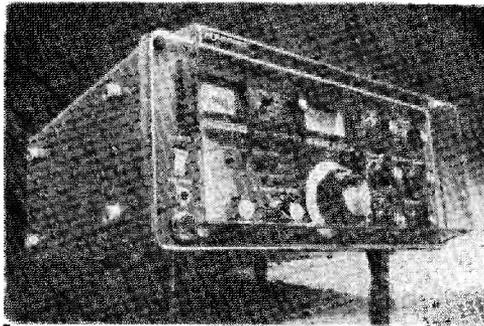
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channel with 10 xtal's fitted	£152
IC225 2m. 80 channel ...	£220
IC201 2m. VFO 10 watt	
12v./230v. FM/SSB	£315
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XTB2, xtal tone burst ...	£8.95
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4-6, 28/30 ...	£16.00 (15p)
4m. converters 28-28.7	£16.00 (15p)
70cm. converters 28/	
30 144/146 ...	£17.60 (15p)
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amps ...	£10.40 (15p)
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116 osc. output ...	£17.60 (15p)
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ler ...	£17.60 (15p)

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UR67 50 ohm coax	£50p mtr. (3p mtr.)
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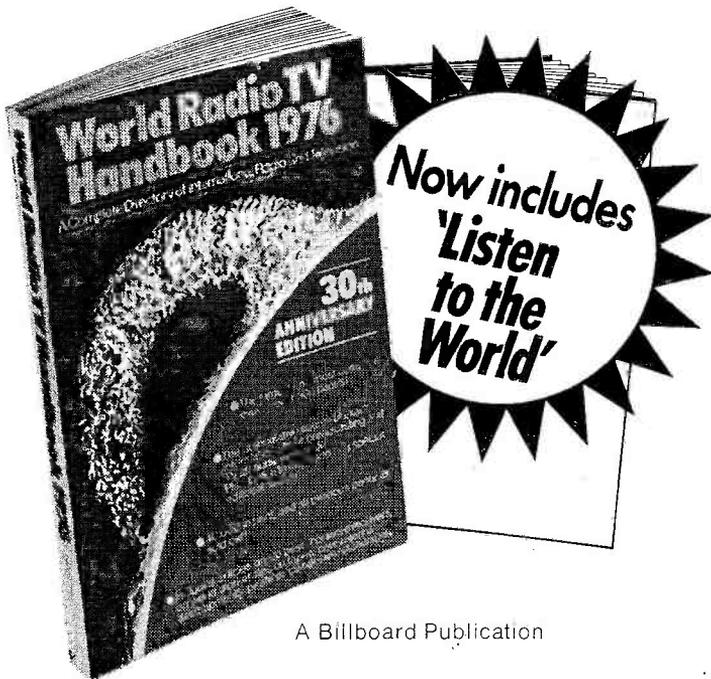
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OUTPUT FREQUENCY														
144-030	b	b	b	b	b	b	b	b	b	b	b	b	b	b
144-4/433-2
144-480
144-600
144-700
145-000/50
145-050/R2T
145-075/R3T
145-100/R4T
145-125/R5T
145-150/R6T
145-175/R7T
145-200/R8T
145-300/S12
145-350/S14
145-400/S16
145-500/S20
145-525/S21
145-550/S22
145-575/S23
145-600/S24
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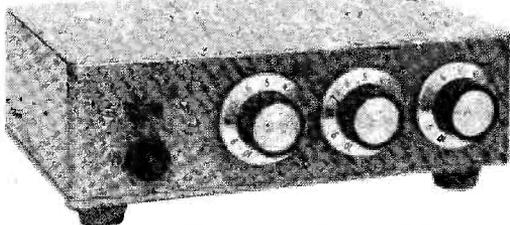
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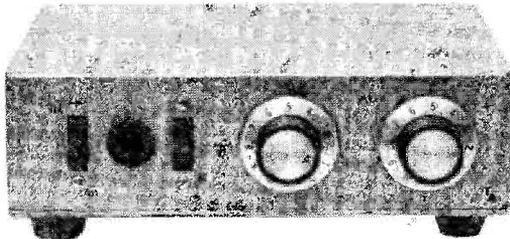
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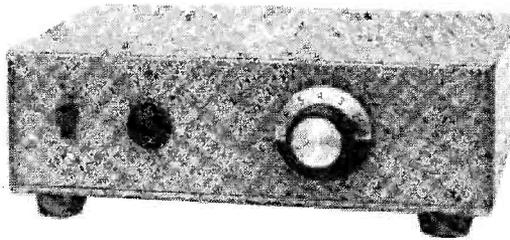
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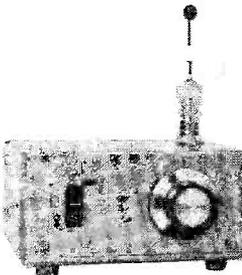


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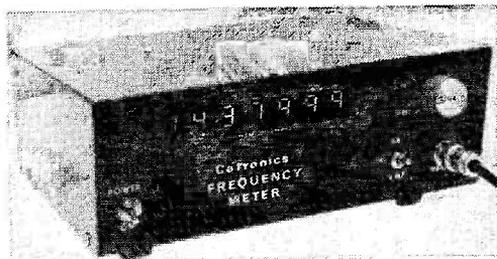
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