June 1983

RADio COMmunication

EQUIPMENT REVIEW

A comparative review of these hf linear amplifiers

THE ICOM IC2KL (with psu, left)

THE YAESU MUSEN FL2100Z

THE TRIO TL922

is published in this issue

Journal of the Radio Society of Great Britain

RSGB

ANNEE MONDIALE DES COMMUNICATIONS
WORLD COMMUNICATIONS YEAR
AÑO MUNDIAL DE LAS COMUNICACIONES
1983

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HB10F3T	3 ele. 10m mono band beam	74.95
HB15F2T	2 ele. 15m mono band beam	60.66
HB15F3T	3 ele. 15m mono band beam	93.46
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HB15M2SP	VP mini size 15m 3 ele.	102.30
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HB33SP	3 ele. tri band beam 10/15/20m	192.50
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SQ10	Swiss quad 10m	97.50
SQ15	Swiss quad 15m	106.90

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YAESU RANGE

FT1	General coverage transceiver	POA
FT102	Price on application	
FV101Z	Remote vfo	POA
FANT101	Fab for 101 series	POA
FT902DM	9 band AM/FM transceiver	POA
FT902D	9 band transceiver	POA
FC902	9 band atu, swr/pwr etc.	POA
FTV901R	Transverter fitted 2m module	POA
430TV	70cm module for above	POA
144TV	2m module for transverter	POA
70TV	4m module for transverter	POA
SP01	External speaker	POA
FL2100Z	9 band 1200W linear	POA
FT77	New HF Mobile	POA
FP77	Power Supply Unit	POA
FC77	Antenna Tuner Unit	POA
FRG7700	SSB/AM/FM recvr. dig. readout	POA
MEM7700	Memory unit for above	POA
Converters		
FRV7700A	118-150MHz	POA
FRV7700B	60-60MHz & 118-150MHz	POA
FRV7700C	140-170MHz	POA
FRV7700D	70-80MHz & 118-150MHz	POA
FRT7700	Receiver aerial tuner	POA
FF5	LF filter for above	POA
FT480R	2m all-mode transceiver	POA
FP80A	230V AC power supply	POA
FT60R	70cm all-mode transceiver	POA
FT290R	2m all-mode portable	POA
NC11C	AC charger	POA
CSC-1	Carrying Case	POA
MMB-11	Mobile mounting bracket	POA
FT208R	2m synthesized portable FM	POA
NC9C	AC charger	POA
FT708R	70cm hand-held	POA
YP150Z	150W dummy load power meter	POA
YH55	Standard 8 ohm headphones	POA
YH77	Lightweight headphones	POA
QTR24D	World Ham clock	POA
YM34	600/50k ohm base mic 8 pin plug	POA
YM35	600 ohm hand mic up/down 8 pin p.	POA
YM36	600 ohm as above (no up/down)	POA
YE7A	600 ohm hand mic. 4 pin plug	POA

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Full range ex. stock. Call 01-422 9585 (3 lines) NOW.

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SA 450N	one in two out N Connectors	13.20

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TONO 2M100W	2m 100w linear/preamp I/P 10w	129.00
TONO MR150	2m 130-150watts linear amp/preamp	169.00
MML 144/30LS	2m linear amp 3w in 30w out	69.95
MML 144/100LS	2m linear amp 10w in 100w out	139.95
MML 432/70	70cms linear amp 3w in 20w out	85.00
MML 432/100	70cms linear amp 10w in 100w out	228.65
ALINCO 230	2m linear amp 1-3w in 30w out	39.00
MIRAGE	2m linear amp 10w in 80-100w out	120.75
MIRAGE B 1016	2m linear amp 10w in 160w out	189.75
YAESU 2010	to match FT290R 10w out	54.00
YAESU 2050	to match FT 290R 50w out	115.00
YAESU 7010	to match FT 790 10w out	90.00
TOKYO HP HL32V	2m linear amp 1-3w in 30w out	53.50
TOKYO HP HL82V	2m linear amp with preamp and output meter 2 in 12 out 35 in 85 out	144.50
TOKYO HP HL160V	2m linear amp preamp output meter 10 in 160 out	242.00

The prices above include V.A.T. and delivery.

ROTATORS

KR 400RC	constant readout round meter 1½-2½ masts	114.90
KR 600RC	200Kg 1½-2½ masts	163.30
KR 500	180° elevation rotor 1½-2½ masts	112.10
AR 40	medium duty HF	90.85
CD 45	constant readout - armature breaks 8½sq.ft. ant	136.85
HAM IV	constant readout wedge solenoid breaks 15sq.ft.	258.70
T2X	THE BIG DADDY up to 30sq.ft. of ant	327.75
RO 250	Light duty suitable most VHF/UHF	45.00
SKYKING SU 4000	medium duty HF constant readout	83.00

The prices above include V.A.T. and delivery.

YAESU HF MOBILE ANTENNAES

RSL 3.5	3.5Mhz resonator and whip	12.50
RSL 7.0	7.0Mhz resonator and whip	12.10
RSL 14.0	14.0Mhz resonator and whip	11.70
RSL 21.0	21.0Mhz resonator and whip	11.60
RSL 28.0	28.0Mhz resonator and whip	11.40
RSL 2A	Mast for above	5.25
RSM 2	Gutter mount-feeder and connector	11.50

The prices above include V.A.T. and delivery.

MORSE KEYS

HK 707	Straight Manual keyer	14.50
BK 100	Semi-automatic mechanical bug	22.99
MK 702	Manual keyer on marble base	26.99
MK 702	Manipulator	22.99
MK 705	Squeeze paddle on marble base	21.72
EKM 1A	Morse code practice oscillator	10.50

The prices above include V.A.T. and delivery.

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SHURE 444D Dual Impedance	49.50
SHURE 526T Mk II Power Microphone	59.50
ADONIS AM502 Compression Mic 1 O/P	39.00
ADONIS AM601 Compression Mic + Meter 1 O/P	49.00
ADONIS AM602 Compression Mic + Meter 3 O/P	59.00

The prices above include V.A.T. and delivery.

INFORMATION FOR TRIO R1000 OWNERS

We don't have to tell you how good the receiver is – neither do we have to tell it is **missing** one essential feature – FM! No longer! Amcomm have specially designed a unit to complete your listening pleasure. It is small and will fit with minimal effort and time. It comes with really simple and concise instructions which can be read and used by the most non-technical users. The FM1000 is available now post free at **£15.99** inc. VAT from AMCOMM.

AMTECH

New Improved range – Made in England

Amtech 300B – To suit all coaxial and random wire antennas – 160-10 metres. 300w PEP. **£49.95** including VAT and carriage.

Amtech 200B – Random wire ATU rated 200w PEP, will tune virtually any wire over 160-10 metres – excellent for base, mobile or temporary QTH. **£32.95** including VAT and carriage.

Amtech 100B – Miniature mobile impedance match, ideal for that difficult matching when mobile – rated 180w PIP and has switched positions. **£17.95** including VAT and carriage.

Amtech FM 1000 – suitable for conversion of Trio R 1000, see details on lower part of page. **£15.99** including VAT and carriage.

ANTENNA PARTS AND KITS

Includes the world's finest traps – REYCO, which are guaranteed for five years no condenser used – no blow up possible. Precision moulded coil forms with stainless hardware – aluminium irridite finish – fully waterproofed and suitable for wire, vertical and beam antennas, rated at 2.5Kw and weigh only 4oz per trap – available for 7Mhz (KW40) 14 Mhz (KW20) 21 Mhz (KW15) and 28 Mhz (KW10). **£16.99** including VAT and carriage.

The BALUN – The Unadilla W2AU is famous because its the best, same rating as the traps and has a built-in lightning arrestor – available 1:1 and 4:1 – get it right first time with W2AU Balun – guaranteed for five years. **£16.99** including VAT and carriage.

THE KITS – AMCOMM 40 – 1 pair KW 40 Traps, 1 PL 259, 1 W2AU Balun, 1 pair insulators and of course 120ft soft drawn copper wire – coverage 80-10 metres (**includes** 10 Mhz). Full instructions included. **£41.50** including VAT and carriage.

AMCOMM 20 – 1 pair KW 20 Traps, 1 W2AU Balun, L PL259, 1 pair insulators and 65ft soft drawn copper wire – coverage 40-10 metres, full instructions included. **£37.50** including VAT and carriage.

AMCOMM 3B – 1 pair KW 10 Traps, 1 pair KW 15 Traps, 1 PL 259, 1 W2AU Balun, 1 pair of insulators and 30ft soft drawn copper wire – coverage 20m, 15m and 10m. Full instructions included. **£47.50** including VAT and carriage.

New WARC Traps – KW 12, KW 17 and KW 30 now available from stock. **£16.99** including VAT and carriage.

ICOM HF EQUIPMENT

IC 720A	Gen. Coverage Tcvr.	P.O.A.
IC 720A	Gen. Coverage Tcvr. with FM	
IC 730	Base/Mobile 8 band HF Tcvr.	
IC 740	WARC 9 Band HF Tcvr.	
IC PS 15	For above rigs	
IC 2KL	Linear Amp. inc PSU	
IC AT 500	Auto antenna coupler	
IC R70	Gen. Coverage Receiver	

ICOM VHF – UHF EQUIPMENT

IC 251E	2m base multimode	P.O.A.
IC 25E	2m 25w mobile	
IC 290E	2m multimode 10w	
IC 290H	2m multimode 25w	
IC 2E	2m handheld	
IC 4E	70cms handheld	
IC L1	soft cases	

Full range of accessories available from stock.

SWR-POWER METERS

HANSEN FS 710 1.8 – 60Mhz – 2Kw PEP with time constant	89.70
HANSEN FS 601 1.8 – 60Mhz – 2Kw PEP	51.35
HANSEN FS 5E 3.5 – 150Mhz 3 ranges to 1Kw (HF)	37.20
HANSEN SWR 50B 3.5 to 150Mhz 1Kw (HF)	26.45
YAESU YS 200 200w to 1Kw	52.90
YAESU YS 2000 PEP meter 2Kw	69.75
RF 2000 twin meter 3.5 – 150Mhz 2Kw	18.60
YM1X twin meter 3.5 – 150Mhz 12 and 120w	15.50

V.A.T. included, but add 75p for carriage.

E.&O.E.

AMCOMM

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JUNE 1983

VOLUME 59 No 6

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The editor will be pleased to send intending authors a manuscript preparation guide and to give any other advice and assistance requested.

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We are aware that amateur radio equipment is being sold in the UK under the Kenwood brand name. This equipment has normally been manufactured for markets other than the UK and may be significantly different than the correct Trio brand equipment. The warranty cover on Japanese home market equipment does not extend outside Japan, and service, therefore, is the responsibility of the dealer selling the equipment. In the case of the UK, those dealers offering Kenwood brand equipment are not distributor approved and so have no access to factory spares or service information.

We give below a list of approved dealers in the UK. Any dealer not on this list has no connection with the distributor network and has no factory backing. Great care should be taken when purchasing your amateur radio equipment, to ensure that the dealer is factory approved. In any case, first contact our sole distributor for the UK: Lowe Electronics Ltd., who will be pleased to advise you of your nearest approved dealer.

Sole Distributor Lowe Electronics Ltd.
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W. Sussex Bredhurst Electronics
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Tel: 0444 400786

Yorkshire Leeds Amateur Radio
27 Cookridge Street, Leeds LS2 3AG
Tel: 0532 452657

Northern Ireland George Moore Electronics
7 Cyprus Avenue, Belfast BT5
Tel: Belfast 647370

the **new** hf amateur band transceiver **and** general coverage receiver... the Trio TS430S

"Digital DX-terity" is a phrase that describes simply the new HF transceiver from Trio. Combining an amateur band HF rig with the facilities of a general coverage receiver, the TS430S provides today's discerning amateur with a transceiver which enables him not only to communicate with his fellow amateurs but to listen to the broad spectrum of shortwave communication worldwide.

- The rig covers 160-10 metres, the amateur bands, plus 150 KHz-30 MHz as a general coverage receiver.
- USB. LSB. CW. AM modes are provided. FM is also available by adding the optional FM430 receive/transmit unit.
- A compact and lightweight design – 270mm wide, 96mm high and 275mm deep, the TS430S weighs only 6.5 Kg (14.3 lbs) and can be said to be a true portable transceiver, ideal for both shack and mobile use.
- The TS430S has dual digital VFO's operating independantly in 10 Hz steps. Both VFO's store frequency, band and mode of operation. The tuning dial torque is adjustable to suit the operator and a step switch provides a fast frequency shift for the VFO (100 Hz steps). An "A=B" switch shifts "B" VFO to "A" VFO frequency and mode, or vice versa. There is also a frequency lock switch, RIT for VFO or memory and an up/down manual scan facility from the optional up/down microphone.
- An all solid state transceiver, the input is rated at 250W PEP on SSB, 200W DC on CW, 120W on FM (with optional FM board fitted) and 60W on AM.
- The rig operates from a 13.8V DC source or by using the optional PS430, 240 volts AC supply.
- The digital readout indicates frequency to 100 Hz (readout is internally modifiable to 10 Hz).
- Eight memories store frequency, mode and band data. The eighth memory stores the receive and transmit frequencies independantly.
- An internal lithium battery having an estimated five year life is provided for memory back-up.
- Memory Scan.
- Programmable automatic band scan width.
- IF shift for minimum QRM.
- Tunable notch filter.
- Narrow/wide filter selection on SSB, CW and AM (filter optional).
- Speech processor built in.

Optional Accessories
PS430 matching AC power supply.
SP430 external speaker.
MB430 mobile mounting bracket.
FM430 FM board.
YK88C 500 Hz CW filter.
YK88CN 270 Hz CW filter.
YK88SN 1.8 KHz narrow SSB filter.
YK88A 6 KHz AM filter.
MC42S up/down fist microphone.
MC60A deluxe desk microphone with up/down switch.

TRIO

TRIO-KENWOOD CORPORATION
Shionogi Shibuya Building, 17-5, 2-chome Shibuya, Shibuya-ku, Tokyo 150, Japan

TRIO-KENWOOD COMMUNICATIONS, GmbH
D-6374 Steinbach-TS. Industriestrasse,8A West Germany

the **TR3500** handheld for those seventy centimetre contacts.

Without a doubt one of life's great mysteries to me is why, when the two metre band is at times so busy, few people are to be found communicating on the wide open spaces of the seventy centimetre band.

I have come to the conclusion that misapprehensions exist about the band. The first being the lack of activity. From my first comments you will have gleaned the fact that seventy centimetres is not a busy band, however there are stations on it, myself G8GIY, my colleagues David G4KFN and Roy G8ROR form the nucleus of a UHF group here in Matlock, there are many others like us up and down the country. Seventy centimetre repeaters abound and are a perfect means of communication, their somewhat shorter range serving well their immediate area and, please remember, in the words of that doyen of seventy centimetres Jack G5UM, "Activity breeds activity," simple but true. The second misapprehension is that the equipment is expensive. Not so, the Trio TR3500 costs only slightly more than its matching stable mate, the TR2500, and here again, with the same sensible approach which we have all come to expect from Trio, the accessories which you bought for your TR2500 are compatible with the new TR3500. The appearance, size and weight are similar to the TR2500, output power is 1.5 watts high and 300 milliwatts low, repeater shift is programmable, ten memory channels are provided and frequency scan between operator-defined limits is included. The conventional memory scan and reverse repeater facilities help to make operating a pleasure no matter how difficult the conditions. With the Trio TR3500 handheld as part of your station, you are equipped to expand your operating and begin communicating on the wide open spaces of the seventy centimetre band.

£250.70 inc VAT carr £5.00

and the **TR7930** for the two metre mobile operator.

Any amateur who has used or owns a Trio TR7800 has had the finest piece of 2 metre mobile technology at his fingertips. The TR7800 had simply everything that the keen mobile operator could ever want. Of course, there were a few points which customers said could be improved on and, I must admit, we, in the majority of cases, agreed. Trio, with the introduction of the new TR7930, have taken note of this feedback of information and the result, I am sure you will agree, is as close to perfection as you will find in a rig.

The improvements are, a green floodlit LCD readout which does not disappear in strong sunlight, additional memory channels, both timed and carrier scan hold on occupied channels, selectable memory channel for the priority frequency and automatically corrected mode selection (simplex or repeater) without having to instruct the rig. The most significant change is the liquid crystal frequency readout on a green illuminated background, but closely following this must be the ability to omit specific memory channels when scanning, and the programmable scan between user designated frequencies. This gives the rig the ability to scan simplex channels only, without holding on repeaters.

The Trio TR7930. The mobile 2 metre FM rig designed with ease of operation coupled to outstanding performance.

£305.21 inc VAT carr £5.00

LOWE ELECTRONICS Ltd

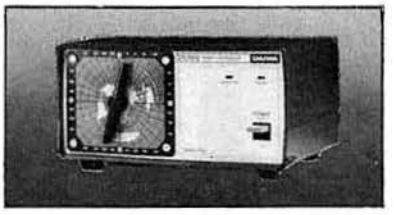
CHESTERFIELD ROAD MATLOCK DE4 5LE TEL 0629 2430/2817

we recommend the DAIWA range.

		Price inc. VAT	Carr.
VHF AMATEUR RECEIVERS			
SR9	2m FM tunable/xtal receiver 144-146MHz	46.00	1.50
SR1000	2m synthesised VHF monitor receiver. Requires no crystals for full amateur band coverage 144-146MHz	72.50	2.25
POWER & SWR METERS			
CN520	1-8 60MHz mini cross needle power/SWR meter	36.50	1.50
CN540	50-150MHz mini cross needle power/SWR meter	39.50	1.50
CN550	144-250MHz mini cross needle power/SWR meter	39.50	1.50
CN620A	1-8-150MHz cross pointer power and SWR meter. Up to 1kW	57.00	1.50
CN630	140-450MHz cross pointer power and SWR meter. Up to 200W	85.00	1.50
CN650	1-2-2-5GHz cross pointer power and SWR meter. Up to 20W	114.00	1.50
CNW419	1-8-30MHz 200W gen. cov tuning unit	130.00	5.00
CNW919	2M power meter and antenna tuning unit	92.00	2.25
CNA1001A	Fully automatic all band ATU. Includes cross pointer meter	156.00	5.00
CNA2002	As for CNA1001A but 2kW rating for tuner and power meter	228.00	5.00
ANTENNA ACCESSORIES			
CS201/TW2	Two way 50 ohm coax switch. 0-500MHz	13.95	1.00
CS401	Four way 50ohm coaxial switch 0-500MHz	43.50	2.00
ROTATORS			
DR7500X	For HF 3 element beams. Preset controller. 6 core cable	113.72	5.00
DR7500R	As for DR7500X but using the DAIWA round controller	125.00	5.00
DR7600X	Heavy duty. Will take up to 2 element 40m beam. Preset control	163.49	5.00

DR7600R	As for DR7600X but using the DAIWA round controller	176.29	5.00
KS065	Deluxe bearing for fixing stays to rotating mast	19.50	2.00
POWER SUPPLIES			
PS200D	Heavy duty power supply 9-15v 20 amps. Fully metered	118.00	5.00
PS300	Daiwa heavy duty PSU 30A max 22A continuous	135.00	5.00
PSR1250	Daiwa 50A max	338.00	5.00

INFRA-RED MICROPHONE			
RM940	New mobile mic with no connections between mic and rig	45.00	1.50
S9	Spare sensor for RM940 mic system	6.50	0.50
M9	Extra mic for RM940 system	13.00	1.50
F4	Set of four windshields for RM940 mic. Available singly at 75p	3.00	0.50



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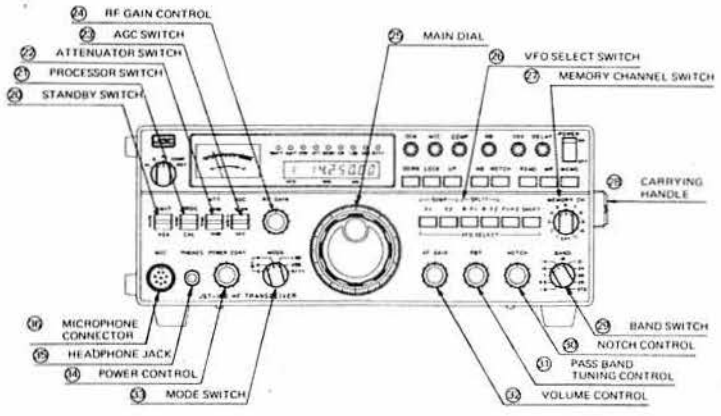
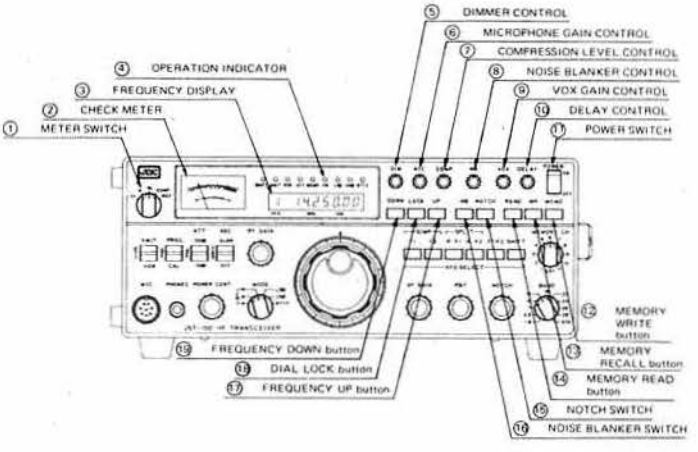
for the hf operator for whom only the best will do, the **JST100** amateur band transceiver.

JRC *Japan Radio Co., Ltd.*





JST100 £998.00 inc VAT carriage £5.00
PSU £149.50 inc VAT carriage £5.00

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OBITER DICTA

Good morning

I've always hankered after a portable rig in the car after those halcyon days with my **Pye Cambridge** dash-mount model. You remember, varicap diode tuning, possibly the first of the scanning receivers. There's one stretch of road leading to **Bakewell**—you know, the town where the 'tarts' come from—where, if you were called after your first CQ call you could **just exchange reports** before having to change gear for the Haddon Hall corner where the rig scooted off up the band. Many's the time I have been right up the back of a cattle truck whilst saying 73's. **Of course** the system had its' **advantages**: one could tune the band simply by giving a quick blip of the throttle. Anyway, back to more mundane things. Whilst driving back from **Darlington** one day and getting stuck in one of those long traffic jams around Catterick, I decided to call CQ, reached in the glove compartment where I keep **my travelling companions** (the Trio **TR3500** and **TR2500**) and selected the 2 metre rig, plugged in my speaker mic and called CQ. Immediately a helpful fellow called me and with **expertise** directed me round the hold-up. All this with 2.5 watts and the standard flexible aerial—no 5/8 whips for me. What a superb receiver. **The sensitivity** of the TR2500 and 3500 has to be experienced to be believed. As I was saying, we had a chat in between instructions and I was asked why I, with all my access to **exotic equipment**, could not find something better. Simple: there is nothing better for the active man dashing round the country to have the matching pair for that occasion when a contact is required. **Remember**, whether in the **car**, out in the **street** or when being transported by **train**, the Trio matching **TR3500** and **TR2500 are the rigs to accompany you.** Of course you must not transmit whilst on a public service conveyance but you could still listen and put yourself in touch when you get on your own two feet. I keep my handheld **in pristine condition** by using **the soft case.** I pulled two out of stock yesterday for my own use and when I opened up the package was delighted to find that Trio had dramatically improved the case design and the belt buckle. I was truly amazed. **How can anyone improve on perfection**—well Trio have. Ask to see the new soft case at your local Lowe Electronics' shop. In true Trio fashion they have not added an additional letter to the code—still the SC4 and priced at £13.80 including VAT, carriage 75p. Those of you who are into chains and things will know me as a leather fanatic. Many's the customer who has bought the hard leather case £24.15 inc VAT for the handhelds for the smell alone. **A quick sniff** in the showroom and the equipment's sold.

Talking about smells, those perfectionists amongst us, I include myself, who own JRC equipment must have noticed **the addictive aroma** of the inside of a JRC box. Unbelievable, the contents are worth a second glance too. **The new JST 100** is on **display** here at **Matlock.** What a set and what performance. The NRD515 is still selling in vast quantities to you discerning listeners. The NCM515 controller that I have is perfection beyond belief. Key in the frequency, immediately you are listening to the station—up and down shift is simple and, of course, one gets four additional memories. However, the NCM515, £125.00 including VAT, can make you lazy; **I don't think I've touched my tuning knob for weeks.** To the CW enthusiast with an NRD515, I noticed whilst wandering round the stock shelves Alan has ordered some 250 Hz filters. The price is perhaps a little high but when you are getting perfection then it is, in reality, little to pay. **The NRD515 is now priced at £965.00**, the speaker £34.50 and the 96 channel, yes 96 channel memory unit, is still £198.00—**all prices including VAT.**

Tuned into **an addictive melody** last night whilst wandering over the 49 metre band. 6185 kHz was the frequency and it turned out to be the programme "**With you in the Night**" broadcast by **Vatican Radio.** Absolutely superb programming and what a catchy signature tune. Perhaps one of you musical buffs out there with a shortwave receiver can tell me what the music is called, I'd write and ask His Holiness but I'm afraid he's got me down as **a Nonconformist.** Another annoying thing, my copy of World Radio & TV Handbook gives **Vatican Radio** as 6190 kHz but on both my receiver and my friend's it's definitely 6185 kHz and **HCJB broadcasting from Quito Ecuador** is given as 21.480 MHz and not 21.477.5 MHz as it's been for some time now. A possible reason for the error could be that the compilers of the frequencies are not using the NRD515 or possibly it's me that's wrong. In all seriousness, life without a current copy of **World Radio & TV Handbook** would not be worth living. Priced at £10.95 it's an essential part of anyone's shortwave station. The WRTV Handbook is on sale from Matlock, London, Glasgow and Darlington. **London and Glasgow** also **stock** selected **tomes** from the **RSGB**—call and see the comprehensiveness of a Lowe Electronics' Shop.

The KX3 is selling well and certainly adds to a shortwave station. Priced at £42.50, including VAT, carriage £2.25. The KX3 is a good aerial tuning unit. We still have the reliable range of Honor test meters: the KRT100, 200 and 500 priced at £5.75, £10.50 and £19.50 respectively. Carriage on each meter £1.00.

Don't forget the Lowe Electronics' Open Day here at Matlock on Saturday, 20th August, 1983. Come along to Matlock, bring the wife (better still bring someone else's) **details later.**

I almost forgot in my enthusiasm for the TR2500 and TR3500 from Trio, I did not mention the mobile rigs, the **TR7930** which you will find a photograph of on page 2 of the advert. For the **serious** mobiler who wants the **best** mobile rig available the choice is simple: **the Trio TR7930.** Pop into a Lowe shop and twiddle with one and, of course, the TR7930 with its rubber feet fitted makes a perfect base station rig, 25 watts and that superb Trio audio quality. For the multi mode enthusiast **the Trio TR9130**, everyone's favourite.

Just a note about **Vatican Radio.** I've popped back from the shack, tonight, the station is on 6190 kHz—strange, last night it was definitely on 6185 kHz—any comments?

Anyway, that's about it for now as I have just heard a rumour that **Beryl**, our new telephonist, has arrived in her **pale blue shorts** on her tandem and the first male member of staff to get his bicycle clips on is invited for a spin so Gud DXes 73es FBYLS, XYLS, esFBOM, etc. David

YAESU MUSEN CO. LTD

A message from the President – Sako Hasegawa – JA1MP

The YAESU MUSEN Co Ltd., which has been established over a quarter of a century, has now grown to be the largest single manufacturer of amateur communications equipment in the world.

This has been achieved to no small degree by the dedication and expertise of the YAESU engineering staff, among whose numbers are to be found nearly 400 active licensed operators, and it is this factor, as much as anything, that has enabled YAESU to sense the needs of the market and produce so many truly innovative equipments.

Quite apart from this important human aspect, we have one of the most efficient production units in the industry world-wide. By utilizing the very latest computer aided design and manufacturing techniques we ensure that you, our valued customer, is provided with the very latest state-of-the-art product. Finally, intensive environmental and computer-aided electronic test procedures guarantee you maximum reliability.

So much for our part in the chain of events - the next critical phase is the safe delivery to you via our specialist distributer/dealer network. When supplied through our authorised network you have my personal guarantee of a superb after-sales back-up extending right back to the factory and the technical support of our own expert staff.

To sum up, all the benefits of the YAESU fraternity are yours ONLY when you buy from an authorised U.K. dealer, so always look for the special YAESU U.K. logo when you make your purchase and ALWAYS ask the dealer if he has my Company's authorisation via our two long-established YAESU agents, Amateur Electronics U.K. and South Midlands Communications Ltd.

Best 73 and good DX!

Sako Hasegawa
President
YAESU MUSEN CO. LTD. TOKYO

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FT-980 ALL MODE HF CAT *

* Computer-Aided Transceiver

This incredible new transceiver incorporates the highest level of microprocessor control ever offered in an HF all solid-state radio. Including a general coverage (0.15-30MHz) receiver with its own, separate front end, this amateur transceiver offers a new dimension in frequency control; whereby frequencies can be entered by either front panel keypad or tuning dial, and then scanned in selectable steps either freely or between any two programmable limits. Twelve memories include four with special protection, and two large digital displays allow full flexibility and control for split frequency operation while two meters allow full transmitter information.

Additional controls include IF Width and Shift on concentric controls, AMGC (Automatic Mic Gain Control) to set microphone input threshold, RF Speech Processor, ALC Meter Hold function, IF Notch and Audio Peak filters, Transmit Monitor, Noise Blanker and CW Full Break-in. Controls are also provided for FM Squelch and CW Keyer Speed when the optional FM and Keyer Units are installed.

The most important feature of the FT-980 is that practically all of the above features can be controlled by the user's separate personal computer, when connected through an optional Interface, also available from Yaesu. Where up to now the few amateur transceivers that offered any kind of computer interfacing at all permitted only frequency control, the FT-980 permits almost total control of all functions from a separate microcomputer, including Mode; IF Width and Shift; Scanner Step, Speed and Limits; and switching of most other functions. (Microcomputers are not available from Yaesu.)

FT-77 THRIFTY HF TRANSCEIVER

UTILIZING THE NEW CAD/CAM* MANUFACTURING TECHNIQUES, YAESU PRESENTS THE FT-77 AS A NEW MILESTONE IN RELIABILITY, SIMPLICITY AND ECONOMY IN HF COMMUNICATIONS.

Thrifty

Featuring efficient, all solid-state, no-tune circuitry, the FT-77 offers a nominal 100 watts of RF output on all amateur bands between 3.5 and 30 MHz, including the WARC bands. New CAD/CAM techniques plus the simple design of the FT-77 add up to one of the smallest, lightest HF transceivers ever; both in your hands, and on your wallet.

Simple

The front panel control layout and operation are actually simpler than some VHF FM transceivers, with only essential operating controls; while the simple circuit design leaves fewer parts that could cause problems. Nevertheless, all of the essential modern operating features for HF SSB and CW are included, along with extras such as dual selectable noise blanker pulse widths (designed to blank woodpecker or common impulse noise), full SWR metering, and capabilities for an optional internal fixed-frequency channel crystal, narrow CW filter and FM Unit.

Reliable

Computer-aided design of the circuit boards in the FT-77 ensures the most efficient component layout possible in the smallest space, while automatic parts insertion and soldering greatly diminish the chance for human error. Reliability and quality control are thus improved and simplified beyond the degree previously attainable in amateur equipment. This means longer equipment life with less chance of breakdown.

Expandable

The extremely compact size and simple control layout make the FT-77 ideal for mobile operation, or as the heart of a complete base station with the optional FP-700 AC Power Supply, FV-700DM Digital Scanning VFO and Memory System, FTV-700 V/UHF Transverter and the FC-700 Antenna Tuner. The competitive price of the FT-77, coupled with the expansion capabilities presented by these accessories, make this transceiver the perfect choice for those new to amateur HF communication, or as a practical second rig for old-timers.

*Computer Aided Design/Computer Aided Manufacture

FT-726R VHF/UHF Multi-bander

Combining all of the best features from Yaesu HF and V/UHF transceivers, the FT-726R opens a new world of operating ease and flexibility for FM, SSB and CW on the 50*, 144 and 430/440 MHz amateur bands. The design of the FT-726R integrates the individual operating requirements of each of the three operating modes into one unit, and the user can then select which of the optional plug-in band modules he desires.

The VFO-A/B scheme has ten programmable memories, and can be tuned in 20Hz steps for CW and SSB operation, or in selectable steps for FM. FM tuning is accomplished by an indented tuning knob. IF Width and Shift controls are provided for CW and SSB operation, while both preset standard and user programmable repeater offsets can be selected for all modes. An optional Satellite Unit makes the FT-726R into a full duplex cross-band satellite transceiver.

*144 MHz Unit installed, other Units available as options according to local regulations.

AGENTS

North West - Thanet Electronics Ltd. Gordon, G3LEQ. Knutsford (0565) 4040
Wales & West - Ross Clare, GW3NWS, Gwent (0633) 880 146
East Anglia - Amateur Electronics UK, East Anglia, Dr. T. Thirst (TIM) G4CTT Norwich 0603 667189
North East - North East Amateur Radio, Darlington 0325 55969
Shropshire - Syd Poole G3IMP. Newport. Salop 0952 814275

For full details of these new and exciting models, send today for our latest SHORT FORM CATALOGUE. All you need do to obtain the latest information about these exciting developments from the World's No.1 manufacturer of amateur radio equipment is to send 36p in stamps and as an added bonus you will get our credit voucher value £3·60 - a 10 to 1 winner!

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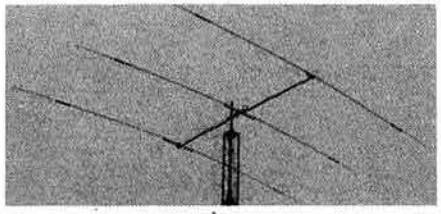
TET ANTENNA SYSTEMS



AX210N	10 ele. yagi for 2m crossed	74.95	(n/c)
HB10F2T	2 ele. 10m mono band beam	51.50	(n/c)
HB10F3T	3 ele. 10m mono band beam	74.95	(n/c)
HB15F2T	2 ele. 15m mono band beam	60.66	(n/c)
HB15F3T	3 ele. 15m mono band beam	93.46	(n/c)
HB15M25P	VP mini size 15m 2 ele.	69.50	(n/c)
HB15M35P	VP mini size 15m 3 ele.	102.30	(n/c)
HB34D	4 ele. tri band beam 10/15/20m	222.90	(n/c)
HB33SP	3 ele. tri band beam 10/15/20m	192.50	(n/c)
HB35C	Tri band array 10/15/20m	283.95	(n/c)
HB35T	5 ele. 10/15/20m	278.50	(n/c)
MV3BH	Vertical for 10/15/20m	37.99	(n/c)
MV4BH	Vertical for 10/15/20/40m	48.90	(n/c)
MV5BH	Vertical for 10/15/20/40/80m	63.95	(n/c)
MLA4	Loop antenna 10/15/40/80	105.60	(n/c)
SQ22	Phased 2 ele. swiss quad 2m	58.95	(n/c)
SQY06	6 ele. quagi 2m	45.75	(n/c)
SQY08	8 ele. quagi 2m	52.75	(n/c)
HB210S	10 ele. dual driven yagi 2m	47.99	(n/c)
TE214	14 ele. long yagi 2m	74.40	(n/c)
SSL720	9 x 2 ele. (18) slot fed 70cm	77.20	(n/c)
HB23SP	2 ele. tri band beam 10/15/20m	135.60	(n/c)
SSL218	9 x 2 ele. (18) slot fed 2m	144.79	(n/c)
TPH2	Phasing harness 2m	17.25	(n/c)
QYU10	10 ele. quagi 70cm	67.90	(n/c)
SQ007	70cm 2 ele. phased swiss quad	66.99	(n/c)
SQ10	Swiss quad 10m	97.50	(n/c)
SQ15	Swiss quad 15m	106.90	(n/c)

YAESU ANTENNAS

Base			
RSL145GP	½ wave base ant. 2m	21.20	(1.50)
RSL435GP	½ wave co-linear 70cm	31.60	(1.50)
HF Mobile			
RSL3.5	3.5MHz resonator & whip	12.21	(0.50)
RSL7.0	7.0MHz resonator & whip	11.80	(0.50)
RSL14.0	14.0MHz resonator & whip	11.45	(0.50)
RSL21.0	21.0MHz resonator & whip	11.20	(0.50)
RSL28.0	28.0MHz resonator & whip	11.00	(0.50)
RSL2A	Mast to suit above	5.00	(0.50)
RSM2	Gutter mount/Feeder/PL259 suit above	10.94	(0.75)
VHF Mobile			
RSL145	2m ¼ wave fibreglass whip	12.10	(0.50)
RSL145S	2m ¼ wave steel whip foldover	9.25	(0.50)
RSL150SS	2m ¼ wave PL259 shock spring	3.90	(0.50)
RSM2	Gutter mount/Feeder/PL259 (RSL145)	10.94	(0.75)
RSM4M	Heavy duty mag/Feeder/PL259	13.25	(1.00)
UHF Mobile			
RSL453S	½ wave antenna	15.50	(0.50)

ANTIFERENCE ANTENNAS

VHF Mobile			
TAP3009	½ wave 3db snap-in hinged whip	11.42	(3.00)
TAP3677	½ wave 3db snap-in shock coil	15.64	(3.00)
TAP3002	¼ wave unity gain snap-in hinged whip	8.81	(3.00)
UHF Mobile			
TAP3462	½ over ½ wave 3db	9.89	(3.00)
TAP3697	½ over ½ wave 5db	18.40	(3.00)
K220	Mag mount/Feeder to suit above	10.73	(2.00)

Antennas Various/Accessories

HQ1	Mini beam 10/15/20m 2 ele. 1kW	TBA	(4.00)
C4	Vertical 10/15/20m	48.50	(3.00)
G4MH	Mini beam 10/15/20	85.00	(4.00)
KTLM-4	Gutter mount/Cable assy. SO239	6.90	(0.50)
DATONG PRODUCTS			
PC1	50KHz to 30MHz receive converter	137.42	(0.50)
VLF	Very low freq. converter	29.90	(0.50)
FL1	Frequency agile audio filter	79.35	(0.50)
FL2	Multimode audio filter	89.70	(0.50)
ASP/A	Auto RF speech clipper (YAESU)	82.80	(0.50)
ASP/B	Auto RF speech clipper (TRIO)	89.70	(0.50)
D75	Manual RF speech clipper	56.35	(0.50)
RFC/M	RF speech clipper module	29.90	(0.50)
D70	Morse tutor	56.35	(0.50)
AD270	Active dipole RX ant. (indoor)	47.15	(0.50)
AD370	Active dipole RX ant. (outdoor)	64.40	(0.50)
MK	Morse keyboard	137.42	(0.50)
DC144/28	2m converter	39.67	(0.50)
RFA	Broadband preamplifier	33.92	(0.50)
MPU	Mains power unit	6.90	(0.50)
MICROWAVE MODULES			
Transverters			
MMT28/144	10m transverter	109.95	(2.50)
MMT70/144	4m transverter	119.95	(2.50)
MMT432/144R	70cm transverter	184.00	(2.50)
MMT1296/144	23cm transverter	184.00	(3.00)
MMT70/28	4m transverter	119.95	(2.50)
MMT144/28	2m transverter	109.95	(2.50)
MMT432/28S	70cm transverter	159.95	(2.50)
Linear Amplifiers			
MML28/100S	10m 100W linear amp.	129.95	(3.00)
MML70/50S	4m 50W linear amp.	85.00	(2.50)
MML70/100S	4m 100W linear amp.	139.95	(3.00)
MML144/30LS	2m 30W linear amp. 1-3W in	69.95	(2.50)
MML144/50S	2m 50W linear amp.	85.00	(2.50)
MML144/100LS	2m 100W linear 1-3W in	159.95	(3.00)
MML144/100S	2m 100W linear 10W in	139.95	(3.00)
MML432/50	70cm 50W linear amp.	109.95	(3.00)
MML432/100	70cm 100W linear amp.	228.65	(4.00)
MML1296/10	23cm 10W linear amp.	199.00	(2.50)
MML432/30	70cm 30W linear amp. 1-3W in	99.00	(3.00)
Converters			
MM1000KB	ASC11 morse converter with keyboard	99.95	(3.00)
MM4001	RTTY to TV converter	189.00	(2.50)
MM4001KB	RTTY transceiver	269.00	(2.50)
MM4000KB	RTTY transceiver with keyboard	299.00	(4.00)
MMC28/144	10m to 2m converter	29.90	(1.00)
MMC50/28	6m to 10m converter	29.90	(1.00)
MMC70/28	4m to 10m converter	29.90	(1.00)
MMC70/28LO	4m to 10m with LO	32.90	(1.00)
MMC432/28S	70cm to 10m converter	37.90	(1.00)
MMC432/144S	70cm to 2m converter	37.90	(1.00)
MMC435/600	UHF ATV converter	27.90	(1.00)
MMC1296/28	23cm to 10m converter	34.90	(1.00)
MMC1296/144	1296MHz low noise converter	69.95	(1.00)
MMK1691/137.5	1691MHz meteosat converter	129.95	(2.50)
Morse Talkers			
MMS1	Morse tutor 2-20WPM Side tone	115.00	(2.50)
MMS2	Morse tutor (advanced) 6-32WPM + speak back	169.00	(2.50)
Amateur TV			
MTV435	70cm 20W (PSP) transmitter	149.00	(2.50)
MMC435/600	Converter ATV UHF output	27.90	(1.00)
Preamplifiers			
MMA144V	2m preamp RF switched	34.90	(1.00)
MMA28	10m preamp	16.95	(1.00)
MMA1296	23cm preamp	34.90	(1.00)
Frequency Counters			
MMD650/500	500MHz digital meter	75.00	(1.00)
MMD600P	600MHz pre scaler	29.90	(1.00)
MMDP-1	Probe	14.90	(0.50)
Filters			
MMF144	2m band pass 40W max.	11.90	(1.00)
MMF452	70cm band pass 40W max.	11.90	(1.00)
Various			
MMS384	384MHz signal source	29.90	(1.00)
MMR15/10	15db 10W attenuator	11.90	(1.00)
HI-MOUND MORSE KEYS			
HK702	Up down keyer marble base	24.50	(0.50)
HK704	Up down keyer	16.68	(0.50)
HK705	Up down keyer	12.50	(0.50)
HK706	Up down keyer	13.75	(0.50)
HK708	Up down keyer	11.96	(0.50)
HK808	Up down keyer marble base	39.57	(0.50)
MK704	Twin paddle keyer	10.95	(0.50)
MK705	Twin paddle keyer marble base	22.00	(0.50)
MOULDINGS			
IK	Iambic keyer	19.95	(0.50)

TOKYO HY POWER

HC150	HF ATU SWR/Power meter 200W PEP	62.50	(n/c)
HC2000	HF 2kW ATU SWR/Power meter 6 POS ant. switch. 6 to 1 vernier high Q coils 2kW peak 1kW continuous	276.55	(n/c)
Antenna Rotators & Accessories			
9502	Channel master med duty up to 8 ele.	57.00	(3.50)
9523	Alignment bearing for 9502	15.81	(1.25)
KR400	Med/Heavy duty 180° meter (inc. lower casting)	90.85	(3.50)
KR400RC	Med/Heavy duty 360° meter Load 200Kg 1¼"-2" masts	114.94	(3.50)
CASTING	Lower casting set (400RC)	15.00	(1.25)
KR600RC	Heavy duty 360° meter Load 200Kg Rot600Kg/cm Brake 4000Kg/cm 1¼"-2"masts	163.30	(3.50)
Antenna Switches			
SA450	SO239 connectors 1 in 2 out	9.75	(0.50)
SA450N	"N" type connectors 1 in 2 out	12.75	(0.50)
Baluns			
BL50A	RAK 50 ohm ferrite BALUN 1:1 1.8-38MHz 1kW	12.88	(1.50)
BL-40X	Balun 2K PEP 1.1	11.52	(1.50)
Dummy Loads			
T30	30W DC 500MHz PL259	6.61	(0.50)
T100	100W DC 500MHz SO239	20.12	(1.00)
T200	200W DC 500MHz SO239	31.36	(1.50)
T210	Wide band 10W 1.2G-2.4G	24.50	(0.75)
AW05	Pocket RF wattmeter 5W up to 500MHz BNC	19.75	(1.00)
Filters			
AKD	Hi-pass blocks 0-200MHz RF interference to UHF above 400MHz	5.50	(0.50)
Linear Amplifiers			
YAESU			
FL110	HF 160/80/40/20/15/10m 100W (10W drive)	155.25	(n/c)
FL2100Z	HF warc 1200w PEP. SSB 1kW CW, 400W AM/FM/FSK	449.00	(n/c)
FL2010	2m VHF 10W linear	54.00	(n/c)
FL2050	2m VHF 50W linear 10W drive	115.00	(n/c)
FL7010	70cm UHF 10W linear	91.00	(n/c)
TOKYO HY POWER			
HL32V	VHF 30W linear 1-5W drive HI-LOW output	53.50	(n/c)
HL82V	VHF linear preamp output meter 2-12W in 35-85+ out	144.50	(n/c)
HL160V	VHF linear preamp output meter 1-10W in 160W+ out	242.40	(n/c)
HL45U	UHF linear preamp 2-15W in 10-45W out	119.75	(n/c)
ADONIS MICROPHONES Mobile/Base			
MM202S	Mobile safety mic. (non scanning)	23.00	(1.00)
MM202HD	Mobile safety mic. (scanning)	30.00	(1.00)
AM502	Desk mic. (compressor selectable)	45.94	(1.00)
Miscellaneous			
Mutec			
SNL144S	2m preamp RF switched	33.90	(1.00)
RPCB	144UB FT221/225 front end board	64.50	(1.25)
Ni-cads			
AA	AA size Ni-cad	1.00	(0.20)
C	C size Ni-cad	2.40	(0.30)
NC1850	Ni-cad charger (4 x C or 4 x AA)	9.50	(1.00)
DRAE PRODUCTS			
DRAE4	4 amp PSU	30.75	(2.00)
DRAE6	6 amp PSU	48.00	(2.50)
DRAE12	12 amp PSU	74.00	(3.00)
DRAE24	24 amp PSU	105.00	(4.00)
DRAE WM	135-450MHz wavemeter	27.50	(1.00)
"N" Connectors (Silver Plated)			
N58	"N" Male connector RG58	2.25	(0.25)
N8	"N" Male connector RG8	2.40	(0.25)
N308	"N" T adaptor (three female)	2.40	(0.25)
N307	"N" L adaptor (1 male 1 female)	2.40	(0.25)
N306	"N" Double female adaptor	1.90	(0.25)
N310	"N" Double male adaptor	2.50	(0.25)
N8304	"N" Female to BNC male adaptor	2.10	(0.25)
N402	"N" Plug to SO239	2.05	(0.25)
N403	"N" Socket to PL259	2.00	(0.25)
N404	"N" Socket to SO239	1.80	(0.25)
Speakers/Headphones			
Various			
RT650	4 ohm, 8 ohm 3W nom 6W max	6.50	(0.50)
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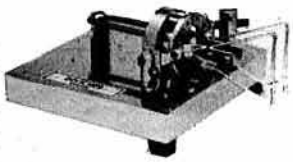

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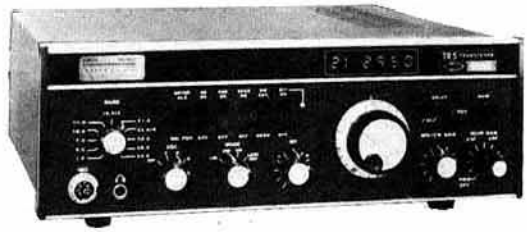

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IC-720A

The main problem that the amateur of today has to deal with is deciding just which rig out of the many excellent products available he is going to choose. Technology is advancing at such a rapid rate and getting so sophisticated that many cannot hope to keep up. Some go too far!

Perhaps one way of dealing with the problem is to look at just What each model offers in its basic form without having to lay out even more hard earned cash on "extras". The IC-720A scores very highly when looked at in this light. How many of its competitors have two VFOs as standard or a memory which can be recalled, even when on a different band to the one in use, and result in instant returning AND BANDCHANGING of the transceiver? How many include a really excellent general coverage receiver covering all the way from 100KHz to 30MHz (with provision to transmit there also if you have the correct licence)? How many need no tuning or loading whatsoever and take great care of your PA, should you have a rotten antenna, by cutting the power back to the safe level? How many have an automatic RIT which cancels itself when the main tuning dial is moved? How many will run full power out for long periods without getting hot enough to boil an egg? How many have band data output to automatically change bands on a solid state linear AND an automatic antenna tuner unit when you are able to add these to your station?

Well you will have to do quite a bit of hunting through the pages of this magazine to find anything to approach the IC-720A.

trap dipole

The MT-240X Multi-band trap dipole antenna (80m – 10m) is a superbly constructed antenna with its own Balun incorporated in the centre insulator with an SO239 connector. Separate elements of multi-stranded heavy duty copper wire are used for 80-40-15 and 20-10 Metres. Really one up on its competitors

IC-730

ICOM's answer to your HF mobile problems – the IC-730. This new 80m–10m, 8 band transceiver offers 100W output on SSB, AM and CW. Outstanding receiver performance is achieved by an up-conversion system using a high IF of 39MHz offering excellent image and IF interference rejection, high sensitivity and above all, wide dynamic range. Built in Pass Band Shift allows you to continuously adjust the centre frequency of the IF pass band virtually eliminating close channel interference. Dual VFO's with 10Hz, 100Hz and 1KHz steps allows effortless tuning and what's more a memory is provided for one channel per hand. Further convenience circuits are provided such as Noise Blanker, Vox, CW Monitor APC and SWR Detector to name a few. A built in Speech Processor boosts talk power on transmit and a switchable RF Pre-Amp is a boon on today's crowded bands. Full metering WWV reception and connections for transverter and linear control almost completes the IC-730's impressive facilities.

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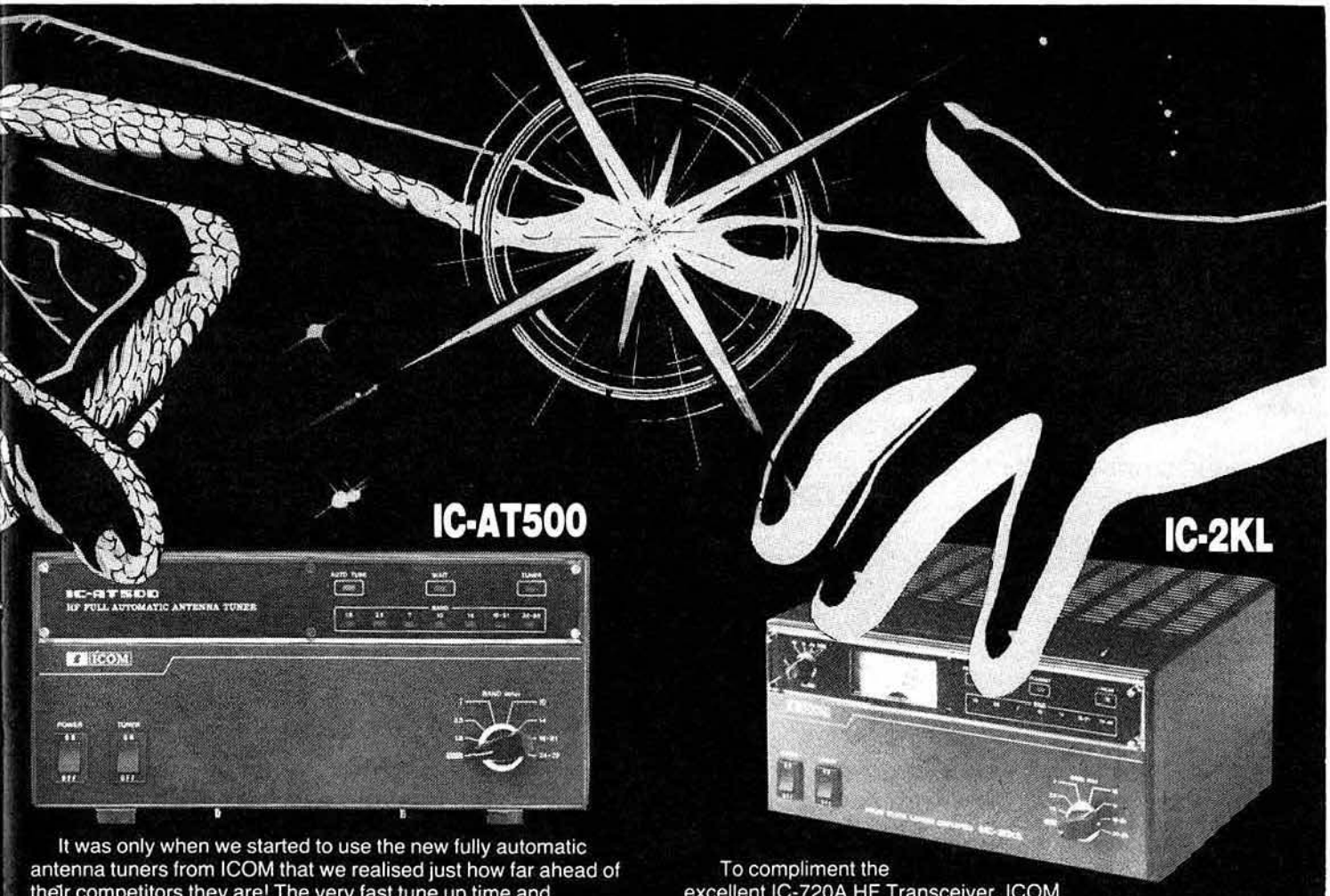

IC-AT500

It was only when we started to use the new fully automatic antenna tuners from ICOM that we realised just how far ahead of their competitors they are! The very fast tune up time and simplicity of use make them a real worthwhile addition to any station even if the rest of your station isn't ICOM. If it is, then you have the added advantage of fully automatic band selection so that you can virtually hide it away in a cupboard if you want (though we think you will want to show it off).

Dual accessory sockets are supplied so that you can easily chain your IC-720A, (or IC-701 or IC-730) together with the IC-2KL and AT-500 to produce what must be one of the most advanced automatic stations available.

And remember we also sell **Yaesu, Jaybeam, Datong, Welz, G-Whip, Western, TAL, Bearcat, Versatower** and **RSGB** publications from our shop and showroom at the address below.

Come in for a demonstration or just a chat, our qualified sales staff and technicians will be glad to assist you.

Listed below are other sets available from Thanet Electronics, a more detailed specification of these will appear in future advertisements. IC-740 PSU for 740 IC-SP3 IC-451 IC-4E IC-410 IC-505 IC-PS20 IC-551 IC-45E IC-R70 IC-ML1 IC-251 IC-PS15 IC-290H IC-AT100 IC490E IC-2E IC-25E TONO: MR250 9000E 550 TELEREADER: CWR-670 -685E -610E

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IC-2KL

To compliment the excellent IC-720A HF Transceiver, ICOM have produced the IC-2KL linear amplifier. It is of a similar size and matches the IC-720A perfectly. It produces 500W output on SSB, CW, AM and RTTY needing 80-100W of drive. As with the IC-720A it will operate from 1.6MHz to 30MHz continuously at full output power, but you still need an antenna that matches. It will follow the IC-720A automatically changing bands WITH NO TUNING – the operating is done from the prime-mover.

Agents (phone first – all evenings and weekends only, except Scotland).
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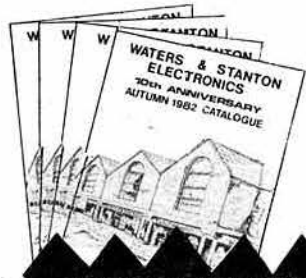

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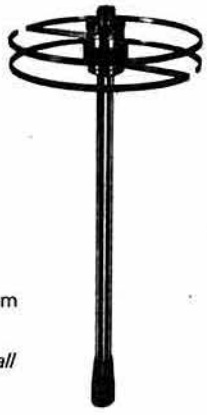

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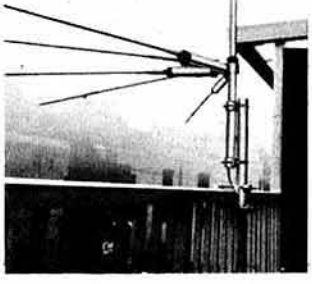

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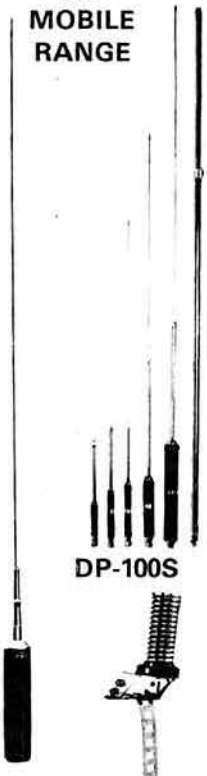
73s Peter Walker G3OJV

"HF" MOBILE RANGE



DP-100S

EL40 LBR
EL80 BDS

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- ★ Universal power supply 110-234V AC and 12V DC.**

SPECIAL OFFER

Every FT902 supplied c/w C.W. and A.M. filters. Also with every FT902 we sell this month we offer an FC902 A.T.U. for only **£35.00.** You **save £100** on the **FC902.**

*Option ** D & DE Models

FT102 £839 inc VAT @ 15% & SECURICOR

FREE CREDIT COVER

- ★ 1.8-3.5-7-10-14-18-21-24.5-28MHz
- ★ All modes: LSB, USB, CW, AM†, FM†, (†Option board)
- ★ Front end: extra high level, operates on 24V DC
- ★ RF stage bypassable, boosts dynamic range over 100 dB!
- ★ Variable bandwidth 2.7KHz→500Hz *and* IF Shift
- ★ Fixed bandwidth filters, parallel or cascade
- ★ IF notch (455kHz) *and* independent audio peak
- ★ Noise blanker adjustable for pulse *width*
- ★ External Rx and separate Rx antenna provisions
- ★ *Three* 6146B in special configuration – 40dB IMD!
- ★ Extra product detector for checking Tx IF signal
- ★ Dual meter, peak hold ALC system
- ★ Mic amp with tunable audio network

SP102: – Speaker, Hi and Lo AF filters, 12 responses!
FV012: – VFO, 10Hz steps and readout, scanning, QSY
FC102: – ATU, 1·2KW, 20/200/1200 W FSD PEP, wire
FAS-1-4R: – 4 way waterproof antenna selector

FT707 £515 inc VAT @ 15% & SECURICOR

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

*Option

SPECIAL OFFER

Buy an FT707 and we will give you a free FTV707R transvertor main frame unit worth £79.00

SMC FM MODIFIED VERSION AVAILABLE; £40 EXTRA

KDK2030 £199 inc VAT @ 15% & SECURICOR

'PLASTIC' BY PHONE

- ★ 2M. 12VDC compact $2\frac{1}{8}$" × $6\frac{3}{8}$" × $7\frac{3}{16}$".
- ★ 25W (+ adjustable low power), $12\frac{1}{2}$kHz steps.
- ★ 10 "year long" memories for "crystal control".
- ★ Display reads to 100's of Hz *or* channel number.
- ★ Sensitivity <0.2μV for 12dB SINAD (0.14μV typical).
- ★ Single knob frequency selection. 20 steps rev.
- ★ Rapid QSY button, end to end in a single turn.
- ★ Digital RIT 1kHz steps, adjusted from main tuning.
- ★ 2, 5 slot memories, simplex, cross or 600kHz split.
- ★ Memories entered by pushing main tuning knob.
- ★ +600kHz split. Instant repeater input monitor.
- ★ Band scan between front panel selectable, limits.
- ★ Scan stop requires squelch open *and* centre zero.
- ★ Scanning and up/down tuning on the microphones.
- ★ Reprogrammable; steps, tone, splits, and coverage.
- ★ C/W mic. "Easy out" mobile mount and handbook.

FT230R £255 inc VAT @ 15% & CARRIAGE

- 150(W) × 50(H) × 176(D)mm.
- Up/down, memory/band scanning.
- Easy "write-in" memory channels.
- Memory backup "5 year" lithium cell.
- Ten memories with priority functions.
- Supplied with scanning microphone.
- Illuminated "any angle" LCD display functions.
- Display to 100's of Hz.
- Two completely independent VFO's.
- Operation between memory and VFO.
- Full reverse repeater function.
- Manual and automatic tone burst.
- Large "full sound" internal speaker.
- Concentric volume and squelch.

2 or 70!

- 144-146MHz (extensions possible).
- 25W RF output, 3W on low.
- 25 and 12½kHz steps provided.
- ±600kHz repeater split, 1750Hz burst.
- Tx; 5A. Rx 300mA (standby).

- 430-434MHz (440-445MHz possible).
- 10W RF output, 1W on low.
- 25 and 100kHz steps provided.
- ±1.6 MHz repeater split, 1750Hz burst
- Tx 3A, Rx 300mA (standby).

FT730R £299 inc VAT @ 15% & SECURICOR

- Multimode USB, LSB, FM, CW
- Optically coupled main tuning
- 100Hz backlit LCD Frequency display
- 10 memory channels "5 year" backup
- Any Tx/Rx split with dual VFOs
- Up/down tuning from microphone
- AF output 1W @ 10% THD
- Bandwidth 2·4kHz and 14kHz @ −6dB
- LED's, "on air", "busy" m/c meter; S.PO
- 58 (H) × 150 (W) × 195 (D), 1.3kg

'790 EX-STOCK

SMC8C	Slow Charger (220mA)	£8.80
MMB 11	Mobile Mount	£22.25
CSC1A	Soft carrying case	£3.45
FL2010	Linear Amplifier 2m 10W	£59.00
FL7010	Linear Amplifier 70cms	£91.00

6, 2 or 70!

FT290R £285 inc

VAT @ 15% & POSTAGE

- 144-146MHz (144-148 possible)
- 2.5W PEP, 2.5W 300mW out or FM
- FM: 25kHz and 12.5kHz steps
- SSB: 1kHz and 100Hz steps
- ± 600kHz repeater split, 1750kHz burst
- Integral telescopic antenna
- Rx, 70mA, Tx: 800mA (FM maximum)

FT790R £349 inc

VAT @ 15% & POSTAGE

- 430-330MHz (440-450 alternative)
- 1W PEP, 1W/250mW FM/CW out
- FM: 100kHz and 25kHz steps
- SSB: 1kHz and 100Hz steps
- 1·6MHz shift with input monitor, 1,750Hz burst
- Rx: 100mA/200mA. Tx; 750mA maximum
- BNC Mounted ¼λ flexi antenna included

FT780R (70cm) £389 inc VAT @ 15% & SECURICOR

- USB-LSB-CW-FM (A3j, A1, F3)
- 30W PIP A3j, 10/1 W out A1 F3
- Any TX Rx split with dual VFO's
- Four easy write-in memory channels
- Memory scanning with slot display
- Up/down tuning/scanning from mic.
- Priority channel on any memory slot
- Digital RIT. Advanced noise blanker
- Satellite mode allows tuning on Tx
- Semi break in with side tone
- Very bright blue 100Hz digital display
- Display shows Tx & Rx freq (inc RIT)
- String LED display for "S" and PO
- LED's; "On Air", Clar, Hi/Low, FM mod.
- Size (Case): 8.3" D, 2.3" H, 6.9" W

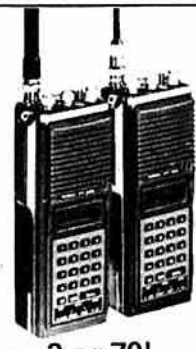
SPECIAL OFFER

- FT780R 1·6 fitted 1·6MHz Shift **£399** inc.
- 430-440MHz (440-450) possible
- GaAs Fet RF for incredible sensitivity
- FM; 100kHz, 25kHz, 1kHz, steps
- SSB; 1,000, 100, 10Hz steps

FT480R R.I.P.!

Sadly Yaesu has discontinued the FT480R. As a mark of respect on this dark occasion, to complete your VHF/UHF station, if you originally bought your FT480R from S.M.C. and you buy a FT780R we will give you a free SC1 matching station consol/power supply worth **£138.00.** Alternatively, anyone buying a FT780R will get a free FP80A matching power supply worth **£55.00.**

- Keyboard entry of frequencies/splits
- LCD digital display with backlight
- Any split + or − programmable
- Ten memory channels "5 year" back up
- Up/down manual tuning. Memory scan
- Manual or auto scan for busy/clear
- Priority channel with search back
- Scan between any two frequencies
- Auto scan restart. 1,750Hz tone burst
- Built in condenser microphone
- 500mW to int/ext speaker
- External speaker/mic available
- 168(H) × 61(W) × 39(D)mm
- C/w Quick change NiCad pack, helical



2 or 70!

FT208R £199 inc

VAT @ 15% & POSTAGE

- 144-146MHz (144-148 possible)
- 12.5/25kHz synthesizer steps
- ± 600kHz repeater split
- 2.5 or 0.3W RF output
- Rx: 20mA squelch 150mA max AF
- Tx: 800mA at 2.5W RF
- 0.25μV for 12dB SINAD

FT708R £229 inc

VAT @ 15% & POSTAGE

- 430-440MHz (440-450 alternative)
- 25kHz synthesizer steps
- ±7.6MHz EU split standard
- 1W or 100mW RF output
- Rx 20mA squelch, 150mA (max AF)
- Tx:500mA it 1W RF
- 0.4μV for 12dB SINAD

2 and/or 70!!

- Four easy write-in memory channels
- Rx priority channel (auto check)
- Scanning band/memory empty/busy
- Up/down tuning/scanning from mic.
- Optically coupled tuning control
- Manual and automatic tone burst
- String LED's for 'S' and PO. 7 status LEDs
- 1½W of audio to internal/external speaker

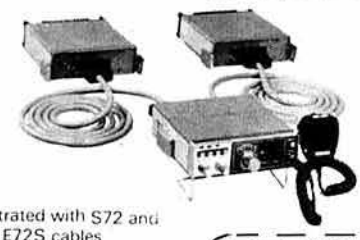
FT720 Control Head

- 3.3 (4.3)" D × 6" W × 2 (2.2)" H

S72 Switching box

- Pushbutton band change Auto steps/splits

E72S Extension cable, 2m long
E72L Extension cable, 4m long
MMB3 Mobile Mounting bracket for deck



illustrated with S72 and two E72S cables

FT720RV £199 inc VAT @ 15% & SECURICOR

- 144-146MHz (144-148MHz possible)
- 12½kHz synthesizer, 600kHz shift
- 0.3μV for 20dB quieting
- Rx 0.5A. Tx RV 3.5A, RVH 6.5A
- 5.8 (6.5)" D × 6" W × 2(2.2)" D

- 430-434MHz
- 25kHz synthesizer steps, 1.6MHz shift
- 0.5μV for 20dB quieting
- Rx; 0.5A, Tx; 4.5A
- 5.8 (6.5)" D × 6" W × 2(2.2)" D

FT720RU £229 inc VAT @ 15% & SECURICOR

★ THE FT7B IS DEAD! LONG LIVE THE FT77! ★

The FT77 is an all new 80-10m (inc. WARC) 100 Watt, transceiver, ideal for mobile (no tune, inbuilt SWR meter, only 3½" × 9½" and less than a foot deep—including heat sink!) or as the heart of a base station with its compatibility with the FTV707 transverter (N.B. FM option available), and the FV707DM digital external memory VFO etc. Operational simplicity is the keynote of this design, nevertheless features demanded by today's discriminating amateurs have not been neglected including dual selectable

noise blanker pulse widths (eliminates woodpecker or impulse noise) and optional narrow CW filter. The FT77 is the perfect first rig or second transceiver for an OT. Computer aided design of circuit board for efficient component layout, automatic parts insertion for high reliability at low cost:

FT77	Transceiver 100W	**£515·00**
FT77S	Transceiver10W	**£435·00**
MARK77	Xtal marker board	**£9·60**
FMU77	FM unit	**£25·30**

COMMUNICATION RECEIVER: NRD515 £985 inc VAT @ 15% & SECURICOR

- ★ 30MHz to 100kHz or lower, 100Hz steps.
- ★ PLL digital VFO, stable (50Hz/hr AWU).
- ★ Backlash free, 500Hz analogue calib.
- ★ Fast tune up/down switch, dial lockout.
- ★ SSB (USB/LSB), CW, AM, RTTY.
- ★ 6 and 2.4kHz, 600* and 300* Hz @—6dB.
- ★ Passband tuning ±2kHz on SSB and CW.
- ★ Variable BFO on CW for preferred tone.
- ★ Modular plug in design with mother board.
- ★ Reliable—low power schottky & CMOS.
- ★ Designed for maximum ease of operation.
- ★ Noise blanker 0-10-20dB attenuator.
- ★ Small (140 × 340 × 300mm) light 7½Kg.

PROFESSIONAL MONITOR

- ★ Up conversion, 70.455MHz and 455kHz
- ★ No R.F. amplifier, balance U310 mixer
- ★ Crystal filter before first IF amplifier
- ★ Transceiver provisions; sidetone, trip etc.
- ★ Frequency data input/output port.

NHD518	96 (4 × 24) channel memory unit.
NCM515	Remote frequency keypad controller, LCD readout, 4 channel memory Up/down step tuning.
CQE515	Junction unit (NCM515 to NHD518).
NVA515	External 3W speaker.
CFL260	600Hz mechanical filter
CFL230	300Hz crystal filter

★ NEW—FT726R, 3 BAND, MULTIMODE, VHF/UHF ★

The FT726R is a revolutionary combination of a full feature VHF/UHF transceiver with the deluxe facilities (which you have always wondered why were only available on HF transceivers) such as IF shift and variable bandwidth for SSB and CW operations plus a full duplex option for the ultimate cross band and satellite transceiver!
The transceiver main frame accepts 3 modules, 2 metres (standard), 430-440MHz and 6 metres (options). Modes catered for are SSB-CW-FM with optimum provisions made for each: 20Hz steps for SSB/CW,

AVAILABLE SOON—HF Module 21, 24, 28MHz

selectable steps for FM (also preset and programmable repeater splits), plus a A & B VFO system with 10 memory channels. Surely the development of the decade in VHF/UHF transceiver technology.

FT726R(2)	Transceiver inc. 145Mhz	**£699·00**
SAT726	Full duplex unit	**£90·00**
430T726	430-440MHz module	**£230·00**
50T726	Six metre module	**£170·00**

RECEIVER WITH 12 MEMORIES: FRG7700M £399 inc VAT @ 15% & SECURICOR

- ★ 30MHz down to 150kHz (and below).
- ★ 12 Channel memory option with fine tune.
- ★ SSB (LSB/USB), CW, AM, FM.
- ★ 2·7kHz, 6kHz, 12kHz, 15kHz, @ —6dB.
- ★ 3 Selectivities on AM. Squelch on FM.
- ★ Up conversion, 48MHz first IF.
- ★ 1kHz digital, plus analogue, display.
- ★ Inbuilt quartz clock/timer.
- ★ No preselector, auto selected LPF's.
- ★ Advanced noise blanker fitted.
- ★ Antenna 500Ω to 1·5MHz, 50Ω to 30MHz.
- ★ 20dB pad plus continuous attenuator.
- ★ Switchable A.G.C. Variable tone.

'7700 THE ONE WITH FM!
NON-MEMORY VERSION £335

- ★ 110 and 240Vac, 12Vdc option.
- ★ Signal meter calibrated in "S" and SIMPO.
- ★ Acc; Tuners, Converters, LPF, Memory.
- ★ FRT7700; 150kHz-30MHz, Switch, etc.
- ★ FRV7700A; 118-130, 130-140, 140-150MHz.
- ★ FRV7700B; 118-130, 140-150, 50-59MHz.
- ★ FRV7700C; 140-150, 150-160, 160-170MHz.
- ★ FRV7700D; 118-130, 140-150, 70-80MHz.
- ★ FRV7700E; 118-130, 140-150, 150-160MHz.
- ★ FRV7700F; 118-130, 150-160, 170-180MHz.
- ★ FF5; 500kHz (for improved VLF reception).
- ★ MEMGR7700; 12 Channels (internal fitting).
- ★ FRA7700; Active Antenna.

SOUTH MIDLANDS COMMUNICATIONS LTD

S. M. HOUSE, RUMBRIDGE STREET, TOTTON, SOUTHAMPTON SO4 4DP, ENGLAND
Tel: Totton (0703) 867333, Telex: 477351 SMCOMM G, Telegram: "Aerial" Southampton.

GRIMSBY
S.M.C (Humberside)
247A Freeman Street,
Grimsby, Lincolnshire.
Grimsby (0472) 59388
9.30-5.30 Mon-Sat

STOKE
S.M.C. (Stoke)
76 High Street,
Talke Pits, Stoke.
Kidsgrove (07816) 72644
9-5.30 Tue-Sat

LEEDS
S.M.C. (Leeds),
257 Otley Road,
Leeds 16, Yorkshire.
Leeds (0532) 782326
9-5.30 Mon-Sat

CHESTERFIELD
S.M.C. (Jack Tweedy) LTD.
102 High Street,
New Whittington, Chesterfield.
Chesterfield (0246) 453340
9-5 Tue-Sat

BUCKLEY
S.M.C. (T.M.P.),
Unit 27 Pinfold Workshops,
Pinfold Lane, Buckley.
Buckley (0244) 549563
9.30-5.30 (Lunch 1.30) Tue-Sat

JERSEY
SMC (Jersey)
1, Belmont Gardens
St Helier, Jersey
Jersey (0534) 77067
10-7 Mon-Sat

STOCK-CARRYING AGENTS WITH DEMONSTRATION FACILITIES

Edinburgh Jack GM8GEC (031-657 2430 Day / 031-665 2420 Eve
Bangor John GI3KDR (0247) 55162
Tandragee Mervyn GI3WWY (0762) 840656
Neath John GW4FOI (0639) 52374 Day / (0639) 2942 Eve
Stourbridge Andrew (038 43) 72632

hy-gain

The TH7DXX is a new 7 element (10-15-20M) broadband VSWR less than 2:1 at band edges! Compact 20' (6·1M) turning radius—31' (9·4M) longest element dual driven element Yagi which by combining monoband *and* high Q, ultra high power, trapped parasitics provides an average front to back of 22dB on 20 and 15 and 17dB on 10 meters. The antenna weighs 75lbs (34kg) and its projected 9·4 sq feet (0·9 sq m) of wind area produces a load of 240lbs at 80 mph (129 kph).

Construction features include: 6063-T832 taper swaged thick wall aluminium, 18-8 stainless hardware, diecast ali boom/mast clamps, heavy gauge ele/boom clamp and rugged phasing lines. It uses a ß match for DC ground and comes complete with preformed feeder straps and the famous BN86 ferrite balun.

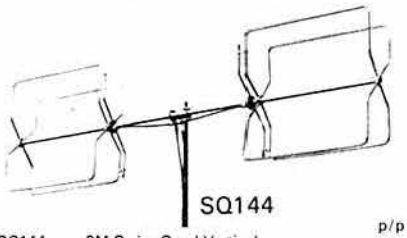
		inc VAT	p/p
12AVQ	Vertical 10-20m inc.	£50.60	£2.50
14AVQ/WB	Vertical 10-40m inc.	£64.40	£2.50
18AVT/WB	Vertical 10-80m inc.	£113.85	£2.50
14RMQ	Roof mounting Kit	£38.52	£2.50
18V	Vertical 10-80m inc.	£36.22	£2.50
103BA	3 Ele Yagi 10m	£67.85	£3.50
105BA	5 Ele Yagi 10m	£155.25	£3.95
153BA	3 Ele Yagi 15m	£90.85	£3.50
155BA	5 Ele Yagi 15m	£236.90	£5.90
203BA	3 Ele Yagi 20m	£178.25	£4.90
204BA	4 Ele Yagi 20m	£286.35	£7.30
205BA	5 Ele Yagi 20m	£396.75	£9.40
402BA	2 Ele Yagi 40m	£247.25	£6.50
DB10/15A	3 Ele Yagi 10-15m	£198.95	£4.80
TH3JNR	3 Ele Yagi 10-15-20m	£202.40	£3.50
TH2MK3	2 Ele Yagi 10-15-20m	£169.05	£3.50
TH3MK3	3 Ele Yagi 10-15-20m	£274.85	£5.30
TH5DXX	"Thunderbird" 5 el.	£419.75	£6.70
TH7DXX	"Thunderbird" 7 el.	£511.75	£8.75
HYQUAD	2'Ele Quad 10-15-20m	£354.20	£6.00
18TD	Dipole Tape 10-80m	£121.90	£2.80
BN86	Balun 1:1·3 30MHz	£16.67	£1.80
LA1	Lightning Arrestor	£59.05	£1.20

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

SMC-HS

HF, VHF, UHF, BASE STATION ANTENNAS

SMC-HS range of base station antennas covers from 80M through to 70cm. All have S0239M connectors and are supplied complete with all required mounting hardware.



SQ144

			p/p
SQ144	2M Swiss Quad Vertical Mounting 2M ⅝ c/w ground plane	£57.60	£2.50
GP2M	3·4dB ¼	£18.00	£2.50
GP144W	2M 2 × ⅝ colinear 6·5dB ¼	£27.60	£2.50
GP23	2M 3 × ⅝ colinear 7·8dB ¼	£39.85	£2.50
GP432	70cm 3 × ⅝ colinear 6·8dB ¼	£29.90	£2.50
70N2V	2M/70cm colinear 2·8dB ¼/5·7dB ¼	£29.90	£2.50
HS770	2M/70cm Duplexer 50W 30dB isolation	£15.35	£1.50
VHFL	65-520MHz Discone Rx only	£15.70	£2.50
GDX1	80-480MHz Discone 3dB ¼	£40.25	£2.50
GDX2	50-480MHz Discone 3dB ¼	£49.45	£2.50
GDXA	100-480MHz Discone 3dB ¼	£33.75	£2.50
LT606	50-500MHz Log Periodic 7-8dB	£115.00	£2.50
HF5V	Trapped Vertical 10-80M 5 bands	£54.80	£2.50
HF5R	Loaded Radial Kit	£34.90	£2.50
3Y1015D20	3 ele 10, 15M Dipole 20M	£144.90	£5.00

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

J-BEAM

				p/p
4 METRES				
4Y/4M	Yagi 4 element	7dBd	£29.90	£2.20
PMH2/4M	Phasing harness 2 way		£16.10	£1.50
2 METRES				
H0/2M	Halo head only	0dBd	£5.98	£1.20
HM/2M	Halo with 24" mast	0dBd	£6.55	£1.50
C5/2M	Colinear omni vert	4·8dBd	£54.62	£2.50
LW5/2M	Yagi 5 element	7·8dBd	£14.37	£2.50
LW8/2M	Yagi 8 element	9·5dBd	£17.82	£2.50
LW10/2M	Yagi 10 element	10·5dBd	£24.15	£2.50
LW16/2M	Yagi 16 element	13·4dBd	£35.07	£3.20
14Y/2M	Yagi 14 element	12·8dBd	£36.23	£3.20
PBM10/2M	10 ele Parabeam	11·7dBd	£44.85	£3.20
PBM14/2M	14 ele Parabeam	13·7dBd	£55.77	£3.20
Q4/2M	Quad 4 element	9·4dBd	£29.32	£2.50
Q6/2M	Quad 6 element	10·9dBd	£39.10	£2.50
Q8/2M	Quad 8 element	11·9dBd	£44.85	£2.50
D5/2M	Yagi 5 over 5 slot	10dBd	£25.30	£2.50
D8/2M	Yagi 8 over 8 slot	11·1dBd	£34.50	£2.50
5XY/2M	Yagi 5 ele crossed	7·8dBd	£28.17	£2.50
8XY/2M	Yagi 8 ele crossed	9·5dBd	£35.65	£2.50
10XY/2M	Yagi 10 ele crossed	10·8dBd	£46.00	£2.50
PMH2/C	Harness cir polarisation		£9.77	£1.50
PMH2/2M	Harness 2 way 144MHz		£12.65	£1.50
PMH4/2M	Harness 4 way 144MHz		£28.75	£1.50
SEVENTY CM				
C8/70	Colinear Omni Vertical	6·1dBd	£62.10	£2.50
D8/70	Yagi 8 over 8 slot	12·3dBd	£25.87	£2.50
PBM18/70	18 ele Parabeam	13·5dBd	£32.20	£2.50
PBM24/70	24 ele Parabeam	15·1dBd	£42.55	£2.50
LW24/70	Yagi 24 element	14·8dBd	£27.02	£2.50
MBM28/70	28 ele Multibeam	11·5dBd	£21.27	£2.50
MBM48/70	48 ele Multibeam	14·0dBd	£35.65	£2.50
MBM88/70	88 ele Multibeam	16·3dBd	£48.87	£2.50
8XY/70	Yagi 8 ele crossed	10dBd	£42.55	£2.50
12XY/70	Yagi 12 ele crossed	12dBd	£52.90	£2.50
PMH2/70	Harness 2 way		£10.35	£1.50
PMH4/70	Harness 4 way		£22.42	£1.80
1296 MHz				
CR2/23CM	Corner reflector	13·5dBd	£40.25	£2.50
PMH2/23CM	Harness 2 way		£31.05	£1.50

NB: PRICES INCLUDE VAT AT 15%
Carriage extra, mainland rate shown

Kenpro

KR600RC
£163.30

360° round type meter Max. load 200kg. Rot, 600kg/cm, brake 4,000kg/m. 1¼in-2½in masts Lower casting optional.

KR400RC
£114.94

360° round type meter Max. load 200kg. Rot, 400kg/cm, brake 1,500kg/cm 1¼in-2½in masts Lower casting optional.

KR500
£112.12

Elevation Rotator (180°) Up to 50kg of Load. 1¼in-2½in mast. 1¼in-1⅝in boom

KR250
£54.91

Twist and switch controller. Rotator 200kg/cm. Brake 600kg. 1in-1½in masts.

NB: PRICES INCLUDE VAT AT 15%
Carriage free (post or road) mainland only

Channel Master

9508
£80.21

Auto control, secondary pointer gives position during travel. Stainless steel hardware. Heaviest duty "offset type". To 5sq

Takes 1-2" masts and 1-2" stub.

9502
£56.92

Automatic control box. Dial direction secondary pointer gives position during travel.

Takes 1-2" mast and 1-1⅝" stub.

Upper mast support bearing.

2" mast and 1¾" stub.

Post and packing **£1.80**
9523 **£15.81**

Rotary bearing 3-way guying.

Takes 1²⁹/₃₂" mast.

Post and packing **£1.50**
9525 **£16.67**

NB: PRICES INCLUDE VAT AT 15%
Carriage free (or as shown) mainland only

CDE

AR40
£90.85

Accurate, silent self calibrating control box. Dial up desired beam heading, push knob; motor rotates to that position and then switches off.

CD45
£136.85

Large illuminated meter gives read out of antenna heading at all times. Armature brake. Low voltage meter. Handles antennas to 8½sq ft.

HAM IV
£258.75

Large illuminated meter gives read out of antenna heading at, all times. wedge solenoid brake mechanism. Handles antennas to 15sq ft.

T2X
£327.75

Large illuminated meter gives read out of antenna heading at all times. Wedge solenoid brake mechanism. Handles antennas to 30sq ft.

NB: PRICES INCLUDE VAT AT 15%
Carriage free (post or road) mainland only

SOUTH MIDLANDS COMMUNICATIONS LIMITED

BRANCHES: CHESTERFIELD · GRIMSBY · STOKE · LEEDS · BUCKLEY · JERSEY

COAX SMC PLUGS

BNC PLUG 50 ohms

UG88	Standard type 5.5mm	£0.78
UG599	Large type 11.2mm	£3.22

BNC SOCKET 50 ohms

UG290	Standard 4 hole type	£0.78
UG1094	Nut fixing type	£0.76
UG69	Free, cable-end, 5.5mm	£0.94

BNC COUPLER 50 ohms

UG914	Back to back female	£1.07
UG491	Back to back male	£1.66
UG274	'T' 2 female 1 male	£2.23
SMC3FBNC	'T' 3 female	£2.02
UG306	Elbow. Male-Female	£1.86

BNC INTERSERIES ADAPTOR 50 ohms

UG255	BNC plug – UHF socket	£1.76
UG273	BNC socket – UHF plug	£1.76
UG201	BNC socket – N plug	£3.28
UG349	BNC plug – N socket	£3.16
UG606	BNC socket – N socket	£2.59

UHF PLUG

PL259	Standard type 11.2mm	£0.55
PL259P	Push on type 11.2mm	£0.79
UG175	Reducer 5.0mm	£0.14
UG176	Reducer 5.6mm	£0.14
PL259R	Reduced type 5.0mm	£0.67
PL259A	Deluxe type 11.2mm	£1.50
PL259B	Deluxe type 5.0mm	£1.13
PL259SL	'Solderless' 11.2mm	£0.63
PL259SS	'Solderless' 5.0mm	£0.63
PL259E	Angle type 5.0mm	£0.95
PL259M	Metric type standard 11.2mm	£0.75
L42P	For LDF2/50 Heliax	£10.58
L44P	For LDF4/50 Heliax	£10.35
PL259PM	Panel mount 4 hole	£1.07

UHF SOCKET

S0239F	Standard 4 hole fix	£0.48
S0239F31000	4 hole PTFE Au plate	£0.97
S0239T	2 hole fixing type	£0.48
S0239NI	Nut fixing inside type	£0.59
S0239NO	Nut fixing outside type	£0.59
S0239E	Free angle type 5.0mm	£1.01
	Free cable end 5.0mm	£2.22
MX913/C	Dust Cap c/w chain	£0.46
MX913/M	Dust Cap metric type	£0.46

UHF COUPLER

PL258	Back to back female	£0.91
PL274	Back to back chassis	£1.07
SMCPL/PL	Back to back male	£1.38
M359	Elbow male-female	£1.07
M358	'T' 2 female 1 male	£1.38
M358AF	'T' 3 female	£1.70
M458	'X' 3 female 1 male	£2.13

UHF INTERSERIES ADAPTORS

UG255	UHF socket – BNC plug	£1.76
UG273	UHF plug – BNC socket	£1.76
S0/25	UHF socket – 2.5mm jack	TOS
S0/35	UHF socket – 3.5mm jack	£0.79
S0/NF	UHF socket – N socket	£1.96
UG146	UHF socket – N plug	£2.25
UG83	UHF plug – N socket	£1.96

UHF CABLES

PL36PL	3.0' RG58 PL259 ends	£1.85

N PLUG 50 ohms

UG536	Small type 5.5mm	£1.66
UG21	Standard type 11.2mm	£1.89
L42W	For LDF2/50 Heliax	£8.51
L44W	For LDF4/50 Heliax	£12.42

N SOCKET 50 ohms

UG58	Standard 4 hole fix	£1.12
UG1052	Free cable end 5.5mm	£2.12
UG23	Free cable end 11mm	£1.70
L42N	Free jack for LDF2/50	£8.51
L44N	Free jack for LDF4/50	£12.42
MX913C	Dust cap c/w chain	£0.46

N COUPLER 50 ohms

UG107	'T' 2 female 1 male	£3.74
UG28	'T' 3 female	£3.16
UG57	Double male adaptor	£2.70
UG29	Double female adaptor	£2.13
UG27	Elbow male-female	£2.24

N INTERSERIES ADAPTORS 50 ohms

UG201	N plug – BNC socket	£3.28
UG349	N socket – BNC plug	£3.16
UG606	N socket – BNC socket	£2.59
UG146	N plug – UHF socket	£2.25
UG83	N socket – UHF plug	£1.96
S0/NF	N socket – UHF socket	£1.96

NB: PRICES INCLUDE VAT AT 15%
Postage: £0.50 any quantity (UK)

HANSEN

IN LINE POWER/SWR BRIDGES P.E.P., R.M.S. 1·8–440MHz

The Hansen range covers 30 quality models with top-of-the-line the FS710. This is a flat frequency response, peak envelope power and average in-line wattmeter with many novel features. Notable being the 'power independent' SWR scale—no forward power calibration knob, just direct reading SWR.

FS710: PEP AUTO-SWR RMS LEVEL
FS710 £89.70

FS710H: 1·8-60MHz. 20, 200, 2kW
FS710V: 50-150MHz. 20, 200W
V.S.W.R: 4:1 and to 20:1
Accuracy: ±7% of FSD
Impedance: 50 52 Ohms
Connectors: SO239
Power: 240 Volts AC 50Hz
Weight: 3·lbs (1·5Kgs)
Size overall: 8 × 4 × 5½"
Size Meter: 2 × 3½"
Time Const: PEP follow 4 second

FS500 £69.75

PEAK READING LEVEL RESPONSE
FS500H 1·8 60MHz 20, 200 & 2kW
FS500V 50 150MHz 20 & 200W
Power ±7% FSD. SWR 1:1 5:1
Size: 8 × 4 × 5½"

FS600 £51.35

PEAK READING LEVEL RESPONSE
FS601M 1·8 30MHz 20 & 200W
FS601MH 1·8 30MHz 200 & 2kW
FS602M 50 150MHz 20 & 200W
FS603M 430 440MHz 5 & 20W
Power ±10% FSD. SWR 1:1 3:1
Size: 6½ × 2½ × 4½"

FS300 £46.40

LEVEL RESPONSE, LARGE METER
FS300H 1·8MHz 20, 200 1kW,
FS300V 50 150MHz 20, 200W FSD
Power ±10% SWR 1:1 3:1 ±10%
Size: 8 × 4 × 5½"

FS7 £41.00

VHF/UHF WATTMETER & BRIDGE
FS7 145MHz & 432MHz 5, 20, 200W
Power average ±10%. SWR 1:1-3:1
Power Max: 144MHz, 200W
432MHz 20W
Size: 6½ × 2½ × 4½". 'N' type sockets

FS711 £36.80

REMOTE INDICATOR TYPE
FS711H 1·8-30MHz 20 & 200W
FS711V 50-150MHz 20 & 200W
FS711U 430-440MHz 5 & 20W
Power ±10% SWR 1:1-3:1 ±3%
Indicator 5 × 2½ × 1½"
coupler 3½ × 2½ × 1½"

FS5E £37.20

INDEPENDENT TWIN METER
FS5E 3·5 150MHz 20, 200 & 1kW
Power average ±10%. SWR 1:1-5:1
Power Max: 1kW 3·5 30MHz
50W 50 150MHz
Size: 7 × 3 × 3½". 'On the Air' LED

FS300M £35.65

LEVEL RESPONSE, POWER & SWR
FS301M 1·8 30MHz 20, 200W
FS301MH 1·8 30MHz 200, 2kW
FS302M 50 150MHz 20, 200W
Power ±10%. SWR 1:1 3:1 ±3%
Size: 6½ × 2½ × 4½"

SWR3S £26.45

WIDE RANGE POWER & SWR
SWR3S 3·5 150MHz 20 & 200W
Power average ±10%. SWR 1:1-3:1
Power Max: 200W 3·5 30MHz
50W 50 150MHz
Size: 6 × 2½ × 2½". Antenna switch

SWR50B £26.45

TWIN METER, RELATIVE POWER
SWR50B 3·5 150MHz Scaled 1kW
Power average ±20%. SWR 1:1-3:1
Power Max: HF 1kW 1:1. 300W 3:1.
VHF 50W
Size: 6 × 2½ × 2½". 'On the Air' LED

8 new models in stock. Sae for details

NB· PRICES INCLUDE VAT AT 15%
Carriage free (surface post) worldwide

SMC-HS

HF, VHF, UHF ANTENNAS MOBILE VERTICALS

SMC-HS Mobile Elements, tabulated below, feature an inbuilt PL259M connector, which mates with the SO239M on any of the four standard mounts. This arrangement is ideal for easy removal —band changes, comparative test, car wash, and anti-vandal, system checks from the feed point, portable operation and for ease of garaging etc. All models have fold over bases (either lift and lay or locking collar) except the 78B which has an inbuilt ball in case the mount must be fitted askew.

Model	Band	Gain	Type	Power	Length	Price
20SE	20m		(¼λ)	100W	1·72m	£17.65
17SE	17m		(¼λ)	200W	1·92m	£15.70
15SE	15m		(¼λ)	130W	1·72m	£14.55
12SE	12m		(¼λ)	200W	1·92m	£14.20
10SE	10m		(¼λ)	100W	1·72m	£13.80
4E	4m	0dB	½λ	150W	1·03m	£7.65
2H/PL	2m		(¼λ)	50W	0·17m	£3.45
2QW	2m	0dB	½λ	200W	0·49m	£2.30
2VF	2m	3dB	⅝λ	50W	1.06m	£11.50
2NE	2m	3dB	⅝λ	150W	1·30m	£6.90
78SF	2m		(⅝λ)	100W	1·42m	£13.80
78F	2m	4·5dB	⅝λ	100W	1·75m	£13.80
78B	2m	4·5dB	⅝λ	150W	1·72m	£13.80
88F	2m	5·2m	⅝λ	100W	2.03m	£18.80
70N2M	2/70	2·7dB 5·1dB	(½λ) 2 × ½λ	100w	0·89m	£16.85
258	70cm	5·5dB	2 × ½λ	100W	0.91m	£12.65
358	70cm	6·3dB	3 × ½λ	100W	1·36m	£16.85

Model	Description	Price
SOWM	Wing Mount. SO239M upper SO239 under adjustable angle	£4.20
TMCAS	Boot Mount c/w 6 mtrs RG58 and PL259 plug	£8.45
GCCA	Gutter Mount deluxe cast type c/w 4 mtrs cable assemble and PL259	£9.95
SOMM	Mag Mount c/w 4 mtrs RG58 PL259 *For use with smaller antennas only*	£9.95

An alternative mounting for any of the two metre antennas listed above is the BSD stainless steel bumper strap at **£8.80** plus the HS88BK extension tube at **£18.80** which raises by 80 cms and acts as a counterpoise to the radiator.

Also fitting the bumper mount is the 10 foot, 3 section (quick disconnect and fold over jointed) mobile colinear element which provides about 7dB of gain for **£29.90.**

Stop press: ⅝λ ultra low radiation angle, typ. 30° below ⅞λ. Substantial improvement on DX (in clear).

For operation on 2 metres and 70 cms the dual band 70N2M is an elegant solution particularly when combined with the HS770 diplexer which provides 50W power handling, 30dB isolation between transceivers with an insertion loss of only 0·5dB for **£15.35.**

NB: PRICES INCLUDE VAT AT 15%
Mainland delivery: accs. £0.80, antennas £1.80

S. M. HOUSE, RUMBRIDGE STREET, TOTTON, SOUTHAMPTON SO4 4DP, ENGLAND
Tel: Totton (0703) 867333, Telex: 477351 SMCOMM G, Telegram: "Aerial" Southampton
See preceding pages for complete addresses and phone numbers

RADIO SOCIETY OF GREAT BRITAIN

(Limited by guarantee)

The national society representing all UK radio amateurs

Registered office

Alma House, Cranborne Road, Potters Bar, Herts EN6 3JW

Telephone (Dialling code 77 from London, 0707 from outside London) 59015. Telex 25280 (RSGBHQ G)

Founded 1913. Incorporated 1926. Member society, International Amateur Radio Union

PATRON: HRH The Prince Philip, Duke of Edinburgh, KG

Membership is open to all those with an active interest in radio experimentation and communication as a hobby. Applications for membership should be made to the general manager, from whom full details of Society services may also be obtained.

GENERAL MANAGER AND SECRETARY
D. A. Evans, G3OUF

EDITOR
A. W. Hutchinson

RSGB QSL BUREAU

QSL cards for distribution should be sent to:
Mr E. G. Allen, G3DRN, QSL Bureau manager, 30 Bodnant Gardens, London SW20 0UD

A list of QSL Bureau sub-managers was published in the January 1983 issue, and amendments appear under "QTC" in the February and April issues.

ANNUAL SUBSCRIPTION RATES

UK corporate: £14.50, incl VAT.
Overseas: £14.50.
Associates under 18: £5.80.
Family member: £5.80.
Students age 18 to 25: £8.70 *(Applications should give the applicant's age at last renewal date and include evidence of student status).*
Affiliated societies: £14.50 (including *Rad Com*); **£8.70** (excluding *Rad Com*).

RSGB HEADLINE NEWS—Tel 0707 59312

By telephoning the above number, members can receive up-to-date amateur radio news of immediate interest from a three-minute recording. This is generally updated twice or more weekly.

RSGB SUNDAY NEWS BROADCASTS

These broadcasts are made every Sunday morning, giving almost complete coverage of the British Isles. Stations broadcasting them (particulars below) use the callsign GB2RS.

The purpose of these news broadcasts is to provide an outlet for amateur radio news items which cannot wait for the next issue of *Rad Com*. Items for inclusion should reach RSGB HQ by letter (marked "GB2RS news") or telephone 0707 59260 before 10am on Wednesdays, although no guarantee of inclusion can be given. Once broadcast, items are not usually repeated.

INTENDED RECEPTION AREA	NORMAL READER	RESERVE READER	LOCAL START TIME
Frequency: 3·640MHz. Mode: ssb			
NE Scotland	GM3HGA	GM3VEY	1130
Frequency: 3·650MHz. Mode: ssb			
SE England	G2MI	G4ARZ	0900
Midlands	G2CVV	G8OZ/G3SZJ	0930
SW England/Wales	G8ML	G3JFH/G4IEY	1000
Northern Ireland	GI3GAL	GI3SXG	1030
NE England	G5VO	G3MCF	1100
E Scotland	GM4CUZ	GM4FLP	1430
Midlands	G8OZ/G3SZJ	G2CVV/G3SZJ	1800
Frequency: 3·660MHz. Mode: ssb			
Central Scotland	GM3TCW	GM3ULP	1130
Frequency: 7·0475MHz. Mode: a.m.			
UK (from Northern Ireland)	GI3GGY	GI2DHB	0900
UK (from N Midlands)	G3LEQ	G2CVV	1100
Frequency: 144·250MHz. Mode: ssb (horizontal polarization)			
N from Carlisle	G4LAA	(Vacancy)	0930
SW from the Midlands	G3BA	G3KQF	0930
NE from S Devon	G3CHN	G3PBV	1000
NW from Manchester	G3SMT	G3SMM	1000
NNW from Cleveland	G4JJB	G8FTZ	1000
W from Carlisle	G4LAA	(Vacancy)	1030
SE from Lincoln	G3NRO	G8ZVF	1030
SW from London	G3FZL/G3VAG	G3IIR	1030
S from Aberdeen	GM8GHV	GM8MBP	1030
W from Bristol	G4CJZ	G3ZWY	1100
NE from Cambridge	G8HVV	G8BBK	1100
W from Bangor, Co Down	GI3TLT	GI3SXG	1130
Frequency: 145·525MHz (S21). Mode: fm (vertical polarization)			
Caithness	GM4KNQ	GM4LNN	0930
Cornwall	G2ABC	G3NPB	0930
North Hampshire	G8CKN	G3PZN	0930
Suffolk	G3ZNU	G4FZZ/G4HMF	0930
Leeds	G3SPX	G8XGN	0930
Co Down	GI3WEM	GI4DOR	0930
Edinburgh	GM4EHO	(Vacancy)	0930
E Cornwall/S Devon	G3ZYY	G8XTE	1000
Londonderry	GI2DHB	GI4AHD	1000
London	G3FZL/G3VAG	G3IIR	1000
Birmingham	G3BA	G4LCM	1000
Lincolnshire	G3NRO	G8ZVF	1000
Tyneside	G4LDT	G8TKU	1000
Glasgow	GM4HCO	GM4CXM	1000
Elgin	GM4ILS	(Vacancy)	1000
Southampton	G8LVC	G4COM/G4IDV	1030
E Sussex coast	G8SC	G3ZFE	1030
Bristol	G4CJZ	G3ZWY/G8NNU	1030
Cambridge	G8HVV	G8BBK	1030
Manchester	G3LEQ	G3JWK	1030
Dumfries	GM3MSG	(Vacancy)	1100
Brighton coast	G3ZYE	G8GEZ	1100
Preston	G8WAT	(Vacancy)	1100
Huntingdon, Cambs	(Vacancy)	G8TQI	1100
Jersey	GJ4JWA	GJ8YVL	1100
Porthmadog, Gwynedd	GW6CGR	GW6ARL/GW3KJW	1100
Clwyd/Merseyside	GW4IEQ	G8NNS	1100
W Glamorgan/N Devon	GW8VHI	GW3VPL/GW8TVX	1100
Aberystwyth	GW4JXB	GW8MAW	1130
Exeter	G3PBV	G4PCB	1130
Leicester	G4JYS	G4EYL	1130
Scarborough	G4OSD	G4EEV	1130
Enniskillen	GI4PCY	GI4CZW	1230

EDITORIAL

Forward Planning

The last few years at the old headquarters in Doughty Street saw the climax of a rather unusual race. On the one hand, there was pressure to stay in the existing building while as much effort as possible went into developing an efficient administration based on data processing techniques, which therefore was highly transportable: at the same time, this gave us breathing space to accumulate adequate financial reserves to pay for the much larger headquarters building that we so badly needed. On the other hand, this delay had to be balanced against the pressures to move due to chronic problems of trying to run a very complicated organization with a membership growing at 10–12 per cent per annum, in a house having five floors and one front door through which everybody and everything had to pass, and with a staff of 20 that could not be expanded because of the limited space available.

As members will know, this race ended in November with the move to the new headquarters at Potters Bar. Now that the dust is just beginning to settle, we at long last can begin to put into operation some of the changes that were not possible in the old headquarters. In particular, now that we have the planned-for space available, we can go ahead with recruiting three new members of staff that are urgently needed: a planning officer who will deal with the crucial and increasingly more difficult area of planning permission for antennas; a technical officer whose first responsibility will be the generation of quality technical material for newcomers to amateur radio; and an additional membership services officer who will provide extra cover for an increasingly hard-pressed team.

In thinking further into the future, the Society has had since September 1980 a Forward Planning Group whose job it is to determine whether or not the Society is providing the necessary support for its members and to recommend appropriate changes. It has been asking some pretty basic questions. One is the likely growth in amateur radio within the UK, since this crucially affects the capacity of the Society to expand its services to its members. A second is identifying and strengthening the links between the Society and outside bodies and institutions who directly and indirectly influence the future of amateur radio in the UK.

Currently, the Forward Planning Group is concerned also with more immediate problems and is studying the work of each of the Society's 15 committees. Despite all the usual jokes about committees made to the contrary, these are a source of great strength that is unique among national amateur radio societies. They represent an invaluable contribution by members to the work of the Society, which benefits amateur radio not only in the UK but throughout the world. This on-going study has already suggested a number of changes that need to be made: one that has already been implemented has been the re-establishment of the Editorial Board for this magazine, one of the functions of which is to use editorials such as this in order to link more closely with members. We are sure this will be appreciated.

D.A.E.

Amateur Radio News

Regional representative vacancies

Region 7
No nominations have been received.

Region 10
Nominations have been received in respect of Mr E. J. Case, GW4HWR, and Mr R. Jones, GW4HOQ.

Region 10 election. Not later than 30 July 1983, members residing in Region 10 may vote for one candidate in the form prescribed below. Completed ballot forms, which must reach RSGB HQ by the above date, should be enclosed in a sealed envelope marked "Region 10 election" and addressed to "The Secretary". The composition of Region 10 is Dyfed, Gwent, Mid Glamorgan, Powys, South Glamorgan, and West Glamorgan.

FORM OF BALLOT PAPER

I,.....
being a fully-paid-up corporate member of the RSGB residing in Region 10 wish to record my vote in favour of
Mr.....
as representative for Region 10
Signed.....
Callsign or BRS No.....
Address.....
.....

VHF band plan

There seems to be a little confusion with regard to some elements of the 144MHz band plan, in particular the frequency used for random ms ssb calling. Historically this frequency was 144·200MHz, and this is still used by some stations. However, a new system was agreed at the last IARU Region 1 Conference at Brighton: a "reference" frequency of 144·400MHz was established and ssb ms users were encouraged to spread out higher frequency from this according to the last letter of their callsign in increments of 1kHz. This means that the upper limit of the "ms ssb calling sub-band" is 144·426MHz, which would be used by a station whose callsign ended in Z. As far as the 144MHz band plan is concerned, the frequency of 144·200MHz has ceased to have any significance, although ms stations are still using it.

Although the new system is working quite well, some users feel that it is not the optimum solution to the problem, and it may well be that the whole ms calling procedure will be reviewed at the next conference in 1984.

Another point concerning the band plan is that the sub-band 144·845–144·990MHz is allocated to beacons, and should not be used for ordinary traffic. It may seem a temptingly clear segment for a contact, but it is possible that other stations are listening for weak beacon signals—and fm transmissions, in particular, make this completely impossible. The all-mode section of the 144MHz band ranges from 144·500 to 144·845MHz, and some areas of this are rather under-used at present; those interested in weak-signal modes would much appreciate the beacon sub-band being kept clear of two-way traffic.

GB3RS

GB3RS is the callsign of the headquarters station at Potters Bar, which is now becoming active on the hf bands and 144MHz. While not yet in the same league as the ARRL's W1AW, it hopes to be able to run the maximum power on these bands from some reasonable antennas. As part of this project, headquarters is seeking some high-voltage capacitors for the power supplies. If any member knows of 3kV working components of 50μF or more, preferably oil-filled paper, headquarters would be pleased to take them off his hands! At present GB3RS is active most lunchtimes and occasionally in the early evening.

Amateurs at professional conference

The Third International Conference on Antennas and Propagation took place recently, and three papers were presented as a direct result of amateur radio activity. One, from Ray Flavell, G3LTP, concerned tropospheric propagation; another, given by Charlie Newton, G2FKZ, dealt with auroral propagation; and a third, on the subject of transequatorial propagation, was given by the well-known vhf dx operator Costas Fimerelis, SV1DH.

GB3IOW and GB3IW

The GB3IOW 1,296MHz beacon and the GB3IW uhf repeater, both of which are located at a Pye site on the Isle of Wight, are temporarily off the air. This is because of a recent change in the control of access to the site, which means that the closedown requirements cannot be met for the moment. Negotiations are proceeding, and it is hoped to resolve the problem and return both units to service as soon as possible.

Amateur radio on space shuttle

One of those on board the STS-9 Space Shuttle, which is scheduled to fly next September, will be Dr Owen Garriott, W5LFL, who has obtained permission to take a 144MHz handheld transceiver with him. Apparently, the intention is that certain repeaters on Earth will be designated "gateway" units and he will work through them, although no further details are to hand at present.

Book news

We regret to say that there are several increases in the "by post" price of some of the books and other publications sold by the Society as of this month. These are the result of recent increases in charges by the Post Office. Also, some USA titles will cost more because of the fall in the value of the pound against the dollar. On a brighter note, Stage 1 of the popular RSGB Morse Course on cassette is now back in stock: Stages 2 and 3 will be available later on in the year and will complete the course. Stage 1 takes the absolute beginner to five words/min. Also, there are four new titles available for your bookshelf: *Satellite Tracking Software for the Radio Amateur* (AMSAT-UK) is a collection of Basic programs for your personal computer: *Semiconductor Data Book* is the new title of what used to be called the *Radio Valve and Semiconductor Data Book* from Newnes; *Television for Amateurs* is a practical introduction to the subject; and the *UHF-Compendium Parts 1 & 2* is a collection of excellent vhf and uhf construction projects which have been originated by a group of West German amateurs. See the RSGB price list for ordering details, or they may be bought over the counter at headquarters.

Insurance for outside events

Short-period insurance cover is now available for events such as field days, rallies and special-event stations through Amateur Radio Insurance Services. All-risks insurance is available for equipment, and public liability insurance for a sum insured of £500,000 is obtainable for periods up to 28 days at a premium of £7.50. Further details are obtainable from Amateur Radio Insurance Services, 19 Quarry Street, Guildford, Surrey GU1 3UY, or telephone Guildford (0483) 33771.

Amtor is spreading

Amtor, the error-correcting teleprinter-over-radio system which was originated in the UK by Peter Martinez, G3PLX, is now permitted in the USA, and the ARRL headquarters station W1AW began experimental transmissions using this mode on 9 February.

Amtor, a development of its commercial maritime equivalent Sitor, is an interpretation of a CCIR maritime specification for amateur use. There are currently about 400 stations around the world which are active using this mode, and indeed a commercial terminal unit, the AMT-1, has recently become available from Advanced Electronic Applications in the USA. Amtor was first described in *Rad Com* August 1979, and the RSGB headquarters station GB3RS is currently considering ways and means of operating in this mode.

IARU Region 1 Working Group

Representatives from 18 IARU Region 1 member societies attended the second meeting of the HF Working Group in Salzburg on 19/20 March 1983. The meeting was chaired by G3FKM, and the RSGB was represented by G3NKS: G5CO was also present in his capacity as Region 1 Secretary. Several subjects were discussed, including the preferred segments of the hf bands for Region 1 contests—LA5QK was appointed Region 1 contest co-ordinator, and his initial tasks will be to resolve date problems as far as possible and to consider how the number of contests could be reduced. It was agreed not to encourage channelization on the 28MHz band, and to encourage the use of this band during sunspot minimum years by various means.

The decisions of the meeting, in the form of recommendations, will be considered at the next meeting of the Region 1 Executive Committee in 1983.

New callsign prefixes for the UK

The Home Office recently discussed with the Society long-term proposals for new prefixes for the amateur service, given that the G6 series in particular is almost at an end. In the short term, the Home Office has decided that the next prefix series will be G0 for Class A licensees and G1 for Class B. It is clear, however, that the question of amateur prefixes in the UK will need to be addressed again in the not too distant future, since the G7 and G9 series are used for test and development purposes, and there appears to be no further scope for G prefixes.

New hf transmitter site for the BBC

The BBC has submitted a planning application to Stratford-upon-Avon District Council for the development of an hf transmitting station on the site of the former Post Office receiving station at Bearley in Warwickshire. The application seeks approval for six 300kW transmitters and for 30 antenna support masts, of which the tallest would be 90m. The new station would be intended for the BBC External Services transmissions to Eastern Europe and elsewhere.

In a recent press release, the BBC said that ". . . . in the neighbourhood of a high-power transmitter, of which there are many in the UK, stray emissions must inevitably cause some degree of interference to domestic television, radio or hi-fi equipment. Most can be cured easily and cheaply, and a good service of local investigation and advice is available from the Post Office Radio Interference Branch. It is interesting to note that amateur radio clubs operate successfully in the immediate vicinity of BBC high-power short-wave transmitters; some amateurs operating actually on the station itself."

Those gremlins again

A particularly virulent gremlin crept into the word processor at headquarters and "corrupted" part of the report on the RSGB National Amateur Radio Convention at the NEC in the May issue. The talk-in station was provided by Solihull & Chelmsley Wood Raynet Group, not by Solihull Amateur Radio Society: also, the hf demonstration station *was* run by Solihull Amateur Radio Society and not, as stated, by the G-QRP Club. Sincere apologies to all three organizations for the error.

Raynet in Coventry

Coventry Raynet Group has been re-formed after a period of inactivity. The new controller is Maideley Smith, G8KVU, and he would like to be contacted by all old-group members as well as any new or prospective Raynet members—he can be contacted via the Coventry Technical College ARS, which meets each Monday evening.

Boys Brigade Centenary

One hundred years ago, in Glasgow, the first Boys Brigade Company was founded by William Smith. In this, its centenary year, many special events have been arranged to celebrate the birth of a youth movement which has grown from strength to strength and today is active internationally. One such event will involve amateur radio in an exercise to link up boys and officers of the brigade throughout the UK and, indeed, worldwide.

"Anchor Chain" will take place on Sunday 21 August with prearranged hf and vhf stations around the country. Starting from the HQ of the Glasgow Battalion of the Boys Brigade, radio contact will be made with the second station in the chain, giving information on QTH, equipment, signal reports etc, together with its "Stedfast Number", which is the number of boys who have already taken part in a local radio event. When the second station calls the next one in the chain, the number of boys involved in that area will be added to the previous "Stedfast Number", and so on around the UK, including Northern Ireland, Orkney, Shetland etc, to eventually arrive back in Glasgow some hours later with an aggregate "Stedfast Number".

Boys Brigade personnel are being encouraged to make arrangements with licensed radio amateurs, and to ensure complete coverage many operators are needed just so the chain will not be broken. Many amateurs have offered their help already, but others are necessary in various parts of the UK.

It is hoped that each station will have a number of youngsters present with the operator, and because of the special event status of the station the boys will get the opportunity to use the microphone to pass on greetings to other members of the Boys Brigade. During 21 August, contacts will also be made worldwide by stations calling "CQ Stedfast".

In addition to this national and international feature arranged by the Communications Committee of the Glasgow Battalion of the Boys Brigade, many local events have been organized throughout the country. These include stations in New Malden, Surrey; Chesham, Bucks; Sutton and Cheam; Liverpool, and even Bermuda! If you would like more information, or have details of your own local event, please contact the chairman of the Communications Committee of the Glasgow Battalion of the Boys Brigade, Mr George Allan, GM4HYF, 22 Tynwald Avenue, High Burnside, Rutherglen, Glasgow G73 4RN.

Want another "ticket"?

For several years J. Michael Gale, MRIN, (Yachtmaster Ocean), G3JMG, has conducted special courses in r/t operation for yachtsmen and fishermen to help them qualify for the various Home Office marine r/t certificates. The courses are conducted at a number of locations in London and on the south coast between Poole and Brighton, on the Isle of Wight and in the Channel Islands. He also arranges for the official examination to be held at the same venue a day or two later.

Courses are conducted for the two lower grades of marine r/t certificate: a one-day (Saturday) course for the "VHF only" certificate and a three-day (Sat/Sun/Mon) course for the "Restricted" certificate which covers mf, hf and vhf operation up to 1·5kW. The "VHF only" examination is held on the Sunday afternoon, and the "Restricted" examination on the Tuesday morning immediately following the courses.

Yachtsmen/radio amateurs often attend these courses for the "VHF only" certificate, and he feels that some might be interested in qualifying for the higher-grade "Restricted" certificate. Because of their specialized knowledge and experience, he is proposing to hold a special two-day (Sat/Sun) shortened "conversion course" for licensed amateurs over the weekend of 25/26 June with the examination on the morning of Monday 27 June in the Portsmouth area. A special (reduced) course fee of £40 will be made; the examination fee is currently £35.

Anyone interested should write to: J. Michael Gale, 33 Island Close, Hayling Island, Hants PO11 0NJ.

Mobile Rallies Calendar

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

5 June—Spalding & DARS Mobile Rally. Springfields, Spalding. Open 11am. S22 and SU8 talk-in. Bring & buy stalls, 25 acres of gardens, bars, restaurants. Details from I. Buffham, G3TMA, QTHR.

12 June—Elvaston Castle Mobile Rally. Elvaston Castle Country Park, 5 miles south-east of Derby on the B5010. Organized by the Nunsfield House ARG. Opens 10am. Talk-in on 144 and 432MHz by GB2ECR. All the usual facilities including full on-site catering facilities. Further details from Ian Cage, G4CTZ, QTHR, tel Derby (0332) 799452. Trade enquiries to Mr R. Woolley, G4HIJ, QTHR, tel Ashbourne 43241.

12 June—RNARS Mobile Rally. HMS Mercury, nr Petersfield, Hants. Opens 10am–5.30pm. Refreshments will be available all day. Arena events, and trade stands. Details from G4DIU, QTHR.

19 June—Denby Dale & DARS Mobile Rally. The Shelley High School, Skelmanthorpe, nr Huddersfield. Open 11am. Something for all the family including excellent refreshments and bar. Details from J. Clegg, G3FQH, QTHR, tel 0484 862390.

26 June—Longleat Mobile Rally, Longleat Park, Warminster. Preliminary enquiries to G4FRG or G8GLQ, both QTHR.

10 July—Worcester & DARC Annual Mobile Rally, Droitwich High School, Ombersley Road, Droitwich. Open 11am–5pm. Attractions will include "strawberry fields", fancy dress competition, model aircraft displays. Details from rally manager, Brian Jones, G8ASO, QTHR, tel Worcester 351565.

17 July—RAIBC Picnic, The Fairground, Broadlands Estate, Romsey, Hants. Talk-in on S22. Details from G4COM, QTHR, tel 0703 693017.

17 July—Cornish RAC Rally. Camborne Technical College, Camborne. Starts at 10am. For further details contact G4PEM, QTHR as G6DFE.

17 July—Sussex Mobile Rally, Brighton Raceground. 10.30am–5pm. Admission £1. Advance tickets for clubs can be obtained for 80p from Miss W. Firmager, Flat 2, 23 Chatham Place, Brighton, Sussex. Children and disabled free. There will be talk-in on S22 and 3·5MHz. Special event station GB2SMR will be in operation. Lots of attractions including free mini-buses to the beach. Popular bring & buy. Many attractions for all the family. Unlimited free parking. Details from G4HUJ, QTHR, tel Worthing 200572, or office hours, Brighton 600235.

24 July—Anglian Mobile Rally, Stanway School, Colchester, Essex. Open 1000 to 1700. Talk-in on 144MHz. Further details from G3YAJ, tel 0206 39 3938.

24 July—McMichael ARS Mobile Rally, Bells Hill, Stoke Poges, nr Slough. Open 11am. Trade stands and fleamarket. ATV exhibitions, hf station, S22 talk-in. Details from David Cochrane, G8IHF, c/o McMichael Ltd, Wexham Road, Slough, Berks SL2 5EL.
31 July—Rolls Royce ARC (Barnoldswick) Mobile Rally, Sports & Social Club, Barnoldswick. Open 11am. Details from Leslie G. Logan, G4ILG, QTHR.
7 August—RSGB National Mobile Rally, Woburn.
14 August—Derby Mobile Rally. Lower Bemrose School, Derby. Further details nearer the date. Details from G4EYM, tel Derby 556875.
21 August—RAIBC/FRARS Hamfest '83, Wimborne, Dorset. Open 11am–5.30pm. Bournemouth & DRAIBC will be promoting the event, and the RAIBC Committee will be holding their agm there. A large number of national and local traders will be present. There will be a special demonstration station, GB2FRH, and talk-in will be available on vhf and uhf. Details from Bob Burrows, G6DUN, QTHR.
28 August—BARTG Rally. Sandown Park Racecourse, Esher, Surrey. Details from Edward Batts, G8LWY, 27 Cranmer Court, Richmond Road, Kingston-upon-Thames, Surrey.
28 August—Preston ARS 15th Annual Mobile Rally. Note new venue at Lancaster University. Easy access, ample free parking, and free admission. Leave M6 at junction 33 and proceed north on A6 for 2 miles. Open 11am. Talk-in on 144MHz fm S22. Cafeteria. Licensed bar on campus. Bring & buy. All enquiries to Mrs D. Stevens, 13 Arrowsmith Close, Hoghton, Preston PR5 0DV, tel Hoghton (025485) 3304.
28 August—Torbay Mobile Rally. ITT Social Centre, Old Brixham Road, Paignton. Talk-in on S22 from 1000h. Ample free parking. Trade stands and used equipment stalls. Draws and general goods stalls. Hot meals in dining room, bar facilities, RSGB book stand. Further details from TARS secretary, Mrs M. Rider, 7 Kingston Close, Kingskerswell TQ12 5EW, tel 08047 5130.
11 September—Telford Mobile Rally. Extensive venue as before: Town Centre Malls, Telford, Shropshire. Varied attractions, full catering, licensed premises on site, plus about 80 trade stands. Free entrance and parking. Further details from G8DIR, tel Shrewsbury 64273; G8UGL tel Telford 584173, or G3UKV, tel Telford 55416.
11 September—Vange Mobile Rally. St Nicholas School, Nicholas Lane, Basildon. Open 10am. Talk-in on 144MHz (S22). Details from Mrs D. Thompson, 10 Feering Row, Basildon SS14 1TE.
18 September—Peterborough R&ES Mobile Rally. Wirrina Sports Stadium, Bishops Road, Peterborough. Situated on the river embankment with good car parking, good food, and bar meals, with bar in the adjacent Gildenburgh rooms. Open 10.30am–5pm. Details from D. T. Wilson, 4 Conway Avenue, Peterborough, tel Peterborough 76238.
25 September—Harlow Mobile Rally. Harlow Sportcentre, Hammarskjold Road, Harlow. Doors open 10.30am. Bring & buy stall, refreshments and licensed bar, good parking, special interest stands. Talk-in on vhf/uhf. For further details contact G8FRG, QTHR.

Special Event Stations

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

27 May–5 June, GB2EF
The Lough Erne ARC will operate this station in conjunction with a show of vintage radio equipment as part of "Enniskillen Festival". HF operations mostly weekends and evenings. Details from GI4CZW, QTHR, tel 0365 4500.
4–5 June or 11–12 June, GB2HB, GB3HBC, GB4HBC
East Kent RS will run the stations as part of the celebrations commemorating the 150th anniversary of the granting of the Royal Charter to Herne Bay. There will be hf and vhf stations on ssb and fm, and special QSL cards will be available. Final details from G6LZG, 66 Downs Road, Canterbury, Kent CT2 7AY.
11 June, GB4WYP
The station will be run to commemorate World Communications Year at the Police Community Day, Pontefract Racecourse Park. It will operate from 1300–1800h, and will be open to the public. Special QSL cards will be available. Details from West Yorkshire Metropolitan Police, Amateur Radio Club, PO Box 9, Wakefield, WF1 3QP.
23 July, GB4WYP
The station will run as above, from Greenhead Park, Huddersfield.
12 June, GB2MMR
Horndean & DARC will have a special event station at the RNARS Rally, HMS *Mercury*, nr Petersfield, Hants. The club hopes to operate on 3·5–28MHz phone, cw and rtty, and hopefully on fstv. The call will count towards the RNARS and Horndean club awards. Special QSL cards will be issued and swl reports would be appreciated.
11 June, GB4BBY
Kidderminster & DARS will operate the station to celebrate Brinton's Bicentenary Year. Details from Tony Hartland, G8WOX, tel Kidderminster (056275) 1584.
23–24 June, GB2HC
Harrogate College RS are celebrating the 90th anniversary of this girls' boarding school in North Yorkshire. Most of the operators are licensed yls under 19. All bands 1·8–144MHz. Special QSL card if wanted.
25 June, GB4OSF
This station will be operated by the Greater Peterborough ARC at the Orton Longueville School Fete from 1200 to 1600gmt. It is hoped to work on 144MHz ssb, fm, and in addition some hf work on 7 and 14MHz. QSL cards will be sent via the RSGB Bureau. Further details from the secretary, G4NRJ, tel 0733-231848.
2 July, GB4WCR
The Nene Valley RC will operate this station at the Wellingborough Charities Carnival, this year being the carnival's 25th anniversary, from the Bassetts Park, Wellingborough, Northants. Special QSL cards will be issued. Operations will be on both vhf, hf and rtty.
23–30 July, GB4FES and GB8FES
These stations will be operating during "Festival 83", a Christian festival to be held at the County Showground, Stafford. The operation will be on cw and ssb on hf, and cw, ssb and fm on vhf. Details from G6CZM or G4LOF (both QTHR).

Other Events

All information for inclusion in this column must be sent to the editor, not to RSGB HQ.

27 August—Scottish Amateur Radio Convention. Cardonald College, Mosspark, Glasgow, followed by dinner/dance in Bellahouston Hotel, organized by West of Scotland ARS. Details from GM4JDU, QTHR.
25 September—Welsh Amateur Radio Convention, Oakdale Community College, Blackwood. Details from R. B. Davies, GW3KYA, QTHR.
8 October—Midlands VHF Convention. British Telecom Training School, Stone, Staffs.
15–16 October—EI—GI Convention, Ballymascanlon.
10 December—RSGB AGM, IEE, Savoy Place, London.

OBITUARIES

The Society records with regret the deaths of the following radio amateurs:

Mr H. R. Dunnico, JP, DL (Essex), LLD, RS51889
H. Rathbone Dunnico died on 6 November 1982. Although he had not been a member of the RSGB for long, he had had a lifetime's interest in amateur radio, and was an avid swl. As a boy he monitored Marconi transmitting from Chelmsford by using a home-made crystal set from the fields of Ilford.

He only started studying for the RAE after retiring from public service in July 1982, although he was an expert in reading morse, at speeds of up to 35wpm.

Mr. D. Fell, G3LIQ
Denis Fell died on 1 October 1982, aged 56. He had been an operator since 1956, and was keen on 1·8MHz, especially cw. He also operated on 144MHz, in particular in the Hull area. He helped many with advice on morse and antennas.

Mr T. Kelly, G8OFP
Tom Kelly, who died on 5 March, aged 46, had been a keen member of the re-formed Raynet group for South Lakeland.

Mr E. Lipton, G3HHE
Eric Lipton died on 29 March. Heart trouble since his retirement had forced some restrictions on his activities, which included the design and construction of much of his own equipment. More recent studies were in the field of the microcomputer, which he said absorbed much of his time. He was a good source of technical knowledge to those who needed it and his expertise spanned many years of sound, practical experience.

Mr J. Scales-Manners, G4EWG
Jack Scales-Manners died on 13 March. He had been a well-known amateur in Cornwall for a number of years, although he had recently moved to Dorset.

Mr J. Skidmore, BRS26431
Joe Skidmore died on 24 December 1982, aged 78. He joined the Society before the second world war, when he held the artificial aerial licence 2AUL. Although a keen experimenter and constructor, he never aspired to a full call after the war but rejoined as a life member, becoming a very keen listener competing in numerous contests and obtaining a large and impressive collection of certificates and awards. He was the recipient of The Metcalfe Trophy on more than one occasion.

Mr W. Stevens, ZD7SD
Bill Stevens died on 4 March, aged 70. He and his wife Sybil, ZD7SS, were well known on the dx bands—although he had never been off the island of St Helena. He had acquired many awards and trophies over the years for his dx and Atlantic rescue work.

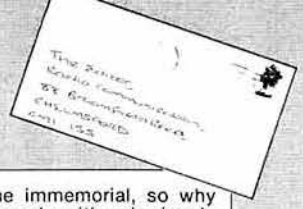
Mr K. A. Taylor, G4EEC, ex-N627, 2VZ
Ken Taylor died on 29 January. His interest in radio began when he was eight years old. He joined the Australian Army in the Signals Division. Later he moved to England and from 1974 could be heard operating regularly on cw and phone. He was a member of the Guildford & D RS, and also RSARS.

Mr A. H. "Tom" Thomas, GW4KJH
Tom Thomas died on 8 April while helping the Swansea ARS prepare the venue for their rally on 10 April. He was 72 years old but had only taken up the hobby in 1979. However, in that short a time, he had made many friends both on hf and vhf. His love for cw, particularly, stemmed from his wireless operator days in the Merchant Navy, and he was quick to volunteer his cw expertise, both at the Swansea ARS meetings and regularly on 144MHz. Numerous hams in the West Glamorgan area will have achieved their GW4 callsigns as a direct result of Tom's coaching.

Mr W. Wright, G2FQC
William Wright died on 27 February, aged 71. He was active, especially on the local 144MHz nets, and thoroughly enjoyed his various construction projects.

Also:
Mr D. J. Burnett, G6DAV;
Mr G. E. Cousins, RS40656, on 15 February;
Mr J. A. Currie, RS12647;
Mr S. C. Hedges, G2CSH, in November 1982;
Mr R. Hurt, RS50757, on 5 October 1982;
Mr E. D. B. Kent, G8OQB, on 2 December 1982;
Mr F. H. Leeder, G3OTP, on 2 January;
Mr A. D. Purvey, G8FKU, on 17 January 1982;
Mr P. A. Radford, G4EYC, on 12 March 1982;
Mr A. D. Stevens, G6GRM, on 22 December 1982;
Mr W. C. Thompson, GM6FP, on 3 March;
Mr J. P. L. Venn, RS36376; and
Mr J. R. Young, RS29724.

Members' Mailbag



50MHz CROSSBAND

The Editor
Radio Communication

Sir—If, as is stated by G8VR in *4-2-70* (April 1983), the reason why Class B stations are not allowed to work crossband with stations on 50MHz is that "the licences of Class B operators do not permit them to communicate using bands not in their schedule of frequencies", then surely by this same qualification Class A operators are not allowed to work crossband with 50MHz.

The 50MHz band is not in the schedule of either the Class A or Class B licence. While the wording of the amateur licence is quite clear in respect of Class B stations working crossband with stations on hf and 70MHz, such frequencies not being in the Class B schedule and therefore not being available for "the purpose of sending to, and receiving from other licensed stations" (sec: 1, sub-sec: 1, para: B of the amateur licence), using frequencies which are "within the frequency bands specified in the Schedule" (sec: 1, sub-sec: 2, para: B). These licence limitations do not seem relevant in the case of a non-scheduled frequency band.

Perhaps someone should ascertain from the Home Office what, if indeed any, are its reasons for preventing 50MHz crossband operation with Class B stations.

W. G. Jones, GW4KJW

Comment

A few letters have been received which ask more or less the same question. Broadly speaking, the Society is aware that there are anomalies in the wording and interpretation of the licence with regard to crossband working and these have been taken up with the Home Office with a view to clarifying them. Some letters on allied subjects have been addressed to the Society's VHF Manager, and he will answer them as soon as possible.

CONTEST WORKING

The Editor
Radio Communication

Sir—I write in support of Gerry Ward, GI3ZCK.

To have a weekend of amateur radio spoilt by contest working *is* frustrating. His view that our hobby should be "all things to all men" echoes my feelings that all the bands should be available at all times (propagation permitting) for all amateur activities. Other branches of amateur radio such as rtty, sstv etc do not put a virtual stop to "normal" radio communication, as does contest working. The allocation of band segments for contests would allow other users to pursue their own interests in amateur radio.

J. H. Wills, G4AXO

Comment

This, and other letters making the same point, represents one side of the coin: however, the fact is that many amateurs thoroughly enjoy contests and find them an important part of the hobby. RSGB contests are designed as carefully as possible so as not to monopolize any one band—there are no multi-mode hf RSGB events, for example—but we cannot legislate for a hundred-odd other national societies, and there would be an outcry if we attempted to curtail major events such as CQ WW WPX! The International Amateur Radio Union has been attempting for some time to co-ordinate international contests organized by national societies, but this is a difficult issue: however, the effort is still being made.

AMATEUR RADIO TODAY

The Editor
Radio Communication

Sir—I would like to comment on the statements made by GW4ALG in the April issue of *Rad Com.*

First of all, Scouts are *not* allowed to pass third-party traffic, but like any other person they are permitted to pass greetings to other radio amateurs within the UK when present at exhibition stations and under the supervision of a qualified amateur.

Is the acquisition of a licence simpler than in the past? By coincidence the comments concerning the ease with which one can now obtain a licence were printed alongside the obituary for G6DW who obtained his licence in 1923 at the age of 15—surely a contradiction. What has happened is that education has improved immensely over the past 30 years (I am not suggesting all have taken advantage of this!) and the present day school pupil has a better understanding of electronics than ever before. Add to this that youngsters are also skilled at using electronic gadgetry which would have completely confused our grandparents. So now the young RAE candidate enjoys greater knowledge before he even starts his studies, and therefore the examination appears easier.

While I agree that it would be very nice for every prospective amateur to have to dabble with old receivers etc; to gain experience, surely many of us were driven to this by necessity—a shortage of cash to spend on our hobby. These days most youngsters are financially solvent and can afford to purchase new equipment outright. And such equipment is relatively cheap—for those that disagree, convert the cost of a postwar AR88 receiver (secondhand) into present-day equivalent value!

Amateur licences are issued for self-training in radio, and this covers a vast range of activity from operating to experimental research. Now I consider that the interest the authorities have in us really stems from our use during emergencies. It is significant that the armed services immediately split us into two groups—operators and technicians—with many more operators than technicians. In other words, if amateur radio can supply many skilled operators who might have a poor technical knowledge then they are quite happy.

Are licence conditions becoming more liberal? There were far fewer conditions on the single-folded sheet which comprised my 1947 licence than in my present version. For about 10 years following the last war I could allow anyone to *operate and speak* over my rig under my supervision. I have been told that in pre-war days if someone spent a lot of time at your station and you considered that they had become technically competent you could recommend them for a licence. It is obvious that licence conditions change to meet new circumstances but are not always less restrictive.

Finally I feel I must make the point that total numbers do affect opinions and situations—the introduction of cb proved this point. I consider it is better to have many more amateurs to safeguard and extend our bands (despite the QRM) than an easily-extinguished small elite band of enthusiasts. I certainly look back to the post-war period with nostalgia, but it is really up to the individual to find some facet of amateur radio which provides satisfaction and perhaps the chance to recapture past enjoyment.

Progress does not please everyone but it cannot be stopped!

Les Mitchell, G3BHK

Comment

An interesting letter. We would be interested to hear what other members think.

BAND PLANS AND THE NEED FOR COMMON COURTESY IN RADIO OPERATING

The Editor
Radio Communication

Sir—May I ask you to publicise repeatedly the recommended frequencies for specialist modes and to exhort all operators to respect them.

Much serious experimentation takes place on these transmission modes and, to say the least, it is irritating for such effort to be rendered useless by the "chat" radio contacts which so often obliterate an already existing experimental contact.

New licensees are often the major culprits—perhaps with our new regulations, the first time a G6 operator listens is when he lifts the ptt button on his transceiver!; however, some *very* old operators can be equally discourteous. They claim: "their net has been operating on the frequency since the time immemorial, so why should they change?"—surely with ssb signals they do not have crystal-controlled transmitters. Do you think they would continue to operate on 7,180kHz in spite of the licence changes! (We used to have a much larger bandwidth on "40m").

Apart from coming on top of existing transmissions (which I believe is contrary to our regulations) one net of so-called old-timers can vie with new call holders in "rude comments". Is it not time such bad behaviour by those who are supposed to set a good example should merit expulsion from the Radio Society of Great Britain. Even if one is over 80 years old, one should change with the times.

Incidentally, why is 144·230MHz not shown as the sstv frequency in the latest *Operating Manual*? Convention puts this as an sstv frequency for ssb, while 144·500MHz is used for sstv fm.

Roderick Clews, G3CDK (ex BRS1543)
(A young old-age pensioner)

Comment

The use of 144·230MHz for sstv, although customary, has never been included in the band plan on an "official" basis, simply because no-one seems to have asked for its inclusion! The VHF Committee would no doubt consider the matter if asked to do so. (See also the item in this month's "Amateur Radio News" on the use and abuse of the 144MHz band plan with reference to ms and beacons).

CB INTRUDERS

The Editor
Radio Communication

Sir—In this area we are more and more aware of the increase in cb intrusion of the cw sector of our 28MHz band.

It is believed that certain local dealers in cb equipment are modifying rigs by adding extra channels. The operators of these rigs are aware that the use of the sets on these frequencies is illegal, but are told that amateurs don't make use of 10m. The channels most badly affected appear to be 28·005-10-15MHz.

May I add my plea—please, all A licence operators, use the band as much as possible, even for local contacts when the band is closed for dx. There will be less chance of the problem getting more serious, and it will lessen, hopefully, if our presence is known.

Jack Bonner, G8LZ

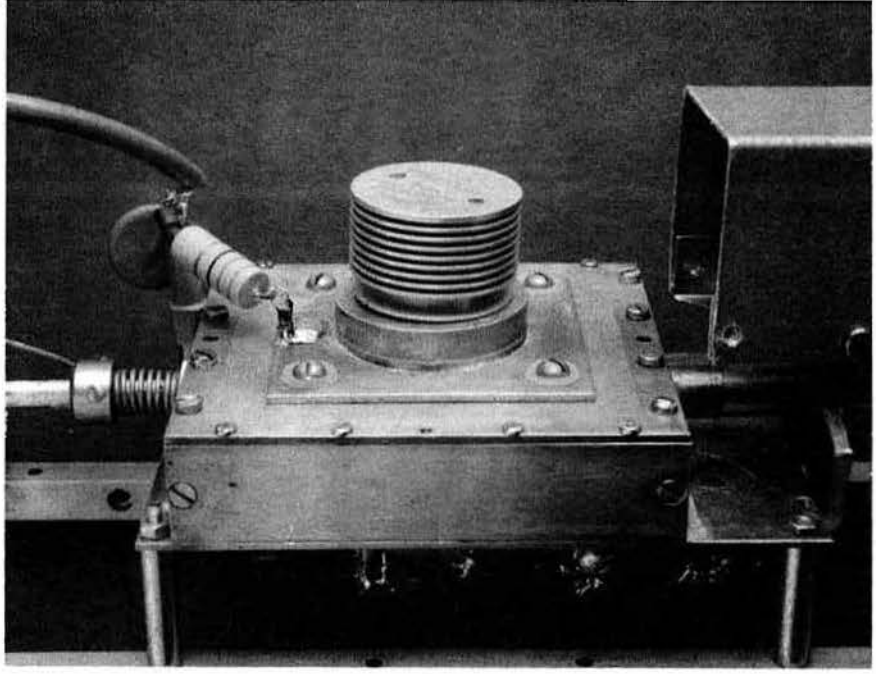
Comment

Unfortunately, equipment covering the amateur 28MHz band in addition to cb frequencies is readily available and is being used illegally: it is hoped that the Telecommunications Bill (which fell victim to the General Election, and will need to be re-introduced in the next Parliament) will be a step towards solving this problem. Many local contacts do take place on 28MHz, and quite naturally the Society is keen to increase the legitimate use of the band.

Comment on G6ITX's letter in the May issue

This letter is typical of several received on this subject. As Mr Beardall says, the requirement for a morse test is the result of international agreements, and the Society—in common with practically all other national societies throughout the world, numbering in excess of 100—feels that the morse test is an important ingredient of the continuing credibility of the amateur service in the eyes of other radio users: the point here is that it is the credibility of amateur radio which gains the privileges accorded to amateurs in the first place. However, it is appreciated that morse does not come easily to everyone, and indeed the Society is currently considering a recommendation to the Home Office that Class B licensees should be allowed to use morse for training purposes on 144MHz and above. Although perhaps not strictly relevant to the UK, it is interesting that amateur opinion in the USA seems strongly against the FCC proposal to introduce a "code-free" licence.

MORE GAIN



from 1·3GHz power amplifiers

by ROGER BLACKWELL, G4PMK and IAN WHITE, G3SEK*

THE CURRENT GENERATION of solidstate transverters for 1·3GHz can seldom provide much more than 1W p.e.p. of linear rf output, which is about all that can readily be achieved using inexpensive transistors. Most users of the band recognize that higher power levels would lead to a greater range under normal propagation conditions, and that the prospect of more QSOs would generate more activity. The problem is that power gain on 1·3GHz is reputed to be hard to achieve at reasonable expense, so many amateurs remain trapped at the 1W level. In this article we describe one way out of the "QRP trap": a single-valve power amplifier of uncommonly high gain which should deliver at least 25W output when driven by one of the popular "1W" transverters. With higher drive power and adequate cooling, correspondingly higher outputs are possible.

The design represents a further stage in the evolution and adaptation of the box-cavity tripler design first published by G2RD [1] which, although virtually obsolete in this age of ssb, has found new life as the basis for 1·3GHz power amplifiers. The principles for achieving high gain are discussed in some detail, since they may be adaptable to other uses and other methods of construction.

In search of a high-gain amplifier to increase the power from our newly-built 500mW 1·3GHz transverters, we reviewed some published designs. Conversions of the G2RD tripler to both a high-level mixer and a power amplifier were described in 1976 by G3LTF and G3WDG [2]. With a 2C39A valve, 7–8W of drive and 800V eht, the amplifier was reported to deliver about 50W rf, which represents a power gain of no more than 8·5dB. Power gains of 10–12dB have been reported [3, 4] from multi-valve amplifiers using 3CX100A5/7289 valves, the more recent ceramic-insulated developments of the 2C39. However, we found no reports of power gains significantly greater than 10dB from single-valve amplifiers until a brief note in *QST* [5] mentioned a new design by Chip Angle, N6CA. This amplifier was said to deliver 200W from a single 7289 adapted for water-cooling, yet required only 10W of drive, implying a power gain of 13dB. Transatlantic enquiries revealed that at lower drive levels the gain of N6CA's amplifier is nearer 15dB; and that the keys to success are to use the highest possible eht voltage (eg 1·3kV) and to pay scrupulous attention to the rf grounding of the grid. Tests by N6CA showed that deliberately increasing the grid-to-ground inductance by raising only one in every four of the contact fingers on the grid ring led to some 3dB loss in gain, due to the introduction of negative feedback.

Clearly the potential of the 2C39-series valves for high power gains on 1·3GHz is far greater than commonly expected: in a well-designed amplifier it should be possible to obtain about 15dB of gain. Since full details of the N6CA design were not available when we began the amplifier project, we set out to apply the same principles to improve the performance of the G2RD-G3LTF-G3WDG amplifier.

Anode cavity

In the original tripler design [1] the base of the anode cavity could be moved up and down inside the walls as a coarse tuning device, and the tuning could also be affected by the axial position of the valve. These features could lead to losses and unreliable operation. Large circulating rf currents flow across the joints between the cavity walls and the top and base plates, and in the

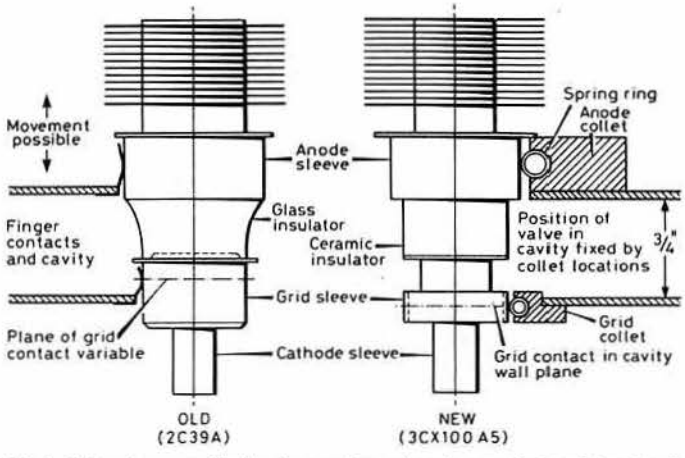


Fig 1. Old and new methods of mounting valves in a cavity (omitting details of anode dc supply)

*2 Aldworth Avenue, Wantage, Oxon.

original tripler the latter joint was secured by only eight screws, none of them at the midpoints of the walls where the currents are greatest.

In the new version the depth of the cavity is fixed at 0·75in† and a coarse tuning screw is provided as described by G3LTF and G3WDG [2]. The base plate is soldered to the walls, and the top plate, which regrettably has to be removable for access, is secured by no less than 20 screws. The result is a rigid, low-loss assembly.

There are several valves in the "2C39" family, which can differ mechanically as well as electrically. The original tripler design was for the type of valve with a long sleeve contact for both grid and anode (Fig 1 (a)). This permitted quite a wide range of axial locations of the valve within the cavity, which altered the tuning and was one of the reasons for needing the movable base plate. Not all of the 2C39 variants have the grid sleeve; the other example in Fig 1 (b) (a 7289/3CX100A5) has its grid contact ring only at the bottom (cathode) end. Inspection of the drawings for the professionally-designed UPX4 amplifier, successfully converted to 1·3GHz amateur use by W2IMU [4], shows that if the grid contact is made at the bottom of the grid sleeve and in the base plane of a 0·75in-deep cavity, then the bottom of the anode sleeve is flush with the top of the cavity. This arrangement, shown schematically in Fig 1 (b), was taken to be the "correct" way to locate the valve in the cavity.

Grid and anode contacts

The greatest single problem in amateur designs using the 2C39 series of valves has always been the contact rings for the grid and anode. To insist on an extremely low-inductance grid contact, in the plane of the baseplate, makes matters worse than ever!

"Straight" finger-stock (Fig 1 (a)) is ruled out because it projects either into or out of the anode cavity. Folded-over finger-stock is used in commercial preformed grid rings, but it is not readily available; and N6CA's experiments suggest that the inductance of the resulting contact is barely low enough. Having rejected conventional amateur methods of grounding the grid, what next? The answer came from several sources at once: a commercial power signal generator, drawings of an amplifier (using a different kind of valve) kindly supplied by the OK1KIR club, and conversations with another amateur employed in the design of rf units for particle accelerators. The solution is to use a ring of spiral spring to contact the valve, the spring-ring itself being held in a collet (Figures 1(b), 2 and 3). In effect, the valve is contacted by several quarter-turns of the spring, all of which are electrically in parallel and combine to make a contact of extremely low inductance. The collet can be let into the base of the cavity, so that the contact is made in the correct plane.

The ideal spring-ring material is a loosely-wound, silver-plated spiral spring of about 0·25in diameter. A perfectly acceptable homemade substitute is a spiral wound from narrow (eg 0·1in wide) phosphor-bronze strip such as draught-excluder; this gives fewer contacts to the valve but each turn of the strip has lower individual inductance. Fig 2 shows the two alternative types of spring-ring in their collets.

Precise dimensions of the collet depend to a large extent on the available spring-ring material, and the prototypes were turned by "cut-and-try" out of old brass vacuum fittings. The first step is to bore out the blank to just clear the grid sleeve of the valve. Then the internal groove is formed using a small boring tool (inset, Fig 3), repeatedly trying first the spring-ring alone for size, and in the later stages both the spring-ring and the valve. The fit of the valve can also be adjusted by pulling or squeezing the spring-ring. When all is well, the valve will be gripped gently but uniformly as it is twisted into place. Owing to the "lay" of the turns of the spring-ring, the valve can only be twisted in one direction—the same for insertion and removal—so if spring-rings are used for both the grid and anode connectors they *must* be wound in the same sense.

The entire machining and fitting process is far easier than it looks, because no individual dimension is critical. The two prototype grid contact assemblies were produced in one lunchtime by a machinist with no delusions of competence!

The anode contact is much more forgiving of stray inductance than the grid contact, so a ring of ordinary finger-stock would probably suffice [2]. Both of the prototypes used spring-ring anode connectors, however;

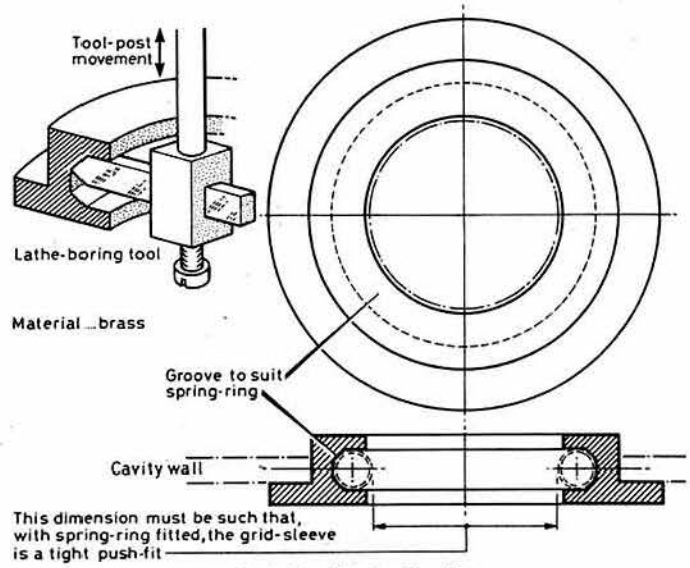


Fig 3. Details of grid collet

G4PMK's being a surplus DET24 anode connector with a flat spiral spring, and G3SEK turning his from a large brass union nut. Correct axial location of the valve can be ensured if the flare at the top of the anode ring bears on the top of the collet, the latter being turned down to the correct thickness.

Besides the basic box-cavity configuration, many other features of the G2RD-G3LTF-G3WDG design [2] were retained. The cathode input circuitry closely follows the original, the coarse-tuning screw has already been mentioned, and the fine-tuning paddle and coupling loop are also as before. Coupling with the magnetic field in the cavity is strongest when the loop is almost fully withdrawn to the cavity wall and at right-angles to the base plate. Coarse loading adjustment is by sliding the loop in and out, and fine adjustment by rotating it.

Dimensions and assembly

A general view of the amplifier is shown in the photograph, and leading dimensions are given in Figs 4–8. Non-critical dimensions are not given, being at the discretion of the constructor. Over-dimensioning the drawing would give a false impression that all dimensions must be slavishly followed: if that were true, we probably could not have built the prototypes! As noted earlier, the dimensions of the anode and grid connectors are only critical in that they must be adjusted to provide a good fit to the valve. However, the two collets *must* be coaxial in order to avoid shear forces on the valve, and detailed assembly instructions for the anode cavity are given in Appendix A.

The cathode circuitry below the base plate (Figs 5 and 6) is assembled after the grid collet has been soldered into place. Rather than fabricating the rf bypass capacitor for the "cold" end of the cathode stripline [2] we chose to make the entire end wall act as a capacitor by making it from double-sided glass-fibre pc board (Fig 6), chamfering the copper from the inside edges to prevent a dc short-circuit. Contrary to popular belief, grounded-grid amplifiers are not unconditionally stable, and this high-gain design requires some attention to the possibility of stray feedback paths. Some stability problems were encountered when one of the prototypes was operated very close to the solidstate transverter driving it, the system gain at 1·3GHz being of the order of 40dB. The top of the cathode compartment was therefore covered with a close-fitting lid of perforated copper sheet; together with careful bypassing of the heater supplies, this solved the problem completely.

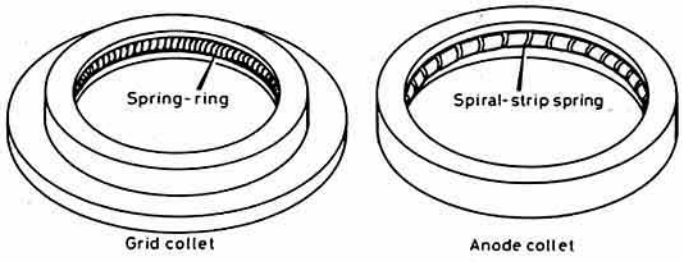


Fig 2. Grid and anode collets showing the two alternative types of spring material

†All dimensions in this article are given in inches, because at the time of writing brass strip and tubing remain more readily available in inch than in metric sizes.

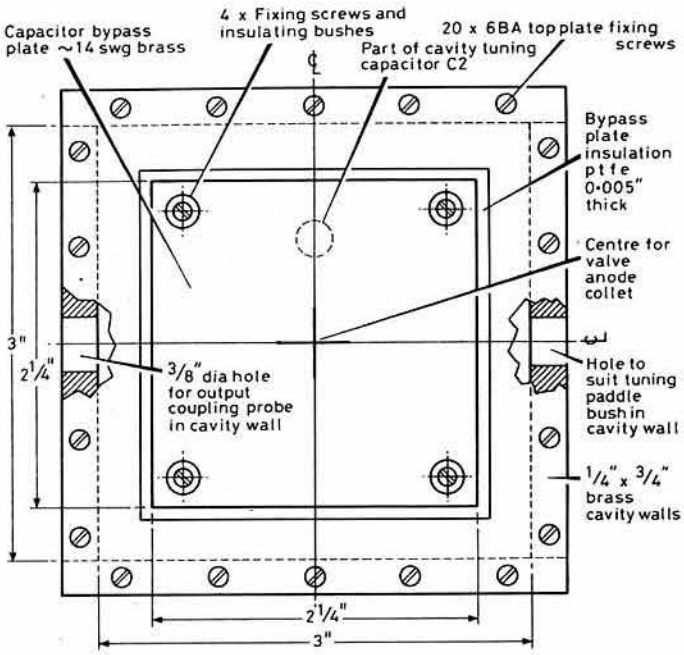


Fig 4. Top view of anode cavity assembly. The cavity top-plate has a 1·25in diameter hole in the centre, to clear the valve anode sleeve

The sliding loop coupling probe (Fig 7) is made using telescoping brass tubing available from good model shops. A safety stop *must* be provided to prevent the loop from touching the anode sleeve of the valve. The tuning paddle (Fig 8) needs to be well grounded to rf; this can be ensured by a strong compression spring over the shaft which maintains a firm contact between the paddle and shaft bushing. It is helpful if the external controls indicate the true orientations of the loop and paddle within the cavity.

As an optional extra, all the components can be silver-plated. The brass parts of the two prototypes were given an ultra-thin but tenacious coating of silver by the method in Appendix B.

Cooling

The original tripler designs [1, 6] were intended to provide only a few watts of output, so forced-air cooling was either uncritical or unnecessary. A significant advantage of the box-cavity arrangement over the stripline variant [6] is that at higher power levels it is quite easy to provide efficient cooling, since the finned anode cooler of the valve is conveniently accessible outside the cavity, yet it is "dead" to rf since the rf currents circulate only inside the cavity.

The multiple fins of the anode cooler present a large surface area for efficient heat transfer, though only if the cooling air is forced between them. If air is merely blown in their general direction, it will take the easy way round the outside and will not cool the anode! A transverse-finned cooler is not as effective as a ducted axial-flow cooler (eg that of the 4CX250B) but a suitable air duct can be made from a variety of easily-worked materials such as Perspex or Formica.

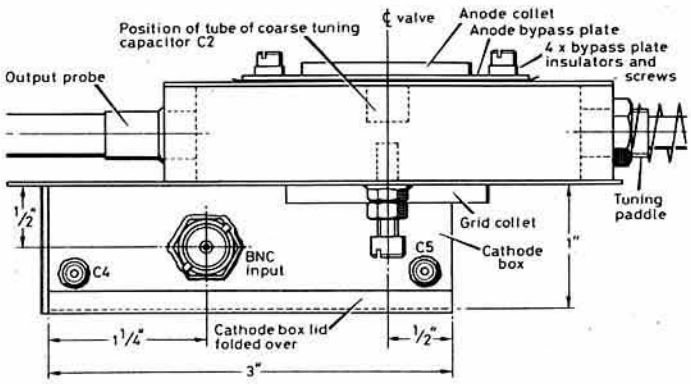


Fig 5. Side view

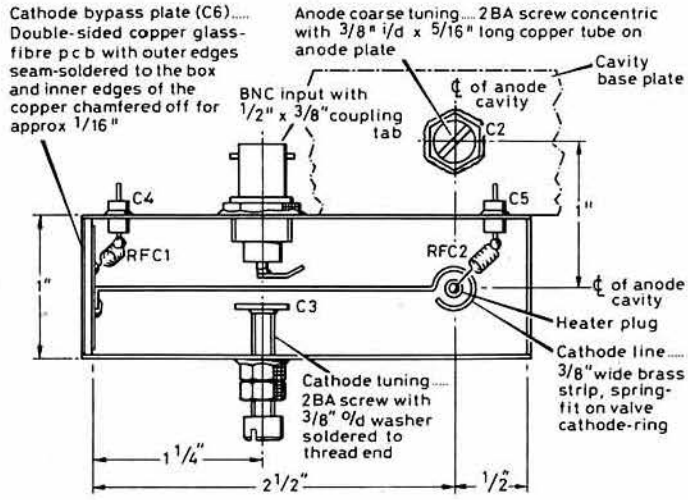


Fig 6. Details of cathode box and anode coarse tuning capacitor

At the higher power levels, overheating of the grid can cause electron emission, leading to dc instability and shortened valve life. The problem can be avoided by efficient cooling of the anode (which otherwise tends to heat up the whole valve) and of the grid/cathode region. The spring-ring grid connector is a good conductor of heat as well as rf, and helps keep the grid cool. If the whole amplifier is mounted upside down, the cathode cavity is adequately ventilated by natural convection through the perforated cover. The anode cavities of the prototype amplifiers were not ventilated at all, a point which should be considered if this design were to be used at power levels of more than a few tens of watts.

All amplifiers of this general type can suffer from the problem that the different thermal loadings on transmit and receive lead to changes in the internal capacitances of the valve, and hence to drift in the output level as the amplifier warms up. The problem is obvious enough at high power levels, but it also occurs at very low drive levels because the valve is only lightly loading the high-Q cavity, making it more susceptible to drift. The difficulties can be largely overcome by cooling the valve adequately on

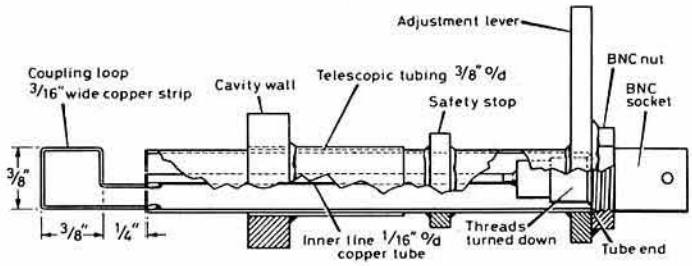


Fig 7. Output coupling probe

transmit and reducing or removing the airflow on receive [7] so that its temperature remains more nearly constant. For example, it is possible to set the tuning paddle either so that the amplifier achieves maximum output within a few seconds and then drifts off tune after about 1min, or alternatively so that it takes about 20s to reach full output and stays in tune for several minutes—for contests and ragchews respectively! A further improvement could be expected from the use of one of the modern temperature-compensated derivatives of the 2C39, eg the 7855.

Operating conditions

The circuit diagram of the amplifier is very simple (Fig 10). For maximum gain, a fairly high standing current of the order of 50mA is required, ie dc efficiency has to be sacrificed. At low drive levels the amplifier will operate at virtually constant anode current, so simple cathode-resistor biasing will suffice. During development of the amplifiers a 250Ω wirewound potentiometer proved perfectly satisfactory, and a 22kΩ resistor connected from the cathode bypass to ground allows the valve to cut off safely during receive periods or if the bias resistor fails. At higher drive levels, constant-voltage biasing must be used in order to maintain linearity on ssb, and an arrangement in which a single transistor acts as both bias regulator and t/r switch is shown in Fig 9. The zener diode sets the cutoff bias on receive and limits the transistor's collector voltage to below Vceo.

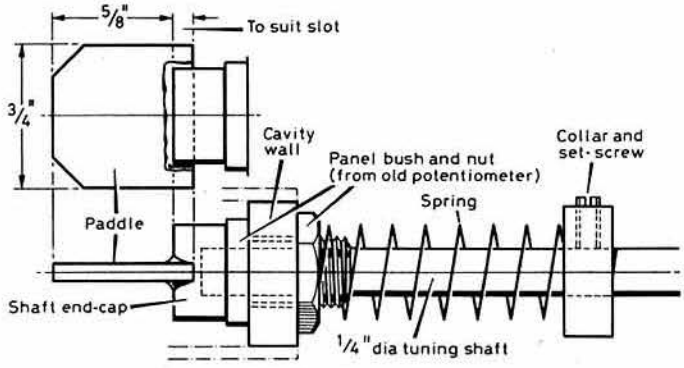


Fig 8. Tuning paddle

The usual precautions regarding heater voltage should be observed when using the amplifier; at no time must the heater voltage exceed 6V. It is important that the cathode of the valve be allowed to reach full operating temperature before the anode voltage is applied. A delay of 60–90s is adequate.

The power gain achievable will depend on the type of valve, and on its operating history if it is secondhand. One of the prototype amplifiers, using a "good" but not remarkable 7289, gave the following measured performance with an eht supply of 1kV, when the input and output matching were re-optimized to suit the available level of drive power.

Available drive power (W)	Output power (W)	Power gain (dB)
0·35	27	19
0·5	32	18
1·0	40	16

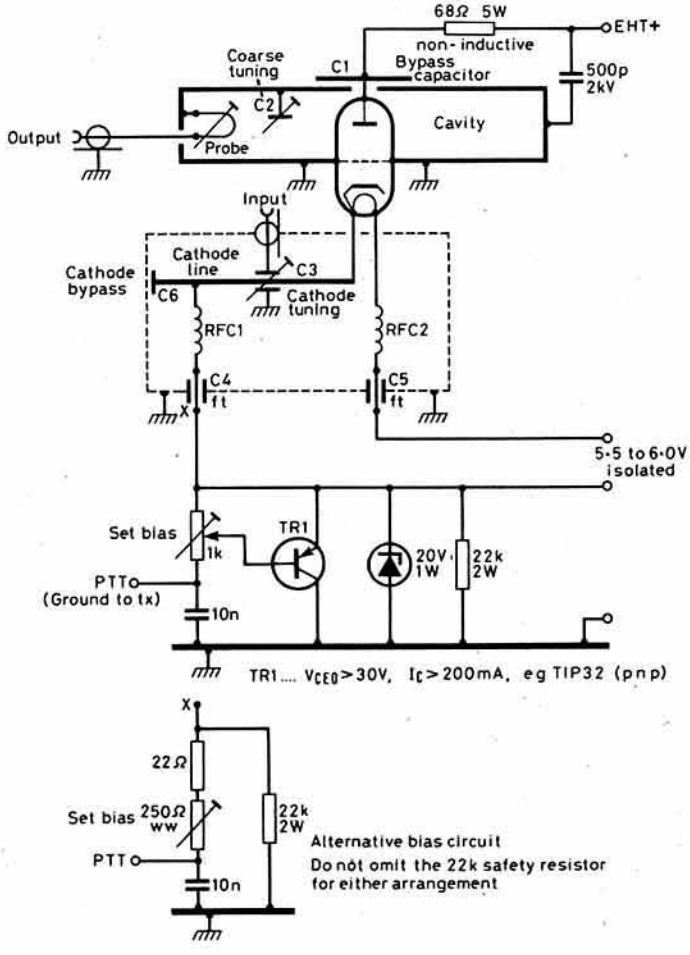


Fig 9. Circuit diagram of the amplifier

The lower power gains at higher drive levels do not imply that the amplifier is non-linear. If the adjustments had been optimized at the 1W drive level, then reduction of drive to 0·5W would linearly halve the output power to 20W. However, if no more than 0·5W drive were available, the amplifier could be reoptimized to give 32W of linear rf output.

The prototypes were developed using eht supplies of 1–1·1kV. Some reduction in gain was found at 800V, and in a brief test using 1·5kV one of the prototypes gave 60W rf output for 1W of drive.

Conclusion

Power gains of 15dB or more at 1·3GHz can be obtained from valves of the 2C39 family in a modified box-cavity amplifier. Effective grounding of the grid is particularly important, and can be achieved without difficulty by a spring-ring connector. When driven by a "1W" transverter the amplifier described in this article can develop more power at less cost than currently available solidstate alternatives, and offers a relatively simple way out of the 1·3GHz "QRP trap".

Many people have contributed to the evolution of this amplifier design. In chronological order we wish to thank G3FP, G2RD, G3LTF, G3WDG, N6CA, G3KJC and the OK1KIR club.

References

[1] (a) *RSGB Bulletin* October 1965, p650.
(b) *VHF-UHF Manual*, all editions.
(c) *Radio Communication Handbook*, 4th edition.
[2] *Radio Communication* January 1976, p24.
[3] Crawford Hill VHF Club (USA), Technical Report No 6, July 1971.
[4] Ibid., Technical Report No 13, December 1972.
[5] *QST* June 1981.
[6] (a) *VHF-UHF Manual*, all editions.
(b) *Radio Communication Handbook*, 4th and 5th editions.
[7] *Radio Communication* August 1981, p732.

Appendix A. Assembly of the cavity

1. Mark out the locations of the side walls and the centre of the cavity on the base plate. Drill a *pilot* hole in the centre of the base plate.
2. Solder the side walls into position. If the ends of the bars can be faced-off square (not impossible by hand or with a three-jaw lathe chuck) they may be pre-assembled into a square frame before soldering. After soldering, stone the top face of the side-walls flat.
3. Mark out and pilot drill the 20 fixing holes in the cavity top plate. Do *not* drill the centre hole yet. Tape the top plate accurately into position on the side walls, and on a drill press drill two holes in diagonally-opposite positions through the top plate and into the side walls. Tap these two holes and secure the top plate more firmly before drilling and tapping the rest of the fixing holes.
4. Again on a drill press, drill square through the pilot hole in the base plate, and through the top plate.
5. Use the pilot hole in the cavity top plate to locate the centre of the anode bypass plate, when marking and drilling through the latter for the four retaining screws.
6. Open out all pilot holes to full size. Be careful to retain concentricity.
7. Drill the four holes in the anode bypass plate slightly oversize for the shoulders of the available insulating bushes. Leave the retaining screws slack until the valve has been fitted squarely into place for the first time; then tighten them.

Appendix B. A simple silvering technique

This is a simple and effective way of applying a very thin but tenacious coating of silver to copper or brass, without resorting to electroplating and cyanide solutions. Although the coating is extremely thin, possibly less than the "skin depth" for rf currents at 1·3GHz, tarnishing of silver affects its electrical properties far less than would tarnishing of untreated copper or brass, so the coating is worthwhile if only as a preservative.

Mix together two parts by weight of finely ground sodium chloride (common salt), two of potassium hydrogen tartrate (cream of tartar) and one of silver chloride. Store the mixture away from moisture or strong sunlight. To silver-plate an article, dampen a little of the powder with water and apply the resulting paste with a cloth using a vigorous rubbing action (wear rubber gloves). The abrasive nature of the paste will help remove any slight tarnish. When finished, wash the article thoroughly and dry it. □

A MODERN HF TRANSCEIVER

(PART 3)

by G. N. FARE, G3OGQ*

Pre-driver

The track layout is shown in Fig 8 and the component layout in Fig 9. The p.i.n. diode shown is a BA379 available from Electrovalue, and is a current-controlled rf type designed for agc networks. Other diodes may be tried, with a forward series resistance not greater than 6·5Ω and a reverse cut-off impedance at −1V of at least 2·5kΩ.

The transformer T501 is wound on an FT37-43 Amidon toroid core and has eight turns of a twisted pair of 24swg enamelled copper wires, about six twists per inch, although this is not critical. The end of one wire is connected to the beginning of the other wire to form the centre tap. L501 and L502 have eight turns of 24swg enamelled wire on FT37-43 toroid cores. A T05 heatsink type 5F (12mm high) should be fitted to both transistors.

After assembly, connect 12V to the two pins (attenuator and power) and earth the alc pin. There are no adjustments to be made. Check the voltages on the bases and emitters and, if these are within 10 per cent or so of those shown, connect the input to the drive output of the main board. With the main board switched to transmit, key the cw oscillator and monitor the output of the pre-driver. A 50Ω dummy load (eg a 51Ω 0·5W resistor) should be fitted. The signal output on 3·5 and 14MHz should be almost equal in amplitude and the trace should be reasonably clean. Connecting the alc input pin to 12V should cut off the signal.

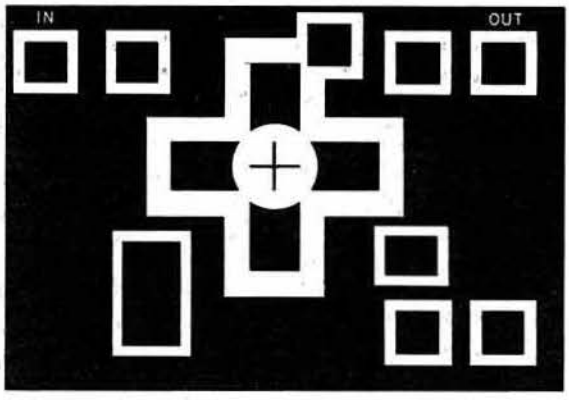


Fig 10. Driver board pad layout. Other side groundplane

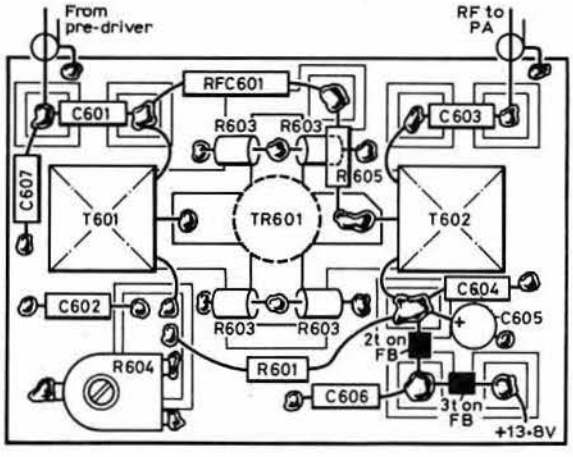


Fig 11. Driver board components layout

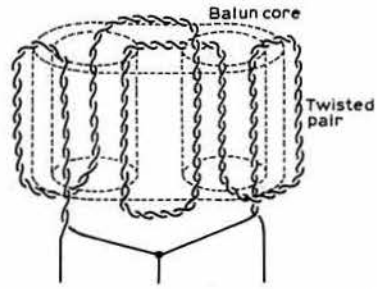


Fig 12. Method of winding T601 and T602. End of one wire is joined to beginning of other wire to form centre tap

Driver

Single-ended driver stages produce more even harmonics than double-ended stages. However, the final amplifier and succeeding lowpass filter successfully reduce these harmonics to an acceptable level. If it is desired, for example, to take off the output of the driver for the purpose of working QRP or feeding a transverter, a lowpass filter must follow it.

This stage is however quite stable under any conditions, is broadbanded and is capable of an output of 4W although less than 2W is required. Track layout is shown in Fig 10 and component layout in Fig 11. All components are soldered direct to the pads.

The transformers T601 and T602 are identical and are wound on balun ferrite twin-hole cores of the type found in tv receivers. The cores used in the prototype are Siemens A0001X001 obtainable from Electrovalue and

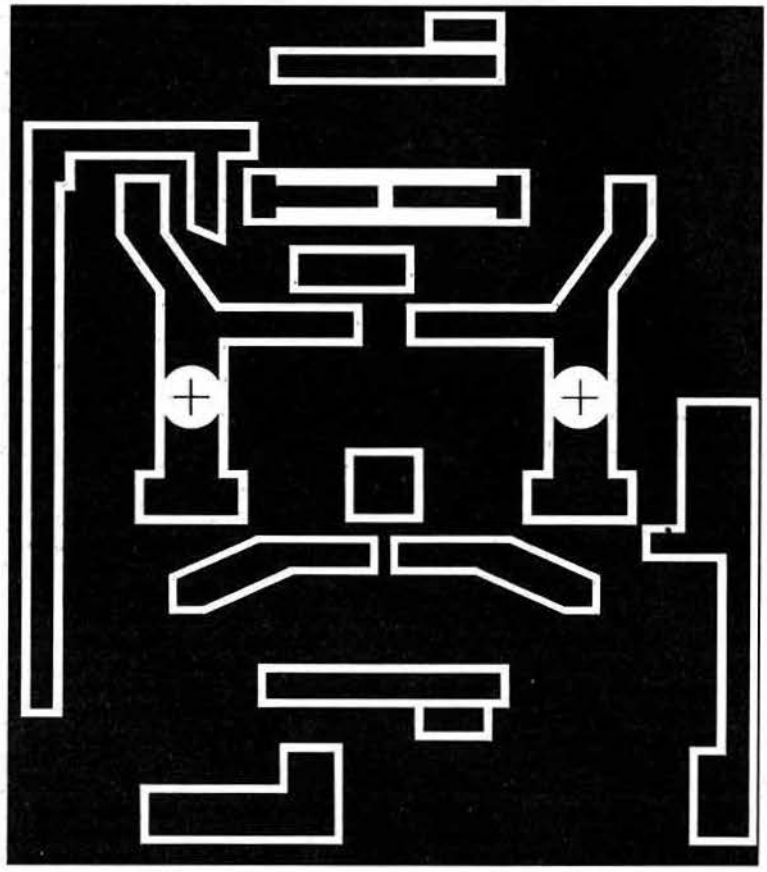


Fig 13. Final amplifier board pad layout. Other side groundplane

*Cobblestones, Walton Old Hall, Walton, Warrington, Cheshire.

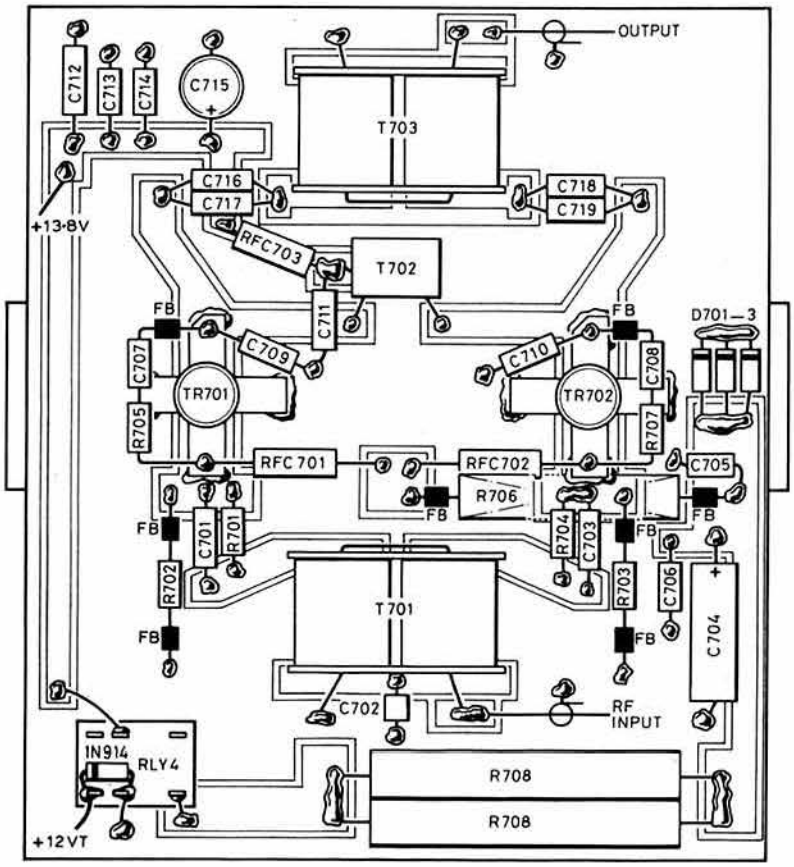


Fig 14. Final amplifier component layout. Components are soldered direct to etched pads. D701-3 must be tight on the board and bedded in heatsink compound

ERRATA

The author apologises for the following errors which have crept into this article.

1. TR201. In Fig 2(c) (April issue) and Fig 4 (May issue) the drain and source connections were accidentally transposed.

2. R115. The value given on Fig 2(c) and in the components list (May issue) should be 22kΩ, not 1kΩ.

3. R706. The value shown on Fig 2(e) (April issue) should be 0·47Ω, not 47Ω.

are size 14·5 by 14·5 by 8mm overall. Anything of similar size and suitable for hf will probably work. The winding consists of a twisted pair of 24swg enamelled copper wires (six twists per inch—not critical). The end of one wire is connected to the beginning of the other to form the centre tap. The method of winding is shown in Fig 12.

The board should be drilled in the position shown and mounted with the plain copper side face down on a Redpoint 2Y heatsink measuring 61 by 50 by 12mm with a temporary 1·5mm washer spacing them apart. The 2N5590 is bolted to the heatsink and then the tabs are soldered to the lands. Leave the heatsink on while testing is carried out. The rfc can be made from 24 turns 30swg enamelled copper wire wound on a 0·5W resistor.

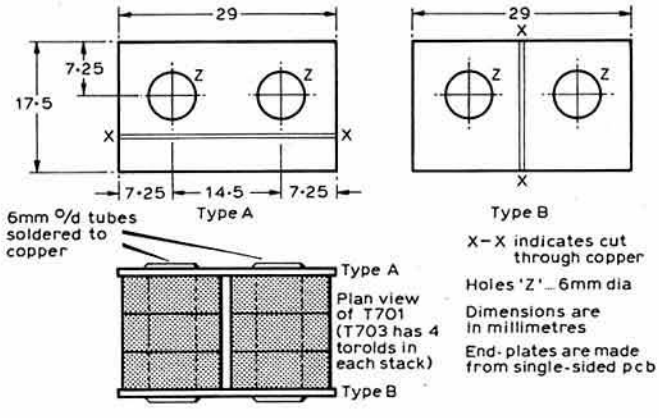


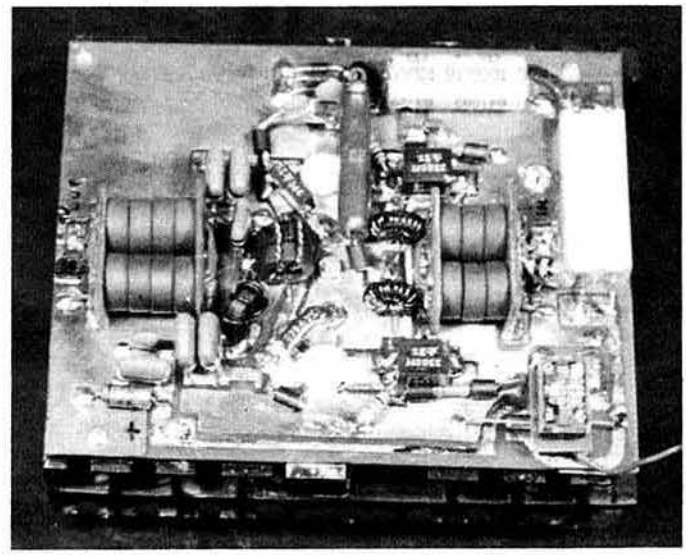
Fig 15. Details of T701 and T703

The chokes in the 13·8V line are two or three turns 24 swg wound through small ferrite beads. When all components are mounted, turn the potentiometer to minimum resistance and apply 12V. Monitor the current and slowly adjust the potentiometer until the total amplifier current drain is 400mA. This sets the bias level. Connecting the amplifier to the pre-driver stage and switching to transmit should give at least 2W output into a 50Ω load. Do not worry too much about the waveform; it will contain harmonics which will spoil an otherwise good sine wave.

Removing the drive should make the output revert to zero. If it does not, there is an instability problem which must be cured before trying to drive expensive pa transistors. However, if built as shown, the driver should be unconditionally stable.

Final amplifier

The track and pad layout is shown in Fig 13, and component layout in Fig 14. Construction is similar to that of the driver stage; that is, all components are soldered direct to the etched pads. The plain side of the board will be mounted on the heatsink.



Final amplifier board mounted on its heatsink. The bias relay in the bottom right hand corner is more easily mounted as described in the text

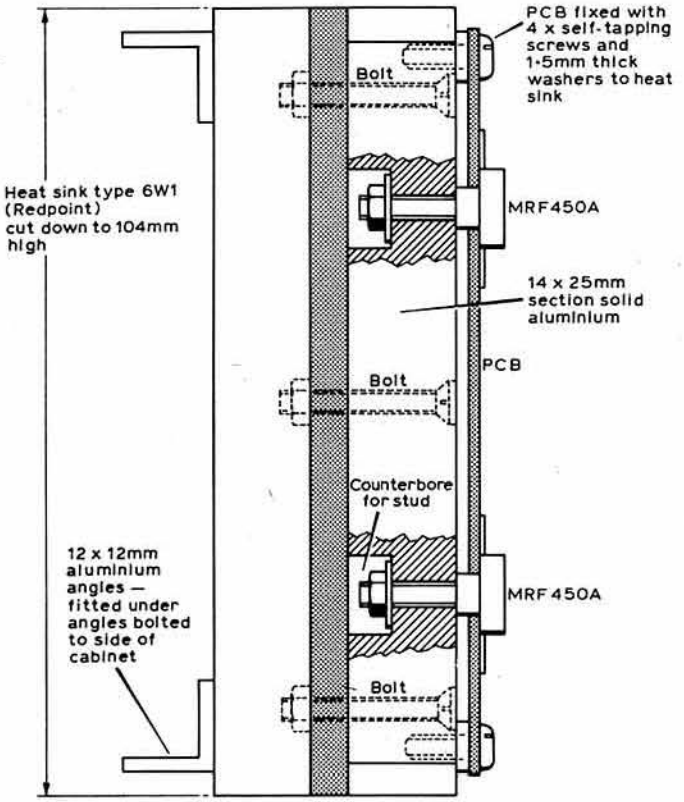


Fig 16. Cross-section through heatsink showing method of mounting transistors. Use heatsink compound between all metal parts

The printed circuit board is double-sided, with one side forming a groundplane and the other side with etched pads. There are several ways of producing the board, apart from photographic processes. One of the best methods is to stick thin strips of decorator's masking tape over the lines and spray the whole board with two coats of paint. After removing the masking strips, the board is etched in the usual way. Another method is to spray the whole board with paint, then, after tracing the outline of the pads, to cut along the lines with the edge of a screwdriver to remove the paint. The board is then etched.

The only other construction difficulty likely to be experienced is in making the wideband transformers T701 and T703. Fig 15 shows how these are constructed. Both use FT50-43 Amidon toroid cores, but other cores with a similar cross-section and magnetic properties will work just as well. There is nothing magical or critical about these transformers. The end formers are made of single-sided pcb, drilled 0·25in (6mm) diameter, and then saw through the copper as shown. The tubes are 6mm od, and can be brass or copper, or, as in the prototype, made by pushing a piece of coaxial braiding over an aluminium tube, coated with flux and soldered to form a tube. Two tubes are soldered to one of the formers at one end and the beads are threaded on. The other former is then soldered on and the aluminium tube extracted. Secondary windings are applied after the assembly is mounted on the board and the ends of the windings soldered to ground and appropriate pad.

Transformer T702 is also not critical and is made up of two bifilar turns (three twists per inch) of 18swg enamelled wire on two T50-2 toroid cores glued together. The 10μH coils (RFC 701 and 702) must be low resistance and are best made up of five turns 24swg on an FT37-43 toroid core.

The heatsink used in the prototype was a Redpoint type 6W1 cut down to 104mm in height. This is probably the minimum size, and if rtty operation is contemplated it will be inadequate. It is, however, quite capable of dissipating the heat produced during lengthy ssb or cw operation. Fig 16 gives a cross-section through the assembly and shows how the transistors are mounted. The type MRF450 transistors have a flange mounting, and type MRF450A have a stud mount. A piece of aluminium about 25 by 14 by 100mm is drilled to take the mounting flanges through the holes in the pcb. This is best done before any components are mounted so that all the mechanical work is completed first.

The relay is mounted by glueing upside down on the board and making connections from the board to the pins. The feedback components (100Ω resistor, 0·01μF capacitor and a ferrite bead) are soldered in series and mounted directly between the collector and base pads.

The board should first be tested without applying rf drive. First disconnect RFC 703. Apply 12V to the board and to the relay to activate it in the transmit position. Check the voltages at the bases of TR701 and TR702. The reading should by 0·68V to 0·7V. Remove the 12V supply, reconnect RFC703 and install an ammeter in the supply line. Apply 12V and again check the base voltages. The ammeter should read about 0·75A. This current is not critical but should be at least 0·6A for good regulation of the bias supply. Further testing should be carried out after the lowpass filter is completed.

Lowpass filters

The output filters are five-pole Chebyshev lowpass filters and are manually switched. The cut-off frequencies are 4·5 and 17MHz. This is the only part of the band switching arrangement which does not employ diode switching. The coils are all wound on Amidon T68-2 cores using 22swg wire for the 3·5MHz coils and 18swg wire for the 14MHz coils. All capacitors are silver mica.

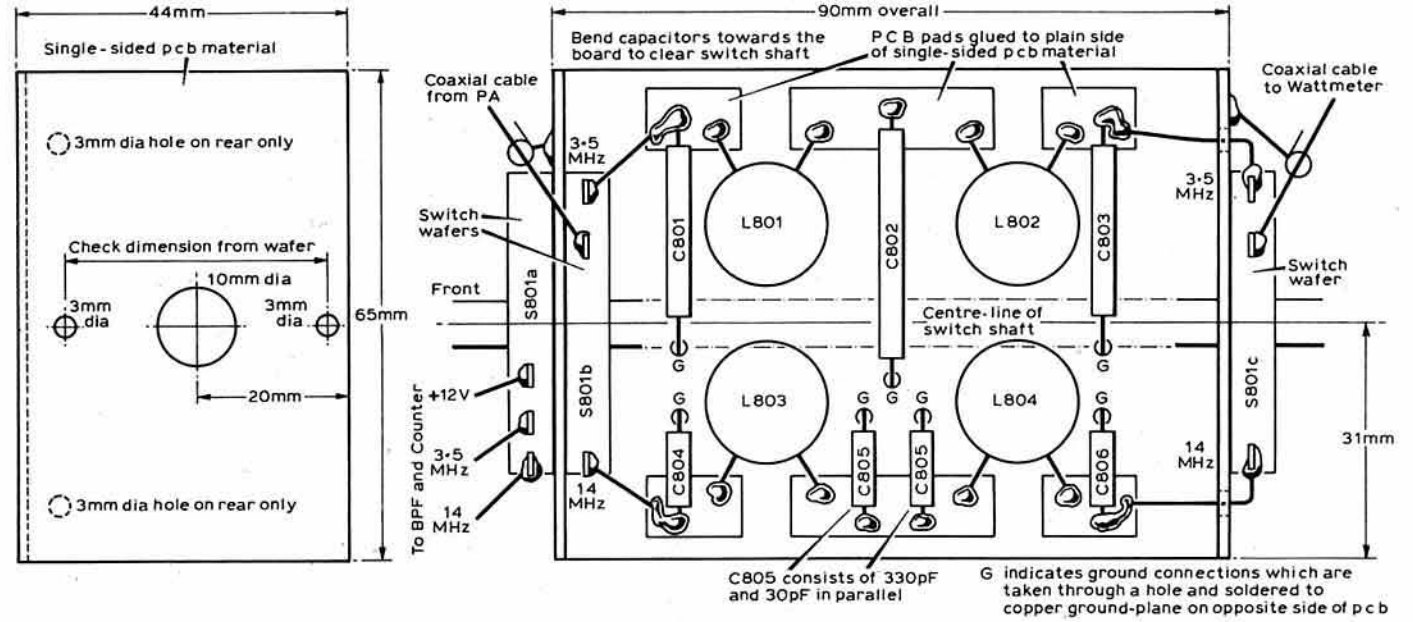


Fig 17. Lowpass filter layout

Components list

PRE-DRIVER

R501	3·3kΩ	C501, 504-511	0·1μF ceramic
R502	560Ω	C502, 503	0·01μF ceramic
R503	270Ω	D501	BA379
R504, 506, 513, 514	1kΩ		(Electrovalue)
R505	330Ω	D502	1N4148
R507	470Ω	TR501, 502	2N3866
R508, 509, 510, 516	10Ω	T501	8t bilfilar 24swg on FT37-43 toroid
R511	39Ω	RFC501	3t 24swg on ferrite bead
R512	100Ω		
R515	1Ω		
All resistors 0·33W			
L501, 502	8t 24swg on FT37-43 toroid		

POWER AMPLIFIER

R701, 704	3·3Ω 2% 0·33W	C701, 703	3,300pF silver mica
R702, 703	6·8Ω 2% 0·33W	C702, 706, 707, 708, 711, 713	0·01μF ceramic
R705, 707	100Ω 0·33W	C704	1,000μF 16V elect
R706	0·47Ω 5W w/w	C705, 714	0·001μF ceramic
R708	2×33Ω in parallel 7W w/w	C709, 710	220pF silver mica
TR701, 702	MRF450A	C712	0·1μF ceramic
D701, 702, 703	1N4001	C715	10μF 16V elect
RFC701, 702	10μH 5t 24swg on FT37-43 toroid	C716-719	0·1μF polystyrene
		T701, 703	See detail
RFC703	6t 18swg on FT50-2 toroid	T702	2t 18swg bilfilar on two FT50-2 toroids
RLY4	Sub-min SMR12 (Electrovalue)	Heatsink	Redpoint 6W1
		Ferrite beads	Eight-off

DRIVER

C601-604	0·15μF polyester B32560 (Electrovalue)	R601	220Ω
		R603	0·8Ω (4×3·3Ω in parallel)
C605	10μF 16V elect	R604	560Ω
C606	0·15μF polyester B32560 (Electrovalue)	All resistors 0·33W	
		R602	47Ω preset
		RFC601	4·7μH Sigma
C607	470pF silver mica		
TR601	2N5590		
T601, 602	24swg twisted pair on balun core (see detail) A0001×001 (Electrovalue)		
Sundries	Two ferrite beads. Heatsink Redpoint 2Y		

LOWPASS FILTER

C801, 803	820pF silver mica
C802	1,500pF silver mica
C804, 806	220pF silver mica
C805	360pF (330pF and 30pF in parallel) silver mica
L801, 802	2·4μH. 21t 22swg on FT68-2 toroid core
L803, 804	0·64μH. 11t 18swg on FT68-2 toroid core
S801	Heavy-duty rotary switch with three wafers, each one pole two-way

WATTMETER

C901, 902	2-10pF Mullard	D903, 904, 905	1N914
C903	100pF silver mica	RFC901	1,000μH Sigma
C904, 905	0·01μF ceramic	R901, 902	47Ω 0·33W
L901	50Ω coaxial cable (see text)	R903, 904, 905	22kΩ preset vertical
L902	19t 24swg on FT50-43 toroid	D901, 902	AA116
S901	Min toggle dpdt type S7201 (Electrovalue)		

An unusual method of construction is used, in that small pads of pcb material are glued onto the plain side of single-sided pcb as shown in Fig 17. Ground connections are made by passing the lead through a hole in the board and soldered to the copper on the other side.

At this stage do not fit the switch but hard wire the appropriate filter to the output of the final amplifier and terminate the filter with a dummy load capable of dissipating at least 50W. It is better at this stage to inject two tones into the microphone input than to use the cw oscillator, as this reduces the power dissipation. Connect the input of the final amplifier to the output of the driver stage. Fit a 10kΩ potentiometer with the slider connected to the alc pin on the pre-driver board. Connect one end of the track to 12V and the other end to ground. Set the slider to the 12V end of the potentiometer. Apply 12V in the transmit mode to all modules, make sure the bandpass filter and the lowpass filter are on the same band, and key the exciter. Slowly adjust the potentiometer and watch the current to the final amplifier. The current should rise as drive increases without any sudden drops or jumps. Increase the drive up to a maximum of 7·6A with a single tone and 4·8A with a two-tone test. Monitoring the output by means of an oscilloscope or an swr meter should show an increase in output as the current rises, to about 50W or more. With a two-tone test, check the power at which flat-topping commences. This should be at about 70W. Check that output is fairly close on both bands. If not, adjust the bandpass filter trimmers for maximum output. This may bring the two bands closer in output. As long as there is 50W output, at least, on both bands, that is the important thing to aim for, as the alc circuit will eventually ensure that output is limited to the same amount on each band.

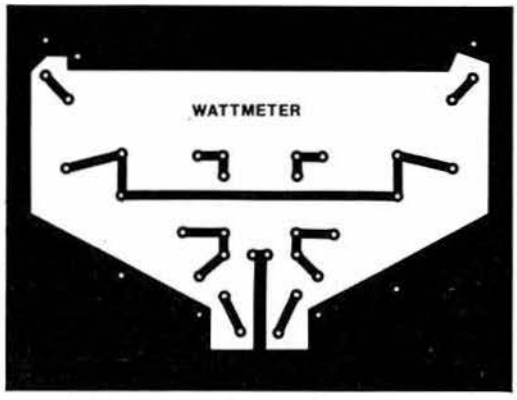


Fig 18. Wattmeter track layout. Single-sided board

Wattmeter

The track layout is given in Fig 18 and component layout in Fig 19. L901 consists of a short length of 50Ω coaxial cable about 6mm diameter. Strip the braid from both ends to leave about 1·75in (44mm) in the centre. L902 consists of 19 turns 24swg enamelled wire on an FT50-43 toroid which is threaded on the coaxial cable. The inner conductor of the coaxial cable is soldered between the Veropins on the board, and the braid is earthed at one end only. The trimmers C901 and C902 should be fixed so that they can be adjusted with a screwdriver in the same plane as the board. All components should be fixed symmetrically. The potentiometers R903 and R904 should be vertical mounting types.

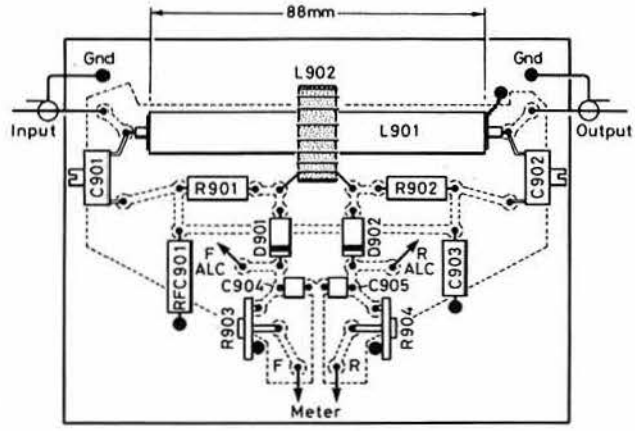


Fig 19. Wattmeter components layout

The wattmeter may be balanced by using a 50Ω load and an oscilloscope or swr meter. Apply a few watts power from the final amplifier and, with both potentiometers at maximum (with the slider at the diode end), adjust C902 for a null on the meter when fixed to the ref pin. Reverse the input and output connections and adjust C901 for a null with the meter connected to the fwd pin. The swr meter is now calibrated. The potentiometers should be adjusted so that 50W output gives a full-scale deflection on the meter.

TO BE CONTINUED

Equipment Review

Yaesu Musen FL2100Z, Trio TL922 and Icom IC2KL hf linear amplifiers

by PETER HART, G3SJX*

Introduction

The author recently welcomed the opportunity to evaluate and compare the hf linear amplifiers manufactured by Yaesu Musen, Trio and Icom. The Yaesu and Trio amplifiers both use valves and employ conventional pi-network tuning. The Icom amplifier uses broadband solidstate techniques requiring no tuning and gives instant bandchange.

Each amplifier has been designed and styled to integrate with existing transceivers in each manufacturer's product range. However, the three amplifiers evaluated were driven satisfactorily from a number of different sources.

Description of the linear amplifiers

Yaesu FL2100Z

The Yaesu FL2100Z is a nine-band linear (1·8–28MHz) largely intended to accompany the FT101Z and FT901 series of hf transceivers. The amplifier is identical in size to the FT101Z, measuring 34·5 (w) by 15·7 (h) by 32·6cm (d), and weighs approximately 20kg. Two parallel-connected 572B (T160L) zero bias triodes are employed, operating in Class AB2 grounded-grid configuration. The amplifier incorporates a built-in mains power supply delivering nominally 2·4kV off-load, and two internal fans are used, one under each valve.

The front-panel controls include bandswitch, pa tune and load, operate/standby, and swr meter sensitivity, together with twin meters to monitor anode voltage together with anode current, relative forward or relative reflected power. The rear panel carries input and output rf connectors, mains fuse, ground connection, alc output to exciter and transmit/receive switching. Shorting this latter connector to ground places the linear in the transmit mode in the usual fashion. ALC level adjustment is provided via an internal trimmer accessible through a hole in the rear panel. Two safety interlocks are incorporated. One interlock isolates the mains supply when the upper section of the case is removed. The second interlock shorts the high voltage rail to ground when the screening cover is removed from the pa compartment.

*42 Gravel Hill, Addington, Croydon, Surrey.

The rf input is coupled to the valve filaments through fixed-tuned bandswitched pi-networks. The anode circuit is coupled to the 50Ω output by an adjustable pi-network constructed from reasonably heavy-duty components. Delayed bias switching is incorporated to keep the valves cut-off while the antenna changeover relays are in the process of switching.

Trio TL922

The Trio TL922 is a six-band linear covering 1·8 to 28MHz but not including the 10, 18 and 24MHz bands. The size is 39 (w) by 19 (h) by 40·7cm (d) and weighs 31kg, which is larger and heavier than the Yaesu linear, but this amplifier is rated at substantially higher power output.

Two parallel-connected Eimac 3–500Z zero-bias triodes are used in Class AB2 grounded grid with a choice of two operating modes, ssb or cw. An internal heavy-duty power supply is built-in and delivers nominally 3·1kV off-load on ssb or 2·2kV off-load on cw. The zero signal quiescent current is reduced by half in the cw mode, resulting in higher efficiency. Heavy-duty construction is used throughout, and this applies particularly to the output tank circuit.

The front panel controls include bandswitch, pa tune and load, operate/standby and twin meters to monitor anode current together with anode voltage, relative rf output or grid current. The rear panel connectors are similar to those of the Yaesu linear. A cooling fan and alc preset are also mounted on the rear panel. Two safety interlocks are incorporated, and these operate in a similar fashion to those of the Yaesu linear.

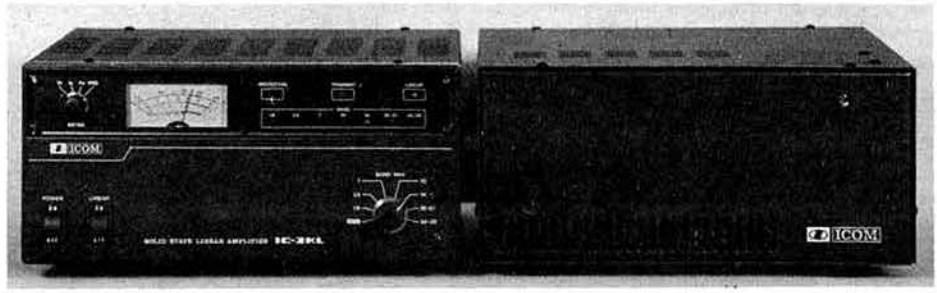
The rf circuitry is also similar to that of the Yaesu, employing fixed-tuned input pi-networks and an adjustable output pi-network. A spark gap across the antenna relay contacts prevents damage if rf is applied before the relay has fully closed, as occurs with vox operation.

Icom IC2KL

The Icom IC2KL is a wideband solidstate linear covering the nine hf bands, and is primarily designed to accompany the Icom range of transceivers. No tuning is required, and even bandchanging is automatic when driven from a suitable Icom transceiver (IC720A, IC740 or others with required interface fitted). The power requirements are 40V at 23A maximum, and a suitable matching mains power supply, the IC2KLPS, is available. Both

The Yaesu FL2100Z

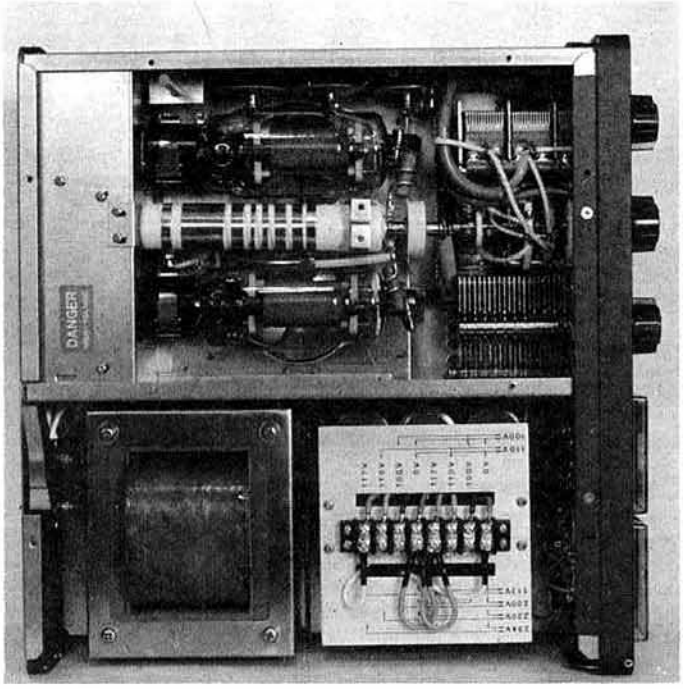
The Trio TL922



The Icom IC2KL with psu

units measure 21·4 (w) by 11·1 (h) by 31cm (d), with the amplifier weighing 6·9kg and the power supply 13·6kg.

The front panel carries bandswitch, operate switch, a number of indicator l.e.ds, and a single switched meter to read collector voltage, total collector current, power output and alc/protection level. The rear panel carries the interface connectors to the psu, exciter and antenna.



FL2100Z with top cover removed

The amplifier uses four high-power transistors, Toshiba type 2SC2652, arranged as two push-pull pairs with hybrid combiners at the input and output of the two pairs. The output from the pa passes through one of seven relay-switched five-pole Chebychev lowpass filters covering 1·8 to 28MHz, selected by the bandswitch or automatically from a suitable Icom exciter. A heatpipe cooling system is used to transfer heat away from the power transistor flanges to a finned heat-exchanger blown by an internal fan. The heatpipe is a relatively new innovation which allows heat to be transferred with very high thermal conductance, much higher than that of copper. As far as the reviewer is aware, this is the first time that heatpipe cooling has been employed in a piece of amateur equipment.

Extensive protection circuitry has been built-in to protect against excessive drive, power output, transistor flange temperature, total collector current, vswr and any fault condition which results in unbalanced output powers from the two pa units.

Measurements

In order to assess the linearity of an amplifier, it is necessary to generate a two-tone drive signal with residual intermodulation distortion products substantially lower than those generated by the amplifier being measured. The reviewer used a synthesized two-tone generator driving a Marconi H1000 hf power amplifier which yielded intermodulation product levels of better than −48dB at the 100W p.e.p. level. In all cases, intermodulation products quoted in this review are given with respect to one tone of the two-tone signal. When measured with respect to p.e.p., as is common in the USA and Japan, the figure should be reduced by 6dB, ie for the drive source quoted above, −48dB with respect to one tone is −54dB with respect to p.e.p.

Each amplifier was tuned (where necessary) according to the manual, and Tables 1–3 summarize the performance figures obtained at 400W p.e.p. output power using a two-tone drive signal. The input vswr and harmonics were measured at maximum power output on cw. Additional comments are as follows:

FL2100Z

On 18MHz, a hot smell resulted at maximum output power, which could be due to losses in the anode choke. The higher input vswr on 10 and 14MHz could cause problems with some wideband transistor exciters and result in reduced drive.

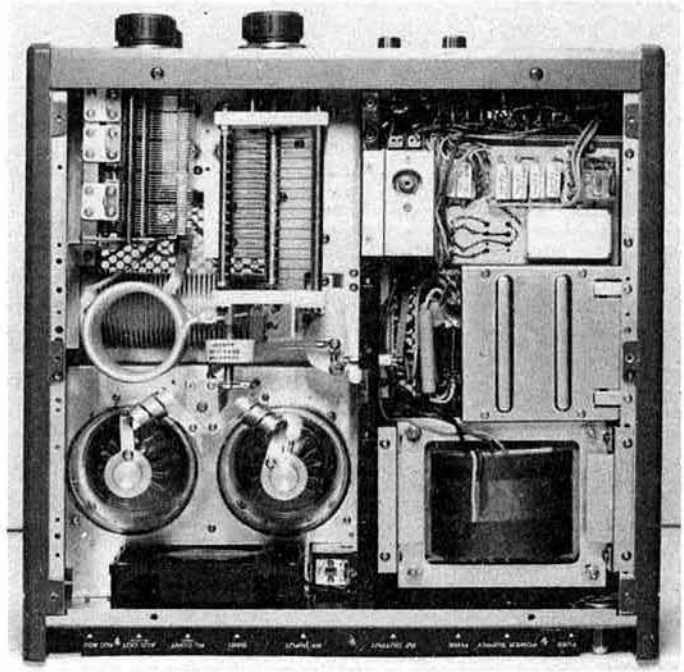
TL922

On 7MHz and 14MHz a vhf resonance in the pi-tank resulted in degraded harmonic output around 90MHz. The figure of −42dB for harmonic output on 14MHz is the amplitude of the seventh harmonic on 98MHz, the second and third harmonics being at a level of −52 and −63dB respectively.

Operation on 10, 18 and 24MHz was also possible by tuning the amplifier on the 14, 14 or 21, and 21MHz positions respectively. However, the maximum power output was generally about 10–15 per cent less, and a careful check that none of the pa components was overheating would be necessary before such operation could be recommended. The anode choke is particularly vulnerable in this respect.

IC2KL

The harmonic output was generally lower with this amplifier than with the valve amplifiers due to the greater filtering, but the higher-order intermodulation products were generally higher. It is difficult to make a



TL922 with top cover removed

direct comparison of ip levels as these are dependent on drive level, but transistor amplifiers generally exhibit higher levels of higher-order products when compared with valves.

The built-in power meter was accurate to within five per cent on cw, but indicated about 10–15 per cent low on two-tone.

General comments

At maximum ratings, the Trio amplifier delivered by far the highest output powers, but all three amplifiers were capable of delivering over 400W p.e.p. on ssb.

Both the Yaesu and the Trio amplifiers produced relatively high levels of higher-order harmonics on certain bands. A 30MHz lowpass filter inserted in the output of the amplifier would be advantageous.

Fig 1 shows the two-tone spectrum produced by all three amplifiers at the 400W p.e.p. level. The vertical scale is 10dB/division, and the horizontal scale 4kHz/division for the TL922 and IC2KL, and 2kHz/division for the FL2100Z. The higher-order intermodulation products are greatly reduced by operating an amplifier well within its capabilities, as Fig 1 (b) shows for the TL922.

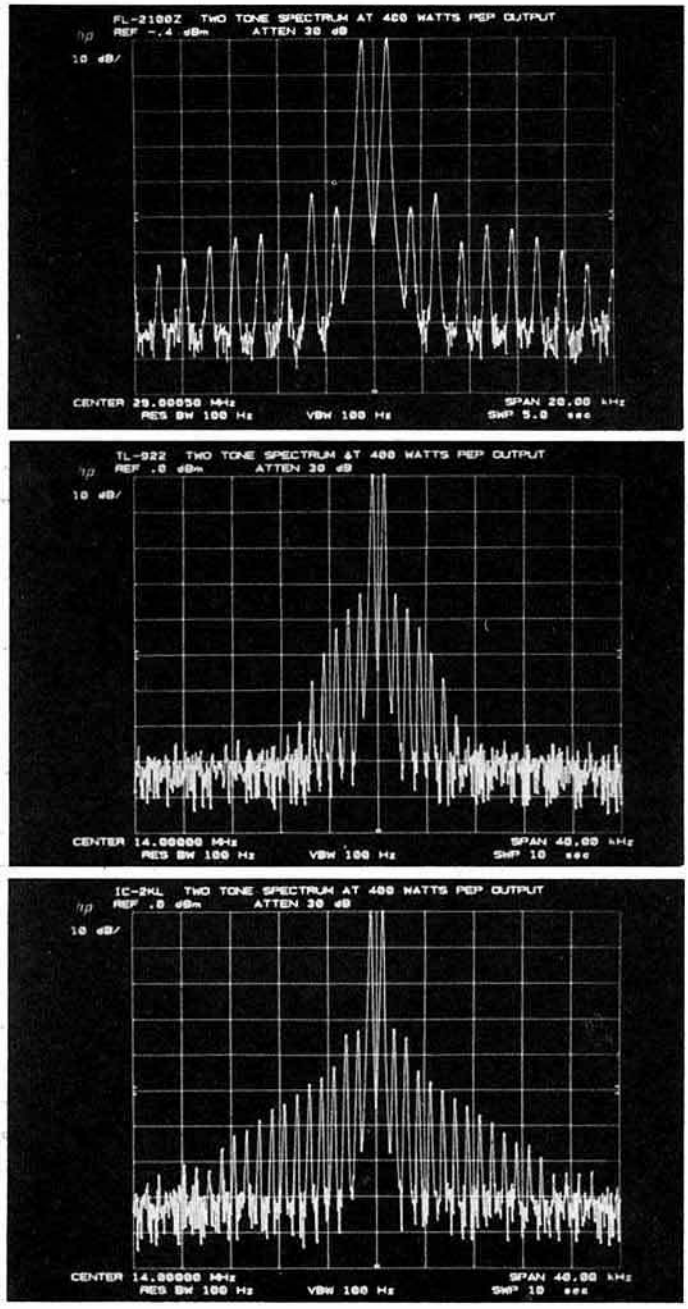


Fig 1. Two-tone spectrum produced by the amplifiers at 400W p.e.p. output. Top, FL2100Z; centre, TL922; bottom IC2KL

Table 1. FL2100Z measurements

Frequency	Drive for 400W output power	Input vswr	Harmonics	Intermodulation products at 400W p.e.p. output		
				3rd/5th order	At ±10kHz	At ±20kHz
1·8MHz	84W	1·4		–40dB	–70dB	–80dB
3·5MHz	56W	1·7	–50dB	–46dB	–70dB	–80dB
7MHz	42W	1·3	–50dB	–46dB	–70dB	–80dB
10MHz	46W	2·4		–44dB	–70dB	–80dB
14MHz	54W	2·0	–54dB	–44dB	–68dB	–78dB
18MHz	50W	1·5		–44dB	–65dB	–78dB
21MHz	49W	1·3	–50dB	–44dB	–68dB	–78dB
24MHz	56W	1·13		–44dB	–65dB	–75dB
28MHz	56W	1·7	–48dB	–43dB	–65dB	–78dB

Note that harmonics were not measured on the 1·8, 10, 18 or 24MHz bands

Table 2. TL922 measurements

Frequency	Drive for 400W output power	Input vswr	Harmonics	Intermodulation products at 400W p.e.p. output		
				3rd/5th order	At ±10kHz	At ±20kHz
1·8MHz	27W	1·10	–44dB	–32dB	< –80dB	< –80dB
3·5MHz	27W	1·07	–45dB	–32dB	< –80dB	< –80dB
7MHz	27W	1·11	–45dB	–32dB	< –80dB	< –80dB
14MHz	32W	1·04	–42dB	–32dB	< –80dB	< –80dB
21MHz	34W	1·31	–61dB	–31dB	< –80dB	< –80dB
28MHz	32W	1·22	–63dB	–32dB	< –80dB	< –80dB

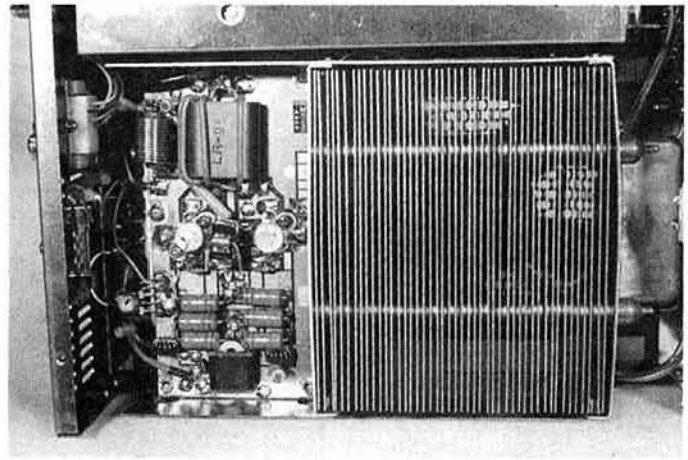
Table 3. IC2KL measurements

Frequency	Drive for 400W output power	Input vswr	Harmonics	Intermodulation products at 400W p.e.p. output		
				3rd/5th order	At ±10kHz	At ±20kHz
1·8MHz	27W	1·22	–64dB	–35dB	–60dB	–76dB
3·5MHz	25W	1·16	–64dB	–35dB	–60dB	–76dB
7MHz	21W	1·16	–62dB	–35dB	–60dB	–78dB
10MHz	22W	1·14	–58dB	–30dB	–60dB	–78dB
14MHz	20W	1·19	–58dB	–32dB	–60dB	–78dB
18MHz	18W	1·19	–60dB	–35dB	–60dB	–78dB
21MHz	22W	1·17	–58dB	–29dB	–60dB	–78dB
24MHz	24W	1·14	–52dB	–30dB	–62dB	–80dB
28MHz	32W	1·09	–55dB	–34dB	–62dB	–80dB

On-the-air results

The three linear amplifiers were used in conjunction with a number of transceivers, notably Yaesu FT101 Mk1, Drake TR7, Yaesu FT200 and Icom IC740, with generally acceptable results. ALC feedback was not used except with the IC740–IC2KL combination, the drive being controlled by the mic gain, power output or drive controls. All three linears produce a negative alc voltage which should be compatible with the majority of transceivers. Due to the low drive requirements of the IC2KL, alc feedback is particularly recommended with this linear to prevent overdrive which results in the amplifier tripping out.

The Trio and Icom amplifiers are rated for 10min operation key down at full output power. Tuning of the Yaesu amplifier at full power output should be limited to 10s, although it is not clear from the manual whether this is to protect the linear or the exciter. For rtty operation (key down) the Yaesu amplifier should be run at reduced power.



Internal view of the IC2KL showing one amplifier pair and heatpipe cooling

The IC740-IC2KL combination was a delight to use. With a multiband antenna, it was possible to switch from band to band with no tune-up whatsoever. With this combination, full remote operation of the linear is possible. One point worth noting is that switching off the power to the IC740 results in the IC2KL defaulting to the transmit condition if in the operate mode.

Conclusion

All three amplifiers are capable of running maximum power output according to the British licence regulations, the Trio in particular with plenty in reserve. The distortion performance of all the amplifiers is generally acceptable and at least as good as most transceivers. At £425 incl VAT, the Yaesu FL2100Z is the cheapest of the amplifiers. The Trio TL922 costs around £700, and the Icom IC2KL with IC2KLPS power supply £1,149 incl VAT.

Acknowledgements

The linear amplifiers reviewed in this article were kindly loaned by South Midlands Communications Ltd of Totton, Lowe Electronics Ltd of Matlock and Thanet Electronics of Herne Bay. □

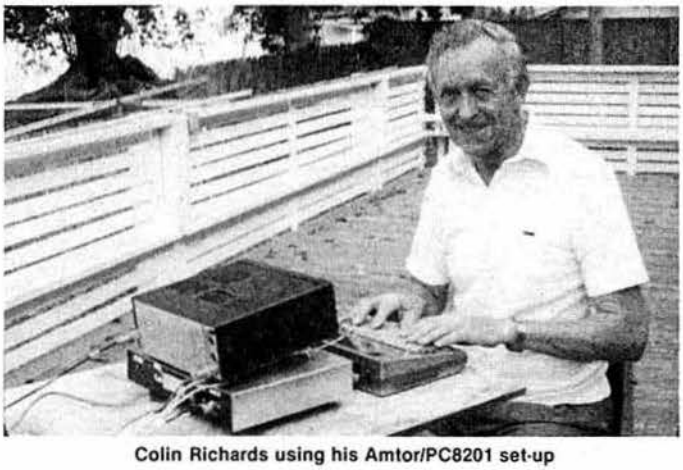
Ten watts to span the world with micro Amtor

by COLIN RICHARDS, 9M2CR (NMCR), also 9M2CR/SM5 (SMCR)

POUNDING A MORSE KEY or chatting into a mic may well be the traditional notion of amateur radio. Yet more and more are taking to the keyboard to run radio teletype (rtty)—with a wide variety of devices from classic teleprinters to computer-based gear. RTTY makes economical use of the radio spectrum with its 60 words/min two-tone signal occupying a 170Hz slot. By common usage, rtty uses the upper end of the cw sections of the hf bands.

At the lower edge of this rtty sector may be heard a curious chirp-chirp-chirp that doesn't bear much resemblance to the "jingle bells" of rtty. It's a second-cousin. It is Amtor—the acronym for amateur microprocessor teleprinter over radio.

Amtor is an error-detecting system which operates between two stations which are locked in sync. The message when typed goes into a buffer which then sends three characters at a time in error-detecting code. The receiving station checks this group for mutilation—then promptly sends back "OK" or "Repeat". It is this two-way "hand-shake" signal which results in the characteristic chirp-chirp twice a second. The astonishing achievement of Amtor is that it produces a spectacular improvement in accuracy over ordinary rtty. What's more, these results can be achieved with tiny transmitter power. Undismayed by QRM or QSB, the Amtor link will continue to turn out perfect copy even when the emerging signal is virtually inaudible. It is no exaggeration to claim that Amtor represents a quantum leap forward in amateur radio.



Colin Richards using his Amtor/PC8201 set-up

The structure of this system is set out in ITU(CCIR) Recommendation 476, and it is now widely used by maritime stations. Credit for the development of the amateur version must be given to Peter Martinez, G3PLX, who first produced a workable microcomputer program—then the design for a small dedicated-mpu board—and later the elegant AMT-1 which houses both the mpu and a terminal unit. The AMT-1 requires to be fed only with ASCII at 75 or 110 bauds, and away it goes, in transmit and receive. The string-l.e.d. tuning indicator is clocked to show clean-spot MARK and SPACE and is a delight to use. As a bonus, the AMT-1 will send and receive normal rtty, and will send, but not receive cw.

The PC8201, showing 9M2CR display

The final "micro" touch at 9M2CR was achieved by using an NEC PC8201 personal computer as keyboard **and** display. The PC8201 is the latest piece of magic to appear from NEC in Tokyo. Running on four penlight batteries, it can house up to 64k of ram, run Basic, and serve as terminal in Telcom mode. The standard RS232C port can be set with the required parameters for the AMT-1 by keying in a code, which stays in the memory even after shut-off. Eight lines of 40 characters come up with a crisp, clean image on the 8 by 2in lcd display panel. An image contrast control provides added refinement, and there are ports for printer, cassette-recorder, crt and disc drives for those who want to spread. At 9M2CR we don't even have the Japanese manual—yet! But added facilities appear to be a built-in word processor program, and a "music" mode. Whatever next? And all in a 10 by 12 by 2in package (with apologies to metric devotees).

With the tiny TS120V putting out its 10W maximum, the system spans the world. It's truly micro-magic!

Tnx, Peter, and our JA friends.

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Technical Topics *by Pat Hawker, G3VA*

MOST PEOPLE when they become amateur-radio enthusiasts tend to believe strongly that the technology is advancing so rapidly that only the very latest model, or latest idea, is worthy of serious consideration. Yesterday's models are consigned, if only in the mind, to the dustbin. If it's new, it's good; if it's old, it's bad.

In real life, in real science, things are never so simple. Often new technology brings advantages in some areas, for some applications, but may also incur significant disadvantages. One has to balance what is particularly important for a given application against what is less important before discarding older technology. Your criteria may include cost, performance, flexibility, versatility, weight, size, reliability etc. As I have often suggested in this column, if all that mattered was performance we would quite possibly all still be using 60-year-old rhombic antennas and 25-year-old 75A4 (or even 40-year-old AR88/HRO) receivers on hf.

THIS MONTH

Small is beautiful?
Integrated receivers
Low-cost, high power hf linear amplifier
Aeronautical radio
GDO ideas
Optimum-shaped and absorbing elements
Digital quadrature generators
Crystal calibrator
Switched noise source
Soft-starting and psu topics
Reflected power is real power

Unfortunately too few of us have much time to study the history of radio communications—yet often it is the past that holds the key to the future. Often, of course, history *is* bunk, as Henry Ford suggested—but that is more the fault of our historians than history itself.

Recently Prince Charles opened a new "Telecommunications—a technology for change" gallery at the Science Museum, South Kensington —generously sponsored by STC to mark the centenary of their first London office, opened in 1883. The new display includes much that will be of interest to radio amateurs and those interested in communications and broadcasting. I don't intend trying to pick out particular items but simply to suggest that if you are ever in or near London, you should head for London SW7 2DD—first floor, two floors below GB2SM. Incidentally one item on show is a 1920s copy of *The T&R Bulletin*—but there are also Yaesu hf and vhf transceivers, as well as a wartime HRO.

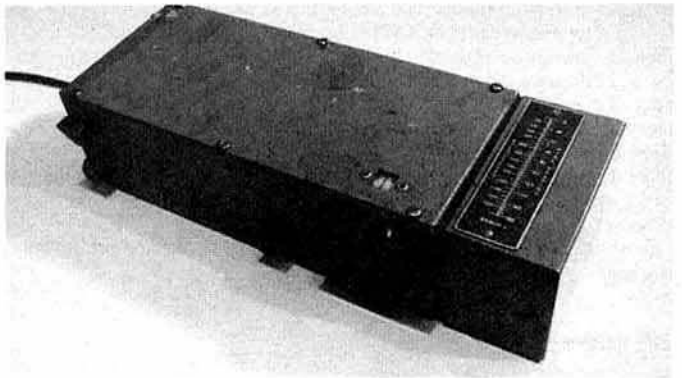
Small is beautiful?

Over the entire period that I have been interested in radio communications there has been a trend towards producing ever smaller and lighter equipment. The final goal of telecommunications is often said to include the ability to communicate instantly with anyone, anywhere, at any time. While some of us may doubt whether, once achieved, this never-out-of-touch facility will actually improve our quality of life, it has spurred designers into producing compact "mobile" and ever smaller "personal", "handheld" and "paging" radio receivers and transceivers. The prime aim these days, in the professional field, appears to be to integrate an entire receiver on to a single silicon chip, although this still poses a number of problems in view of the difficulty of achieving large-value capacitors or resistors (or almost any value of inductance) in true monolithic form.

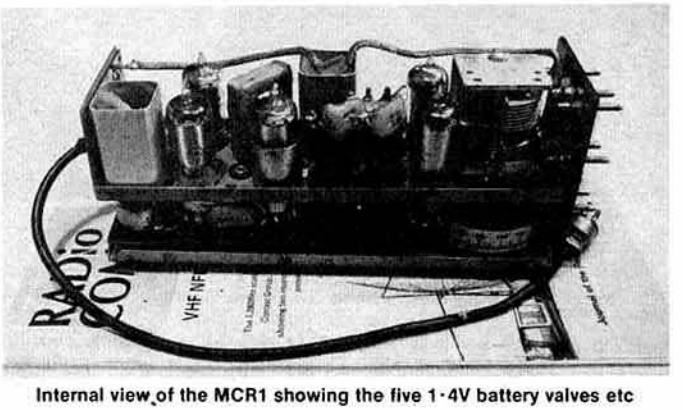
In practice, industry is now coming fairly close to fully integrated monolithic chips and is also making progress in the use of "hybrid technology" (*TT* December 1981, pp 1127-8). These techniques are producing microminiature vhf/uhf receivers of sufficient performance for such purposes as "paging", with selective calling, and for the tiny "bugs" so often claimed to be in widespread use for industrial and other espionage. On the other hand, portable hf equipment still tends to be limited by the size and weight of economical power sources, since the use of a few milliwatts of power, although valuable at vhf, is not reliably effective with small whip or other hand-portable antennas on hf.

Curiously enough, most of the original trend to miniaturization was for hf, primarily for second world war military and "clandestine" equipments. A major reduction in size became possible with the development of physically small valves, including the American "acorn" series in the mid-thirties, about the same time as a Hivac miniature series appeared. Then, in the early 'forties, came the miniature battery valves with 1·4V 50mA (later also 25mA) filaments, using what became known in the UK as the B7G base. Used in conjunction with the more packable layer dry batteries, it became possible to build quite compact hf receivers, transmitters, transmitter-receivers and transceivers; the most difficult operational problem was making hf receivers for *general coverage* with adequate calibration; transmitters overcame this problem by using a selection of quartz crystals.

The very first handheld transceiver (then termed a "handi-talkie") that came my way was the one-piece American BC611 (SCR536) that provided a.m. phone over distances of about 1km in urban areas and considerably more in open country; I recall trying one in Brussels in 1944-5. These operated over the range of about 3·5 to 6MHz, both transmitter and



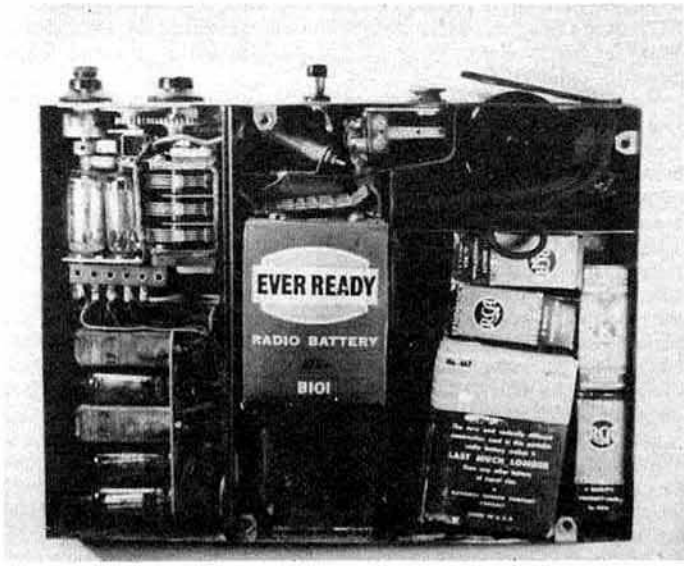
The MCR1 "miniature communications receiver" manufactured in 1943-4 by Philco (GB) for SOE/Special Forces for use as a broadcast receiver by Resistance organizations etc. It covered 100kHz to 15MHz by means of four plug-in coil assemblies. The photograph shows a Range 1 coil assembly with its calibration chart covering 100 to 1,600kHz. From the collection of Pieter Windey, ON6PW (*Photo:* Guido Roels, ON6RL)



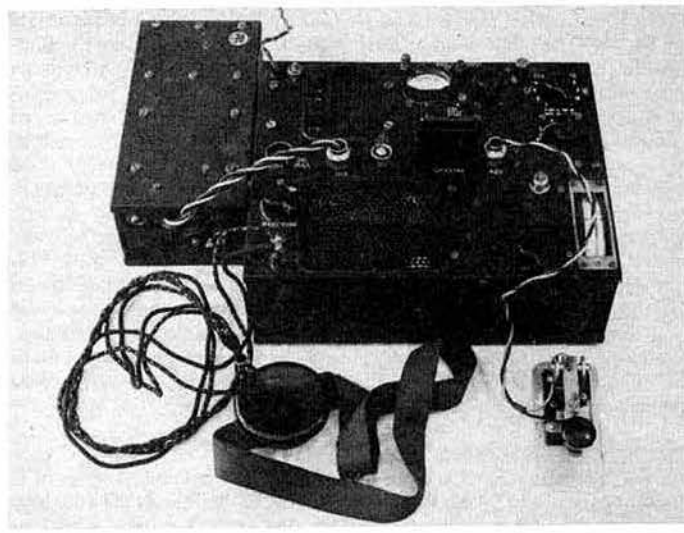
Internal view of the MCR1 showing the five 1·4V battery valves etc

receiver using crystals and coils that could be set up in the field using ar associated large box of crystals and coils. The BC611 had five valves anc was a transceiver rather than a transmitter-receiver: 3S4 (pa/rf amplifier): 1R5 (oscillator/frequency changer); 1T4 (not used on transmit/i.f. amplifier); 1S5 (microphone amplifier/detector and af amplifier); and 3S4 (modulator/af output). Batteries were 103·5V and 1·5V lt. Microphone and earphone were fixed to the equipment to form a telephone handset with a large push-to-talk switch on the side. A circuit diagram and several photographs appeared recently in the "nostalgia" feature of *Electron* (November 1982, No 11, pp580–2).

During 1944 I also came across and used the MCR1, a "miniature communications receiver" known also as the "biscuit-tin" set. This was made in large numbers by Philco (GB), mostly for Special Forces (OSS/SOE), for reception of broadcast transmitters rather than two-way communication. Nevertheless it was a good example of early miniaturization, and was strong enough to withstand dropping in parachute containers; it is still in demand by the increasing number of enthusiasts who are determined that valve equipment should survive in working order outside of a few museums. With four plug-in coil assemblies, it covered 100 to 1,600kHz and 2·5 to 15MHz using five battery valves: 1R5 (mixer), 1T4 (local oscillator), 1T4 (1,730kHz i.f. amplifier), 1T4 (detector/af amplifier) and 1R5 (output).



A compact "briefcase" superhet receiver with room for spare battery, spare valves and earphone, yet still a thin unit. Believed to have been a "Whaddon Special" for Intelligence operations about 1943–4. (*Photo:* Keith Melton, USA)



The Type A Mark 3 (A3) compact "suitcase" transmitter-receiver (often incorrectly known as the "B2 Minor") with internal mains power pack and external vibrator-type power unit for 6V battery operation. Some 4,000 of these units, using full-sized valves, were made by the Marconi Company for SOE in 1943–4, mostly for use in Western Europe. Superhet receiver with 1,200kHz i.f.: 7Q7/7H7/7H7/7H7. Transmitter providing about 4–5W output using 7H7 co and 7C5 pa. Covered 3·2 to 9MHz in two wavebands and intended for medium-distance working, being lighter and smaller than the more powerful B2 equipment made by SOE themselves. Also from the ON6PW collection (*Photo:* ON6RL)

In the post-war period the compact Mark 123 transmitter-receiver, designed in the 'fifties and occasionally available in recent years as "surplus", continued the tradition of the B2 transmitter-receiver as an effective para-military "infiltration" equipment. Smaller valves resulted in a relatively powerful transmitter (almost 50W input) using a two-stage transmitter (5A/163 co and "miniature 807" CV428/5B254M pa): Fig 1. The seven-valve receiver is based on the EF72/EF73/EA76 range of sub-miniature 6·3V valves with B8D base (wires for the EA76 diode). These small valves were never widely used in specifically amateur-radio equipment but are capable of good performance. The size and weight of the basic transmitter/receiver unit, including mains power pack and built-in morse key, are 7lb 12oz (3·5kg) and 11·38 by 3·3 by 5·38in (29·9 by 8·5 by 13·6cm). The equipment covers the complete range of 2·5 to 20MHz in three wavebands, with the transmitter providing up to 25W rf output, with adjustable impedance output tappings that allow it to be used reasonably effectively with random-length, end-fed antennas.

Solidstate devices have made such equipments "obsolete" but not, I would suggest, necessarily because of size or weight, although switched-mode (dc/dc, ac/dc) power supplies and the elimination of powered heaters undoubtedly make for greater portability. Rather, or so I would guess, the

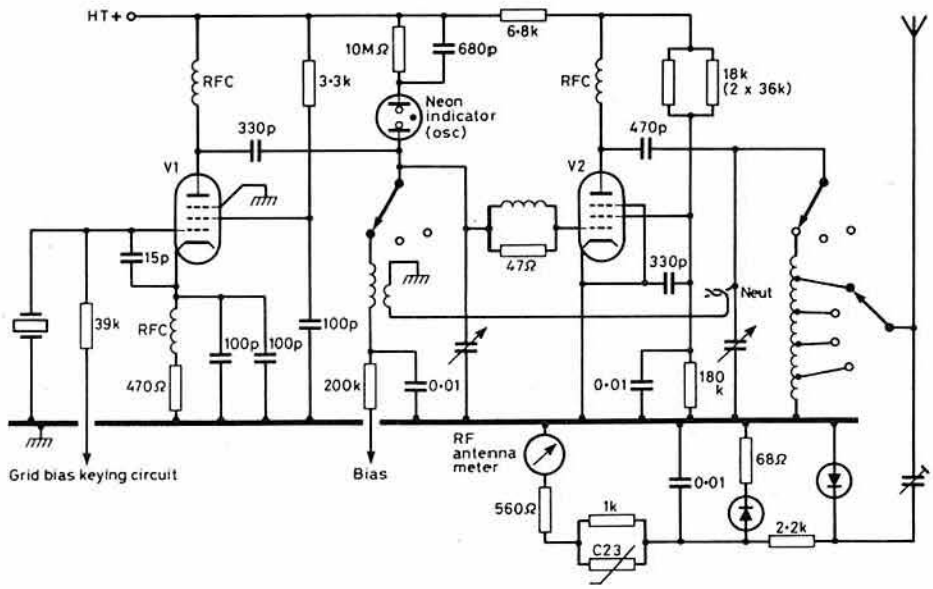


Fig 1. Simplified circuit diagram of the post-war Mark 123 two-stage transmitter providing up to 25W rf output using a "miniature 807" (5B254M) pa and 5A/163A co

major advance offered by current technology is the miniature frequency-synthesizer. Though hf synthesizers, unless designed to provide exceptionally low jitter and phase noise, tend to degrade performance of high-grade receivers for domestic operation, there can be no question that for *general-coverage* "portable" operation the ability to set an hf receiver or transmitter accurately to any desired frequency represents a tremendous advance. The Mk123 receiver, for example, despite reasonably good calibration and tuning arrangements, but with no electrical bandspread, can easily be set 10 or 15kHz away from a required frequency at, say, 18MHz, while the transmitter is just as "rock-bound" as the wartime models.

It was for the "Clansman" series of military pack sets in the late 'sixties that Plessey developed one of the first effective synthesizer units to be based on ic devices. Amateur radio is also indebted to cb radio for current low-cost frequency synthesis chips, though again I would emphasize that on hf the main application should still be for portable and general-coverage applications rather than high-performance "home" use.

Integrated receivers

For high-performance hf receivers, probably the most useful series of ic devices continues to be the linear devices offered by Plessey (SL600/1600 series etc), though equipment manufacturers tend to oppose situations where only a single manufacturer offers unique devices, much preferring to utilize devices which are "second-sourced".

For other applications the aim is to put as much as possible of the receiver on to a single chip. In 1981, for instance, STL, working in conjunction with Plessey, designed a vhf direct-conversion paging receiver including selective calling. However, it is my understanding that Plessey have not yet marketed such a chip, waiting to assess demand before going into production. On the other hand, Mullard/Philips have put an almost complete fm superhet receiver on to their TDA7000 chip. The only external components required are one tunable resonant circuit, 14 small ceramic capacitors and (if loudspeaker output is required) an audio power amplifier. It is claimed that with this type of device a radio receiver can be made to fit into a wristwatch, a pen, a pocket calculator, or even a key ring. Philips have eliminated the need for i.f. resonant circuits by reducing the i.f. from the conventional 10·7MHz right down to 70kHz and then using simple resistance-capacitor filters, though presumably it would be difficult to make these selective enough for use in crowded amateur bands. The device is suitable for carrier frequencies between 2 and 110MHz and contains 280 circuit elements.

The more usual approach for consumer-type receivers, where size is not such a critical factor, is for the heart of an a.m., fm or a.m./fm receiver to be integrated on a single chip, but to retain discrete components, such as ceramic resonators, as i.f. filters etc; it can also often be advantageous to use a discrete device as local oscillator to reduce sensitivity to temperature variations. An interesting new "heart" device is the Mullard TEA5570 intended for good-quality a.m./fm broadcast receivers but suitable also for use on hf. For a.m., it incorporates a double-balanced mixer, "one-pin" oscillator, two-stage i.f. amplifier, detector, agc circuit, and level detector for tuning indicators. For fm it has a separate first i.f. stage (2nd and 3rd stages are combined with a.m.), and a symmetrical limiter stage for a ratio detector. It also has simple dc switching between a.m. and fm modes, using one dc contact to ground. This type of device can of course also form part of a receiver for the microwave bands.

A Siemens "vhf-tuner ic" type TUA2000, originally developed for cable-tv, is reported to be finding application also in a.m. and ssb land-mobile services as it offers "communications-quality" performance over the band 50 to 480MHz. As shown in Fig 2, it contains an input amplifier, oscillator-mixer, i.f. amplifier and a driver stage for use with a saw (surface acoustic wave) filter. It features a double-balanced mixer and vco, compensated for the effects of amplitude variations, temperature and supply-voltage changes. It is claimed to be the first monolithic tuner whose performance, in some applications, exceeds that of a receiver having a discrete front end. Noise figure is said to be 2dB better than the usual (consumer) vhf tuner using discrete devices. The double-balanced mixer results in less harmonic generation; better unwanted signal suppression; less oscillator radiation; and better suppression of oscillator output from the tuner.

Low-cost, high-power hf linear amplifier

In *TT* (March 1983), John Stebbings, G4BTV, drew attention to the ex-RAF T4188 hf amplifier as a source of high-grade components, or alternatively as a 150W cw amplifier. Derek Bundey, G3JQQ, also referred to this useful item of surplus equipment in his article on improving the FT7B (*Rad Com*, July 1982, pp582-3) where he mentioned using a modified T4188 both as a source of an air-failure-alarm device and as a linear amplifier.

Modification of the T4188 into an all-band linear, he points out, took some two frustrating years of development work and is not a project he would wish to repeat. However, in view of the increasing cost of high-power linear amplifiers, even when these use less than ideal components, it remains a project that merits consideration by those with the necessary experience and patience. It is, for example, worth noting that although the T4188 is rated at 100W output for use in unpressurized aircraft, the pa is fully capable of delivering 400W at sea level in ssb service with the blower fitted. In practice G3JQQ runs his unit at around 300W p.e.p. output, though this involves supply and component modifications. Recently he has replaced the two 4X150 valves with 4CX250s, which stand the pace a little better. Two types of blower were fitted to this unit: an old and noisy type of about 1·25in diameter motor body; and a later smaller version, 0·875in diameter, which runs very quietly.

G3JQQ supplies the following summary of the required modifications. While not many amateurs may wish to tackle such a project, the less favourable exchange-rate means that commercially-built high-power linears do not come cheaply, with some now easily breaking the £1000 barrier!

(1) All driver stages to the 4X150 valves removed, including tuning circuits; the space is used to accommodate the input and output changeover relays.
(2) The pa base enclosure is used to house the 50Ω passive grid input resistors.

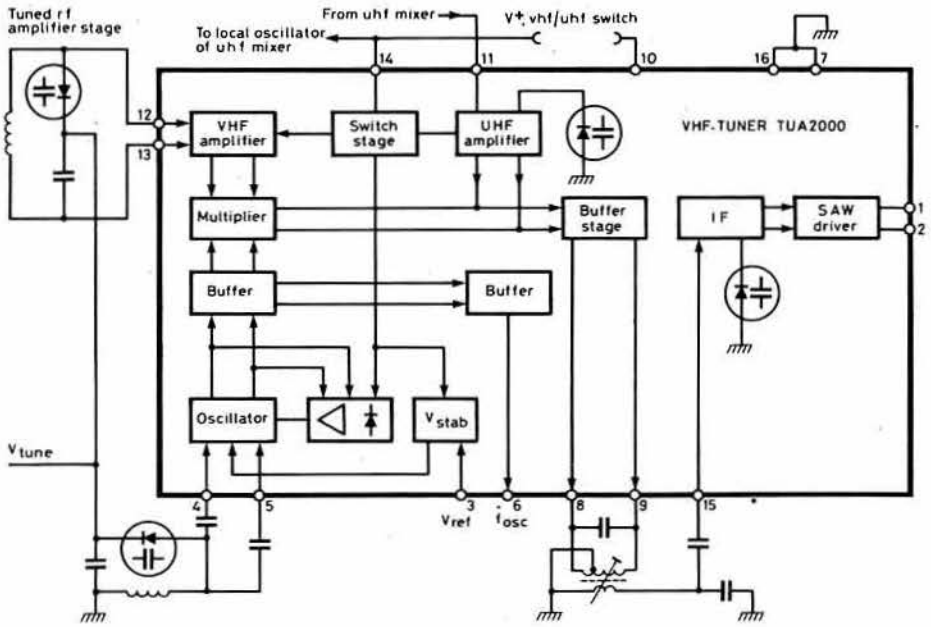


Fig 2. Integrated vhf tuner based on the Siemens TUA 2000 device originally developed for cable tv receivers. Suitable for use between 50 and 480MHz and claimed to offer characteristics superior in certain applications to tuners based on discrete components now in use

(3) Original anode choke assembly replaced by home-wound single-layer rf choke on ceramic former.
(4) Anode coupling capacitor and ht decoupling capacitors replaced by tv eht capacitors, 1,200pF, 8kV. (G3JQQ notes this may be an "overkill" but the tv capacitors were available at 10p each!)
(5) Internal fixed rf high-power capacitors re-arranged to cover 3·5 to 28MHz in two bands (3·5, 7MHz and 14, 21, 28MHz). Changeover provided by heavy-duty rf relay fitted in pa. Only one control used for tuning; ie the roller-coaster inductor; if desired this can be tuned remotely using the built-in circuitry.
(6) Air-failure alarm wired to power supply eht cut-out. G3JQQ stresses that this *is* worth the effort. It has already saved one set of valves when a blower failed to start.
(7) Valves used in class AB1 with grid-current detector alc circuit fed back to the FT7B used as a driver. This arrangement makes for excellent linearity and, without it, possible to overdrive the amplifier with resultant splatter.

The power supply used by G3JQQ "weighs a ton". It comprises: (a) 1800V up to 500mA, with choke input, paper smoothing capacitors; (b) 300V for screen-grid supply; (c) Heater supply, 12V ac; (d) Blower supply 28V dc, 0·5A; (e) AB1 bias supply, 50V negative; also 80V negative to bias valves to cut-off for "receive"; (f) An eht trip circuit operating overcurrent, air-failure or manual; (g) Fuses and internal blower (G3JQQ is a strong believer in keeping things cool by air-blowing everything).

Aeronautical radio

Some readers may be puzzled that equipment such as the T4188 should be rated so differently at 10,000ft than at sea level. Basically this arises from the considerable effect of reduced pressure on flash-over and/or corona in components operating at high voltages; in other words the breakdown voltage in air-insulated components such as variable capacitors etc is much reduced at high altitudes. Moreover, aircraft equipment has had for many years also to comply in its mechanical and electrical design with such factors as (1) rigidity to prevent failure through shock and vibration, including enhanced vibration due to mechanical resonances; (2) even before the advent of printed circuit boards all components had to be rigidly fixed and not be supported by the wiring; (3) there has to be good temperature compensation to ensure that performance is maintained over a wide range of temperatures; and (4) every effort has to be made to overcome the effects of humidity.

All these factors make surplus aeronautical radio and radar equipment a useful source of high-grade components—though often the mechanical construction does not lend itself to easy modification for amateur radio applications.

GDO ideas

In *Amatør Radio* (November 1982), journal of the Norwegian Radio Relay League, Stein Torp, LA7MI, presents a useful survey of grid, gate and bipolar "dippers". For example, many amateurs still prefer a valve to a solidstate dipper, but they do present the problem of a high-voltage power supply. Fig 3 shows one way of using a DC70 valve with just a single 4·5V battery. This uses a small dc/dc converter to provide about 70V for the anode circuit (LA7MI does not provide any additional constructional details) and an LM317T ic regulator for the 1·25V filament supply. With the ht supply switched off, the unit functions as a metered absorption-wavemeter/field/strength meter. With suitable coils and ganged capacitor it should prove effective up to and beyond 144MHz.

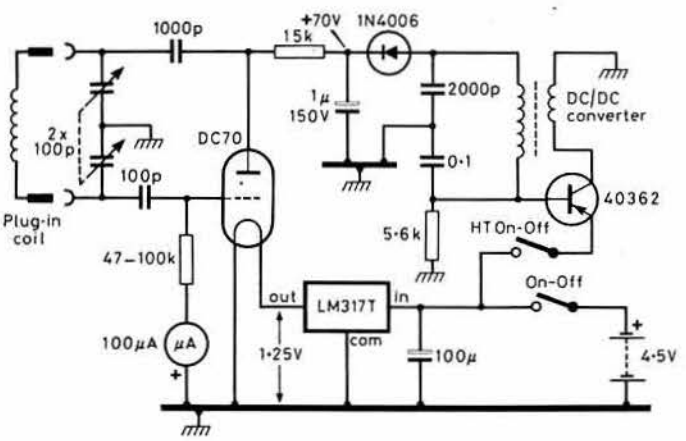


Fig 3. A valve-type gdo powered from a single 4·5V battery by means of a dc/dc converter and LM317T ic regulator

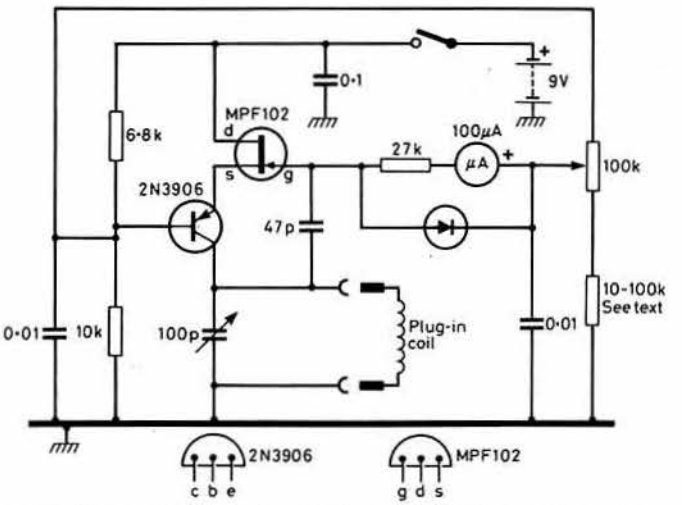


Fig 4. Solidstate "dipper" using single-gang variable capacitor and two-terminal coil

Another arrangement mentioned by LA7MI, originally published in *QST*, permits the use of a single-gang variable capacitor while retaining simple two-terminal plug-in coils: Fig 4. The potentiometer adjusts the amplitude of oscillation to suit the meter and battery voltage; the fixed series resistor determines the range of voltage adjustment, and its value should be selected by trial between about 10kΩ and 100kΩ.

Optimum-shaped and absorbing elements

The Landstorfer concept of "optimum-shaped" antenna elements (*TT* December 1982, pp 1054–5; February 1983, pp131–2) continues to attract interest. Les Moxon, G6XN, confesses he is rather puzzled at the emphasis given in *Electronics Letters* to the wire diameter and the rather precise shape. He feels that, at least for hf, roughly the same useful characteristics could be achieved with a simpler, though related, structure consisting of a colinear pair with optimum spacing (3dB gain) in conjunction with a relatively inefficient reflector spaced 0·25λ behind, the whole constituting a driven array with a phasing line (Fig 5). This is not entirely unlike the suggestion made by Jim Watt, G6ZC, except that unquestionably it would provide a "unidirectional" pattern.

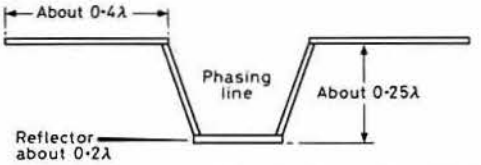


Fig 5. G6XN's suggested version of the "optimum shaped" element that would be simpler to implement on hf than the original Landstorfer shape

G6XN believes it should be possible to achieve a front/back ratio of about 1·0/0·6V, that is to say, about 4·5dB, which would be significantly better than that indicated by Cheng and Liang (*TT* February 1983, Fig 3). The reason for this improvement could be, G6XN suggests, because their "phasing line" is mismatched; "inspection of their Fig 3", he writes, "allowing for beamwidths, suggests that only about a third of the total power is being radiated backwards, and this should give a gain of 1·5 times in power, ie 1·76dB. Add to this the 3dB colinear gain, and one arrives at 4·76dBd or 6·91dBi, in good agreement with the reported forward gain figures for the "optimum-shaped" element, with an easier to realise structure."

However, he does not expect these systems to have a major impact on hf antenna design, although he admits that he cannot think of any other instance of a unidirectional radiation pattern being obtained using a single wire without a resistive termination; he feels that, if only for this reason, the Landstorfer concept is worthy of study.

Les Moxon also comments on G8SEQ's "absorber" elements (*TT* November 1982, pp959–60). Although he accepts the basic principle as implemented in the multi-element beam, he is not happy with the explanation given for the simpler two-element array developed for 144MHz df applications (Fig 3 of p960). He writes: "I fear this cannot be! In proof whereof, consider the 44Ω resistor short-circuited. We still have 73Ω radiation resistance of the reflector element and, even with optimum tuning

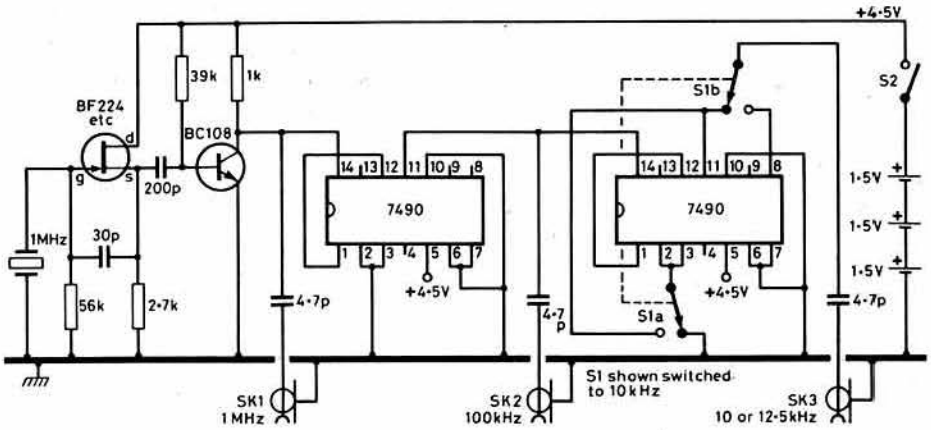


Fig 7. Crystal calibrator arrangement popular for several years using 1MHz crystal and two decade-dividers

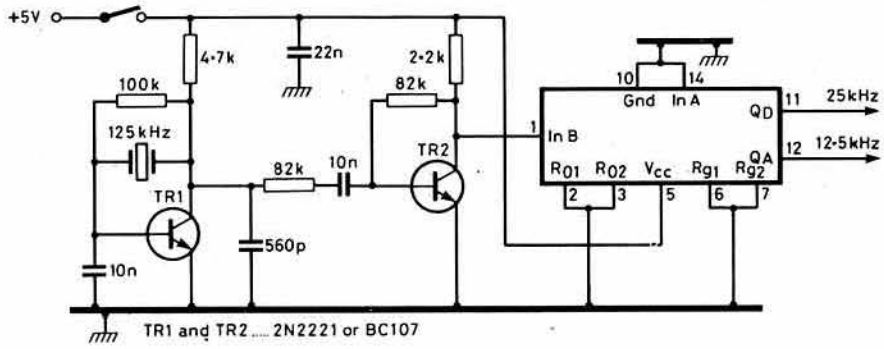


Fig 8. PA0BM arrangement using 125kHz crystal but probably adaptable for 100kHz crystal (see text)

of the array, rather poor null depth, since the current in the reflector is too low (ie lower than with an optimum close-spaced two-element Yagi array). Connecting additional resistance in series can only reduce the current in the reflector element still further; it cannot invoke any new principle. Knowing current and phase, both gain and radiation pattern can be precisely specified along the lines of Dr George Brown's original 1937 *Proc IRE* paper, ie as also indicated in my *HF Antennas for All Locations*."

G6XN in fact feels that the cardioid with a very deep null as indicated by G8SEQ defies any simple explanation but, in the absence of a balun, the outer braid of the coaxial feeder could be acting as part of the antenna system; the transmitted signal may also have had cross-polarization effects arising from the same cause. All this suggests that for 144MHz, df results with the arrangement developed by G8SEQ might well not prove reproducible.

This does not imply that the basic idea of an extra "absorbing" element such as the reflector shown in G8SEQ's multi-element array (Fig 2, p959) is not without interest. G6XN writes: "Without departing from the principles outlined above, one can perhaps envisage the second reflector of Fig 2 cleaning up the sidelobes of the array as suggested."

Digital quadrature generators

For several years it has been recognized that it is possible to use digital techniques to obtain two rf signals having an accurate phase difference of 90° (ie "in quadrature") as required for ssb phasing-type generators and demodulators. However, the usual arrangement (Fig 6 (a)) requires that the input signal is at four times the required output frequency. In *Wireless World* (April 1983, p51) S. Sondergaard provides an alternative arrangement capable of generating quadrature signals at *half* the input frequency: Fig 6 (b). The input-signal should be from an equal mark-to-space ratio source; the latches are edge triggered. Performance at rf is unknown.

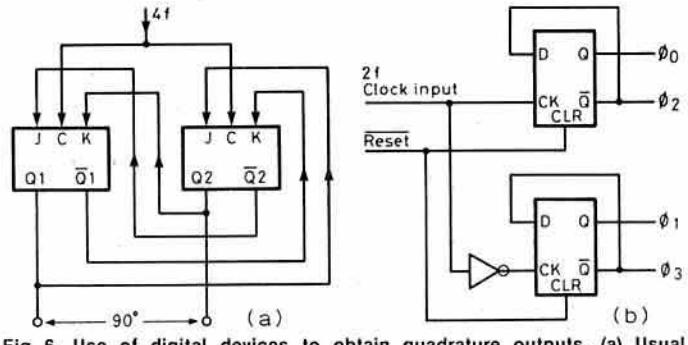


Fig 6. Use of digital devices to obtain quadrature outputs. (a) Usual arrangement requiring a clock input of 4f. (b) Arrangement suggested by S. Sondergaard (*Wireless World*) with a 2f clock input

Crystal calibrator

Several years ago *TT* included a useful crystal calibrator based on a 1MHz crystal, a couple of transistors and two 7490 ic digital dividers. By making use of the ability of the 7490 devices to function as either divide-by-ten or divide-by-eight, the calibrator provided markers at 1MHz, 100kHz, 12·5kHz and 10kHz. This proved a popular design and is still to be found in recent editions of *A Guide to Amateur Radio*: see Fig 7.

Table 1. Divide-by-n connections for the 7490

Divisor	Input Pin No	Output Pin No	External connections
2	14	12	Pin 2 or 3 low
3	1	8	Pin 8 to 2; 9 to 3
4	1	8	Pin 11 to 2 and 3
5	1	11	Pin 2 or 3 low
6	14	8	Pin 12 to 1; 9 to 2; 8 to 3
7	1	11	Pin 11 to 14; 12 to 2; 8 to 3
8	14	8	Pin 12 to 1; 11 to 2 and 3
9	14	11	Pin 12 to 1 and 2; 11 to 3
10	14	11	Pin 12 to 1; 2 or 3 low

A basically similar, but even simpler, calibrator based on a 125kHz crystal and intended to provide 25 and 12·5kHz markers appears in "Reflecties door PA0SE" in *Electron* (November 1982, p564) stemming from PA0BM: Fig 8. This requires only a single 7490 in view of the lower frequency crystal.

Since 100kHz crystals are more readily available than 125kHz types, it would appear to me that it should be entirely possible to make use of the flexibility of the 7490 as a divider. This would permit the use of a 100kHz crystal to provide 25kHz (divide-by-four), 12·5kHz (divide-by-eight), 10kHz (divide-by-ten) markers. The accompanying table (from *ART*) lists connections for each divisor from 2 to 10. In all cases pins 10 and 6 should be connected "low" (earth) and pin 5 to +5V. No connections are required to pins 4, 7 and 13.

Switched noise source

From David Long, G3PTU, comes a useful aid (Fig 9) for the alignment of converters, receivers etc. This is in the form of a wideband noise source that can operate in either a switched mode or as a continuous source. The device, like most modern noise sources, takes advantage of the fact that a 400mW zener diode produces wideband noise when operated in the zener-breakdown mode. An ic oscillator switches the zener on and off at intervals of approximately 20mS. When switch S2 is "on" the switching action ceases and the device provides a continuous noise output. The 50K potentiometer enables the voltage on the diode to be adjusted; this has the effect of varying the noise output in relation to frequency.

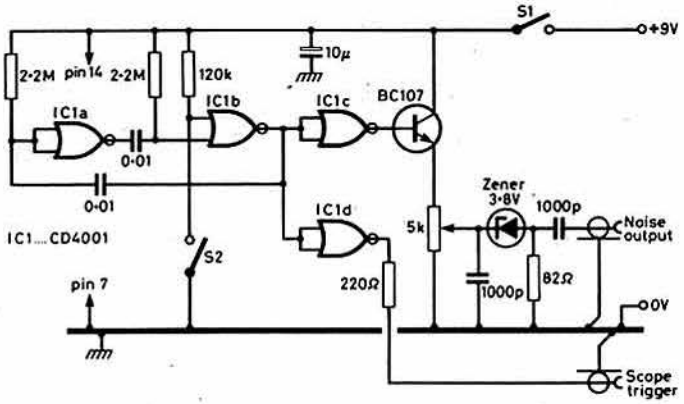


Fig 9. G3PTU's switched noise source for alignment of converters, receivers etc

For alignment of converters, etc, the i.f. or demodulated signal is observed on an oscilloscope (an output is provided for triggering). Construction is straightforward, except that the zener diode and its associated components should be built as close to the output socket as possible.

Soft-starting and psu topics

In his simple, but not too simple, 13·5V 20A power supply unit (*TT* April 1983, pp328-9), G4HYD noted the very large amount of energy that is stored in a 100,000µF reservoir capacitor. This led him to recommend the use of a bleeder resistor to eliminate the potential hazard that can exist when the fuse is blown by the action of the crowbar overvoltage protection circuit. However, there is another problem that can arise from the use of very large reservoir capacitors: the heavy initial switch-on "inrush" current. The transformer/diodes "see" virtually a short-circuit for an appreciable period of time, accounting for frequent diode failures.

In *Electronic Design* (14 April, 1983, p166), J. E. Buchanan notes that a switching-type power fet can be used to limit inrush currents without the waste of power or degradation of voltage regulation that often occurs when series resistors are used for current limiting. He shows that a resistor can be connected in parallel with a power fet whose internal resistance is controlled by a time-constant circuit so that it progressively reduces to under 1Ω over a finite period of time.

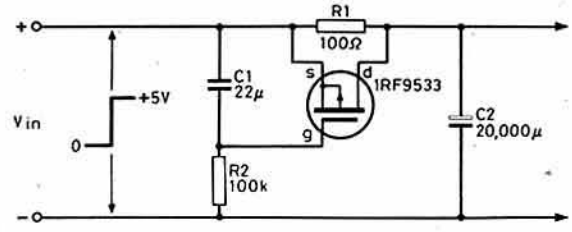


Fig 10. Use of a power fet as a bypass element across a 100Ω resistor to reduce inrush currents to the high-value capacitor (*Electronic Design*)

Of the arrangement shown in Fig 10, he writes:

"Because its gate is at the same potential as the source, the p-channel power fet is 'off' at power turn-on. The initial inrush of current to C2 is controlled by R1 which limits the initial peak transient charging current to about 50mA. As C1 charges, the gate voltage of the fet becomes more negative with respect to the source, and its internal resistance, in parallel with R1, decreases in value with time until it reaches the full 'on' value of the device.

"The turn-on time of the fet is determined by the time-constant C1-R2, as well as by the threshold level of the device, which is typically about −3V. Its high gate impedance makes possible the use of a high-value R2 and low-value C1.

"For applications that require an even lower bypass impedance (or where the current exceeds the maximum 'on' rating of the fet) several power fets could be paralleled with no increase in gate circuit complexity."

D. R. Coomber, G8UYZ, makes a number of constructive and useful comments on G4HYD's 20A psu (*TT* April 1983):

(1) There are several alternatives for the MJ11016 pass transistor, including the MJ4001, while, if the transformer voltage can be set to exactly the right value, and provided the suggested 78HG regulator is used, a 2N3771 would be suitable.

(2) The 78HG (5A rating) is quite an expensive component (about £8.10 from British distributors). The device in this application would not need to carry more than about 200mA so that the 317K device (about £3.40) would appear to be more than adequate and the 317M (500mA rating), costing less than £1, a satisfactory alternative.

(3) The real problem in a "crowbar" arrangement is the rate of rise of current (dI/dT). As a rough guide, G8UYZ suggests, you can safely allow a rating of 100 times the average current (It.av). The trick in limiting dI/dT is to put a small *inductor* in one lead. An applications engineer at AEI has suggested an 0·1µH inductor (just about 6t, 1in) or even a rather long connection wire. It is also important to limit gate current to under about 100mA.

(4) Instead of using a 150Ω, 10W resistor as a "bleeder resistor" across the large-value electrolytic capacitors, it is possible to use a 24V bulb which then also provides an indication of the state.

(5) In estimating the necessary value for the reservoir capacitors, G8UYZ points out that some psu designers work to a figure of about 1000µF/A of output current and rate the transformer accordingly. Allowing a ±10 per cent swing in mains voltages (the figure used by broadcast equipment designers) a 20A psu works out at about 70,000µF at 30V working, 40V forming.

(6) G8UYZ strongly recommends that when using a zener diode as a sensor for a crowbar protection circuit, that the diode should be carefully checked beforehand, since a typical 15V zener diode may not, in fact, switch the thyristor until it reaches 16·5V!

Reflected power is real power

Walter Maxwell, W2DU, who over the past decade has done so much to clear up widely-held misconceptions regarding standing waves and swr on transmission lines, has been having another go in the "Technical Correspondence" columns of *QST* (February 1983, pp52-3). This time he is concerned at the erroneous notion that in a transmission line reflected power is fictitious power. Indeed, this idea may have gained some credence from misinterpretations of his own earlier efforts to demolish the fixation of so many amateurs with achieving a 1:1 swr despite the fact that, at least on hf, all efforts at reducing the swr below about 2:1 are doomed to have virtually no effect on the power radiated by an antenna.

The truth is, he stresses, that reflected power is just as real as the power delivered to the transmission line by the transmitter or the power actually radiated from the antenna. W2DU's letter shows how the idea of fictitious reflected power has arisen and, unfortunately, has been disseminated in several articles over the past decade in various American magazines, including *73 Magazine* and *Ham Radio*. What, of course, is a myth is the idea that the reflected power re-enters the transmitter and is dissipated therein, causing overheating and/or damage. As so many of us have stressed many times, what happens is that real power after being reflected back down the feeder is then re-reflected up the feeder to the antenna (remember a transmitter correctly matched to a 50Ω transmission line does *not* mean that the transmitter looks like 50Ω to the feeder). Where a mismatch exists between the feeder and the antenna, power will be reflected up and down the feeder so that the amount of forward power flowing in the feeder may be greater than the power output from the transmitter (see Fig 2 of *TT* January 1982, or the latest edition of *A Guide to Amateur Radio*). And, of course, all the power coming out of the transmitter is derived from the dc power delivered to the power amplifier (it is another myth to believe that the rf power is actually generated by the pa valve or transistor). For example, a Class C or Class D power amplifier is, in effect, a switch that diverts the ht power to the antenna at a toggling rate determined by the output frequency. □

THE SECOND RSGB NATIONAL HF CONVENTION

by J. D. KAY, G3AAE*

John Kay, G3AAE, (1) chairman of the HF Committee, with the Lord Mayor of Birmingham, Cllr Peter Hollingworth, JP; and the RSGB President, Don Baptiste, CBE

THE HF COMMITTEE had only just recovered from the effects of the June 1982 convention held near Oxford, when it was asked to hold the 1983 event at the National Exhibition Centre, Birmingham, at the same time as the RSGB National Amateur Radio Exhibition in March 1983. Of course, combining the two events made for simplified organization, as the Exhibition & Rally Committee—to whom grateful thanks—arranged the dealers, the accommodation and the refreshments, but it was still something of a rush. In the event we had the use of the magnificent Pendigo Room, which can seat 300 people, plus a refreshment/natter room, and other areas which were ideal for the additional attractions which the committee arranged.

The convention got off to an auspicious start, as just before the start of

* 75 Roundmead Avenue, Loughton, Essex.

L to r: W. Davidson, GW3NYY, receiving the Somerset Trophy—he was also awarded the Victor Desmond Trophy; members of the Verulam ARS accept the Houston Fergus Trophy; and the BERU Receiving Rose Bowl goes to C. A. Bradbury, BRS1066

L to r: P. Zollman, G4DSE, receives the L. H. Thomas, G6QB, Trophy; the Scottish NFD Trophy being accepted by GM3YOR on behalf of Glenrothes & D ARC; and a representative of Guernsey ARS accepting the Gravesend Trophy

L to r: The NFD Shield won by Racal AR group being accepted by D. G. Alexander, G3KLH, with I. Trusson, G3RVM, centre; D. Thom, G3NKS, receives the Bristol Trophy on behalf of the Great Western Contest Group; and the Powditch Trophy being presented to D. Vizard, G3UKS, who also received the 1930 Committee Cup

L to r: G5CMX accepts the Frank Hoosen Trophy on behalf of the Maidenhead & D ARC; representatives of the Swansea ARS receiving the Northumbria Trophy; the G2QJ Cup Winners Cup being presented to D. Beattie, G3OZF, who was also awarded the Whitworth Trophy

the first lecture on the Saturday the President arrived with the Lord Mayor of Birmingham, and after having the programme explained they listened to a considerable portion of G3RZP's lecture on "Parameters for hf receivers", which provoked a considerable amount of interest and numerous questions. The following lecture was by G3PLX on "Amtor", the very low error rate rtty system which is now being rapidly adopted on an international basis.

The afternoon session commenced with G3RJV expounding on the merits of QRP under the title "Amateur radio—an alternative approach". This session almost filled the Pendigo Room and showed the very considerable level of interest in simple homebrew low-cost low-power equipment. The last formal presentation was given by G2YS and G3HCQ of the Interference Committee who, as well as providing detailed advice on how to deal with emc problems, also fielded numerous questions from the audience.

At 1600 the President presented the hf trophies and awards, and the formal programme in the Pendigo Room ended with the HF Forum at which G3FKM, G3KDB and G3AAE answered a multitude of questions relating to hf matters from the audience.

The lecture programme was repeated on the Sunday to equally large audiences.

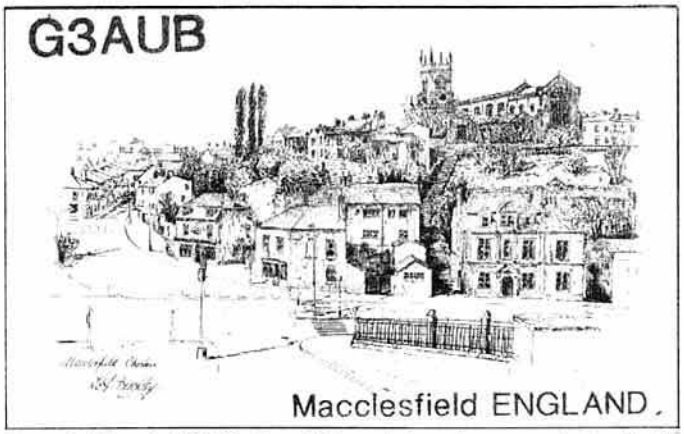
In addition to the lecture programme there was a competition for the most attractive QSL card, which was won by G3AUB, and a display of Society's hf operating awards. The new RSGB countries list was available for the first time (it can now be obtained from RSGB Publications (Sales)). There was also a display showing recent editions of the *DX Newsheet*, together with a partially compiled "next week's" issue.

The convention area also included a well-stocked refreshment area where many hf enthusiasts were grateful for the opportunity to rest their aching feet, and to enjoy the inevitable eyeball QSO with old friends. Over 400 people were persuaded to sign the visitors' book, and the total attendance must have been well over 500.

Those of you who did not attend the convention and now regret it, and those who did attend and enjoyed it, may like to know that the HF Committee is already planning the 1984 event, which is likely to be in the autumn. G3RZP has already agreed to give another lecture, which will probably be on the design of linear amplifiers, while G3RJV and members of the G-QRP Club will provide another session relating to homebrew. It also seems likely that a leading dxpeditioner will be asked to give a lecture on his experiences and explain what it is like to be on the other end of the pile-ups.

If **you** have any particular aspect of the hf scene that you would like to see covered in 1984, please let the HF Committee know your wishes while there is still plenty of time to make the arrangements.

Finally, I would like to express my sincere thanks to my colleagues on the committee, to their yls and xyls, and, of course, to the lecturers, who made the event the success that it undoubtedly was. □



Congratulations to G3AUB whose QSL card shown here was adjudged by the HF Committee as the best handed in during the HF Convention at the NEC in March

The Month on The Air

*by John Allaway, G3FKM**

HOT ON THE HEELS of the complaints from other IARU Region I countries about ssb activity on 10MHz comes news of operation—particularly by UK and West German stations—in the beacon sub-band on 28MHz (28·2 to 28·3MHz has been agreed by all IARU Region I societies as "preferred frequencies for beacons"). This comes from C35AP, who hears local phone nets being run in this area, and he mentions that among the G stations concerned "most are old enough to know better". As with illegal cb, the nuisance is much worse at a distance—just because a particular beacon is inaudible here this doesn't mean that it can't be heard somewhere else in the world and accompanied by the interfering signal. The 28MHz band is 1·7MHz wide and grossly under-occupied—please, isn't it possible to avoid this part of it?

Robert Ratcliffe, G4ACY, reports that his callsign is being pirated on 28 and 144MHz. Likewise, Dave Dhuglas, GM4ELV, who is receiving QSLs for alleged contacts on hf—he is currently only active on vhf.

Expeditions

Andrew Sharpe, G4MLM, chairman of the Imperial College ARS, reports that this year the club hopes to be visiting the Faeroe Is and be on the air from 27 June to 10 July. Club members will use their own callsigns/OY. Equipment has been loaned by Microwave Modules and Jaybeam Ltd (at the time of writing) and the group will be operational on all bands 1·8 to 432MHz using an FT902DM, TR4, MLA2500, and various antennas. Modes will include rtty and Oscar. Callsigns will be mainly G5YC/OY, G4SAR/OY and G4MLM/OY. Last year the club mounted a very successful trip to Andorra as C31YF and C31YG.

9K2AN says that Iris and Lloyd Colvin operated as 9K2QL from 1 to 16 March, during which they contacted 3,600 stations in 125 countries. Previously they operated as HZ1AB during the ARRL International CW DX Contest, and from Kuwait they moved on to Jordan where they operated as JY5KG before returning to the USA. In the six months from October 1982 to March this year the Colvins made over 50,000 QSOs as J20DU, G5ACI/AA, W6KG/A4, W6KG/A7, 9K2QL, HZ1AB and JY5KG. All QSLs should go to the address in "QTH Corner".

Overseas news

Andrew Pomfret, C53AP/G3LZZ, should now be back in the UK after his six-year stay in Gambia, any further QSL requests should be directed to his address in "QTH Corner". Andrew makes mention of a minority of individuals who, over a period of time, have been making use of C5 as a kind of amateur "flag of convenience". Two in particular, C5AAY/MM and C5AAZ/MM—neither of whom is a Gambian national or has been in Gambia for some years or paid his annual Gambia licence fee and neither of whom seems to be sufficiently well informed to realize that the prefix changed from C5A to C53 in January 1982. He suggests that we should all be wary of maritime mobile stations who are not of the nationality of the country whose callsign they are using. On the matter of the callsign change, Andrew says that this was not done in connection with any political change but to satisfy ITU regulations—two numbers were required and the "3" was adopted because the country used to have a "3" in its prefix in ZD3 days.

The location of the shack on Heard Island. *Photo:* Dave, VK3DHF

Dave, VK0HI/VK3DHF (left), and Al, VK0CW/VK6AHI/K8CW, at the operating position of the shack. *Photo:* VK3DHF

Two other points raised by Andrew were the illegal cb intrusion into the 28MHz band in Europe—not always heard in Europe but very noticeable in Africa where signals arrive via F2 propagation. Modes include a.m., fm and ssb, and a favourite frequency is 28,305kHz. Pirate amateur calls including G3JHF, G4AGV, G4BSM, G4CBS, G4FQO, G4GJY, G4HRS, G4RKB, G4YDW, G5LMS, G6TBA, G9EXR, GW6DQQ and GW35TH have been logged. The second matter is raised in the opening paragraph of this month's column.

A very successful reception was held in the officers mess at the US Navy Training Centre in Orlando on 4 and 5 March by members of the Ex-G Radio Club and RNARS. Roy, W8PR, president of the Ex-G club, says that thanks are due to Tom Bowers, WD4CQY (of RNARS), and his wife for the excellent arrangements. Those in attendance included VE3TD, WB6BPA (G8KL), G3DOT, G3UAZ, W8PR (G2HLP), W4CXH (G5AWU), GM3DTE, WD4CQY, W3CTR (G3BSY), G2CWL/W8, G3ZQS, KA4IFF, WA4WLX, WB4BXH, G3KQL/W4 and lady guests.

From G4HYD comes news of two new amateurs in Kenya—Tony himself, who is now 5Z4DJ, and Tony Sherer, (formerly G3TEU) who is now 5Z4DP. Both stations are active on rtty and ssb on all bands 3·5 to 28MHz, but at the time of writing none of the new bands (or 1·8MHz) was available to Kenyan amateurs. Both operators travel extensively in East Africa and to the Indian Ocean islands, so additional callsigns will be applied for as the opportunity arises—applications for 5H3 and 5H1 were already well advanced at the end of March.

The 13th SEANET Convention will be held at the Hotel Equatorial, Singapore, from 18 to 20 November. The fee for attendance is US$50 for delegates and US$40 for accompanying ladies. Those planning to attend should contact: The Hon. Secretary of the Organizing Committee, SEANET Convention, Singapore ARTS, PO Box 2728, Singapore 9047.

*10 Knightlow Road, Birmingham B17 8QB

The RSGB has received a letter concerning 9V1VS, who is an Indian engineer working in Singapore. He is particularly looking for UK stations on 14 and 21MHz between 1200 and 1600 on weekdays and until 2000 on Fridays and Saturdays.

The Cyprus ARS held its agm on 6 March and elected the following officers: president, 5B4AP; vice-president, 5B4AC; secretary, 5B4BS; treasurer, 5B4CF; and other committee members 5B4RI, 5B4CR and 5B4JY.

Angus, G8PG, in a letter headed "P29s as common as UAs?", reports that Bill Robinson, P29BR, and another licensed staff member of the Technical University in Papua New Guinea set up an open-air station outside the university dining-hall and demonstrated amateur radio. As a result they now have a class of 110 preparing for the next RAE (in November). The G-QRP Club has already supplied taped morse training material, and hopes to provide further assistance in the future. If only half the candidates pass, this should make quite a dent in the "rare dx" status of P29 besides bringing amateur radio to the notice of an increasing number of people in the area.

Turkiye RAC writes that a new amateur radio law was announced on 7 April, and that in six months time all amateur activities will be legal in Turkey. This is indeed good news, but it might be wise perhaps to still avoid mentioning amateur radio on the outside of any correspondence mailed to TA amateurs until the six-month period has passed.

Heard Island

The VK6 DX Chasers Club issued the following on 17 April: "The two amateur operators Dave, VK3DHF/VK0HI, and Al, K8CW/VK6AHI/VK0CW, succeeded in their endeavours by taking VK0, Heard Is, off the most-wanted country list by working some 30,000 amateurs during their stay. The bands proved to be very unreliable, with at one time a complete blackout for some 48 hours. Included in the expedition of 20 that sailed on the maxi-yacht *Anaconda II* were the mountain climbers (including two women) and scientists. Five of the mountain climbers were successful in ascending Big Ben, an active volcano and the highest mountain in Australia and its territories.

A multi-coloured card produced by the VK6 DX Chasers Club, the driving force behind this expedition, is available to all amateur and swl stations who were lucky enough to log these rare stations. All QSLs for VK0CW and VK0HI (except those for N America and Japan) are being handled only through VK6NE. Please send an sae and adequate ircs for return postage. (Tnx, VK3AH.)

DK0WCY

This is an aurora information beacon set up by DARC at Norden in the FR of Germany. It operates with 30W into a dipole, uses A1A, and will transmit between 10,140 and 10,150kHz. Initially the beacon-keeper will switch in an appropriate message when auroral propagation is noted in northern Europe, but later it is planned to use a magnetometer to measure the geomagnetic field activity and to calculate the K-figures with a computer and transmit continuously. DK0WCY will operate from early afternoon to late evening, and as 10MHz is a secondary band for the amateur service its frequency may need to be changed from time to time. It transmits 20s dashes to indicate "no aurora observed" or "not probable due to low K-figure", and 10s dashes to mean "aurora reported" or "high geomagnetic activity, aurora effects probable". The beacon-keeper is Rolf Niefind, DK2ZF, whose telephone number is 49 4931 15884. DK0WCY is a contribution of German radio amateurs and DARC to the worldwide activities in WCY 1983.

USA phone bands

Expansion of the USA 14MHz phone bands became effective at 0001 on 22 May. The new bands are as follows:

14,150 to 14,175kHz—Extra class;
14,175 to 14,225kHz—Advanced and Extra classes;
14,225 to 14,350kHz—General, Advanced and Extra classes.

According to ARRL Bulletin No 23 the FCC is also still considering phone band expansion proposals on other bands and terms for 10-year licences.

Ganta leper colony

LRAA has announced that special callsigns have been issued by the Liberian administration—A81LC, A82LC, A85LC, A87LC, A88LC and A89LC—for use from 6 May and 31 December this year. These are to draw attention to the colony's plight, and those who work them will be told about the special activity and that any amounts sent for postage of QSLs will be donated to the colony. There will be a special award for those having evidence of contact with all six stations. The LRAA hopes to make 60,000 contacts. QSLs should be sent to the address in "QTH Corner".

Spratly Island

Many readers will already have been shocked by the outcome of the recent attempt by a small group of German amateurs to mount a dxpedition to Spratly. Those who did not follow newspaper reports of the Vietnamese attack on the yacht *Sidharta* will be dismayed to learn that it was fired on and sunk on 10 April—apparently in the neighbourhood of Amboyna Cay, one of the islands in the group whose ownership is disputed. Gero Band, DJ3NG, and Diethelm Mueller, DJ4EI, both died as a result of the attack, and the survivors drifted for 10 days before being rescued by a Panamanian freighter about 350km from the point of the attack.

It is very sad that lives should have been lost just because of the existence of the DXCC Award. It seems to the writer that the time has come to delete such areas as Spratly Is from the "countries" list, and perhaps to look into the amount of damage that may be being done to the image of amateur radio in less developed countries by those seeking to operate from them for the sole purpose of providing contacts for an award.

Our sympathy goes to the families of those who died so tragically.

Top band

GM2BUD asks whether his contact with W1BB on 1·8MHz at 0655 on 16.12.1956 would be the "first" for GM-W, or even perhaps for UK-USA on the band. He received one of W1BB's special giant QSL cards (16 by 12in) for it and would be interested to know who received similar cards in G, GI and GW? Dave's equipment at the time had a TT11 tube in the final and a long-wire antenna.

Challenges to previously published "firsts" come from Chas, G3REA. He lists the following:

HB9EO-G3REA (16.2.63)	OH3NY-G3REA (9.3.63)
OE3LI-G3REA (5.3.64)	OH0NI-G3REA (2144 on 5.12.63)
VO1FB-G3REA (14.2.64)	5A3CJ-G3REA (7.3.63)

1983 28MHz countries table

Scores notified by the closing date are as follows:

G3GIQ—128	G3XBY—81	G4EHQ—30
G3XQU—108	G4PKP—49	G3XBM—18
G3KDB (cw)—85	G4OBK—43	G3KSH—16

Awards

The Mary Rose Award

The Marconi club will be using the special callsign GB2MAR from 2 to 30 June. This will highlight the opening of the Mary Rose Museum in Portsmouth.

The GB1BOY Award

This is being issued by the Bromsgrove & District ARC to celebrate Prince William's first birthday. GB1BOY will be on the air all day on 21 June on all bands 3·5 to 432MHz. Souvenir awards will be available. Full details from G6DZH, QTHR.

Contests

The V Diploma Guide Dog Competition

0000 4 June to 2400 5 June

3·5-28MHz telephony. Contact members of the Society of Handicapped Radio Amateurs of Spain (URME). Each contact counts one point, QSOs with official stations (using EC prefix) count two points, and with ED8DPG, EF8DPG and EA8RCU five. Each station may be worked once on each band on each day. One of the three last-mentioned stations must be worked. Exchange RS plus serial QSO number (from 001). QTH must be recorded in log. Logs must be "of the official pattern". Name/callsign must appear on every page, and duplicates must be marked. They should reach URME, V Guide Dog Competition, PO Box 1.000, Santa Cruz de Tenerife, Spain, no later than 5 July. Europeans need 30 points for a diploma—trophies and diplomas will be sent or given personally in Santa Cruz de Tenerife on 28 August.

The 24th All Asian DX Contest

0000 18 June—2400 19 June (Phone)
0000 27 August—2400 28 August (CW)

1·8 to 30MHz. Single-operator single- and multi-band, and multi-operator multi-band sections. Exchanges consist of RS/T plus (for om operators) two numbers indicating their age. Lady operators send "00"! Non-Asians work Asian stations, and for each contact score three points on 1·8MHz,

QTH CORNER

A81LC –A89LC	via SM4CWY, B. Johannson, Box 134, S-67101 Arvika, Sweden.
C53AP	now A. Pomfret, G3LZZ, "East Lodge", Baldersby Park, Topcliffe, Thirsk, N. Yorks.
JY9CL	F. C. Lathwood, G3MUL, 1 Woodcote House, Woodcote Green Rd, Epsom, Surrey.
JY9KG	via YASME Foundation, PO Box 2025, Castro Valley, Cal, 94546, USA.
JY9RC	via W1VBI, R. Churchill, 220 N. Pond St, Bristol, Ct, 06010, USA.
ZD7CW	via N4CID, T. F. Wood, Box 116, Dunn, NC, 28334, USA.
ZD7WT	via ZD8TM.
VQ9AJ	via WA1LJP, 67 Albrecht Rd, Torrington, Ct, 06790, USA.
ZK2RS	PO Box 37, Niue Is.
ZL1WCY –ZL9WCY	via ZL2HE, A. Law, Mangatoro, Dannevirke, New Zealand.
ZL1AMO/C	R. Wright, 28 Chorley Av, Massey, Henderson, Auckland 8, New Zealand.
ZL2BJE/C	via ZL2BMY, E. Meek, 16 Grant St, Dannevirke, New Zealand.
ZL2BKM/C ZL4DE/C	via ZL2HE (see ZL1WCY).
5H3TM	T. Merrills, Box 1426, Mbeya, Tanzania.
9N1MM	(Op'n by YU2DX) Tom Dugec, Vetranica 13, 58000 Split, Yugoslavia.

two on 3·5MHz, and one on other bands. The multiplier is the number of different Asian *prefixes* worked on each band (according to the WPX rules) added together in the case of multiband entries. Note that USA military stations do not count, and that JD1 stations on Minamitorishima (Marcus) are in Oceania. Log sheets should have 40 QSOs/page and show date, time, station worked, numbers sent and received, multipliers, and points claimed. Photocopies of the summary sheet are available from G3FKM (sae please). Post entries to reach JARL, PO Box 377, Tokyo Central, Japan, before 30 September (Phone) or 30 November (CW). In the **1982 contest (phone)** the only UK entrants were **G4HBI** (10,164 points) and G3NT (902)—both in the multiband section. Note that this year cups commemorating WCY will be awarded to each continental winner in the multiband section (single-operator) by the Minister of Posts & Telegraphs. Special certificates from the Minister will also be issued.

Fourth EU Fraternising CW QSO Party

18 and 19 June

EUCW is an association of European cw clubs: AGCW (DL), Benelux QRP Club (PA), CWC (HB), G-QRP Club (G), HSC (DL), INORC (I), TOPS (G), SARS (G), SCAG (LA, OZ, SM), and VHSC (PA). Single-operator only, all two-way cw. Four classes: Class A, members of EUCW clubs with more than 10W input or 5W output; Class B, with less than 10W input or 5W output; Class C, all others; and Class D, listeners. The contest covers the following times/frequencies: 1400-1600 on 18 June on 7MHz, 1800-2000 on 18 June on 3·5MHz, 0700-0900 on 19 June on 3·5MHz and 1000-1200 on 7MHz. Club members give RST, QTH, name, club, and membership number; others send RST, QTH, name and "NM". Stations may be worked once per band. QSOs with own country count one point, with others two. SWLs score three points for each complete QSO logged. A bonus of three points per EUCW club worked on each band. Logs must show date, time, info sent, info received and points. Enclose summary sheet giving full details including power. Send them to VHSC-Manager, D. J. Hoogma, PA0DIN, Schoustraat 15, 6526 XR Nijmegen, Netherlands, to arrive by 30 July.

The 7th Citta di Messina Contest

1400 25 June to 1400 26 June

3·5 to 28MHz, ssb, cw and rtty. Stations may be worked once per band and exchange RS/T and serial number (from 001) with stations in Messina. Copies of rules available from G3FKM (sae please).

A group of Brunei amateurs at VS5RP's farewell "do" at the airport restaurant, Bandar Seri Bagawan. L to r: (back) Bob, VS5RP; Derek, VS5DG; Chris, VS5CH: a G3 visitor; Rob VS5DD; Albert, VS5PP; (front) Alan, VS5TX; VS5KF; Les, VS5LH; and Ambran, VS5SS

ALL-TIME COUNTRIES TABLE

Scores received to 20 April are as follows (band leaders in bold type):

Callsign	1·8MHz	3·5MHz	7MHz	14MHz	21MHz	28MHz	Total
G3KMA	72	**212**	**285**	327	**329**	**314**	1,539
G3GIQ	48	170	211	326	327	306	1,388
G3MCS	30	184	228	315	316	302	1,375
G3UML	3	187	189	325	294	251	1,249
G3HTA	49	156	195	301	276	240	1,217
G4DYO	41	109	164	300	294	282	1,190
G3XTT	66	154	192	249	262	240	1,163
G4FAM	41	147	201	263	261	241	1,154
G2DMR	35	126	133	277	287	250	1,108
G3RUV	6	141	147	269	279	232	1,074
G3XJS	26	100	115	274	286	272	1,073
G3NOF	4	79	60	**339**	316	271	1,069
G3TXF	34	147	156	242	243	202	1,024
G3IGW	**87**	129	228	217	192	170	1,023
G3RUR	1	120	138	267	226	212	964
G3XQU	1	80	114	253	240	223	911
G4FXT	1	87	115	174	258	223	858
G3YMC	62	80	128	191	199	170	830
G3JJG	28	72	92	189	237	189	807
GM3PPE	29	113	132	174	163	138	749
G4KPE	1	142	156	156	137	119	711
GM3YOR (cw only)	36	64	103	164	165	164	696
G4LJF	1	65	75	182	149	164	636
Average	*31*	*125*	*155*	*251*	*249*	*225*	*1,035*

The next table will be in the September issue—please send your scores to reach G3GIQ QTHR, by 15 July.

In the **1982 CQ M Contest** UK entrants scored as follows: (3·5MHz) **G3CCZ** (2,310 points), (14MHz) **G4GIR** (50,138), G3TXF (17,996), G4KXW (444), (21MHz) **G4HPS** (224), (multiband) **G3VZT** (141,848), G3ESF (77,280), G3EKG (21,812), G4FVK (11,908), G4IUF (8,305), G3LQI (2,331), G3VDL (264), and G4KIU (240). In the listener section **RS42501** scored 199 points.

In the **1982 IARU Radiosport Championship** UK scores were as follows: **(Single-operator, cw) G4GIR** (483,912), G3KDB (196,868), G3XTT (173,221), G3SXW (151,028), GJ5EMB (94,450), G3ESF (67,600), G3TXF (51,686), G5CFJ (44,768), G4MVA (25,440), GW3MPB (24,500) G4BUO (19,173), GM3RAO (21,489). In the **single-operator phone** section, **GM4HQF** scored 37,290 points and G5EBA 14421. This year's competition will take place on 9-10 July.

Results of the **1982 VK/ZL/Oceania** contests have been received via G3PVA. In the cw section UK scores were: **G5MY** (2,478 points), G3XTJ (2,415), G3ESF (1,071), **GW3MPB** (649), G3PVA (576) and G3KSH (270). In the phone section **G3RRS** led with 10,792 points, G3TR scored 3,211, G5MY 1,078 and G3YCP 378.

Around the bands

The G8KG summary of the past two months reads as follows: "Solar activity was rather low during March and April, though the steep fall which began in the last quarter of 1982 seems to have ended for the time being. During the period the 27-day average solar flux moved gently between about 125 and 105 sfu, a fall of some 75 units as compared with a year ago, and there were no days on which the daily value exceeded 150 sfu.

"By the last week in April there were some signs of a modest recovery in the level of activity and, with daily values in the 140's, conditions on the higher hf bands were quite good for the time of the year."

Thanks to the following for supplying information for this section: G2HKU, G5JL, G3s AAE, GHY, GIQ, GVV, HCT, IMW, KSH, LOL, UKH, XBY, YRM, G4EHQ, GW4KGR, G4s LDS, NXG/M, OBK, and GM4RFE.

Stations listed in italics were on cw.

1·8MHz. 0500 *W2,4,8.* **2000** *PA3ATA/LX.* **2200** RF6FFW, *SM0KV.* **2300** *OK4AWQ/MM, SP1s ADM, DPA, 4X4NJ.*

3·5MHz 0000 *FM7WU,* PY0ZSE, *UA0YAN, UM8NAP,* VP2MDB, *ZC4BI.* **0500-0700** LU2DKT, *most W, VE1-VE3,* ZL1,2,4. **0600** HH2JR, *OA4CYK,* ZLs *1BX,* 2SN. 6W8DL. **2100** *UG6GDS, 4U1ITU.* **2300** DF3NZ/ST2, LA2EX/3X1.

7MHz. 0000 *CO1RH,* JY8KG, *TR8JD, VP2MM.* **0100** HZ1AB. **0500** *4K1F.* **0600** *KJ8G/J6L, W6-W7, ZL.* **0700** VP2MRA, *ZL1AMO/C, 3B8FG.* **1600** *9J2LL.* **1800** *3B8CF, 7P8CM, 9N1MM.* **2000** *JN1KEJ,* TR8GM, *VU2TTD, W6YB/3D6, K1BJ/3B9.* **2100** *5Z4DR.* **2200** *CE8AD, EL7M, FY7BW, HZ1AB, JA6OBY, OX3RA, TR8JD, VU2BK, XT2AW.* **2300** *KJ8G/J6L,* SV0CJ/SV5, *8P6FZ, 9Y4VU.*

10MHz. 0600 *W1,2,4,8,0.* **0700** *F0CBK/FC, VK, XT2AN, YN1BO, ZL, 6W8HL.* **1600** *VK9YC.* **1700** *3B8CF.* **1800** *3V8AA, 9H1HO.* **1900** *ZC4MR, K1BJ/3B9, 9J2BO.* **2000** *JA6HV, OY1R, ZS6BUF.* **2100** *HI3PC, JA1XYB, VK3MR, VP8ANT, ZS6BUF, 4Z4FC.* **2200** *TR8JD, VK8HA, VP2MRA, VP9HK, ZP5RG,ZS6BTY.* **2300** *KV4CI, VP9IB.*

14MHz. 0100 N5RM/SU, TR8DR. **0700** CE0ZAD, F6FDK/CE0Z, KC4AAA, KH6KU. *LA8UX/OD5,* YI1BGD, ZL, ZL4PO/C, 5W1DG. **0800** KH7AA, *OX3UD,* T30BP, VK, VK9NS, ZK2RS, ZL, ZL1AMO/C, 9L2FD. **0900** T30AT, YJ8MP. **1100** VP5WJR. **1400** KC6IN, VQ9AJ, *4K1F.* **1500** VS5s DA,DD,GA. **1600** JA, KC4AAA, KD1MP/VS6. **1700** 3A2LF, 3B9DA, 4S7KG, 9N1MM. **1800** *HL1EY,* KH6DQ,

YI1BGD. **1900** *JX5DW, JY8KG,* KH6WU, *T30AT,* WL7E. **2000** *SM6HCX/OX,* VP8ALD (S Orkney). **2100** J73AH, *PY0ZSD, ZD7WT,* ZL1BGW, 5T5AP. **2200** VPs 2MRA, 8MT, 4K1F. **2300** PY1EFM/PY0T, *TR8JLD.*

18MHz. 1600 *VK9RC.*

21MHz 0800 JA, *JY9RC,* VK, *3B8FG,* 3V8PS, *9N1MM.* **0900** TR8s DX, *IG,* TU4AT, KL7IHP/VS6, *9K2QL.* **1000** P29NBF, ZD7s BW, *WT.* **1100** TA2TB, UA0s, ZD9BZ, 4S7VG. **1200** HL1ACP, J28DN, P29MF. **1300** DU1CK, *TL8ER,* 5N8YPM, 9Y4TAM. **1400** *A92Z,* VK9YC, TB5AF, *6W8HL.* **1500** DU7RLC, *HH2VP, N5RM/SU,* VQ9CE, VS5GF, 4S7EA, *9H3AR.* **1600** *A4XJP,* A71BJ, G4ABI/ST2, TA1UA, YC8QQ, 1Z9A, 1Z9B, 3B8CF, 5H3FN, 5V7WI. **1700** TZ6FIC, W6–W7, *3D6BW,* 7P8AF, 9L1DR. **1800** C6AEY, S79ARD, TU2JB, *KR4C/V2A,* VP8AQV, 5Z4DR, 8Q7AZ. **1900** AL7H, T70A, VP8s ANT, AQQ. **2000** PY1EFM/PY0T. **2100** W6,7,0.

24MHz. No reports.

28MHz. 0800 VQ9CM. **1000** VK6WT, YC6DN. **1100** AP2MB, CR9FE, FB8ZP, P29MF, VK9YC, VP2EC, ZD7CW. **1200** A71AD, SU1ER, *VU2BK.* **1300** J73AE, 5H3DM. **1400** EL2AM, FH8CQ, JY9CL, TL8CK, *TT8AD.* **1500** *CX8DR,* HZ1AB, N5RM/SU, VP8MT, ZD8FX, ZS3HL. **1600** CE6EZ, VP8ALD, VQ9WB, ZD8FX, 5N9EM. **1700** TZ6FIC. **1800** *VP2EH, ZD7WT.* **1900** *8R1J.*

Thanks to the following for items extracted: *CQ Magazine* **(W1WY)**, *DXNL* **(DL3RK)**, the *DX Bulletin* **(K1IN)**, the *Long Island DX Bulletin* **(W2IYX)**, *DX News Sheet* **(G3XTT/G3ZAY)**, the *Ex-G Radio Club Bulletin* **(GI3OEN/W6)**, *Long Skip* **(VE3EUP)**, *Lynx DX Group Bulletin* **(EA2JG/EA3CBQ)**, and *DX'press* **(PA0GAM)**.

Please send items for the **August** issue to reach G3FKM no later than **24 June**, and for **September** by **19 July**.

HF propagation predictions for June 1983

Using the table

The time is presented vertically at two-hour intervals 00(00)gmt to 22(00)gmt for each band.

The probability of signals being heard is given on a 0 (indicated by a dot) to 9 scale; the higher the number the greater the probability, with 1 meaning 10 to 19 per cent of days, and so on. Additionally 50MHz F-layer and 1·8MHz openings are indicated by a dagger (†) sign in the 28 and 3·5MHz columns respectively. The higher probability figures are printed in RED, lower probability in GREEN and lowest probability in BLACK.

	28MHz			21MHz			14MHz			10MHz			7MHz			3·5MHz		
GMT	0000 0246	0111 8024	1122 6802	0000 0246	0111 8024	1122 6802	0000 02	0111 02	1122 02	0000 0246	0111 8024	1122 6802	0000 0246	0111 8024	1122 6802	0000 0246	0111 8024	1122 6802
EUROPE																		
Moscow	....	....	....	...1	2211	1231	5456	6665	6898	8754	4444	4689	7532	1111	2367	42..	....	..35
Malta	....	....	....	...1	2211	2341	6347	7666	7898	9876	5444	5789	8863	2222	2468	††3.	....	..4†
Gibraltar	....	....	....	....	1...	.12.	4115	6555	5787	9767	6555	5789	8864	3222	3478	††42	....	.24†
Iceland	....	....	....	....	....	....	3111	3433	3465	7665	5555	5678	7764	3222	2356	443.	....	..23
ASIA																		
Osaka	....	....	....	....	1111	1.1.	1112	3222	3564	....	1...	1362	....	....	.13.	....	....	....
Hong Kong	....	....	....	..11	2211	2211	3111	2222	4676	2...	....	1465	....	....	.142	....	....	....
Bangkok	....	....	....	..12	3322	332.	4111	1222	4687	3...	....	1467	1...	....	.145	....	....	...2
Singapore	....	....	....	..12	3322	1...	4211	2222	3453	4...	....	1467	1...	....	.146	....	....	...3
New Delhi	....	....	.1..	..23	3322	3541	5421	1122	4688	62..	....	1468	3...	....	.146	....	....	...3
Teheran	....	.1..	.11.	..34	3433	4663	7552	1122	4689	852.	....	1478	62..	....	.146	3...	....	...3
Colombo	....	.1..	....	..23	3433	411.	5421	1222	4677	72..	....	1478	4...	....	.146	....	....	...3
Bahrain	...1	11..	121.	1.34	3443	5764	8652	1122	4689	852.	....	1478	73..	....	.146	4...	....	...3
Cyprus	...1	11..	122.	1.25	5554	6775	8776	5555	6799	9852	2222	3578	862.	....	1257	53..	....	..24
Aden	...1	.111	22..	2124	3444	6754	8762	1112	4689	873.	....	1478	741.	....	.146	42..	....	...3
OCEANIA																		
Suva (S)	....	....	....	....	....	..1.	1134	321.	1452	..23	1...	133.	...1	....	.11.	....	....	....
Suva (L)	....	....	....	3112	....	..44	2256	2...	.163	..33	1...	.331	...1	....	.11.	....	....	....
Wellington (S)	....	....	....	....	....	..1.	2244	1111	..74	1133	1...	1252	..11	....	.12.	....	....	....
Wellington (L)	....	....	....	311.	....	...4	5564	....	..56	2243	1...	.253	..21	....	.131	....	....	....
Sydney (S)	....	....	....	..12	1...	...1	2235	4211	2216	1.13	1...	1354	....	....	.141	....	....	....
Sydney (L)	....	....	....	31.1	....	...3	4335	2...	..36	1124	2...	.164	...1	....	.131	....	....	....
Perth	....	....	....	..24	42..	....	5433	4211	111.	52..	1...	135.	2...	....	.144	....	....	...3
Honolulu	....	....	....	....	....	..1.	1133	3211	2311	..33	2...	11..	..11	....	....	....	....	....
AFRICA																		
Seychelles	...1	1.11	2...	..24	3345	641.	6552	1122	4677	863.	....	1478	74..	....	.146	4...	....	...3
Mauritius	...1	1111	1...	..25	4555	5412	6 63	1222	4678	853.	....	1478	751.	....	.146	42..	....	...3
Nairobi	...1	.122	33..	1.25	3455	7842	8674	1122	4688	8851	....	1478	762.	....	.146	43..	....	...3
Salisbury	....	1122	32..	2..5	4456	7722	8566	2222	4688	8863	....	1478	763.	....	.146	43..	....	...3
Capetown	....	1123	1...	...4	5456	541.	21.6	4222	3675	75.3	1...	1378	7621	....	.146	43..	....	...3
Lagos	....	1.23	452.	21.3	5346	7873	9866	3111	3689	8863	1...	1378	7631	....	.146	44..	....	...3
Ascension Is	....	1.11	242.	....	5445	6882	53.1	4211	3688	8843	1...	.368	7631	....	.146	44..	....	...3
Dakar	....	1.12	243.	4113	5345	5885	9876	4211	2589	8863	1...	.368	76 1	....	..46	44..	....	...3
Las Palmas	....	1...	.12.	3..2	5445	4675	9767	7656	6799	9975	4333	3579	8753	11..	.257	552.	....	..24
S AMERICA																		
South Shetland	....	...1	11..	....	..25	562.	....	.112	3683	423.	....	.367	7641	....	.146	44..	....	...3
Falkland Is	....	...2	221.	....	.135	666	512.	.222	3687	8652	1...	.368	7641	....	.136	44..	....	...3
Rio de Janeiro	....	...1	1231	3...	.445	5785	9751	2222	2479	8863	2...	.158	7641	....	..26	44..	....	...3
Buenos Aires	....	...1	1231	41..	.235	5685	9854	.222	3479	8863	1...	.148	7641	....	..26	44..	....	...3
Lima	....	....	..11	4...	1.23	3356	9755	4222	1137	8864	2...	...4	6641	....	...2	43..	....	....
Bogota	....	....	..11	3...	.223	2245	8744	4222	1126	8864	2...	...3	5631	....	...1	23..	....	....
N AMERICA																		
Barbados	....	....	..11	4...	1323	2356	9755	4321	1147	8864	2...	..15	7641	....	...2	43..	....	....
Jamaica	....	....	....	3...	.122	2134	8643	2222	1125	6863	2...	...3	4631	....	....	.3..	....	....
Bermuda	....	....	....	3...	.222	1134	8643	3221	1136	7863	2...	...3	5631	....	...1	23..	....	....
New York	....	....	....	2...	.111	1123	7631	1222	1125	6863	2...	...3	3631	....	....	.3..	....	....
Mexico	....	....	....	2...	...1	1123	6532	1112	1112	3763	1...	....	1531	....	....	.2..	....	....
Montreal	....	....	....	1...	..11	1113	7531	2222	1135	5763	2...	...3	3531	....	....	.2..	....	....
Denver	....	....	....	1...	....	...1	4432	..11	1112	2553	1...	....	.331	....	....	....	....	....
Los Angeles	....	....	....	....	....	....	3332	1..1	2111	1453	1...	....	.231	....	....	....	....	....
Vancouver	....	....	....	....	....	....	3333	2111	2111	1353	2...	....	.131	....	....	....	....	....
Fairbanks	....	....	....	....	....	....	2233	3211	2211	.233	2...	11..	..11	....	....	....	....	....

The provisional mean sunspot number for April 1983 issued by the Sunspot Index Data Centre, Brussels, was 79·7. The maximum daily sunspot number was 137 on 30 April, and the minimum was 36 on 5 April. The predicted smoothed sunspot numbers for June, July, August, September and October are, respectively: (classical method) 77, 76, 74, 72 and 70; (SIDC adjusted values) 76, 75, 73, 71 and 69.

4-2-70

*by Ken Willis, G8VR**

WITH SNOW FALLING in many parts of the country over Easter, the general weather pattern was not conducive to much dx working on the vhf bands during the month of April. In fact, looking back through the records, the month was one of the worst for propagation at vhf/uhf for some years. Also, no major auroras were reported, so the bands have been very quiet, although there was a very brief tropo opening from the south of England to France on 15/16 April.

However, with this being read in June, a much better prospect should now be before us. June is a good month for sporadic-E openings, and an excellent time for meteor scatter operation, using both sporadic meteors and some minor showers. Both are mentioned in a little more detail in the appropriate sections of this report.

It was a great pleasure to meet so many readers and fellow vhf addicts at the VHF Convention in March. The gathering seems to have been generally successful, and a short write-up covering this event will appear in *Radio Communication* shortly under the joint authorship of G4ANB, G3WDG and G8VR.

Repeater news and views

Manchester's second 2m repeater, GB3MB, became operational on 10 April on Channel R0. On 3 April the Perth repeater GB3PU on 70cm came on the air on Channel RB0. GB3MW is now operating again following site modifications.

During the recent controversy in this feature on the subject of repeater use by fixed stations, Mike Dennison, RWG chairman, has been studying the various points put forward by readers and now feels that the time has come to make known his own views on the subject. He starts by taking an official view; ie, that repeater licences were originally negotiated on the argument that mobile and hand-held portable stations needed a boost to increase their range. Most emphatically, they were not negotiated on the premise that they would enable amateurs to use inefficient antenna systems. Also, a most important point, while it is possible to design a repeater network providing excellent mobile coverage by siting the repeaters some 30 miles apart, a system used only by fixed stations would need repeaters with a separation of about 100 miles. What is not possible is to have fixed stations using a network specifically designed for mobiles without some co-channel interference, because of the potentially greater range of the fixed station.

Mike goes on to say that he sees no objection to fixed stations using repeaters provided that they do it sensibly. He quotes examples of misuse which can frequently be heard, particularly during tropospheric openings. For example: "The repeater is end-stop with me . . . . .I am running 100 watts to a Slim-Jim in the loft". . . . . "I can hear another strong repeater underneath this one". . . . . "You are a good signal on the input" (and then staying on the repeater).

Mike offers the following advice to fixed stations wishing to access a repeater:

a. Run 10-40W into a small beam—you may be surprised by what you can work.
b. Avoid omni-directional antennas for transmitting.
c. Run the lowest power needed to access the repeater. This is, in any case, a licence condition!
d. Always listen on the input frequency to see if the station can be worked simplex. If so, move off the repeater.
e. Be on the look out for heterodyne whistles indicating that other repeaters are on the channel and within range. If you hear two or more repeaters on the channel, do not use it.
f. Avoid using repeaters during openings. There should be plenty of dx about on simplex, and these contacts count for awards whereas those through a repeater do not. If you must use a "dx" repeater which you are hearing well, beware of interfering with other repeaters on the same channel and keep the contact short. Choose a mobile dx station to work rather than a fixed station.
g. Always be aware of mobiles waiting to use the repeater. It is not enough to say "We will leave a break for any mobiles" . . . . most British amateurs are too polite to break up a conversation. Keep all overs and contacts as short as possible to give as many operators as possible the chance to use the repeater.
h. Avoid using repeaters for regular schedules and, as a final resort, use other bands or other modes rather than tie up a repeater in this way. We managed very well before the repeater system was introduced!

Finally, Mike gives some advice to mobile stations wishing to use a repeater which has become "hogged" by fixed stations. During the "courtesy pause" before the "K" (or "pip"), say something like "G6ZZZ/M will listen on S22 for a contact in the ******* area". This can have a remarkable effect. Fixed stations hearing it may vacate the repeater and move the the channel mentioned, when a simplex contact frequently results. Though it may not always work, Mike feels that some sort of constructive attitude such as this is better than sitting in your car fuming to yourself, since this achieves nothing.

G4NRV (Kent) took a handheld 2m rig with him on holiday to Madeira, having first applied for a reciprocal licence by writing to Lisbon. The licence took some time to come through, but was finally collected from a local post office in Funchal. Tony found three repeaters operating in Madeira. On the main island at Pico da Silva, a repeater operates on channel R2, while at Cabo Guerao on the second highest sea-cliff in the world there is an installation operating on channel R3. Finally on the nearby island of Porto Santo a repeater is active on channel R6. Tony had some interesting contacts during which he was told that these repeaters were often accessed by stations in Tenerife and Portugal when conditions were good. The callsign issued by the Portuguese authorities was Tony's British call/CT3.

While on the subject of repeater dx, G8AVA, who is working in Saudi Arabia, has a 2m fm receiver and a five-element beam which enables him to hear a Bahrein repeater. Through this he has heard Bahrein stations both on the input and output of the repeater, but his best so far is having copied 9K2BE (Kuwait) very weakly on the repeater output, and on switching to the input frequency hearing the station at S8. In an area almost bereft of any vhf activity such as Saudi Arabia, having any repeater within range must be a great asset and a change from hearing white noise emanating from the receiver all day long.

ATV and repeater interference

Following the removal from amateur use of the top part of the 70cm band, repeater and atv signals can overlap because there are simply not enough channels to accommodate both exclusively. The same is true of the satellite band and atv, but this is less troublesome since satellites are "visible" for relatively short periods and antennas are often pointed skywards to access them. Mutual interference between repeaters and atv can be coped with if both sides co-operate and recognize the other's problems.

In a joint memorandum from Mike Dennison, G3XDV, and Graham Shirville, G3VZV, member of the BATC Committee, the following "codes of practice" are suggested as a means of minimizing interference between the two modes.

ATV OPERATORS should operate as high as possible in the band and use the minimum necessary bandwidth. This is particularly the case for digitally-generated signals. ATV operators should be aware that their long overs may be keeping several repeaters open for long periods. They should be able to adjust the fine-tuning of their rigs to reduce this effect. On atv, polarization should always be horizontal.

REPEATER USERS should always use vertical polarization, and repeaters will always be equipped with vertical antennas. In fact, all non-tv terrestrial transmissions above 433MHz should be vertically polarized. When the repeater is not in use, periodic callsigns should be kept to a maximum of one every 5min. Groups should take care to prevent their repeaters "locking up" for long periods when they are not in use for fm traffic. It should be appreciated that UK repeater frequencies are deliberately non-standard in an attempt to avoid interference with atv operators. There seems to be no reason why individual repeaters could not be switched off during an atv contest by prior arrangement between the repeater group and the RSGB.

Sporadic-E

Over the years much has been written about methods of monitoring for the onset of Es propagation, yet there will be many operators who have tried to follow all the rules and still contrived to be in their "local" when the 144MHz band went wide-open to the Ukraine. That experienced vhf

*11 Old Downs, Hartley, Kent DA3 7AA.

operator G3POI told me a long time ago that he had noticed that the big Es events often occurred on more or less the same dates every year. While there is no known reason why this might be so, there is also no fully-accepted theory as to the real nature of Es, so I thought it merited a study of the records over the past five years to see if any statistical evidence could be found to support Clive's findings.

Since 1978, significant Es openings have occurred on 144MHz on 1, 2, 4, 5, 7, 8, 9 and 10 June (though not all in the same year of course), so it would seem that there would be a good case to watch the band very closely during the period 1 to 10 June. There has often been a further opening during the last two or three days in June, so a date around 28 June is also favoured. Readers who have back-copies of magazines covering the past few years can do their own statistical surveys for July and August if the June forecast proves useful. If it doesn't, I cannot take responsibility for cancelled holiday plans for those who opt to stay in the shack throughout the first two weeks in June!

This year may provide the first cross-band Es contacts between the UK special-permit 50MHz stations and some of the better-equipped Europeans using 28,885kHz as the talk-back frequency. One station which is likely to feature in such contacts is CT1WW. Tiago has separate equipment for all bands from hf to 2·3GHz, though he can only listen on 50 and 70MHz of course due to his licence conditions. He, and his neighbour CT1WB, are very keen to make crossband contacts on both 6 and 4m with UK stations. Tiago can often be heard on the vhf net during the daytime. G4IJE has already worked him 50/144MHz on ms cw, and has had a 70/144MHz ms cw contact also.

Expeditions

David Hardy, G8ROU, has sent details of a Derbyshire Hills Contest Group expedition to Wales between 6 and 19 August, operating from XM80f, some 25km east of Cardigan. Both 2m and 70cm will be used. On 144·225MHz they will use a TS700 plus a pair of 4CX250Bs running 400W into 2 × 17-element Tonnas. On the higher band, an FT780R plus a 2C39 amplifier running 60W will feed 4 × 21-element Tonnas on 432·225MHz. They will also operate on 1,296MHz, and if there appears to be sufficient demand, they will move to XL10f on the afternoon of Sunday 14 August to work on both 70 and 23cm. During 10 to 14 August they propose to be available for meteor scatter contacts on 2m. They are seeking a Class A licensee to accompany them since this would enable them to work cw, and this will also determine whether they can use the vhf net for setting up ms skeds. Tentative callsigns, however, are GW6APZ/P on 2m and GW8ROU/P on 70 and 23cm.

The Dutch expedition to Lichtenstein, reported in *4-2-70* for May, is scheduled for 10 to 12 June. This is a rare opportunity, so don't overlook it.

GM3WOJ and GM4IGS will be portable in some rare northern squares during the Perseids meteor shower. They plan to operate on 70, 144 and 432MHz from both XS and XQ squares. The dates are 8, 9 and 10 August 1983 from XS, and 11 August from XQ. Skeds may be arranged by writing to GM3WOJ, PO Box 6, Fort William.

Beacons

All Cyprus beacons have been overhauled and are at present in operation beaming towards South Africa. The 2, 4 and 6m beacons will be turned towards the UK when there is evidence that the Es season has arrived.

Geoff Grayer, G3NAQ, reports that the frequency of the Italian beacon IX1A, mentioned in *4-2-70* for March, is 144·845MHz, with keying in the fsk mode.

Rolf Niefind, DK2ZF, who is vhf editor of *CQ DL*, has drawn attention to a new auroral warning beacon in DN37a square on a site some 90km west of Bremerhaven. This is not itself a vhf beacon, but one operating on 10·144MHz (an easy frequency to remember) with a power of 30W into a dipole. When vhf auroral propagation is observed, the beacon will be switched to send an appropriate message. Initially this will be very simple; a callsign (DK0WCY) followed by 20s dashes will signify that no auroral activity has been observed or reported. When aurora is present or geomagnetic levels are high, callsign plus 10s dashes will be transmitted. At a later date when a suitable magnetometer has been constructed, "k" values will be transmitted, a microcomputer being used to process data. As the callsign suggests, the beacon is a contribution by West German amateurs to World Communications Year 1983.

Serious vhf operators in the USA have long envied the European beacon system which provides such a good indicator of propagation. Until now the FCC has not allowed automatic unattended beacon operation, and this has ruled out the use of beacons on the scale to which we have become accustomed in the UK. Now, however, the rules have been changed, and we can expect to hear of beacons being set up all over the USA during the next few years. While those on the higher bands will only be of interest to amateurs visiting or working in the USA, any 50MHz beacons which arise from this change in rules will be very welcome.

Aurora

As the solar cycle declines rapidly the occurrence of auroras has become very much reduced compared with a year ago. Only two reports of auroral events have come in since the last issue of *Radio Communication*. The first, reported by G3IPV (Norfolk), occurred on 24 April around 1825gmt when Peter heard LA9BM for about 20min at 51A but was unable to raise him for a contact. Peter was running only 50W, and his antenna rotator was out of action which limited him to a beam heading approximately NNW.

The second report is a little more significant. On the evening of 25 April, G8ECI noticed that GB3LER was coming through with auroral tone in Lincolnshire, though little was heard in the way of dx activity. However, at approximately 2345 local time, GM3WOJ worked GW3LDH via aurora on 50MHz, and this may have been the first auroral contact on that band since the special permits were issued to UK amateurs.

70MHz

Not much news has come in of late on the 70MHz band, but activity on the frequency is probably as high as it ever was due to its new role as a talk-back channel for the 50MHz experiments. Devotees of this band should note the details of the GM3WOJ /GM4IGS expedition planned for August when XS and XQ squares will be activated. Those who have never seriously tried meteor scatter on this band, either on cw or ssb, should give it consideration since it is a fine way of covering long distances without the use of very high power or exotic antenna systems.

Some time ago Garry, G4FRO, reported that he was now installed in a new QTH some 250ft asl, which is about the highest possible spot in the Bristol area. He put up a four-element Yagi under cover of darkness to avoid inquisitive neighbours (I know the feeling!) and it has survived some major gales. He says he can hear the four UK beacons all the time and also hears EI4RF whenever there is a slight lift. His new QRA locator is YL48h.

One of the earliest operators to work 70MHz, Lyell Herdman, G6HD, was interested in the list of IARU dx records printed in *4-2-70* April 1983. What he says proves that we need further information if the records are to be correct, for G6HD worked GM3UAG (YR27d) from AL square on 23 March 1969 via aurora. He makes this a distance of 745km, which beats the listed record of 709km (G3OSS-GM3JFG) which arose from a contact in 1978. Lyell also worked TF3EA on 70MHz on 6 July 1970, the propagation being via sporadic-E, but this of course falls short of the G5MR-CN8MG contact which is the current record for this mode on 4m. Any stations with results better than those claimed (on any of the bands listed) should write to *4-2-70* or to the official record keeper, Folke Rasvall, SM5AGM.

As a result of the increased occupancy of the 70MHz band by those seeking crossband contacts from 50MHz, G3IMW (London) has worked G3ENY (Bridgenorth) and G4JCC for new ones. Between 0600 and 0800 local time is a good period to monitor 70MHz since there are usually several stations listening.

50MHz

The 50MHz "experiment" continues with the Home Office having clarified the permitted operating times which had still been the cause of some confusion. Basically, unless there is a Band 1 Channel 2 transmitter in the immediate area, 50MHz special permit holders can operate between 2330 and 0830 local time. The matter of crossband working by other than Class A licence holders is currently under discussion. One further amateur (GM4IGS) has been issued with a permit to replace another who has dropped out. Mike, GM4IGS, is well known for his expeditions to the far north with GM3WOJ, and he also is experienced in the cw ms mode of operation so he should be in much demand both from his XP home location and on his travels, assuming he can obtain permission to operate 50MHz from a portable site in due course.

Meanwhile the experiment continues very much as before, with most permit holders having worked between one half and two thirds of the stations licensed to use the band. On 14 April GM3WCS worked GI3ZSC to make the first GM-GI contact since the permits were issued. This was by tropo (at least not by ms!) and reports of 559 and 53/79 were exchanged. Earlier, on March 16, G6XM worked GJ3YHU for a probable G-GJ "first". They have since worked several more times. The first auroral QSO is mentioned separately.

GM3WOJ has been running regular cw schedules with W2IDZ/KA1PE on a weekly basis, but as yet nothing has been heard either way. Chris says that the Americans feel that it is unlikely that they will make contact during

these skeds, but they have hopes for multi-hop sporadic-E during the summer months. The schedules are every Wednesday at 0500-0600gmt on 50·014MHz. Chris also points out that the liaison frequency for transatlantic tests is 14,345kHz (virtually the vhf net) on Sundays at 1700gmt with W2IDZ acting as net controller.

G4IJE still favours ms on 50MHz and has completed 30 contacts on the band using this mode since his permit was issued. He regularly works GM3WCS and GM3WOJ in the early morning, and looks forward to GM4IGS joining in very soon.

GM3WOJ says that tropo on the band seems very poor, rather like the 28MHz band when it is "closed". The Americans, he says, regard 50MHz as an hf band! Chris has a somewhat poor location. The land rises to 3,700ft about seven miles due south of him, but he has a good take-off to the northeast and northwest (good for aurora and his transatlantic skeds). As a result, in two months operating he has been able to work two-way with only G4IJE, G3LTF, G3ZIG and G3COJ, plus six other stations using ms. On crossband 50-3·7MHz he has worked G4JLH, G4JCC and GM4FZH. It clearly isn't all fun being a remote station in a rare square.

Another Scot who finds the going rather difficult is GM3ZBE in Aberdeen, who so far has not managed a two-way contact on the band. His nearest station is GM4DIJ (Edinburgh) who seems unable to hear Alex, though the Edinburgh stations come in all the time on 2m at Alex's location. GM3ZBE also ran a sked with GM4FZH in Caithness, and although he heard his 10W at 539, Clive could not read Alex running 30W output. However, to indicate that there is little amiss with Alex's transmitter, he has worked crossband (50-3·7MHz) with G3FDW, G4GLT and others. He would like to see Class B licence holders given the opportunity to work crossband as there are several living fairly close to him. Alex would like to hear from those wanting schedules with him. He is available at "sensible" times, his regular operating times being 0730 to 0815 local time on 50·100-50·110MHz cw. From the occasional "ping" he suspects that there is ssb on his cw frequency, so he also uses 50·120MHz in an attempt to be clear of this.

Jeremy Whitfield, G3IMW (ZL40j), listens on the band using a homebuilt converter as described in the 1979 *ARRL Handbook*. For most of the time he has used a rotary dipole at a height of 65ft, but this has now been replaced by a two-band Yagi having six elements on 70MHz and five elements on 50MHz. The elements are interlaced, with equal spacing of 18in throughout. Jeremy has heard all English permit holders except G3VZJ, G3USF and G4HUP. He has also heard a good deal of ms, including one GM who could not be identified. He comments that the most notable feature of tropospheric propagation on 50MHz which he has observed is slow fading over periods of minutes. As an example, G2AOK (Cheltenham) was swinging between S5 and S1 for long periods. He wonders if time of day is important, and particularly whether there is any significance in the time during which the sun has been above horizon.

Martyn Vincent, G3UKV (Shropshire), is another station with listening facilities together with 4m and 80m crossband capability. He has heard, or knows to be active, 33 of the original permit holders, but suggests that too many of them are underpowered (10W or less) and using poor antenna systems, some not even designed for the band. This frustrates him, since he was unlucky not to receive a permit yet is very well-placed to fill part of the "northern gap" which has been commented on here. Among those worked crossband are GM3WOJ, GW3LDH, GW4HXO and GW4IIL/A, while GI3ZSC has been heard. Martyn recommends a harmonic of a Midlands navigation transmission as an "extra beacon" which transmits 24h a day on 50·863MHz keying "GKC" in A1A mode. He also hears GB3SIX daily, just out of the noise, with meteor pings and the aforementioned long slow fading associated with 50MHz tropo.

Another who comments on the QSB characteristic is G4GLT. He had a crossband contact with G4CG in Devon when it was noticeable, as it was in a contact with GW4IIL/A (YM). The latter QSO was made after several hours of trying for a two-way. GW4IIL/A is completely shielded by mountains and had to beam northeast for the contact to be made. To enable G4GLT to work G3FDW crossband, the Notts station had to beam at a massive cooling tower a mile or so away. Dave has also worked 6-80 crossband with GU2HML for a possible "first", but his best contacts have undoubtedly been with GM3WCS and GM4DIJ which resulted from schedules. On 5 April he heard GM3WCS continuously from 0611 to 0735gmt sending high-speed cw. The path between Leicester and Edinburgh is much impeded by mountains or high ground. G3LTF has suggested that some form of scatter is assisting the normal tropo propagation, though on this occasion the signals lacked any flutter or deep fading. G3LTF has also noticed that following a meteor burst, GM3WCS's signals remain enhanced for a while. Dave reminds us that in William Orr's *VHF Handbook* it is stated that E-layer ionospheric scatter paths are stronger on N-S paths than E-W, and tend to peak between 0600 and 1200gmt. Dave hopes that more Scottish stations will continue to beam south despite the many obstacles in their paths.

Finally, GW4IIL/A has sent in two reports covering the period 24 February to 3 April. He lives in Brighton but operates from the Welsh mountains, where he finds the going very difficult indeed. He uses an FT620B with 12-20W out on ssb/cw and, at present, a homebrew two-element antenna. He has had two-way contacts with GW4HXO, G4GLT and G4BPY, and has heard the GM3WCS high-speed cw. G6XM heard him by back-scatter off the mountains when Peter was beaming to the north. He listens when in Brighton and hopes to get permission to transmit from there soon.

STOP PRESS

GW3MHD is now licensed for 50MHz operation . . . GM3ZBE has now made two-way contacts, the best with G3LTF . . . EA3ADW heard beacon GB3SIX for 20min on 1 May at 599 by *Es* mode . . . G6XM copied ZB2VHF on 50MHz on 2 May between 0700 and 0800gmt with ms enhancement on path . . . 6 May G5KW worked ZB2BL two-way on 50MHz by *Es*.

Meteor scatter

I asked John Matthews, G3WZT, to summarize his views on ms operation during the month of June. John is a very experienced ms operator who chooses to work mainly during showers rather than on sporadic meteors. He says that June is usually very good, and in particular the Arietids shower can give very good results, though the shower tends to be little known and under-used. Over the past few years he has completed most of his schedules arranged for this shower, and has at times been amazed at the strength and prolific rates of reflections. He gives 6-9 June as the best period for the Arietids, and says that the mornings are to be preferred, with 0600-0800gmt as an optimum period for a generally east-west path.

During the month there is another shower, the 54 Perseids, but this does not always give noticeable returns. For those wishing to experiment with the shower, John suggests the same times as for the Arietids. The peak of the 54 Perseids is given in published data as around 26 June with an hourly rate of 30.

A similar shower due to peak on 29 June is the Beta Taurids with an hourly rate of 24, but this is a daylight shower, so the period 1000-1500gmt is suggested for those wishing to experiment at this time.

G3WZT has written a most informative article on meteor scatter working which appeared in *Ham Radio Today* February and March 1983. This not only goes into the basic theory of this mode in language very understandable to the non-professional, but also compares and contrasts the various vhf bands, including 432MHz, when using this mode. John says, however, that in conversations with G4DGU, they have reluctantly come to the conclusion that ms on 70cm is a "masochistic pastime". After many hours of dedicated operation on this band using sophisticated eme-capability equipment, Chris has not managed a single complete contact. G4DGU asks whether anyone in Europe has completed a "valid" contact via ms on 70cm. At least one has been reported here (OZ7IS-OY5NS *4-2-70* January 1983) but further information on this and any other 432MHz ms contact would be much appreciated.

G3WZT makes a final plea to ms operators to consider his proposals for random working during major showers as set out in *4-2-70* December 1982. He has had no comments from any operator on these proposals, yet everyone agrees that with the growth of interest in this mode some improved random-channel operating is in everyone's interest.

Meanwhile G4IJE, who repeatedly shows that ms contacts using sporadic meteors are possible on any day, at almost any time, provided one has a station optimized for this type of working, is continuing his skeds on 50MHz, and with DJ5MS on 2m. During April he had a contact with a German expedition located on a small island off the southern tip of Italy using ms cw, working DF1CF/IM0 for his 292nd square. The station was in EY03h square, and the contact, which produced good reflections, was during the afternoon hours.

Another station to make good use of sporadic meteors was G8ECI (AN). Derek works overseas, and has to confine his ms activity to short spells of home leave. On 25 April he had a *sideband* ms sked with UC2AA (NN18d) in Minsk on 2m. UC2AA is better known to dx operators as UC2ACA, and although he has a high power cw rig, on ssb he is limited to 100W *input*, feeding a 16-element Tonna antenna. Even with this low power, G8ECI and UC2AA completed within the hour between 0600 and 0700gmt. UC2AA reported via the vhf net that he copied both callsigns after only four 1min periods. The distance between these stations is 1,804km. Working such a long distance on ssb ms should encourage others to try the mode. Class B operators should enlist the aid of those licensed to operate on the hf bands to get skeds arranged via the vhf net, especially if they reside in squares which are relatively rare and in demand by the European meteor scatter operators. □

Microwaves

*by Charles Suckling, G3WDG**

An Alford slot antenna for 2·3GHz

One of the difficulties with any beacon project is the provision of an omnidirectional horizontally-polarized antenna having useful gain. Following his success with the Alford slot antenna on 1·3GHz, Mike Walters, G3JVL, has developed a version of this antenna for 2·3GHz. One of the prototypes is now in use in the GB3LES beacon, and is performing extremely well. Constructional details of the antenna are published here, in the hope that other beacon groups may be stimulated into building 2·3GHz beacons, for which there is a very urgent need.

Mechanical details of the antenna are shown in Fig 1(a). The prototype was built from 22mm copper water pipe. Material was removed from part of the tubing to produce a "slotted" tube with an outside diameter of 18·5mm. A former was used during the manufacture of this, around which the tube was bent to ensure that the 18·5mm od section was round. Small tabs were soldered across the slot at the top and bottom to define the "active" length of the slot. A plate was soldered at the junction of the 18mm and 22mm tubes to strengthen the structure.

The rf is fed via a length of 0·141in semi-rigid cable inside the antenna to the centre of the slot via a 4:1 balun, which is constructed in the end of the cable. Details of this are given in Fig 1 (b). It should be noted that the outer of the semi-rigid is slotted on both sides. Connection is made between the balun and the slot by two tabs, made from thin copper foil.

When built, the antenna should exhibit a low vswr. If suitable test equipment is available, the match may be optimized by adjusting the width of the slot, either by squeezing the antenna in a vice, or by prising the slot apart. These operations should be done carefully!

Before installing the prototype, G3TQF took the opportunity to measure its performance, using professional equipment. The vswr and the horizontal and vertical radiation patterns were measured, and his results are given in Figs 2, 3 and 4. The gain was also checked, by comparison with an 8·71dBi standard gain antenna, and measured 6·4dBi. The radome used was a length of 63mm diameter plastic drain pipe, with a 2mm wall thickness. G3JVL notes that polypropylene tubing (if available) tends to offer slightly lower loss than conventional drain pipe.

If anyone intending to build this antenna has any problems with obtaining semi-rigid cable or with setting-up the antenna, then I would be very happy to help.

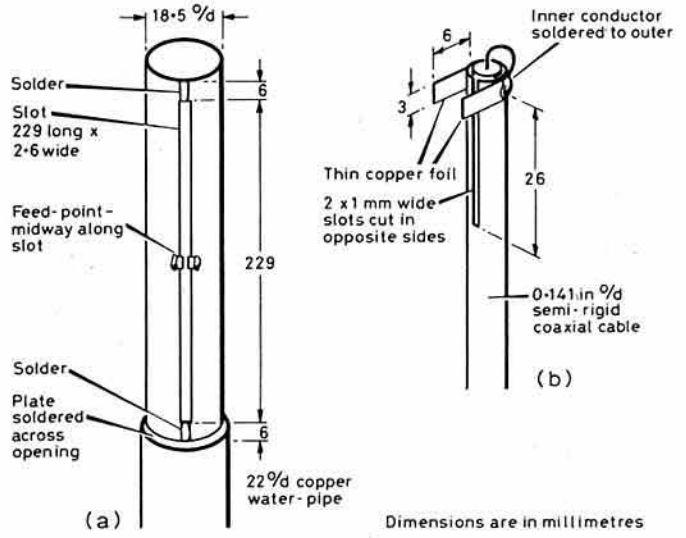


Fig 1. (a) Constructional details of the G3JVL 2·3GHz Alford slot antenna. (b) Balun details

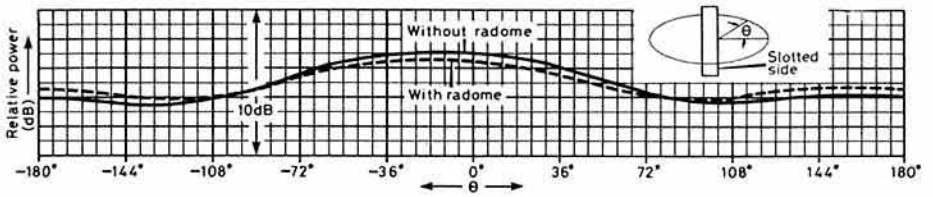


Fig 3. Horizontal radiation pattern of the 2·3GHz Alford slot

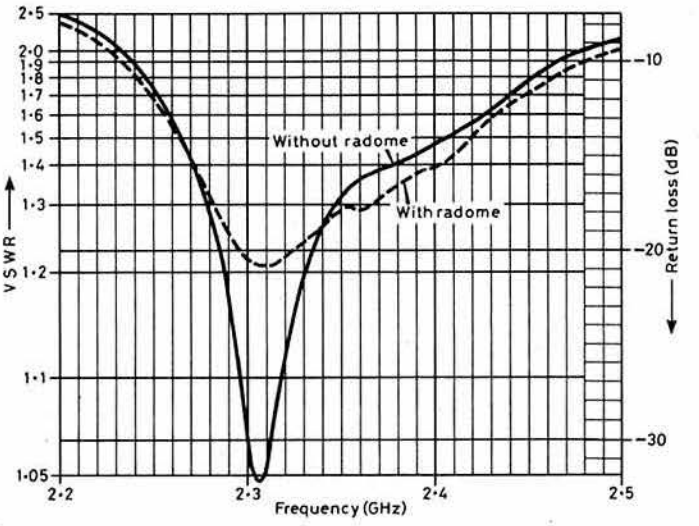


Fig 2. VSWR response of the 2·3GHz Alford slot

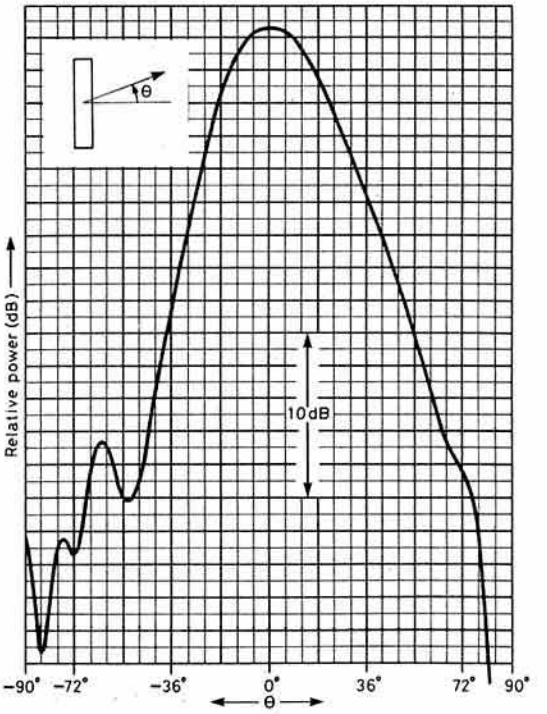


Fig 4. Vertical radiation pattern of the 2·3GHz Alford slot

DARC Microwave Contest

This will be held 1400–1400gmt 18–19 June on all microwave bands.

*46 Windsor Close, Towcester, Northants.

EPHEMERIS

Satellite news and views

*by R. O. Phillips, G4IQQ**

ONCE AGAIN there is plenty to report on the space activity scene. The annual general meeting of AMSAT-UK provided an opportunity for around 35 visitors to get an up-to-date briefing on many aspects—but more of that later.

Satellite status reports

Oscar 8 continues to function under its revised operational programme, though there is increasing concern over its state of health. The continued exposure to sunlight has caused a considerable increase in the spacecraft temperature and, in particular, that of the battery. It is worth remembering that battery failure due to excessive temperature resulted in the demise of Oscar 7. At such critical times it is very important to obtain frequent and accurate telemetry data from the satellite. G4AJJ would be happy to receive any such reports, collate the information then pass it on to the spacecraft control centre.

Martin Sweeting, G3YJO, provided a detailed report on events affecting UOSAT over the last 12 months to the AMSAT-UK meeting referred to above. Attempts to overcome the problems which have prevented the full deployment of the gravity gradient boom have not yet proved successful. There are still a number of manoeuvres that can be tried, but even if these fail all is not lost. It may be possible to achieve spacecraft stabilization by use of the short boom or perhaps by inducing an appropriate amount of axial rotation. While the operational role of UOSAT is now somewhat more restricted than originally planned, it can still provide a useful service both as an educational tool and as an in-orbit test bed for spacecraft control using onboard computers.

All is well with the six operational RS satellites, but it is sad to report the occurrence of what appears to be deliberate interference into the Robot transponders on both RS5 and RS7. Hopefully this is the result of over-enthusiastic operators, but it does stress the need to check that your signals will not disrupt contacts already in progress.

Lastly, back to the RS1-RS2 saga. The currently-held theory is that, in spite of earlier reports, the signals detected over recent months are in fact from RS1. It has been suggested that the telemetry transmitter is being powered directly from the solar cells but that due to the low voltage both the callsign and the telemetry data are being corrupted.

Phase 3B

At the risk of getting it wrong once again, it does seem that activities are at last underway for the launch of Phase 3B. The spacecraft was due to begin its long trip to French Guiana on 11 April prior to integration into the dual-launch system with the European Communication Satellite ECS-1. At the time of going to press, the earliest launch date will be about 21 June. Until the launch takes place, the latest information can be obtained by listening to the AMSAT-UK net on 3,780kHz at 7pm daily. However, even if this launch date proves to be true, it is likely to be a further several weeks before the satellite has been placed into its nominal orbit configuration and the communication transponders switched on.

Other news

One of the major agenda items at the AMSAT-UK agm was the presentation by the committee of a revised constitution for the organization. There followed a lively discussion on a wide range of topics, including the purposes of the organization and whether members of the committee should be licensed amateurs or not. The outgoing committee were elected to serve for a further year, with Dr Arthur Gee, G2UK, as chairman, and Ron Broadbent, G3AAJ, the secretary/treasurer. In spite of ever-rising costs it was decided not to raise the minimum annual donation from the existing sum of £6. Dr Gee reported that a further $2000 had been sent to AMSAT as a contribution to the amateur space programme.

There has been much discussion recently about a possible new amateur satellite called PACSAT, which has nothing to do with video games, but involves a method of digital transmission called packet switching. The technique is finding increasing application in the commercial field, and is suitable either for data or telephony transmission, or in fact a hybrid of both. In this context it is worth mentioning that the Japanese amateur satellite organization, JAMSAT, is to design and build an amateur satellite which will carry a digital transponder for packet-switched communications as well as a linear mode J transponder. The satellite is planned to be placed into a medium altitude circular orbit (around 1,500km) using the Japanese H1 launch vehicle, probably in 1986.

Dave Rowan, G4CUO, is continuing the Monday evening teach-ins at 7pm on 3,780kHz. He has provided guidance to many newcomers to overcome some of the problems encountered, but he reports that interest continues at a high level.

Finally, after a long search, AMSAT has announced the appointment of a new general manager. William L. Lazzaro, N2CF, took his post on 25 April, and we wish him every success. □

*170 Shirehall Road, Hawley, Dartford, Kent DA2 7SN.

RAYNET

*by G. Cluer, G4AVV**

IN THE LAST Raynet column the activities of the Norfolk and NE Suffolk Raynet group during a flood emergency in the earlier part of this year were reported. The group has now received letters of thanks from their user services and other groups which they assisted, through the county emergency planning officer, and these have been passed to the RSGB for their files. These letters include messages from the chief coastguard, the Marine Search and Rescue regional controller, the chief constable, the police superintendent, the North Norfolk District Council, the emergency planning officer and the WRVS, all of which praise the expertise and professionalism of Raynet. Radio amateurs in that area can see that Raynet has a part to play in supporting the emergency services, and those who are interested and have not yet joined Raynet have only to contact G3HRK for information about the local groups.

However, I am reminded of a letter I received last year from the secretary of the Mid-Bedfordshire Raynet Group who said that not all groups are in the enviable position of having the confidence of their local potential user services. In Bedfordshire the police believe that the time will never come when their own resources will not cope, and the other potential users are either non-existent or reluctant to contact Raynet. How much more difficult it must be, then, for this group to attract members. However good internally-organized exercises are, they will never fire the enthusiasm of Raynet members in the way that an exercise for a third party will. Luckily this group is able to get a user service to call on them to help at charity walks, marathons and the like, so they get some practice at working under live conditions. This provides them with valuable experience as well as helping the organizers and participants in terms of safety. Some groups do not even have this level of support and they must rely on their own resources and hope that, should an emergency arise, someone will remember to contact them.

The recent agreement by the Home Office that Raynet can work with user services on the charity-walk type of exercise has been a great relief to groups with no other active involvement with the user services. So far this year there have been about 50 such exercises despite the fact that the main season for this type of activity is later in the year. Groups are to be encouraged to use this facility as an excuse to contact potential user services so that their abilities may be brought to their notice. As an example, by the time that you read this the whole of the county of West Midlands will have participated with the St John Ambulance at a 28-mile "Walkathon" on 1 May.

This Home Office agreement has meant that Raynet can now play a part in live situations other than disasters—which, thankfully, are rare events —and can be much more use on a more regular basis. Most groups, then, are keen to attract new members. You don't have to be equipped with the most marvellous equipment, nor have been licensed for a couple of decades to be of use. Indeed, most groups can find a use for non-licensed operators. All you need is to be prepared to give up a little time to pick up the jargon used in Raynet (which isn't so different to amateur radio operation). As indicated above, some groups have very different

*12 Bingham Road, Addiscombe, Croydon CR0 7EB.

commitments to others, and the best way of finding what is happening in your area is to contact the local group controller. If you don't know who this is then contact the Raynet zonal representative for your zone and he will put you in touch. The zonal representative's name and address can be obtained from RSGB HQ.

Have you heard the repeater GB3ES on R7 going "funny"? It is not a fault, but a Raynet mode which will cause it to put its carrier on continuously while sending a letter "R" in morse every 15s. This is an indication to local Raynet members that a callout is in progress and they should contact their controller on their Raynet frequency.

Group reports received from . . .

Oxfordshire, Gloucestershire and East Lincolnshire who all, independently, took part in the Home Defence exercise "Warmon" at the end of last year. A number of these report teleprinters being used to good advantage. No doubt many others took part in this exercise.

Norfolk and NE Suffolk a number of exercises throughout the last few months held with a number of different user services.

Gloucestershire on exercise "Papa" held last November.

Bury assisted the Red Cross at a parachute jump (at which the group controller was one of the parachutists).

Oxfordshire on an exercise using complex alphanumeric messages designed to give the control station a hard time.

Cornwall on an exercise involving all Cornwall groups and a total of 42 different stations. □

Confessions of an RAE instructor

by JOHN MORRIS, GU6BGI*

John Morris, GU6BGI, has made exceptional use of the opportunities which amateur radio offers to young people. Nine months after passing the RAE at age 15 he became an instructor for the Guernsey Amateur Radio Society's training programme, with his own class of six for the December 1981 Radio Amateurs' Examination.

WHEN I HEARD that a lot more people than had been expected had turned up to enrol in the Guernsey Amateur Radio Society's RAE class, I went along to our clubroom to see if there was anything that I could do to help. I thought that my own experience in having taken the exam nine months earlier in December 1980 might prove useful to the new students. I certainly didn't expect to find myself in charge of an RAE class of my own, but that is exactly what happened!

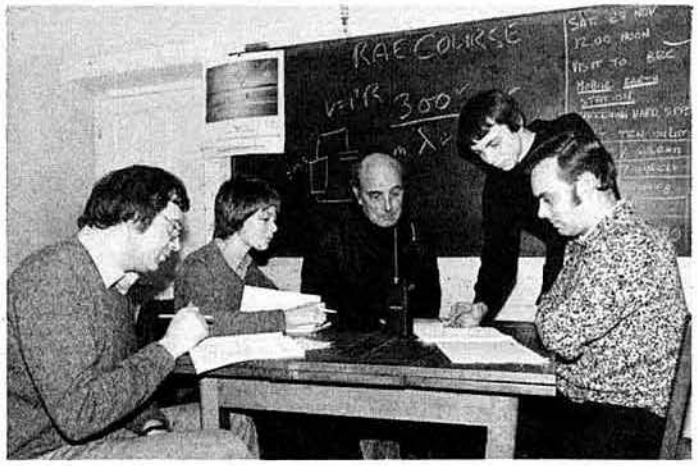
The planned course was intended to carry through to the May 1982 examination, but six of the students who had just enrolled wanted to try for the December exam, just 12 weeks away, and it was this group that I found myself responsible for. Richard Stockwell, GU8FBO, was the instructor for the full length course. One year earlier I had been in his class when I took the RAE myself.

What a variety of pupils I had! None had previously taken the RAE, but some had begun reading the RAE manual. They ranged from a retired doctor down to a little lad of 12 who didn't seem to know much beyond Ohm's Law. What struck me after a while was that they all seemed perfectly happy to find themselves with a teacher who may have appeared a bit young. Anyway, they had invested their exam entrance fees in me, so it was too late for me to turn back!

Although things sometimes became a bit disorganized I tried to stick to the format of the *RSGB Radio Amateurs' Examination Manual,* which was invaluable to me during this time. It was pretty difficult to squeeze everything into the 12 weekly two-hour classes, and I found it a bit strange to be sitting in school doing "A" level studies during the daytime, and then to find myself standing before a class in the evening.

I decided not just to read the information directly from the textbook (the students were meant to do that for themselves), but rather to put my ideas across from the blackboard to explain particular topics. I found that I had to do a lot of background reading in order to be able to answer all manner

*Vue de la Normandie, Calais Road, St Martins, Guernsey.



The Guernsey ARS RAE class in session, November 1981: L to r: Chris Le Tissier (later licensed as GU6JST); Tim Hodkinson (aged 13) (GU6JSC); Dr Stanley Kellett Smith, GU6JVM; course instructor John Morris, GU6BGI, and Koos Scheffer

of questions, and I now know G3HB's *RAE Manual* like the back of my hand!

Anyway, by the beginning of December I had managed to cover just about everything, and one Monday evening my team all went down to the Guernsey College of Further Education where they took the examination as external candidates. I heard some despondent reports when they left the examination room, and complaints about "botched up" RAE questions. I began to feel my own confidence diving, and the following weeks were a bit tense while we waited for the results.

However, when I got back from school one bleak February evening I heard to my delight that the results were out, and that only one student had been referred to re-take one paper! The other five had come up with some pretty good results, much to my surprise, and one had gained Distinction grades in both papers! Tim Hodkinson, my youngest pupil, was to become Britain's youngest radio amateur when he received his GU6JSC licence on the day before his 14th birthday.

Guernsey ARS president, GU3MBS, went a bit overboard with all the good news, and there was an item on RSGB GB2RS News, together with pictures in our local paper and in *Rad Com*, and even a mention in *Wireless World*. But I was really pleased to receive a nice letter of commendation from RSGB President Dr John Allaway, G3FKM. It seems that he is not very used to writing to 16-year-old RAE instructors!

Considering the results of the previous course, I had few worries about volunteering as instructor for the course for the December 1982 examination. Once again Richard Stockwell, GU8FBO, took the class for the long course for the May exam. This time eight people turned up to start with me, and we were joined by one who had to re-sit one paper. On this occasion I was able to plan things much better, and I was determined not to let anybody fail! Once again there was a lot of hard work, and I am pleased to report that everyone passed, including 14-year-old Andrew Hamon (now GU6TDE). There are now seven radio amateurs in Guernsey's schools. Until I got my own licence two years ago there was none.

I think that the RAE syllabus gives a wide and interesting introduction to communications and electronics, however, sometimes I think that straightforward and unambiguous questions, with a higher pass mark to match, might be an improvement.

Here in Guernsey we are very lucky. It is up to the island's radio amateurs, through the Guernsey Amateur Radio Society, to organize courses ourselves. This results in a very friendly club atmosphere at classes, and allows for the enrolment of young people (and instructor!) who might be unlikely to go along to a college of adult education. Another result is that nearly every local amateur is a Guernsey ARS member! Any young radio hams who might find themselves with similar opportunities to myself should make the most of them.

I would like to especially thank Richard Stockwell, GU8FBO, who taught me so much, and also my students who worked so hard.

GU6BGI's pupils have together taken 29 RAE papers, and gained five Distinctions, 18 Credits, five Passes, with only one student referred to re-take one paper. Resulting licences are GU6JQF, GU6JSC, GU6JST, GU6JVM, GU6KEH, GU6SPP, GU6SWH, GU6TDE, GU6TLQ, GU6TKE, G6TKH, GU6SYK and GU6WCZ. □

SWL News

*by Bob Treacher, BRS 32525**

Computers and the swl

G4INP has advised me of the Sinclair Amateur Radio User Group, which is open to swl and licensed amateurs alike and provides a means of sharing circuits, programs and hints on the use of the Sinclair micros in amateur radio. Programs so far include QRAs, coil winding, antenna plotting, morse sending and receiving, and rtty. A system has been designed whereby morse can be received on the ZX81 with minimum hardware, requiring only a simple-to-build interface, which you can build yourself, and three connections inside the ZX81. Using the same interface, rtty can be received. Several projects are up and coming. They are a full ZX81 rtty system with a pcb available, and a comprehensive locator and distance suite for the Spectrum. The swl will find many uses for the micro in his shack, including calculation of the muf (program soon available), antenna bearings for satellite tracking, logging, contesting and listening to rtty and cw. The micro can even help you to learn morse. G4INP will be happy to provide more details on receipt of an sae; he is QTHR.

UBA 1983 Competition

Marc Domen, ONL6945, forwarded the first quarterly results of the UBA's all-year-round contest. It is pleasing, yet frustrating, to see 123 swl entries! The listings, however, show only a few British swls; the highest-placed RSGB listener in the phone section was BRS51634 in 52nd place, although BRS44395 was 2nd in the cw section. Perhaps the HF Contests Committee ought to consider a similar contest next year? However, the rules of the UBA event are not too dissimilar from our own countries table, although the one difference between them is that the UBA rules allow the total number of different countries to be multiplied by the total of the six-band score.

YL news

It is pleasant to be able to report some news from two yl members. First, a welcome to Tina Keil, a new member from Eire. Tina did not give her BRS number (please do that next time, Tina), but she holds two other swl numbers—EI835 and DE1YLT. She included a countries table score which has been entered as EI835 for the time being. After using an FRG7700M for some time, she is now able to use the receive side of an FT-ONE. An MM4001 rtty converter is also used, and Tina is hoping to build an sstv converter from a design by G3WCY. Although her QTH is located in a valley, with mountainous areas and forests all around, she is satisfied with her listening exploits to date.

My xyl, BRS62088, has also been more active of late, and has also entered a table score for the first time. CQ WPX provided a few new countries for her but, in general, conditions were fairly ordinary during that event. Best dx during WPX was FM7CD, VO1AW and YY3BQS on 7MHz, and 9H3AM and 9K2BE on 28MHz. Outside the contest JY8KG and TT8/DL9ZAX on 28MHz, plus EE1ONS, TO5RV/FC, VP8MT, YI1BGD and 5H3JR on 14MHz, and ZS3KC on 7MHz were logged.

News and views

Peter Lincoln, BRS42979, reported the latest on his CWR670 telereader. He had been carrying out some comparison tests with the MM2001, and considers the CWR670 a little better because of the narrower filters. It also has the advantages of being connectable to a scope, and that the tuning can be adjusted more precisely. RTTY QSLs to hand so far include one from CR9AN, and one from WA1AW who also forwarded details of the ARRL rtty news transmissions.

John Sutton, G6TEP (exBRS35509), reported little hf activity, as he has purchased an FT290R for use on 144MHz. He is awaiting the dx season on that band so that he can report the good dx to this page. From his QTH at Margate, Kent, he has the useful advantage of being close to the Continent.

Brian Wainwright, BRS44703, has been studying for the RAE so did not have too much to report. However, he listed some interesting dx, most of which we have mentioned over the last couple of months, but TL8CK on 28MHz, JT1BG on 21MHz, ZL4PO/C on 7MHz, and 3V8AA on 3·5MHz were the more notable callsigns listed.

Colin Watson, BRS46598, had been using his 144MHz scanner while driving around Scotland. From a portable QTH near St Andrews he could hear GB3SB, GB3PR and GB3GN on a λ/4 whip antenna.

Dave Whitaker, BRS25429, has been receiving a flood of QSL cards as a result of his activities on 144MHz last summer. He now has 90 QTH locators confirmed, helped recently by OE3JWC (HI75g), EI2BBB (VM37h), F1CAS/P (AF79h), OK1MDK (HJ06e), SM5MIX (HS66g), Y46XF (HL24h), SM4KL (GT46d) and LA9CM (FT72h). Readers may be interested to know that Dave is recording details of all the dx heard on 144MHz, so if anyone needs to know which QTH locator any particular dx station is located in, he may be able to help. To date he has QTH information for over 800 stations, including 150 SMs! On the hf scene, Dave went to the NEC exhibition and eyeballed G3ZAY, G3FKM and G3GIQ. FB8XAB and 4S7OM obliged for new confirmations on 7MHz, while VK6HD provided Zone 29 on 3·5MHz. JT1AO and 9N1MM provided two new 7MHz countries.

Harold Moss, BRS18529, has been largely inactive, but was pleased with 9N1MM on 7MHz. TZ6BMA, TG9GI and J73CB were the best catches on 14MHz, while FB8ZP and FH8CQ were new on 28MHz. There are very few reports of much 28MHz activity these days, with the band "dead" for long periods. However, several listeners have managed to break the 100-countries barrier for the year. Paul Crankshaw, BRS48909, was another to mention 9N1MM on 7MHz, giving him his 160th country on the band. He also remarked on KL7IHP/VS6, N5RM/SU, 4S7NE and 9M2CH on 14MHz, and DF1MM/C6A and VE3CVX/J37 on 3·5MHz.

Brad Bradbury, BRS1066, also reported some inactive periods, but he was pleased to catch VP9IB on 10MHz and VK6AKG on 24MHz. Brad now has three countries heard on 24MHz, 13 on 18MHz and 42 on 10MHz. He has received a QSL from HI8RPD for a 10MHz logging, plus UD6DHC and UM8MAZ on 1·8MHz, and also had a direct QSL from BY8AA.

For once, Robert Small, BRS8841, reported a poor month. His high spot was meeting VO1FG who was passing through London on his way to a holiday in South Africa. Elsewhere, Robert had received a speedy QSL from VK0JS for his 315th DXCC confirmation. Also received were cards from F6FIC/TZ, J20/Z, 6C35O, FB8ZQ, TT8AD and 7Q7LW.

1983 HF Countries Table

(Starting score 150)

Station	28	21	14	7	3·5	1·8	Total	Mode
BRS8841	118	153	173	121	116	31	712	ssb/cw
BRS48909	112	148	156	95	94	29	634	ssb
BRS44395	78	122	131	85	57	29	502	cw
BRS44703	100	84	75	68	106	34	467	ssb
BRS1066	69	82	99	99	67	36	452	cw
BRS50134	47	102	79	80	93	26	427	ssb
BRS52543	28	72	80	95	104	22	401	ssb
BRS25901	73	84	101	52	67	10	387	ssb
BRS46084/7Q7	82	116	124	42	18	0	382	ssb
RS49327	63	91	114	57	39	11	375	ssb
RS53844	24	56	79	51	51	9	270	ssb
RS49875	37	61	96	37	17	5	253	ssb
BRS42979	35	45	58	36	50	19	243	ssb/rtty/sstv
ORS45992/7Q7	25	77	112	8	0	0	222	ssb
BRS25429	0	0	0	82	104	28	214	ssb
G6TEP (exBRS35509)	39	35	34	36	59	2	205	ssb
EI-835	21	46	89	22	23	3	204	ssb
BRS18529	14	11	11	44	86	17	183	ssb
BRS62088	11	19	45	42	48	8	173	ssb

Newcomers

Dave Shapiro, RS53844, joined the Society in February. He has entered a table score and, thanks to some good propagation at around tea-time on 21 and 14MHz, has been pleased to log stations in 9J2, PY, 7P8, HZ and DU, all at 59. He discovered the lower frequency challenge too late, but was hoping for another. The finishing touches are being put to an all-band challenge to coincide with CQ WW in October. More details in due course, but it should be an exciting way to boost those scores.

Finale

News, views, table scores plus, hopefully, news of vhf activity should reach your scribe by Tuesday 14 June for publication in the August issue, with short late items by Wednesday 23 June. It is worth remembering that there are vhf contests with swl sections on 26 June and 2–3 July. Why not have a go? Apologies for publishing the all-time table one month early in the May issue. A revised all-time table will be included in due course. □

*79 Granby Road, Eltham, London SE9 1EH.

Contest News

Low Power Field Day 1983 rules

When the rules for last year's 3·5MHz Field Day were published, the HF Contests Committee asked entrants for comments and suggestions with a view to changing the format of the contest so that it was more attractive for those with an enthusiasm for low power portable operation.

The committee was delighted to receive no fewer than 22 suggestions of ways to change the contest. As a result of their consideration by the committee several changes have been incorporated in this year's event, the main one being to make the contest dual band, using both 7 and 3·5MHz. It is therefore important that intending entrants read the rules carefully.

The committee would like to thank most sincerely those people who tendered comments for its consideration, and it is hoped that the changes made will encourage greater participation.

BRS32525

1. The general rules for RSGB hf contests, published in the supplement to the January 1983 issue of *Radio Communication*, will apply.
2. Eligible entrants. RSGB members resident in the British Isles. Multi-operator entries will be accepted.
3. Periods. a) 0900–1200gmt on 3·5MHz between 3·520–3·570MHz only, and b) 13–1600gmt on 7MHz between 7·010–7·040MHz only on Sunday 17 July 1983.
4. Sections: a) 15W dc input maximum
b) 5W dc input maximum
5. Contest call and exchange. Call CQ FD. Exchange RST plus serial number, starting at 001, on each band, together with location (defined by a place name) and county code (see the supplement to the January 1983 issue of *Radio Communication*).
6. Scoring.
Portable or mobile stations ..... 15 points per QSO
Fixed stations ..... 5 points per QSO
A station may be worked once on each band.
7. Special conditions.
a) Power. The power for all parts of the station must be derived from dry batteries, accumulators, or "natural" sources (eg solar cells or wind-driven generators). The practice of float charging batteries from petrol, gas, or diesel driven generators is not permitted.
b) Equipment. Entrants using equipment capable of running more power than the specified input power for the section entered must specify how the power limit was adhered to.
c) Antennas. The maximum height must not exceed 35ft (11·5m) above ground level.
8. Logs. Standard RSGB hf contest log sheets (HFC1) must be used, with column (5) headed "Location and county code received".
9. Declaration. The log sheets must be accompanied by the standard RSGB hf contest summary sheet (HFC2) with the declaration signed by the operator responsible for the contest entry.
10. Address for logs. Logs should be postmarked not later than the Monday 15 days after the end of the contest, and sent to RSGB HF Contests Committee, c/o R. A. Treacher, BRS32525, 79 Granby Road, Eltham, London, SE9 1EH.
11. Awards
a) The Houston-Fergus Trophy will be awarded to the leading station in the 15W section.
b) Certificates of merit will be sent to the first three stations in each section.
c) A certificate of merit will be awarded to the fixed station, irrespective of power, who gives most points to portable stations, and who submits a check log.

IARU Region 1 VHF/UHF/SHF Contest rules

1. Eligible entrants. All licensed radio amateurs in Region 1 can participate in the contests. Multi-band entries from UK groups competing in the IARU Region 1 UHF/SHF contest, working from a single location and using one callsign on each band, will be accepted for the "all other stations" section of the contest. The contest entry should show which single callsign should be used in the final tabulation of the results. Contestants must operate within the letter and spirit of the contest and at no greater power than permitted in the ordinary licences of their country. Stations operating under special high power licences do so *hors concours* and cannot be placed in the contest proper.
2. Contest sections. The contest will comprise two sections for each band:
1. Single-operator station, operated by owner of the licence (no club stations).
2. All other stations.
3. Dates of contests.
VHF Contest: The contest will take place during 3 and 4 September 1983 on the 144MHz band.
UHF/SHF Contest: The contest will take place during 1 and 2 October 1983 on 432MHz and each higher band.
4. Duration of contest. The contests will commence at 1400gmt on the Saturday, and will end at 1400gmt on the Sunday.
5. Contacts. Each station can be worked only once on each band, whether it is fixed, portable, or mobile. If a station is worked again during the same contest, only one contact will count for points, but any duplicate contact should be logged without claim for points and clearly marked as duplicate. Contacts made via active repeaters of translators do not count for points. Any telephony contact made with stations generating in the cw (A1A) sub-band shall not count for points.
6. Type of emission. Contacts may be made on A1A, J3E, R3E, F3E. F2A may be used above 1GHz. Only one transmitter or transceiver may be used on each band at any time.
7. Contest exchanges. Code numbers exchanged during each contact shall consist of the RS or RST report, followed by a serial number commencing at 001 for the first contact on each band, and increasing by one for each successive contact on this band; this must be immediately followed by the QTH locator of the sending station (eg 59 003 GX24j or 579023 HG46e).
8. Scoring. Points will be scored on the basis of .1pt/km. The final claimed score must be shown on the first sheet.
9. Entries. Entries should be sent to the VHF Contests Committee, c/o the adjudicator for the RSGB contest on the same date.
10. Awards. The winner of each section will receive a certificate. The entrants compete for the following challenge trophies:
VHF contest: (a) The IARU Region 1 VHF Trophy, for the winner of Section 1. (b) The PZK Trophy, for the winner of Section 2.
UHF/SHF contest: (a) The Vittoria Alata Cup 1, for the winner of the 432MHz Fixed Section. (b) The Vittoria Alata Cup 2, for the winner of the 432MHz Portable/Mobile Section.
Overall winner: An overall winner of the IARU Region 1 UHF/SHF Contest will be declared. For this competition, the scores of the entrants will be combined, using the following multipliers:

432MHz	×1
1,296MHz	×5
2,400MHz	×10
Higher bands	×20

The entrant scoring highest will be awarded an IARU Region 1 Medal. The 1983 organizing society is the Norwegian national society, NRRL.

432MHz Low Power & SWL Contest rules

0900–1700gmt, 31 July 1983
The transmitter output must not exceed 15W.
The following general rules, published in the January 1983 issue of *Radio Communication* will apply: 1, 2, 3, 4e, 5a, 6a, 7a, 9, 10a, 11a, 12a, 13–26.
All entries and checklogs to VHF Contests Committee, c/o Mrs P. Suckling, G4KGC, 46 Windsor Close, Towcester, Northants NN12 7JB.

70MHz Trophy & SWL Contest rules

0900–1700gmt, 14 August 1983
The following general rules, published in the January 1983 issue of *Radio Communication* will apply: 1, 2, 3, 4e, 5a, 6a, 7a, 9, 10a, 11a, 12a, 13–26.
All entries and checklogs to VHF Contests Committee, c/o C. Sharpe, G2HIF, 20 Harcourt Road, Wantage, Oxon OX12 7DQ.

DF Qualifying Event Dartford Heath

Date: 26 June 1983
Map: OS Sheet 177, 1:50000 series, East London
Assembly: 1300bst for start at 1320bst
Location: Dartford Heath; car park just south of Layton Cross, ngr 526725
Competitors requiring tea should notify Mr C. Merry, 11 Edith Road, Chelsfield, Orpington, Kent BR6 6JQ, tel 0689 59381, not later than 19 June 1983.

DF Qualifying Event Salisbury

Date: 10 July 1983
Map: OS Sheet 184, 1:50000 series, Salisbury and the Plain
Assembly: 1300bst for start at 1320bst
Location: On A345, 2 miles south of Amesbury, ngr 159382
Competitors requiring tea should notify Mr A. Newman, 74 Victoria Road, Wilton, Salisbury, Wilts SP2 0DY, tel 0722 743837, not later than 3 July 1983.

144MHz Fixed Station Contest results

This very popular contest was again well supported, with entries up on the previous year. The 427 forms contained many useful comments and some interesting suggestions for consideration by the committee. One group suggested that the log sheets be changed from 30 to 40 per page, presumably in the context of computer print-out entries. It is significant that 93 per cent of logs received were hand written.

Congratulations to the winners G4ANT and G4MDZ, and particularly to both runners-up, G4NXO and G4BWG who both operated from non-"U" areas.

Adjudicator's thanks for many check logs.

G5HD

SINGLE-OPERATOR

Posn	Callsign	Points	QSOs	QRA	Best dx	Km
1	G4MDZ	3,626	354	AL76	DG7AT	675
2	G4BWG	3,054	420	ZL60	GM8FFX	661
3	G3NNG	2,551	341	ZL23	GM8SAU	821
4	G4DEV	2,236	238	AL67	GD4IOM	525
5	G8CKZ	1,879	260	ZK04	GI8YDZ	610
6	GM8YJU	1,743	168	YO05	GJ4JWA	630
7	G6ECM	1,514	190	AL56	DL3YBP	520
8	G4ASR	1,307	255	ZL40	F1GTR	575
9	G4KUX	1,207	146	ZO21	PA3BRS	587
10	G8XVJ	1,195	193	YN48	GU8NIS	440

Posn	Callsign	Points	QSOs	QRA	Best dx	Km
11	G8ZWJ	1,147	114	AK12	DF7DJ	528
12	GI4OPH	1,072	84	XO33	GJ4JWA	630
13	G8WPD	1,067	209	ZN51	DL4NBT	835
14	GW4ALG	982	201	YL37	PE1ILC	507
15	G6FPU	863	168	ZM51	DL2QC	560
16	G8SVF	763	175	YM30	F1FHI	622
17	G4NVA	696	153	YN69	G4MDZ	334
18	G4PSU	670	165	ZL24	PA0ME/A	419
19	G6NHU	654	179	AL11	DJ9UX	488
20	G8JXV	481	126	ZL60	GW3KJW	335
21	G6HIC	472	96	ZM04	GW4JWA	422
22	G8VAY	469	107	YN69	GM8OEG	371
23	G4HAY	452	120	ZL30	GM8YJU	396
24	G8ZQB	425	107	ZM35	G8DPV	350
25	G8GGG	423	101	ZL24	F1FHI	505
26	G6KLG	415	101	AL62	DF7KF	444
27	G4FVK	407	84	ZM39	GI4OPH	410
28	G8EGL	654	136	ZN33	G8IQO	333
29	G8PNN	635	55	ZP52	G4RFR	501
30	G8RDZ	619	125	ZN52	GJ4JWA	437
31	G4ATH/A	615	99	YN15	GJ4JWA	519
32	G4HLX	597	141	ZL23	GD4IOM	348
33	G6RKR	576	97	ZN17	G8OPV	470
34	G4JLG	520	104	YN39	GJ4JWA	455
35	G8TPR	501	144	ZL39	GM8YJU	421
36	G8GWC	488	106	ZM69	GJ4JWA	357
37	G8ABI/A	388	112	ZL39	DL3YBP	600
38	G4NPS	370	72	ZN40	GW2OP	385
39	G6CHD	358	95	YN78	G4MDZ	310
40	G6ATA	337	83	ZL24	GM8YJU	385
41	G4MID	322	53	AM64	G4KUX	323
42	G3ORX	317	73	YL49	PA0NIE/A	480
43	G8XWA	316	44	YO57	G4MDZ	433
44	G8UIO	299	77	ZM53	GI4OPH	364
45	G8XTJ	284	82	ZL27	GD4IOM	379
46	G6HML	278	54	AM44	G4KUX	307
47	G8UCN	276	58	ZN43	GM6MJY	399
48	G8OMI	272	82	ZM41	GD4IOM	265
49	G6GJG	262	104	ZL40	GJ4JWA	298
50	G4OTV	258	88	AL62	GW2OP	365
51	G6DTD	239	61	YN48	G6ECM	343
52	G8YEZ	228	56	AL33	GM8YQD	456
53	G8TBL	223	71	AL51	G8WXA	290
54	G4ASL	222	78	ZL60	GM8YJU	449
55	G4EUR	219	57	ZM35	F1EYM/A	399
56	G8AKB	210	55	ZM27	GD4IOM	301
57	G6LZD	204	65	ZL10	PA0NIE/A	338
58	G8UYD	192	60	ZN64	GD4IOM	252
59	G4PDP	178	56	ZM80	PA0NIE/A	355
60	G8IGQ	176	51	ZM04	GD4IOM	264
61	G6FXH	175	29	YK23	G4ANT	400
62	G8TLC	173	61	ZM25	GM8YJU	291
63	G4NSD	151	61	AL51	G6DKN	214
64	G6AFH	121	63	YN49	GM8YJU	167
65	G8TZJ	97	25	YN07	G3NNG	262
66	G8LXY	94	60	ZL09	G4MDZ	139
67	G3GQC	80	40	ZN65	G4BRK	113
68	G6CQB	71	37	ZL29	G4NXO	133
69	G8UDV	56	38	ZL39	G4NXO	127
70	G6NVS	55	23	ZM21	G8RLW	169
71	G2WS	54	14	YL56	F6FLB	330
72	G4PXW	15	5	AL63	G6CHK	103

MULTI-OPERATOR

Posn	Callsign	Points	QSOs	QRA	Best dx	Km
1	G4ANT	4,479	371	AM27	DD8SI	657
2	G4NXO	3,710	410	YL19	DF9CY	715
3	G8RZO	3,391	360	AL45	DG7AT	690
4	G8ZHP	3,205	275	ZM29	DC2GY	751
5	GD4IOM	2,566	244	XO67	F6FLB	559
6	G4DEZ	2,111	247	AL35	DG7AT	686
7	G4PSX	2,087	302	ZL56	DL6FAW	613
8	G3RQZ	2,086	340	AL51	GM6HGY	654
9	G4KAR	2,072	192	AK12	DG9ZH	614
10	G6IKS	2,041	199	AL24	DF8AE	535
11	G3OUL	1,940	284	YN46	F1FHI	703
12	G4NUT	1,583	253	ZM77	F6CCH	591
13	G4BRK	1,329	225	ZM68	DF7DJ	561
14	G4RFR	1,320	195	ZK11	GI4GVS	509
15	G4NJR	1,249	234	YM10	ON4BG	472
16	G4MHC	1,196	216	YM79	DF8KV	656
17	G6DOD	1,171	239	ZL09	GM6MJY	585
18	G6MGL	1,153	223	AL31	DL6FAW	567
19	G6CYL	1,067	155	AM64	GI4LKA	516
20	G8AHK	1,029	192	ZL68	GM4CXM	—
21	G6UT	994	205	AL11	DB1BP	515
22	G8TIC	974	193	YM69	DK7KF	635
23	G4HVC	963	181	ZN67	DF8KV	575
24	G4MEL	961	192	ZL80	DD4QI	531
25	GW2OP	956	100	XL26	ON7CB	645
26	G4HSK	926	186	AL33	GI4OPH	517
27	G8NTD	859	204	ZM34	F1FHI	564
28	G6LUA	791	181	ZL10	DF8KV	502
29	G3TAD	779	166	YL48	PA0NIE	507
30	G6CW	769	179	ZM05	F0DPS	739
31	G3BZU	704	153	ZK05	DF8KV	568
32	G6KPE	698	180	ZM51	GM4KTJ	425
33	G5FZ	691	142	ZN68	F1KCP	546
34	G8IQO	673	95	AK12	DF8KV	460
35	G3UOA	633	170	ZM10	G6PNN	350
36	G6CAQ	618	178	ZL39	F1FEM	548
37	G4LIZ	610	88	ZN19	GJ4JWA	519
38	G4CHK	607	171	ZL27	F1FHI	509
39	G8JAY	572	122	YL10	GM8MJV	449
40	G8ZKE	568	164	ZM41	PA0NIE	470
41	G3SDC	551	150	ZM25	F1FHI	612
42	G8JAM	487	126	ZM25	GM4CMX	210
43	G8MLQ	485	129	AL41	GD4IOM	437
44	G3RR	471	79	YN10	GJ4JWA	520
45	G6ECC	455	69	XK57	GM6MJY	740
46	G8TRS	414	118	ZM32	PA0ERM	441
47	G6EDS	402	114	ZM78	PA0NIE	360
48	G6HOH	390	123	ZL08	GM8YJU	383

Contests calendar

4-5 June	NFD *(Rules in February issue)*
4-5 June	V Diploma Guide Dog *(Rules in June* MOTA*)*
12 June	70MHz/SWL *(Rules in May issue)*
12 June	DF Qualifying Event Rugby *(Details in May issue)*
18-19 June	24th All Asian (Phone) *(Rules in June* MOTA*)*
18-19 June	4th EU Fraternising CW QSO Party *(Rules in June* MOTA*)*
19 June	BATC ATV Summerfun *(Rules in May issue)*
25-26 June	Summer 1·8MHz *(Rules in May issue)*
25-26 June	7th Citta di Messina *(Rules in June* MOTA*)*
26 June	VHF 144/432MHz Phone *(Rules in April issue)*
26 June	DF Qualifying Event Dartford Heath *(Details in June issue)*
2-3 July	VHF NFD *(Rules in April issue)*
10 July	DF Qualifying Event Salisbury *(Details in June issue)*
17 July	3·5MHz FD *(Rules in June issue)*
31 July	432MHz Low Power *(Rules in June issue)*
31 July	DF Qualifying Event Mid-Thames
14 August	70MHz Trophy & SWL *(Rules in June issue)*
21 August	DF Qualifying Event Slade
27-28 August	24th All Asian (CW) *(Rules in June* MOTA*)*
28 August	ROPOCO 2
3-4 September	144MHz Trophy & SWL (IARU) *(Rules in June issue)*
3-4 September	SSB Field Day *(Rules in May issue)*
11-12 September	International ATV *(Rules in May issue)*
18 September	DF National Final South Manchester
October/ November	432MHz Cumulative
1-2 October	432-24GHz & SWL (IARU) *(Rules in June issue)*
9 October	21-28MHz Phone *(Rules in May issue)*
16 October	21MHz CW *(Rules in May issue)*
16 October	1,296MHz Cumulative
5-6 November	144MHz CW
6 November	LF CW *(Rules in April issue)*
12-13 November	Second 1·8MHz
4 December	144MHz Fixed

Posn	Callsign	Points	QSOs	QRA	Best dx	Km
49	G3LRS	350	114	ZM25	DF7GO	574
50	G6LRC	340	114	ZL07	GM8YJU	374
51	G3CMH	325	108	YK07	F1GTV	—
52	G6PNB	322	80	YL38	GD4IOM	320
53	G3GDU	309	97	ZL80	GM8YJU	467
54	G8XYS	300	58	YK23	G8RLW	414
55	G4BLX	191	77	ZL30	PA0NIE	330
56	G8YGD	171	62	ZL67	F1FQM	231
57	GW3SSY	91	33	YL15	GJ4JWA	235

White Rose ARS Third Lower Frequency Bands SWL Contest results

This year's contest was arranged to coincide with two major cw transmitting contests—CQWW 160m, and the French DX Contest. Sadly, all this increased cw activity did not rub off on our listeners and only seven entries were received. However, the phone section did well once again, and an interesting selection of stations was heard throughout the contest. Entries were slightly down on last year, particularly from the UK, but increased support came from the Continent and Japan. Altogether 14 countries were represented and the White Rose ARS would like to thank all those who sent in logs for making the event a truly international affair.

PHONE SECTION

Posn	Contestant	1·8MHz	3·5MHz	7MHz	Mult	Total
1	R. Smit, NL/8207	Nil	534	416	109	103,550
2	M. Domen, ONL/6945	Nil	532	219	120	90,120
3	P. van Audenaeren, ONL/5566	2	566	152	122	87,840
4	M. Parry (England)	8	545	331	99	87,516
5	I. Unrau, DLH03/1946086	2	503	275	97	75,660
6	D. A. Whitaker, BRS25429	Nil	529	117	113	72,998
7	A. Miller (England)	Nil	343	232	98	56,350
8	R. A. Treacher, BRS32525	9	346	183	101	54,338
9	R. Pols, BRS31440	12	301	206	103	53,457
10	N. Hembry, BRS28198	18	491	56	90	50,850
11	R. Akhurst, BRS25209	4	405	110	67	43,077
12	T. D. Feise, DE6XTA	6	278	194	72	34,272
13	T. Keil, EI/835	1	221	203	68	28,900
14	A. Edmondson, BRS47285	6	241	116	75	27,225
15	J. Zerlk (Germany)	Nil	216	239	50	22,750
16	F. van Oostenbrugge, NL-4483	Nil	229	55	47	13,348
17	C. Thomson, ZL1/287	Nil	61	206	49	13,083
18	E. Bartunek, OE1/109976	Nil	210	27	53	12,561
19	R. Bouchet, ONL/620	Nil	109	108	48	10,416
20	R. Wishart (Scotland)	Nil	240	Nil	41	9,840
21	J. Davies, BRS42501	9	158	50	37	8,029
22	I. Kazir, 4X4/1401	16	21	183	35	7,700
23	R. Tanaka, JA6	Nil	76	88	29	4,756
24	T. Mollers, BD1BC	Nil	30	77	25	2,675
25	J. E. Treacher, BRS62088	3	33	61	21	2,037
26	M. Opsommer (Belgium)	Nil	Nil	123	13	1,599
27	H. Ohashi, JAZ-8764	Nil	29	490	3	1,557
28	B. Woodcock (England)	Nil	51	16	23	1,541
29	G. Butow, OE1/114081	Nil	19	54	21	1,533
30	W. Schommer, DE1WSS	Nil	18	58	15	1,146
31	T. Fijiki, JA1-Z8001	Nil	6	62	11	748

CW SECTION

Posn	Contestant	1·8MHz	3·5MHz	7MHz	Mult	Total
1	E. L. Antalfy, HE9EVI	29	46	155	59	13,570
2	K. Karolj, YU7RS-713	Nil	56	168	60	13,440
3	K. Suzuki, JA6-9330/JAI	43	35	177	40	10,200
4	C. Luc, ONL-7347	Nil	55	127	25	4,550
5	T. Ogata, JA9-2840	6	12	27	7	315
6	A. Takano, JAI-7777	25	6	6	8	296
7	D. Hanak, OK2-9329	11	Nil	Nil	10	110

Club News

The following is the latest information received by RRs from RSGB affiliated societies, clubs and groups in time for inclusion in this issue. Basic unchanged information on other affiliated organizations will be published in the July issue.

RSGB affiliated organizations are requested to report all programmes and news items to their regional representatives regularly. Information for inclusion in the **August** issue should reach them by **11 June** and for the **September** issue by **7 July.**

Club programmes are given in order of date, subject, time and place of the meeting. All callsigns of club secretaries and other contacts are QTHR (correct in the current *RSGB Call Book)* unless otherwise stated.

All clubs welcome visitors and would be pleased to hear from potential new members.

REGION 1—RR W. R. Parkinson, G3FNM, 141 Norris Road, Sale, Cheshire M33 3JR. Tel 061-973 1472.

Accrington (NW Repeater Group)—16 June, 8pm. Globe Bowling Club, Willows Lane, Accrington. Sec Howard Aspinall, G3RXH.

Ainsdale (AARC)—7, 21 June, 14 June (Club visit to the Heysham Nuclear Power Station), 7.15pm. Ainsdale Scouts HQ. Sec Joe Wollaston, G6JOE, tel 0704 27219. CW classes are now held at the club.

Blackburn (East Lancs ARC)—7 June (A general get-together and quiz), 5 July (A talk on satellites by a member of Amsat), 7.30pm. Shadsworth Leisure Centre, Blackburn. Pro Graham Pountain, G4MWY, tel 0254 678933.

Bury (BRS)—14 June (Formal meeting with a guest speaker, details from pro), 7, 21, 28 June (Informal meetings). Mosses Community Centre, Cecil Street, Bury. Newcomers are invited to contact the sec Brian Tyldsley, G6OKE, tel 0282 24254, for further information. Pro Malcolm Pritchard, G3VNQ, tel 0706 355922.

Fylde (FARS)—7 June (Equipment sale), 21 June ("Repeaters—their logistics and their logic", by Steve Williamson, G3WGU), 5 July ("Computers in the home", a talk), 7.45pm. The Kite Club, Blackpool Airport. Sec Wally Poupard, 14 Beach Street, Lytham, tel 0253 734596.

Leyland (LHARG)—13 June, 11 July, 7.30pm. Astley Park Sports Club, Hallgate, Astley Village, Chorley. Sec Arthur Jolly, G4JCO.

Liverpool (L & D ARS)—7 June ("Conversion of 11m multi-modes to 10m", by A. Evens), 14 June (Talk on repeaters by G. Adams, G3LEQ), 21 June (Equipment show by G. Adams, G3LEQ), 28 June ("Amateur tv", by Colin, G3RLA, and John, G6DBP), 5 July ("HF inquest", by Al Neilson, G4CVZ), 8.15pm. Wavertree Conservative Association, Church Road, Wavertree, Liverpool. Sec Gordon Purslow, G6MHG, tel 051-263 5837.

Manchester (South Manchester RC)—3 June (Kit construction contest part 2), 10 June (Visit to a telephone exchange), 17 June ("Aerial logistics"), 24 June (Mid-summer df and barbecue), 1 July (Preparation for VHF Field Day), 8pm. Sale Moor Community Centre, Norris Road, Sale. Informal meetings Monday evenings in the club shack. Sec David Holland, G3WFT, tel 061-973 1837.

Preston (PARS)—2, 16, 30 June (Fox hunts), 9 June (Subject to be announced), 23 June (Preparations for VHF NFD), 6 July (Visit to Heysham nuclear power station), 8pm. Lonsdale Club, Fulwood Hall Lane, Fulwood, Preston. Sec George Earnshaw, G3ZXC, tel 0772 718175.

Thornton Cleveleys (TCARS)—6 June (Talk on computers), 13 June (Talk on hf aerials by Len Green, G3AOW), 20 June (Film and talk on car rallying), 27 June (Natter night), 4 July (Talk on ordnance survey by Mr R. Trotter), 7.45pm. Norbreck First Scout Hut, Carr Road, Bispham. Sec Mrs Jen Ward, G8YOK, tel 0253 890114.

Warrington (UK FM Group Western)—2 June, 7 July. Grappenhall Community Centre, Bellhouse Lane, Warrington. Sec Gordon Adams, G3LEQ, tel 0565 4040.

Wirral (WARS)—1 June (Pre-National Field Day meeting), 15 June ("Aerials in small gardens"), 6 July (Sale of surplus equipment), 7.45pm. Minto House School, Birkenhead Road, Meols, Wirral. Sec Cedric Cawthorne, G4KFY, tel 051-625 7311.

REGION 2—RR D. S. Smith, G4DAX, Red Roof, Goathland, Whitby, North Yorks YO22 5AN. Tel 094 786 333.

Bradford (UoBARS)—Wednesdays, 7.45pm. N10, Main Building. Sec G8GOV. Net frequency 145·275MHz.

Denby Dale (DD&DARS)—Second and fourth Wednesday in each month, 1 June (Rally meeting), 15 June (Rally meeting), 22 June (Rally inquest), 13 July (G4RV), 7.30pm. Pie Hall, Denby Dale. Don't forget the rally on 19 June. Sec J. Clegg G3FQH.

Goole (G&DARS)—7 June (Natter night), 14 June (Treasure hunt), 21 June (Ham radio picnic (barbecue in the woods)), 28 June (VHF NFD preparation), 5 July (Natter night), 8pm. The Junior Chamber Buildings, Boothferry Road, Goole. Sec Richard Sugden, G8IOH. Details from G8IOH or G8VHL.

Halifax (H&DARS)—First and third Tuesdays in each month, 21 June (Surplus sale), 7.30pm. Clairmount Liberal Club, Belgrave Avenue, off Clairmount Road, Halifax. Sec G4LEC, tel 0422 33080.

Halifax (Northern Heights ARS)—First and third Wednesday in each month, 1 June (Natter night), 15 June (Rig alignment and test gear demo), 29 June ("Radio in light aircraft"), 13 July (Junk sale), 8pm. Bradshaw Tavern, Bradshaw, Halifax. Sec G6CJL. Club net frequency is 145·275MHz.

Ripon (R&DARS)—Thursdays, 7pm. St John Ambulance Hall, Ripon. Sec P. Faultley, G6CUG, tel 0845 24945.

Spen Valley (SVARS)—Thursdays, 9 June (Surplus sale), 23 June (Pie and pea supper), 7 July (Swindon Cup, constructional project), 8pm. Old Bank Working Men's Club, Mirfield, W. Yorks. Sec G4MLW.

UK FM Group Northern—5 June, 5 July, 7.30pm. The Royal Hotel, Church Street, Barnsley. Sec G4LUE.

Wakefield (NWRC)—Thursdays, 23 June (Visit to Holme Moss TV tx), 7.45pm. Carr Gate Working Man's Club, Wakefield. Sec G6ELE.

Wakefield (W&DARS)—14 June (2m df hunt), 28 June (TBA), 8pm. Holmfield House, Denby Dale Road, Wakefield. Sec G4BLT, tel Wakefield 255515.

REGION 3—RR L. W. Craven, G4EQI, Grass Moor, Radford Road, Alvechurch, Birmingham B48 7DT. Tel 021-445 1347.

Atherstone (AARC)—9 June (Informal evening), 16 June ("RTTY", by G8SYE), 7.30pm. Tudor Centre, Coleshill Road, Atherstone. Sec G6IQM, tel Fillongley (0676) 40946.

Birmingham (MARS)—21 June (Surplus sale), 7.30pm. 294a Broad Street, Birmingham B1. Sec G8BHE, tel 021-770 3474.

Birmingham (South Birmingham RS)—1 June ("Cosmic radio transmitters", by Dr Graham Alphrey), 7.45pm. Hamstead House, Fairfax Road, West Heath, Birmingham B31. Sec G8RGQ, tel 021-459 8312.

Kidderminster (K&DARC)—7 June ("Antenna systems", by Dave Yates, G3PGQ), 21 June (Surplus equipment sale), 8pm. Aggborough Community Centre, Hoo Road, Kidderminster. Sec Tony, G8WOX, tel Kidderminster (0562) 61584.

Redditch (RRC)—9 June ("Returning from Brunei", by Les Hickingbotham, VS5LH/G3HZG), 23 June (Informal). WRVS Centre, Ludlow Road, Redditch. Sec G3EVT, tel Alcester (0789) 762041.

Solihull (SARS)—21 June ("Antennas and feeders—the truth about gains and losses", by G8AYY), 7.30pm. The Manor House, Solihull. Sec G4NRR, tel 021-707 3684.

Stourbridge (StARS)—6 June (Informal evening), 20 June (Main meeting, subject to be announced), 8pm. The Garibaldi, Cross Street, Stourbridge. Sec G8JTL, tel Lye (038482) 4019.

Stratford-upon-Avon (S-upon-A&DARC)—13 June (Activity night, "test your rig" etc, sophisticated test equipment to be available), 20 June ("Making use of Oscar", by Glen Ross, G8WMR), 7.30pm. Bearley Radio Station. Sec G6CWK, tel Stratford (0789) 68863.

Sutton Coldfield (SCARS)—13 June (Visit to Police Centre, also natter night), 27 June ("Slow and fast scan tv", by Haden Bate, G8AMD). Central Library, Sutton Coldfield. Sec G8TUR, tel 021-353 2061.

Warwick (Mid-Warwickshire ARS)—7 June ("Aerial and feeder systems", by Glen Ross, G8WMR), 21 June (Open meeting), 8pm. 61 Emscote Road, Warwick. Sec Mrs Finnis, G6LKP, tel Southam (096281) 4765.

Worcester (W&DARC)—6 June ("CW operating", by R. Dobdinson, G3RGD). Oddfellows Club. 20 June (Discussion evening at the Old Pheasant Inn), 8pm. New Street, Worcester. Sec G4NRD, tel Evesham (0386) 41508.

REGION 4—RR M. Shardlow, G3SZJ, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. Tel Derby (0332) 556875.

Bourne (BARS)—A new club meets in the Village Hall, Edenham, near Bourne, first and third Tuesdays in each month, 7.30pm. Sec Ian Bothwell, G6SBE, tel 0778 424426.

Buxton (BARS)—14 June (TBA), 28 June (Visit to SMC Chesterfield), 8pm. Egerton Hotel, 36 St Johns Road, Buxton. Sec Derek Carson, G4IHO, tel 0298 5006.

Derby (D&DARS)—1 June (Junk sale), 8 June ("Narrow band tv", a talk by Doug Pitt), 15 June ("The RSGB", by RR Martin Shardlow, G3SZJ), 22 June (TBA), 29 June (Bar-B-Q, at Drum Hill), 7.30pm. 119 Green Lane, Derby. Sec Jenny Shardlow, G4EYM, tel Derby 556875.

Derby (NHARG)—3 June (Rally preparation evening), 10 June (Rally, last minute preparation), 12 June (Fourteenth Elvaston Castle Rally), 17 June ("TV servicing and repairs"), 24 June (The rally—how it went, a discussion), 7.45pm. Room 7, Nunsfield House, Boulton Lane, Alvaston, Derby. Sec Ian Cage, G4CTZ, tel Derby 799452.

Grimsby (GARS)—2 June (NFD preparation), 16 June (DF hunt), 30 June (10MHz transmitter project), 7.30pm. Cromwell Social Club, Cromwell Road, Grimsby. Sec Reg Scarlett, G4HZF.

Grantham (GRC)—21 June (Visit to Texas Instruments), 8pm. Shirley Croft Hotel, Harrowby Road, Grantham. Sec John Kirton, G8WWJ, tel Grantham 5743.

Lincoln (LSWC)—8 June ("Drugs", by Lincolnshire Police), 22 June (Night on the air), 8pm. City Engineers Club, Waterside South, Lincoln. Sec Pam Rose, G8VRJ, tel Gainsborough 788356.

Loughborough (LFARC)—3 June (Preparation for NFD), 10 June (DF exercise, 160m), 17 June (Skittles evening), 19 June (Family treasure hunt), 24 June (Golf competition), 8.30pm. Brush Sports & Social Club, Fennel Street, Loughborough. Sec Peter Crooks, G4KGG, tel Loughborough 268561.

Mansfield (MARS)—3 June ("The RSGB", a talk by RR Martin Shardlow, G3SZJ), 1 July ("ATV", a talk by G8EHX). Victoria Social Club, Princes Street, Mansfield. Sec Graham Ridgeway, G8UYD, tel Mansfield 652093.

Melton Mowbray (MMARS)—17 June (Visit, tba), 7.30pm. St John Ambulance HQ, Asfordby Hill, Melton Mowbray. Sec Richard Winters, G3NVK, tel Melton Mowbray 63369.

Newark (N&DARC)—2 June (VHF Field Day discussion, and a light-hearted quiz), 7.30pm. Palace Theatre, Appleton Gate, Newark. Sec Roger Hiscock, G4MDV.

Skegness (S&DARS)—First and third Tuesday in each month, 21 June ("Fast-scan tv", a talk by Joe Ross, G8CTG), 8pm. Coach House, White Swan, Burgh-le-Marsh, Skegness. Sec Clive Ironmonger, G6HYF.

REGION 5—RR J. S. Allen, G3DOT, 77 Rosslyn Crescent, Luton, Beds LU3 2AT. Tel 0582 21151 ext 200, or at home, 0582 508515.

Bedford (B&DARC)—8 June (Video lecture "Aerial circus"). RAFAs Club, nr the railway station, Bedford. Further details from the local 432MHz net, or from sec J. Ferguson, G6JJT.

Cambridge (C&DARC)—10 June (Talk by RR, G3DOT). Coleridge Community College, Radegund Road, Cambridge. Club press officer D. Leary, G8JKV, tel Swavesey 31120.

Dunstable Downs (DDRC)—3 June (Slow-scan colour tv demonstration), 17 June (National Field Day planning meeting), 8pm. Chews House,

The newly-formed Three Counties ARC held its inaugural meeting at Liphook, Hants, on 27 April. The founder-members, seen in the photograph, all come from the three counties of Hampshire, Sussex and Surrey, and were pupils of Ian Munro (also a founder member) who passed the RAE in December 1982.
Meetings are held on alternate Wednesdays (eg 8, 22 June) at the Railway Hotel, Liphook, and all visitors will be welcome. Further information can be obtained by telephoning 04203 3395 (G6SOQ), 0428 713248 or 0428 712931, or calling G6SQQ on 144·550MHz beaming towards Liphook, Borden, Headley or Petersfield. L to r: (standing) C. Shalley, G6SRD; R, Coombe, G6SPF; N. Lee, G6SLZ; D. Lawrence, G6SLV; J. Travers, G6TNG; R. Borzych; C. Tidwell, G6SQQ; P. Baker, G6SLK; T. Rampton, G6MXP, president; M. Baker, G6SOR; D. Heather, G6SNA; R. Bloodworth, G6SQP; (seated) J. Cooke; J. Bloodworth, G6SQO; I. (Matt) Munro, G8NLF, chairman; J. Munro; D. Rampton; and C. Baker, G6SOQ, secretary. *Photo*: D. C. Eades

Dunstable High Street. Sec C. Asquith, G4ENB.
Leighton Linslade (L&LRC)—6 June (Meeting at Vandyke Community College), 12 June (70MHz contest, from somewhere on a Welsh mountain), 20 June (Meeting), 26 June (DF hunt No 8). Van Dyke Community Centre, Room A64, Van Dyke Road, Leighton Buzzard. Sec P. Brazier, tel Heath & Reach 270.
Luton (Kent Process Controls ARC)—1 June (Planning for the Kent Open Day), 8pm. Kent Club House, Tenby Drive, Luton. Chairman H. Gadsen, G3JLW, sec J. Allen, G3DOT. The club is only open to employees of the company.
Northampton (NRC)—2 June ("RTTY computers", by G3ZJO), 9 June (Pre-Elveston junk sale), 23 June ("WAB working", by G4HFS), 8pm. Kingsthorpe Community Centre. Sec G3VMU, tel Northampton 28516.
Peterborough (GPARC)—23 June (Short wave listeners' evening or film), 7.30pm. Southfields Junior School, Stanground. Sec Frank Brisley, G4NRJ.
Shefford (S&DARC)—2 June (2m df hunt), 9 June (Postmortem on NFD, also planning for LLRC family picnic), 16 June ("Dxpedition to the island of Montserrat, VP2M", by Ricky, G3VZT), 23 June (VHF NFD planning and transmitter tuning instructions), 30 June ((Provisionally) "More on the spectrum analyser", by Vic), 8pm. Church Hall, Shefford. Sec Brian Elliot, G4MEO.
St Neots (StN&DARC)—13 June ("Six metres", a talk by John Worsnop, G4BAO), 27 June (A visit to the linear accelerator at Addenbrookes Hospital (courtesy of G3TAG, to be confirmed). Details from sec G4FOH.
Wellingborough (Nene Valley RC)—Lectures and natter nights are held at the Dolben Arms public house in Finedon. Transmitting and constructional activities held at the First St Marys Scout Hall, also in Finedon. 1 June ("My impressions of the USA", by John, G3DOT). Sec L. Parker, tel Wellingborough 79539.

REGION 6—RR F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks HA3 7EA. Tel Penn (049481) 4240.

Aylesbury Vale (AVRS)—14 June (Lecture by Chris Warden), 8pm. Stone Village Hall, nr Aylesbury. Details from sec Cathy Clark, 9 Conigre, Chinnor, Oxon, tel Kingston Blount (0844) 51461.
Harwell (HARS)—21 June (A talk "Ionosound in the Falklands" by John Gilbert of the Rutherford & Appleton Labs), 25 June (The HARS 2m df hunt and barbeque. Further deatils to be broadcast over GB2RS, and from Dave, G8DVK, nearer the event), 7.30pm. Harlequin Room, Social Club, AERE. Visitors and new members are welcome but are requested to contact the area rep, Cliff Sharpe, G2HIF, tel Wantage 3497, prior to the meeting.
High Wycombe (Chiltern ARC)—Second Wednesday in each month (Family evening), last Wednesday in each month (Lecture), 7.30 for 8pm. Sir William Ramsay School, Hazelmere, High Wycombe. Mondays, morse classes, and starting 24 May, theory classes. 26 June (Club to participate in the Brighton Bike Ride. Special callsigns GB8BBR and GB4BBR have been allocated. The ride is sponsored in aid of the British Heart Foundation Appeal—the club is looking for sponsors. Contact Brian, G4JUM, Tony, G6FTT or Ron, G3NCL. There will be a special QSL card). Club details from Ron, G3NCL.
Maidenhead (M&DARS)—2 June, 21 June (Arrangements for VHF National Field Day), 7.30 for 8pm. The Red Cross Hall, The Crescent, Maidenhead, Berks. Sec Roger Hemmings, G3VCT, tel Bourne End 21036.
Reading (R&DRS)—For details of June meeting contact sec Chris Young, G4CCC, or tune into the club net Mondays, on 145·325MHz at about 8pm.
Vale of the White Horse (VWHARS)—7 June (John Morris, G4ANB "Computing and the amateur"), 5 July (AGM), 8pm. Club net frequencies: Thursdays, 28·750MHz, 7.30pm; Sundays, 145·00MHz, 7.30pm. Sec Ian White, G3SEK, tel 0235 31559.

REGION 7—RR to be appointed

Crystal Palace (CP&DRC)—18 June (Evening on the air, hf and vhf), 8pm. All Saints Parish Rooms, Upper Norwood, SE19. Details from G. M. C. Stone, 11 Liphook Crescent, SE23, tel 01-699 6940.
Echelford (EARS)—Second Monday and last Thursday in each month, 13 June (Don Walmsley, G3HZL, on *HMS Belfast*), 7.30 for 8pm. The Hall, St Martins Court, Kingston Crescent, Ashford, Middx. Club nets Sundays, 1000 local time, 1·93MHz ± QRM; Wednesdays, 2000-2100 local time, 144·575MHz fm. Details from sec Alfred H. Othen, G8FSZ, tel Byfleet 48307.
Wimbledon (W&DRS)—10 June (Video film on the work of Tesla), 24 June (Natter night and cw practice), 8pm. 124 Kingston Road, SW19. Details from G.Mellett, G4MVS, tel 01-644 8249.

REGION 8—RR K. A. Crouch, G8KEN, 14 Victoria Road, Capel-le-Ferne, Folkestone, Kent CT18 7LR. Tel 0303 55241.

Brighton (B&DARS)—15 June (Tell us a story; what ever we make it); 29 June (Evening rally), 7.45pm. YMCA Centre, Marmion Road, Hove. Club net 28·400MHz usb, 2100h, listen for Gee, G4NLA, on Friday evenings. Details from sec Wendy Firmager, 26 Brownleaf Road, Brighton.
Burgess Hill (Mid-Sussex ARS)—30 June (Windmills evening). Adult Education Centre, Marle Place. Details from Colin Campbell, G6NPY.
Canterbury (EKRS)—2 June (TBA), 16 June (Natter night), 8pm. "The Cabin", Kings Road, Herne Bay. During June listen for GB3HBT or GB4HBT celebrating the 150th anniversary of the town's birthday. Stations will be on hf and vhf. Special QSL cards. Details from Stuart, G6LZG.
Chichester (C&DARC)—7 June (Club meeting), 16 June (Annual club Bar-B-Q on Trundle Hill, Goodwood), 7.30pm. Fernleigh Centre. Club net 145·275, Wednesdays, 7pm. Details from G4ETU, tel West Ashling 463.
Crawley (CARC)—22 June (G4BUE on QRP), 8pm. Trinity United Reformed Church Hall. Informal meetings second Wednesday in each month. Members QTH. Details from G4IQM.
Dartford (DDFC)—Club meets at Malt Shovel PH. Club members are taking part in RSGB events on 12 June at Rugby and at Dartford on 26 June. Details from Steve, G4NKM, at Malt Shovel PH.
Dover (SEKYMCAARC)—Wednesdays, 22 June (Amateur's view of Dover—slide show by G4EGQ), 7.30pm for 8pm. Mondays, RAE; Tuesdays, cw with G3VSU. Further details from new chairman G6AGK, or sec, G3VSU.
Eastbourne (Southdown ARS)—6 June ("Amateur licence and privileges in USA", by G5CRD), 20 June (Committee meeting). Chaseley Home, South Cliff. Details from Tom, G4MVN.
Hastings (HERC)—Wednesdays, 15 June (Summer social), 8pm. First, second and fifth Wednesdays, micronights, Ashdown Farm Centre. Basic computer language course same evening. Third Wednesdays, main meetings. West Hill Community Centre. Details from Alan Beecher, G8VEM, tel Hastings 216516.
Medway (MARTS)—Fridays, 3 June (Film "Junction transistors", and "Micro circuits"), 24 June (Junk sale), 7.30pm. Contact G4EVY for further details, tel Medway 76463 between 6.30-9.30pm only please.
Thanet (RCT)—14 June (Junk sale), 19 June (Annual picnic), 28 June (Business meeting and

video show). Club has moved to new QTH and changed evenings to Tuesdays. Sec Ian Gane, G4NEF.
Tunbridge Wells (WKARS)—Fridays, 10 June (Text "communication from teleprinter age to computer age", by G8CAA), 24 June ("At the touch of a switch—part 2", by G4DRV), Monson Road. Informals following Tuesday at Drill Hall. Details from Brian, G4DYF.
Worthing (W&DARC)—7 June (G4BUE on QRP), 14 June ("Technology in medicine", by Roy, G6AIW), 21 June (Mobile rally at Whiteways Lodge), 28 June (Video film "World at their fingertips"). Pond Lane Amenity Centre, Worthing. Details from Joyce Lillywhite, tel Worthing 63062 after 6pm.

REGION 9—RR W. J. Colclough, G3XC, "Highview", Indian Queens, St Columb, Cornwall TR9 6LL. Tel 0726 860 485.

Camborne (CRAC)—New details from AGM: president, A. H. Hammett, G3VWK; chairman, D. W Blackford, G3NPB; vice-chairman, P. Lock, G4STB; sec J. J. Vinten, G6GKZ; treasurer, P. Smart, G4DSU; magazine editor, G. W. Cooper, G3VJB; pro S. Rodda, G4PEM; Cornish award manager, E. Bowden, G2AYQ; contest managers: hf, G4PEM; vhf, G8ZDS. 2 June ("Repeaters", by D. Blackford, G3NPB), 7 July ("You and interference", by A. H. Hammett, G3VWK). Computer section: 20 June ("Boolean algebra"), 18 July (CP/M tutorial, by C. Bowden, G3OCB), 7.30pm. SWEB Clubroom, Pool, Redruth. Mobile rally, 17 July at Cornwall Technical College, Camborne. The 144MHz ssb net has now ceased to operate due to lack of support. New club calls: G6KVC, now G4SRA; G8HTE, now G4STB; G8XAI, now G4SDU.
Exeter (EARS)—The club has a new call, G6ARE. 13 June (Inter-club quiz kindly hosted by Torbay ARC), 26 June (Coach trip to Longleat Rally, details from G6FAK, tel Exeter 59894). First and third Mondays in each month, informal meetings, 7.30pm. Scout Hut, Emmanuel Road, Exeter. Details from sec G8YOA, tel 0392 39597.
Plymouth (PRC)—6 June (Activity night), 20 June (Talk), 7.30pm. Tamar High School, Paradise Road, Stoke, Plymouth. A new committee was elected at the AGM on 18 April and it intends to give a varied programme during the year. New chairman, G6EQM; vice-chairman, G6BJJ; sec, G6CZM; treasurer, G3WYJ.
Torbay (TARS)—Fridays, 7.30pm, weekly morse classes are now being organized. Contact Les Mays, G2CWR for details. The location of the mobile rally on 28 August has now been confirmed as ITT Club Room, Paignton. All details from Mrs M. Rider, 7 Kingston Close, Kingskerswell, Devon, TQ12 5EW, tel 0804 75130.
Treverbyn (English China Clay RC)—6 and 20 June, The Club Room, Treverbyn. Friday net, S22, 1900-1930h; Sunday net 3·690 ± QRM, 1100h. Details from J. Redfearn, G8HSZ, tel 0726 3647.

REGION 10—RR to be appointed.

Mr Philip Jones, the representative for Region 10, has resigned for personal reasons.

Any affiliated clubs or groups in the region who would like to have an entry in "Club News" should send it direct to the editor until a new regional representative is elected.

Cardiff (CRSGBG)—13 June (Film show), 7.30pm. Pantmawr Hotel, Tyla Teg, Pantmawr Estate, Whitchurch, Cardiff. Details from sec Cyril Laws, tel Cowbridge 3212.
Rhondda (RARS)—Thursdays, fortnightly, 7.30pm. NUM Club, Tonypandy. Due to the death of the club's president, Sam Weaver, MBE, GW3ITQ, and a recent agm, the new officers will be: president, Cyril M. Parry, GW3PHH; sec, John Howells, GW4BUZ; treasurer, Trafford Challoner, GW4KBG; and chairman, Ivor Williams, GW4KRP.

REGION 11—RR B. H. Green, GW2FLZ, 1 Clwyd Court, Tan-y-Bryn Road, Colwyn Bay, Clwyd LL28 4AH. Tel 0492 49288.

Anglesey (ARG)—Club meetings 14, 28 June, 7pm. The Primary School, Benllech, Anglesey. Sec Mr C. Williams, GW6DOK, tel Gaerwen 603.
Colwyn Bay (Conwy Valley ARC) (GW6TM)—9 June (AGM), 7.30pm. Green Lawns Hotel, Bay View Road, Colwyn Bay. Sec Mr J. N. Wright, GW4KGI, 46 The Dale, Woodlands, Abergele, Clwyd LL28 7DS, tel 0745 823674.
Dolgellau (Meirion ARS) (GW4LZP)—2 June. Nannau Country Club, Llanfachreth. Sec Mr Bob Halhead, GW3KOR.
Rhyl (R&DARC)—9 June (Activity night), 23 June (Amateur tv demonstration), 7.30pm. 1st Rhyl Scout HQ, Tynewydd Road, Rhyl. Sec Mr B. Jones, 6 Rhodfa Maes Hir, Rhyl, Clwyd, tel 0745 37284.

REGION 12—RR M. R. Hobson, 4B Tummel Crescent, Pitlochry, Perthshire. Tel 0796 2140.

Aberdeen (ARS)—3/4/5 June (National Field Day), 10 June (Junk sale), 17 June (Construction contest), 24 June (Visit to Mormond Hill Radio Station), 7.30pm. Club Rooms, 35 Thistle Lane. Details from Don, GM4GXD, tel Aberdeen 9643428.
Caithness—Graham Brooks, GM4NHX, appointed Area Representative.
Dundee—Bernie Deans, GM6PQE, appointed Area Representative.
Invergordon (Easter Ross Radio Club) (GM4MFL)—Fridays, 7.30pm. The Community Room, South Lodge School, Invergordon. RAE and morse classes available every week. Details from George, GM4DKL, tel 086284 2556.
Kirkwall—Members meet infrequently to discuss amateur radio and allied subjects. Details from GM3IBU.

The above are the only groups to communicate with RR12 with programmes and other information. Please remind your club secretary.

REGION 13—RR A. B. Givens, GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife KY1 2LH. Tel Kirkcaldy (0592) 200335.

Dunfermline (DARS)—Second Thursday in each month, 7.30pm. Room 7, Old High School, Priory Lane, Dunfermline. Details GM8IID, tel Dunfermline 728778.
Borders Repeater Group—The club is responsible for GB3SB at Duns and GB3BT at Berwick-on-Tweed. Details from GM4BDJ, "Cairndhu", Walter Street, Langholm, Dumfries, tel 0541-80018.
Edinburgh (Lothians RS)—9 June (AGM), 23 June (Forward planning), 7.30pm. Drummond High School, Broughton Street, Edinburgh. Details from GM6JAG, tel 031-664 5403.

REGION 16—RR T. D. Howe, G3PLF, 18 Vange Hill Drive, Basildon, Essex SS16 4DD. Tel 0268 24453.

Colchester (CRA)—9 June (The amateur radio emergency network), 23 June ("Today's amateur satellites", by G3FIJ), 7.30pm. Colchester Institute, Sheepen Road. Details from Frank Howe, G3FIJ, tel Colchester 70189.
Ipswich (IRC)—8 June (Treasure hunt), 22 June (ESWR post mortem), 25/26 June (Demonstration station for the Boy's Brigade at the Suffolk Showground), 29 June (Planning for VHF NFD). Club Room, Rose & Crown, Norwich Road. Details from Jack Tootill, G4IFF, tel Ipswich 44047.
Southend (S&DRS)—10 June ("Video"), 24 June (Junk sale). Civic Suite, Council Offices, Hockley Road, Rayleigh. Details from G3YOA.
Vange (VARS)—2 June (Junk sale), 9 June ("QRP working", by G4INM), 16 June ("ZX81", by G4OJN), 23 June (Essex repeater), 30 June (Discussion on VHF NFD), 7.30pm. Main Hall, Barstable Tenants Community Association, Long Riding, Basildon. Details from Mrs D. Thompson, 10 Feering Row, Basildon SS14 1TE.

REGION 17—RR H. G. Cunningham, G8FG, 235 Station Road, West Moors, Wimborne, Dorset BH22 0HZ. Tel Ferndown (0202) 876018.

Andover (ARC)—7 June (Bar-B-Q), 22 June (Natter night), 8pm. Wolversdene Club. Sec G4OZL.
Bournemouth (BRS)—First and third Friday in each month, 3 June ("History of radio", by G3FPV), 7.30pm. Kinson Community Centre, Kinson, Bournemouth. Sec G4EKE, tel Ferndown (0202) 877945.
Eastleigh (Itchen Valley ARC)—Club callsign G3IVR. This newly formed club, which meets every fourth week in the St John Ambulance HQ, Blenheim Road, Eastleigh would welcome members from the local area. June meeting on 9 June. Sec G4PPJ, tel Botley (04892) 3312.
Fareham (F&DARC)—1 June ("DF construction night", by G4ITF), 8 and 22 June (Natter night), 15 June ("Getting started", by G4ITG), 29 June ("My computer", by Andrew Sinclair), 7.30pm. Porchester Community Centre, Portchester. Sec G4ITG, tel Fareham (0329) 234904.
Farnborough (F&DRS)—8 June ("HF aerials", by G5RV), 22 June (VHF Field Day preview), 7.30pm. Railway Enthusiasts Club, Access Road , off Hawley Lane, Farnborough. Sec G4BJQ, tel Farnborough (0252) 534036.
Gosport (Rowner & DARS)—First and third Monday in each month, 7.30pm. Hardway Community Centre, Gosport. Prospective members should contact the club pro, G4NAB, tel Stubbington (0329) 662144.
Horndean (H&DARC)—12 June (The club will be operating a speical demonstration station, GB2MMR, 80 to 10m, phone, cw, and rtty, at the RNARS Rally. Possibility of fstv also. Items from the club construction contest will also be on view). Second Thursday in each month, 7.30pm. Merchiston Hall, Horndean. Sec G4RLE, tel Horndean (0705) 593429.
Jersey (JAEC)—8 June (Building foxhunt equipment and demo on five-mile road), 8pm. The Communication Centre, St Brelade. Sec GJ8KNV, tel 53333.
Swindon (S&DARC)—2 June ("Microwaves", by G8MWR), 16 June ("Contest operating", by G3NKS), 9 and 23 June (RAE course and natter night), 7.30pm. Park School, Marlowe Avenue, Swindon. Sec G4IYW, tel 0793 27227.
Weymouth (SDRS)—At the agm, held on 5 April, the following officers were elected: president, G6SV; vice-president, G3EAT; chairman, G3SDO; sec G3ZGP; treasurer, G2FNK; ordinary members, G6HKD and G8BCH. 7 June (Technical forum, 10m fm and df hunts), 7.30pm. Army Bridging Camp, Wyke Regis, Weymouth. Sec, tel Weymouth (0305) 812893.
Wimborne (FRARS)—5 June ("Tracking the moon by computer", G4BGT and G6JGR), 12 June ("Simple gear for hf", by G2KV), 19 June (G8MCQ's informal natter), 26 June (No meeting—Longleat), 7.30pm. Flight Refuelling Social Club, Merley, Wimborne. Sec G8VFY, tel Wimborne (0202) 882271.

REGION 19—RR R. J. C. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ. Tel 01-989 6741.

Cheshunt (C&DARC)—1 June (Natter night), 8 June (G3OJI on direct broadcasting by satellite), 15 June (Natter night), 22 June (4m portable operation on Baas Hill Common), 29 June (Natter night), 8.15pm. The Church Room, Church Lane, Wormley, Nr Cheshunt, Herts. Details from Roger Frisby, G4OAA, tel 09924 64795.
Chiswick (ABCARC)—21 June (New members' forum. (That's a good idea for other club secs to copy, *RR19*)). The Committee Room, Chiswick Town Hall, High Road, London W4. Sec W. G. Dyer, G3GEH, tel 01-992 3778.
Edgware (EDRS)—9 June (Talk on crime prevention by the local police), 23 June (Informal meeting and briefing for VHF Field Day). The Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware. Details from G4LUJ.
Gould (Advance RC)—New entry. This club is active on the premises of the above company we welcome them to "Club news". Club call is G4CAE, and it should be active on Wednesdays, the club night, at Service Dept, 2-8 Roebuck Road, Ilford, Essex. New sec is R. Howard, G4JOK, QTH as above. At present employees-only admitted.
Havering (H&DARC)—1 June (Informal), 8 June (DF hunt), 15 June (Informal), 22 June (Pre-Contest briefing for VHF Field Day), 29 June (Informal), 8pm. It is hoped to arrange an outing to Ongar Radio Station in the near future. Club meets in the Fairkytes Art Centre, Billet Lane, Hornchurch, Essex, Wednesdays. Details from A. Negus, G8DQJ, tel Upminster 24059, or on 0708 69770 to G8ZKZ.
Ilford (IRSGBG)—Information on this group from Jim Hooper, 50 Mortlake Road, Ilford.
St Albans (Verulam ARC)—28 June (Club forum), 8pm. RAFA Club House, New Kent Road, St Albans, Herts. Full information from G6EQO, tel St Albans 58132.
Southgate (SARC)—9 June ("Marconi—the man", by Mr S. Wood), 8pm. St Thomas' Church Hall, Prince George Avenue, London N14. Pro John Fitch, G8EWG, or S. Wilson, G6BOX, tel 01-452 1915.
Stevenage (S&DARC)—This club has recently had a change of officers, and thus a new programme. The chairman is G6BTT; sec, G4BGP; treasurer, G6ADX and Trevor, G8KMV is publicity sec. 7 June ("Crime prevention", by Sgt Harris), 21 June ("AFST", by G8WWI). T S Andromeda, Shephall View, Stevenage, Herts. All other information from Cliff Barber, tel 0462 893736.
Wanstead (ELGRSGB)—19 June (Chat and social afternoon with a RSGB film show). A df contest is being held on 12 June to which all are

welcome. Details from any ELG member. The DF Cup will be presented at the 19 June social meeting by Ron Broadbent, RR19. Wanstead House, The Green, Wanstead, London E11. Details from G6DXW, tel 01-550 7013.

REGION 20—RR B. L. Goddard, G4FRG, 2 Greenfield Park, Portishead, Bristol BS20 8NQ. Tel 0272 848140.

Bristol (BARC)—7 June ("A boring evening"), 14 June (Club projects), 21 June (Computer group meeting, and preparation for Longleat), 28 June (Contest preparation), 7.30pm. YMCA, Park Road, Kingswood, Bristol. Details from Trevor Cockram, G8GFZ, or Mark Goodfellow, G4KUQ.

Bristol (BRSGBG)—27 June (Les Hawkyard, G5HD, Zone D Manager, will be talking to the group about the RSGB), 7.30pm. Queens Building, Bristol University. Details from Chris Short, G8GLQ, tel 0272 621253.

Gloucester (GARS)—Wednesdays, 1 June (G4HFT and G3YEU will be talking about aerials), 22 June (No meeting), 7.30pm. St Barnabas Hall, Stroud Road, Gloucester. 4, 5 June (NFD. The Gordon League Rugby Ground). 11 June (Special event station at Longlevens Junior School), 18 June (Special event station at Coney Hill Hospital), 2 July (Special event station at ICI Fete). Details from Tony Martin, G4HBU.

Thornbury (T&DARC)—1 June (Talk on test equipment), 7.30pm. The White Horse, Groves End, on the A38. Details from Alan Jones, G8AZT, tel Thornbury 416381.

Yeovil (YARC)—2 June ("Great circle propagation maps" by G3MYM), 9 June ("Global distribution of ionization", by G3MYM), 16 June (Briefing for Tuesday (21 June), "Chordal hop test", by G3MYM), 23 June ("Wind loading", by G3GC), 30 June (Natter night), 7.30pm. Milford Recreation Centre, Milford Park, Yeovil. Details from Adrian Dening, G4JBH, tel 0935 23873.

Members' Ads

CONDITIONS OF ACCEPTANCE

These subsidized flat-rate advertisements are accepted as a service to members of the RSGB only. They must be submitted on the Members' Ad form printed on the back of a *recent* address label carrier used to mail *Rad Com* to the advertiser: this will automatically provide proof of membership and should not be more than two months old. No acknowledgement of receipt will be sent, and advertisements not clearly worded or punctuated, or which do not comply with the conditions of acceptance, will be returned. No correspondence concerning this service will be entered into.

Trade or business advertisements, even from members, will not be accepted for "Members' Ads" but should be submitted as classified or display advertisements in the usual way. Traders who are members must enclose a signed declaration that the items for sale or wanted are part of, or intended for, their own personal amateur station.

The RSGB reserves the right to refuse advertisements, and accepts no responsibility for errors or omissions, or for the quality of goods offered for sale. Advertisements for citizens band equipment will not be accepted.

Warning. Members are advised that they should, as far as possible, ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The "purchase" of goods legally owned by a finance company could result in the "purchaser" losing both the goods and the cash paid.

The current rate is £1 for 40 words or less: advertisements containing more than 40 words will cost an additional £1 for every additional 40 or less words. Each advertisement must be accompanied by the correct remittance, either as a cheque or postal order made payable to Radio Society of Great Britain.

Closing dates in 1983 for issues in brackets, are **16 June** (August); **12 July** (September); **24 August** (October); **22 September** (November); **20 October** (December); **17 November** (January); **15 December** (February).

Post to: MEMBERS' ADS, RSGB, 88 BROOMFIELD ROAD, CHELMSFORD, ESSEX CM1 1SS
Do not post to RSGB HQ or Advertising officer.

FOR SALE

Have lots of vacuum tubes, second world war to present, manuals, send me your needs. *Wanted*: British/German second world war military radios and manuals. W.H.Y? I buy or swap. Serious collectors only. Tony Grogan, WA4MRR, 5 Rollingwood Drive, Taylors, SC 29687, USA.

Beautiful FT101 quality leather carrying case, £30. FT207R, handbook, spkr/mic, nicads, antenna, mains charger, £140. NC2 battery eliminator/quick charger, £30. RSL145GP 5λ/8 antenna, £15. Blaupunkt Frankfurt car radio, excellent, £40. Taylor, G3UCT NOT QTHR. Tel York 29777.

Heathkit SB101 tx/rx, SB660 spkr/psu, £190. Heathkit HW12A 80m single bander, psu, £80. Kestral trawler rx, £30. Sailor type 76D 16ch tx, £30. Nimbus coastal radio type 340 tx/rx, 24V psu, £30. G3WXB, QTHR Eastbourne.

Sirius 1 16-bit 128k micro, inspect and collect, £1,500 cash. *Wanted:* FAX equipment to copy Paris/Bracknell weather maps; Thruline element 250H; FV901DM, YO901P, SP901, FC901; Bencher keying lever, lopass filter; 9508 Channelmaster; Modem. G3AZI, QTHR. Tel Preston (0772) 37815.

Trio TS700S, psu needs attention, works ok on 12V, otherwise mint cond, £195. Homebrew 10-40W amp for 144MHz, £30 ono. G6HKS, QTHR. Tel Wisbech 584640.

HC1400 25W fm mobile, exc cond, no mods, £100 ono. G6IDH, QTHR. Tel Ely (0353) 61427, evenings.

UK101 personal computer, 12k basic, Cegmon, toolkit, professionally built, expanded, uncased, hence price, incl postage, some software, lots of documentation, £95. G8YZL NOT QTHR. Tel Fordingbridge 52718, after 6pm.

PET disk drive type 2031, as new, perfect cond, hardly used, programs saved in 10sec—loaded in 5sec—you'll wonder why you didn't buy one years ago! Inspect and collect, £300 or carriage extra. G3AZI, QTHR. Tel 0772 37815.

FRG7700, memory, FRT7700, atu, FRV7700D, FF5, FRG7700 dc kit installed, Western five-way safety antenna switch, manuals for above, like new, in orig boxes, I will send via Securicor to buyer, GB only, £300. Tel 0479 810612, after 6pm.

Welz SP200 swr/power meter, mint cond, boxed, £50. G4PGB, QTHR. Tel 0279 722612.

Sullivan & Griffiths universal inductance bridge, range 1μH-100H absolute units, in good cond, mahogany case, offers. Cottrell, G3PSY. Tel Tenterden (Kent) 4531.

TR2300 2m tx/rx, portable, strap, 5/8, comp with box, mic etc, eight months old, need money for hf, vgc, bargain, £115 ono. Tel Norwich 721082, after 6pm please.

Going QRT: Yaesu FT707; matching atu, £425. FT227R 2m fm tx/rx, £130. AR240 handheld, 1W, 144-148, 5kHz steps, Trio TS820S, matching atu, £475. Datong D70 morse tutor, £30. Trio TS700G fm/a.m./ssb/cw vfo, £175. Homebrew 10GHz tx/rx £35. Homebrew 2m doppler df, £35. 2m 10-el Horz beam, rotator, £15. Bearcat vhf/uhf scanning rx, £135. VTR, £10. Pye Lynx tv camera, lens, £45. G4IAG, QTHR. Tel Fillongley 41814.

Amtech 300 hf atu, 200W, p.e.p., 160-10m coaxial, wire antennas, as new, £28. Global AT1000 swl atu 0·2-30MHz, wire, coaxial as new, £22. GW4RLP, ex-GW8ZZQ NOT QTHR. Tel 0286 5322.

Trio TS130S, eight bands, seven months old, £400. Buyer collect or carriage extra. Tel Bournemouth (0202) 426647.

TS130S with ssb nb filter, less mic, power leads, ac supply. G2HOP, QTHR. Tel 0780 63125.

Trio TS515 hf tx/rx and PS515 psu, five bands only, cw filter, £175. Eddystone EA12 ham bands only rx, £150. Buyer to collect or pay carriage. G3BMO NOT QTHR. Tel York (0904) 54579.

Heathkit SB610 scope, used little, needs slight adjustment, £30. Codar PR30 preselector with p/pack, £10. Power pack with 80 valve, 250V, 100mA, £3. Low pass filter, 75Ω 30MHz Belling Lee sockets, £2. Buyers collect. G3HOD, QTHR. Tel Knowle 3024, evenings.

FT-ONE, perfect, all options, all accessories, manual, box, hardly used, will exchange for high performance rx as NRD515 with memory unit. Let me know what you have. Hurry, hurry, it's your last chance! Tel 0279 22473, anytime day or night.

TR2300, 2m fm portable, cw nicads, mobile mount etc, as new, in orig packing, £110. Trio JR599 fm/ssb hf rx, 160-10m and 2m, £130. TX599 matching tx, £120 or £230 the pair. G8AYN NOT QTHR. Tel 04555 57790.

FT101E, cw filter, fan, seven bands 160-10m, dc/dc converter, new face plate, spare pair pa and driver valves, Yaesu mic, £320. G3LBW, QTHR (1983 only correct). Tel Middlesbrough 317547.

IC225 2m 10W fm synthesized mobile rig, cw mic, mount etc, £95. IC30A 70cm, 10W fm mobile rig, 22ch, 10 fitted, mic/mount, £100. TV lens "C" mount Cosmicar f1·5 8·5mm, £25. GEC viewdata terminal, £50. G8IWX, QTHR. Tel 047485 2577.

Trio stereo amplifier, 13W per channel, £20. VHF broadcast tuner, mono power pack, £3. *Radio Communication* 1976-80, comp, unbound, £2 per volume. HT transformers, chokes, capacitors, resistors, valves, other components, cheap. Buyers collect. G3HOD, QTHR. Tel Knowle 3024, evenings.

Oric 1 programs: rtty, £7.50; morse tutor, £4.50; distance, £3.50. 70cm 8-el XY Yagi, £20. 2A 13V psu, £7.50. 15W 144MHz linear, £20. Datong FL1 filter, £40. Brookes MB6R rtty tu, £60. G8KMV, QTHR. Tel 0438 54689.

Cossor 1049/3 oscilloscope, vgc, £20. Solartron CD513, gwo, copy manual, £15. Buyers collect please. *Wanted:* Hartley 13A scope, must be gwo. G8LIU, QTHR. Tel Uxbridge 30006.

Comp 2m base/mobile station: Trio TR7010, 65W linear, 4-el quad, 5Y2M, 2m whip, magnetic mount, swr meter, rotator, all good cond, £220. Buyer inspects and collects. G4INV, QTHR. Tel 051-724 3998.

FRG7, six months old, Datong FL2, £200 ono. Can deliver. Tel 021-472 0218, evenings.

TS130V, new bands, as new, £375. Wanter vertical hf, 80, 20, 15, 10. G4JFE, QTHR. Tel Newbury (0635) 41613.

FTDX150 hf tx/rx, five band, ac dc psus built-in, realigned, £165 ono. Sony ICF2001, mains adapter, manual, as new, £90. Mobile hf tx/rx 4ch, a.m./ssb, 125W p.e.p., wkg 40m, 2-18MHz, manual, cw mobile remote atu, xtal controlled, £75 ono. Will deliver 40 miles Swindon. G3VHE, QTHR. Tel Ray, 0793 22989, after 7pm.

Ex-G3XJJ silent key: Shure 444 mic, £20. Trio HS4 headphones, £5. TA33 tribander Yagi, £40. 30ft lattice mast, £100. Buyer inspects and collects. G4ICC, QTHR. Tel Northampton (0604) 52601.

Oskerblock (SWR200B) swr and power meter,

almost unused, £25. Helford pw hf ssb tx/rx, part-built, most parts incl professional quality full case and chassis, pc boards, xtal filter, xtals, v/caps, with sm drive, £75. G8VHD, QTHR. Tel Nottingham 211032.

Yaesu FT707 tx/rx, £360. FP707 psu, £80. TA33JNR antenna, £60. Yaesu FL2100Z linear, £300. All exc cond. *Wanted:* Drake TR7A tx/rx or Yaesu FT102. Would also consider FT101ZDFM3 part-exchange, swop, cash, haggle, pistols at dawn! G4DIC, QTHR. Tel Hinckley 636315, evenings.

Heliax 50ft LDF5, large quantity 0·5in airspaced, LDF45 N-connectors, MM2/70 transverter, £120. 12V/20A psu, £55. 240,000μF 7·5V, £1.50 each. Channelmaster rotator, £35. 175MHz transistors, 40W/28V, £3 each. Lots UR67, 30p/m. Eddystone slow-motion drive, £10. *Wanted:* 4CX350B 8877/ base. 9-el 144MHz Tonnas. Tel Bursledon 4714.

G2DAF rx, most major parts, incl chassis, panel, S-meter, dial, all variable capacitors, filter, coil formers, ifts etc, psu and af stages complete, offers. Tel Brighton 37100.

T1154, £40. PCR, £30. A.M. valve tester type 4, £20. AVO valve tester, £15. US Army Motorola fm rx, £7. Command set, £5. R1155 (poor), £5. A.M. psu type 3, £8. Box assorted valves, £10. 17 set, no case, £5. Or exchange R1155/T1154 peripherals and spares. Especially wanted: type 3 loop aerial, inner and outer tubes, loop plug type 68, T1154 screwdriver etc. G6MQJ NOT QTHR. Tel 0483 572653, weekends.

Heathkit IB1100 frequency counter, £35. Central 280 valve voltmeter, £28. Amcomm fm module for Trio R1000 rx, £10. Eagle rf indicator, £4. High impedance mic on base, £8. Lafayette TE18 grid dip meter, £16. Three Creed spring gauges, £10. Strobe fork, 125Hz, £5. All items plus postage or will deliver for cost of petrol. G3RDG, QTHR. Tel 01-455 8831.

Icom IC202E, 144–144·4MHz, Modular Electronics 25W linear amp, cw preamp, home brew psu for above, £95 the lot. Tel Wantage (02357) 68336, after 6pm and weekends.

TS510, psu, spkr, £175. G4LLJ, QTHR. Tel Leeds (0532) 868707.

R209 rx, 1–20MHz incl handbook, £25. Packer 2m atu, £15. Sentinel 2m auto preamp, £15. HK707 morse key, £7. MW/lw car radio, £10. G8RXH, QTHR. Tel Hornchurch 49335.

Model MBARO advanced electronic morse, baudot, ASCII reader, £100. Trio 120V tx/rx, no mods, PS20, 80–10m, £300. Shimizu Denshi SS105S tx/rx, ssb, fm, cw, noise blanker, fm rx/tx fitted, 80–10m, £300. Tel Shipley 596584.

Manuals: Redifon R50M rx, £2.50; GR470 tx/rx, £3.25; GR289 Mk2 tx/rx, £1.25; GR336 tx/rx, £1.25; Marconi CR300, £1.50; Unimetrics Digi Scan-8, £1; Dura Scan-8, £1; Hudson FM208 tx/rx, £1.25. All items post, packing extra. G3LTU, QTHR. Tel Cleethorpes 696412.

TS700, perfect, unmarked, unmodified, pristine cond, new, boxed vox unit, MC50 desk mic, £275. Heathkit oil-filled 1kW dummy load, £15. Trio 2m bandpass filter, £15. GPV5 2m base antenna, 30ft UR67, £18. GW8IQC, QTHR. Tel 0633 894708, evenings.

Westower, 40ft lattice telescopic mast, framed base plate mount, still under man's warranty, mast is dismantled, £400 ono. Consider swop for Collins/Racal equipment. 44 Glamis Drive, Chorley, Lancs. Tel Mike, 02572 65748.

Pye Cambridge AM10D, two glider channels, 130·1, 130·4, £65. Bantam hb/fm, nicads, charger, £55. Both vgc. GU3HKV, QTHR. Tel 0481 47278, 6–7pm only.

G2DAF Mk2 rx, Kokusin MF45510CK mechanical filter, £40 ono. Heathkit HW30, £10. G4JGG. Tel 0908 368420.

KM4000 memory keyer, £45. New Curtis keyer chip, new, £12. Squeeze paddle, £3. DJ6HP cw filter, £5. KW103 swr/power meter, £12. FSM, £3. Unused IC701 dc lead, £3. Fraser. Tel 0908 653961, daytime, 029672 340, evening.

Fullerphone Mk4 (Canadian) 1943 land line morse kits, two comp field sets in orig wooden boxes, useful for practice, wonderful collector's items, £25 for the two. Tel 0524 419495.

QM70, 432-6MHz–2m converter, two switched ranges, spec, £17. QM70 2FM70, 144/432MHz tripler, 432/144 converter, provides 70cm at the flick of a switch, max input 30W, typically 10/15W out, manual, £39. G4ALV, QTHR. Tel 01-460 3852.

Video: Philips N1700, £98. Sailor marine rx, df, 250kHz–4·0MHz, £48. Telephone autodialler, 99 memories, £49. TR2400, AOR245, comp spkr/mics, £120 each. IC215, £89. IC260E, £245. TR3200, £110. All in good cond and ono. G3LZN, QTHR. Tel Lapworth (nr Warwick) (05643) 2014.

Alternators: Markon self-regulating/exciting, 50Hz, 230/115V cont, 2·17/4·3A, 3·9krpm, £140 ono. SEV 28/24V, 1·3kVA self-regulating, £60 ono. Both unused, abandoned wind generator project, will exchange for hf tx/rx. W.H.Y? Tel Jackson, Lowick (Cumb) 022985 669, evenings.

Solartron CD1014·3 oscilloscope, spare crt, vgc, £40. Cossor type 89 crts, VCR138A crt, Marconi 600Ω attenuator, offers. *Wanted: CQ* articles August 1980 onwards on German second world war rxs. Cooper, 11 Radical Ride, Wokingham, Berks. Tel 0734 734312.

Datong D70 morse tutor, £35. Microwave Modules MMÇ144/28, £15. New teleprinter handbook, unwanted gift, £10. Pye Westminster, unmodified, manual, accessories, £40. G8KNJ. Tel Redhill (0737) 72202.

FT7B tx/rx, YC7B digital display, FP12 matching power supply, spkr unit, mobile mount, unused, all in exc cond, £370 ono. AVO model 8, £25. Tel Luton 581141.

KW204 tx, 160–10m, vgc, £130. *Wanted:* Codar AT5 tx. G4HET, QTHR. Tel Sandown (IoW) 404118.

Alas! Q4/2 Jaybeam, new, boxed, bought in error last week, loft proves too small (new QTH) to permit rotation, £22. So also AR40 rotator, unused, boxed, £45. Exchange TR9130, new, for new BBC B micro-computer. G4PVV. Tel Leamington Spa (0926) 881507.

70cm linear amp, comp with built-in power supply, contact-cooled valve, 10dB gain up to 120W output, ideal atv use, £85 ono. Consider swap 50W solidstate 70cm linear. G8XPZ, QTHR. Tel Langley Mill 68475.

FT7 10W hf tx, no mods, well cared for, 10A, 10B, 10D xtals, handbook, orig packing, mobile bracket, spare power socket, £220. G4ORF (G8SKW, QTHR). Tel 0703 864962.

Trio 7010 2m 8W ssb/cw tx/rx, 144·180–144·395, 3SK88 preamp, beacon xtal, mobile mount, manual, £120 ono. EDL144 linear amp, 100W, preamp, QQVO640A, valve, spare, mains operation, £90. Buyer collects above. Labgear Televerta CM6022/RA preamp, unused, £10. Manual for ITT Starphone SF1, £3. Post paid above two items. G6BCO, QTHR. Tel Garstang (Lancs) 2687.

Oscilloscope: Solartron CD643 5in crt, 10MHz bandwidth, 100mV/cm, in wkg order, service manual, large, heavy (120lb), contains 83 valves, huge transformer, prefer buyer collects, £15 or offer. G8CIT. Tel Wokingham 790125.

Icom 701 and 701PS/LS, all supplied accessories, mic, manual, boxes, HB5 vertical and unused gp kit, £450 ono. *Wanted:* Collins S-line, separates or KWM2 etc. G3ONU, QTHR. Tel Garston (09273) 76344.

Oscilloscope Telequipment D43R dual beam, dc–10MHz, £70 ono. Ferrograph 20+20W hi-fi amp, £45 ono. Rank Cintel 21in professional bw monitor, £10 ono. All wkg, with manuals. Buyers collect. Mark Lee, G6FKN, QTHR. Tel 01-876 4379, evenings and weekends.

Gem quad GQ2E, still in pack, brand new, offers. KW E-Zee Match. G4DRH, 36 Clifton Street, Lytham FY8 5EW. Tel John, 0253 730033.

FT101B Mk2, mint cond, wide narrow cw filter, fan, dc leads, spare valves, workshop manual, orig packing, Datong asp processor, mint, £385 pair. G4MH mini-beam, rotator, support bearing, £70. G4NPG, QTHR. Tel 021-743 0789.

TS180S, PS30, cw filter, new bands, latest Robot 800, KW monitorscope, homebrew Z-Match, swr meter, 500W load, 400W tx/linear, 4–400 pa, 3·5kV ht, two spare 4–400s, comp station, £1,249. Might separate. G3FRB, QTHR Dartford. Tel Crayford (0322) 524693.

Rello prof radio mic, comp, £375. Two HH audio amps, £95 each. Disco deck unit, poa, two disco projectors, poa, Belcom LS102 10m, ssb, fm, a.m., poa. G4RQN, QTHR. Tel Neil, Kings Lynn (0553) 71389.

FT101ZD fan, mic, dc/dc, SP901, no fm/a.m., exc cond, £450 ono. FT708R 70cm nicads, charger, used little, £200 ono. SMC monitorscope, £35. G4GWF, QTHR. Tel Newton-le-Willows 5151, ext 366, office hours.

Datong PC1 gen cov convertor, £80. Newbrain AD, unused, £215 ono. Acorn Atom with BBC Basic, KSR33 teletype, wkg, stand, paper, Roband 25A psu, regulator faulty, rest wkg, offers. Ex-G8UPP, QTHR. Tel Kevin, 051-709 6022, ext 2549, daytime, Formby (07048) 79643, evening.

VHF fm hand portable (PF2FMH), case, spare nicads, mint cond, £38. Wood & Douglas 2m synthesizer, wkg, mic, 20W pa stage, £50. 35mm slide projector, £15. Akai GXC38D stereo cassette deck, Dolby nr, £30. G3WUN, QTHR. Tel Rochdale 57353.

NAD 4030 hi-fi stereo tuner, silver, fm/mw, wooden case, exc cond, half price at £50. Matches 3030 amplifier. Katsumi EK150 electronic keyer, in decent condition with its instruction sheet, a snip at only £30. G4IAC, QTHR. Tel 06755 2745.

Heath SB104A, 100W solidstate power supply, remote vfo, Shure 444 mic, £350. Buyer collects. Allen, G3AAH, QTHR. Tel 021-472 1301, ext 3470, 9am to 5pm, Monday to Friday.

TR7010 2m 8W ssb/cw, 144·100–144·335 (add xtal would give 144·05–144·065), comp, mint cond, £65. GI4JJF, QTHR. Tel Bangor 57362.

Drake L7E power amp, new, pair 3-500 2·5kW input, MN2700 atu, only used 10 times, current price £1,400 plus, offers over £800. Buyer collects. GJ4ICD, QTHR.

Microwave Modules MML100LS, 1·3W in, 100W out, as new, in box, suit FT290 etc, £110, or swap, haggle for variable voltage high current psu, cash adjustment. IC255E, £145. TR8300, 10–1W out, uhf rig, £140 ono. G6HKD. Tel Dennis, Weymouth (030581) 3998, (0305) 787747.

DX302, as new, boxed, Datong indoor active antenna, AD270, comp, £170. RS51504. Tel 01-550 2346.

Racal RA17 Mk2 rx, 0·5–30MHz, vgc, recently realigned, handbook, £175 ono. New washing machine forces reluctant sale! G6DLV, QTHR. Tel 0344 52865, after 6pm and weekends.

FT101E, late model, FV101B, ext vfo, mint cond, no mods, spare pa tubes (two sets), £425 ono. Prefer buyer inspects, collects. G3AJX, QTHR. Tel Winchester 61605.

Trio R1000 gen cov rx, 200kHz–30MHz, a.m., ssb, cw, etc, exc cond, Stephen James atu, used little, £210. G6BVH, 2 Herbert Hill, Whitehaven, Cumbria CA28 7HD. Tel 0946 4802.

RTTY Creed 444, convert your 50 baud machine to 45·45 bauds by changing only one gear, instructions included, £9.25. G3PPD, QTHR. Tel 01-422 4153.

Uniden 2030 10W fm 12ch, £55. Standard C430, uhf, 70cm, 10W, £75. G8DGR. Tel Rod, 0635 46480, after 7pm.

Icom 701, 701PS, SM2 mic, used little, orig packing, exc cond, £500 only. Quick sale required. Buyer inspects and collects. G3MCA. Tel Farnborough (Kent) (0689) 56497.

Marconi sig gen TF144HS, 10kHz–72MHz, completely serviced, calibrated by Marconi last year, superb cond, £150 ono. Counter/timer divider, 500MHz Racal 835/9010, mint, £100 ono. G6EII. Tel 0925 572332.

Icom IC201 2m fm/cw/ssb rig, 12V or mains, operational but needs some attention, hence only £100 ono. Buyer inspects and collects (Reading area). G4CIK NOT QTHR. Tel 0734 666153, evenings and weekends.

G2DYM 40/10 trap dipole, 55ft long, twin feeder, fb antenna, £40. G2DYM balance unbalance unit, £10. Both items together, £47.50. Powerful zoom binoculars, 6×14×32 vision, 320ft at 1,000yd, £40, or exchange 144MHz equip. W.H.Y? G3OAZ, QTHR. Tel 0256 65126.

Dynamic rams, 4116, 16KX1, 4027 4KX1, 50p each. Eight for £3. 4164 64KX1, £1.50 each. TMS9900JL 16-bit cpu, £5 each. 2147 static ram, £1.50 each. All rams new, cpus ex-eqt. G8ECZ, QTHR. Tel Newcastle (0632) 710834, after 5.30pm.

Unhappily I must part with my Icom 730, cw narrow filter fitted, homebrew psu, hf trans, it is in as new cond, orig packing, new computer forces sale, a bargain at £485. G6LLJ. Tel 0783 40999.

FT708, spare nicad, spkr, mic, PA3 mobile psu, charger, mint cond, £205. Jaybeam D8/70cm 8-over-8 unused beam, £18. Toyo T430N thruline wattmeter, swr, £22. One 2×5/8, one 3×5/8 mobile whips, unused, £17 pair. G4NPG, QTHR. Tel 021-743 0789.

Codar CR70A short wave rx, amateur bands, £25 ono. Trio T599S tx, 80–10m, £160 ono. G3CGQ, QTHR. Tel 0582 25519.

RTTY Creed 444, as new, only 595h use from new, 45·45 and 50 baud gears, service manual, spare paper, ST5 terminal unit, dual machines, autostart, as a pair, £175. Might split. TR2200GX 2m portable, nicads, charger, £80 ono. Daiwa CNA 1001 auto atu, as new, in box, £110 ono. G6SYZ, Nieuport, 18 Tintagel Terrace, Port Isaac, Cornwall. Tel 020 888 738.

Yaesu FT102, FV102DM, scanning memory vfo, filters, a.m./fm board, new October 1982, rig used little, together £850 ovno. G4RHL. Tel Richard, 0783 846435, evenings/weekends, or Durham City 41840, daytime.

FT101B, cw filter, spare tubes, orig packing, £290. FL2100B, hf linear amp, hardly used, orig packing, £290. SX200 scan rx, orig packing, £190. Going QRP! G4BXT, QTHR. Tel Paul, Dartford 77401.

FT290R, 144–148, 5–10/12·5–25 steps, 3SK88 front end, £200. MML 144/25 30W power/preamp,

£25. MMC 432/144S, converter as new, £20. £240 the lot. Tel 0226 41943, evenings and weekends.
Trio TR9000 all mode, PS20 power supply, Daiwa DR7500R rotator with round controller, Jaybeam 8XY Yagi, mast, wall brackets, UR67, five-core cables, comp 2m station, ideal for new G6, bargain, £460 ono. G6FCB. Tel 021-477 4697.
PET 3032, 32k, new rom, Nick Hampshire's p.e.t. revealed, dos, manuals, programs, assembler/disassembler, word processor, many games incl chess, only £300 or any offers! Could deliver from Liverpool. Bob, GW6UTP, 17 Aled Drive, Colwyn Bay, Clwyd LL28 4UU.
FL2500 linear, £200 ono. Solartron CD513 oscilloscope, manual, £40. Solartron CD714 oscilloscope, £25. Carriage at cost. G3ION, QTHR. Tel Southampton (0703) 769706.
FT101 Mk2, 160-10m, spare pa valves, orig packing, £250. G3KAF, QTHR. Tel 061-439 4952.
Trio 2400, extras, £135. Yaesu FT7B, 50W out, all 10m xtals, £285. Belcom LS102 10m all mode mobile, 10W out, 26-30MHz, £195. 14AVQ 10-40m trap vertical, £30. MMT144/28 transverter, £70. Pye Bantam 160MHz fm, no mods, £25. Ajax 24V marine valve tx/rx, 1·8-3·5MHz a.m., good for top band and 80m, £35. Labgear Colourtext converter for Oracle/Ceefax, £75. Sony 18in Trinitron colour tv, ideal computer monitor etc, £100. Tel South Benfleet 50985.
2m repeater based on TR7200G with logic, cabinet, xtalled R0, £95 ono. Two Pye "Home Office type" uhf repeaters: one 24V solid-state, other 240V valve, suitable conversion to uhf repeater, £50 ono. G4MQS, QTHR. Tel Leicester (0533) 553293.
Want to try 70cm? KF430, compact black box, 3W, RB0, 2, 4, 6, 10, 14, SU8, 8, 18, 20, 22, bargain, £80. Liner 430, fitted preamp, immac cond, £110. *Wanted:* Microwave Modules transverters, 28MHz to 2m/70cm. G4SHF/G8GHZ, 26 Westminster Gardens, Chippenham, Wilts. Tel 0249 654188, ext 153.
Trio TS500 hf ssb, a.m., cw tx/rx, Trio PS500 power supply, instruction manual, £165 ono. Tel 051-430 6032, after 6pm.
HRO rx, five coils incl four bandspread, power pack, service book, rack mounting, working, needs adjusting, £25. Elizabethan homebrew tx, 50W with huge power pack, modulator, £20. Buyers collect. G3HOD, QTHR. Tel Knowle 3024, evenings.
Drake R4C, MS4, recently serviced, £230 ono. G3LLL clipper for FT101 Mk2, etc, £15. G4DJC. Tel Chelmsford (0245) 62728.
FT707, exc cond, matching psu, atu, fm conversion, incl mobile connecting unit, D104 desk mic, £600. R. Hodges, RS49218, POB 11, Lincoln.
Yaesu FT902 dm, Yaesu FTV901R, antenna tuner FC902, £701. RS47501. Tel 542 9151.
Icom 720A, £750. PS20, psu, spkr, £99. ICAT500 auto atu, £240. Mobile mount, Icom headphones, all boxed, mint, £950 the lot. Icom 701, PS20 psu, spkr, very fine 160-10m tx/rx, £470. G6PBG. Tel 0293 510491.
Pye W15U Westminster 10ch boot mount, comp, works but requires new pa transistor, £30. KW Victor 80W a.m./cw hf tx, w/manual, £20. G6AAL NOT QTHR. Tel 01-267 8534.
Yaesu FT107M, power pack, as new, £500. Normand Tower motor type DR5, TOR100 240V worm and gear, £100. Hygain DB101 5A 10/15m duobander, £35. Hygain 204BA, £70. Buyer collects. G4GI, QTHR. Tel 0522 720366.
Partridge mini vertical antenna, Joymaster atu, tx version, artificial earth, £65. Welz SP10X power swr meter, £15. G4RAP. Tel Norwich (0603) 618327.
KW204 hf tx, six bands, 160-10m, ssb, a.m., cw, Shure 201 mic, spare 6146s, £135. Matching KW202 rx, Q-mult, notch filter, cal, spkr, handbooks, £135. KW107 Supermatch, £95. All exc cond. G4KKG, QTHR. Tel Yeovil (0935) 25327.
Philips N1702 video recorder, clean but needs attention, 1950 Bush television cabinet model, comp and wkg, sell for vcr, £40. TV, £30 or swap for any 2m gear. Tel 0702 202216 (Essex).
Teletype ASR33, tape punch, reader, on stand, 110 baud ASCII, 20mA current loop, RS232, £60. Heathkit SB610 monitorscope, £65. Heathkit IB1100 frequency counter, £35. Heathkit AV3U millivoltmeter, £28. All items plus postage. G3RDG, QTHR. Tel 01-455 8831.
KW204 hf tx, vgc, used little, pa valves, £100. Trio JR310 amateur bands rx, narrow filter, 160m a.m./usb/lsb/cw, recently revalved, vgc, £80. G3ZQF, QTHR. Tel Medway (Kent) 723694, evenings or weekends.
TS830S, mint cond, SP230, £575. Trio 1000, mint cond, £195. G4BXR, QTHR. Tel 0908 566266.
Icom IC730, mic, as new, ideal portable rig, £500. Swan PSU5 power supply available, £90. Yaesu FRG7700 rx, memory version, mint, matching active antenna, vhf converter, tuner, £420 ovno. *Wanted:* KW linear. G3MIN, QTHR. Tel Shoreham (Sussex) 3552.
FT225RD, £460. Mutek board for FT225/221, £30. Acorn Atom, 12k ram, floating point rom, toolkit eprom, £110. TS120V, mic, cw filter, £285. TL120 linear amp, £100. G4JNZ, QTHR. Tel 01-868 2159.
Marconi/BBC ribbon mic, the type used for years in BBC studios, swivel mounting on desk stand, £75. G5CS, QTHR. Tel 01-398 1582.
RTTY Creed 7B, wkg, good cond, £20. 6S6M tape sender, unused, £10. Two VCR97 crt, some slight burning, £5 each. Transformer, two capacitors for crt, power supply, £10. Buyer to collect. G3YWO, QTHR. Tel Witham-on-the-Hill 642, after 7pm.
QTH: Rural mid-Suffolk village between Diss/Stowmarket, close school, shop, detached three-bedroom modern house, enclosed corner, good-sized plot, garage, electric heating, cavity insulated, large lounge/diner, carpets, shack by negotiation, £29,000. Lockwood, G3XLL, QTHR. Tel Mellis 596.
FT901D a.m./fm/fsk, usb/lsb, exc cond, spkr (FP901), £420 ono. Sony air band rx TR8460, £40 ono. G8WTM. Tel Chelmsford 62174.
Late FT101B, FL2100B, FV101B, all mint, orig cartons, cw filter, all accessories, best offer. GM3OXC, QTHR. Tel 0224 832544, office, 0224 646984, evenings.
Eddystone S870 rx, £15. AR510 rx, internal psu, offers. Freq meter CKB74028 (aircraft BC221), charts, no psu, £20. Various bc valve rxs, round tube BBC1 tv, *Rad Com* 1975-9, offers. *Wanted:* 24V ct 10A transformer. G4GAS. Tel Swindon 750130.
BX1 post-mounted two-section telescopic tilt-over tower, prop-pitch motor, Selsyn indicators, TA33 Yagi with balun, £300. G3UFZ NOT QTHR. South Devon. Tel 0803 845304.
KW202, exc cond, comp with manual, matching spkr, £160 ono. Homebrew sstv monitor, £35. Prefer buyer collect. GW8JQW, QTHR. Tel 0639 812763.
Pye PF1 tx/rx, unmodified, nicads, £20 pair. BC5 charger for PF1s, £10. 2m conv, £5. Sankyo XL40S Super-8 sound/cine camera, unused, £80. Stereo amps, 25W transistorized, as new, psu, £30. Pair Fane stereo spkrs, unused, £30. Petrol generator 240V/50Hz, 500W, £50. Heath factory-built GR110 scanning rx, 144·0/146MHz, manual, fully xtalled, £45. Organ keyboards, 49-note c-c with switching, £30. RA17 case, £20. Buyer collects or carriage extra. G3MOE, QTHR. Tel 0242 24217.
SX200N, mint cond, £190 plus carriage. Approx 50 magazines *Practical Wireless, Radio Constructor,* 1960-70, offers. Buyer collects. Tel 01-886 9363 (North London), evenings.
TR2400 2m handheld tx/rx, digital readout, 10 memories retained, automatic memory scanning (busy-open channels), repeater, reverse repeater, keyboard selection 5kHz channels, lcd indicators for on air, memory, battery, dial light, nicads, ac charger, flex ant, hardly used, £115. Morrison, G8KUJ. Tel 0902 755634.
Pet disk single drive type 2031, hardly used, perfect, inspect and collect, £300. *Wanted:* any Thruline elements, fax equipment, KW lopass filter, IEEE488 to/from RS232 interface, modem, Stolle rotator, automatic, microscope slides. G3AZI, QTHR. Tel 0772 37815.
Colour studio camera, Marconi Mk7 incl psu, ccu, viewfinder, etc, £195. Heavy duty wood tripod, £20. Super 8 film camera, flood lamp, case, £45. Telequipment rack scope, £50. Vision mixer, C mount, telephoto lens, £25. G8GQS. Tel Gainsborough 3940.
KW1000 linear amplifier (property of a 'silent key', G6DW), two spare 572B valves, £240. Shure 444 mic, £20. G5CS, QTHR. Tel 01-398 1582.
TS830S, exc cond, nine months old, £550. Tono 250W 2m amp, £250. Pair quad es spkrs, £100. Quad 33 control unit, hb 303 amp, £80. Garrard 301, SME3009 with VIS3, £55. G8KLV, QTHR. Tel 0249 650880, after 7pm.
Drake C-line, R4C, T4XC, MS4, lp filter, £500. Fisher tuner/amp a.m./fm 15wpc, £40. HK1000 cassette recorder, £40. Goldring Lenco GL75 record player, Ortofon arm, Shure V15/111 cartridge, £30. G4GHG, QTHR. Tel Torquay (0803) 37050.
Yaesu FRG7700 rx, comp with Yaesu FRT7700 atu, both boxed, in new cond, new price approx £385, for quick sale accept £250. BRS51423. Tel Ray, Harpenden (05827) 62250, after 6pm.
Sirius 1 16-bit 128KB micro computer, CP/M86, MSDOS86, MBASIC 86, usual utilities, inspect, (bring your own programs if you wish) pay cash and take away, £1,500. Tel 0772 37815.
G4MH minibeam, 72 countries worked in nine months, sole interest now 10 so must sell, £50. *Wanted:* Yaesu FC107 atu, must be vgc, good price paid. G4OBK, QTHR. Tel Phil, Chorley 74451.
FT101E, 160-10m, cw filter, mic, extras, recent model in exc cond, offers. Wilson. Tel Ipswich (0473) 626205.
RTTY and Video Genie: computer and Catronics rtty terminal with all manuals, programs, connecting leads, exc cond, £200. Hitachi 12in monitor, £70. Tel Alan, 01-952 7711, ext 238, day, or 01-952 3848, (Harrow), evening.
Palm 4 70cm 1W 6ch handportable, fitted SU20, charger, as new, £75. Brown. Tel 01-556 6866, between 6-9pm.
FT901DE cw filter, desk mic, spare new pa valves, good cond, £500 ono. Linear trans, 1,900V dc, fw, rec, £7. G3SIO, QTHR. Tel Kings Winford 295924.
Icom IC2E 2m handheld, comp with base charger, BC30, hand spkr-mic, soft case, four months old, used little, as new cond, £175 ono. G4NUO. Tel Redcar (0642) 481216, or 0642 483464.
FT290R, nicads, charger, carrying case, MML144/30LS, £250 ono. Will split. Atom progs, rtty etc, tel for details. G4RWM, QTHR as G6GYW. Tel 0323 846577 (Sussex).
Sharp MZ80K computer, 48k, software includes: Basic: (SP259, extended, plus); Forth, Pascal, machine code, 100 program library, word processor, mc games, cost over £500, accept £390. Trio 9R59D rc, £70. All exc cond, going hf. G6UKL. Tel Tewkesbury 297579.
KW2000E, full 10m coverage, ac psu, KW110 Q-multiplier, vgc, occasional use only, reluctant sale but nowhere to sit down, £250. G3XSH, QTHR. Tel Southampton 760178, anytime.
Icom narrow cw filter FL32, 9MHz, 500Hz, at −6dB, 1·5kHz at −60dB, £21. G3WLX, QTHR. Tel Great Milton (084-46) 643 (Nr Oxford).
Acorn Atom, rtty prog interface, terminal, £180. Elekterminal, £20. ASCII keyboard, £20. Xitex ABM200, duff mpus, £20. GW4EVJ, QTHR. Tel 0792 843948.
MMT 438/28S 28-30MHz in, 432-436MHz out, repeater shift, £115 ovno. G4OIZ. Tel 0532 677054, after 6pm.
2200GX, charger, rubber duck, etc, orig box, spare nicad pack, mobile mount, spare xtals, VB2200GX, 10W pa, £100. Tel Uxbridge 58800.
Rockwell AIM65 microcomputer 6502, cpu unused, in orig packing, exceptional documentation, on board 20 column printer, single line display, full address data and control extension porting, twin tape recorder control, tty and two eight-bit user ports, 4k ram and 8k monitor/editor rom installed, three spare 4k rom sockets for Basic or Forth, Assembler etc, £165. G5CDE. Tel Egham 33500.
Sirius 1 16-bit 128KB micro computer, CP/M86, MSDOS86, MBASIC86, utilities, offered in exchange for Northstar Advantage in new cond, or £1,500 inspect, pay cash and take away. G3AZI, QTHR. Tel 0772 37815.
Shack clearance: 2050 rotator, mint cond, £30. Jaybeam 8-over-8 2m Yagi, mint, accessories, £25. 2m Storno Viscount, xtals for eight channels, accessories, £25. *Rad Com* 1964-83, binders, offers. Components, valves, klystrons, ics, transformers, etc. SAE list. G3ZDN. Tel 0625 610686.
Yaesu FT480R 2B tx/rx multimode, £290. Rotator 9502B, top bearing, 20m cable, £45. Dactron 13·8V 5A power supply, £30. Drae vhf wavemeter, £15. Jaybeam 8XY 2m ant, £25. GPV5 colinear, 2m ant, £15. 2 x 15m low loss coaxial, £10. 2m 5λ/8 and magmount, £15. SA450 coaxial switch, £5. SWR/power meter, £5. Wall brackets, 2in and 1·5in masts, £15. G6OBX. Tel Oswestry 662128.
Heathkit HW101 ssb tx/rx, 10-80m bands, comp with power pack, recently built, factory checked, tuned, cost £600, yours for £300 ono. Robert McGloin, 72 Maree Drive, Cumbernauld, G67 4LP. Tel 023-67 33770.
Trio 2400 2m hh, orig packing, plus soft case, remote spkr/mic, Wood & Douglas 10W amp/preamp (rf switched), 7/8 colinear whip, semi-folded dipole base antenna, swr meter, £165 the lot. G8ZZV. Tel Alan, Nottingham 278589.
Morse tuition programs on tape for VIC20, Spectrum, ZX81-1k, ZX81-16k (specify). Full instructions, variable speed and run length, checks and scores your copy, characters come in five stages for easy fast learning, £5 each. GW3RRI, QTHR. Tel 0286 881886.
Trio TX599/RX599 custom special matched pair, 2m converter, exc cond, £325. G4HLK, QTHR. Tel Staplecross (East Sussex) 326.
Trio 3200, 70cm fm, comp with case, charger etc,

£110. Tandy TRS80 pocket computer, cassette interface, software, £55. KVG XF9B ssb filter, carrier xtals, £30. G4AQB, QTHR. Tel Bolton (0204) 389033.

FT7, as new, used twice on holiday, never mobile, xtalled to 29MHz, £250. G-whip, 10, 15, 20, 40MHz with base, holdall, never used, £16. GM3GJB, QTHR. Tel 0324 23608.

RCA AR88LF hf rx, ideal for swl, incl spare valves, handbook, etc, £55 ono. *Wanted:* 2m ssb tx/rx such as Icom IC202S. David Dodds, GM6SXF. Tel Dunfermline (0383) 723056, evenings/weekends.

Sommerkamp TS280 fm, 50W version, vgc, £130, or would part exchange for scope, preferably TEK or Telequipment. G8YFK, QTHR. Tel 021-355 1513.

EC10 communications rx, good cond, £40. G3HUB, QTHR. Tel 023-062 505.

Pair KT88, as new, £10 ono. Eddystone s/m dial, £10 ono. G3OHE, QTHR. Tel 0429 61186.

FT290R, mint, case, helical, £190. VB2300 10W pa, £35. MMC 432/144 converter, £23. G8MYX, QTHR. Tel 0993 841305 (Oxon).

FT101, fan, cw filter, G3LLL clipper, 10MHz, SP101, £265. MMC 144/28LO, £12. G5RP, QTHR. Tel East Hendred 384.

Trio TR9DS, LS Calstar, £45, collect. *Wanted:* BC453 (Q5er) help to modify Marconi mobile type RC680 and Pye Olympic cat No M201B circuit diagram, notes for 144MHz. GM3CAN. Tel 0324 814269.

Low band fm Storno boot mount, control box, £45 ono. Pye PF2 uhf portable, antenna, mic, batts, charger, xtals, SU8, RB10, toneburst, £45 ono. G8XVV. Tel 0772 313886.

New, unused 4CX350 QY4400, £15 each. QY4250, £10. Several of each. 2,000pF vacuum variable capacitor, £20. Racal 50/600Ω 1kW 3/30MHz transformer, £5. 500W variable inductor, £5. All plus postage. G3NR, QTHR. Tel Woking 4844.

Icom 251 multimode base, £375. IC202S internal charger, deacs, £120. Fortop tv tx, psu converter relay switching, £140. Sony 0·5in vtr, one semi-working, spare heads, £70 worth of virgin tape, all for £170. Buyer to collect. G8UNZ, QTHR Colchester.

Comp hf station: Yaesu FT7 tx/rx, Yaesu FL110 linear, 100W 30A mains psu, battery back-up, G-whip multi-mobile 40-10m, chrome base, £400. *Wanted:* 4m and 2m transverter, 28MHz i.f., solidstate, defunct Heathkit RG1 rx. G4IDF, QTHR. Tel 0905 20135, evenings.

Panda tabletop tx PR120, 150W a.m./cw, five bands, 3·5-28MHz, offers around £45. Delivery can be arranged. G3RVD, QTHR. Tel Reading (0734) 340961.

Sota 100W, 2m linear, internal mains psu or 12V dc supply, £130. Trio TL911 2kW hf linear, spare valves, £275 ono. G3PLX rtty system, bargain at £80. *Wanted:* NAG 144XL or similar, VF900, DC900. G8NQP. Tel Salisbury 743335.

Cushcraft A3 3-el hf beam, 10/15/20m, dismantled ready for transport, £130. G3VQL, QTHR. Tel Shrewsbury 55179.

Lowe SRX30, vgc, £85. Prefer buyer inspects and collects. Datong D70 morse tutor, G3HSC morse records, £35. *Radio Amateurs Handbook* 1981 (ARRL), £4. Mutek 3SK88 2m preamp board, £5. G8CXQ, QTHR. Tel 0926 313669.

500W 144MHz W1SL linear kit, all valves, SK620A bases, metalwork, blower, relay etc, as received preassembled from GJ4ICD, £285. Teletype ASR33, manual, £65 ono. *Wanted:* Back numbers *QST, VHF Communications.* G4NVA, QTHR. Tel 0477 33011 (Cheshire).

Heathkit monitorscope SB610, £75. SWR/pwr meter HM102, comp with manuals, £20. Yaesu FT227R full scan mods, manual, £175. FT202R nicads, charger, whip antenna, six xtals, £100. Three QY4400 high pwr transmitting valves, £25 each. Two sets Pye pocketphone batteries, £18 per set. G4JA, QTHR. Tel 0507 604967 (Louth).

Beam antenna sale: TH3JR Hygain, £65. Tonna 9-el, 2m crossed Yagi, £10. Jaybeam 10-el Skybeam 2m, unused, £10. Buyers collect. G3GVV, QTHR. Tel Tonbridge (0732) 353360.

FT480R, 2m multimode, £280. FT780R 70cm multimode, £365. SC1 base console to accept both rigs, psu clock, etc, £85, as one unit £700. YM38 desk scanning mic, £20. FT780R and console, five months old. G6MUK. Tel 03316 2479 (Derbyshire).

Hallicrafters SX111 rx, 80-10m, £60. SR9 2m fm rx, £30. Converters, 2m: 4-6MHz i.f., £10; 28-30MHz i.f., £8. λ/4, 2m, guttermount, cable, PL259, £8. 19 set valves, offers? G4SFS (ex-G6ANP) QTHR, Avon. Tel 027583 2768, weekends.

Robot 400, mint cond, orig packing, used little, offers over £400. G4HNB, QTHR. Tel 051-638 9448.

RCA AR88D, good cond, £85 ono. BC221, £15. Buyers collect. G3VW, QTHR. Tel Lyme Regis 5282.

KW Viceroy Mk4, £60. AR88LF, £45. KW Vanguard, 160m inc, £30. CR300/2, int p/p, £30. QRO and vintage components. GM3FAK, QTHR. Tel Helensburgh 5407.

10m QRP homebrew cw tx, £5. Multimeter, new, boxed, 100,000 c/v, £20. Pentax screw type lenses, Optomax 500mm telephoto manual, preset type, £30. Mirage 28mm wide angle automatic, £10. Auto teleplus x2 converter automatic, £10. Tripod, £10. Standard 8 cine outfit, quartz zoom camera, Eumig projector, Boots editor and accessories, £30. G6MLJ. Tel Terry, Basildon 557938.

Swan SS200 solidstate tx/rx, 80-10m ssb/cw, 200W input, matching psu, spkr, manual, £200. G4BVI, QTHR. Tel Ipswich (0473) 53270.

CR100, B28, rx, cw full set of valves, some spares, accepts 6BA6 valves for rf stages as plug-in mod, £40 ono. G6VBM, QTHR. Tel 01-644 0126 (Cheam).

Teletype KSR33, comp with RS232 interface, suit home computer (printer), £55. Stand for ASR33 or KSR33, £10. Stabilized power supply (ITT) 13·8V, 10A, vgc, £25. 6-24V 1A Roband, £5. G6ENL NOT QTHR. Tel Milton Keynes 582702.

Galvanized lattice mast, sections 12ft 6in long, 14in each side, four available, £30 each or £100 all four to make soft tower. Buyer collects N. Somerset near M5. *Wanted:* Heathkit SB303, SB104. G3YCP, QTHR.

TS530S, immac, seven months old, 500Hz cw filter, manual, accessories, orig packing, £470, carriage extra. GM3HBT, QTHR. Tel Larkhall 883306, after 6pm.

Hygain TH3 Mk3 tribander, Daiwa DR7500 rotator, DC7001 controller, all good wkg order, £160. G3UJA, QTHR. Tel Alderley Edge 582295 during day.

Cue-Dee 10-el Yagi, only four months use, £35. G6ETA, QTHR. Tel 022779 3262, evenings.

TS120V, exc cond, fitted cw filter, £300, no offers, carriage extra. G4ERT, QTHR. Tel Markfield 242079, evenings.

AD370 active antenna, £30. MM4000KB rtty, £200. (VDU available extra). YC355D, £150. SWR bridge by Polar, £25. All vgc, plus postage. G8ESK, QTHR. Tel 0274 45611.

Yaesu FT227R memorizer, synthesized 2m fm tx/rx, 10/1W 25/5kHz step, one memory, reverse repeater, mobile mount, manual, vgc, £140 ono. G8JBK, QTHR. Tel Colchester 241032.

FT101, fan, cw filter, 160m 10MHz modified *Rad Com,* 4·78, good cond, £190. FV101B vfo, exc cond, £50. RAIC trap dipole 10-80m, £15. Speech processor, £10. W2AU balun, £5. G&D 144MHz converter, £7. G3NBP, QTHR. Tel 0223 248779.

Dragon rtty machine code transceive program, decodes tones directly or uses external tone detector, auto tone sync, split screen, QSO review, station paging (supply callsign) etc, rom, cartridge, £18, tape £9.50. Enquire other Dragon software. G4BMK, QTHR. Tel 0323 893378.

Clark telescopic air-operated ant mast, extends to 30ft plus 6ft extension, £95 or exchange oscilloscope. W.H.Y? Geordie Carman, 77 Oliver Road, Bury St Edmunds, Suffolk. Tel Bury St Edmunds 2783, after 7pm.

Kenwood 820S, mint cond, MC50 desk mic, new, fitted mobile power supply, £475 ono. Big signal W2AU balun, £10. 1-1, 50-75Ω Joystick, mobile mount, £7. G3JNY, QTHR. Tel Leeds 863058.

Computer panels, £1.65. Digital display tubes, neon, £1. Component packs, £3.50, incl ics resistors, diodes, capacitors etc, sae list, post incl. GW8XWH, Bryn Bugeiliaid, Nebo, Penygroes, Caernarfon, Gwynedd LL54 6EB. Tel Penygroes 880294.

MMT transverter, 432/144, as new cond, £125; 18-el parabeam free to buyer. G8FFQ, QTHR. Tel 0902 762194.

Wrasse sstv unit, tx/rx three mems, keyboard, lightpen, as new, £500. Yaesu FT101ZD, FT2100 linear, vgc, £550 both. TS2400 handset, base charger, £100, no offers. G4MLQ, QTHR. Tel 0226 87707, after 6pm please.

Trio TS520S, cw filter, mint, recent overhaul, £365. Europa 2m transverter, spare pa, £50. Homebrew atu, will take about 3kW! £20. Creed 75, believed working, offers? House move forces reluctant sale. G4NQB NOT QTHR. Tel Stan, 0902 341956.

BBC model B software to teach you morse 6-32wpm, learn code, keyboard test, mixed groups, random words, 200 in store, adjustable pitch, colour or b&w, 80 frames of advice, menu driven. Briggs, 57 Charlton Drive, Sheffield S30 4PA.

FT101Z, mint, nine band, fan, £425. BBC B micro ·10S, £350 ono. QTH, semi, kitchen, lounge, study, three bedrooms, integral garage, superb views, gardens, 550ft asl, vg uhf, £25,000 to incl 30ft tower and hf beam. G4AGE, QTHR. Tel Chesterfield 823394.

Vertical 10-80m groundplane, wires missing, otherwise perfect, unused, £45. Tel Bruce, 072278 396.

Racal RA17L in orig matching table cabinet, superb cond, £240. Honda E300 generator, used little, £125. Tonna 16-el portable, £25. Jaybeam 8-over-8 2m, £18. 4-el 4m, £15. AR22 rotator, £27. Buyers inspect and collect. G3SPJ, QTHR. Tel 01-311 8405.

Thandor 10MHz oscilloscope, X10 adaptor, as new, mains unit, nicads, £75. Datong morse tutor, £25, no offers. G4MLQ, QTHR. Tel 0226 87707, after 6pm please.

HW101 tx/rx, comp SB600, HP2B, in good cond, cw filter fitted, £150. OS2 oscilloscope, £20. G3IBW, QTHR.

Pan/tilt mechanism for cctv, remote variable speed, joystick control, max load 40lb, RCA type V350PTV, weight 40lb, as new, never used outdoors, £250. Buyer collects. G6AOX. Tel Bolton (0204) 592387.

KDK 10W 2m tx/rx, vgc, £100 ono. Standard C146A 5ch, 2W handheld, xtalled R3, R6, S20-22, case, nicads, base charger, £55 ono. Exchange the pair for IC2E, TR2400 or similar. G8GCU, QTHR. Tel Heathfield 3122.

Transformer, mains inputs 475-0-475 250mA, 13V 6A ct, 4V 2A ct, 4V, 2A, 35V 0·2A, 35V 1A, 6in deep, three paper condensers, 10mF 1,000V dc, wkg, offers. 8mF, 600V paper. G3MBL, QTHR. From 18 June tel 01-445 4321.

35ft telegraph pole (fully-equipped) with free QTH, Nottingham! Very good elevation, large shack/workshop at base, double garage, parking for several vehicles, spacious, versatile detached property, quiet suburb two miles city centre, three first-floor bedrooms, bathroom, large dining kitchen, lounge, two rooms to side extension (indoor shack/study/office/second reception/guestroom) full gas ch, small easily-managed garden to one side and rear (lawn, shrubs, fruit trees), £32,500 only, early completion accommodated. G4IRX NOT QTHR. Tel Nottingham (0602) 872909.

Gulbransen model 2101 electronic organ, two manuals, octave pedal board, manual one, nine voices, manual two, five voices, tremulo and chorale effects, Leslie spkr, additional rhythm unit, £300. Delivery by arrangement G8RW, QTHR. Tel 01-462 1592.

Rioch Digilarm mains clock, orange, time wkg, no alarm, 7 × 3in, £4.50. Valve 6BW6, new, £1.50. KW2000 three-gang preselector tuner, £4. Filter unit type 504, 34-86MHz, digital, £2. G3MBL, QTHR. From 18 June tel 01-445 4321.

FT901DM tx/rx, all optional filters fitted, ideal rig for new G4, as supplied mint cond in every respect, history, £475. G3KDH, QTHR. Tel Tring 3505.

Datong FL1, £30. Atlas 206 remote vfo, £70. Teletype model 32ASR printer, £30. Bi-Pak module amplifier, £20. Garrard SP25 Mk4 turntable, £4. G4CIN, QTHR. Tel Bilston 403416.

SSTV memory boards to upgrade the G3WCY sstv system to colour and/or extra bw memories without using additional digital boards, £3.75 per pcb. G4ENA, QTHR. Tel Stroud (04536) 79453.

TRS80 micro computer, 16k level 2, full size keyboard, comp with vdu, cassette program recorder, cassettes, detailed instruction, programming manuals, etc, cost over £500, sell £350 or exchange hf tx/rx. G4MLI NOT QTHR. Tel St Gennys 282.

FRG7 digital, £140. G4FBZ, QTHR. Tel Dave, 021-526 6136.

Yaesu FT902DM, as new, £780. Icom IC260E, vgc, £220. Sanyo RP8880 rx, vgc, £150. Tel 01-660 0370.

Miniature instruments: Nombrex cr bridge, £8. Nombrax inductance bridge, £12. TE20D sig gen, 120kHz-500MHz, £20. RTTY scope tuner, parts cost £21, £11. See and collect, or post extra. Tel Colin, 042-43 4726.

Racal RA17 Mk2 rx, 0·5-30MHz, six filters, 100-8kHz ssb adaptor with afc, latest new mains operated preamp, matching homebrew atu, all wkg perfect, buyer please collect owing to weight, £325 ono. G4LW, QTHR. Tel Trowbridge 3166.

FT225RD, £350 ovno. Shimizu Denshi tx/rx, 10W, fm, £235 ovno. Pye Lynx camera, lens, £35 ovno. G6HUP, QTHR. Tel 0522 692638.

FC707 hf atu, 10-80m, dummy load, brand new, few hours use only, £70. GM4CUX, QTHR. Tel 031-332 5300.

Manuals for Trio KA2000A stereo amplifier, Yaesu FRDX400 rx, Wilcox-Gay Master osc, xtal multiplier, £2 each. New 8Ω 5W spkr, 6 × 4in approx, £2.

Two 6JS6C valves, USA General Electric, boxed, £4 pair. G3MBL, QTHR. From 18 June tel 01-445 4321.

Icom ICR70 rx, fm board, three weeks old, new cost £529, genuine reason for sale at £470 with manual, orig packing, super performance. Yaesu FRT7700 atu, brand new, cost £42.55, bargain at £30. Tel Bulls Green (Herts) 219.

Sommerkamp TS802 tx, as new, comp with power supply, battery charger, £100 ono. 5-el beam, £10. SWR meter, £5. G8SIG, 1 Launceston Close, Winsford, Cheshire. Tel Winsford 53814.

Marine vhf 4MHz xtals, ex-equipment HC6U TX5 4340·28. TX6 4341·67. TX8 4344·44. TX9 4345·83. TX10 4347·22. TX11 4348·61. TX12 4350. TX14 4352·78. TX16 4355·56. TX18 4358·33. TX20 4361·11. TX21 4362·50. TX22 4363·89. TX26 4369·44. £1.25 each incl p&p. G3LTU, QTHR. Tel Cleethorpes 696412.

IC25E, exc cond, still under warranty, part exchange FT707. G6AOZ, QTHR. Tel Whitstable (0227) 273660, after 6pm or weekends.

70cm equipment: Yaesu FT720RU 10W fm mobile, 5/8 + 5/8, mag mount, 5/8 + 5/8 + 5/8 colinear, 18-el parabeam, £185 lot. *Wanted:* good comm rx. G4PFK. Tel 021-360 9306.

FRG7, fine tune, no mods, £120. Pye U450 base station, wkg on 70cm, £25. Mufax paper for D900, £12 per roll. G4LOO, QTHR. Tel Luton 28667.

Yaesu FT107M. FP107E, mic, WARC, mint, £550 ono. Yaesu FT720R 2m fm, mint, £150 ono. Standand C78 70cm fm, vgc, £160 ono. Trio 3200 70cm fm, nicads, etc, £90 ono. All orig packing, buyers pay carriage. Tel Weymouth 786930.

FT7 hf tx/rx, comp with mic, power cables, mobile mounting bracket, boxed, rarely used, incl multimobile G-whip, absolute bargain, £265. FL110 hf amp, 10W in, 100W out, mint cond, £65. G3VBW, QTHR. Tel West End (04218) 2584.

PF2FM, three comp, almost new, leather cases, spare batts, helical ants, xtalled on common simplex channel, ac charger, capacity 10 batts, comp set-up, £220. Tel 0533 606188, after 6pm.

TR2500 handheld, soft case, spkr mic, AA type battery box, boxed as new, £195 ono. G6IFZ, QTHR. Tel Chelmsford (0245) 400966.

WANTED

IC2KL, IC2KLPS, 1k dummy load, power meter, both in perfect cond. G4OWV. Tel Great Yarmouth (0493) 663195).

Help: poor swl wants cheap FRG7, doesn't have to work. Can also exchange Marconi oscilloscope for use or spares, also large power supply, ac 240V. Tel Nigel, Southampton 760400, any time up to 8pm.

Collins TCS12. Please will someone help me. I need a handbook and/or circuit information for the tx unit. Willing to pay through the nose for original or photostats. Tel Philip Stokes, 01-348 0947.

Circuit diagrams, manuals, buy or borrow to photostat for Kay Electrics Ligna Sweep SKV935C and Philips tv monitor EL8100/03. Philips 6in monitor cr tube type AW1769. G3DQL, QTHR. Tel Ernie, Doncaster 840240, anytime.

50W booster amp, height preferably 4in or less for 4Ω induction loop at local Red Cross Hall. G4PTD. Tel Clacton (Essex) 81 3697.

Complete prop pitch motor or gearbox alone. Tel May, Liss (Hants) 2143.

Plot of land for erection of three-bedroom bungalow. Will consider any area with pleasant site and outlook. The bungalow is for own use. Letters only please. All will be answered. Information on pin diode relay tr switching for HW8. Details of full QSK methods for same. Been searching for years without success. Your help much appreciated. Any parabolic dish (> 12in). Heath SB620 analyser. Letters please—all answered. G4GTU, QTHR.

Sait MR14II technical manual, to buy or borrow for copying. 18 Rochester Avenue, Reading RG5 4NA, Berks, all costs paid. Tel Mike Dawson, 0734 694654.

Video: modern vhs set, in good cond. G3RDX, QTHR. Tel 0395 32364.

Manual for Swan 350 tx/rx. Buy/borrow. G3XLF NOT QTHR. 5 Pickerings Close, Runcorn, Cheshire.

Suitcase tx/rxs; any spares, incomplete or damaged sets. WS (CDN) No29 spares, particularly connecting leads. Army tx No53. Any commercial or military a.m. fone tx or tx/rx covering about 3-8MHz continuous. Taylor, G3UCT, 8 Government House Road, York YO3 6LU. Tel York 29777.

£10 reward for information leading to purchase pedal generator, 1945 vintage, tripod tubular frame with rectangular back-frame and canvas deckchair seat. Square housing generator has five-pin Plessey connector, webbing straps and canvas cover. G3EUR, QTHR. Tel South Ockendon 852371.

US Army Signal Corps rx BC224C/BC348C. BC312/342, esp early models. Dynamotors, transformers, antenna relays, capacitors, jacks, etc for same. RX OA252 (post-war BC342 with improved psu and other official mods). G8LIU, QTHR. Tel Uxbridge 30006.

HQ minibeam required by disabled op. First class cond only. Other makes considered. G4OBR, QTHR. Tel Malton (Yorks) (0653) 4382, anytime.

QST Jan, Feb, 1974. Buy or borrow, photocopy and return, postage refunded. DX Eng or Magnum Six rf processor for T4XC. SB200, KW1000. G4DJC. Tel Chelmsford (0245) 62728.

KW107 Supermatch atu or Trio AT230 atu. G4PJY, QTHR. Tel Oakham 2721.

Yaesu FV101B external vfo. G4NSJ. Tel Worthing (0903) 47139, after 6pm.

Myford metal working lathe, accessories. Engineer's tools, ie micrometers, calipers, gauges etc. G4MA, QTHR. Tel 0472 814838.

External vfo for FTDX560. Monitor scope, and other accessories to suit the above. G4LMA. Tel John, Telford 49306, evenings only.

TS520S, preferably with DG5 freq counter, must be in good cond. GU6JSC. Tel Guernsey (0481) 24930.

Canadian 58 set, 6-9MHz manpack, good cond please. G8IDL, QTHR. Tel 0638 76230.

Wide-spaced variable capacitors for homebrew atu, 200pF or near value. R. E. Hammond, Winchester. Tel 0962-72 557, evenings.

Supply unit rect No30, supply unit, rotary 24/530V, 450mA, coaxial, plug a.m. type 161 10H/184. G4FUY, QTHR. Tel Reading 733633.

FT2FB, FT2 auto, faulty front end board for spares, ie, front end coils and helical filter, rest of board would be returned. Can you help please? G8BIH. Tel John, Alton (0420) 82739.

Copies of *Rad Com* test of HW8, Nov '76; R4C alignment, April '77; circuit diagrams Drake R4C, T4XC; all costs met. GM4IAO (ex-GM8OVN), QTHR. Tel 0466 2673.

ARRL handbooks, 1975-82 incl. *Radio Engineering Handbooks* by Langford Smith or Terman or Orr. *Problems in Electronics with Solutions* by Benson. *Radio Communication* Feb 1983. Scott, 91 School Road, Peterhead, Aberdeenshire. Tel 0779 76062.

Video monitor or combined tv/monitor, colour or mono. Anything considered, though must be in good wkg order. G4GIJ, QTHR (nr Croydon). Tel 01-660 5474.

Mostek clock chip MK50253N. GM4JNB, QTHR. Tel 0397 2100, office hours.

KW Atlanta, Victor, Viceroy or any Yaesu tx, any cond. Mini-beam HQ1 or G4MH, reasonable price paid. G4JA, QTHR. Tel 0507 604967 (Louth).

G4MH mini-beam for disabled person, must be reasonable price. Tel Burnley (0282) 59320, anytime.

Circuit diagram for Pride Electronics HFL125 linear amplifier. G3RSJ, QTHR.

8873 transmitting triode valve. Offers for *QST* 1981-82. G2DRT, QTHR. Tel Penn (049481) 4240.

Eddystone All World Two rx, Eddystone 14mm td bandspread unit with dial, part number 1043. No2 coil pack for MCR1. Mains transformer for Hallicrafters SX24 S20R rxs. Any early amateur/shortwave rxs. G4HHZ, QTHR. Tel 04215 68705, home, 0962 822401, work.

KW Vespa Mk2, manual, if poss within reasonable reach of Oxford. G2ACB, QTHR. Tel Longworth 820332.

LM14 frequency meter, must be in good cond, preferably East Anglia so I can inspect. Early wireless components by Telsen & Ormond. G8AMJ, QTHR. Tel Norwich (0603) 738440, evenings.

VFO for Heathkit DX60B tx. G3CNR, 7 Lancaster Road, Uxbridge, Middx UB8 1AP.

Yaesu YO901(P) multiscope. £5 reward for anyone helping me to successfully locate and purchase one. Good price paid, distance no object. G4NOW. Tel 01-850 4848, evenings and weekends.

By ex-swl starting up again: AR88D Collins, Hallicrafters 1154, 1155, wd or any similar comms rx, wkg or not as long as repairable. R. Newell. Tel Cambridge 861354, after 6pm.

W/S62 spares, No10 xtal calibrator. W/S18 and W/S48 case. A510 canvas case. W/S38 Mk1. W/S88, W/S88 AFV, W/S38 AFV power supply, C12 psu and atu, antenna for Pye Walkiephone. No19 set Mk1 or Mk2 power supply. B44 Mk2. Larkspur sets. Information for Cossor CC3/AB3. G8MQT, QTHR. Tel Terry, 07073 27233.

Attempting my own "real" radio collection. Good price paid for mint 19 sets, 38 sets, 1154, 1155, BC348, anything of this era accepted. W.H.Y? G3ZYC, QTHR.

Buy, beg or borrow for copying circuit dia/manual for Panda Cub tx. G3GMM, QTHR. All letters answered.

Racal 806R 32MHz counter. Serviceable pcbs wanted, particularly in series 190012-190094. G6HL, "Lamont", Mill Lane, Cleeve Prior, Evesham, Worcs WR11 5JZ.

3032K Commodore PET or 4032K with any peripherals. FT75B, also with any vfo. FP75, etc. Going rates paid by new station. Sig gen 100kHz-150MHz logic checkers, 14/16way d.i.l. TTL/DTL-cmos, or TTL/CMOS logic pulser. Colour camera video similar Panasonic 3030E, with power unit if available. ZX80A. G4IZQ. Tel Ken, 0632-678828, Newcastle-upon-Tyne, anytime.

RADIO EXCHANGE

YAESU

FT980CAT	NEW all-mode transceiver with AM/CW/FM/SSB/AFSK	1199.00
FT102	160-10M 9-Band Transceiverr **NEW**	819.00
FT ONE	Gen. Coverage Transceiver **NEW**	1345.00
FT790R	70cm all-mode portable **NEW**	309.00
FT101ZFM	160-10m 9-Band Transceiver	535.00
FT101ZDFM	160-10m 9-Band Transceiver	599.00
FC902	9-Band atu, swr/pwr etc **SPECIAL**	99.00
SP901	External speaker	31.00
FL2100Z	9-Band 1200W linear	459.00
FT77	8-Band solid state 100W	469.00
FP707	230 volts AC power supply	99.00
FC707	Aerial tuner (unbalanced only)	85.00
MR7	Metal rack for above	15.70
MMB2	Mobile mounting bracket	16.00
FRG7700	SSB/AM/FM recvr. dig. readout	319.00
MEM7700	Memory unit for above	90.00

CONVERTERS FOR ABOVE—OLD PRICES HELD

FRV7700A	118-150MHz	69.75
FRV7700B	50-60MHz & 118-150MHz	75.50
FRV7700C	140-170MHz	65.95
FRV7700D	70-80MHz & 118-150MHz	72.45

FRT7700	Receiver aerial tuner	37.85
FF5	LF filter for above	9.95
FT480R	2m all-mode transceiver	*365.00
FP80A	230V AC power supply	63.00
FT780R	70cm all-mode transceiver	*399.00
FT290RD	**SPECIAL** 1983 version with ARE mods	269.00
NC11C	AC charger	8.00
CSC-1	Carrying case	3.45
MMB-11	Mobile mounting bracket	22.25
FT208R	2m synthesized portable FM	199.00
NC9C	AC charger	8.00
FT708R	70cm hand-held	209.00
YH55	Headphones, low Z	10.00
YH77	Lightweight h/phones, low Z	10.00

ICOM

IC740	Multimode H.F. transceiver **NEW**	769.00
IC720A	HF transceiver and gen. cov. rec	849.00
IC730	HF mobile transceiver 8-band	599.00
ICR70	New multimode receiver	499.00
PS15	Power supply for 720A	109.00
IC251E	2m multimode base station	559.00
IC25E	2m synth compact 25W mobile	259.00
IC290H	2m multimode mobile 25W	419.00
IC2E	2m FM synthesised handheld	169.00
IC4E	70cm handheld	189.00
ICL1/2/3	Soft cases	4.25
ICHM9	Speaker/microphone	15.00
ICCP1	Car charging lead	3.75
ICBP2	6V Nicad pack for IC 2E	33.00
ICBP3	9V Nicad pack for IC 2E	23.00
ICBP4	Empty case for 6 × AA Nicads	6.95
ICBP5	11.5V Nicad pack for IC 2E	44.00
ICDC1	12V adaptor pack for IC 2E	9.75

TRIO-KENWOOD

TS430S	Gen. coverage multi-mode **NEW**	725.00
TS930	Gen. coverage transceiver **NEW**	P.O.A.
TS130S	8-Band 200W pep	469.00
AT130	100W antenna tuner	79.00
TR2500	2m FM synthesised handheld	217.00
HC10	Digital desk World Clock	58.75
DM801	Dip meter	P.O.A.
R600	Gen. coverage receiver	235.00
R2000	Gen. coverage receiver	395.00

SCANNING RECEIVERS

	ARE Communications	
AR3000	720 channel synthesised air band receiver	99.00
	Fairmate	
AS32320	VHF/UHF scanning receiver, air band/military/police	149.00
	FDK	
ATC720	720 channel air band handheld	129.00
ATC720SP	Professional version of above	189.00
	JIL	
SX200N	16 channel memory, synthesised AM/FM	259.00
	Maximal-Mickey	
MK4000	8 channel memory, 70-80MHz, 140-176MHz, synthesised	99.00
	Bearcat	
BC100FB	16 channel memory, synthesised, handheld	345.00
BC150FB	10 channel memory, synthesised	144.90
BC2020	20 channel memory, AM/FM, synthesised	269.00
BC250FB	50 channel memory, synthesised	249.00

TONO

THETA 9000E	RTTY/CW/ASCII, Tx/Rx	669.00
THETA 550	RX only	299.00
	AMPLIFIERS	
UC70	430MHz 55W + preamp	159.00
2M 50W	144MHz 30-50W	69.00
2M 100W	144MHz 100W + preamp	129.00
MR 150W	144MHz 130-150W + preamp	169.00
MR 250W	144MHz 250W + preamp	325.00

TASCO

TeleReader CWR685 RTTY/CW/ASCII	769.00
TeleReader CWR670E As above Rx only	345.00
TeleReader CWR610E Basic unit	189.00

TOKYO HY-POWER

HL32V	VHF 30W linear 1-5W drive HI-LOW output	53.50
HL82V	VHF linear preamp output meter 2-12W in 35-85 + out	144.50
HL160V	VHF linear preamp output meter 1-10W in 160W + out	242.40
HL45U	UHF linear preamp 2-15W in 10-45W out	119.75
HC150	HF ATU SWR/Power meter 200W PEP	62.50
HC2000	HF 2kW ATU SWR/Power meter 6 POS ant. switch. 6 to 1 vernier high Q coils 2kW peak 1kW continuous	276.55

HI-MOUND MORSE KEYS

HK702	Up down keyer marble base	24.50
HK704	Up down keyer	16.68
HK705	Up down keyer	12.50
HK706	Up down keyer	13.75
HK708	Up down keyer	11.96
HK808	Up down keyer marble base	39.57
MK704	Twin paddle keyer	10.95
MK705	Twin paddle keyer marble base	22.00

BNOS ELECTRONICS

12/6A	Power supply, 13.8V.6 amp fully protected	48.30
12/12A	Power supply, 13.8V.12 amp, fully protected	86.40
12/24A	Power supply, 13.8V.25 amp, fully protected	125.45
12/40A	Power supply, 13.8V.40 amp, fully protected	225.40

DRAE

FULLY PROTECTED POWER SUPPLIES

4 amp	30.75	6 amp	49.00
12 amp	74.00	24 amp	105.00

VHF Wavemeter 130/450MHz	27.50
Morse Tutor	49.00

ALINCO

ELH 230	2M RF amp 3W in/30W out	39.00
ELH 720	70cm RF amp 1W in/10W out	59.00
EMR 400	Rotator—heavy duty	89.00

TET ANTENNAS

AX210N	10 ele. yagi for 2m crossed	74.95
HB10F2T	2 ele. 10m mono band beam	51.50
HB10F3T	3 ele. 10m mono band beam	74.95
HB15F2T	2 ele. 15m mono band beam	60.66
HB15FT	3 ele. 15m mono band beam	93.45
HB15M25P	VP mini size 15m 2 ele	69.50
HB15M35P	VP mini size 15m 3 ele	102.30
HB34D	4 ele. tri band beam 10/15/20m	222.90
HB33SP	3 ele. tri band beam 10/15/20m	192.50
HB35C	Tri band array 10/15/20m	283.95
HB35T	5 ele. 10/15/20m	278.50
MV3BH	Vertical for 10/15/20m	37.99
MV4BH	Vertical for 10/15/40m	48.90
MV5BH	Vertical for 10/15/20/40/80m	63.95
MLA4	Loop antenna 10/15/40/80	105.60
SQ22	Phased 2 ele. swiss quad 2m	58.95
SQY06	6 ele. quagi 2m	45.75
SQY08	8 ele. quagi 2m	52.75
HB210S	10 ele. dual driven yagi 2m	47.99
TE214	14 ele. long yagi 2m	74.40
SSL720	9 × 2 ele. (18) slot fed 70cm	77.20
HB23SP	2 ele. tri band beam 10/15/20m	135.60
SSL218	9 × 2 ele. (18) slot fed 2m	144.79
TPH2	Phasing harness 2m	17.25
QYU10	10 ele. quagi 70cm	67.90
SQ007	70cm 2 ele. phased swiss quad	66.99
SQ10	Swiss quad 10m	97.50
SQ15	Swiss quad 15m	106.90

ANTENNA SWITCHES

SA450	SO239 connectors, 1 in, 2 out	9.75
SA450N	N-type connectors, 1 in, 2 out	12.75

ROTATORS

KR250	Kenpro Lightweight 1-1½" mast	48.00
9502B	Colorotor (Med. VHF)	56.60
KR 400RC	Kenpro—inc. lower clamps	P.O.A.
KR 600RC	Kenpro—inc. lower clamps	P.O.A.

BENCHER

BY1	Keyer Paddle (black base)	35.84
BY2	Keyer Paddle (chrome base)	43.72
BY3	Keyer Paddle (gold plated)	92.00
ZA 1A	Balun 3-5-30MHz for dipoles	15.00
ZA 2A	Balun 14-30MHz for beam ant	17.25

ADONIS MICROPHONES

202HD	Head set mic with control box and fet head	29.00
202HM	Headphones unit, fet mic with control box	39.00
202S	Flexible neck clip mic with control box	21.95
MS10	Mobile speaker and message pad, visor mount	16.25

WELZ PRODUCTS

SP200	1.8-160MHz 20-200W-1kW PWR/SWR Meter	69.95
SP300	1.8-150MHz 20-200W-1kW PWR/SWR Meter	97.00
SP400	130-500MHz 5-20-150W PWR/SWR Meter	69.95
SP600	1.8-500MHz 20-100-2kW PWR/SWR Meter	97.00
SP15M	1.8-160MHz 5-20-200WW PWR/SWR Meter	35.00
SP45M	130MHz-470MHz POWER/SWR Meter	51.00
SP-10X	Compact version of SP15M	24.45
SP250	1.8-60MHz 20-200-2kW	49.50
SP350	1.8-500MHz 5-20-2kW	59.95
SP380	Compact version of SP300 (200 watts max)	49.00
AC38	3.5-30MHz ATU 400W PEP (8 bands)	65.00
CT15A	15-50w dummy load. (PL259)	7.95
CT15N	15-50w dummy load. ('N' plug)	13.95
CT150	150/400w dummy load. Rated 250MHz (SO239)	35.50
CT300	300/1kW dummy load 250MHz (SO239)	49.50
CT03N	3W dummy load 1.3GHz ('N' socket)	30.00
CH20A	2 way coax switch 1kW 900MHz (SO239)	17.95
CH20N	2 way coax switch 1kW 1.3GHz ('N' socket)	31.95
TP05X	50-500MHz power meter with load	13.95
TP25A	50-500MHz 25W power meter with load	17.50
TP20G	30-1500MHz power meter with load	139.00
CA35A	Static discharge protector. DC 500MHz 300w SO239	10.75
CA23N	Static discharge protector. DC 1500MHz 300w 'N'	12.60

MICROWAVE MODULES

MMT 144/28	2M Transverter for HF Rig	109.95
MMT 432/28S	70cm Transverter for HF Rig	159.95
MMT 432/144R	70cm Transverter for 2m Rig	184.00
MMT 70/28	4m Transverter for HF Rig	115.00
MMT 1296/144	23cm Transverter for 2m Rig	184.00
MML 144/30LS	2m 30W linear Amp (3WI/P)	69.95
MML 144/50S	2m 50W linear Amp (10W1/P)	85.00
MML 144/100S	2m 100W linear Amp (10W1/P)	139.95
MML 432/20	70cm 20W linear Amp (3W1/P)	85.00
MML 432/50	70cm 50W linear Amp	109.95
MML 432/100	70cm 10/100W linear Amp	228.65
MM 2001	RTTY to TV converter	189.00
MM 4001	RTTY transceiver	269.00
MM 400KB	RTTY transceiver with keyboard	299.00
MMC 50/28	6m converter to HF Rig	29.90
MMC 70/28	4m converter to HF Rig	29.90
MMC 144/28	2m converter to HF Rig	29.90
MMC 432/28S	7cm converter to HF Rig	37.90
MMC 432/144S	70cm converter to 2m Rig	37.90
MMC 435/600	70cm ATV converter	27.90
MMK 1296/144	23cm converter to 2m Rig	69.95
MMD 050/500	500MHz dig. frequency meter	75.00
MMD 600P	600MHz prescaler	29.90
MMDP 1	Frequency counter probe	14.90
MMA 28	10 meter pre amp	16.95
MMA 144V	2m RF switched pre amp	34.90
MMF 144	2m band pass filter	11.90
MMF 432	70cm band pass filter	11.90
MMS 1	The morse talker	115.00
MMS 2	Advanced morse trainer	169.00

DATONG

PC1	Gen. Cov. Converter HF on 2m	137.42
VLF	Very Low Frequency Converter	29.90
FL1	Frequency Agile Converter	79.35
FL2	Multi-mode Audio Filter	89.70
FL3	FL2 with auto notch **NEW**	129.37
ASP	Auto R.F. Speech Clipper (Trio or Yaesu plug)	82.90/89.70
D75	Manually controlled R.F. Speech clipper	56.35
RFC/M	R.F. Speech Clipper Module	29.90
D70	Morse Tutor	56.35
AD 270	Indoor Active Filter (inc. PSU)	54.05
AD 370	Outdoor Active Filter (inc. PSU)	71.30
MK	Keyboard morse sender	137.42
PTS1	Programmable tone squelch systemm (two units)	45.99
RFA	Wideband preamplifier	33.92
MPU	Mains Power Unit	6.90

muTek

SLNA 70s	70MHz switched preamp	33.90
SLNA 70u	70MHz unswitched preamp	20.38
SLNA 70ub	Unboxed SLNA 70u	12.41
SLNA 144s	144MHz switched preamp (now 0.9dB nf typical!)	33.90
SLNA 144u	144MHz unswitched preamp	20.38
SLNA 144ub	Unboxed SLNA 144u	12.41
SLNA 145sb	Optimised preamp for FT290RD **NEW**	24.90
BLNA 432ub	1.3dB nf sub-min 432MHz preamp	12.43
TLNA 432s	432MHz bipolar switched preamp	54.90
TLNA 432u	432MHz bipolar unswitched preamp	26.40
TLNA 423ub	Unboxed TLNA 432u	18.50
GLNA 432u-1	432MHz gasfet unswitched preamp 0.8dB nf/ 13dB gain	46.90
GLNA 432u-2	432MHz gasfet unswitched preamp 0.65dB nf/ 13dB gain	56.90
BLNA 129ub	1.3GHz bipolar unswitched preamp 1.8dB nf/ 12dB gain	24.50
GLNA 1296u	1.3GHz two-stage ultra-low noise gasfet unswitched preamp 20dB gain	82.25
HDRA 95u-1	1.5dB nf/8.5dB gains high dynamic range band II preamp (input intercept + 22dBM)	29.90
HDRA 95u-2	11.5dB gain variant (input intercept + 16dBm)	29.90
BBBA 500u	20-500MHz broadband high dynamic range preamp	26.40
BBA 860u	250-860MHz broadband low-noise preamp	20.50
XBPF 700ub	Band tV-V bandpass tvi filter	2.95
PPSU 012	12v (nominal) mains psu for BBBA 500u and BBBA 860u	6.95
RPCB 144ub	FT221/225 replacement front-end board	64.50
RPCB 251ub	IC211/251E replacement front-end board	69.90

WOOD & DOUGLAS

NEW PRODUCTS are appearing—
such as the 144LIN25B and MPA2.
Send for further details

PROJECT	CODE	ASSEMBLED	KIT
70cms EQUIPMENT			
Transceiver Kits and Accessories			
FM Transmitter (0.5W)	70FM05T4	38.10	24.95
FM Receiver	70FM05R5	68.25	48.25
Synthesiser (2 pcb's)	70SY25B	84.95	60.25
Synthesiser Transmit Amp	A-X3U-06F	27.60	17.40
Synthesiser Modulator	MOD 1	8.10	4.75
Bandpass Filter	BPF 433	6.10	3.25
PIN RF Switch	PSI 433	9.10	7.75
Converter (2M or 10M i.f.)	70RX2/2	27.10	20.10
FM Package 2 (Synthesised)	70PAC2	163.00	128.00
TV Products			
Receive Converter (Ch 36)	TVUP2	26.95	19.60
Pattern Generator	TVPG1	39.95	32.53
TV Modulator	TVM1	8.10	5.30
3W Transmitter (boxed)	ATV-1	87.00	–
3W Transceiver (boxed)	ATV-2	119.00	–
Power Amplifiers (FM/CW Use)			
50mW to 500mW	70FM1	14.65	8.85
500mW to 3W	70FM3	19.65	13.25
500mW to 10W	70FM10	30.70	22.10
3W to 10W	70FM3/10	19.75	14.20
10W to 45W	70FM45	58.75	45.20
Combined Power Amp/Pre-Amp	70PA/FM10	48.70	34.65
Linears			
500mW to 3W	70LIN3/LT	25.75	18.60
3W to 10W (Compat. ATV1/2)	70LIN3/10E	39.10	28.95
Pre-Amplifiers			
Bipolar Miniature (13dB gain)	70PA2	7.90	5.95
MOSFET Miniature (14dB gain)	70PA3	8.25	6.80
RF Switched (30W Max)	70PA2/S	21.10	14.75
2M EQUIPMENT			
Transceiver Kits and Accessories			
FM Transmitter (1.5W)	144FM2T	36.40	22.25
FM Receiver	144FM2R	64.35	45.76
Synthesiser (2 pcb's)	144SY25B	78.25	59.95
Synth Multi/Amp (1.5W o/p)	SY2T	26.85	19.40
Bandpass Filter	BPF 144	6.10	3.25
PIN RF Switch	PSI 144	9.10	7.75
Synthesised FM Package (1.5W)	144PAC	138.00	105.00
Power Amplifiers/Linears			
1.5W to 10W FM (No Changeover)	144FM10A	18.95	13.95
1.5W to 10W FM (Auto-Changeover)	144FM10B	33.35	25.95
1.5W to 10W SSB/FM (Auto c/o)	144LIN10B	35.60	26.95
2.5W to 25W SSB/FM (Auto c/o)	144LIN25B	40.25	29.95
Pre-Amplifiers			
Low Noise, Miniature	144PA3	8.10	6.95
Low Noise, Improved Performance	144PA4	10.95	7.95
Low Noise, RF Switched	144PA4/S	18.95	14.40
SYNTHESISER ACCESSORIES			
Display Decoder/Driver	DISP1/2	22.60	16.10
GENERAL ACCESSORIES			
Toneburst	TB2	6.20	3.85
Piptone	PT3	6.90	3.95
Kaytone	PTK3	8.20	5.95
Relayed Kaytone	PTK4R	9.95	7.75
Regulator	REG1	6.80	4.25
Solid State Supply Switch	SSR1	5.80	3.60
Microphone Pre-Amplifier	MPA2	5.95	3.45
Reflectometer	SWR1	6.35	5.35
CW Filter	CWF1	6.40	4.75
TVI Filter (Boxed)	HPF1	5.95	–
MICROWAVE PROJECTS			
Microwave Drive Source	MD05T	29.50	20.40
Bandpass Filter	BPF 384	5.10	3.25
4M EQUIPMENT			
FM Transmitter (1.5W)	4FM2T	34.75	21.20
FM Receiver	4FM2R	61.65	43.15
Pre-Amplifier	4PA4	10.95	7.95
Pre-Amplifier, RF Switched	4PA4/S	18.95	14.40
6M EQUIPMENT			
Converter (2M)	6RX2	27.60	19.95

Enquiries by post should contain a SAE. Please restrict telephone technical enquiries between 6 pm and 9 pm in the evening on either 0256 24611 or 07356 5324. Access and Barclaycard orders can be taken on 07356 5324.

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Why suffer when you don't have to? Model ANF provides the high-technology answer to tune-up whistles and other heterodyne interference to SSB communications. It also features an excellent 4-pole tunable bandpass filter to make life easier on CW.
Connected in series with the receiver's loudspeaker Model ANF continuously searches the audio spectrum for continuous tones. When it finds one it stops the search, locks on, and removes it with a really deep, narrow notch.
The filter's centre frequency is shown on a 10 LED bargraph-type display at all times. You can see at a glance the position of the sweep during the search or the approximate frequency of the interference during "lock".
The display is also useful when using the auto-assisted manual tuning mode or the CW mode.
A built-in compandor system eleminates the need for careful input level setting. The receiver volume control works exactly as normal yet the auto-notch performance and signal-to-noise ratio remain just as good at any volume setting.
Built to truly professional quality standards, Model ANF is available now either direct or via Datong Dealers, price £59 plus VAT (£67.85 total). Send for a free copy of the full data sheet.

COMING SOON

The amazing Datong Automatic Woodpecker Blanker – the star of the recent RSGB show at the NEC.

AUDIO FILTERS
MODELS FL2, FL3, FL2/A

Model FL3 represents the ultimate in audio filters for SSB and CW. Connected in series with the loudspeaker, it gives variable extra selectivity better than a whole bank of expensive crystal filters. In addition it contains an automatic notch filter which can remove a "tuner-upper" all by itself.
Model FL2 is exactly the same but without the auto-notch.
Any existing or new FL2 can be up-graded to an FL3 by adding Model FL2/A conversion kit, which is a Fully tested auto-notch module in P.C.B. Form.
Datong filters frequently allow continued copy when otherwise a QSO would have to be abandoned.

Prices: FL2 £78.00 with VAT £89.70, FL3 £112.50 with VAT £129.37, FL2/A £34.00 with VAT £39.67

GENERAL COVERAGE RECEIVER CONVERTER MODEL PC1

MODEL PC1

Once upon a time it was the norm to use a ten metre receiver to receive the two metre band. Now, large numbers of special purpose two metre SSB rigs are in use and conversion the other way becomes a very attractive possibility.
With the addition of Model PC1 each of these two metre SSB rigs becomes a really good general coverage receiver (from 50 kHz to 30MHz!).
Two metre SSB rigs are not cheap and it makes good sense to get the most out of them. They also tend to have very good performance in terms of sensitivity, selectivity, and big signal handling. Each of these features is just as vital for short wave reception and Model PC1 is designed not to degrade them at all. The result, your two metre SSB rig receives below 30 MHz as well as it receives on two metres. And compared to many medium cost general coverage sets, that is saying a lot!
Try this test. Listen on twenty metres after the band goes dead in the evening. With many general coverage receivers the band never dies. It remains populated with phantoms generated by the receiver from the many very strong signals on forty metres. This is the kind of effect that the higher quality receivers minimise, and that goes for PC1 plus a good two metre rig. Reviews: Rad. Com., April 1982.

PC-1 £119.50 with VAT £137.42

KEYBOARD MORSE SENDER
THE ULTIMATE "MORSE KEY"

- STRAIN-FREE sending: Converts "hunt and peck" typing to perfect morse. Just plug into any key jack and type.
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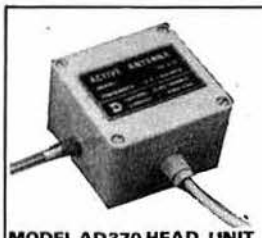
- EXCLUSIVE COLOUR CODED KEYBOARD DESIGN: Separate key switches beneath a tough polycarbonate membrane combine excellent "feel" with a splash proof wipe clean surface.
- LAVISH MEMORY: four 64-character memories with auto-repeat and programmable "pause" function, for all the routine sending.
- BUFFER MEMORY: ensures perfect sending despite less than perfect typing.
- COMPREHENSIVE CHARACTER SET: includes punctuation, procedure signals, accented letters. Plus a "merge" key for making any non-standard character. BEAUTY AND STYLE: only one inch thin and with four-colour panel Model MK
- looks every bit the thoroughbred it is. Model MK is supplied with output leads and spare connectors but without batteries (four HP7 pen cells).



MODEL AD370 HEAD UNIT

COMPACT RECEIVING ANTENNAS
MODELS AD270/370

Datong Active Antennas solve the age-old problem of finding space for a 'good' receiving aerial.
Model AD370 mounted on a roof top or Model AD270 in a loft will give similar sensitivity to much larger conventional aerials yet are only 2½ and 3 metres long respectively.
Moreover they do not suffer from interference picked up by the feeder cable; such pick-up can be a problem with conventional dipoles because it is hard to maintain good balance over a band of frequencies.
Although active antennas were introduced to the amateur market by Datong only a few years ago they have long been used by military and commercial receiving stations. The performance specifications achieved by the Datong AD270/370 are very close to those of "professional" active antennas selling for ten times the price – a point which is not lost on our many professional customers.
The advanced design ensures two things: that you don't miss signals through inadequate sensitivity and that the antenna does not invent signals which are not there.
Datong Active Antennas represent an advanced solution to a common problem and so far as we know have no serious competition in terms of performance at the price. (Reviewed in Rad. Com., June 1982)

AD270 £41.00 with VAT £47.15 AD370 £56.00 with VAT £64.40

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

FL3	112.50	(129.37)	AD370	56.00	(64.40)	Codecall (Linked)	28.00	(32.20)
FL2/A	34.00	(39.67)	AD270+MPU	45.00	(51.75)			
FL1	69.00	(79.35)	AD370+MPU	60.00	(69.00)	Codecall (Switched)	29.50	(33.92)
FL2	78.00	(89.70)	MPU	6.00	(6.90)	Basic DF System	149.00	(171.35)
PC1	119.50	(137.42)	DC144/28	34.50	(39.67)	Basic Mobile DF System	159.00	(182.85)
ASP	72.00	(82.80)	DC144/28 Module	28.00	(32.20)	Complete Mobile DF System	214.00	(246.10)
VLF	26.00	(29.90)	Keyboard Morse Sender	119.50	(137.42)	PTS1	39.99	(45.99)
D70	49.00	(56.35)	RFA	29.50	(33.92)	Model ANF	59.00	(67.85)
D75	49.00	(56.35)						
RFC/M	26.00	(29.90)						
AD270	41.00	(47.15)						

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ALL DATONG PRODUCTS ARE DESIGNED AND BUILT IN THE U.K.

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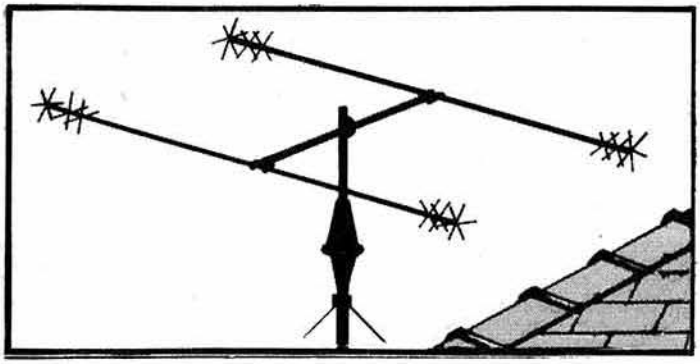
THE G4MH MINI BEAM



SMALL SIZE, HIGH PERFORMANCE

PACKAGE: Beam, rotator, 15m coax UR43, 15m 5 core £189.00
AERIAL ONLY: ..... £ 88.50
SELF ASSEMBLY KIT: Coils, spokes etc., ... £ 67.50
(Aluminium tube NOT included)
(Carriage UK mainland £2.50 – kit £1.50)

SPECIFICATION:

Element length	11 feet	SWR at resonance	1·5 to 1:00 max
Boom length	60 inches	Power rating	1400 watts PEP
Turning radius	7 feet	Input impedance	50 ohms
Operating frequencies	10m, 15m, 20m	Wind resistance	80 mph
Forward gain (ref D pole = 1:00)	3·6 dB	Weight	14 lbs
		Rotator requirements	AR40

– UK AGENTS –

Amateur Electronics Ltd, Birmingham
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MOTOROLA CAR CASSETTE PLAYERS model 401 & BL512 etc, warranty returns and needing repair, supplied with circuit only **£5.00.**
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21·4 MHz ± 7½KHz BW @ 3dB OK FM, imp. approx 2k ohm. new **£4·00.**
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BOLT-IN FEEDTHROUGH CAPACITORS 2BA size thread, 1000pf 500vw brand new and made for us by famous manufacturer, **ONLY 40p** each.
Solder-in type 1000pf 500vw 3·2mm hole **50p per 10.**

3SK88 DUAL-GATE MOSFET ideal replacement for most 2mtr Tcvr front ends only 1·1dB noise figure 26dB gain, also OK for 70cms. PRICE REDUCED £1.00 **two for £1.75.**
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10·7MHz FM	8 pole, BW 7·5kHz at – 3dB and 17·5kHz at – 70dB	**£24.00**
10·7MHz FM	8 pole, BW 15kHz at – 3dB and 35kHz at – 70dB	**£24.00**
21·4MHz FM	8 pole, BW 15kHz at – 3dB and 50kHz at – 80dB	**£25.20**

455kHz CFU series ceramic filters, various bandwidths in stock **£1.50**
TBG-2 crystal tone-burst generator **£8.00**

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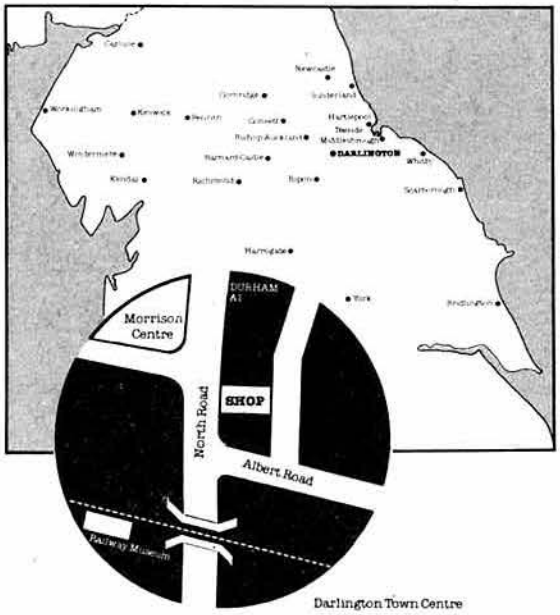

Darlington Town Centre

A huge free car park, a shopping complex which has within it a large supermarket, a wine and spirits shop, a bistro restaurant and convenient banking facilities has nothing at all to do with amateur radio.

However, as all these facilities are to be found across the road from our new amateur radio shop in the North East of England, then you will appreciate that we take great care in positioning the Lowe Electronic shops to help both you and other members of your family. The shop is in Darlington, 56 North Road, that is on the A167 road to Durham, only a few minutes from the town centre. Darlington is a delightful market town with extremely good links to the A1 north or south and to the west and east. Indeed, Darlington is easy to get to from towns such as Scarborough, Bridlington, York, Harrogate, Penrith and Carlisle. To the fortunate Radio Amateurs of the North East, then you have Lowe Electronics in your own backyard.

A Lowe Electronics' shop means the opportunity to browse, to try out, without sales pressure, a new or second hand piece of equipment before you buy it. And not only that, the shop will stock all the usual accessories, aerials, swr meters, cables, rotators, tuning units, plugs, sockets, etc. All equipment bought from the Darlington shop will carry the now well-known Lowe after sales service. It is a fact that today's equipment, although very reliable, is extremely complex and although not beyond the amateur, the expensive test equipment required for the repair leave most of us in the hands of the person who sold us the rig.

With Lowe Electronics not only are the hands helpful but technically able.

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OUR APOLOGIES . . .

To all who had hoped to purchase some of the New POPES H100 SUPER LOW LOSS COAX CABLE at the NEC Convention . . . The NRS Southport Show . . . The VHF Convention and the White Rose Rally and left it late in the day only to find that we were sold out. Due to the fantastic demand following our advert in March Radcom, the first shipment (over a ton) sold out within 5 days of the magazine's appearance!

Since then we have received the entire factory stock from Popes in Holland and at the time of writing (April) this has also sold out. We have now programmed with Popes deliveries for the next 12 months so we hope that by now stocks of at least 10,000m will be 'off the shelf' at any one time.

We have received a lot of professional interest from organisations such as BBC; IBA; Ministry of Defence, British Telecom and many of the above have placed orders.

Feedback has also been received from many amateurs who bought some in March and the comments have been extremely good . . . comments such as 'does everything that you quote' and 'has made a 100% improvement over my UR67', etc.


UR67 H100

H100 Super Low Loss 50Ω coaxial cable

Typical example:
Transmitter power – 100 watts (cable length 40m)

MHz	UR67	H100	
28	72W	82W	+14%
144	46W	60W	+30%
432	23W	43W	+87%
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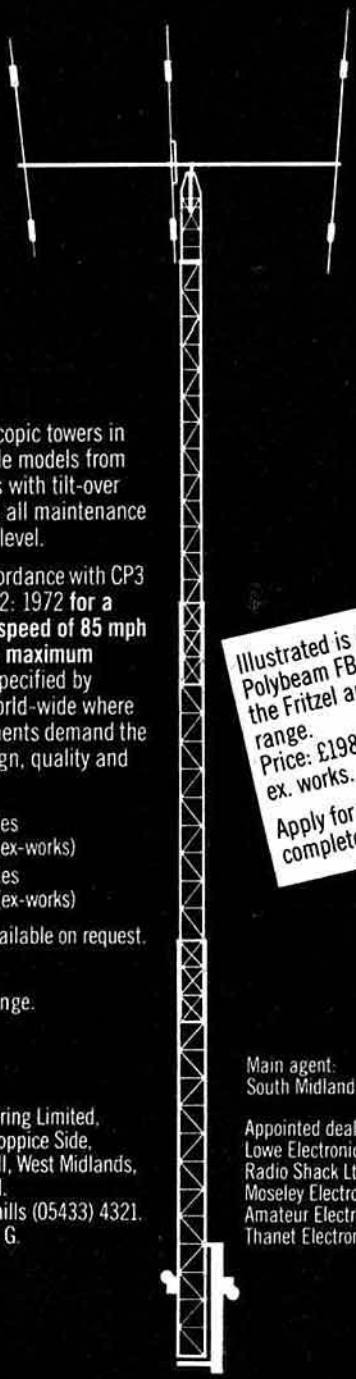

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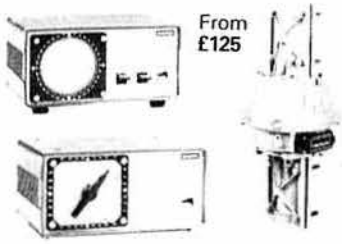

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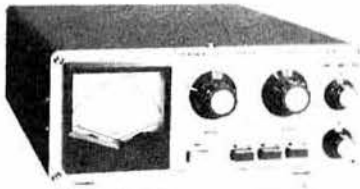

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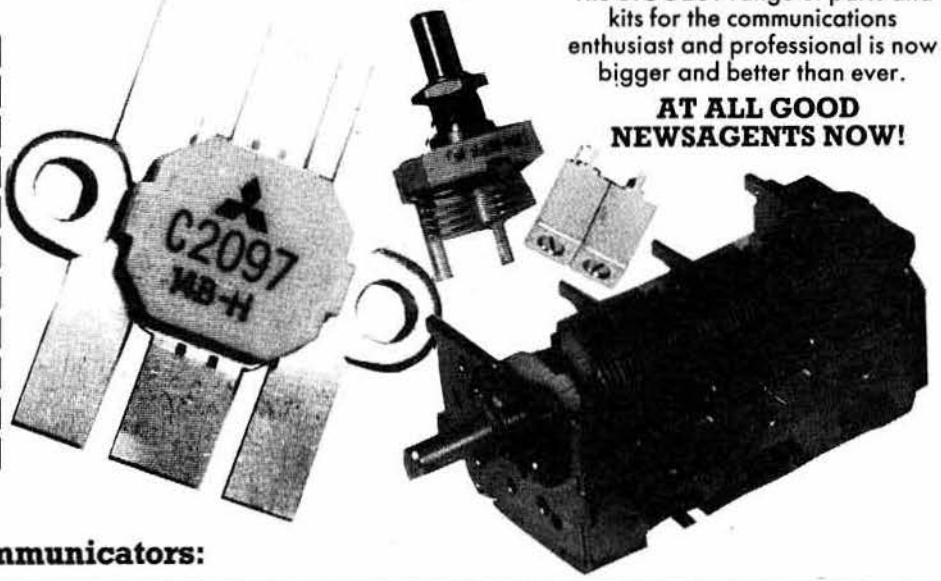

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MC.3	Charges 2 or 4 'AA', 'C' or 'D' cells.	£7.50
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All battery prices include VAT, and FREE postage on orders over £5, for orders under £5 please add 60p to cover P&P.

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3SK88	145MHz, 26dB gain, 1·1dB NF	1.05
BF981	145MHz, 18dB gain, 0·7dB NF	1.38
BFR91	432MHz, 18dB gain, 1·9dB NF	1.50

R.F.POWER TRANSISTORS

MRF260	145MHz, 10dB gain, 5W output	6.56
MRF261	145MHz, 6dB gain, 10W output	8.74
MRF262	145MHz, 6.3dB gain, 15W output	14.40
MRF264	145MHz, 5.2dB gain, 30W output	15.26
MRF221	145MHz, 6.3dB gain, 15W output	17.60
MRF247	145MHz, 7dB gain, 75W output	40.74

All figures for gain and output power are minimum values, full data supplied with all orders. Send SAE for free data on any of the above transistors.

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- ★ 10A output terminals
- ★ LED shut down indicator
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- ★ 15A maximum output current
- ★ Large 20A current meter
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- ★ Large 30A current meter
- ★ 30A output terminals
- ★ LED shut down indicator
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12/40A ★★NEW★★ **£225.40**
- ★ 13·8V, 40A continuous output
- ★ 50A maximum output current
- ★ Large 50A current meter
- ★ Large output voltmeter
- ★ LED shut down indicator
- ★ LED out of regulation indicator
- ★ Output sensing terminals
- ★ Fully protected

UHF CONNECTORS

PT. No.	TYPE	PRICE
Plugs		
BU 01	PL259 for Ø 0·4in cable (UR67)	0.47
BU 01A	Reducer for Ø 0·2in cable	0.12
BU 01B	Reducer for Ø 0·25in cable	0.12
BU 02	as BU 01 but with metric thread	0.56
BU 03	PL259 for Ø 0·2in cable	0.56
BU 04	PL259 push on connector	0.81
BU 05	PL259 elbow plug for Ø 0·2in cable	0.78
Sockets		
BU 11	SO259 square flange	0.40
BU 12	SO259 single hole, inside nut	0.47
BU 13	SO259 single hole, outside nut	0.47
Couplers		
BU 21	Back to back female	0.57
BU 22	Back to back male	0.79
BU 23	Male to female elbow	1.13
BU 24	1 male, 3 female 'T'	1.35
BU 25	3 female 'T'	1.46
BU 26	Female to female lightning arrestor	1.22
Adaptors		
BU 31	UHF plug to BNC plug	1.75
BU 32	UHF plug to BNC socket	1.15
BU 33	UHF socket to BNC plug	1.49
BU 34	UHF socket to BNC socket	1.64
BU 36	UHF plug to N socket	2.90
BU 37	UHF socket to N plug	2.90
BU 39	UHF socket to phono/car aerial plug	0.52

DUMMY LOAD

BL 01	PL259 connector, 50 ohm impedance, 30W max, 15W continuous rating, DC-150 MHz, VSWR less than 1·2:1	6.78

FERRITES

Ferrite rings for TVI suppression (data supplied)	Small type	0.42
	Large type	0.80
Ferrite Beads	Single hole type O/D 4mm	0.05
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The new range of 144MHz solid state linear amplifier has been introduced to use with the increasingly popular low power transceivers currently available. Utmost care has been taken to produce a reliable unit with performance characteristics and extra features previously not available in the UK.

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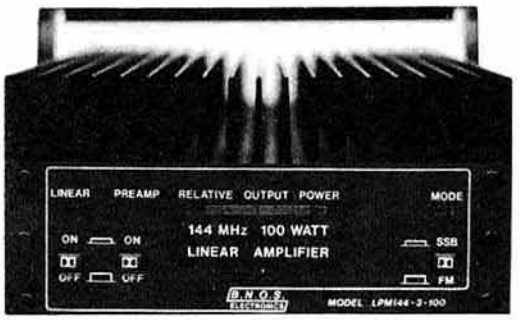

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SPECIFICATION

Power outputs	100 Watts nominal
Power inputs	1, 3 or 10 Watts (according to model)
Power requirements	1, 3 Watt models—14 Amp at 13·8V DC 10 Watt model—12 Amp at 13·8V DC
Pre-amp gain	12dB (typical)
Pre-amp noise figure	1·0dB (typical)

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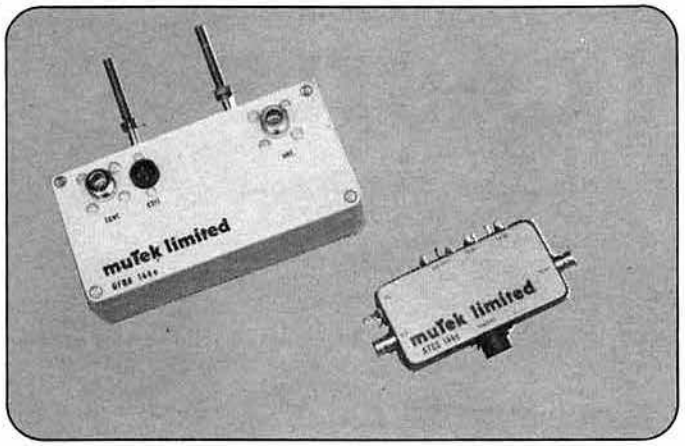

The vast majority of manufacturers of preamplifiers for the amateur radio market are quite content to use 'traditional' amateur designs without too much thought. Whilst it's true that almost anyone can make a low-noise amplifier of sorts it's a rather different matter to make high quality amplifiers at prices attractive to radio amateurs. There are also other important factors which many of our competitors either don't understand or try to ignore. To do the job properly requires considerable investment both in test equipment and engineering skills. It's a sobering thought that even a humble SLNA 144ub sees around £20k in test equipment before it leaves our factory!

We've always approached the design of our products rather differently from many of our competitors. Rather than simply copy what has gone before it's been our practice to approach the design problem in a rather more systematic manner. Our two new 144MHz preamplifiers perhaps demonstrate this.

It is probably not going too far over the top to say that the GFBA 144e is the best 144MHz band preamplifier manufactured anywhere. It uses an MGF1200 gasfet in a unique negative-feedback circuit (this is probably the only sensible way to use gasfets at vhf) which simultaneously achieves a very low noise figure (better than 0·9dB) and very good strong-signal performance (input third-order intercept point typically + 14dBm).

As is usual with our amplifiers we've incorporated extensive bandbass filtering not only does this help to remove problems with image breakthrough from the 118-136MHz aircraft band but it will also provide protection from out-of-band intermodulation problems.

The antenna changeover switching has been designed to handle powers way in excess of the UK legal limit. In order that relay life isn't shortened drastically by switching hundreds of watts on load the GFBA 144 is only supplied with its companion ATCS 144 controller. THis will interface with any 144MHz transceiver.

The SLNA 145sb is a different amplifier for a different application. We've taken a conventional low-noise mosfet (BF 981) and designed around it a preamplifier tailored specifically to the FT290. Our traditional regard for good filter design hasn't been forgotten and we've also fitted a low-loss relay to bypass Yaesu's lossy diode antenna changeover circuit.

THE RANGE		Price £
SLNA 50s	50MHz low noise switched preamplifier using BF981	33.90
SLNA 70s	70MHz low noise switched preamplifier using BF981	33.90
SLNA 70u	70MHz low noise unswitched preamplifier using BF981	20.38
SLNA 70ub	Unboxed version of SLNA 70u	12.41
SLNA 144s	144MHz low noise switched preamplifier using BF981 (0·9dB noise figure)	33.90
SLNA 144u	144MHz low noise unswitched preamplifier using BF981	20.38
SLNA 144ub	Unboxed version of SLNA 144u	12.41
SLNA 145sb	Transceiver optimised preamplifier with antenna c/o switching using BF981. Intended for the FT290R, but has many other applications!	24.90
GFBA 144e	Ultra-high performance environmentally housed switched gasfet preamplifier using advanced negative feedback circuitry for superb dynamic performance. Supplied with ATCS 144s controller	129.90
TLNA 432s	Very high performance bipolar transistor switched preamplifier for 430-440MHz using BFQ69 for 1·4dBnf and 0dBm input intercept performance	54.90
TLNA 432u	Unswitched boxed variant of TLNA 432s	26.40
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HDRA 95u-1	1·5dBnf/8·5dB gain high dynamic range 88-108MHz preamplifier	29.90
HDRA 95u-2	11·5dB gain variant	29.90
BBBA 500u	20-500MHz broadband high dynamic range preamplifier	26.40
BBBA 860u	250-860MHz broadband low noise amplifier	20.50
XBPF 700ub	Microstripline bandpass tvi filter	2.95
PPSU 012	12V (nominal) mains psu for HDRA95 & BBBA860	6.90
CISA 001	'UHF'(f) to BNC(m) coaxial adaptor	1.60
ATCS 144s	Transmit receive changeover sequence and controller	20.50
Carriage/Postage Rates		
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SSB (USB, LSB) CW & FM
Frequency response:
300-2,700Hz @ −6dB
Carrier Suppression:
Better than −40dB
Sideband Suppression:
Better than −40dB
FM Deviation:
±5kHz (max)
Tone burst frequency:
1,750Hz
Selectivity:
SSB/CW: 2.4kHz @ −6dB
4.1kHz @ −60dB
FM : 14 kHz @ −6dB
25 kHz @ −60dB
Image rejection:
Better than −60dB
Audio output:
1 Watt @ 10% THD
Audio output impedance:
8 Ohms
Dimensions:
58H × 150W × 195D mm
1.3kg (without cells)

Power requirements:
8 × C size dry cells
8 × C size Nicad cells
External 8.5-15.2VDC
Memory backup: Lithium cell
Microphone:(YM47 supplied)
600 ohms ppt with scan

ACCESSORIES

YM49
Remote speaker mic
YM50
DTMF keyboard mic
MMB11
Mobile mounting bracket
FL2010
2 metre 10W amplifier
FL7010
70cms 10W amplifier
CSC1A
Vinyl carrying case
NC11C
Battery charger
FLC11
H.D. Leather case
YHA15
Helical antenna (FT290R)

FT-290R

Frequency coverage (MHz):
144-146 or 144-148
Synthesizer steps:
SSB/CW: 100Hz/1kHz
FM : 12.5/25kHz
Current consumption:
70mA receive
800mA Tx (2.5 W RF FM)
Antenna:
SO239 on rear
Telescopic ¼ Wave supplied

RECEIVER

Intermediate frequencies:
1st IF 10.81MHz
2nd IF 455kHz (FM)
Sensitivity (better than):
SSB/CW: 0.5μV for 20dB S/N
FM : 0.25μV for 12dB SINAD

TRANSMITTER

Power Output:
2.5 Watts at 12VDC
Spurious radiation:
Better than −60dB
Repeater split:
600kHz (+ and −)

FT-790R

Frequency coverage:
430-440MHz
Synthesizer steps:
SSB/CW: 100Hz/kHz
FM : 25/100kHz
Current consumption:
100mA receive
750mA Tx (1W RF FM)
Antenna:
BNC on top panel
¼ Wave flexi supplied

RECEIVER

Intermediate frequencies:
1st IF 67.3MHz
2nd IF 10.7MHz
3rd IF 455kHz (FM)
Sensitivity (better than):
SSB/CW: 0.16μV for 10dB S/N
FM : 0.25μV for 12dB SINAD

TRANSMITTER

Power Output:
1 Watt at 12VDC
Spurious radiation:
Better than −50dB
Repeater split:
1.6MHz (input listen)

SOUTH MIDLANDS COMMUNICATIONS LTD
SM HOUSE, RUMBRIDGE ST
TOTTON, SOUTHAMPTON SO4 4DP

SMC

YAESU MUSEN'S ONLY AUTHORISED UK AGENTS

G3FIK

AMATEUR ELECTRONICS UK
504-516 ALUM ROCK ROAD
ALUM ROCK,
BIRMINGHAM 8

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