October 1982

RADio COMmunication

IN THIS ISSUE

ANOTHER OF PETER HART'S POPULAR REVIEWS; THIS TIME OF . . . .

THE YAESU FT-ONE HF TRANSCEIVER

Journal of the Radio Society of Great Britain

RSGB

AMCOMM are making it even easier to buy your favourite equipment. A choice of easy payments to suit you! (1) Interest free payments from ⅓ deposit. (2) 10% deposit with balance payable your choice up to 3 years and all with 2 year guarantee. Write or call for written details. Free items excluded.

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YAESU FT 1
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A new 9 Bander in traditional ICOM livery – facilities galore and every one a practical and helpful function to assist and satisfy your operating needs. All mode inc. optional FM and built in Keyer – Notch Filter, IF/Pass band tuning – variable tuning rate – memory – split operation facility – dual VFO – variable AGC and variable noise blanker – we could tell you a lot more but you'll enjoy it more by calling in to try it – it's on show now – if you can't make it forward a SAE and we'll send you a leaflet – **£659.00** inc. VAT and carriage and of course the **two year AMCOMM guarantee.**

YAESU FRG 7700
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150Hz – 30MHz

Must be top of your list when shopping for a Receiver. You'll find it rewarding to use an antenna tuning unit and even more rewarding to get one from us! Buy an FRG 7700 or FRG 7700M and you can have the matching unit FRT 7700 completely **FREE.**
FRG 7700 + FRT 7700 **£329.00**
FRG 7700M + FRT 7700 **£409.00**
Carriage and VAT included.
Two year guarantee.

ICOM 730
Mobile or Base Transceiver

An extremely compact 8 Band Transceiver with an output of 100 watts RF, dual VFO's with 10Hz, 100Hz and 1KHz tuning rate – plus an abundance of features including pass band tuning facility. **N.B.** Preamp and SWR Detector. **£569.00** including VAT and carriage. **Two year guarantee.**

YAESU FT 290R

The world's leading portable from Yaesu, "the people who know your needs". 2.5 Watt all mode SSB/CM/FM, 10 memories – Price **£249.00** includes FREE nicads and charger, carriage and VAT.
Two year guarantee.

YAESU FT 480R

Big performance mobile station offering you all the options you expect in such a piece of equipment – all mode – full scanning, two VFO's, satellite mode etc. Price includes absolutely FREE your own choice from our stock, any VHF base or mobile antenna at **£379.00** including VAT and carriage.
Two year guarantee.

ICOM 720A
General coverage or amateur transceiver.

Silky smooth tuning and easy operation makes this a delight for the amateur or commercial operator – a host of features which make it ICOM's pride and joy. It can be yours, too, at **£883.00** VAT and carriage paid.

Two year guarantee.

YAESU FT102 with AM/FM included

NEW

We wonder how Yaesu do it! Quite simply superb. The new FT102 with a host of features and new designs in the VFO, Noise Blanker and IF Shift. A three valve PA stage for new standards of purity. Call us and we'll send you a leaflet. Read the Spec. and agree with us that Yaesu have produced a piece of gear guaranteed to retain their place as the manufacturer of the worlds Number One Rig. Available from stock now with AM/FM fitted, carriage paid right to your bench for **£725.00.**

ICOM IC 290E

2 mtr. all mode with 5 memories from which priority channel can be selected – twin VFO's, scanning, reverse repeater – 25KHz tuning rate on FM 100Hz on SSB.
£369.00 including VAT and carriage.
Two year guarantee.

WRITE FOR DETAILS OF FREE INTEREST TERMS

E.&O.E.

BARCLAYCARD VISA

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RC 10 82

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VOLUME 58 No 10

RADio COMmunication

CONTENTS

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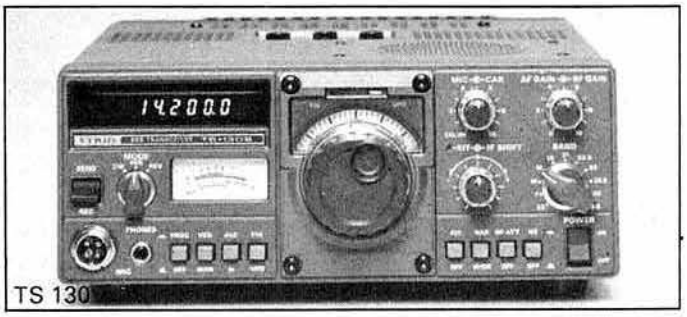
Closing date for contributions unless otherwise notified: five weeks before publication date

One could be forgiven for thinking, that after 15 years of handling amateur radio equipment for six days a week, I would be tired of it. Why is it, I ask myself, that sitting down to use **any Trio HF transceiver** still gives me **such pleasure and satisfaction?** No doubt those of you who are wise enough to be operating Trio rigs right now will know what I mean, and those of you who haven't experienced that special satisfaction should make an effort to call on us here at Matlock and *see* what I mean.

Regardless of the particular transceiver, it's the way that Trio give the operator that "at home" feeling, with every control falling naturally to hand, with the necessary **operator information** being **instantly available** and with the quiet pleasure of having other people on the air say **"superb signal, you must be using Trio".**

Just look at the current HF transceiver line up from Trio; **the TS130S for example.** This is a most amazing rig which **packs a complete 200W pep,**


TS 130

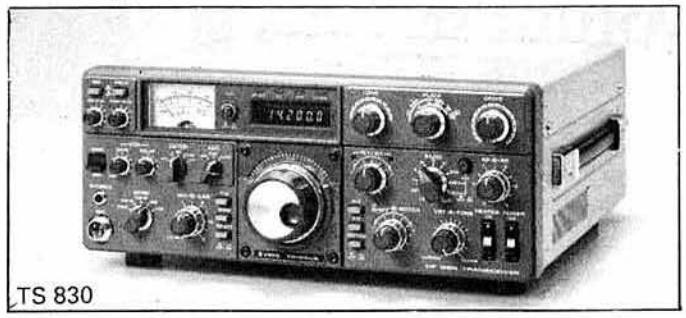
8 band top performance transceiver into a box you can sit on the palm of your hand. **Without compromises too,** since the TS130S (and its little brother, the 130V) has every feature you could ever need. **I.F. shift** for dodging QRM, **speech processing** for that extra punch when needed, **full metering, noise blanker,** full band coverage right up to 30 MHz, and an amazing PLL frequency generation system which guarantees accuracy you wouldn't believe. You can switch on the calibrator and go to each band in turn without a change in beat note which means, of course, that each band is accurate to within cycles (sorry, hertz) of all the others. Add to this the completely truthful digital readout (just ask us about *other* makers' products) and the fact that when you switch sidebands you stay on frequency (try that with a "101") and you have part of the story. I've watched amateurs sitting in our car park working PY and VK with the 130S, and that's all anyone can ask. Mobile, fixed, caravan or boat, **it's all easy with a TS130.**

For the man who doesn't need mobile operation, there is the TS530S.


TS 530

This transceiver is **winning friends** all over the world with its **unbeatable combination** of **top performance** allied to **competitive price.** Our customers normally compare the TS530 to the FT101ZD, and I suppose that makes sense. The 530S, however, has that magic Trio quality, both in design and construction, and offers a terrific range of facilities which belies the £535 price tag. With a pair of 6146B tubes in the PA, the 530S is easy to tune up, and remarkably uncritical of poor loads whilst delivering a top quality, punchy signal aided, if you need it, by built in speech processing. The TS530 again **gives you those Trio standards** of all band coverage, unambiguous *accurate* digital readout, I.F. shift, wide/narrow filter switching, noise blanker, VOX, RIT, XIT, and so on. But it's in the **using and handling** department where these Trio rigs score—**beautiful to just settle down and operate.** Sensitivity? typically 0.1 microvolt on SSB—yes—that's typical for Trio. It's no good me drivelling on, just ask us for a detailed leaflet.

As for the TS830S, words fail me. All you need to do is listen on any band, in any part of the world and locate those TS830S users. All sitting


TS 830

steadily on their net frequencies (read the drift figures in RadCom!) and producing that quality signal only Trio know how to get. Again, if you need comparisons in the market place, our customers tell us they weigh the 830 against the 902 range, but generally we find that once anyone has sat down and tried out the 830, he seldom buys anything else. I know this sounds a bit pompous, but it's all true, and we are so proud of the 830S.

If you need specific details on the why or wherefore, leaflets are available on request and our two enthusiastic Davids (Brown and Monkhouse) are just a 'phone call away, ready to answer any detailed requests.

We firmly believe that **the TS830S** is the **best amateur band transceiver** available to the amateur today. Why don't you see if that's true by coming along to try it out.

And **what about the TS930S** at the very top of the range. THERE IS *NOTHING* TO TOUCH IT. I can say no more. Read David's adverts in past issues for the details. Suffice to say that we cannot, nor can we see how we can ever, supply the demand for this transceiver, **from those discerning**


TS 930

people who simply will have the best.

I've seen the ads from dealers purporting to sell Trio equipment by calling it Kenwood/Trio or some such title. This immediately marks the gear as being imported via the back door from some other market. If you really want a discount purchase, and are prepared to put up with equipment which may not be suitable for use in the UK and will **certainly** not have any service backing—by all means go ahead. **BUT** only Trio approved dealers have the necessary long term connection with the factory and can give you piece of mind, knowing that you will always be looked after in the future.

Look in this ad for the list of **approved** Trio stockists.

And if you dislike the odd comparison in this screed, I will simply quote Thomas Fuller who, in 1732, wrote, **"Nothing is good or bad but by comparison".** If you think also that I might offend worthy traders, a further quotation (got me going tonight), this time from "Taming of the Shrew". **"Do as adversaries do in law; strive mightily, but eat and drink as friends."** Vale, John Wilson.

VHF UHF

Now, with the production of the TS780, the dual bander has come of age, giving the two band multimode facilities of the original concept, plus a wealth of additional operating facilities. Trio have again produced a rig which others cannot even copy.

- Full coverage of 2 metre and 70cm band. 144·00 to 146·00 430 to 440.
- All modes. Upper sideband. Lower sideband CW and FM. Also a position with which you will not be familiar FM CH. This gives the VFO a mechanical click stop feel and increments of 12·5 or 5kHz. Ideal for 2 metre and 70cm simplex working.
- Free running VFO with 2 speeds of frequency coverage, slow in 20Hz steps, fast in 200Hz steps. Add to the VFO a friction brake and ease of fine tuning is the result.
- Band scan in either 0·5, 1, 3, 5, or 10MHz widths.
- Memory scan. The rig can be instructed to scan either the 2 metre or the 70cm frequencies in the memories or to scan the total content.
- IF shift to move the receiver pass band without changing the receive frequency and give greater operability under crowded band conditions.
- Full repeater shift facility for either 2 metres or 70cm repeaters plus tone access and reverse repeater switches.
- Up down microphone supplied as standard.
- 13·8V DC or 240V AC 50/60Hz operation

TS 780

TS 780 £748.00 inc. VAT carriage £5.00

The TR9130 is the new all mode VHF mobile or base station rig from Trio giving 25 watts output on 2 metres FM, USB, LSB and CW and now having a green LED display to make for easier mobile operation.

- 25 watts output on FM, SSB and CW.
- FM/USB/LSB/CW all mode operation.
- For added convenience in all modes of operation, the mode switch, in combination with the digital step (DS) switch, determines the size of the tuning step, and the number of digits displayed.
- Six memories. On FM, memories 1 through 5 for simplex or +600kHz offset, with the OFFSET switch. Memory 6 for non-standard offset. All six memories may be operated simplex, any mode.
- Memory scan. Scans memories in which data is stored. Stops on busy channels.
- Internal battery memory back-up. With Ni-Cad installed (not Trio supplied), memories will be retained approximately 24 hours, adequate for the typical move from base to mobile. A terminal is provided on the rear panel for connecting an external back-up supply.
- Automatic band scan. Scans within whole 1MHz segments (ie 144·0-144·999MHz), for improved scanning efficiency.
- Dual digital VFOs. Incorporates two built in digital VFOs, selected through use of the A/B switch and individually tuned.
- Squelch circuit on all modes (FM/SSB/CW).
- Repeater reverse switch. For checking signals on the repeater input, on FM.
- CW semi break-in circuit with sidetone. Built-in, for convenience in CW operations.
- Digital display with green LEDs.
- Transmit offset switch for repeater shift.
- High performance noise blanker.
- RIT (Receiver Incremental Tuning) circuit. Useful during SSB/CW operations.
- HI/LOW power switch. Selects 25 or 5 watts RF output on FM or CW.
- Accessory terminal. A four-pin accessory terminal is provided for use with a linear amplifier or other accessory.
- Includes quick release mobile mounting bracket and up/down microphone.

TR9130

TR9130 ALL MODE TRANSCEIVER £395 carr: £5.00

TR9000 IS STILL AVAILABLE AT £359.00

APPROVED TRIO DEALER

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Newport Pagnell
Bucks. 0908 610625

EAST SCOTLAND
Jay-Cee Electronics
20 Woodside Way
Glenrothes
Fife KY7 5DE. 0592-756962

ESSEX
Waters & Stanton Electronics
Warren House
18-20 Main Rd
Hockley, Essex. 0702 206835

HAMPSHIRE
Telecomms
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North End, Portsmouth
0705 660036/662145

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47 Warrington Rd
Leigh
0942 676790

NORTH LONDON
Radio Shack Ltd
188 Broadhurst Gardens
London NW6 3AY
01-624 7174

SOUTH LONDON
Catronics Ltd
20 Wallington Square
Wallington SM6 8RG
01-669 6700

WALES
MRS Communications Ltd
Imperial House
95 Penarth Road
Cardiff CF1 7JT
0222 24167/8

W. SUSSEX
Bredhurst Electronics
High St. Handcross
Haywards Heath
W. Sussex 0444 400786

YORKSHIRE
Leeds Amateur Radio
27 Cookridge St
Leeds LE2 3AG
0532 452657

NORTHERN IRELAND
George Moore Electronics
7 Ravenhill Park Gardens
Belfast BT6 0DH
Belfast 647570

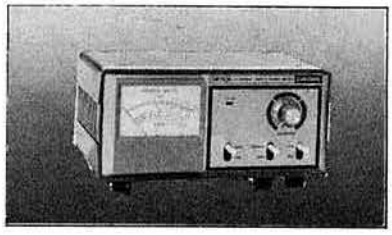
TRIO

As the appointed distributors for Trio, we recommend that you purchase your Trio equipment from an approved stockist (list above). Any stockist *not* on the list has no connection with the Trio UK sales and service organisation and cannot, despite claims to the contrary, offer any meaningful guarantee of backup service on Trio equipment.

we recommend the DAIWA range.

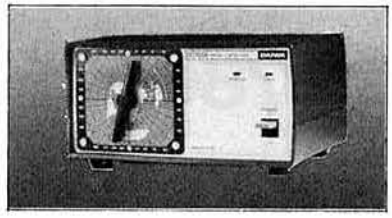
		Price inc. VAT	Carr.
VHF AMATEUR RECEIVERS			
SR9	2m FM tunable/xtal receiver 144-146MHz.....	46.00	1.50
POWER & SWR METERS			
CN520	1·8-60MHz mini cross needle power/SWR meter	32.50	1.50
CN540	50-150MHz mini cross needle power/SWR meter	35.00	1.50
CN620A	1·8-150MHz cross pointer power and SWR meter. Up to 1kW.....	52.81	1.50
CN630	140-450MHz cross pointer power and SWR meter. Up to 200W.....	75.00	1.50
CN650	1·2-2·5GHz cross pointer power and SWR meter. Up to 20W.....	95.00	1.50
CNW518	3-30MHz 8 band hi power tuner and cross needle power meter.....	175.00	2.00
CNA1001A	Fully automatic all band ATU. Includes cross pointer power meter.....	156.00	5.00
CNA2002	As for CNA1001A but 2kW rating for tuner and power meter.....	228.00	5.00
SW110A	SWR/power meter 1·8-150MHz. 0-20 and 0-200W. Not cross pointer.....	29.90	1.25

ROTATORS			
DR7500X	For HF 3 element beams. Preset controller. 6 core cable.....	98.04	5.00
DR7500R	As for DR7500X but using the DAIWA round controller.....	107.98	5.00
DR7600X	Heavy duty. Will take up to 2 element 40m beam. Preset control.....	141.00	5.00



DR7600R	As for DR7600X but using the DAIWA round controller.....	152.00	5.00
KS065	Deluxe bearing for fixing stays to rotating mast.....	18.50	2.00
MOBILE WHIP ANTENNAS			
DA500	Dual band whip. 2·7dB gain on 2m and 5·5dB gain on 70cm. 200W.....	16.50	1.00
ANTENNA ACCESSORIES			
CS201/TW2	Two way 50 ohm coax switch. 0-500MHz.....	11.98	1.00

POWER SUPPLIES			
PS300	Daiwa heavy duty PSU 30A max 22A continuous.	117.99	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



the HONOR family

ANNOUNCE THE ARRIVAL OF THE GT1000 DIGITAL MULTIMETER

The GT1000 is the newest multimeter in the established range from Honor. Different because its digital LCD display gives instant unambiguous readings over its wide range (200mV full scale up to 1000 V full scale DC, 2 V-600 V AC). The meter is auto ranging and auto polarity selecting so you can pay attention to the measurement in hand without bothering with switch twiddling. Its even auto ranging on the ohms scales, and will measure from 200 ohms full scale up to 2M ohm. Amazing.

£39.50 inc VAT carriage £1.50

the MX 4

SSB and CW from 70.150 to 70.250 MHz with 200 mW power output.
Internal telescopic aerial. CW key and Nicad charger. Operates from either an internal battery or an ext 9 volt DC supply. (Optional module for 12 volts) the rig is supplied in semi-kit form for around **£75.00.**

AT LAST! A 4 METRE TRANSCEIVER

LOWE ELECTRONICS | Access | BARCLAYCARD VISA | LOWE ELECTRONICS | Access | BARCLAYCARD VISA

EMPORIUM NEWS

Another Emporium News,
I've just been handed a copy of the **Lowe Electronics** price list for the next few months dated August 1982, it is **interesting to note** that although many companies use a new edition of the price list to **surreptitiously increase prices** you will find if you compare the new one with the previous one that with only a few minor exceptions prices **have remained constant** indeed one price has been reduced. Why then a new price list you ask, the answer is new products, new items which have been added to the already wide stock range. **This month** I intend to draw your attention to **some** of these **items.** Of course you could always drop us a line along with 70p in postage for a copy of our new **comprehensive** list. For those who are still waiting with bated breath to find out **which item has been reduced** I will tell you, the NRD515 receiver has been reduced from £1084 to £985. The reason, a better deal from the manufacturer and straightaway passed on to yourselves. Of course, being an NRD man and owner I still maintain that this general coverage receiver is and always has **been value for money** and to me is a source of great enjoyment. I am pleased to note that many more of you are finding out likewise.

Back to the new price list. How many of you knew we had **a digital door alarm,** battery operated and costing £12.50 inc VAT, carriage £1.50. For those of you who have been to Matlock you trigger one each time you enter the shop, **ding dong** it goes, but it can also be programmed with your own personal code. Very nice and from the looks on many of your faces as you enter quite a surprise.

From Daiwa many new products, **the RF670 mike audio compressor** at £38.50 inc VAT, carriage £1.50. Typical Daiwa quality we now all have come to expect from this innovative company. Likewise **the AF606K all mode active filter** at £56.80 inc VAT, carriage £2.00. A lot to pay for an audio filter I can hear you saying, but not for one that incorporates a PLL CW tone which will lock onto and faithfully reproduce **without background noises and fading** the clear CW signal. Of course, if QRM should totally remove the received signal then not even the AF606K will bring it back. However, many have seen the device, made the mistake of switching it on and have bought one.

For those who have to operate quietly then what about the **AR6800 earpiece.** Obviously designed for the Van Gogh's amongst you or those who cannot afford one for both ears the AR6800 at £1.97 inc VAT, carriage 50p is just the thing. Of course we do have a range of headsets, **the JH77** @ £4.94 inc VAT, carriage £1.00 and the Trio trio the **HS4, 5 and 6** being respectively £10.35, £21.85 and £14.95. I personally use the **HS6** being lightweight but still giving real communication **quality** audio.

By now you will have seen the new range of small tools which we have introduced. A variety of types but all excellent quality and each priced at £4.50 inc VAT, carriage 50p.

Not a new item but one which has been advertised many times is the Shimizu **SS105S** 80 to 10 metres **solid state** SSB/CW/FM **transceiver.** Available in semi kit form and recently reviewed by Geoff Arnold in Practical Wireless, Geoff incidentally bought himself the Shimizu, built it and then enthusiastically reviewed it. The rig costs £275 inc VAT, carriage £5.00 and I cannot think that a rig can be made giving more value for money than the Shimizu. Those who have bought them, built them and operated them are the people to talk to. **The Shimizu** has a full range of options at realistic price, telephone for further details.

A new addition to the range of microphones is the **Hi-2 high impedance ceramic mike** complete with Trio type 4 pin plug. A good quality item priced at £4.49 inc VAT, carriage £1.00. We still sell **the Daiwa infra red mike** together with additional mikes, sensors and wind shields and **the DX450 amplified desk mike** and **station clock plus transmission timer** can still be bought for £63.00 inc VAT, carriage £1.00.

New to the Honor family of multimeters is the **GT 1000** an auto ranging digital device at the unbeatable price of £39.50 inc VAT, carriage £1.50.

I had always thought that our range of **power supplies** took some beating but to the already well known PP13056S, PP1307 and PP1310 has been added the following. Two new PSU's from Daiwa, **the PS200D** 9-15V at 20 amps, price £98 inc VAT, carriage £5.00 and the big daddy of them all **the Daiwa PS300.** 30 amp max, 22 amp continuous, price £117.99, carriage £5.00 . This is the power supply that accompanies us to talks to provide a reliable and safe source of 13.8 volt to power up the Trio demonstration equipment.

For the chap with the SR9, VHF converter or other small piece of equipment we have had specially **made in England the PS13003.** A 12V 300mA supply, the unit plugs straight into a 13 amp socket the fly lead connecting to the equipment.

A 9 volt 300mA model is also stocked, code being **PS9003.** Both these "plug in" PSUs are priced at £8.49, carriage being £1.50.

Yet another new product from Daiwa is **the 4-way 50 Ohm coax switch.** You all have seen the 2-way one and many have seen the 4-way one in the Daiwa catalogue, you've never seen the Daiwa catalogue? Ring and ask Traci to send one. Well, many of you have asked for the 4-way switch, now it has arrived and I am pleased to say it is a real beauty. John took the first one to pieces and seemed quite pleased with it so it must be good. Priced at £36.99 inc VAT carriage. **The CS401** is now in stock.

One of the CB accessories that has with justification found its way into the general Lowe catalogue is **the NSF1000** noise filter kit. Originally for the mobile CBer, amateurs with vehicle suppression problems now stand some chance of success. **The NSF1000** noise filter kit at £11.50 inc VAT, carriage £1.50 is now part of the new price list.

I think after this amount of reading for the new products **a little light relief** is called for.

Remember **the fun** to be had when calling CW contest on 20 metres when there is no contest running. Remember the earnest Japanese station with his crisp 5·9 001 followed by a query regarding more information on the contest, and the American guy immediately there with his 59 301 just to show he has a **bigger** rig and a **better** aerial system. A thing of the past. To the chap who wrote to complain about Emporium News there seems little point to talk and write in that particular style. Knowing that **nobody** would read 1,800 words without a bit of encouragement, references to **Traci,** yes, she does have red toenails, **to my family,** yes, we do have a budgerigar and one small boy, to my friend **Bill Capstick** and the other people who have passed this way.

What about the latest creation from JRC, the NCM515. **The NRD515** is **a fine receiver.** I, as you know, run the full station, but I have just received details of the above unit. **The NCM515** is a remote control for the NRD515, providing the ability to key in any frequency within the range, to add to the frequency or take away, to step up or down and all from the palm of your hand. An essential item for any NRD man, the NCM515 really gives truth to the comment **"armchair copy".**

Anyway, that's about it for now as I have just heard a rumour that the company that supply us with drinks for the dispensing machine in the shop have introduced a new one called "gin and tonic", so I, in my executive capacity, must go and check the samples. So until next time GUD DXes 73es FBYLS, XYLS, esFBOM etc. DAVID.

APPROVED TRIO DEALER

TELECOMMS

APPROVED TRIO DEALER

★ South Coast TRIO Superstore ★

TRIO – FULL RANGE STOCKED

TS830S	160-10m transceiver 9 bands	£694.00 (5.00)
VFO230	Digital VFO with memories	215.00 (5.00)
AT230	All-band ATU power meter	119.00 (2.25)
SP230	External speaker unit	34.95 (1.50)
DS2	Optional dc pack for TS830S	43.95 (1.50)
DFC230	Dig frequency remote controller	179.00 (1.50)
YK88C	500Hz CW filter	29.60 (1.00)
YK88CN	270Hz CW filter	32.60 (1.00)
TS530SE	160-10m trans 200W pep digital	534.00 (5.00)
VFO240	External VFO	92.50 (5.00)
SM220	Station monitor scope	198.00 (5.00)
BS8	Pan display TS820/180/830	44.85 (.50)
BS5	As above for TS520	44.85 (.50)
R820	Amateur band receiver	589.00 (5.00)
YG455C	500Hz CW filter	61.00 (.50)
YG455CN	250Hz CW filter	65.00 (.50)
YG88A	6kHz AM filter	35.40 (.50)
TS180S	160-10m S/State transceiver	679.65 (5.00)
VFO180	External VFO	96.60 (1.50)
SP180	External speaker unit	36.80 (1.50)
AT180	Matching 200W antenna tuner	95.45 (5.00)
YK88C	500Hz CW filter	29.60 (.50)
YK88S	Second SSB filter option	29.20 (.50)
PS30	AC power supply for TS180S	88.50 (5.00)
TS130S	8 band 200W pep	525.00 (5.00)
TS130V	8 band 200W pep	445.00 (5.00)
DFC230	Dig frequency remote controller	179.00 (1.50)
TL120	200W pep linear for TS120V	144.00 (5.00)
MB100	Mobile mount for TS120/130	17.00 (1.00)
YK88C	500Hz CW filter	29.60 (.50)
YK88S	2nd SSB filter option	32.60 (.50)
VFO120	External VFO	85.00 (5.00)
SP120	Base station external speaker	23.00 (1.25)
SP40	New mobile speaker unit	12.40 (1.50)
AT130	100W antenna tuner	79.00 (1.50)
PS20	AC power supply TS120/130V	49.45 (5.00)
PS30	AC power supply TS120/130S	88.50 (5.00)
MA5	5 band mobile aerial system	88.75 (4.50)
TL922	160-10 metre 2kW linear	624.00 (5.00)
MC50	Dual impedance desk microphone	£25.75 (1.50)
MC35S	Fist microphone 50K impedance	13.80 (1.00)
MC30S	Fist microphone 500ohm imp.	13.80 (1.00)
LF30A	HF lowpass filter. 1kW	19.30 (1.00)
RD300	1kW oil filled dummy load	52.00 (1.50)
TS780	2m/70cm all mode transceiver	748.00 (5.00)
SP70	External speaker unit	18.60 (1.00)
TR9000	2m synthesised multimode	359.00 (5.00)
TR9500	70cm all mode	449.00 (5.00)
BO9	Base plinth for TR9000	34.95 (5.00)
TR7800	2m FM synthesised mobile	257.00 (5.00)
TR7850	40W version of above	314.00 (2.50)
TR8400	70cm FM synthesised	2 [illegible].00 (2.50)
PS10	AC psu for above	64.75 (2.50)
TR2300	2m FM synthesised portable	166.75 (5.00)
VB2300	10W amplifier for TR2300	58.00 (1.50)
MB2	Mobile mount TR2300/VB2300	17.70 (1.00)
RA1	Rubber flexible antenna	6.90 (.50)
PS1200	AC power unit and charger	29.50 (1.50)
TR2500	2m FM synthesised handheld	207.00 (5.00)
SMC25	External speaker/mic	14.49 (1.00)
ST1	Base stand and quick charger	45.00 (1.50)
BC5	12V quick charger	18.40 (1.50)
SC4	Soft carrying case	12.19 (.50)
LH2	Hard leather holster	21.39 (.50)
PB25	Spare battery pack/charge lead	22.31 (1.50)
MS1	Mobile stand and charger	28.00 (1.50)
R600	Gen. coverage receiver	235.00 (5.00)
R1000	Gen. coverage receiver	295.00 (5.00)
SP100	External speaker	26.90 (2.50)
HC10	Digital desk world clock	58.75 (1.50)
HS5	Deluxe Comm. headphones	21.85 (1.00)
HS4	Standard headphones	10.35 (1.00)
DM801	Dip meter	60.00 (1.75)
TR7730	New 25W FM transceiver	247.00 (5.00)
TR9130	New 25W 2m all-mode	395.00 (5.00)

JAYBEAM ANTENNAS

2 metre Antennas

C5/2M	5dB glass fibre colinear	£47.70 (3.50)
5Y/2M	5 element yagi	12.07 (2.00)
8Y/2M	8 element yagi	15.50 (2.50)
10Y/2M	10 element 'long yagi'	33.36 (3.50)
PBM10/2M	10 element Parabeam	39.67 (3.50)
PBM/14/2M	14 element Parabeam	48.30 (4.50)
5XY/2M	Crossed 5 element yagi	21.72 (3.00)
8XY/2M	Crossed 8 element yagi	31.00 (3.50)
10XY/2M	Crossed 10 element yagi	40.80 (4.00)
X6/2M6X12/70cm	Dual band crossed yagi	41.40 (4.50)
PMH/2C	2 way phasing harness	8.00 (.75)
Q4/2M	4 element quad yagi	25.87 (2.50)
Q6/2M	6 element quad yagi	33.90 (4.50)
D5/2M	Double 5 slot-fed yagi	21.85 (2.50)
D8/2M	Double 8 slot-fed yagi	29.32 (4.00)
SVMK/2M	Kit for vertical polarization	5.15 (1.50)
UGP/2M	Ground plane	10.90 (1.50)
HO/2M	Mobile 'halo' head only	5.75 (1.75)
HM/2M	Mobile 'halo' with 24 mast	5.75 (1.75)
PMH2/2M	2 way phasing harness	10.90 (1.00)
PMH4/2M	4 way phasing harness	25.30 (1.75)

70cm Antennas

C8/70cm	8dB glass fibre colinear	54.00 (3.50)
D8/70cm	Double 8 slot-fed yagi	22.40 (2.50)
PBM18/70cm	18 element Parabeam	27.60 (2.50)
MBM48/70cm	43 element Multibeam	31.00 (3.00)
MBM88/70cm	88 element Multibeam	42.55 (4.50)
8XY/70cm	Crossed 8 element yagi	36.80 (4.50)
PMH2/70cm	2 way phasing harness	9.20 (1.00)
PMH4/70cm	4 way phasing harness	19.55 (1.50)

Same Day Despatch. Our Hotline 0705 662145. Simply ring quoting your Barclaycard/Access number for immediate despatch of items listed

Access **TELECOMMS** 189 LONDON ROAD, NORTH END, PORTSMOUTH BARCLAYCARD VISA

The professional double act that turns on the amateur.

IC-Rx70, The very latest from Icom! £469.

The New Rx 70 receiver from Icom is designed to provide a really stunning performance at a price not much greater than its inferior competitors.

It covers all modes (when the FM option is included), uses 2 CPU – driven VFO's for split frequency working, has 3 IF frequencies – 70MHz, 9MHz and 455KHz and a dynamic range of 100dB.

Other features are:-

Input switchable through a pre-amplifier, direct or via an attenuator.
Selectable tuning steps of 1KHz, 100Hz or 10Hz.
Adjustable IF bandwidth in 3 steps (455KHz)
Noise limiter. Switchable AGC. Tunable notch filter.
Squelch on all modes. RIT. Tone control.
Tuning LED for FM (discriminator centre indicator)
Recorder output. Dimmer control.
Separate antenna sockets for LW-MW with automatic switching.
Large front mounted loudspeaker - 5.8W output.
Frequency stability 1st hour ± 250Hz, thereafter ± 50Hz, sensitivity -SSB/CW/RTTY better than 0.32 μv for 12 dB $\frac{S+N}{N}$.
Am – 0.5 μv, FM better than 0.32 for 12 dB Sinad.
Built in mains supply – DC optional.
Size 286mm x 110mm x 276mm – weight 7.4Kg.

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Introducing the NEW IC-740

This latest transceiver contains all the most asked-for features, in the most advanced solidstate HF base station on the amateur market...performing to the delight of the most discerning operator.

Study the front panel controls of the ICOM IC-740. You will see that it has all of the functions to give maximum versatility to tailor the receiver and transmitter performance to each individual operator's requirements.

Features of the IC-740 receiver include a very effective variable width and continuously adjustable noise blanker, continuously adjustable speed AGC, adjustable IF shift and variable passband tuning built in. In addition, an adjustable notch filter for maximum receiver performance, along with switchable receiver preamp, and a selection of SSB and CW filters. Squelch on SSB Receive and all mode capability, including optional FM mode. Split frequency operation with two built-in VFO's for the serious DX'er.

The IC-740 allows maximum transmit flexibility with front panel adjustment of VOX gain and VOX delay along with ICOM's unique synthesized three speed tuning system and rock solid stability with electronic frequency lock. Maximum versatility with 2 VFO's built in as standard, plus 9 memories of frequency selection, one per band, including the new WARC bands.

With 10 independent receiver and 6 transmitter front panel adjustments, the IC-740 operator has full control of his station's operating requirements.

See and operate the versatile and full featured IC-740 at your authorized ICOM dealer.

Options include:
- FM Module
- Marker Module
- Electronic Keyer
- 2 - 9MHz IF Filters for CW
- 3 - 455MHz Filters for CW
- Internal AC Power Supply

Accesories
- SM5 Desk Microphone
- UP/DWN Microphone
- Linear Amplifier
- Autobandswitching Mobile Antenna
- Headphones
- External Speaker
- Memory Backup Supply
- Automatic Antenna Tuner

IC-730 The best for mobile or economy base station £586.inc.

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.

IC-25E The Tiny Tiger £239.inc.

Amazingly small, yet very sensitive. Two VFO's, five memories, priority channel, full duplex and reverse. LED S-meter, 25KHz or 5KHz step tuning. Same multi-scanning functions as the 290 from mic or front panel. All in all the best 2M FM mobile ICOM have ever made.

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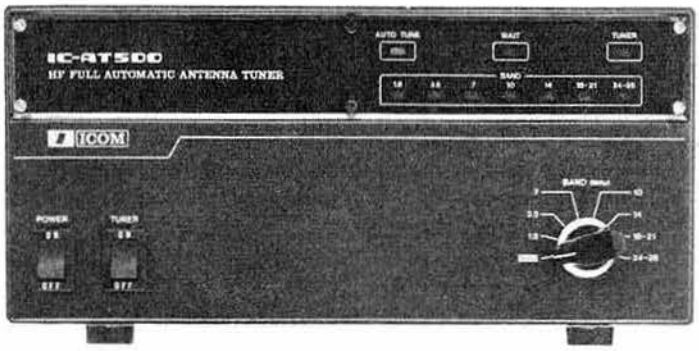
IC-AT500 Automatic antenna tuner £299.inc.
100W version AT100 £249.inc.



The Automatic Antenna Tuners which put all the others to shame.

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).

Apart from its very rapid action and auto band selection facilities it will select the correct antenna for the band (up to four). The new bands are covered of course, but the AT100 does not cover topband, whereas the AT500 does.

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.

Why not call us for more details or get your dealer to demonstrate one to you today?

Tono RTTY and CW computers 7000E-£550./9000E-£650.inc.

The TONO range of communication computers take a lot of beating when it comes to trying to read RTTY and CW in the noise. Others don't always quite make it!

Check the many facilities offered before you buy – especially look at the 900E which also throws in a Word Processor. Previous ads have told you quite a lot about these products – but why not call us for further information and a brochure?

IC-2KL Super Linear £839.inc. Matching power supply IC-2KLPS £211.inc.

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.

This automatic facility can be overriden for use on rigs other than the IC-720A, but can be added to the IC-701, IC-730, IC-74O The IC-2KL employs a heat pipe cooling system for the heatsink of the power transistors. This is a new technology used to transfer the heat, and has a high conductance, several hundred times that of copper, plus a very quick response.

The IC-2KL has a matching power supply the IC-2KLPS delivering 40vDC at 25A continuous for 10 minutes maximum.

NEW! £699.inc. with built-in VDU.

The **Telereader** range of communications computers are becoming very popular right through the range. All have composite video and UHF output for use with a TV set. Add a new dimension to your short wave listening.

CWR685E Send/receive with VDU and Keyboard	**£699**
CWR-670 Delux rx only version with CW and six selectable baud rates – 3 shifts	**£259**
CWR-600 "Morse Master" Rx only (but it does RTTY also-3 baud rates). Key socket and built in oscillator for morse practice.	**£189**

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IC-720A. Possibly the best choice in HF. £883.inc.

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. It may be just a little more expensive than some of the others – but when you remember just how good it is, and of course the excellent reputation for keeping their secondhand value you will see why your choice will have to be an IC-720A!

CUE DEE antennas

The BEST in recent tests and really well made too. Send for a catalogue of these DX antennas. Here's part of the range:-

4el 2m yagi VHF	4144A	8 dBd	£24.93
10el 2m yagi VHF	10144	11.4 dBd	£45.16
15el 2m yagi VHF	15144	14 dBd	£63.00
17el 70cm yagi UHF	17432	14.5 dBd	£48.00
4/5el HF Beam	DUO 2	(14/21 MHz) 9/8 dBd	£356.71

All matching cables, clamps and booms available for stacking 10 and 15 element yagis.

The World's most popular portables IC-2E £159.inc. IC-4E £199.inc.

Nearly everybody has an IC2E – the most popular amateur transceiver in the world – now there is the 70cm. version which is every bit as good and takes the same accessories.

Fully synthesized – Covering 144 – 145.995 in the 400 5KHz steps. (430-439.999 4E).

Power output – 1.5W with the 9v. rechargeable battery pack as supplied – but lower or higher output available with the optional 6v or 12v packs. Rapid slide-on charging facility.

BNC antenna output socket – 50 ohms for connecting to another antenna or use the Rubber Duck supplied (flexible ¼ whip – 4E)

Send/battery indicator – Lights during transmit but when battery power falls below 6v it does not light, indicating the need for a recharge.

Frequency selection – by thumbwheel switches, indicating the frequency. 5KHz switch – adds 5KHz to indicated frequency.

Duplex simplex switch – gives simplex or plus 600KHz or minus 600KHz transmit (1.6MHz and listen input on 4E).

Hi-Low switch – reduces power output from 1.5W to 150mW reducing battery drain.

External microphone jack– If you do not wish to use the built-in electret condenser mic an optional microphone speaker with PTT control can be used. Useful for pocket operation.

External speaker jack – for speaker or earphone. This little beauty is supplied ready to go complete with nicad battery pack, charger, rubber duck.

A full range of accesories in stock.		£ p
ICML1	10W mobile booster for IC2E	49.00
BP5	11 volt battery pack	30.00
BP4	Empty battery case for 6 x AA cells	5.80
BP3	Standard battery pack	17.70
BP2	6 volt pack	22.00
BC30	Base charger for above	39.00
BC25	Mains charger as supplied	4.25
DC1	12 volt adapter pack	8.40
HM9	Speaker microphone	12.00
CP1	Mobile charging lead	3.20
IC1 2 3	cases	3.60
All prices include VAT		each

Fully approved marine version now available £199.+VAT.

ICOM are proud to introduce the IC-M12 which is the Marine version of the worlds most popular portable, the IC-2E. It uses all the same accessories, has the same exceptional receiver sensitivity and versatility of the 2E and it is HOME OFFICE APPROVED. 12 Channels – Synthesised – No Crystals to buy!

12 programmable channels which include the private ones

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Great base stations
IC-251 £499.inc./IC-451 £569.inc.

ICOM produce a perfect trio in the UHF base station range, ranging from 6 Meters through 2 Meters to 70 cms. Unfortunately you are not able to benefit from the 6m product in this country, but you CAN own the IC-251E for your 2 Meter station and the 451E for 70 cms.

Both are really well designed and engineered multi-mode transceivers capable of being operated from either the mains or a 12 volt supply. Both contain such exciting features as scan facilities, automatic selection of the correct repeater shift for the band concerned, full normal and reverse repeater operation, tuning rate selection according to the mode in use. VOX on SSB continuous power adjustment capability on FM and 3 memory channels. Of course they are both fitted with a crystal controlled tone burst and have twin VFO's as have most of ICOM's fully synthesized transceivers. There is now a superb low noise mast head pre-amp available for the IC-451.

Multimode mobiles
IC-290E £366./IC-490E £445.inc.

10W RF output on SSB, CW and FM. Standard and non-standard repeater shifts. 5 memories and priority channel.

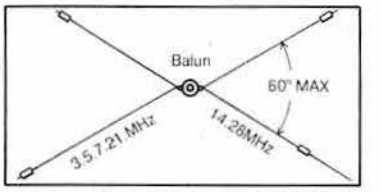
Memory scan and band scan, controlled at front panel or microphone. Two VFO's LED S-meter 25KHz and 1KHz on FM – 1KHz and 1000KHz tuning steps. Instant listen input for repeaters.

Thanet Agents Agents (phone first – all evenings and weekends only, except Scotland).
Scotland – Jack GM8 GEC (031 665 2420)
Midlands – Tony G8AVH (021 32 - 2305)
North West – Gordon G3LEQ (0565 4040 Ansafone available)

IC-24G Low-priced mobile
£169.inc.

The famous IC-240 has been improved, given a face life and renamed the IC-24G. Many thousands of 240's are in use, and its popularity is due in part to simplicity of operation, high receiver sensitivity and superb audio on TX and RX. The new IC-24G has these and other features. Full 80 channels (at 25kHz spacing) are available and readout is by channel number – selected by easy to operate press button thumbwheel switches. This readout can clearly be seen in the brightest of sunlight. Duplex and reverse duplex is provided along with a 12½ KHz upshift, should the new channel spacing be necessary. The old IC-240 proved to be the most reliable rig we have ever sold – the IC-24G because it is so similar, looks like following the same pattern. Remember for mobile use a rig MUST be easy to operate to be safe. Send for technical details.

A new trap dipole £49.50.inc.



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 £49.50 inc. VAT.

Available nationwide through local dealers a selection of which are listed below:

Tyrone Amateur Electronics N. Ireland (0662) 2043
Amateur Radio Exchange London (01) 992 5765
Bredhurst Electronics Sussex (0444) 400786
Photo-Acoustics Ltd. Bucks (0908) 610625
S & S Amateur Radio Lancs (07) 744 22239
Alyntronics Tyne & Wear (0632) 761002
Fanthorpes Humberside (0482) 223096
LAM Electronics Glos (0242) 43891
Booth Holdings Avon (02217) 2402
Telecom S Yorks (0226) 5031
Gemini Lancs (0204) 652233

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143 Reculver Road, Herne Bay, Kent.
Tel: 02273 63859
Trade Enquiries Welcome.

STEPHENS-JAMES LIMITED

Access BARCLAYCARD VISA

TRIO TS-930S HF TRANSCEIVER

TRIO R-600 SOLID STATE RECEIVER
200 KHZ·30MHZ. AC OR DC OPERATION

TRIO TS-830S HF TRANSCEIVER

TRIO TS-130S SOLID STATE HF TRANSCEIVER

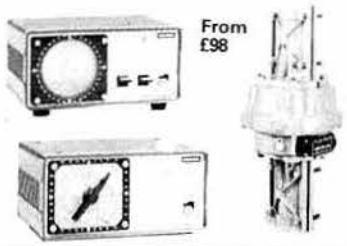
NEW TRIO R-600 RECEIVER AT £235.00

TRIO PRICES
Full Range of Accessories Available

TS830S	£694.83	TS530S	£534.98	TS130S	£525.00	AT130	£79.12	TR78500	£314.87
AT230	£119.83	VFO240	£92.92	TS130V	£445.05	TR2300	£166.75	TR8400	£299.00
SP230	£34.96	R820	£589.95	TL120	£144.90	TR2500	£207.00	TR9130	£395.00
VFO230	£215.97	TS180S	£679.00	SP120	£23.00	TR7730	£247.94	TR9500	£449.88
DFC30	£179.86	PS30	£88.55	PS20	£49.45	TR7800	£257.60	TS930S	£1078.00

THE ONLY OFFICIAL STOCKIST OF TRIO EQUIPMENT IN THE NORTH WEST

DAIWA Full range of reliable antenna rotators



From £98

DAIWA AUTOMATIC ANTENNA TUNER/

CN1001A 200 watt £156.00
CN2002 2kW £228.00

YAESU
FRG7 Receiver £199.00

DRAKE
TR5 HF Transceiver/AC PSU £745.00
MN2700 ATU £253.00
MN75 ATU £189.75
MN7 ATU £125.50
Full range of Drake equipment available to order.

STABILISED POWER SUPPLIES
Model 125 10-15V 5A £28.00
Model 156S 4-15V 6A Twin Meter £40.00
Model 1210S 4 20V 10A Twin Meter £75.00
Maximum ratings quoted

STATION ACCESSORIES (inc post)
SWR 25 Twin meter £12.80
2-way Antenna switch (V2) £6.50
3-way Antenna switch (V3) £10.80
4-way Antenna switch (V4) £11.00
2-way Antenna switch (VHF) £11.85
DL50 50 watt dummy load 50ohm £7.00
DL50 Dummy load/wattmeter £38.00
FX1 Station Wavemeter £34.00
Wellz SP200 swr/power £59.95
HP4A High Pass Filter £6.00
Daiwa CN620A £54.00
Full range of aluminium tubing, wall clamps, brackets "V" bolts for the caller.

TRANSCEIVERS AND RECEIVERS
AR22 Hand held 2m receiver £83.00
FRG7700 Receiver £329.00
SR9 2m FM Receiver £46.00
FDK750E Transceiver £289.00
FDK700E Transceiver £169.00

HY-GAIN ANTENNAS
12AVQ 10-15-20m Vertical £43.25
14AVT/WB 10-15-20-40m Vertical £58.08
18AVT/WB 10-15-20-40m-80 Vertical £90.85
TH2 MK3 2 Element Tribander Beam £136.85
TH3 JNR 3 Element Tribander Beam £159.28
TH3 MK3 3 Element Tribander Beam £205.85
TH6 DXX 6 Element Tribander Beam £281.75
205BA 5 Element 20m Beam £281.75
203BA 3 Element 20m Beam £159.85
Mini Products HQ-1 Minibeam £119.00
Mini Products C4A 10-15-20m Vertical £55.00
GPV-5 2 m Co-linear £29.50
GPV-7 70cm Co-linear £25.30
HF5 10-80 m Vertical £48.50
G4MH Mini Beam £82.50
Hustler 5 band vertical £86.75
The new TET range of VHF and HF antennas now available
Complete range of Jaybeam Yagi's Co-linear etc available
Complete range of G.WHIP Mobile Antenna's available

DATONG PRODUCTS
PCI Converter £137.42
VLF Converter £29.90
FL1 Audio Filter £79.35
FL2 M mode Filter £89.70
RF Speech Clipper £82.80
D75 Man. Speech Clipper £56.35
D70 Morse Tutor £56.35
AD370 Active Antenna £52.90
AD270 Active Antenna £37.95

FULL RANGE OF PUBLICATIONS IN STOCK RSGB, ARRL, ETC.

NRD-515 RECEIVER

For the discerning DXER comes the modern NRD-515 general coverage receiver • Full of all performance advantages offered by any receiver • All modes of operation PLL Digital VFO • Solid state • Up conversion type double conversion • Frequency coverage 100kHz to 30MHz • LF/MF bands below 1·6MHz are clearly receivable through the use of a filter/tuned circuit • Band Pass tuning • Noise Blanker • RIR • Attentuator • AGC • Recording terminal • Mute terminal, etc which permits operation with the NSD-505 transmitter or ant transmitter • Optional: speaker, memory unit, cw filter available. PRICE **£985.00** inc VAT

JRC NSD515 Transmitter. Matching unit to the NRD515 Receiver available shortly. 65 years of experience produces the finest "separates" available in the world to the Radio amateur who wants the best in Amateur Radio.

Shop Hours: Mon to Fri 9.30am to 5.30pm
Saturday 9.30am to 4.30pm ACCESS and Barclaycard facilities
HP terms arranged. Part exchanges always welcome
We are located on the A574. Turn at the Greyhound Motel on the A580 (East Lancs Road) and we are about ½-mile on right. No parking problems at any time. **SAE FOR S/H LIST.**

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LEIGH WN7 3EA
ENGLAND
Telephone (0942) 676790

AMATEUR ELECTRONICS UK

Your number one source for YAESU MUSEN

G3FIK

YAESU

KEEP AHEAD WITH THE NEW FT-102!

Once again YAESU lead the field with the exciting new FT-102 HF transceiver– no other manufacturer offers so many innovative features.

Better Dynamic Range
The extra high-level receiver front end uses 24 VDC for both RF amplifier and mixer circuits, allowing an extremely wide dynamic range for solid copy of the weak signals even in the weekend crowds. For ultra clear quality on strong signals or noisy bands the high voltage JFET RF amplifier can be simply bypassed via a front panel switch, boosting dynamic range beyond 100dB. A PLL system using six narrow band VCOs provides exceptionally clean local signals on all bands for both transmit and receive.

Total IF Flexibility
An extremely versatile IF Shift/Width system, using friction-linked concentric controls and a totally unique circuit design, gives the operator an infinite choice of bandwidths between 2.7kHz and 500Hz, which can then be tuned across the signal to the portion that provides the best copy sans QRM, even in a crowded band. A wide variety of crystal filters for fixed IF bandwidths are also available as options for both parallel and cascaded configurations. But that's not all; the 455kHz third IF also allows an extremely effective IF notch tunable across the selected passband to remove interfering carriers, while an independent audio peak filter can also be activated for single-signal CW reception.

New Noise Blanker
The new noise blanker design in the FT-102 enables front panel control of the blanking pulse width, substantially increasing the number of types of noise interference that can be blanked, and vastly improving the utility of the noise blanker for all types of operation.

Commercial Quality Transmitter
The FT-102 represents significant strides in the advancement of amateur transmitter signal quality, introducing to amateur radio design concepts that have previously been restricted to top-of-the-line commercial transmitters; far above and beyond government standards in both freedom from distortion and purity of emissions.

Transmitter Audio Tailoring
The microphone amplifier circuit incorporates a tunable audio network which can be adjusted by the operator to tailor the transmitter response to his individual voice characteristics before the signal is applied to the superb internal RF speech processor.

IF Transmit Monitor
An extra product detector allows audio monitoring of the transmitter IF signal, which, along with the dual meters on the front panel, enables precise setting of the speech processor and transmit audio so that the operator knows exactly what signal is being put on the air in all modes. A new "peak hold" system is incorporated into the ALC metering circuit to further take the guesswork out of transmitter adjustment.

New Purity Standard
Three 6146B final tubes in a specifically configured circuit provide a freedom from IMD products and an overall purity of emission unattainable in two-tube and transistor designs, while a new DC fan motor gives whisper-quiet cooling as a standard feature. For the amateur who wants a truly professional quality signal, the answer is the Yaesu FT-102.

New VFO Design
Using a new IC module developed especially for Yaesu, the VFO in the FT-102 exhibits exceptional stability under all operating conditions.

ANCILLARY EQUIPMENT

SP-102 EXTERNAL SPEAKER/AUDIO FILTER
The SP-102 features a large high-fidelity speaker with selectable low- and high-cut audio filters allowing twelve possible response curves. Headphones may also be connected to the SP-102 to take advantage of the filtering feature, which allows audio tailoring for each bandwidth and mode of operation to obtain optimum readability under a variety of conditions.

FC-102 1.2 KW ANTENNA COUPLER

FV-102DM SYNTHESIZED, SCANNING EXTERNAL VFO

FT-101ZD Mk III

YAESU's FT-101ZD **WITH FM** is still rolling off the line as fast as YAESU can produce - thanks to its very comprehensive specification and competitive price. Incorporates notch filter, audio peak filter, variable IF bandwidth plus many other features.

FT-ONE SUPER HF TRANSCEIVER

The ultimate in HF transceivers - the superb FT-ONE provides continuous RX coverage of 150KHz-30MHz plus all nine amateur bands (160 thru 10m).
All-mode operation LSB, USB, CW, FSK, AM, *FM • 10 VFO system • **FULL** break-in on CW • audio peak filter • notch filter • variable bandwidth and IF shift • keyboard scanning and entry • RX dynamic range over 95dB! and **NO** band switch!!!

*OPTIONAL

AMATEUR ELECTRONICS UK

NEW! FT-230R 25watt 2m FM mobile

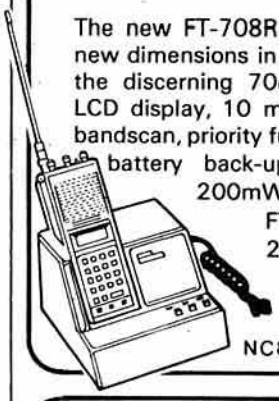
- Two independent VFO's
- 10 memories
- Priority function
- Memory and band scan
- 12.5/25 KHz steps
- Large LCD readout.

FT-290R All-mode 2m portable

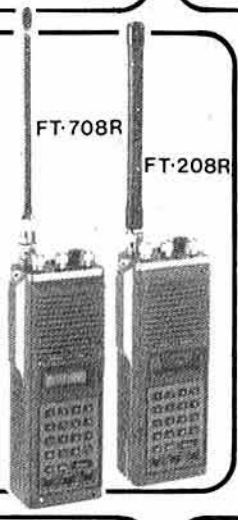
10 memories, 2 VFO's, LCD display, C size battery, easy car mounting tray, 2·5 watts out.

FT-708R and FT-208R Synthesized UHF/VHF transceivers

The new FT-708R and FT-208R provide new dimensions in operating flexibility for the discerning 70cm and 2m operator. LCD display, 10 memories, memory and bandscan, priority function, internal lithium battery back-up. RF output FT-708R, 200mW low, 1 watt high, FT-208R, 300mW low, 2·5 watts high.



NC8 Charger DC PSU



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

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

FRG-7 General coverage receiver

The set with the world-wide reputation. YAESU's famous FRG-7 out-performs many a more expensive set. Rugged and reliable, it features high sensitivity and Wadley loop stability - a delight to use for the established amateur and new SWL alike.

FRG-7700 High performance communications receiver

YAESU's top of the range receiver. All-mode capability, USB, LSB, CW, AM *and* FM 12 memory channels with back-up. Digital quartz clock feature with timer. Pictured here with matching FRT-7700 Antenna tuner and FRV-7700 VHF converter.

Access — Buy it with Access
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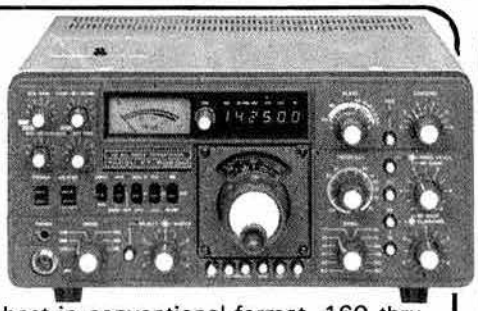
For full details of these new and exciting models, send today for the latest YAESU PRICE LIST & LEAFLETS. All you need do to obtain the latest information about these exciting developments from the World's No.1 manufacturer of amateur radio equipment is to send 36p in stamps and as an added bonus you will get our credit voucher value £3·60 – a 10 to 1 winner!

FT-902DM Competition grade HF transceiver



The HF transceiver with the pedigree for the man who insists on only the best in conventional format. 160 thru 10 metres including WARC bands.
All-mode capability, SSB, CW, AM, FSK **and FM** transmit and receive. Teamed with the FTV-901R transverter coverage extends to 144 & 430MHz.

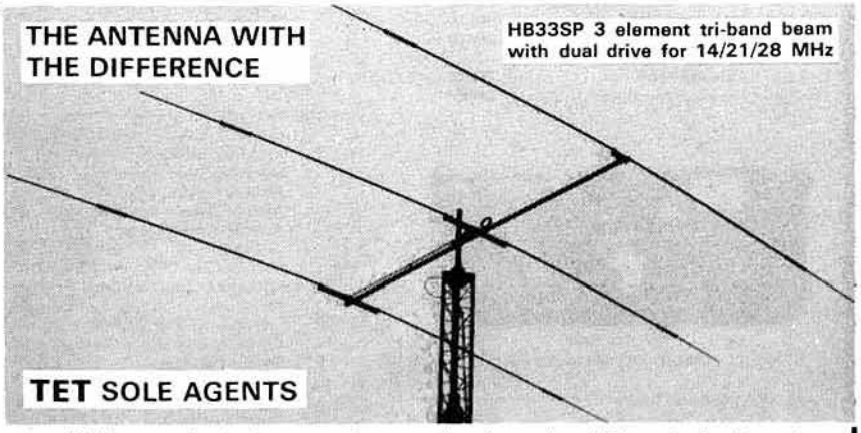
FT-707 All solid-state HF mobile transceiver

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

TET ANTENNA SYSTEMS

TET HF antennas are unique in that they employ dual driven elements with the following distinct advantages—

- **Improved gain over conventional arrays.**
- **Broader bandwidth with lower SWR.**
- **Enhanced front to back ratio.**
- **Better matching into solid state transceivers without an A.T.U.**
- **High power handling capacity.**



TET manufacture an exciting range of multi-element HF beams including superb monobanders plus HF verticals. Also there is a full range of VHF/UHF antennas most of which have multi-element drive or distinctive technical features.

Model	Description	Price incl. VAT	Carriage
HB10F2T	2 Ele. Mono Band Beams for 10 Meter Band	50.75	2.75
HB10F3T	3 Ele. Mono Band Beams for 10 Meter Band	73.79	2.75
HB15F2T	2 Ele. Mono Band Beams for 15 Meter Band	57.21	2.75
HB15F3T	3 Ele. Mono Band Beams for 15 Meter Band	88.49	2.75
HB34D	4 Ele. Tri Band Beams for 10/15/20 Meter Band	202.69	5.87
HB23SP	2 Ele. Tri Band Beams for 10/15/20 Meter Band	128.80	2.60
HB33SP	3 Ele. Tri Band Beams for 10/15/20 Meter Bands	189.23	4.60
MV3BH	Vertical Antenna for 10/15/20 Meter Band	40.25	1.75
MV4BH	Vertical Antenna for 10/15/20/40 Meter Band	49.50	1.75
MV5BH	Vertical Antenna for 10/15/20/40/80 Meter Band	71.25	1.75
MLA4	Loop Antenna for 10/15/40/80 Meter Band	105.60	2.10

- Full range of VHF/UHF Beams now in stock — an S.A.E. for full details please

YOUR LOCAL TET STOCKISTS

Amateur Radio Exchange, 373 Uxbridge Road, Acton, London W3

Amcomm Services, 194A Northolt Road, South Harrow, Middlesex

Bredhurst Electronics, High Street, Handcross, Haywards Heath, West Sussex RH17 6BW

Stephens James Ltd., 47 Warrington Road, Leigh, Lancs. WN7 3EA

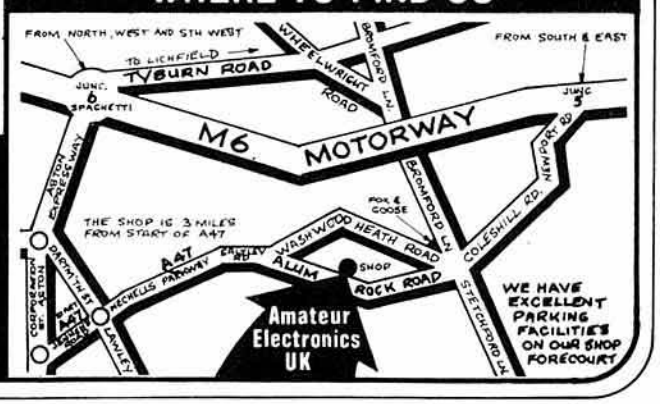
Uppington Tele Radio, 12-14 Pennywell Road, Bristol BS5 0JT

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 66189
North East – North East Amateur Radio, Darlington 0325 55969
Shropshire – Syd Poole G3IMP, Newport, Salop 0952 814275

Amateur Electronics UK
504-516 Alum Rock Road · Birmingham 8
Telephone: 021-327 1497 or 021-327 6313
Telex: 334312 PERLEC G
Opening hours: 9.30 to 5.30 Tues. to Sat. continuous – CLOSED all day Monday.

WHERE TO FIND US



AMATEUR RADIO EXCHANGE

Brenda G8SXY and Bernie G4AOG invite you to see them on their Stand at Leicester for the warmest welcome, the widest range, the best deals... and if you can't get to the Granby Halls, phone or write for our helpful and efficient Mail Order service.

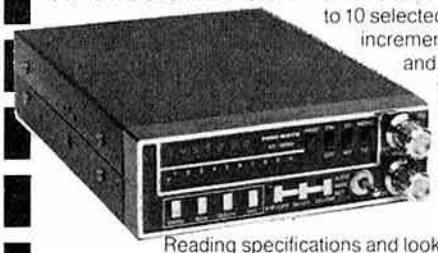
First, our scanning receivers, and to lead off, the **MAXIMAL MK-4000** (right) with FM coverage of 70-87.9875MHz and 140-175.9875MHz in 12.5kc steps on both bands. Sensitivity is 0.5µv S/N 20dB, and selectivity ±15KHz at –50dB, and its AF output is more than 1.3W. All that, plus a built-in digital clock, for just **£99.00.**

Next, two really first-class digital-readout scanning receivers, the **CORONA CD-3000** and **CD-4000** (pictured). Their identical format presentation conceals totally different specifications as follows.

CD-3000 Professional-standard air-band receiver covering 110-139.995MHz on AM in 5kc steps. With sensitivity of 0.5µv S/N 10dB, this is tremendous value at **£99.00.**

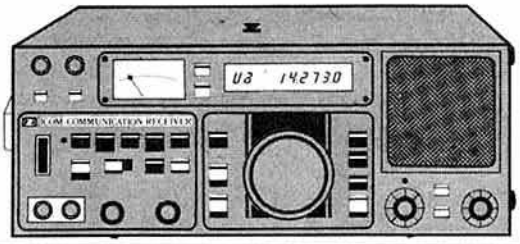
CD-4000 (left) For full coverage of public services, amateur and marine bands between 140 and 159.995MHz on FM at a price of only **£69.00.**

Finally, the **FAIRMATE AS-10960** (below), which covers VHF from 140 to 175.995MHz and UHF from 275 to 410MHz and is programmable to 10 selected frequencies in 5kc increments. Also featuring memory and priority channels, it is tremendous value at **£95.00.**



Reading specifications and looking at pictures are all very well, but the best way to appreciate the quality of these exclusive imports is to come and hear them if at all possible... and that way you'll get a cup of Brenda's coffee too while you're making up your mind which one (ones?) to buy!

Another item seen on our trip to Japan... the new ICOM general coverage receiver. Having tried it, we are convinced that this could well become the market leader in its field. With features like these, everyone who wants the best in today's receiver technology will now be asking for ICOM.



ICR-70
- **Tunable from 100kc to 30MHz**
- **AM/SSB/FM right across the range**
- **Pass band tuning • Scan facility**
- **Notch filter • Two VFO's**

Whether you want to buy outright or part-exchange your existing receiver, phone or call in without delay and be one of the first to enjoy a remarkable new experience in general coverage radio reception.

The two new RF amplifiers from ALINCO are undoubtedly the smallest units yet available in the UK measuring just 156mm x 91mm x 28mm, but there is nothing diminutive about their performance.

The **ELH-230** has an input of 3W and output of 30W over the frequency range 144-146MHz with a power consumption of 3.5 amps. **Price £39.00.**

The **ELH-710** covers 430-440MHz and has rated input of 1W/3W with output figures of 3W/10W. **Excellent value at £59.00.**

Not shown is the **EMR-400** Rotator, but performance figures like these need no picture... Rotation torque 550kg/cm (475ft/lbs) minimum. Stationary braking torque 1,500kg/cm (1,300ft/lbs) minimum. Vertical load 200kg (440lbs). Wind load area 0.5–0.8m (5.4–8.6ft) with stay bearing. Weight 5kg (11lbs). **Marvellous value at only £69.00.**

The regular-format **JUMBO HP-30** linear amplifier covers 144-148MHz with input power of 3W and output power of 30W. RF pre-amp 18dB gain. **Price £59.00.**

All prices include VAT and are correct as we go to press. However, we reserve the right to vary them if forced to do so by the time this advertisement appears.

MORE OVER PAGE!

AMATEUR RADIO EXCHANGE

FT-790

Yaesu's popular 2m Portable format now available for 70cm as well, with full 10MHz coverage, all-mode FM/CW/USB/LSB, 25/50kc steps, 1.6MHz shift for repeater operation, toneburst, etc.

£295

FT-102

Yaesu's latest HF transceiver...a worthy successor to the evergreen FT-101 series, with so many extra features.

- Notch filter • Three 6146B final tubes • IF shift control
- Bandwidth control from 2.7kHz to 500Hz • APF control
- RF processing • Tunable audio network for speech tailoring
- SSB/CW/AM/FM

PHONE FOR FULL DETAILS OF THE TRANSCEIVER ITSELF AND OF THE RANGE OF MATCHING ACCESSORIES. £699

IC-720A

Introduced a year ago, this superb HF rig from ICOM has become a firm favourite because of its remarkable general coverage receive capability from 100kc to 30MHz, plus transmit facility across its entire range for commercial purposes.

OUR PRICE £795

IC-740

The latest addition to the ICOM transceiver range, this gives all-mode coverage – AM/CW/SSB/FM – right across the amateur bands from 1.8 to 30MHz. Incorporating such features as IF shift, pass-band tuning and notch-filter as standard, this is one rig that has to be seen and tried by anyone in the market for a really top-quality base station.

PHONE FOR LATEST PRICE

Ever wanted to decipher all those funny morse code (CW) and radio teletype (RTTY) noises you hear on your communications receiver? Well, now you can – with the new TASCO Codemaster CWR-600.

Simply connect the input side of the Codemaster to your receiver or transceiver, and the output either to a domestic TV (UHF) or to a proper VDU which we can also supply. RTTY and CW will be automatically demodulated and displayed on the screen, CW at speeds of up to 250 characters per minute, RTTY between 45.5 and 110 Bauds.

£189

LICENSED CREDIT BROKERS ✻ Ask for written quotation on HP terms. Also interest-free terms with 50% deposit.

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CREDIT CARD SALES BY TELEPHONE.

YAESU

FT 102	160-10M 9-Band Transceiver	NEW	699.00
FT ONE	Gen. Coverage Transceiver	NEW	1295.00
FT 790R	70cm all-mode portable	NEW	295.00
FT 101ZFM	160-10m 9-Band Transceiver		590.00
FT 101ZDFM	160-10m 9-Band Transceiver		P.O.A.
DIGT 1012	Digital unit		90.00
DCT 101Z	DC Adaptor		42.50
FV 101Z	Remote vfo		112.00
FT902DM	9-Band AM/FM Transceiver		885.00
FC 902	9-Band atu, swr/pwr etc		135.00
FTV 901R	Transverter fitted 2m module		285.00
430 TV	70cm module for above		185.00
144 TV	2m module for Transverter		100.00
70 TV	4m module for Transverter		80.00
FV 901DM	Remote vfo for 901		260.00
SP 901	External speaker		31.00
FL 2100Z	9-Band 1200W linear		425.00
FT 107	9-Band 100W solid state		699.00
FT 107DMS	As above with memory		779.00
DMST 107	Memory unit		92.75
FV 107G	Remote VFO for above		98.50
SP 107G	External speaker		29.00
FC 107G	Aerial tuning unit		112.70
FP 107	230V AC power module		101.95
FP 107EG	Cased PSU with speaker		113.00
FT 707	8-Band solid state 100W		545.00
FP 707	230 volts AC power supply		125.00
FC 707	Aerial tuner (unbalanced only)		85.00
MR7	Metal rack for above		15.70
MMB 2	Mobile mounting bracket		16.00
FRG 7	0.5-30MHz receiver		199.00
FRG 7700	SSB/AM /FM recvr. dig. readout		299.00
MEM 7700	Memory unit for above		90.00

CONVERTERS FOR ABOVE

FRV 7700A	118-150MHz	69.75
FRV7700B	50-60MHz & 118-150MHz	75.50
FRV 7700C	140-170MHz	65.95
FRV 7700D	70-80MHz & 118-150MHz	72.45

FRT 7700	Receiver aerial tuner	37.85
FF 5	LF filter for above	9.95
FT 480R	2m all-mode transceiver	365.00
FP 80A	230V AC power supply	63.00
FT 780R	70cm all-mode transceiver	449.00
FT 290R	**SPECIAL** 2m all-mode portable with ARE mods	249.00
NC 11C	AC charger	8.00
CSC-1	Carrying case	3.45
MMB-11	Mobile mounting bracket	22.25
FT 208R	2m synthesized portable FM	199.00
NC 9C	AC charger	8.00
FT 708R	70cm hand-held	209.00

TRIO-KENWOOD

TS 930	Gen. coverage transceiver	NEW	999.00
TS 830S	160-10m transceiver 9 bands		650.00
AT 230	All-band ATU power meter		110.00
YK 88C	500Hz CW filter		29.60
YK 88CN	270Hz CW filter		32.60
TS 530S	160-10m trans 200w pep digital		475.00
TS 130S	8-band 200W pep		499.00
TS 130V	8-band 20W pep		445.00
AT 130	100W antenna tuner		79.00
TR 2300	2m FM synthesised portable		166.75
TR 2500	2m FM synthesised handheld		207.00
HC 10	Digital desk World Clock		58.75
DM 801	Dip meter		60.00
TR 7730	New 25W FM transceiver		247.00
R 600	Gen. coverage receiver		199.00

ICOM

IC 740	Multimode H.F. transceiver	NEW	P.O.A.
IC 720A	HF transceiver and gen. cov. rec.		P.O.A.
IC 730	HF mobile transceiver 8-band		586.00
ICR 70	New multimode receiver		795.00
PS 15	Power supply for 720A		99.00
IC 251E	2m multimode base station		499.00
IC 25E	2m synth compact 25W mobile		259.00
IC 290E	2m multimode mobile		366.00
IC 24G	2m FM mobile 10w		169.00
IC 2E	2m FM synthesised handheld		159.00
IC 4E	70cm handheld		199.00
ICL1/2/3	Soft cases		3.50
IC HM9	Speaker/microphone		12.00
IC CP1	Car charging lead		3.20
IC BP2	6V Nicad pack for IC 2E		22.00
IC BP3	9V Nicad pack for IC 2E		17.70
IC BP4	Empty case for 6 X AA Nicads		5.80
IC BPS	11.5V Nicad pack for IC 2E		30.50
IC DC1	12V adaptor pack for IC 2E		8.40

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 4000KB	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

MORSE EQUIPMENT

MK 704	Squeeze paddle	10.50
HK 707	Up/Down key	10.50
EK 150	Electronic keyer	74.00

MOBILE SAFETY MICROPHONES

ADONIS AM 202S Clip on	20.95
ADONIS AM202F Swan neck + up/dwn bttns	30.00
ADONIS AM202H Head band + up dwn bttns	30.95

DRAE

FULLY PROTECTED POWER SUPPLIES

4 amp	27.95	6 amp	44.95
12 amp	69.00	24 amp	99.00
VHF Wavemeter	130 450MHz		24.95
Morse Tutor			47.00

DATONG

PC1	Gen. Cov. Converter HF on 2m	137.42
VLF	Very Low Frequency Converter	29.90
FL1	Frequency Agile Converter	79.35
FL 2	Multi-mode Audio Filter	89.70
FL 3	FL 2 with auto notch NEW	129.37
ASP	Auto R.F. Speech Clipper (Trio or Yaesu plug)	82.90/89.70
D 75	Manually controlled R.F. Speech clipper	56.35
RFC/M	R.F. Speech Clipper Module	29.90
D 70	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 system (two units)	45.99
RFA	Wideband preamplifier	33.92
MPU	Mains Power Unit	6.90

BENCHER

BY 1	Keyer Paddle (black base)	32.00
BY 2	Keyer Paddle (chrome base)	39.95
BY 3	Keyer Paddle (gold plated)	92.00
ZA 1A	Balun 3-5-30mHz for dipoles	12.65
ZA 2A	Balun 14-30MHz for beam ant	13.80

TONO

THETA 9000E	RTTY/CWASC11	650.00
THETA 7000E	RTTY/CW/ASC11 Receive only	550.00
THETA 350	As above, basic unit	259.00
THETA 550	The latest – a winner!	299.00

AMPLIFIERS

UC 70	430MHz 55W + preamp	149.00
2M-50W	144MHz 30-50W	65.00
2M-100W	144MHz 100W + preamp	115.00
MR 150W	144mHz 130-150W + preamp	159.00
MR 250W	144MHz 250W + preamp	259.00

ROTATORS

KR 250	Kenpro Lightweight 1-1½" mast	44.95
9502B	Colorotor (Med. VHF)	55.00
KR 400RC	Kenpro – inc. lower clamps	99.95
KR 600RC	Kenpro – inc. lower clamps	139.95

TASCO

TeleReader CWR 685 RTTY/CW/ASC11	699.00
TeleReader CWR 670E As above RX only	259.00
MorseMaster CWR 600 As above basic unit	189.00

WELZ

SP 200	1-8-160MHz 20W-200W-1KW		59.00
SP 300	1-8-500MHz 20W-200W-1KW		79.00
SP 400	130-500MHz 5W-20W-150W		59.00
SP15M	1-8-150MHz 0-2-5-20-200W		29.00
SP 380	.1-8-500MHz 20W-200W	NEW	49.00
AC 38M	8 band ATU 400W		59.95
CT-15A	DC-450MHz dummy load		6.95
CT-15N	As above N-type socket		11.75
CH 20A	DC-450MHz coax switch SO239		15.95
CH 20N	As above – N type sockets		23.95

373 UXBRIDGE ROAD, ACTON, LONDON W3 9RH
Tel: 01-992 5765/6/7 *Just 500 yards east of Ealing Common station on the District and Piccadilly Lines, and 207 bus stops outside*

136 GLADSTONE STREET, ST HELENS, MERSEYSIDE
Tel: 0744 53157 *Our North West branch run by Mike (G4NAR) just around the corner from the Rugby Ground*

Closed Wednesday at Acton and Monday at St Helens, but use our 24-hour Ansafone service at either shop

SMC SERVICE

Free Finance on most substantial items. Importer guarantee on Yaesu Musen. Free Securicor on major Yaesu items. Access, Barclaycard over the 'phone. Biggest branch/agent/dealer network. Ably staffed and equipped service dept. Securicor 'B Service' contract at £4.49. Biggest stockist of amateur equipment. 24 years of communications experience.

FREE FINANCE

On *regular* priced items from: Yaesu, Ascot SMCHS, CDE, HyGain, Channel Master, Hansen, SMC, MFJ, KLM, Mirage and Hi-Mound, on invoices over £100 SMC offers Free Finance! How is it done? Simple, pay 20%, split the balance equally over 6 months or pay 50% down and split the balance over a year.

You pay no more than the cash price!!

GUARANTEE

Yaesu's *own* warranty does not extend outside Japan. Repairs are the responsibility of the UK retailer. SMC's guarantee is backed, as UK distributors, by daily contact with the factory and many tens of thousands of pounds of spares and test equipment. Avoid hawkers offering sets without serial numbers, spares, service or advice back-up.

NEW SHOWROOM

Our superb new showrooms located within our new administrative headquarters in Rumbridge Street (abuts the Osborne Road Stores/Service/Manufacturing complex) is now open *six* days a week *9 till 5.30*.

Six "Yaesu line up length" demonstration benches provide *you* with full "on the air" and "side by side" evaluation facilities. Check on a FT102, FT ONE or FT23OR TODAY.

SUPER SELECTION

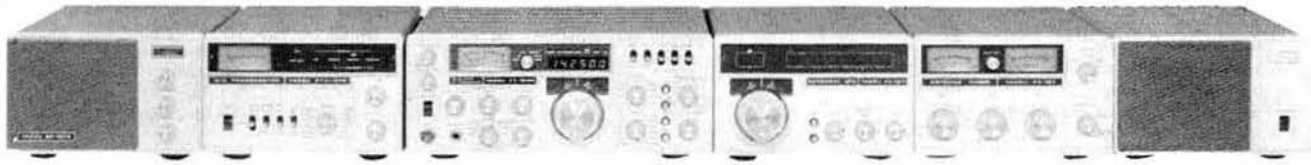
In our catalogue you will find the widest selection anywhere: 200 stock lines of Yaesu, 600 different antennas, masts, rotators, coaxes, plus 300 items of communications equipment.

If that is not enough to tempt you into our showrooms we are delighted to announce: substantial price reductions on the FT107 and accessories, added value on the FT902 and a super sale.

SUPER SALE!

Bearcat 220	Scanner	£195
MMT432/28	70cm Transverter	£119
260/145	⅝ λ c/w gutter clip	£10
FT227RB	Synth 2m Mic tune	£175
FT227RXS	Synth 2m Scanner	£195
CPU2500RKS	Synth 2m Keyboard	£205
CPU2500RK	Synth 2m 25W	£210
CPU2500RKSt	Synth 2m stepper	£220
ME521	Digital Multi metre	£39
MD35FS	Foot switch	£5

All prices include VAT and carriage



FT107M

SUPER RADIO—SUPER PRICES!

If you have a yen for an all solid state HF transceiver with a "broad band" output that will deliver 75 per cent of maximum power into a 3:1 load, then look no further than this incredible value Yaesu. The FT107M covers 160-10M (all nine bands) and is fully equipped with: variable IF bandwidth, audio peak/notch filter, RF speech processor, variable threshold noise blanker, full metering—including SWR, and boasts a Schottky diode ring mixer for excellent receiver dynamic range. The optional memory system provides 12 stored channels (with fine tuning), scanning from the optional microphone and the exclusive DMS—digital memory shift. This system using a photo interrupter (with fine tuning) to control the 100Hz synthesizer to provide any offset—up to 500kHz!—from the memory channel. A full list of accessories is available to complement the FT107M. Illustrated above (from left to right): the SP10107P speaker/phone patch (normal speaker SP107 available); the FTV107R two band transverter (two from 432, 145 or 70 or 50MHz); the FT107, itself, the FV107 remote VFO (with 5 crystal channels); the FC107 antenna coupler with twin VSWR/power meters, and the FP107E AC psu with speaker. Buy a FT107 and you can choose your accessories from the "Line up" prices.

If sight of the full line up:
(FT + FP + DMS + FV + FTV + 144TV + SP—List £1,267.30) is too much to stand, its yours for £999!!!

	FT107M	FP107	FP107E	DMS	FV107	FTV107	SP107P	SP107
LIST	£725	£101.95	£113.10	£92.75	£98.50	£119.20	£57.50	£29.90
SALE	£599	£90	£100	£90	£80	£110	£55	£29
LINE-UP		£79	£89	£79	£59	£99	£49	£25

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Grimsby, Lincolnshire.
Grimsby (0472) 59388
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S.M.C. (Stoke)
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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
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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) 549583
9.30-5.30 (Lunch 1.30) Tue-Sat

SMC AGENTS

Edinburgh	Jack	GM8GEC	(031-657 2430 Day (031-665 2420 Eve	Bangor	John	GI3KDR	(0247) 55162	Neath	John	GW4FOI	(10639) 55114 Day (10639) 2942 Eve
Stourbridge	Brian	G3ZUL	(03843) 5917	Tandragee	Mervyn	GI3WWY	(0762) 840656	Jersey	Geoff	GJ4ICD	(0534) 26788

FT ONE £1,295 inc. VAT @ 15% & SECURICOR

*Option

FREE FINANCE

★ Rx: 150KHz-30MHz. Continuous general coverage.
★ Tx: 160-10m (9 bands) or 1.5-30MHz commercial.
★ All Modes: AM, CW, FM*, FSK, LSB, USB.
★ 10 VFO's!!! Any Tx-Rx split within coverage.
★ Two frequency selection ways, *no* bandswitch.
★ Main dial, velvet smooth, 10Hz resolution.
★ Inbuilt keyboard with up/down scanning.
★ Dedicated digital display for RIT offset.
★ Receiver dynamic range up to 100dB!!!
★ SSB: Variable bandwidth *and* IF shift.
★ 300* or 600Hz*, 2.400 → 300Hz, 6kHz*, 12kHz*.
★ Audio peak and notch filter. FM squelch.
★ Advanced variable threshold noise blanker.
★ 100W RF, key down capability, solid state.
★ Mains and 12VDC. Switch mode PSU built in.
★ RF processor. Auto mic gain control. VOX.
★ Last but not least *full* break in on CW.

FT902DM £885 inc. VAT @ 15% & SECURICOR

SPECIAL OFFER
NOW WITH CW FILTER, AM FILTER, CURTIS KEYER AT NO EXTRA!

★ 160-10 metres including new allocations.
★ Variable IF bandwidth 2.4kHz down to 300Hz.
★ Audio Peak and independent notch controls.
★ AM, FSK, USB, LSB, CW, FM, (Tx and Rx).
★ Semi-break in, inbuilt Curtis IC Keyer option.
★ Digital plus analogue frequency displays.
★ VOX built-in and adjustable.
★ Instant write in memory channel.
★ Tune up button (10 sec, of full power).
★ Switchable AGC and RF attenuator.
★ Optional 350 or 600Hz CW, 6kHz, AM filters.
★ Clarifier (RIT) switchable on Tx, Rx or both.
★ Plug in modular, computer style constructor.
★ Fully adjustable RF Speech processor.
★ Ergonomically designed with necessary LEDS.
★ Incredible range of matching accessories.
★ Universal power supply 110-234V AC and 12V DC.

*Option ** D & DE Models

FT102 £725 inc. VAT @ 15% & SECURICOR

"INSTANT" H.P.

★ 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

FT101ZD £635 inc. VAT @ 15% & SECURICOR

★ 160-10 metres including new allocations.
★ Variable IF bandwidth 2.4kHz down to 300Hz.
★ Selectable CW fixed bandwidth CW-W and CW-N*.
★ Semi-break in with sidetone for excellent CW.
★ Digital plus analogue frequency displays.
★ 180W PIP and—31dB 3rd order intermod.
★ RF speech processor fitted—adjustable level.
★ VOX built-in and is adjustable from the front panel.
★ Wide dynamic range for big signal handling.
★ High usable sensitivity, for those weak ones.
★ Superb noise blanker—adjustable threshold.
★ Attenuator; 0-10-20dB, AGC; slow-fast-off.
★ Clarifier (RIT) switchable on Tx, Rx or both.
★ Low level transvertor drive output facility.
★ Universal power supply 100-234V AC and 12V DC*
★ Incredible range of matching accessories.
★ 6 models: Digital/Analogue—AM/FM options.

FREE SECURICOR

*Option

FT707 £569 inc. VAT @ 15% & SECURICOR

SMC FM MODIFIED VERSION AVAILABLE

PLASTIC BY 'PHONE

★ 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

WIDE COVERAGE ALL MODE RX; FRG7700 £329 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!

- ★ 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.

FT207R: SALE £159 inc. VAT at 15% and postage

LOW PRICE

- ★ 144-146MHz (144-148 possible)
- ★ 12.5kHz synthesizer steps
- ★ Keyboard entry of frequencies
- ★ Keyboard lockout safety features
- ★ Digital display to hundreds of Hz
- ★ Display auto shutdown timer
- ★ Four Channels of memory
- ★ Memory back up, disable switch
- ★ Up/down manual tuning

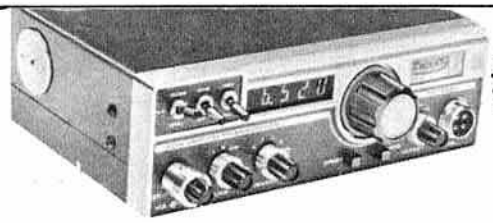
- ★ Bandscan for busy or clear channels
- ★ Memory scanning features
- ★ + 600kHz split built in
- ★ Any split + or − programmable
- ★ BNC antenna connector
- ★ "On Air" and "Channel Busy" LEDs
- ★ Built in condenser microphone
- ★ 200mW AF to internal/external speaker
- ★ 2.5/0.2W of RF output
- ★ Rx; 35mA squelch, 150mA full vol.
- ★ Tx; 250mA low, 800mA high
- ★ 0.3μV for 20dB quieting
- ★ External speaker/mic available
- ★ 1.7 (2.2)" D × 2.5 (2.7)" W × 6.7 (7.2)" H
- ★ c/w Easy change NiCad pack, case, helical

FT230R £239 inc. VAT 15% & Securicor

- ★ 144-146 MHz (144-148 possible)
- ★ 25 watts RF output (Low 2.5W)
- ★ 150 (W) × 50 (H) × 176 (D) mm. 1·3Kg
- ★ Selectable 12½ or 25 KHz steps
- ★ Up/down, memory/band scanning
- ★ Ten Memories with priority function
- ★ Easy write in memory channels
- ★ Large illuminated "any angle" LCD display
- ★ Display to 100's of Hz and special functions
- ★ Two independent VFO's
- ★ Operation between memory and 'other' VFO
- ★ Memory backup "5 year" lithium cell
- ★ ± 600 KHz and simplex
- ★ Manual and automatic tone burst
- ★ Large "full sound" speaker
- ★ Concentric volume/squelch controls

YAESU

NRD515 COMMUNICATIONS RX £995 inc
100 kHz—30 MHz, Digital, Electronic tune,
100 Hz VFO, SSB/AM/CW RTTY



£20 OFF

2m, 25W, FM, £179 inc. VAT @ 15% + SECURICOR
2025 MARK II Full coverage 2M Transceiver, 12½kHz (set 12½-200kHz), rapid tune, 10 "easy write" memory channels, memory or band-scan between programmable limits, auto scan stop dependent on squelch *and* centre zero.

KP202 c/w KCP2 £100 INC!

6 chnl, 2W, 144 MHz Handheld c/w charger Telescopic ant S20, S21 etc

SAVE £24!

PA15/160 £175
2 m linear. 10 W➔ 160 W. over temp. RF and hard wire switch etc...

GIFT

YC221 £8[illegible]35.00
D[illegible]ut for FT221 (R)
SOLD OUT

£50 OFF

2m, 250W(+) PEP. £449
NAG 144XL LINEAR. 4CX350F tube, 10W nom. drive, switchable pre-amp. RF and hard switching. Thermal delay.

'790 EX-STOCK

- 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

SMC2.2C	NiCad 2.2 A/hr, "C"	£2.70
SMC8C	Slow Charger (220mA)	£8.80
MMB 11	Mobile Mount	£22.25
CSC1	Soft carrying case	£3.45
FL2010	Linear Amplifier 2m 10W	£64.40
FL7010	Linear Amplifier 70cms	£99.65

2 or 70!

FT290R £249 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)

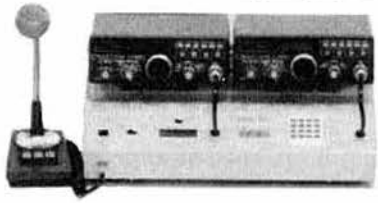
FT790R £299 inc

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

2 or 70!

- 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", Cᵣ, Hi/Low, FM mod.
- Size (Case): 8.3" D, 2.3" H, 6.9" W



illustrated with SC1 station consol & YD148 mic

FT480R (2m) £379 inc.

VAT @ 15% & SECURICOR

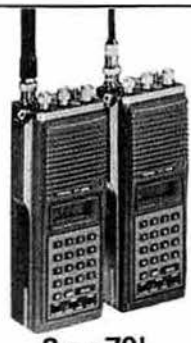
- 144-146MHz (143.5-148.5 possible)
- ±600kHz standard repeater split
- Excellent dynamic range and sensitivity
- FM; 25, 12½, 1kHz steps
- SSB; 1,000, 100, 10Hz steps

FT780R (70cm) £449 inc

VAT @ 15% & SECURICOR

- FT780R1·6 fitted 1·6MHz Shift **£459** inc.
- 430-434MHz (440-445) possible
- GaAs Fet RF for incredible sensitivity
- FM; 100kHz, 25kHz, 1kHz, steps
- SSB; 1,000, 100, 10Hz steps

- 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 £209 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

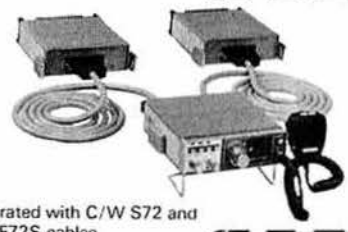
FT708R £219 inc

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 C/W S72 and two E72S cables

FT720RV £245 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

FT720RU £265 inc.

VAT @ 15% & SECURICOR

- 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

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.

BARCLAYCARD VISA

GRIMSBY
S.M.C (Humberside)
247A Freeman Street,
Grimsby, Lincolnshire.
Grimsby (0472) 59388
9.30-5.30 Tue-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) 549583
9.30-5.30 (Lunch 1.30) Tue-Sat

SMC AGENTS

Edinburgh	Jack	GM8GEC	031-657 2430 Day / 031-665 2420 Eve	Bangor	John	GI3KDR	(0247) 55162
Stourbridge	Brian	G3ZUL	(03843) 5917	Tandragee	Mervyn	GI3WWY	(0762) 840656
Neath	John	GW4FOI	(0639) 55114 Day / (0639) 2942 Eve				
Jersey	Geoff	GJ4ICD	(0534) 26788				

hy-gain

The TH7DXX is a new 7 element (10-15-20M) broadband VSWR less than 2:1 at band edges! Compact 20' (16·1M) 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**	£2.20
14AVQ/WB	Vertical 10-40m inc.	**£64.40**	£2.20
18AVT/WB	Vertical 10-80m inc.	**£109.25**	£2.20
14RMQ	Roof mounting Kit	**£36.22**	£2.20
18V	Vertical 10-80m inc.	**£29.78**	£2.20
103BA	3 Ele Yagi 10m	**£67.85**	£2.20
105BA	3 Ele Yagi 10m	**£143.75**	£3.95
153BA	3 Ele Yagi 15m	**£90.85**	£2.20
155BA	5 Ele Yagi 15m	**£217.35**	£5.90
203BA	3 Ele Yagi 20m	**£166.75**	£4.90
204BA	4 Ele Yagi 20m	**£286.35**	£7.30
205BA	5 Ele Yagi 20m	**£362.25**	£9.40
402BA	2 Ele Yagi 40m	**£247.25**	£6.50
DB10/15A	3 Ele Yagi 10-15m	**£146.05**	£4.80
TH3JNR	3 Ele Yagi 10-15-20m	**£194.35**	£3.10
TH2MK3	2 Ele Yagi 10-15-20m	**£169.05**	£3.20
TH3MK3	3 Ele Yagi 10-15-20m	**£274.85**	£5.30
TH5DXX	"Thunderbird" 5 el.	**£378.35**	£6.70
TH7DXX	"Thunderbird" 7 el.	**£458.85**	£8.75
HYQUAD	2'Ele Quad 10-15-20m	**£332.35**	£6.00
18TD	Dipole Tape 10-80m	**£113.85**	£2.80
BN86	Balun 1:1·3 30MHz	**£15.53**	£1.40
LA1	Lightning Arrestor	**£48.19**	£0.92

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

UHF SMC PLUGS

UHF PLUGS			
PL259	Standard type 11·2mm	**£0.55**	£0.50
PL259P	Push on type 11·2mm	**£0.79**	£0.50
UG175	Reducer 5·0mm	**£0.14**	£0.50
UG176	Reducer 5·6mm	**£0.14**	£0.50
PL259R	Reduced type 5·0mm	**£0.67**	£0.50
PL259A	De-luxe type 11·2mm	**£1.50**	£0.50
PL259B	De-luxe type 5·0mm	**£1.13**	£0.50
PL259SL	'Solderless' 11·2mm	**£0.63**	£0.50
PL259SS	'Solderless' 5·0mm	**£0.63**	£0.50
PL259E	Angle type 5·0mm	**£0.95**	£0.50
PL259M	Metric type standard	**£0.75**	£0.50
PL259PM	Pabel mount 4 hole	**£1.07**	£0.50
UHF SOCKETS			
S0239F	Standard 4 hole fix	**£0.48**	£0.50
S0239F31000	4 hole PTFE Au plate	**£0.97**	£0.50
S0239T	2 hole fixing type	**£0.48**	£0.50
S0239NI	Nut fixing inside type	**£0.59**	£0.50
S0239NO	Nut fixing outside type	**£0.59**	£0.50
S0239E	Free angle type 5·0mm	**£1.01**	£0.50
	Free cable end 5·0mm	**£2.22**	£0.50
MX913/C	Dust Cap c/w chain	**£0.46**	£0.50
MX913/M	Dust Cap metric type	**£0.46**	£0.50
UHF COUPLERS			
PL258	Back to back female	**£0.91**	£0.50
PL274	Back to back chassis	**£1.07**	£0.50
SMCPL/PL	Back to back male	**£1.38**	£0.50
M359	Elbow male - female	**£1.07**	£0.50
M358	'T' 2 female 1 male	**£1.38**	£0.50
M358AF	'T' 3 female	**£1.70**	£0.50
M458	'X' 3 female 1 male	**£2.13**	£0.50
UHF INTERSERIES ADAPTORS			
UG255	UHF socket - BNC plug	**£1.76**	£0.50
UG273	UHF plug - BNC socket	**£1.76**	£0.50
SO/25	UHF socket - 2·5mm jack	**T.O.S.**	
SO/35	UHF socket - 3·5mm jack	**£0.79**	£0.50
SO/NF	UHF socket - N socket	**£1.96**	£0.50
UG146	UHF socket - N plug	**£2.25**	£0.50
UG83	UHF plug - N socket	**£1.96**	£0.50
UHF CABLES			
PL36PL	3·0' RG58 PL259 ends	**£1.85**	£0.50

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

J-BEAM

FOUR METRES			
4Y/4M	Yagi, 4 element	7·0dB	**£22.43** £1.73
PMH2/4M	Harness, 2 way		**£13.23** £1.44
TWO METRES			
HO 2M	Halo, head only	3·0dB	**£5.17** £0.63
HM 2M	Halo, 24in mast	3·0dB	**£5.75** £0.75
UGP 2M	Ground Plane	0·0dB	**£10.92** £1.73
C5 2M	Colinear omnivert	4·8dB	**£47.72** £1.73
5Y 2M	Yagi 5 element	7·8dB	**£12.07** £0.58
8Y 2M	Yagi 8 element	9·5dB	**£15.52** £1.73
10Y/2M	Long Yagi, 10 element	11·4dB	**£33.35** £1.73
14Y/2M	Long Yagi, 14 element	13·0dB	**£36.23** £1.73
D5/2M	Yagi, 5 over 5 slot	10·6dB	**£21.85** £1.73
D8 2M	Yagi, 8 over 8 slot	12·3dB	**£29.32** £1.73
PBM10/2M	10 element parabeam	12·4dB	**£39.67** £1.73
PBM14/2M	14 element parabeam	13·7dB	**£48.00** £1.73
Q4 2M	Quad, 4 element	10·0dB	**£25.87** £1.73
Q6 2M	Quad, 6 element	12·0dB	**£33.92** £1.73
5XY/2M	Yagi, 5 element cross	7·8dB	**£24.72** £1.73
8XY/2M	Yagi, 8 element cross	9·5dB	**£31.05** £1.73
10XY/2M	Yagi, 10 element cross	11·3dB	**£40.82** £1.73
PMH2 C	Harness, Cir. Polar		**£8.05** £0.52
PMH2 2M	Harness, 2 way		**£10.92** £0.86
PMH2 2ML	Harness, 2 way long		**£11.92** £1.15
PMH4 2M	Harness, 4 way		**£25.30** £1.73
SEVENTY CMS			
C8/70	Colinear vert.	7·8dB	**£54.05** £1.73
D8/70	Yagi, 8 over 8 slot	12·3dB	**£22.43** £1.73
PBM18/70	Parabeam 18 element	14·9dB	**£27.60** £1.73
PBM24/70	Parabeam 24 element	15·1dB	**£36.80** £1.73
MBM28/70	Multibeam, 28 element	12·5dB	**£18.40** £1.73
MBM48/70	Multibeam, 48 element	15·7dB	**£31.05** £1.73
MBM88/70	Multibeam, 88 element	18·5dB	**£42.55** £1.73
8XY/70	Yagi, 8 element cross	10·0dB	**£36.80** £1.73
12XY/70	Yagi, 12 element cross	13·0dB	**£46.00** £1.73
PMH2/70	Harness 2 way		**£9.20** £0.75
PMH4/70	Harness 4 way		**£19.55** £1.44
TWENTY THREE CMS			
D15/23	15 over 15 slot	15·0dB	**£36.80** £1.73
CR/23	Corner reflector	14·8dB	**£35.08** £1.73
PMH2/23	Harness 2 way		**£27.60** £1.73

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

Kenpro

KR600RC
£132.25

360° round type meter Max. load 200kg. Rot, 600kg/cm, brake 4,000kg/m. 1¼in-2¾in masts Lower casting optional.

KR400RC
£90.85

360° round type meter Max. load 200kg. Rot, 400kg/cm, brake 1,500kg/cm 1¼in-2¾in masts Lower casting optional.

KR500
£86.25

Elevation Rotator (180°) Up to 50kg of Load. 1¼in-2¼in mast. 1¾in-1⅝in boom

KR250
£44.85

Twist and switch controller. Rotator 200kg/cm. Brake 600kg. 1in-1¼in masts.

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

Channel Master

9508
£74.75

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
£54.63

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

Takes 1-2" mast and 1-1⅞" stub.

Upper mast support bearing.

2" mast and 1¾" stub.

Post and packing **£1.20**
9523 **£14.38**

Rotary bearing 3-way guying.

Takes 1²⁹⁄₃₂" mast.

Post and packing. **85p**
9525 **£14.38**

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

CDE

AR40
£65.55

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

CD45
£113.85

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

HAM IV
£189.75

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

T2X
£270.25

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

VERSATOWER

TELESCOPIC & TILTOVER RADIO TOWERS 25-120 FT

Below is a photograph of the versatowers chosen for the important approach lights for Manchester Airport. Be sure of quality and reliability by using the original Versatowers achieved through twelve years of continuous development which has produced a range of over 50 models, all of which, being made in England, conform to the current B.S.S., requiring minimum designed wind speeds of 85mph and up to 117mph.

Before purchasing a Tower, we strongly recommend consulting one of our engineers for advice regarding the most suitable combination for an installation. *It would be incorrect to nominate a specific headload as this is dependent upon load distribution, geographical location and siting.*

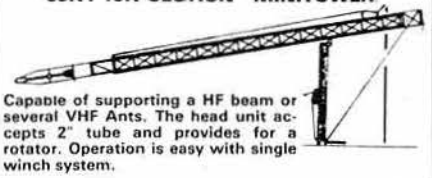
SEND NOW FOR SPECIFICATIONS/PRICES

They cost less than you would expect:

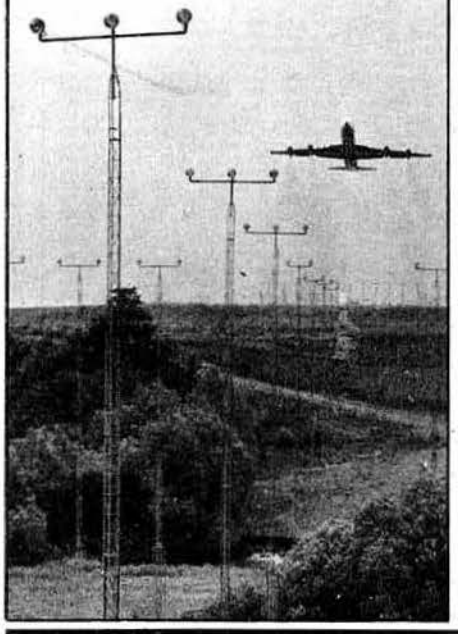
Post mounting 30ft inc. VAT **£388.35**

Post mounting 60ft inc. VAT **£533.83**

'30ft': 10ft SECTION "MINITOWER"



Capable of supporting a HF beam or several VHF Ants. The head unit accepts 2" tube and provides for a rotator. Operation is easy with single winch system.



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. SWR.

FS710; PEP AUTO-SWR RMS LEVEL

FS710 £78.20

FS710H: 1·8-60MHz. 15, 150, 1·5kW
FS710V: 50-150MHz. 15, 150W
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 £60.95

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 £44.85

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 £40.25

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 £35.65

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

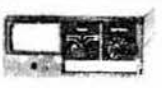
FS711 £32.20

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 £32.20

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 £31.05



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 £23.00

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 £23

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		(½λ)	100W	1·72m	£15.35
17SE	17m		(½λ)	200W	1·92m	£14.20
15SE	15m		(½λ)	130W	1·72m	£13.80
12SE	12m		(½λ)	200W	1·92m	£13.40
10SE	10m		(½λ)	100W	1·72m	£12.65
4E	4m	0dB	¼λ	150W	1·03m	£7.65
2H/PL	2m		(½λ)	50W	0·17m	£3.45
2QW	2m	0dB	¼λ	200W	0·49m	£2.30
2VF	2m	3dB	½λ	50W	1.06m	£10.35
2NE	2m	3dB	½λ	150W	1·30m	£6.90
78SF	2m		(⅝λ)	100W	1·42m	£12.25
78F	2m	4·5dB	⅝λ	100W	1·75m	£12.25
78B	2m	4·5dB	⅝λ	150W	1·72m	£12.65
88F	2m	5·2m	⅝λ	100W	2.03m	£16.50
70N2M	2/70	2·7dB 5·1dB	(½λ) 2 × ½λ	100w	0·89m	£14.20
258	70cm	5·5dB	2 × ½λ	100W	0.91m	£11.50
358	70cm	6·3dB	3 × ½λ	100W	1·36m	£14.95

Model	Description	Price
SOWM	Wing Mount. SO239M upper SO239 under adjustable angle	£3.45
TMCAS	Boot Mount c/w 6 mtrs RG58 and PL259 plug	£7.30
GCCA	Gutter Mount deluxe cast type c/w 4 mtrs cable assemble and PL259	£8.80
SOMM	Mag Mount c/w 4 mtrs RG58 PL259 *For use with smaller antennas only*	£8.45

An alternative mounting for any of the two metre antennas listed above is the BSD stainless steel bumper strap at **£7.75** plus the HS88BK extension tube at **£16.50** 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 **£28.35.**

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 **£13.40.**

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

MAIL ORDER
BY TWO WAY FREEPOST

Send 50p for our bumper bundle literature

All items advertised in stock at time of going to press.

SWR POWER METERS

SWR 25	3.5-150MHz twin meter	12.96
OSKERBLOC 200B	3-200MHz 20/200/2000W	41.00
TET P220	3-30MHz 2000 Watts	56.75
Yaesu YS 200	1.8-150MHz 200 Watts	46.50
Yaesu YS 2000	1.8-60MHz 2000W PEP/RMS	61.80
Reece UH 74	50-542MHz 10 Watts	17.25
Reece T4359	144/435 MHz 100 Watts	32.50
Hansen 601MH	1.8-30MHz PEP/RMS 2000W	44.85
Hansen FS7	144/432 - 200 Watts	35.65

TET ANTENNAS

HB 33SP	3 El Tribander 10/15/20 mts	189.23
MV5BH	Vertical 10/15/20/40/80 mts	71.25
MV3BH	Vertical 10/15/20 mts	40.25
MV4 BH	Vertical 10/15/20/40 mts	49.50
SQ22	Stacked 2 el Swiss Quad 144/-146 MHz 16dB GAIN 20db F/B	55.67
SQY08	6 Element Quagi 2 mts	44.68
SSL 720	Stacked 2 x 9 element Yagi 2 mts	74.65
MLA4	Loop Antenna 80/40/15/10 mts 4 Elements of 1-8 mtrs.	105.60

VAT inclusive. Carriage £4 per item.

MONITOR RECEIVERS

DAIWA VHF - Scan and VFO Control	49.00
AR 22 SYNTHESISED 2 metre Receiver	79.00

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 **£13.99** inc. VAT from AMCOMM.

ROTATORS

Skyking SU 4000	88.50
ART 3000 hd	88.50
KR 400RC	92.50
KR 400 1wr bkt	10.35
Hirschmann 250	45.00
AR 40	65.00
2" KS 065 bearing	16.50
1½" S100 bearing	16.50

MORSE KEYS

HK 707	Straight up/down keyer	10.99
BK 100	Semi-automatic mechanical bug	22.12
MK 702	Up/down keyer on marble base	24.50
MK 702	Manipulator	24.50
MK 705	Squeeze paddle on marble base	21.72
EKM 1A	Morse code practice oscillator	10.50
MK 1024	Automatic memory keyer	135.13
EK 150	Semi/automatic keyer	74.00

DESK MICROPHONES

SHURE 444D Dual Impedance	33.00
SHURE 526T Mk II Power Microphone	46.00
ADONIS AM502 Compression Mic 1 O/P	39.00
ADONIS AM601 Compression Mic + Meter 1 O/P	49.00
ADONIS AM802 Compression Mic + Meter 3 O/P	59.00

NEW

DATONG

FL3	Audio Filter with Auto Notch	129.37
FL2A	Converter PCB to upgrade your FL2 to FL3. Supplied complete with new FL3 Front Panel	39.67
	Complete Datong range available ex stock. Ring for information and price.	

ANTENNAS

Wide range in stock including JAYBEAM - HYGAIN-GOTHAM TELECON-HOKUSHIN ⅛ ETC. ETC.

Bantex ⅝ mobile whip complete antenna	9.99
Bantex ¼ W mobile whip complete antenna	3.99

MOBILE SAFETY MICROPHONES

ADONIS AM 202S Clip-on	20.95
ADONIS AM 202F Swan Neck + Up/Down Buttons	30.00
ADONIS AM 202H Head Band + Up/Down Buttons	30.95

HY-GAIN ANTENNAS

12AVQ	Vertical 10-20m inc.	43.13	1.73
14AVQ/WB	Vertical 10-40m inc.	58.08	1.73
18AVT/WB	Vertical 10-80m inc.	90.85	1.73
14RMQ	Roof mounting Kit	30.48	1.73
18V	Vertical 10-80m inc.	31.97	1.73
18HT	"HY Tower" 10-80m	320.85	12.54
103BA	3 Ele Yagi 10m	60.38	1.73
105BA	3 Ele Yagi 10m	112.70	3.16
153BA	3 Ele Yagi 15m	74.75	2.36
155BA	5 Ele Yagi 15m	135.13	4.77
203BA	3 Ele Yagi 20m	159.85	3.97
204BA	4 Ele Yagi 20m	217.35	5.87
205BA	5 Ele Yagi 20m	281.75	7.59
402BA	2 Ele Yagi 40m	201.25	5.23
DB10/15A	3 Ele Yagi 10-15m	146.05	3.91
TH3JNR	3 Ele Yagi 10-15-20m	159.28	2.47
TH2MK3	2 Ele Yagi 10-15-20m	136.85	2.59
TH3MK3	3 Ele Yagi 10-15-20m	205.85	4.66
TH5DXX	"Thunderbird"-5 Ele	228.85	5.41
TH6DXX	"Thunderbird" 6 Ele	281.75	6.97
HYQUAD	2 Ele Quad 10-15-20m	240.35	4.89
18TD	Dipole Tape 10-80m	80.39	2.30
BN86	Balun 1:1 3.30MHz	15.53	1.15
LA1	Lightning Arrestor	TOS	.75

VAT inc. Carriage shown for mainland only.

ANTENNA PARTS AND KITS

Includes the worlds finest traps - Unadilla, 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) 14MHz (KW20) 21MHz (KW15) and 28MHz (KW10) - **£14.99 + 50p p&p** VAT included.

The BALUN - The Unidilla W2AU is famous because **it's 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 the W2AU Balun - **guaranteed for five years - £14.99 + 50p p&p** VAT included.

THE KITS - AMCOMM 40 - 1 pair KW40 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 - **£37.50** including carriage and VAT.

AMCOMM 20 - 1 pair KW20 Traps, 1 W2AU Balun, 1 PL 259, 1 pair insulators and 65ft soft drawn copper wire - coverage 40 - 10 metres, full instructions included. **£33.50** including carriage and VAT.

AMCOMM 15 - 1 pair KW15 Traps, 1 W2AU Balun, 1 PL 259, 1 pair insulators and 40ft soft drawn copper wire - coverage 20 - 10 metres, full instructions included. **£31.50** including carriage and VAT.

AMTECH

New improved range Made in England

AMTECH 300B - To suit all coaxial and random wire antennas - 160 - 10 metres, 300W PEP. **£44.95** 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 - **£31.95** including VAT and carriage.

AMTECH 100B - Miniature mobile impedance match, ideal for that difficult matching when mobile - rated 180W PEP and has switched positions. **£17.95** including VAT and carriage.

AMTECH FM7 - Transform your FRG 7 or any receiver to FM. Small easily installed PCB with 455KHz/IF. **£13.99** including VAT and carriage.

YAESU RANGE

FT1	General coverage transceiver	POA
FT102	Price on application	
FT101ZFM	160-10m 9 band transceiver	590.00
FT101ZDFM	160-10m 9 band transceiver	645.00
DIGT 101Z	Digital unit for	90.00
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REGIONAL REPRESENTATIVES

Region 1—W. R. Parkinson, G3FNM. Tel 061-973 1472
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Correspondence to RRs and honorary officers should be addressed directly to them (QTHR), not to RSGB HQ.

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Mr E. G. Allen, G3DRN, QSL Bureau manager, 30 Bodnant Gardens, London SW20 0UD

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The national society representing all UK radio amateurs

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 HEADLINE NEWS—Tel 01-837 4118

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 weekly, or more frequently as necessary.

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 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	G8QZ	0930
SW England/Wales	G8ML	G3JFH/G4IEY	1000
Northern Ireland	GI3GAL	GI3SXG	1030
NE England	G5VO	G3MCF	1100
E Scotland	GM4CUZ	GM4FLP	1430
Midlands	G8QZ	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
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	G8ADM	1030
E Sussex coast	G8SC	G3ZFE	1030
Bristol	G4CJZ	G3ZWY/G8NNU	1030
Manchester	G3LEQ	G3JWK	1030
Dumfries	GM3MSG	(Vacancy)	1100
Brighton coast	G3ZYE	G8GEZ	1100
Preston	G8WAT	(Vacancy)	1100
Enniskillen	GI6EZT	GI4CZW	1100
Huntingdon, Cambs	G8BBK	G8TQI	1100
Jersey	GJ4JWA	GJ8YVL	1100
Barmouth, Gwynedd	GW4LNK	GW6CGR	1100
Clwyd/Merseyside	GW4IEQ	G8NNS	1100
Aberystwyth	GW4JXB	GW8MAW	1130
Exeter	G3LSQ	G8TKL	1130
Leicester	G4JYS	G8LT	1130
Scarborough	G4OSD	G4EEV	1130

QTC
Amateur radio news

Important operating changes

Discussions with the Home Office during the course of this year have now led to a number of important agreements; most of the changes take place from 1 October 1982, and will appear in the various Gazettes prior to that date. As far as the amateur service is concerned, there are good and bad points—but the good points are very good! First, the bad news:

1. The sub-band 431–432MHz is to be allocated to private mobile radio services in the London area. Although this section of the band is not to be withdrawn at present (it is not exactly highly populated anyway), amateurs are requested to desist voluntarily from using it within 100km of central London. The Home Office has also reminded us that amateur use of 430–440MHz in the UK is on a secondary basis to all other users.
2. The sub-band 10·25–10·4GHz is also allocated to the amateur service on a secondary basis and, although we sometimes tend to forget the fact, there are primary users operating within this part of the spectrum. Since the Government has now given the go-ahead to "Mercury", which will be using frequencies above our 10GHz allocation, the displaced users will now have to operate within our band. In other words, we will have to share with additional primary users. The Home Office do *not* intend to withdraw this sub-band for the time being, but this could prove necessary if harmful interference were caused to the new primary users.

Both of these changes stem from the intense pressure on the rf spectrum.

So much for the bad news — now for the good news.

1. Although the 18 and 24MHz bands, agreed at the World Administrative Radio Conference in Geneva in 1979, will remain allocated to the fixed and land mobile services until amateur primary status is achieved, not later than 1 July 1989, these bands *will* become available to UK radio amateurs from 1 October 1982 under the following conditions:
   (a) The amateur service will operate on a non-interference basis to all other services operating in conformity with the Telecommunication Convention and the International Radio Regulations.
   (b) The class of emission will be limited to cw (A1A).
   (c) Maximum antenna gain in any direction shall not be greater than 0dB with respect to a $\lambda/2$ dipole.
   (d) The antenna shall be horizontally polarized in order to reduce ground-wave radiation.
   (e) Carrier power supplied to the antenna shall be 10dBW (10W).
   (f) Frequencies to be allocated from 1 October 1982 are 18,068–18,168kHz and 24,890–24,990kHz.
2. For research purposes only, a very limited number of Class A licensees will be permitted to operate from 50 to 52MHz outside UK broadcasting hours, on a non-interference basis. Those interested in taking an active part in night-time tests in this section of the spectrum are asked to contact the RSGB vhf manager, Keith Fisher, G3WSN, 7 Burlington Road, Swanage, Dorset BH19 1LR.
3. The Home Office has now agreed to a relaxation in the controls for greetings messages. From 1 October 1982 non-licensed persons may send greetings to other stations; as part of an on-going experiment, the facility will initially be for users of special event (GB) callsigns only. Greetings messages may only be sent within the UK to begin with, since agreements with other countries are required before international messages may be transmitted.

   The Society feels that the re-introduction of greetings messages, although limited to special event stations only, is very much a step in the right direction. In order to make the experiment a success, it has agreed the following simple guidelines with the Home Office:
   (a) Each greetings message should not exceed 2min in length.
   (b) The message may only be sent once to each station with which the originating station is in contact.
   (c) The non-licensed person may speak into the microphone, but the licensed operator must operate the transmitter controls and identify the station.

   The Society has a letter of authority from the Home Office to go ahead with this experiment; the terms of the amateur licence will be changed in due course. It is delighted to have achieved this facility after many years of effort, and to have achieved it just prior to this year's Jamboree on the Air: the Scout movement should have an enjoyable time on 16/17 October. It is hoped that, if the new facility is used with care, further advances will be made after the initial experimental period.
4. The four new microwave bands agreed at WARC 1979 will become available from 1 October 1982. These are at 47–47·2GHz, 75·5–76GHz, 142–144GHz and 248–250GHz. Power, classes of emission and safety precautions should be as for the other bands above 1GHz.

The Society very much regrets the bad news, but there is plenty of good; if the gains and losses are taken into account, the four new microwave bands alone give an extra 4,700MHz of spectrum, or the equivalent space of more than 150 hf bands!

RSGB PRESIDENT, 1983

The RSGB Council has unanimously elected Mr D. E. Baptiste, CBE, to be the 1983 President of the Society

Until his retirement in January 1981, Don Baptiste held senior positions in the Post Office, Ministry of Posts & Telecommunications, and the Home Office for 30 years. In 1969 he became head of the Radio Regulatory Department, and subsequently led the British delegation to five world administrative conferences of the International Telecommunication Union; the last of these being the World Administrative Radio Conference in 1979. He travelled widely in the preparation of these conferences, and was instrumental in obtaining many facilities for radio amateurs.

He was awarded the honour of Commander of the Order of the British Empire in the 1981 New Year Honours List.

The Society is honoured to have Don Baptiste as its President for 1983

The rumoured loss of the 432MHz band

There have been many rumours that the 430–440MHz band is about to be lost to amateurs in favour of a Ministry of Defence communications system. These rumours have no foundation in fact; the correct position is that the amateur service is a secondary user of this part of the spectrum and the primary user is radiolocation. The common manifestation of the latter is Syledis. Overall control of 430–440MHz is in the hands of the military in the UK and they seem to have no obligation to consult other users if they wish to utilize this part of the spectrum.

In this case the Ministry of Defence has introduced a mobile communications system which appears to be spaced 12·5kHz away from amateur uhf repeaters. The RSGB first heard about the system a short time ago and contacted the Home Office in order to discover more about the position—however, the Home Office knew nothing at all about it. The military seem to have apparently gone ahead with their system without consultation with other bodies, as indeed they had every right to; however, one is left with some doubts as to the wisdom of this course of action, quite apart from the apparent lack of courtesy in this complex area of spectrum management. Most operators on 432MHz will be familiar with Syledis and its effects on amateur contacts; Syledis has also shown itself to be very vulnerable to in-band strong signals. Presumably, the MoD has established that its system is compatible with Syledis; the Society also assumes that MoD is aware that amateurs in Region 1 are shared primary users of 430–440MHz and that a conservative estimate suggests that there are about 20,000 active amateurs on the band within range of the UK.

Meetings between the Society and interested parties continue to take place, but there is no truth whatsoever in the rumoured loss of the 432MHz band. Any further news will be broadcast via GB2RS, the Headline News Service and Oracle.

Regional elections

The result of the elections held to fill the vacancies for representatives for Regions 3 and 12 were:

Region 3

L. W. Craven, G4EQI 129 votes (3 spoilt)
L. W. Ross, G8MWR 58 votes (5 spoilt)

Region 12

M. R. Hobson, GM8KPH 11 votes
C. V. Smith, GM4FZH 10 votes

Messrs L. W. Craven, G4EQI, and M. R. Hobson, GM8KPH, have therefore been elected representatives of Regions 3 and 12 respectively.

Length-of-membership lapel badges

The RSGB has expanded its range of lapel badges by introducing colours to represent length of continuous membership of the Society. The colours and the periods of membership which they represent are:

Black	0 to 5 years	**Red**	25+ to 40 years
Green	5+ to 10 years	**Grey**	40+ to 50 years
Blue	10+ to 25 years	**Gilt**	Over 50 years

A coloured loose insert in this issue shows the colours and the range of types of badge now available. Details of price and ordering information will be found in the Mail Order Price List on page 916 of this issue.

QSL Bureau

G4BAA–BZZ series. The sub-manager for this callsign series is now Miss L. Harper, G4FNC, 50 Ravenglass Road, Westlea, Swindon, Wilts SN5 7BW.

G4GAA–GZZ series. The sub-manager for this callsign series is now Mr R. Maskill, G4JDL, 107 Swallows Meadow, Shirley, Solihull, W Midlands B90 4PH. The former sub-manager, Leo Craven, G4EQI, relinquished the appointment on his election as Region 3 representative.

G3LAA–NZZ series. The sub-manager for this callsign series is holding a large accumulation of unclaimed cards which are taking up valuable space. Anyone requiring their cards should send a supply of saes to G3GHS, QTHR. All unclaimed cards will be destroyed four weeks after publication of this notice.

The 145·8 and 145·825MHz satellite frequencies

The large number of operational amateur satellites which are now orbiting the earth and which use this segment of the 144MHz band have brought about a considerable increase in satellite communications. However, operation via satellite is often impaired by the presence of stations using this section of the band for local contacts. It may be that these operators, who predominantly use fm, are unaware of the 144MHz band plan and the fact that this section of the band is allocated internationally for space communications.

It would be most helpful if amateurs would avoid this section of the band unless engaged in satellite communications. Band plans are not mandatory but are devised internationally so that amateurs with diverse interests can co-exist with the minimum of disturbance to other operators.

There is plenty of room for local fm working in the 144MHz band without making life difficult for satellite users.

"A power fet amplifier for 144MHz"

The Technical & Publications Committee has recently discussed correspondence received from members of the Martlesham Radio Society and others on various aspects of the above article (*Rad Com* May 1982, pp508–9). Measurements made by the committee of the characteristics of the preamplifier have shown its gain at 144MHz to be 17dB, which agrees well with the claimed 15dB. The preamplifier was shown to reduce the noise figure of a standard "black box" from 7dB to 3dB, which represents a significant improvement. However, because the preamplifier does not incorporate any tuned circuits, readers must recognize that there is a risk that strong out-of-band signals *may* cause overloading of the receiver: it is to be noted that the gain of the preamplifier exceeds 25dB at hf and is still significant above 400MHz, and the only protection is the selectivity of the antenna system employed and that of the front-end of the receiver.

A second point made in the correspondence is that the actual output power of commonly used transmitters often exceeds the specification value. It would not be surprising, therefore, for a 15W output to be obtained from a nominal 10W transmitter. To avoid the risk of overloading the power amplifier, it would be good practice to measure the actual output of the driver transmitter and to increase the value of the 5dB attenuation employed in the original circuit as appropriate.

G3RPE

December RAE

The next Radio Amateurs' Examination will take place on Monday 6 December 1982. RSGB examination centres are again being arranged in Central London and Derby, and candidates wishing to enter at either centre should write for an application form to: MSO, RSGB, 35 Doughty St, London WC1N 2AE, enclosing a stamped addressed envelope. The closing date for completed application forms to be received at RSGB HQ is 15 October.

The fees are: £19 for both parts of the examination, and £15 for either part.

The City & Guilds of London Institute is arranging for an additional RAE in 1983, to take place on 21 March, but for administrative reasons the RSGB cannot arrange examination centres for that date. RSGB centres will, however, again be arranged for the RAE on 16 May 1983, for which the closing date for receipt of applications is 15 February 1983.

RAE in Suffolk

All those wishing to sit the RAE in Suffolk are advised that following the decision of The Suffolk College, Rope Walk, Ipswich, not to accept external candidates for any examinations, the Ipswich Radio Club is pleased to announce that, with the help of the County Education Authority, arrangements have been completed for students to sit the Radio Amateurs' Examination at the Kesgrave and Claydon Adult Centre, The High School, Kesgrave, Ipswich, tel Ipswich 624386.

Candidates should make their own arrangements direct with the centre, being careful to ensure that they complete enrolment by the date applicable to the examination for which they wish to sit (usually mid-October for the December examination, mid-January for March and late January for the May examination).

IARU Region 1 secretary visits Geneva

As proposed by the Executive Committee of Region 1 at its meeting in Bremen in April, Eric Godsmark, G5CO, visited Geneva from 17 to 24 June. 4U1ITU was visited and discussions on the station were held. Several of the permanent officers of the International Telecommunication Union, including the assistant secretary-general, were kind enough to receive G5CO, and it was a fruitful visit.

Guide to Oscar Operating

The fifth edition of this AMSAT-UK publication is now available, and provides an invaluable guide to all who are keen to tackle communication by satellite. Commencing with a brief history of amateur radio satellites, from the launch of the first OSCAR (Orbiting Satellite Carrying Amateur Radio) in December 1961, the booklet is based on original work and experience over many years by AMSAT-UK members world-wide. It covers such subjects as: where to listen (and what for); orbit information; receiving and transmitting systems; practical communication, with related items on polarization, range, telemetry and doppler shift; current and future satellites; and national and international AMSAT organizations.

This 16-page 121 by 147mm booklet is obtainable from the honorary secretary/treasurer of AMSAT-UK, R.J.C. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ, and costs 55p plus postage of 15p for UK addresses.

Equipment stolen . . .

From a car in Coventry on 21 July: Kenwood/Trio 7800, serial number 1010022, with l.e.d. fitted in upper cover to indicate high-power mode. Information to Coventry police, tel 0203 555333, or G6GYN, tel 0203 554400 ext 4539 (working hours), or 0203 335414 (outside working hours).

From a van in London SE1 on 8 August: Yaesu FT290R, serial number 031043, modified for 144-148MHz coverage, 3SK88 input stage, and other minor changes. Information to G6AWM, tel 01-928 2033 ext 419 (day) or Kennington police, tel 01-928 6900.

. . . and found

On the A505, Baldock Road, Royston, on 12 August: FT202R, serial number 8N053997. Contact Royston police, tel 0763 42222.

Longleat Mobile Rally 1958–82

The Longleat Rally, organized annually by the City of Bristol RSGB Group, held its quarter-century event on 26 June 1982. As on every previous occasion, it took place in the splendid setting of the Longleat estate, by courtesy of Lord Bath. In spite of inclement weather over 7,000 visitors confirmed the popularity of the event.

To mark the jubilee, Lord Bath presented engraved plaques to six founding members of the group who were present, and a special buffet lunch was graced by the presence of Lord and Lady Bath. Also present and representing the RSGB were John Allaway, G3FKM, President; Bob Barrett, GW8HEZ, executive vice-President; Basil O'Brien, G2AMV, immediate past-President; Brian Goddard, G4FRG, regional representative; and David Evans, G3OUF, general manager.

A mast-erecting contest was won by the Maidenhead & D ARC, which became the first recipient of the Longleat Trophy—a shield carrying the Longleat coat of arms—presented by Lord Christopher Thynne.

An experimental adjustable null receiving antenna for 14 and 21MHz

by R. M. PAGE-JONES, CEng, MIERE, G3JWI*

MOST AMATEUR USERS of the hf bands have at sometime or other come up against the problem of man-made noise. This can in some instances be tackled at source, but often the only course is to try to alleviate it, and it was an attempt to do this that instigated the experiment described below.

The principle of an antenna system of this type is to minimize pick-up from the direction of the interference, while affecting signals from other directions as little as possible. After a few unsuccessful experiments with loops etc, the desired results were achieved with a simple phased vertical arrangement.

As luck would have it, the local noise disappeared a few months ago, but the experiment was continued to see how well it would cope with long range interference. The results were much better than expected—in the majority of cases it was possible to reduce an unwanted signal by two to four S-points. Considering the crowded state of the hf bands and the number of illegal intruders, this is not to be sneezed at. At the risk of stating the obvious, it should perhaps be said that care should be taken when nulling an amateur signal (or any signal in a shared band)—just because you cannot hear him do not assume you are not causing him interference.

Cancelling principles

The principle of a nulling or cancelling device is to take signals from two sources and arrange for them to be exactly 180° out of phase, and of exactly the same amplitude, and add them together. In this case the sources are two vertical whip antennas, spaced between $\lambda/4$ and $\lambda/2$ apart. The relative phase of the signals induced into the whips will depend on the direction from which the signal comes, being greatest along the line of the whips (when the signal has to cover the greatest distance from arrival at one antenna to arrival at the other), and zero when signals are coming from a direction at right angles to the line of the whips. For signals from other directions the phase difference will be between these two values. By introducing phase and gain adjustment to the signals from the two whip antennas and then combining them, it is possible to arrange for signals from any specific direction to be cancelled. In fact there are usually two directions from which signals will be cancelled for a given phase adjustment—a null on one side of the line of the antennas has a mirror image on the other side, because the phase difference will be the same for signals from both these directions. The sort of patterns obtained are shown in [1]. Most antenna text books cover the straightforward case of signals arriving horizontally, and some [2] cover the more complicated case of signals arriving at different angles of elevation. Home computer enthusiasts will find the plotting of the patterns from the text book formulas interesting, but the doubtful earth conditions and general clutter of a typical amateur's garden are likely to make these of limited value in practice. As a rough guide it can be said that raising the angle of elevation has a similar effect to reducing the spacing of the antennas, and/or reducing the phase difference caused by a given signal.

The experimental set-up

A good deal of thought was given to devising circuitry to give the necessary phase and amplitude adjustment. It had to be simple and easy to control from the shack several metres away, and at the same time it had to give a reasonable arc of null adjustment. Another prime requirement was that it should not degrade receiver performance by introducing non-linear conditions into the antenna circuit. Fig 1 shows the arrangement adopted.

Ant 1 and Ant 2 are two 4·5m whips, mounted on varnished wooden stakes. These act as insulators and also make it very easy to vary the spacing of the antennas if required. Earths at each antenna are provided by 1m of copper central heating pipe driven into the ground. The convenience of this arrangement outweighs the disadvantage of the relatively poor performance of vertical antennas at ground level at these frequencies, though there seems no reason why elevated antennas with radials should not be used where this is practical, with a consequent reduction of losses due to screening, earth connection resistance etc.

The combiner unit takes signals from the two antennas via two equal lengths of coaxial cable—vhf grade domestic tv coaxial cable is quite adequate. L1 and L2 consist of 11 turns of about 24swg enamelled wire on 0·25in formers with dust cores. The coils are tapped 2·5 turns from the earthy end to form low-impedance take-off points. Varactor diodes D1(a & b) and D2(a & b) form tuned circuits with the coils L1 and L2. Coupling coils L3 and L4 are 1·5 turns wound over L1 and L2 using short lengths of insulated stranded wire. So far as possible the two tuned circuits and coupling coils have been kept identical, and the coils are mounted far enough apart (2–3in) to prevent significant inductive coupling. In order to give an initial 180° phase difference, L3 and L4 are wound in opposite directions. The effectiveness of cancellation depends on the conditions existing at the tuned circuits. Experimental adjustment of the number of turns and position of L3 and L4 may be required to achieve the best compromise between signal pick-up and cancellation. Varactor diodes D3 and D4 form variable capacitors which vary the amplitude of signals fed from the tuned circuits to the output socket of the combiner unit, SKT3. All the varactor diodes are high capacitance ratio type such as are used in a.m. domestic radios. D1(a & b) and D2(a & b) use two diodes in series to give a convenient maximum capacitance and capacitance ratio. The dc control lines are decoupled by small ceramic capacitors to avoid unwanted signal pick-up. The combiner unit is built into a rectangular metal box measuring 130 by 100 by 40mm, which gives ample space and allows the two halves of the circuit to be laid out symmetrically. Earth return to the shack is via the outer of the coaxial cable coming from SKT3—again, low-grade tv coaxial cable is suitable. All the coaxial plugs and sockets are tv type.

The shack unit could not be much simpler, consisting as it does of four potentiometers whose function is to vary the bias voltages on the varactor diodes in the combiner unit. The 12V comes from a stabilized supply already available in the shack. (It is essential to ensure that no high voltages—mains or any other supply—can accidently become connected to equipment out in the garden, due to power supply faults etc.)

Potentiometers RV2, RV3 and RV4 are fitted with knobs with the skirts marked 1 to 10, and RV1 is arranged with a simple scale which can be marked to show the tuning point of the 14 and 21MHz bands. If desired, RV1 can be replaced with switched preset potentiometers.

Circuit function

It would be nice to be able to say that when RV1 is tuned to the required band then RV2 varies the phase of the signals, and RV3 and RV4 vary the amplitude, but unfortunately this is only half the story. In fact all the controls vary both phase and amplitude to some extent, and when the coupling between the two circuits is taken into consideration the situation becomes quite complicated. Fortunately it is only necessary to achieve a null—exactly where in the circuit the phase and amplitude variations are taking place is not important. In practice the effect of the interaction of the controls is simply that it is very difficult to predict the control settings for a given null direction from theory, though once they have been found experimentally they are repeatable.

Setting-up

The only setting-up required for the combiner unit is to adjust the cores of L1 and L2 so that the tuning tracks reasonably well. To do this, set RV2, RV3 and RV4 to mid-range ("5" on the knobs), and set RV1 approximately half-way from the earthy end. Connect a signal generator to one antenna input and a 50Ω load across the other, and peak the tuned circuit to which the generator is connected to 14MHz, using its dust core. Reverse the positions of the signal generator and the 50Ω load, and peak the other coil. The process should be repeated to make sure that the alignment is as close as possible. Without moving any controls except RV1, check that 21MHz tunes in at approximately the same setting of RV1 for both tuned circuits. If no signal generator is available then the signals from one of the antennas could be used, though this would be much less convenient. The tuning points of 14 and 21MHz can now be marked on the scale of RV1, but it is best to use pencil at this stage as small changes may need to be made when the equipment is in operation.

Set up the antennas about 6m apart and at right angles to the direction in which the sharpest nulls are desired. The lengths of coaxial cable joining the antennas to the combiner unit should both be the same, and about 4m is a reasonable compromise and avoids too great a mismatch on either band. (The whips are reactive on both bands—too short on 14MHz and too long on 21MHz—so that the impedance presented to the combiner unit inputs depends on the length of coaxial cable.)

The control cables can be any plastic-insulated flexible wire, and two lengths of the grey flat twin cable intended for hi-fi speaker leads have proved

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Components list

C1 to C10	1nF ceramic.
R1, R2	47Ω 0·25W
R3, R4	12kΩ 0·25W
R5, R6	27kΩ 0·25W
R7, R10	12kΩ 0·25W
R8, R9, R11, R12	2·7kΩ 0·25W
RV1 to RV4	20kΩ potentiometer, linear, non-wirewound
Varactor diodes	Toko type KV1230 (9V series)
L1, L2, L3, L4	See text

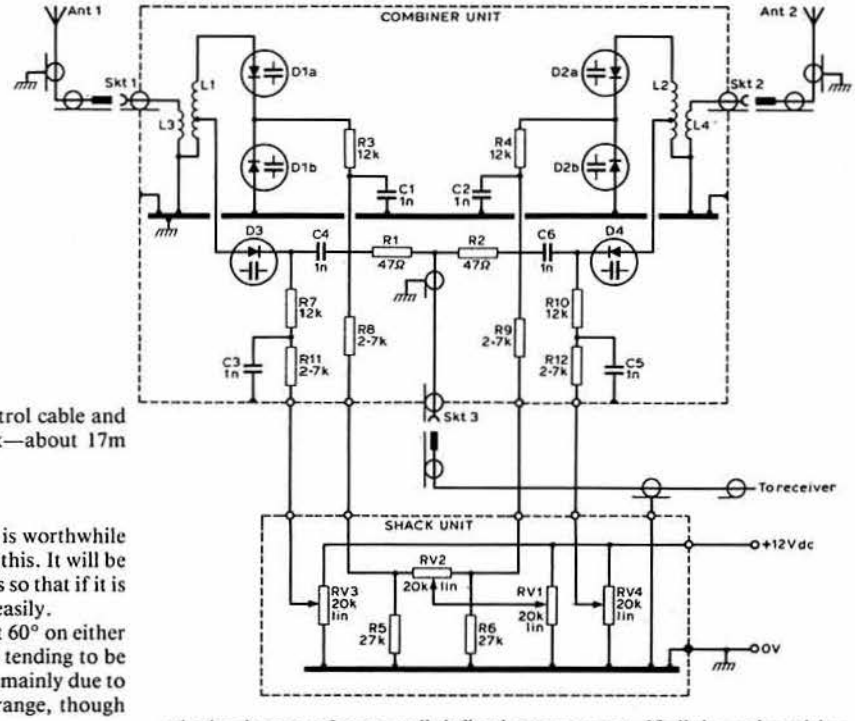

Fig 1. Overall circuit diagram. The combiner unit is mounted near the antennas, and the shack unit is fitted at the operating position

satisfactory. There is no restriction on the length of the control cable and coaxial cable running from the combiner unit to the shack—about 17m being used in the present case.

Operation

Directing a null onto a signal requires a little practice, and it is worthwhile to make a table of directions and control settings while doing this. It will be found that there is a definite pattern to settings of the controls so that if it is known which quadrant the signal is in, it can be nulled very easily.

Generally the best nulls will be obtained in a segment about 60° on either side of a line at right angles to the line of the antennas, nulls tending to be poor (or non-existent) along the line of the antennas. (This is mainly due to the "tuned circuit" phase-shifting circuit having a limited range, though other factors are also involved.)

Before starting, set RV1 for the band in use, RV2 for mid-range ("5" on the scale), and RV3 and RV4 to near the low voltage end of their range (about "8" on the scale). Tune-in a suitable signal on the receiver, and move RV2 slowly off its centre position while swinging RV3 slowly backwards and forwards through its range. If no null is found anywhere in the range of RV3, set RV3 to "8", and repeat the process with RV4. Once a null has been detected it is very easy to tweak the controls to achieve a minimum. (It is easier to find the null with the agc switched off.)

Ionospheric signals will be found to have poorer nulls than local signals, due presumably to the vagaries of the propagation path, though the strong (single-hop F2?) signals which are so often a problem to G stations seem to null remarkably well. Where no interference is present the controls can be adjusted for maximum on the wanted signal.

The sharpness of null which can be obtained on local QRN will depend on whether it comes from a well-defined source or not. If all the mains wiring in local houses is radiating interference, so that it appears from the antenna to be coming from a wide angle, then the null will be poor—though by judicious siting of the antennas a worthwhile reduction of the interference may still be obtained. Fortunately if an interference source is too far away to be traced, it is usually far enough away to be in a well defined direction.

Though the main interest has been the amateur bands, an occasional visit to the broadcast bands in the tuning range of RV1 (about 12 to 22MHz) showed that useful results could be obtained on these bands also. There is, of course, a danger to all this—it is easy to spend so much time nulling out unwanted signals, that you never get on the air to work any wanted ones!

References

[1] *Amateur Radio Techniques,* 7th edn, page 324. RSGB.

[2] *Antenna Engineering Handbook,* edited by H. Jasik. McGraw-Hill.

QTH and other calculations with the Sharp PC1211 computer

by W. BLANCHARD, G3JKV*

NO SOONER have radio amateurs got used to the hand-held transceiver revolution, than along comes another one—this time in hand-held computers. It would be trite to say yet again "aren't microprocessors wonderful?", but when it is possible to get a computer that (*a*) is no bigger than an average calculator was a few years ago (and some still are); (*b*) can do quite complex calculations; (*c*) retains the program in memory permanently even when switched off; and (*d*) even when "on" consumes so little power that it can run on batteries all the time without need for a mains converter, there really has been a minor revolution. The Sharp PC1211—also sold as the Tandy TRS80 (Radio Shack TRS80 in the USA)—is such a device; the Casio FX702P is another, and no doubt more will appear. Perhaps the facilities they offer are elementary compared to a main-frame computer, but considering their size and reliance on batteries they are surprisingly powerful and process quite a reasonable set of Basic instructions. The lack of a full set places some restrictions on programming, as does the relatively restricted memory, although its 2k puts several allegedly more powerful machines to shame.

Anyone who has only used a calculator before may find operating in Basic a little strange at first, but the handbooks supplied with the Sharp are quite comprehensive, even if written in that slightly odd "Japanese English" commonly seen in transceiver manuals. The amount of Basic needed for the PC1211 is fairly small and quickly learnt, and should be no obstacle. Probably the main difficulty most beginners face is trying to remember the correct syntax—when writing English a misplaced comma or two does not really matter, but they will stop program operation altogether if in the wrong place in Basic. So when copying programs, copy exactly—colons, semicolons and all. They will run perfectly well on the computer alone, but the addition of the optional cassette interface and printer is well worthwhile, particularly if the user is going to write his own programs or run a lot of data. But get a few dozen rolls of paper—the three supplied do not last long! One advantage of a printer is that less time is taken; when the answers are printed out the computer goes straight on to the next calculation without waiting for an ENTER command as it does if only the lcd display is used.

The PC1211, with its limited memory and speed, is more suited to mathematical operations than listing and sorting. It can do a bit of both but is slow, and if this is the main reason for buying a computer it would be better to buy one of the bigger machines. For amateur radio purposes this means that some of the "nicer" applications—like listing contact by time and area, printing logs, and filling out contest sheets—are not possible, but others such as those described here are very useful and perfectly practicable.

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TABLE 1

```
10:"L":CLEAR :
   INPUT "BASE
   LAT";E,"BASE
    LON";S:E=
   DEG E,S=DEG
   S
12:INPUT "1ST L
   TR QRA";A$
14:IF A$GOTO 20
16:GOTO 185
20:INPUT "2ND";
   B$,"3RD";C,"
   4TH";D,"5TH"
   ;F$
25:USING "##":
   PRINT A$;B$;
   C;D;F$
30:W$=A$:GOSUB
   211
40:IF I<=20LET
   G=(I-1)*2
50:IF I>20LET G
   =((I-26)*2)-
   2
60:IF D=0LET H=
   G+1.8
70:IF D>=1LET H
   =G+(D-1)*.2
80:W$=B$:GOSUB
   211
85:IF D=0LET C=
   C-1
90:J=I+40,K=J-(
   C/8)
100:IF F$="A"LET
    X=K-(1/48),Y
    =H+.1
101:IF F$="B"LET
    X=K-(1/48),Y
    =H+(5/30)
102:IF F$="C"LET
    X=K-(3/48),Y
    =H+(5/30)
103:IF F$="D"LET
    X=K-(5/48),Y
    =H+(5/30)
104:IF F$="E"LET
    X=K-(5/48),Y
    =H+.1
105:IF F$="F"LET
    X=K-(5/48),Y
    =H+(1/30)
106:IF F$="G"LET
    X=K-(3/48),Y
    =H+(1/30)
107:IF F$="H"LET
    X=K-(1/48),Y
    =H+(1/30)
108:IF F$="J"LET
    X=K-(3/48),Y
    =H+.1
110:P=X-INT X,Q=
    P*60,R=INT X
120:PRINT "LAT "
    ;USING "###"
    ;R;USING "##
    #.##";Q;" N"
130:IF SGN Y=-1
    GOTO 170
140:L=Y-INT Y,M=
    L*60,O=INT Y
150:PRINT "LON "
    ;USING "###"
    ;O;USING "##
    #.##";M;" E"
    :GOTO 190
170:N=ABS Y,L=N-
    INT N,M=L*60
180:PRINT "LON "
    ;USING "###"
    ;N;USING "##
    #.##";M;" W"
    :GOTO 190
185:INPUT "LAT";
    X,"LON";Y:
    USING "####.
    ####":PRINT
    X,Y
187:X=DEG X,Y=
    DEG Y
190:T=(SIN E*SIN
    X)+(COS E*
    COS X*COS (Y
    -S)),Z=69.09
    1*ACS T
200:PRINT "DIS "
    ;USING "####
    #.#";Z;" STM
    "
201:F=ACS T*111.
    18,G=1+(INT
    ((F-.01)/50)
    *2)
202:PRINT USING
    "#####.#";F;
    "K PTS";
    USING "####"
    ;G
203:V=V+G:PRINT
    "TOTAL ";V
204:D=ACS ((SIN
    X-(SIN E*T))
    /(SIN (ACS T
    )*COS E))
206:U=Y-S:IF SGN
    U=-1LET D=36
    0-D
208:PRINT "BRG "
    ;USING "####
    .#";D;" DEG
    T"
210:GOTO 12
211:IF W$="A"I=1
212:IF W$="B"I=2
213:IF W$="C"I=3
214:IF W$="D"I=4
215:IF W$="E"I=5
216:IF W$="F"I=6
217:IF W$="G"I=7
218:IF W$="H"I=8
219:IF W$="I"I=9
220:IF W$="J"I=1
    0
221:IF W$="K"I=1
    1
222:IF W$="L"I=1
    2
223:IF W$="M"I=1
    3
224:IF W$="N"I=1
    4
225:IF W$="O"I=1
    5
226:IF W$="P"I=1
    6
227:IF W$="Q"I=1
    7
228:IF W$="R"I=1
    8
229:IF W$="S"I=1
    9
230:IF W$="T"I=2
    0
231:IF W$="U"I=2
    1
232:IF W$="V"I=2
    2
233:IF W$="W"I=2
    3
234:IF W$="X"I=2
    4
235:IF W$="Y"I=2
    5
236:IF W$="Z"I=2
    6
240:RETURN
```

Whether operating hf or vhf, contest or not, the questions "How far away is he?" and "Where do I point the beam?" often arise, and vhf contest scoring can get rather tedious if it has to be done by hand on a map. The equations necessary to calculate ranges and bearings are not very complicated, and are well within the PC1211's capabilities, while extensions to calculate contest points and add them up are simple. However, there is a problem in that although latitude and longitude form the only worldwide grid, and have to be used for calculations, a particularly illogical local area locator system (QTH, formerly QRA) is widely used on the vhf bands, and must be converted to latitude/longitude before any calculations can be done.

The following program will do this conversion, work out distance and bearing from the base station, and calculate the score and add it up progressively for each contact. It will also calculate range and bearing between any two points in the world, with one small proviso: it will not calculate bearings for stations precisely north or south of each other. This is because it cannot divide by zero, and will show an error message "1 . . . . . " when it happens. The usual way around this is to test for the divisor and, if zero, use an alternative method, but this program already uses almost all the memory available and such a guard would mean dropping something else. Since only a very small change from directly north or south is needed to make the divisor non-zero, it only happens on very rare occasions, and it was hardly thought worthwhile to prevent it. In practice, if it runs through the calculations satisfactorily until it gets to bearing, then stops and displays the error message, it is safe to assume the bearing is 360° or 180° (easily resolved by looking at the two latitudes).

Range, bearing and vhf contest scoring

The program is initiated by selecting mode DEF and keying SHIFT 1. The lcd display will show "BASE LAT" and waits for an entry, which should be in degrees, minutes (and seconds, if desired) entered as DD. MMSS (South is minus). "BASE LON" is entered the same way. West minus.

Next the display shows "1ST LTR QRA" and if the QRA for the distant station is being used it will now be entered (see QRA calculation description below). Assuming that it is desired to use latitude/longitude, press the ENTER key without actually entering anything, and the display will show "LAT" after a short interval. Enter the latitude and longitude of the distant station as for the base station, and they will be printed out for reference, as shown on the display.

Next, the distance in statute miles is shown, followed by distance in kilometres, points score, total points, and bearing. (If non-contest, the points and score are ignored—of course, to program so that they were not presented when latitude/longitude is used throughout would again have run into memory problems).

If nautical miles are preferred to statute miles, change the 69.09 in line 190 to 60, and the "STM" in line 200 to "NM". If only kilometres are needed, change the 69.09 to 111.18; "STM" to "KM", delete the "F= . . . ." statement in line 201, substitute Z for F in the "G= . . . ." statement; and change line 202 to read:

202: PRINT USING "+ + + + "; G; "PTS"

Taking the program line by line (see Table 1):

10 enters base station data and changes it into decimal degrees.
12 asks for QRA.
14 decides whether anything has been entered in 12 and, if so, jumps the program to line 20, otherwise continuing.
16 jumps to line 185 if nothing was entered in line 12.
185 takes an input of distant latitude/longitude and prints/displays it as entered.
187 converts it to decimal degrees.
190 is the actual range calculation in great circle degrees, and converts to statute miles.
200 prints/displays the result.
201 calculates distance in kilometres for scoring purposes and calculates score. The "F – .01" is due to the small illogicality in the scoring system of making distances exactly on the 50km rings score low instead of high. .01 is a little arbitrary but the calculation using QRA is not better than about 2·5km anyway.
202 prints out 201.

TABLE 2

```
          53.2651
           0.0010
DIS   100.0 STM
  160.9K PTS   7
TOTAL    7
BRG    0.0 DEG T
```

```
          50.3309
           0.0010
DIS   100.0 STM
  160.9K PTS   7
TOTAL   21
BRG  179.9 DEG T
```

```
          52.0000
           2.2133
DIS   100.3 STM
  161.4K PTS   7
TOTAL   14
BRG   89.0 DEG T
```

```
          52.0000
          -2.2133
DIS   100.3 STM
  161.4K PTS   7
TOTAL   28
BRG  270.9 DEG T
```

203 adds up a cumulative total score and prints it. Note that this is only reset to zero if the full program is initiated by line 10.
204 is the bearing calculation.
206 corrects the bearing for values between 180° and 360°.
208 prints 206 in degrees true. If degrees magnetic are preferred, put in a new line:
207 D = D + 6
and change "T" in 208 to "M"

(If the local magnetic variation is significantly different from 6°, substitute whatever it is).

These calculations are quite accurate and are far better than those obtainable from a map, even at short ranges.

To test that all is working satisfactorily, enter the following examples; all for a base station position at 52°00'N, 00°00'.

DISTANT STN	LAT	LON
(a)	53° 26′ 51″N	00° 00′ 10″E
(b)	52° 00′ 00″N	02° 21′ 33″E
(c)	50° 33′ 09″N	00° 00′ 10″E
(d)	52° 00′ 00″N	02° 21′ 33″W

The printout/display which should result is shown in Table 2.

QRA conversion

It is a pity that QRA was designed before computers came into wide use; a few alterations would have made it much easier to program, but unfortunately it seems radio amateurs are going to have to use it for some time to come. Perhaps when a new locator system is designed it will be borne in mind that most amateurs will be using relatively simple computers!

The PC1211 suffers in this conversion in that the program is somewhat clumsy and lengthy, partly due to the nature of QRA itself, and partly due to its own limitations. Thus, for instance, the locator must be entered into five different memory locations because the 1211 cannot access a given digit or letter in a single string variable. Nor can it translate a letter to a number, forcing the use of look-up tables which are always expensive in memory and time.

Initiating the program the same way as for range and bearing (above), the base station latitude and longitude are entered. It is a moot point whether this should be in QRA if all the other data is QRA but, in practice, provided contacts are made more or less equally over the full 360° it probably does not matter.

When the display shows "1ST LTR QRA", enter it, and then the other four digits/letters, as requested by the display. The complete locator is then printed out as reference, and after about 10s, latitude and longitude, followed a few seconds later by distance (miles and kilometres); points, total points, and bearing, as before. The program then returns to "1ST LTR QRA" for a further input. Changes can be made to the output, as already suggested, if statute miles are not required.

Taking it line by line:
10 (as before)
12 (as before), but now it is entered.
14 (as before)
20 asks for the entry of the rest of the locator.
25 prints/displays it.
30 goes to the look-up table.
211 —
236 assigns a numerical value to the first QRA letter.
240 goes back to 40.

TABLE 3

```
AM 7 1F
LAT  52  1.24 N
LON   0  2.00 E
DIS     2.0 STM
   3.2K PTS   1
TOTAL    1
BRG   44.5 DEG T
```

```
ZL 1 0B
LAT  51 58.75 N
LON   0  2.00 W
DIS     2.0 STM
   3.2K PTS   1
TOTAL    3
BRG  224.5 DEG T
```

```
ZM 8 0D
LAT  52  1.24 N
LON   0  2.00 W
DIS     2.0 STM
   3.2K PTS   1
TOTAL    2
BRG  315.4 DEG T
```

```
AL 0 1H
LAT  51 58.75 N
LON   0  2.00 E
DIS     2.0 STM
   3.2K PTS   1
TOTAL    4
BRG  135.4 DEG T
```

40 works out the actual value of easterly longitudes for QRA letters up to T, which is 40°E (just to the east of Moscow).
50 does the same but for westerly longitudes from U (west coast of Eire) to Z. Hence, if easterly squares beyond T are worked, the program will not give the right answer, but such dx is surely worth a special calculation!
60 corrects longitude for small squares with numbers ending in zero.
70 corrects longitude for all other small squares.
80 takes the second letter (latitude) and goes to the look-up table.
211—
236 assigns the second letter a numerical value.
240 goes back to 85.
85 corrects the first number of numbered squares when the second one is zero.
90 corrects latitude in accordance with numbered squares.
100—
108 is a second look-up table which makes corrections to both latitude and longitude in accordance with the small lettered squares, the centre of these squares being assumed the correct position.
110 changes the latitude decimal degrees obtained so far into degrees and minutes, these being easier to plot on a chart. (There is a DMS function on the 1211 which superficially would seem an easier solution but in fact it does not provide the required format and its use would lead to extra instructions).
120 prints/displays latitude.
130 decides whether longitude is east or west and directs the computation to the appropriate line.
140 changes longitude decimal degrees into degrees and minutes, and re-formats.
150 prints/displays longitude east.
170 changes and re-formats longitude west.
180 prints/displays it, and jumps to 190.
190—
208 are as before.

The complete QRA/range/bearing/score calculation takes about 25s. To check correct operation, use the following examples: Base station at 52° 00′ 00″N, 00° 00′ 00″

(a) AM 71F
(b) ZM 80D
(c) ZL 10B
(d) AL 01H

Print-outs/displays should be as shown in Table 3. It is an interesting sidelight on the QRA system that any one of these four locators would be correct for the base station position given, and all would be inaccurate by 3·2km!

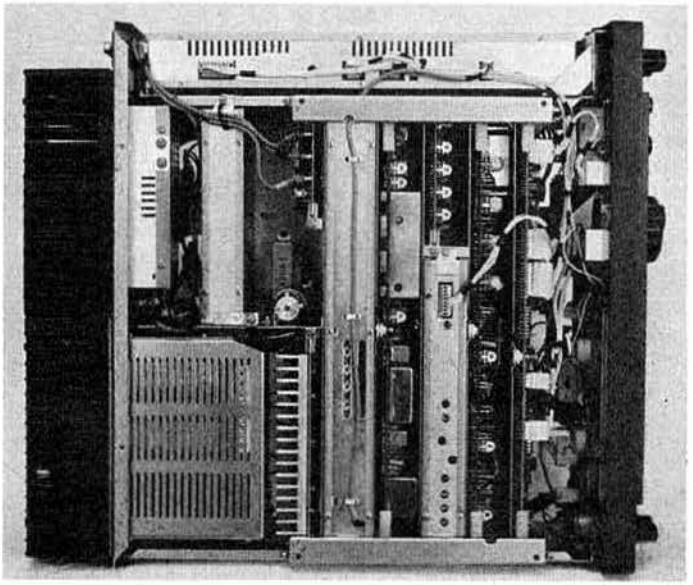
It might be thought that since the centre of the small lettered squares is being taken as the correct position, and the actual location is at one of the corners, all the bearings should be multiples of 45° exactly. That they are not is not a result of inaccurate calculation; it merely shows that they are **not** squares, due to the unequal proportions of latitude and longitude.

This program leaves the 1211 with only 23 steps and two memories vacant, hence some of the "tidying-up" that would have been done on a bigger machine has not been possible. Also, if this program is left permanently in memory there is really no space for anything else. It is wise with a program of this length to use the cassette interface to dump it on tape as a precaution against the batteries going flat. □

EQUIPMENT REVIEW

The Yaesu Musen FT-ONE hf transceiver

by PETER HART, G3SJX*



Top view of the FT-ONE with cover removed

Introduction

The FT-ONE is the latest top-of-the-range elite-class transceiver produced by Yaesu Musen. Boasting virtually every conceivable facility, this transceiver employs the most advanced techniques to yield a fully solid-state, broadband, multimode design. General-coverage operation is provided with, in the standard version, transmit inhibit outside the amateur bands. Full frequency synthesis is employed together with 10 dual-access memories and a variety of methods of frequency selection.

The item obtained for review comprised an FT-ONE with all options fitted. These included fm board, keyer board, r.a.m. board and all additional filters.

Principal features

Virtually every feature provided by any present-day transceiver is incorporated into the FT-ONE. It is basically a broadband design employing up-conversion to the first i.f., requiring no preselector or transmitter tuning controls. The general coverage receiver tunes 150kHz to 30MHz, and the transmitter 1·8 to 30MHz at 100W p.e.p. output, with transmit inhibit outside the amateur bands. The FT-ONE(G) version is intended for professional communications and features general-coverage transmitter operation. The frequency synthesizer provides continuous coverage with no bandchange switch. The frequency may be set in a number of ways:

(1) Conventional rotary knob tuning in steps of 10 or 100Hz, giving tuning rates of 2 or 20kHz per revolution.

(2) Keyboard entry of frequency to within 100Hz with separate entries for megahertz and kilohertz.

(3) Manual scanning from the keyboard in steps of 100Hz or 100kHz.

(4) Manual scanning from the microphone in steps of 100Hz or 100kHz when a suitable microphone is used.

(5) Automatic scanning in steps of 100Hz, stopping when signals are encountered.

(6) Frequency selection from 10 memories. Each memory position may be loaded with a frequency anywhere within the range of the transceiver, and any two memory positions may be used independently for split frequency operation. The memories may be selected either by 10-position switches or from the keyboard.

(7) Rapid changes in 1MHz steps via the rotary tuning knob.

Digital readout of frequency and clarifier offset to 100Hz resolution are provided. The clarifier operates either on receive or transceive over a range of ± 9·9kHz in steps of 10 or 100Hz and clarifier offset is also stored with frequency information in the memory. A mains psu is built-in, and the transceiver will also operate from an external 12V supply. A fan is incorporated as standard. The mode switch provides for operation on usb, lsb, transmit and receive on opposite sidebands, three cw bandwidth settings, two fsk bandwidth settings, a.m. and fm.

Receiver facilities include variable bandwidth, i.f. shift, two age time constants plus off, audio peak and notch filters and fully adjustable noise blanker.

Transmitter facilities include full break-in on cw, speech processor, vox, transmission monitor, direct 170Hz fsk, built-in electronic keyer, comprehensive metering with two meters and a microphone squelch circuit to eliminate background noise.

The rear panel carries a comprehensive range of input/output connectors. These include ac and dc power input connectors, antenna socket, external receiver antenna, antenna output to external receiver, low-level rf output for a transverter, receiver af output, transmitter af input (patch socket not mentioned in the manual), external speaker, ptt, fsk keying, two cw key jacks for straight key and keying paddle for the built-in keyer, anti-trip input and sidetone output. Two multi-way accessory connectors are provided for transverter control and linear amplifier control. Provision is also made for using a full break-in linear amplifier. Unlike the Icom IC720A, both linear control and transverter output can be used together without swapping plugs and links. No provision is made for digital remote control of either the transceiver or any range of matching accessories, as is done with the IC720A.

Certain boards are not provided with the basic transceiver but are available as easily-fitted optional extras. These are the fm board, keyer board and r.a.m. board. The r.a.m. board, powered by three AA-size batteries, allows the memory contents to be stored when the transceiver is disconnected from the mains. The batteries last about one year.

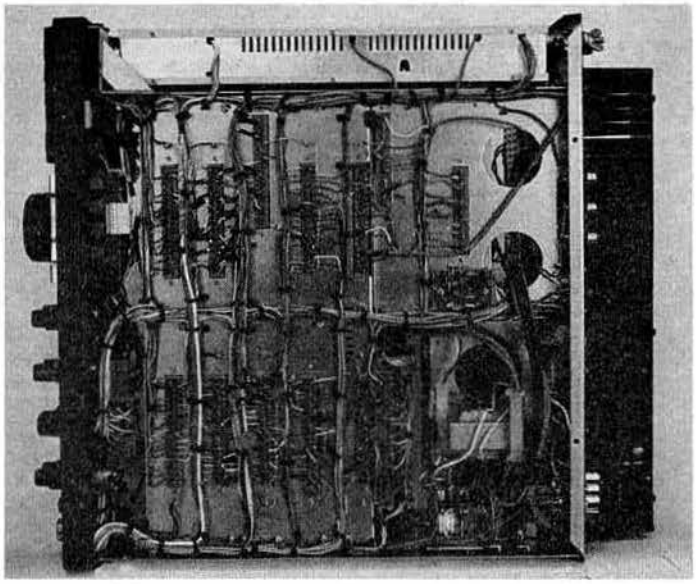
At the time of writing, there were no dedicated matching accessories available for the FT-ONE, although a range is planned. The FT107 transverter accessories are directly compatible with the FT-ONE.

Description

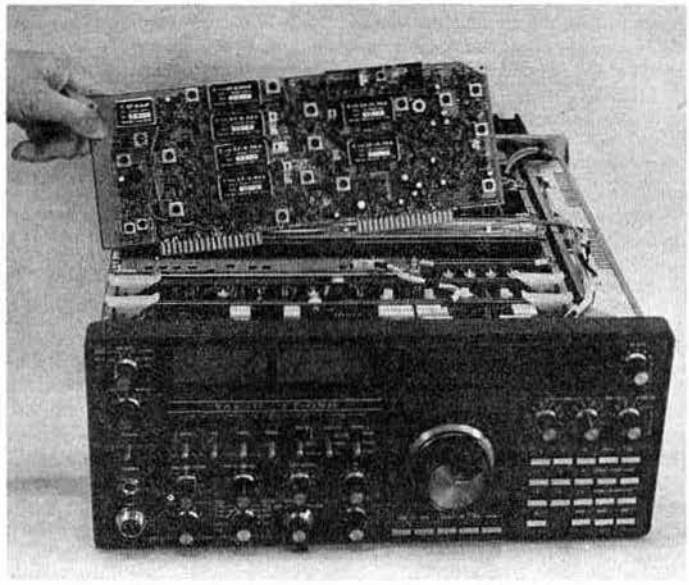
This transceiver is relatively large, measuring 38 (w) by 16·5 (h) by 46·5cm (d), and requires a fairly deep table. It is important not to push the transceiver back against a wall, as this obscures the fan. The weight is 17kg. The transceiver circuitry is constructed on a number of glass-fibre printed boards which mount vertically and plug into the main chassis via edge connectors. Interconnections are routed via the main chassis, and extensive screening is employed between boards. This results in a rugged and very neat layout. Board extenders are required for in-situ servicing. All the controls are mounted on the front panel, and a 7·5cm diameter speaker is mounted in the top of the case. Miniature dual concentric rotary controls are used extensively, with the i.f. shift/width control giving a novel pictorial presentation of bandwidth and position. However, adjustment of bandwidth is a two-handed process. Lever switches select certain functions, and in the down (off) position these tend to interfere with the upper row of rotary controls. With so many user-selectable functions, a certain amount of learning time is required to make full use of all the facilities. Frequency readout is provided by a six-digit orange l.e.d. display with a separate miniature red display for clarifier offset and memory. Although the brightness is adequate under normal artificial lighting, under direct sunlight or high ambient light levels these displays are difficult to read.

The overall equipment is quite complex, using (according to the manual)

*42 Gravel Hill, Addington, Croydon, Surrey.



Bottom view of the FT-ONE with cover removed



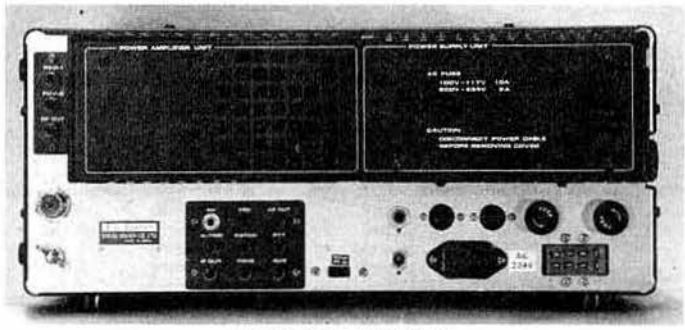
View of the FT-ONE showing the plug-in boards

214 transistors, 35 fets, 72 ics, 344 diodes and 8 crystal filters. A total of 22 poles of i.f. selectivity are used. A simplified block diagram is shown in Fig 1.

On receive, incoming signals pass through one of 10 computer-selected bandpass filters and a pin diode attenuator to the push-pull rf amplifier. The pin diode attenuator is both manually and agc controlled. The rf amplifier doubles on transmit as a predriver and uses 2N4427 overlay transistors. The first mixer, using a Schottky diode ring, converts to an i.f. of 73·115MHz; this mixer also serves as the signal frequency mixer on transmit. The usual grounded-gate fet preamplifier preceeds the 20kHz-wide four-pole roofing filter at 73·115MHz before conversion down to the main i.f. at 8·9875MHz. The second mixer, comprising a balanced pair of dual-gate fets, is followed by a further 20kHz-wide four-pole filter, the noise blanker gate and the main eight-pole i.f. block filters. Variable bandwidth is provided in the usual Yaesu fashion by further mixing up to 10·76MHz, passing through a six-pole filter and then mixing back down to 8·9875MHz using the same vcxo. Optional narrow-bandwidth filters for 8·9875MHz and 10·76MHz may be fitted for cw operation. Separate detectors are used for a.m. and ssb, and a separate 455kHz i.f. strip and demodulator for fm.

On transmit, ssb generated at 8·9875MHz, using a separate six-pole ssb filter, is passed through the speech processor to the main i.f. filter block and the transmitter i.f. amplifier. At this stage, a.m. or fm signals are injected from separate modulators when these modes are selected. CW keying is also performed at this low level. A push-pull dual-gate mixer converts the transmit signal to 73·115MHz where it is filtered and mixed to final frequency. Amplification and filtering at final frequency uses stages common to the receiver followed by a three-stage wideband power amplifier to the 100W level.

Oscillator injection for the 8·9875MHz product detector and balanced



Rear view of the FT-ONE

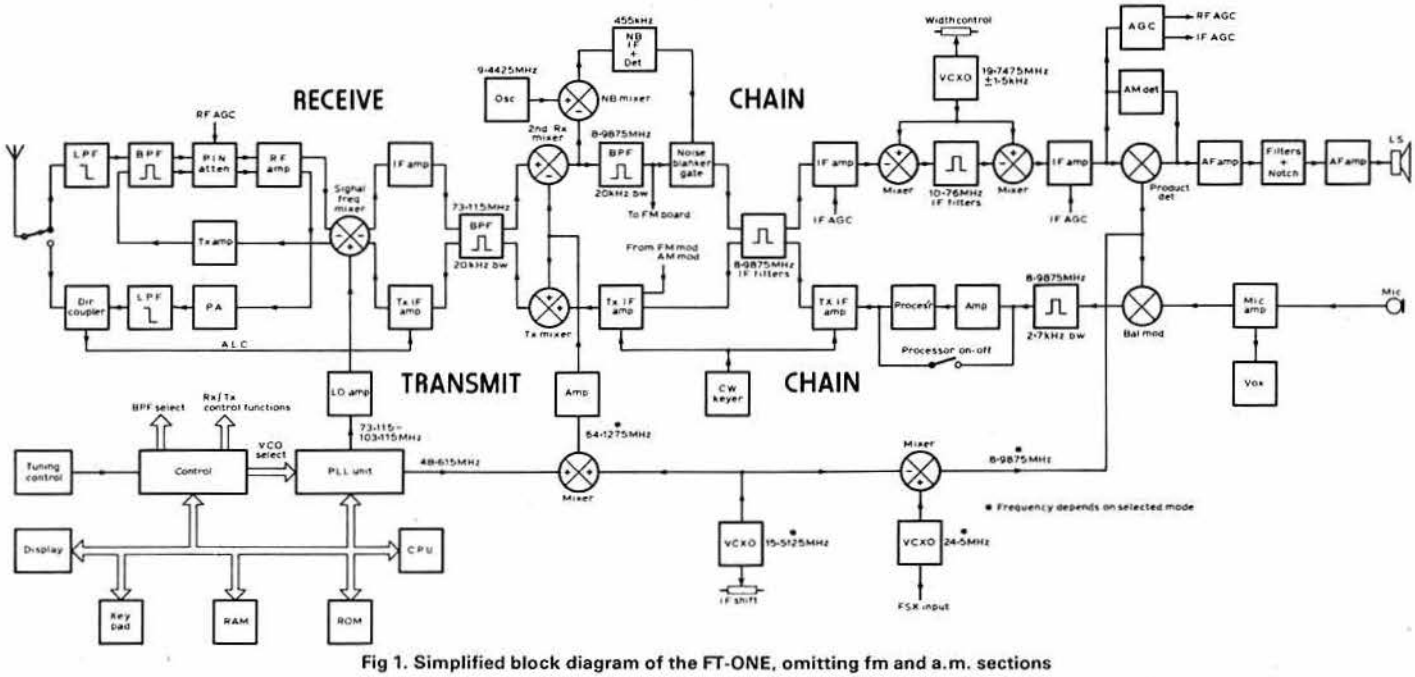


Fig 1. Simplified block diagram of the FT-ONE, omitting fm and a.m. sections

modulator is derived from mixing 24·5MHz and 15·5125MHz vcxos. The latter vcxo provides the i.f. shift function. Local oscillator injection for the receiver second mixer and transmitter first mixer is derived from mixing the 15·5125MHz vcxo with a 48·615MHz signal from the pll unit. Local oscillator injection for the signal frequency mixer lies in the range 73·115–103·115MHz. This is obtained from one of six vcos, each tuning a 5MHz range. Four separate phase locked loops are used to generate this injection signal in steps down to 10Hz. The pll unit is controlled from a four-bit microprocessor which also selects relevant bandpass and lowpass filters via the control unit from frequency information provided by the keyboard, memory, tuning control photochopper and other front-panel controls.

Measurement technique

The measurement technique adopted was substantially the same as that used in previous reviews [1]. All signal input voltages are given as pd across the antenna terminal. When performing transmitter or receiver two-tone intermodulation measurements, the amplitude of intermodulation products generated is quoted with respect to either tone of the test signal.

Unless stated otherwise, all measurements were made on ssb with the audio gain set to give about 100mW af output, width control to maximum, shift control central and the audio filter switched out.

Receiver measurements

Sensitivity

Table 1 shows the sensitivity results obtained on ssb and a.m. The figures on ssb indicate a noise floor between −130 and −134dBm or a noise figure between 7 and 11dB. The a.m. figures were obtained with the generator modulated by a 1kHz tone to a depth of 30 per cent. The receiver bandwidth on a.m. was 6kHz with the optional a.m. filter fitted. FM sensitivity measurements were made at 28MHz with the generator frequency modulated by a 1kHz audio tone to give a peak deviation of 3kHz. The input for a 10dB s+n:n ratio was 0·63μV. Note that the standard fm board is provided with a 15kHz-wide 455kHz i.f. filter. The item reviewed was fitted with a 9kHz-wide filter available from SMC for £3.50 plus VAT.

The range of the rf attenuator control was measured as 32dB at 1·8MHz rising to 48dB at 28MHz.

Table 1. Receiver measurements (1)

Frequency	Sensitivity for 10dB s+n:n SSB	A.M.	Input for S9
1·8MHz	0·16μV (−123dBm)	1·8μV (−102dBm)	4·5μV
3·5MHz	0·14μV (−124dBm)	1·6μV (−103dBm)	4·0μV
7MHz	0·16μV (−123dBm)	1·6μV (−103dBm)	4·0μV
10MHz	0·16μV (−123dBm)	1·6μV (−103dBm)	4·0μV
14MHz	0·20μV (−121dBm)	2·0μV (−101dBm)	4·5μV
18MHz	0·20μV (−121dBm)	2·0μV (−101dBm)	4·5μV
21MHz	0·22μV (−120dBm)	2·2μV (−100dBm)	5·0μV
24MHz	0·22μV (−120dBm)	2·2μV (−100dBm)	5·0μV
28MHz	0·22μV (−120dBm)	2·2μV (−100dBm)	5·6μV

S-meter calibration

The input signal level required to give an S9 meter reading is shown in Table 1. At 14MHz the S-meter calibration was:

S-reading	Input signal	Relative increase
S1	0·9μV	
		4·5dB
S3	1·5μV	
		3dB
S5	2·1μV	
		3·5dB
S7	3·1μV	
		3dB
S9	4·5μV	
		15dB
S9+20	25μV	
		17dB
S9+40	178μV	
		31dB
S9+60	6·3mV	

Spurious responses

Table 2 shows the rejection of the primary image frequency which occurs 146·230MHz above the frequency to which the receiver is tuned, and also rejection of the first and second i.fs together with sub-multiples of the first i.f. These sub-multiples are due to harmonic generation in the first mixer, and can occur at levels worse than the 73·115MHz response on bands where the input filters offer little rejection. There was no detectable response on any band at the 10·76MHz i.f.

To check for internally-generated spurious signals, the antenna socket was terminated in 50Ω and the receiver set on auto-scan across the entire frequency span of 150kHz to 30MHz. Although a number of weak spurii were identified, notably at 442 and 771kHz above each megahertz and at frequencies associated with internal crystal oscillators, just one response on usb only at 22·000MHz was strong enough to move the S-meter (S3). In addition, at certain frequencies across the range of the receiver, a strange "drifting pulsating burble" up to S5 was received. According to the distributors, this occurred with some of the early sets and is due to instability in the local oscillator unit. This does not occur in current production models.

Other spurious responses were checked by setting the signal generator on either side of the on-tune frequency and noting the amplitude for any responses obtained corresponding to an S1 meter reading. The generator was tuned from 100kHz off frequency down to 1MHz and from 100kHz off frequency up to vhf. Generator harmonics, image and i.f. responses were ignored.

Frequency	Worst response	Other responses
1·8MHz	16mV	5 up to 70mV
3·5MHz	16mV	9 up to 70mV
7MHz	7mV	many 20-70mV
10MHz	5mV	many 10-25mV
14MHz	8mV	many 10-25mV
18MHz	6mV	many 20-70mV
21MHz	11mV	many 20-70mV
24MHz	4·5mV	many 20-70mV
28MHz	4·5mV	many 20-70mV

Most of the spurious responses occurred at 113 and 886kHz above each megahertz.

AGC performance

The agc threshold was measured as 1·3μV. A 10dB increase in rf input above the threshold level resulted in a 1dB increase in audio output. A further 100dB increase in the rf input resulted in a further 1·2dB increase in audio output. The attack time for a 20dB increase in a 100μV signal was measured as about 5ms in the fast position or 50ms in the slow position. Corresponding decay times for a 20dB decrease in a 1mV signal were measured as 20ms and 1·2s respectively.

Selectivity

The i.f. selectivity was measured with the width control set to maximum on ssb and on the two narrower bandwidth cw settings. It was not possible to measure more than about 55dB down the skirts of the ssb filter before local oscillator noise masked the wanted signal. Considering the level of oscillator sideband noise, 22 poles of i.f. selectivity seems rather unnecessary.

Response	SSB filter bandwidth	CW (medium) bandwidth	CW (narrow) bandwidth
−3dB	2·5kHz	390Hz	230Hz
−6dB	2·7kHz	530Hz	320Hz
−10dB	2·9kHz	620Hz	370Hz
−20dB	3·1kHz	750Hz	460Hz
−40dB	3·4kHz	870Hz	630Hz
−50dB	3·6kHz	970Hz	720Hz
−60dB	Noise	1,080Hz	840Hz

The ripple in the passband of the ssb filter was about 0·5dB and the skirt response of all the filters was reasonably symmetrical.

Oscillator sideband noise

Noise on the spectrum of the local oscillator, in particular phase noise, gives rise to reciprocal mixing between the noise and signals on adjacent frequencies and can result in components within the i.f. passband. If excessive, oscillator sideband noise will result in a widening of the effective

Table 2. Receiver measurements (2)

Frequency	Image rejection	8·9875MHz i.f. rejection	73·115MHz i.f. rejection	36·557MHz half i.f. rejection	24·372MHz third i.f. rejection	18·278MHz quarter i.f. rejection	14·623MHz fifth i.f. rejection
1·8MHz	102dB	–	98dB	–	–	–	–
3·5MHz	102dB	119dB	103dB	–	–	–	–
7MHz	116dB	83dB	101dB	–	–	–	–
10MHz	100dB	80dB	102dB	–	–	103dB	102dB
14MHz	110dB	116dB	98dB	–	91dB	96dB	98dB
18MHz	103dB	–	94dB	–	91dB	97dB	99dB
21MHz	94dB	–	92dB	79dB	90dB	98dB	112dB
24MHz	89dB	–	89dB	78dB	90dB	98dB	114dB
28MHz	84dB	–	89dB	77dB	90dB	99dB	116dB

Note: dashes signify an unmeasurable response

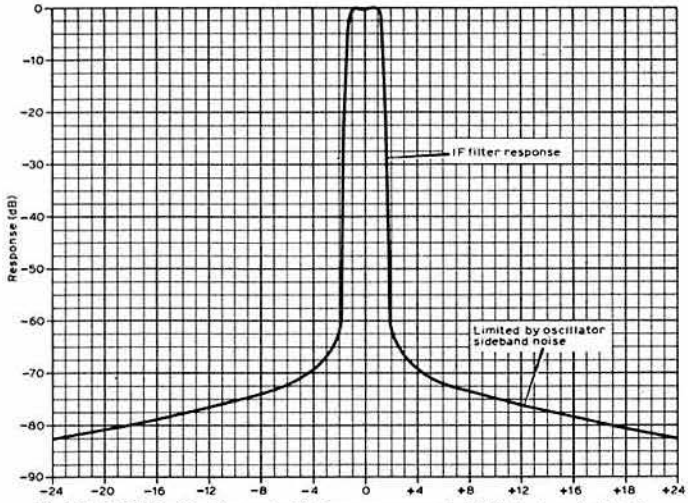


Fig 2. FT-ONE effective selectivity curve on ssb (2·5kHz bandwidth)

receiver skirt selectivity and reduction of dynamic range. Reciprocal mixing measurements were made by connecting a signal generator to the antenna socket, tuning the receiver away from the generator frequency and noting the generator level required to give a 3dB increase in noise output from the receiver. This level can then be related to the noise floor of the receiver. It is essential to use a generator which has a noise spectrum considerably lower than that of the local oscillator being evaluated, and to ensure that this was the case an ssb filter with suitable matching transformers was inserted between the generator and the receiver. Measurements made at 10·7MHz on ssb (2·5kHz bandwidth) were:

Frequency offset	Input level	Level wrt noise floor
3kHz	−63dBm	69dB
5kHz	−61dBm	71dB
10kHz	−57dBm	75dB
15kHz	−54dBm	78dB
20kHz	−51dBm	81dB
30kHz	−45dBm	87dB
40kHz	−40dBm	92dB
50kHz	−37dBm	95dB
75kHz	−32dBm	100dB
100kHz	−29dBm	103dB
150kHz	25dBm	107dB
200kHz	−22dBm	110dB
300kHz	−20dBm	112dB

The effective selectivity curve is shown in Fig 2.

Third-order intermodulation

Measurements were made on 7 and 28MHz with signal spacings of 200kHz. This wide spacing was necessary to avoid masking of the products by oscillator noise. On 28MHz two signals each of −32dBm (5·6mV) gave rise to third-order products at 10dB s+n:n ratio. This corresponds to a third-order intercept of +12dBm and, related to the noise floor of the receiver, a spurious free dynamic range of 95dB in a 2·5kHz bandwidth. Measurements at 7MHz gave a similar dynamic range of 95dB and a third-order intercept of +9dBm. The rf attenuator control improved intermodulation performance but the rf gain control had no effect. Oscillator noise prevented the full dynamic range from being achieved up to 50kHz off frequency.

In-band linearity was assessed with signal spacings of 200Hz, centred in the i.f. passband, and the af output viewed on a spectrum anayser [2]. With input signals of 2μV, third-order intermodulation products were −34dB. Above 20μV, third-order products were constant at −30dB. Reducing the rf gain control reduced the level of intermodulation products dramatically to −50dB even with signal levels as high as 100mV.

Blocking

Due to the action of the agc-controlled rf input attenuator, blocking—caused by gain compression of the front end—varied according to on-tune signal level. With a 5μV input signal, blocking occurred at about 35mV (−16dBm). Below 5μV, oscillator noise prevented measurement. With a 50μV signal, blocking occurred at 160mV (—3dBm), and with a 500μV signal, at 280mV (+2dBm). Frequency offsets of 100, 200 and 500kHz gave identical results.

Audio

The maximum audio power output into a 8Ω load was measured as 1·8W at about one per cent distortion before the onset of clipping. Maximum audio output could be achieved with a 0·5μV input signal.

Transmitter measurements

Power output on cw, fm, fsk and a.m.

The drive control may be used to set the power output from virtually zero to full cw ratings. On full power cw, the pa collector current, IC, indicated between 15·5 and 17A. The present operating manual states that on fm and fsk, IC should be limited to 10A, and on a.m. to 5A carrier. It is possible to drive to full cw ratings but overheating of the pa could result. Driving to the recommended values gave the following output powers:

Frequency	CW power output	FM/FSK power output	A.M. carrier power output
1·8MHz	125W	35W	11W
3·5MHz	118W	36W	11W
7MHz	115W	35W	10W
10MHz	112W	36W	10W
14MHz	112W	38W	11W
18MHz	112W	46W	14W
21MHz	114W	44W	15W
24MHz	114W	43W	14W
28MHz	105W	42W	13W

The power derating on fm, fsk and a.m. is unnecessarily conservative, and Yaesu currently recommend driving to 50W output on fm and fsk and 25W carrier output on a.m.

Harmonics and spurious outputs

Harmonics and other spurious outputs were measured on cw at full power output.

Frequency	Harmonics	Other spurii
1·8MHz	−55dB	Less than −80dB
3·5MHz	−58dB	Less than −80dB
7MHz	−58dB	Less than −80dB
10MHz	−58dB	Several −70 to −80dB
14MHz	−58dB	Five −65 to −75dB
18MHz	−55dB	Several −66 to −80dB
21MHz	−58dB	Several −70 to −80dB
24MHz	−53dB	Several −70 to −80dB
28MHz	−55dB	Several −68 to −80dB

SSB power output and distortion

Audio tones of 700Hz and 1·7kHz were applied to the microphone socket. With the processor switched off, and the microphone gain control set to give an alc meter reading of half fsd, the following two-tone results were obtained:

Frequency	Power output (p.e.p)	Intermod products 3rd	Intermod products 5th	Intermod products at ±10kHz	Intermod products at ±20kHz
1·8MHz	120W	−32dB	−36dB	−65dB	−72dB
3·5MHz	112W	−31dB	−36dB	−63dB	−74dB
7MHz	110W	−28dB	−35dB	−64dB	−74dB
10MHz	110W	−24dB	−35dB	−60dB	−70dB
14MHz	110W	−24dB	−42dB	−60dB	−72dB
18MHz	110W	−20dB	−40dB	−58dB	−72dB
21MHz	112W	−21dB	−46dB	−60dB	−70dB
24MHz	114W	−20dB	−41dB	−60dB	−72dB
28MHz	103W	−26dB	−38dB	−60dB	−72dB

On 1·8MHz, 32W p.e.p. could be obtained at −34dB ips.

With the speech processor in operation, additional distortion was generated which was largely confined to the audio bandwidth of the transmitter. With the compression level between 2 and 25dB, this distortion level was relatively constant. Figs 3 and 4 show the two-tone spectrum with and without the processor in operation. The frequency span in both cases is 10kHz and the vertical scale 10dB/division.

The carrier suppression was −56dB with respect to 100W output. The sideband suppression with a 1kHz audio tone could not be measured as this was lower than the wideband transmitter noise level. The transmitter noise output, measured with single-tone audio drive, was about −70dB wrt 100W in a 30Hz bandwidth at ±4kHz.

Audio

The transmitter audio performance was evaluated with the processor off. The frequency response was measured as 340Hz to 2·87kHz between the −6dB points. Full output could be achieved with 0·5mV af input. The audio distortion was low; the second harmonic of a 1kHz tone driving the transmitter to 100W output power was at a level of −60dB.

Frequency stability

The frequency drift was exceptionally low even for a crystal oscillator referenced synthesizer. On 28MHz transmit in transverter mode, the frequency drifted 10Hz lf during the first 10 min after switch-on, after which time the frequency stayed within 3Hz during the next 2h.

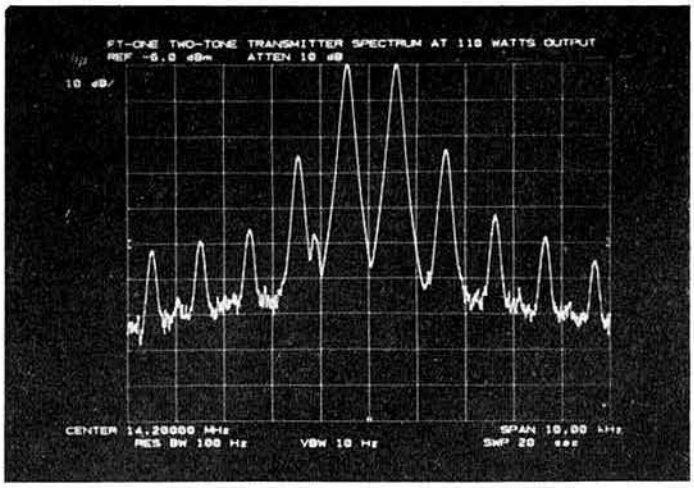


Fig 3. Two-tone transmitter spectrum with processor off

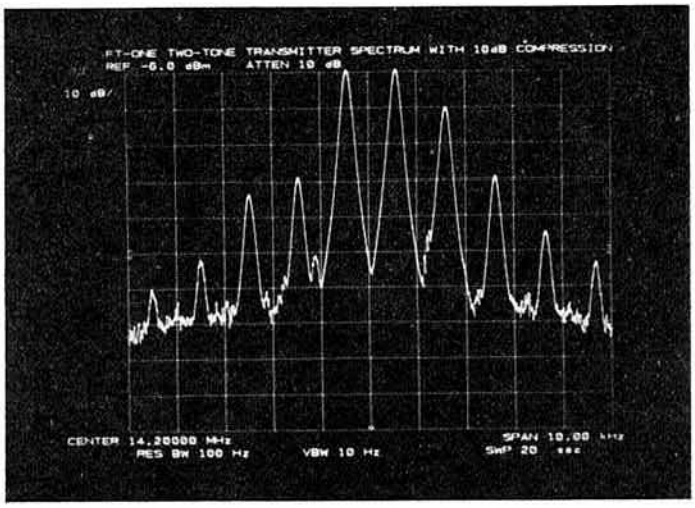


Fig 4. Two-tone transmitter spectrum with 10dB speech compression

Transverter mode

Low level rf output for transverter operation may be selected by linking pin 4 to +13·5V (pin 5) on accessory socket ACC2. This is not obvious from the operating manual. With this link connected, the pa is disabled and rf drive is routed to the low-level rf output connector. On cw, 1mW output was obtained at 1·8MHz, rising to 4mW at 28MHz. On ssb at 28MHz, 3·5mW p.e.p. could be obtained with −30dB two-tone intermodulation products, or 1·2mW p.e.p. at −40dBips.

On the air performance

The transceiver was used for a period of two months from the home station and also during HF NFD, and in conjunction with a 70MHz transverter during VHF NFD.

In general, the receiver performed very well, coping with strong and weak signals on 7MHz. The limited dynamic range on adjacent channels due to oscillator noise was not immediately obvious, and cases of signal overloading were virtually non-existent. Switching from usb to lsb is accomplished without a change in frequency, and this can be useful for checking sideband suppression and splatter of other transmissions. The headphone jack is not stereo compatible.

When a memory position is selected, any subsequent tuning rewrites into the memory and the original frequency is lost. This has both advantages and disadvantages. A better system may have been to use a store or enter button. The scan facility was not found to be particularly useful at hf, but this facility could be of more use in conjunction with vhf transverters. However, there are no limits to the scan range, and once set scanning will continue to do so throughout the entire range of the receiver until a signal is found. Tuning from the microphone was found to be a little fast for ssb. A 10Hz step size was generally preferred for tuning cw, and sounded much like an analogue vfo. A 100Hz step size was more convenient for ssb. When tuning close to a strong carrier with 10Hz step size and a quiet background, clicks every 100Hz were audible. This appears to be fairly common with present-day synthesizers. However, in practice these clicks presented no real problem.

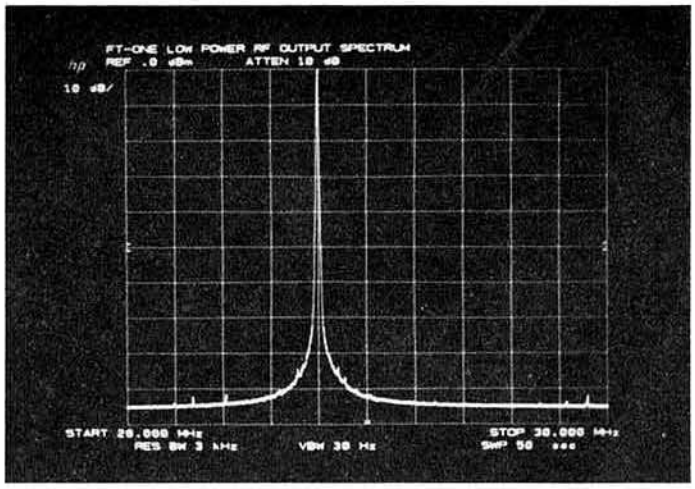


Fig 5. Transverter low-power output spectrum

On transmit, excellent quality reports were received with a YM35 microphone, both with and without the processor. About 10 to 15dB compression appeared to be optimum. On cw, local stations reported key clicks up to ±5kHz, and wideband noise was audible to ±10kHz or more with a quiet background. Full break-in was most impressive, allowing the presence of on-frequency signals to be identified immediately even while transmitting at speeds up to 30wpm. Break-in continued to function perfectly even when transmit and receive frequencies were on totally separate bands. The built-in keyer incorporates a single dot or dash store and can be iambic in operation.

Early FT-ONEs exhibited problems with the i.f. board and switched mode power supply. Current transceivers on sale from factory approved distributors exhibit no such problems. The item reviewed was equipped with a conventional mains power unit.

Manuals

Two manuals are included as standard with the transceiver. The 36-page *Operating Manual* covers operation of the controls, installation of the equipment and fitting of the options. The 122-page *Technical Manual* covers circuit description, modifications, full service information, parts lists and all circuit and layout diagrams. The two manuals together provide complete documentation.

Conclusions

The FT-ONE offers virtually every facility available on any present-day hf transceiver, together with a wide ultimate dynamic range, flexible frequency control and excellent cw break-in. It is a pity that the local oscillator sideband noise is not lower, as this is degrading close-in dynamic range. This is a common problem with synthesized equipment.

The basic transceiver costs £1,295 incl VAT, with the keyer, r.a.m. board and fm unit extra. The additional eight-pole i.f. filters are reasonably priced at £15·35 incl VAT, and the six-pole 10·76MHz cw filter is £13·80.

Acknowledgements

The transceiver used in this review was kindly loaned by South Midlands Communications Ltd of Totton, Southampton. The reviewer would like to thank G3UFY for providing critical on-th-air comments, and fellow members of the Addiscombe Amateur Radio Club for comments on the performance during HF NFD and VHF NFD.

References

[1] "The Icom IC720A hf transceiver", P. J. Hart, G3SJX, *Rad Com* February 1982, pp 129-33.

[2] "The Trio TS830S hf transceiver", P. J. Hart, G3SJX. *Rad Com* July 1982, pp 576-80. □

TECHNICAL TOPICS

Pat Hawker, G3VA

IN RECENT MONTHS an unusually large number of articles have been appearing that stress the continued value of hf systems for professional and defence communications. It is not so many years ago since we were being told that hf would soon be left to a few radio amateurs and the hf broadcasters, and replaced by space systems for long distances and vhf/uhf for short-range tactical and mobile communications.

There appear to be many reasons for the renewed interest in hf. Undoubtedly one is the development of microprocessor control of frequency synthesizers and other automatic systems that make hf much easier to use without the services of a skilled hf operator. To quote an article "Trends in mobile military tactical communications" by Ben Chilcott of MEL (*Communications International* May 1982), brought to my notice by Harry Bradshaw, G3VTJ:

"Only the man who understood the radio, who was able to tune both it, and the antenna properly, could get the best out of it. It was true that vhf equipment suffered from its line-of-sight operating limitation, but the argument ran that satellite communication would quickly become the order of the day and extend effective line-of-sight to every corner of the battlefield.

"Why then has the pendulum swung back in the opposite direction? There are at least three very good reasons. First, military tacticians have come to realize that satellite communication systems are far more vulnerable than was once assumed . . . Second, the airwaves are becoming ever more crowded and vulnerable to ecm (electronic counter measures) . . . especially vhf. Finally recent technical developments have made it possible to overcome the traditional drawbacks of hf. Speech quality is much improved, equipment is smaller and lighter and it is possible to design sets which can be operated even by unskilled personnel after a few minutes' training."

Where does this leave the radio amateur? Not, I hope, to encourage him to neglect his operating and technical skills. HF may work well enough for those without know-how. It still works much better for those who take the trouble to understand its curious, fascinating and often infuriating ways! And with appreciation of the technical side.

144MHz handheld transceivers

The series of "owners' surveys" initiated several years ago in *Ham Radio Horizons* and continued more recently in *Ham Radio* has recently taken a look at seven popular small handheld 144MHz transceivers. These include the Yaesu FT207, Trio TR2400, Icom 2AT and 2A, Temco S1 and S5 and Santec HT1200. Not all are the latest models, some are not well known in the UK, and all are versions for the American 144 to 148MHz band. Nevertheless some general points of interest arise from the detailed surveys that apply to the European versions and to the genre generally. To pick out a few comments:

TR2400. Of 134 replies, 83 per cent indicated that the owners would buy the rig again, 43 per cent reported "no problems", 41 per cent had had some service work on the equipment; 17 per cent considered the "worst feature" to be the short battery life, 15 per cent considered the scanning rate too slow, and 10 per cent regretted lack of any high/low power switch.

FT207. Of 126 replies, 75 per cent said they would buy it again. 52 per cent reported "no problems", with 33 per cent having had some servicing work done (problems mentioned included hum on transmitted signal [seven per cent], difficulties with memory function [six per cent], or with microprocessor [five per cent]). Some 46 per cent said "worst feature" was the difficulty of reading the l.e.d. display in direct sunlight, 44 per cent regretted batteries did not last longer, seven per cent considered the keyboard too small. Of "best feature" 34 per cent liked the frequency selection facility and channel scanning, 12 per cent opted for ease of operation, and another 12 per cent for the switchable power levels.

IC2A/2AT: Of 234 replies, no less than 96 per cent said they would "buy again" what they clearly regarded as an excellent rig. Some 66 per cent reported "no problems", and only 16 per cent had had any servicing work carried out. Fifty four per cent opted for small size, and 31 per cent the quick-change battery packs as "best feature"; also mentioned were ease of operation (14 per cent), price (11 per cent), quality of receiver (10 per cent), audio quality (eight per cent) and reliability (eight per cent). Most-disliked features were: switch positions on back (20 per cent), batteries drain too fast (17 per cent), too little audio output (11 per cent) and difficulty in obtaining accessories (eight per cent).

It is significant that a common feature of these reports is the feeling that battery consumption is excessive, particularly on the higher transmitter power levels, suggesting that a high/low output switch is a very useful feature with such rigs. Makers' specifications for power consumption on these three units are:

	TR2400	FT207	IC2A
Receive	28mA	150mA	130mA
Receive (with squelch)	—	35mA	20mA
Transmit (high)	500mA	800mA	550mA
Transmit (low)	—	250mA	220mA
Power output (high)	1·5W	2·5W	1·5W
Power output (low)	—	0·2W	0·15W
Weight	740g	680g	490g

It is interesting that on the basis of "would buy again" markings, the Icom units score highest of any of the units surveyed, doing well on weight and power consumption, yet having no memory channels, no scanning and no "odd splits". Since many amateurs use these handhelds only as "second units", it would seem that users prefer simplicity, economy and reliability to some of the microprocessor-type features that tend to increase battery consumption.

VK3ABP 144MHz converter

There must surely still be a need for a simple and basic 144MHz converter that makes no claims to being state-of-the-art. In *Amateur Radio* May 1982, (pp14–6) W. M. Rice, VK2ABP, provides a 1982 solidstate version of a 144MHz converter which he first described (with valves) in November 1962, and which in its time tempted many hundreds of Australian amateurs on to the band (which in Australia covers 144 to 148MHz). The 1982 model (Fig 1) uses an MPF131 dual-gate mosfet amplifier, 2N3819 junction fet mixer and 2N3563 bipolar transistor overtone oscillator providing output at about 116, 120, 130MHz etc, depending on what i.f. you wish to use and whether you want to cover 2 or 4MHz. There are many suitable alternatives to these particular devices, though for the junction fet mixer it should be noted that different devices often have different pin connections.

For the Australian band VK3ABP suggests a 40·000MHz crystal to provide an i.f. of 24 to 28MHz, but for IARU Region 1 (and using an amateur-bands-only receiver) a more convenient choice would be the traditional 116MHz oscillator calling for a 38·667 crystal. This is unlikely to require any changes in component values etc. With suitable inductors etc, the converter could also get you on to the still under-used 70MHz band.

The three air-cored coils, L2, L3, L4 are mounted in line to provide inductive coupling, and can be adjusted by "knifing" the coils into two parts and spreading them apart with a non-metallic blade while watching for the signals to peak. L5 may need slight adjustment of the core to obtain reliable oscillator starting, and this has a small effect on the oscillator frequency. The 11 fixed capacitor should be of disc or bead type ceramics; the six 470pF capacitors can be the usual Hi-K bypass type, but the remaining five should be more stable and preferably have negative temperature coefficients of N470 or N220.

VK3ABP has the following advice on winding the coils: "All coils are close-wound. It is recommended that L1 and L5 be prewound on a suitable diameter drill or other mandrel so that when they uncoil slightly after winding they will be a snug fit on the Neosid formers. A No 14 drill (0·182in, 4·6mm) is best. The coil may need to be sprung open a little farther to slide over the former, and when released will lock in place. Leads can be bent and tinned so as to drop into the appropriate holes in the pcb. The tap on L1 is made before winding by twisting a small one-turn loop in the wire and tinning it. After the two end connections are soldered in, the tap is connected to the board with a piece of scrap resistor pigtail. This prewinding technique is not appropriate for the i.f. transformer because the wire is too fine, but winding direct on to the mounted former is quite simple. Use a dab of quick-setting glue or a little melted beeswax to hold the winding in place. The three-turn secondary is wound over the "earthy" end of the primary in the same way, perhaps with a layer of cellulose tape between the windings, although this is unnecessary with tough enamel wire (all windings must use enamelled wire). The remaining three coils are prewound on appropriate mandrels, eg drills of 0·312in for 8mm and 0·25in for 7mm. Their end leads bent out radially and tinned so that the coils will line-up on the board on a common axis parallel to the surface."

VK3ABP also provides a good deal of advice on preparing the pcb and drilling it. Total power consumption of the converter is about 10mA at 12V.

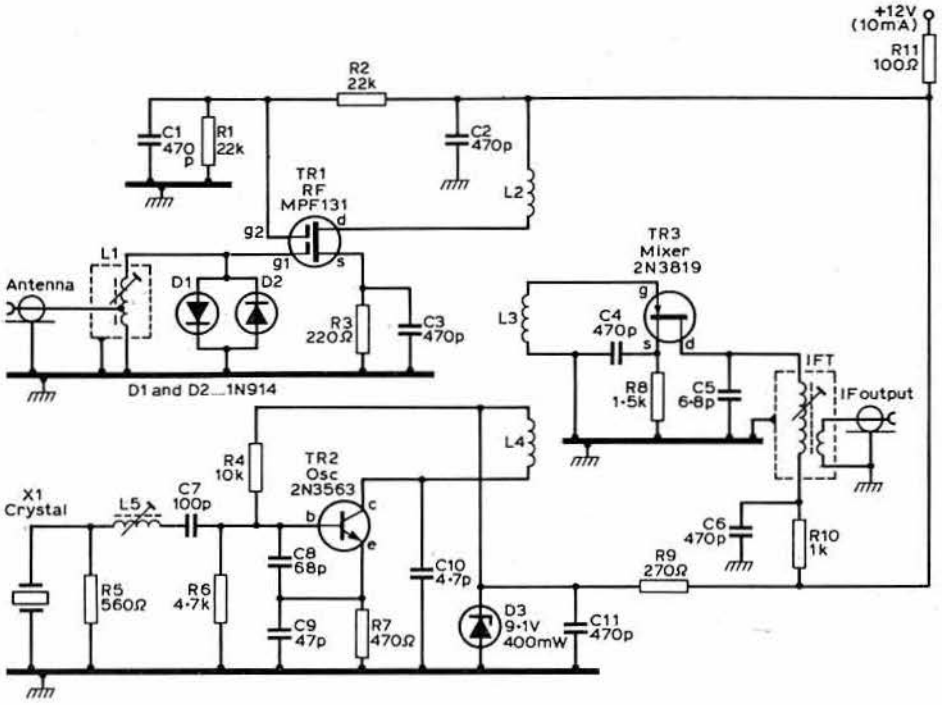


Fig 1. Not state-of-the-art but still a reasonably effective form of 144MHz converter (VK3ABP)

Coil data
L1 6·5 turns on 5mm Neosid, tapped at 1·75 turns
L2 6 turns on 8mm id, self-supporting
L3 6 turns on 8mm id, self-supporting
L4 5 turns on 7mm id, self-supporting
L5 9·5 turns on 5mm Neosid
IFT 43 turns on 5mm Neosid, three-turn secondary
L2, L3, L4 mounted in line, spaced about 1mm
Enam copper wire: **L1 to L4** 22swg (20 B&S)
L5 28swg (26 B&S)
IFT 39swg (36 B&S)
All windings closewound
IFT turns are for 24-28MHz i.f. and should be suitably reduced for 28-39MHz

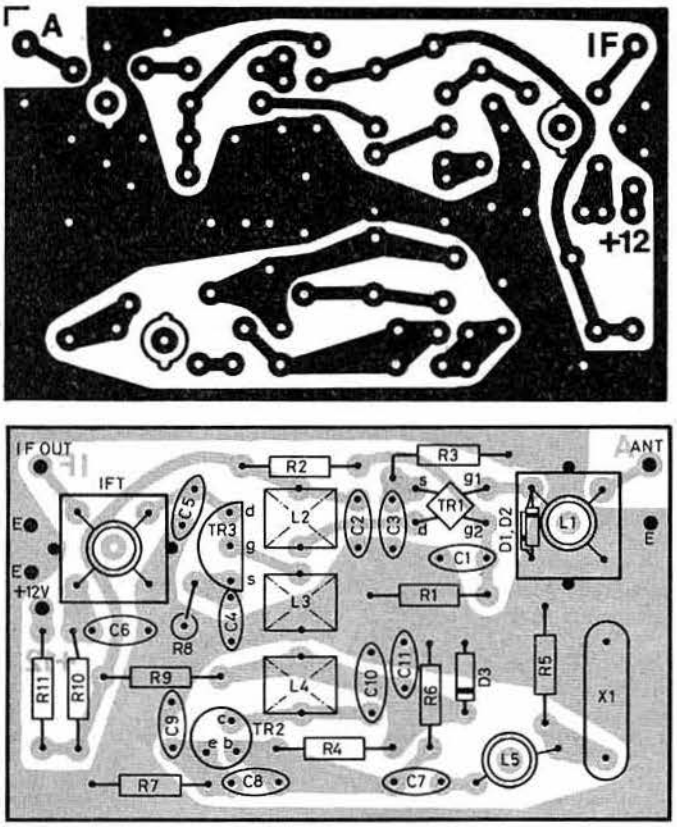


Fig 2. PCB and component layout for the VK3ABP 144MHz converter

Lithium batteries

Military manpack communications equipment has sometimes to be designed to meet a user requirement that it should be capable of operating continuously throughout a 24h mission, often with a specified duty cycle of "transmit" and "receive" times. This is not an easy specification to meet with lightweight batteries, and has not been made easier by the increasingly complex nature and not insignificant load represented by modern frequency-synthesized equipment.

One way of overcoming this problem is to specify the use of high-energy lithium batteries, although these are often still considered too costly for general use. In practice lithium batteries are sometimes specified for combat use or during major training exercises, with a lower-cost standard battery-pack specified for routine training exercises where weight and extended mission-life are of lesser importance.

For many years it has been recognized that the metal lithium offers the possibility of electrical cells of greatly improved energy density. Today there are a number of different lithium batteries. For example, in the UK high-performance lithium sulphur dioxide ($LiSO_2$) batteries are currently manufactured, under licence, by the Vidor division of Crompton Parkinson Ltd. These provide, when new, 2·8V/cell and have up to 30 times higher energy density than a conventional carbon-zinc cell. In terms of Wh/kg, a lithium sulphur dioxide cell rates 275 compared with 88 for mercury cells, 84 for alkaline manganese cells and 44 for carbon zinc cells. Equally important for some applications is that they have a shelf life of at least 10 years, and can work effectively over the wide temperature range of −50°C to +70°C.

For example, a Vidor "Eternacell" type G20, equivalent in size to a standard "D" cell, has a rated capacity of 7·7Ah for a load of 323mA and weighs 80g. It will provide a continuous 1A at 20°C to a 2V cut-off point for a minimum of 7h.

A detailed article "Lithium batteries for super power applications" in *Middle East Electronics* July/August 1982 (based on information provided by Vidor) suggests that such batteries are poised to become accepted as a standard power source for an increasing number of industrial and military applications, particularly where microprocessors form part of the equipment. It therefore seems important to note that a number of safety factors need to be taken into account, particularly when using the larger units. Batteries in production range from miniature (½AA) sizes up to the G22 (2D) and the G62 which has a 30Ah capacity, rated load of 1,250mA, weighs 280g, has a 41·7mm diameter, and is 141·2mm in height.

Precautions are needed to prevent the build-up of excessive internal pressure or uncontrolled venting with consequent risk of explosion in the event of (a) accidental incineration, (b) exposure to abnormally high temperatures or (c) prolonged short circuit. Surge resistant fuses are incorporated in some $LiSO_2$ batteries to prevent overheating from a prolonged short-circuit. Care needs to be taken in disposing of worn-out cells. The manufacturers suggest: "They may be buried in a secured landfill or a landfill where they can be dispersed in large quantities of solid waste; incinerated in a waste disposal furnace with adequate flue gas scrubbing; or returned to the battery manufacturer". One has the impression that apart from the explosion hazard, the materials used in these cells need to be treated with respect.

This form of $LiSO_2$ cell is not designed for recharging, although—as with some other primary cells—a limited degree of charging is possible (trickle charging at a few milliamps or short-term, higher-current charging at a 20h rate) without causing venting. The cells, although nominally sealed, are provided with a special safety vent to reduce the risk of excessive internal pressures building up.

To sum up, $LiSO_2$ cells clearly offer an effective and superior energy source for communications and other portable electronic equipment

drawing appreciable power, though for the time being cost considerations seem likely to restrict their use primarily to defence and industrial applications.

Flexible battery charger

A considerable number of circuit arrangements for battery chargers for nicad or lead-acid cells have been published in *TT* and elsewhere. However, an unusual combination of useful features can be found in a low-cost charger described by Huynh Trung Hung in the "Designer's Casebook" section of *Electronics* (14 July 1982, p155):Fig 3. This is designed to provide a constant charging current of 400mA to a 7·2V, 4Ah nicad battery, but can be readily adapted for other voltages or for currents up to 1A. The charger is protected against overcharging a nicad battery by switching off the charging current automatically when a predetermined voltage is reached across the battery under charge; with nicad batteries this voltage increases quite rapidly as the fully-charged state is reached. The turn-off voltage is fully adjustable by means of RV1. For a 7·2V nicad battery the end-of-charge voltage should be set between 7·9 and 8V. An l.e.d. glows to indicate charging and acts as a useful pilot indicator. The charging current is determined by the value of R6.

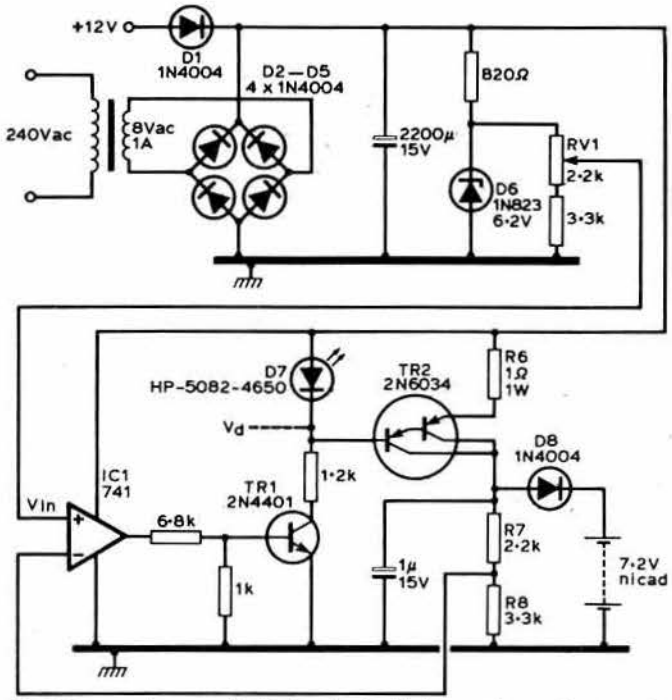


Fig 3. Battery charger suitable for nicad cells that can be used on ac mains or 12V car batteries with automatic switch-off when battery is fully charged

The charger is protected against a short-circuit, and arranged to operate from either 240V ac mains or directly from a 12V car battery. With a discharged battery the voltage at the inverting input of the op-amp is lower than the non-inverting voltage, Vin, and TR1 and TR2 are turned "on". When the two voltages are equal the output of IC1 is, in effect, grounded and TR1, TR2 switch "off". TR2 should be mounted on a suitably large heatsink. The preset output voltage can be calculated from Vin (R7 + R8)/R8.

Transmitter loading

Only a minority of amateurs design their own equipment from first principles. Even in the days when most transmitters were home-built the usual practice was to take all or part of the design from constructional articles or the handbooks etc. Nothing wrong with that of course, but it does mean that we sometimes tend to think in over-simplifications and the "black box" concept. One of the results has been the long-standing belief that you can measure the "goodness" of an antenna by the minimum swr you obtain when feeding it directly from the "50Ω" transmitter output. That idea is gradually (very gradually) vanishing but it is being replaced by the belief that, with a 50Ω output socket, the transmitter can be considered as a power generator with a 50Ω *source impedance*, and that the whole business of feeding the antenna can be regarded as a straightforward example of the power transfer theorem. Its a convenient and attractive idea, but as various amateurs, including Tony Harwood, G4HHZ, and others have pointed out, "it just ain't so".

The whole business of delivering power from valves and transistors into a load is altogether more complex than that. In the valve era one remembers the diagrams showing how a "load line" could be plotted; then there was the design of pi-networks with all that talk of loaded Q and unloaded Q. In reality, it is a matter of finding a load impedance that permits the optimum voltage swing to be achieved with the minimum permissible distortion, and the voltage swing will be related to the supply voltage, whether for valves or the much lower voltages for semiconductors. What this means in practice is that the equivalent "source impedance" of a transmitter is *not* the 50Ω that is usually specified as being the optimum load impedance. Indeed, for a Class C amplifier it is roughly twice the internal impedance.

To quote once again from the classic series of articles written by Walter Maxwell, W2DU, in *QST:* "The reason for this difference may be more fully appreciated when we consider that the classical network generator has a maximum efficiency limit of 50 per cent because it delivers its maximum available power when its load impedance equals its internal resistance. But in the Class C amplifier the effective internal ac impedance is about half of its optimum load impedance because the current pulses which excite the loaded tank are of high peak value and short duration, while the instantaneous anode voltage during current flow is very low. This results in proportionately less power lost in the generator and more delivered to the load, enabling it to operate at an efficiency as high as 75 per cent or more." So, load a transmitter with 50 resistive ohms, but do not think of it as a 50Ω generator.

Tips and topics

Gerald Stancey, G3MCK, notes the reference by G4JQY (*TT* February 1982) to his belief that "with a copy of *Solid State Design for the Radio Amateur* (ARRL), a reasonable electronic voltmeter and a signal generator, anyone with half an interest in homebrewing need not question the wisdom of having a go (at a 70MHz direct-conversion transceiver or other solidstate projects)".

G3MCK agrees with this but suggests that even if you have no conventional signal generator a very effective low-cost substitute for most constructional projects can take the form of a simple crystal oscillator with a selection of spare crystals.

More thoughts on "ideal" hf receivers

In the September 1982 *TT* an outline was given of a 1981 paper by William Sabine, W0IYH, which discussed in some detail the thinking behind the current trend towards broadband front-ends (combined with mixers of wide dynamic range) for the increasingly common up-conversion type of general-coverage hf receivers. I suggested then that while, with care, this approach can provide "acceptable" performance for most applications, and is clearly here to stay, it is not one that brings in train many advantages for the radio amateur intent on the highest possible performance during two-way weak-signal operation. It was pointed out that there is still much to be said in favour of providing a high degree of premixer rf selectivity in the "old-fashioned" form of gang-tuned LC resonant circuits in a single-conversion superhet design (or possibly pre-second-mixer with a crystal-controlled hf oscillator and double-conversion). The drawback to this form of configuration is that it has become increasingly costly to manufacture, though still reasonably economical for a home constructor. Recent professional models tend to be of the form shown in Fig 4.

The case for premixer selectivity is put strongly in an article which I had not seen when writing the earlier comments: "A reappraisal of hf receiver selectivity" by R. A. Barrs of Rediffusion Radio Systems (formerly Redifon) in *The Radio and Electronic Engineer*, Vol 52, No 7, pp315–20, July 1982. This provides a detailed assessment of the limitations still found in hf receivers, provides a quantitative analysis of the effects of these on performance, and suggests how these problems could be minimized in an "ideal" receiver design—presumably reflecting the approach to be used in a new Rediffusion professional general-purpose model costing some thousands of pounds.

The principal hindrances to good reception that result from limitations in current design on hf receivers and transmitters are listed as including:

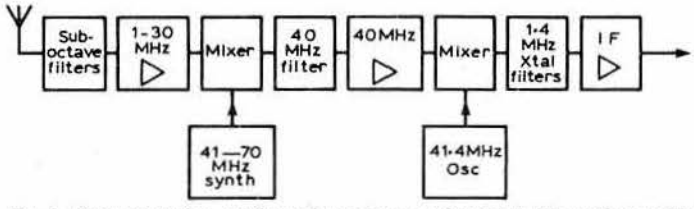


Fig 4. Representative outline of modern professional hf receiver with frequency synthesizer and up-conversion

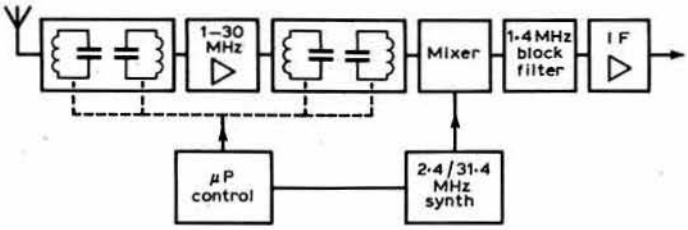


Fig 5. R. A. Barr's proposed "ideal" receiver with four ganged-tuned rf circuits to provide premixer selectivity

adjacent signals; reciprocal mixing; transmitter noise, close-in, of adjacent signals; co-located transmitter signals; wideband noise radiated from co-located transmitters; cross-modulation and blocking by strong unwanted signals; i.f. breakthrough; image (and other) spurious responses; and intermodulation products produced by strong unwanted signals. The first three of these limitations can be minimized by providing a high degree of skirt selectivity in the form of the i.f. filters, but all the others can be reduced by providing good rf selectivity.

R. A. Barr points out that the use of frequency synthesizers, double-conversion and digital "clocks" has worsened the self-generated spurious signals. He also notes that wideband modes such as ssb with 3kHz bandwidth have a higher minimum noise level than, say, cw with 300Hz selectivity filters, and are *less* demanding in terms of dynamic range than the narrowband modes.

In fact the main improvements have been better frequency resolution, improved frequency stability, sharper skirt selectivity and more facile control systems; it can be argued that only the improved skirt selectivity has direct application to amateur radio provided always that the short-term frequency stability is adequate.

The author discusses the effects of the various limitations, noting that intermodulation products (resulting from limited dynamic range) are one of the worst forms of interference, with the first mixer usually the main culprit. He shows that even with a mixer having the very good imd performance of 90dB μV (ie two input signals at a level of +90dB referenced to 1μV emf will produce third-order intermodulation products of less than 1μV emf) it can be expected that with a broadband input (2 to 30MHz) there will typically be about 28 transmissions (hf broadcast stations) delivering signals of 100mV emf at the input to the receiver. Then for an imd characteristic of 90dBμV, these 28 signals are liable to produce:

14,644 imps up to third-order at +30dBμV emf;
175,000,000 imps up to seventh-order at +10dBμV emf;
84×10^{12} imps up to 15th order at −10dBμV emf.

In practice this enormous number of spurious imd products will increase the noise floor of the receiver to about +15dBμV and also result in a high probability of noticeable interference on wanted input signals of up to about +30dBμV emf. It may be worth inserting the comment that the noise floor resulting from a mass of imd products will not normally show up in laboratory measurements of receivers.

Even with a good sub-octave filter in the front-end (for example, a filter rejecting signals outside of, say, 10–15MHz) there would still be typically about 10 stations providing signals of around 100mV emf. These would have the effect of increasing the noise floor to about +5dBμV emf and a high probability of interference on signals less than +20dBμV emf. Sub-octave rf filters clearly provide a significant advantage over the completely broadband 2 to 30MHz form of input circuit, but still limit performance unless a mixer of exceptionally wide dynamic range is used.

To summarize, R. A. Barr considers that to reduce imd to negligible proportions it is desirable that the front-end selectivity should provide attenuation of about 37·5dB at five per cent off tune and about 20dB at 2·5 per cent off tune. This can be achieved and bettered with four rf ganged-tuned circuits each with a working Q of 30 to 40 (note this does not include the local oscillator tuning, see Fig 5).

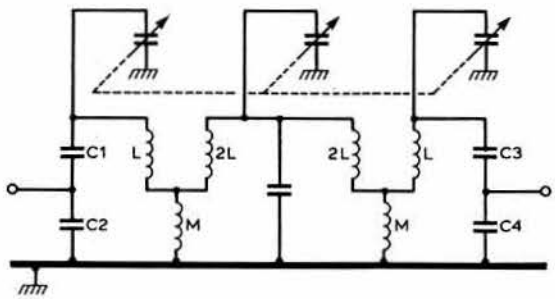


Fig 6. The Cohn tunable three-pole minimum-loss bandpass filter can provide a high degree of selectivity before a first or second mixer. Ratios C1/C2 and C3/C4 govern input and output impedance matching

In the proposed receiver the rf filter uses a four-section ganged variable capacitor with a one per cent matching accuracy; these capacitors are motor driven by a servo which is controlled from the frequency controls via a microprocessor, with errors in the gang law corrected via the program. It is claimed that only an LC filter has the ability to withstand very high input powers, has a low power-insertion loss, can be extremely linear and generates negligible noise. It also provides an input circuit well suited to withstand the effects of lightning and electromagnetic pulses (emp). It is not suggested that such an approach could, or should, be implemented for an amateur-type receiver. Nevertheless it is worth recalling such LC selective filter arrangements as the three-pole, minimum-loss filter advocated by Cohn in 1959 (see *ART* and Fig 6). This was suggested by William Sabin in 1970 for use as an i.f. tuned filter in a double-conversion design. With a high-performance first mixer, with moderate rf selectivity, followed by a tunable Cohn filter one could produce a very effective double-conversion superhet.

In his article, R. A. Barr does admit that a low-cost method of improving the performance of solidstate receivers not having such a degree of rf or first-i.f. selectivity is to use variable front-end resistive attenuators and adds: "This can be very effective when manually controlled by an expert operator". In his case he rejects this palliative since "one aim of this study is to reduce operator skills and enable multiple (remote or local) control of receivers to be implemented". In this, one must again draw attention to the difference in design aims for professional applications and those more suited to amateur-type receivers, where remote or computer control is *not* a requirement and where we should surely encourage operators to develop their skills when this is a valid means of improving performance of receivers within the budgetary limitations of the hobby.

Variable selectivity crystal filters

R. A. Barr's "ideal" receiver uses a frequency synthesizer and a novel form of variable selectivity crystal filter; it is thus not surprising that little is said in his paper about the problems of synthesizer phase noise or dynamic range limitations imposed by crystal filters. Both of these impose limitations that need to be taken into account if the very highest possible performance is sought.

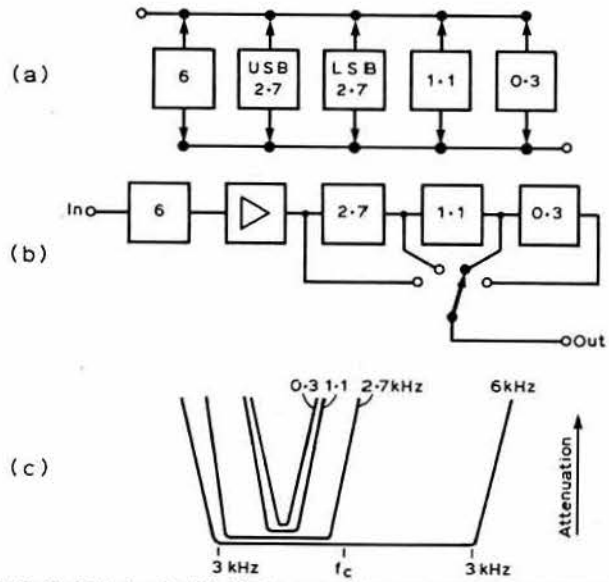


Fig 7. Variable bandwidth block crystal filter developed by Rediffusion. (a) Conventional bank of separate filters. (b) Block filter configuration. (c) Responses of block filter

The crystal filter design (UK patent application No 80/12528 "Multi-bandwidth filter" R. A. Barr and C. W. Higginbotham) provides a 1·4MHz block filter using a series of sections cascaded within the same package and is claimed to represent a cost saving of some 30 per cent over the more conventional approach of a number of separate filters: Fig 7. For amateur applications it may be worth pointing out once again that a switched bandwidth facility could be achieved using a single ladder crystal filter but with switched capacitors, as originally suggested by G3UUR in *TT* December 1980.

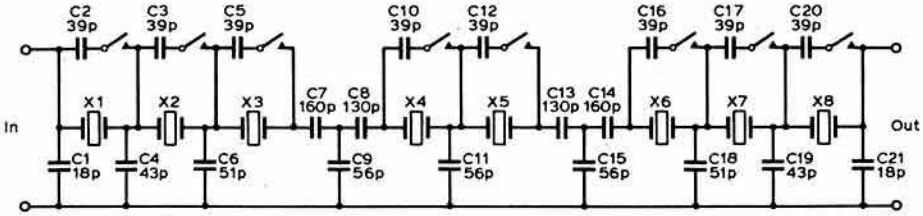


Fig 8. 5·5MHz crystal ladder filter for ssb/cw (UP2NV)

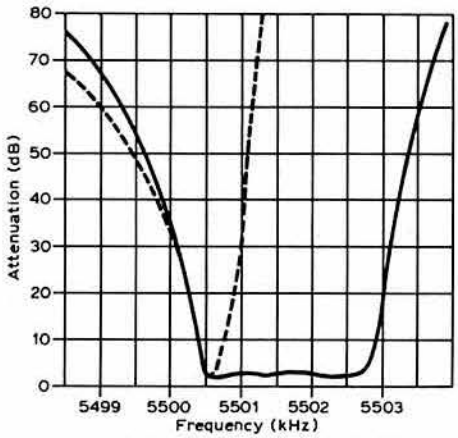


Fig 9. Response curves of the filter shown in Fig 8. It is uncertain, without translation of the text, whether these are based on calculation or measurement

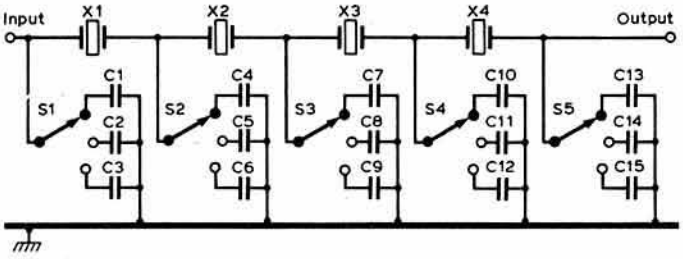


Fig 10. Variable-bandwidth ladder filter from the UP2NV article basically similar to the G3UUR proposals

The ladder filter has been attracting attention in recent issues of the Russian magazine *Radio* in several articles by V. Zalnerauskas, UP2NV. In the June issue (No 6, 1982, pp23–4) a design of a switched dual-bandwidth filter based on 5·5MHz crystals is presented: Figs 8,9. This uses eight crystals and provides a switchable ssb/cw filter, though I am uncertain whether this is presented as a possible filter or whether it represents one that has been implemented and measured. The Russian text may make this clear, and the article also includes a design similar to that advocated by G3UUR with bandwidths selected by switching the capacitors: Fig 10.

High-voltage power fets

The increasing capabilities of power fets for transmitter applications is underlined by a new series of vhf n-channel enhancement-mode power fets announced by Siliconix. These are based on a high-voltage process yielding breakdown voltages in the 200V region. The new devices are specified for use with supply voltages of 80 to 120V to provide a useful safety margin. The first of the devices, type DVD030S, can provide an output of 120W at 175MHz with 10dB gain, or 150W output at 100MHz with 17dB gain. Such devices would seem particularly attractive for 144MHz nbfm operation.

The makers point out that 100V 1A power supply units are less expensive than 25V at 4A or 13·5V at 8A. On the other hand a 12V bipolar power transistor can be run directly from a vehicle battery. It is also claimed that fet devices are easier to match to 50Ω transmission lines. These devices do not come cheaply, and single-unit price in the USA is around $100. It could be argued that if solidstate is heading towards 100V supplies, then a good case can still be made for using 600V at 150mA to a double-tetrode!

The development in recent years of the "v-groove" form of power fet has been complemented by the appearance of "hex" and "T" vertical channel structures in which the difficult-to-fabricate v-groove is replaced by a gate within a straight surface. These retain the freedom from secondary breakdown and thermal runaway, though in all these devices one needs to avoid gate punch-through caused by even momentary over-voltages. Bipolar rf power devices still tend to be more linear at vhf for ssb applications and tend to cost less for equivalent power. In fact both bipolar and power fets have advantages and disadvantages and it is seldom that there can be a clear-cut choice between them.

Protecting high-power valves

Irreversible damage to high-power, high-perveance and increasingly high-cost transmitting valves is most frequently caused by their running excessively hot. This can be caused by mistuning, parasitic oscillation, failure of bias supplies and frequently by failure or malfunctioning of a cooling fan. Various forms of temperature or pressure sensitive devices are used to protect amplifiers in professional equipments, both to protect valves and to prevent unattended equipment from catching fire.

D. Kirkley, G8WRB, notes that semiconductor heat sensors and bi-metallic strips exist, but are mostly designed to operate at temperatures well below, for example, the 250°C that is the specified safe limit for the 4CX250 series of valves; such devices often need further amplification or control arrangements before they can be used to operate a relay to remove power from the valve. On a recent visit to a factory he was shown rf heating equipment using a 500kW water-cooled valve (replacements cost around £1,500). This incorporated a simple protection system that should be simple to duplicate for amateur equipment.

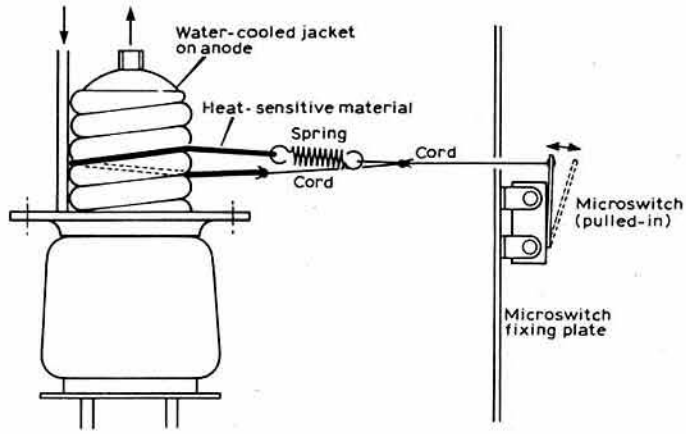


Fig 11. System noted by G8WRB for protecting 500kW water-cooled valve but adaptable for high-power tetrodes etc

A thin piece of plastic material of known temperature characteristics is cut into the form of an elastic band and wrapped half way around the valve: Fig 11. This plastic material is attached via a spring and cord to a microswitch, being kept under tension by the elastic nature of the material and the action of the spring. The switch is thus kept pulled on unless the valve temperature rises to the point where the material melts. Clearly one needs to choose a plastic material that melts at the right temperature, though this can often be determined experimentally if data is not available. G8WRB draws attention to the temperature sensitivity data tables available from RS Components (555-415/421/437). He has now installed such protection on each of his two 4CX250B valves. He adds:

"If old and useless valves are available the system can be fully tested, but in any case the following points should be noted:

(1) Should the valves overheat and trip the protection circuit it is important to make sure that the metal spring cannot come loose and cause a short-circuit.

(2) Some materials break down when exposed to high rf fields. Make sure you do not use these.

(3) If the amplifier is frequently moved around, make sure that movement will not cause the heat-sensitive material to slip and so cause false tripping. There was no risk of this with the industrial water-cooled valve since the surface was in the form of the ribbed cooling pipe. □

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Ken Willis, G8VR*

THE PAST MONTH has not only provided excellent and sustained tropospheric conditions, but also a modest amount of Es, good meteor reflections and some further major auroral activity. In the words of the song, "Summer time, and the living is easy"! Newcomers to the bands must get the impression that vhf dx working is a pretty simple affair, and with all those prefixes to work, who needs a G4 - - - and the hf bands? I can only advise all concerned to enjoy it while it lasts, and to build up some memories to brighten those long winter nights when gales rock the antenna, rain lashes the shack window and only white noise issues from the speaker. Those times will surely come again!

Tropo

Paul McMichael, GI4LKA (WO), summed it up when he wrote to apologize for having several times delayed sending in his report having "waited to see if the extraordinary conditions had *really* come to an end". He went on to say that while July 1981 was notable for the variety and excellence of the propagation, he and his fellow GIs were agreed that this year had been much better. Paul worked numerous LA, OZ and SMs, Sweden providing him with a new country.

At a time like this the problem is clearly not what to include, but what to leave out, so if you have written to me and do not find your information used, please accept my apologies but be assured that all reports help to provide a full picture of what occurred.

Stable weather conditions produced an almost continuous path between Scandinavia and the British Isles for days on end, and contacts with LA, SM and OZ became so commonplace that people were heard to complain that "only OZs" were on the band and that the SMs were "too far south" to be real dx. A large number of UK stations made first-contacts with the Scandinavian countries. At the receiving end of the system, SM7FJE reported that although he had operated a successful vhf/uhf station for several years, this period was the first time he had worked into GI, EI, GC and GD on tropo. He worked scores of stations, and how easy it was is illustrated by a contact he had with a G-mobile who used 1·5W to a halo, reports being 59 both ways.

GD3YEO found himself much in demand throughout the conditions and worked LA8EW while driving home in his car, his rig being a Liner 2 and a 7λ/8 whip antenna. No doubt many more such contacts were made during the fine conditions which embraced all the vhf/uhf bands. At times 432 was better than 144MHz, but the lower band provided most of the action, probably because of its greater occupancy. On several days it was possible to work stations deep into Sweden during the morning or lunchtime hours both on cw and ssb. Beacons never before heard provided consistent signals over much of the country. G8SVG heard an LA beacon on 144MHz all day long on 18 July, as did GI4LKA. DL0PR was S9 on many occasions between 30 July and 4 August. SK4MPI appeared on tropo, a very rare event, while GB3ANG was very strong in the south since it was an interesting feature of the opening that very good north-south propagation existed up as far as Shetland while the band remained open to all parts of Scandinavia. To the east tropo extended to at least HN square. Signal strengths from LA, OZ and SM were so great that they could sometimes be mistaken for locals.

There is little doubt that some new records were established during the period. Two possible contenders for the first GI-OZ on 432MHz are GI4GVS and GI8TBQ, so further information from their logs is required. There is likely to be a claim for the first EI-OZ on 432MHz, this time from EI6AS, and also a "first" on 1·3GHz between EI and SM, which will no doubt be reported by G3WDG.

Chris Petermann, DF9CY, writes to say that on the evening of 8 July he worked 89 stations in southern England and in Wales using 144 and 432MHz. His best was GW3NYY and GW8XLY in XL square on 144, and into YK, YL and YM on 432MHz. He says that many German operators complain that UK stations work only into PA0, even when conditions make it possible for contacts to be made deeper into Europe (shades of our GMs complaining about all those Gs in the south cutting them off from the Continent!). However, Chris pays us a nice compliment by saying that the "ham spirit" is more evident in the UK than in his country.

OZ1CFO worked over 400 G stations in two or three days of operation, so if the QSL cards are sometimes not immediately forthcoming, spare a thought for the man at the other end of the pile-up.

GI4LKA (County Antrim) learned what it was like to be on the receiving end when on 19 July he found himself in such demand on 144MHz from strings of Netherlands and West German stations that he had to be helped out by GI6DRK/P who was operating in WO square. They referred all those wanting to try 432MHz to Tim, GI8TBQ, and between them they handled upwards of 200 contacts in one session, mostly from stations saying "my first GI, please QSL".

Operation on 432MHz became much more popular during the good conditions as many reports testify. Mike Dennison, G3XDV (Whitstable), arrived home at 1545gmt on 30 July and found OZ2UHF to be 569 on 432·865MHz, and LA3UHF a little stronger on 432·880MHz. He put out CQ calls for 15min to no avail, and heard no amateur signals although Sydelis was very strong. Shortly afterwards, however, things improved and he worked SM6EYK (FR), LA3FV (FT) at 1,025km, LA8AK (DS) and LA8AE (FT) at 1,030km, all being between S4 and S8. All amateur signals disappeared again, though the beacons remained strong, and Mike was able to raise several repeaters, among them LA6HR (RU2), LA7FR (RU4) and LA7SR (RU8). Repeater signals were up to S8, and at one point Mike accessed LA7FR using only 0·5W, but he still could not raise any dx until, when discussing this with a local, LA3FV broke in at S9 plus 40 to say he was hearing the QSO. Mike checked 144MHz but found only a few weak signals from Scandinavia, and cites this as a case when 432 was much better than 144MHz. Mike uses an FT221R, a Microwave Modules 144/432 transverter running 10W to a crossed 12-element Yagi, and finds the power quite adequate at 432MHz, though not much use on 144MHz. He has a very good path into Scandinavia from AL56a.

G3BUX (Wolverhampton) does not work on 144MHz at all, but has recently returned to 432MHz after having had a "good go" at the hf bands. His first QSO was with GM4JLY (YR), and during the 18–19 July opening he worked eight GMs and EI2DJ in a batch which provided a remarkable assortment of squares but "no great dx". Leaving the Midlands VHF Convention committee meeting on 21 July he says he could smell the opening, and when he arrived home he worked Y23BD (GM), OZ1EKI (EP), DL7ZL (GM) and eight other Ds, a truly welcome return to uhf. However, the best was yet to come, for on 28–29 July he worked nine new squares, had 10 contacts at distances over 1,000km, and achieved new personal 432MHz records by working 1,118km and his 17th country. His log included 11 SM, 10 OZ, 9 DL, 1 LA and 4 PAs.

GM3JFG is usually thought of in the south as an auroral beacon, happily situated in XR square, so consistent is his signal. However, he forsook 144MHz on 30–31 July to work 432MHz with great effect, filling two pages of his log with LA, SM, OZ, DL and PA contacts. His best were SM6GXV and SM6KXN (both in GR), SM6DHD (GR), OZ2GG (GP), SM7AAC (GP) and PA3BYI (CM). He said that the pile-ups of people wanting to work XR for the first time were enormous.

The 432MHz Low Power Contest took place on 1 August, and G6CSY sent in his comments on the event. Conditions were flat with him, with two slight openings which promised much but which came to nought. He operated G4KKF/P in ZO, and worked PA0EZ (CM), PA0FRE (CL), F6DKW (BI), F2CF (BK), and stations in BL and DK. The best dx was with DF4KT (DL) at a distance of 438km. He feels that the publicity for this contest was totally inadequate and few stations worked had any knowledge of it. With more stations active much more dx would, he thinks, have been possible.

Although somewhat out of context, several reports which arrived late are worth including because of their documentary value in outlining this amazing period of good conditions. Between 7 and 8 August, the Spanish National 144MHz Contest was held and coincided with some excellent tropo into the UK. G8IEM (Portsmouth) worked EA1RCA (WD), ED1RCF (WD), EA1TH/P (YC), EA2DJ (ZD), EA1CR/P (YC), EA2AA (YD) and EA1CR (XD), all on 144MHz. He also worked EA1RCA and EA2AA on 432MHz. Many stations in the south worked the EAs, especially the duo EA1RCA/ED1RCF who hunted together, everyone in the pile up having to work both before being allowed to move on! EA2AA (YD) worked over 400 G stations in two days.

EA1TH (ex G3URY) went portable in the contest from a mountain-top site 6,500ft asl, approached by 33km of unsurfaced roads *after* leaving the last village on the ascent. The weather was atrocious until late on 7 August, but using a TS700G, NAG 80W and a 16-element antenna, Bob worked 215 contacts on 144MHz in 10 countries and 50 squares. His best dx was 1,333km, and all but one of the contacts were on ssb. Highlights for Bob, who thinks he will be the single-operator class winner, were QSOs with

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GB2XM (XM), GD4GNH, G6CYW/P (running 2·5W—EA1TH barefoot at 10W) and hearing G3CHN calling CQ in Spanish at S9 plus!

Repeater dx

Repeaters are not immune to good conditions, so networks outside the UK can sometimes be accessed by British amateurs, often inadvertently as similar channel frequencies are used both here and overseas. G6HKS (Cambs) found that he was able to get into the Lyon repeater (R3) during the big Es opening on 8 June. He worked F1FVX (BF), F2BI (BI) and F5IL (AJ), and was interested in a novel feature of this repeater. It transmits a series of "pips", each counting as an S-point, so the caller gets an automatic report on the strength of his signal on the repeater input. G6HKS used only 10W to an 8XY antenna.

Dave Preston, RS50604, in Nottingham also listened to some good dx through repeaters during a tropo lift on 13 July. Through GB3NA (Barnsley R3) he heard LE3NY, through GB3GN (Aberdeen R7) he identified GM6HDW/M while on GB3HS (Hull R2) he heard GM4HIE, GM8SVB, GM4LBE (Shetland), GM6AXU and GM8FFK. What is interesting about this is the distance of some of the GMs heard from the repeater, especially the Shetlands station. Dave is 13 years of age and plans to go for the RAE examination next year.

GM4LBE (ZU) says that during the good tropo conditions he could access some German repeaters, notably DB0XA at Cuxhaven. He comments that this is comparable with a station in AL square getting into a repeater in Milan or Bilbao!

By the time this appears in print the Stirling repeater GB3OH (RB4) should be operational. Incidentally, the Repeater Working Group of the RSGB plans to hold an open meeting at the Station Hotel, Stirling, at 1430 local time on Saturday, 6 November. All repeater users are welcome, and tea and biscuits will be available. G4CCC will be in the chair.

Aurora

The big aurora of 13/14 July occurred too close to deadline for it to be reported fully, but some further information has now been received. Despite the fact that solar cycle 21 is well past its peak, the sun was very active from about 0700 on 12 July and continued so for several days. The peak of activity occurred on 13 July when the Meurdon Index reached 80 units. This was the day of the massive aurora, the final phase continuing until the morning hours of 14 July.

GD3YEO worked 67 stations in 12 countries during the event, his "bag" including I, OK, YU, OE and F as well as the more conventional prefixes heard during auroras. In all, 37 QRA locator squares were worked, his best contact being with YU2SFU (IG) at 1,655km.

G4IGO (Bristol) had contacts with F, Y22, HG, YU, OE, OK, I, SM, UP2 and UQ2, and not surprisingly says that it is the best aurora he has ever experienced. G4KLN worked several stations during the string of auroras between 11 and 14 July but "not much in the way of real dx".

G8YHL (Dorset) caught the first phase on 13 July on arriving home from work, and made his first-ever contact by this mode with GM8GFF, also his first GM. This was followed by QSOs with G stations, and he heard several GMs, F1FHI and OK1MBS (HK), all on ssb. He regrets not having joined the queue for the OK, because when he returned to the frequency later all was quiet. In the second phase, which he discovered on getting up at 0325gmt, he managed another GM, this time GM8MJV.

GM3WCS had 40 contacts during the early phase, his best being LX1GR (DJ), but in the overnight affair his keyer developed trouble—causing him to spend an hour repairing it while listening to strong signals from HB9, OE, I etc. Those old-time straight keys still have their merits!

GI4LKA (XO) had some good first-phase contacts in OK2KZR (IJ), OK1AFN (IK), OK1MDK (HJ) and I4XCC (GD), but as he has to get up early for work he missed the final phase. During the event his beam headings varied between 10° and 120°, the 120° heading being for the contact with I4XCC. He also noted, with GI8UPV, a reversal of doppler shift just before and shortly after the period when the dx was best at his location.

There was another aurora in the north on 24 July when GM4DJS (YP) worked 19 stations in G, ON, F and D using only 50W to a 10-element antenna, all on a beam heading of 50°.

After the excitement of 13 July, all eyes were on the 27-day charts to see if there was to be a repetition of events as the active area on the sun came around into view again. Predictably in this amazing period of outstanding conditions, a major aurora developed right on schedule on 7 August. It started at breakfast-time in the south, with the Netherlands expedition station GM5EHK/P (ZR) being 10 over 9. It was not easy to work, being more interested in LA, SM and D, but G3IMV and G4ARI managed to get in. G4IJE worked SM1BSA (JR) while GM3WCS and G8VR made contact on 144MHz and then moved to 70MHz where reports of 51A were quickly exchanged.

This was only the precursor of a much more significant aurora, however, for around 1300gmt a second phase of great intensity started, and for the next four hours there was phenomenal activity on all the vhf/uhf bands, including 1,296MHz, where a possible first auroral QSO took place.

On 70MHz G3OSS heard far more activity than ever before on this band, and had contacts with GJ3YHU, EI6AS and EI6DT, plus some GMs.

The GM3WOJ/P and GM4IGS/P expedition to YT square arrived on site just too late to get set up for much of the 70MHz activity, but worked several stations on 144MHz from locator YT75j. An immediate QSY from 144 to 70MHz with G8VR was unsuccessful as the aurora was, by this time, weakening considerably. As was to be expected, most of the action took place on 144MHz, and although this event did not embrace as much of the European continent as did that on 13 July, many Russian prefixes were heard and worked. It is understood that a Russian field day event was in progress at the time, which probably accounts for the large number of stations active.

It was not easy to penetrate the layers of Netherlands and German signals at S9 at the cw end of 144MHz. Those who did so, however, were amply rewarded. G3POI (AL) worked an astounding batch of USSR stations, including UC2ACA (ON), UB5WBG (LJ), UB5WDI (LJ), UT5GF (LJ), RB5PAA (ML), UY5XQ (MJ), RB5BAA (MJ), UK5PAN (ML), RP2PED (MP) and UC2ABN (MN), plus HG8KWG (KG). He used a beam heading of 30° for the UP2 region, and about 80° for the UB5s, which suggests that the active patch was fairly south, and may account for the fact that few Scandinavians were heard.

G3VYF (AL) had similar success on 144MHz. He worked five new squares with contacts with UC2ABN (MN), UP2BEA (NP), UP2BDO (NR), UB5DBC (LI), UB5PAA (ML) and UC2ACA (ON). Mike says that during this event he feels sure that the first "UB5-G" contact via aurora on 144MHz was made, so some detailed information from individual logs will be necessary to find out who got in first. GW3NYY and colleagues operating GB2XM (XM) are understood to have worked into UB5; if confirmed, this would seem to be a first "UB5-GW" contact via aurora.

G4IJE found the QRM difficult to deal with because of strong local stations flattening his receiver, but was pleased to have UT5DL return to a CQ call. G3PBV (Devon) found conditions good and picked up a few new squares to bring his total to 145, but did not hear the Russians. G3CHN winkled one out, however, with a contact with a UB5 in LI square. Further north quite different prefixes were being copied, and GM3XOQ/A (ZT) worked a new country in OK1KPU/P (GK). He also worked OH2AA and OH2MX/3 (MV) on a beam heading of 040°.

On 432MHz G3VYF worked EI6AS (WN) and GM4DIJ (YP), and heard GM4JLY (YR). G4KGC also worked EI6AS on this band. It remains to be seen whether the increase in auroral activity on 432MHz has arisen from greater band occupancy or simply from the intensity of the auroras recently, but it is significant that a number of operators chose to abandon 144MHz at the height of the aurora and its promise of good dx to try 432 and 70MHz.

For this aurora the Meurdon index rose to 69 units compared with 80 units for the major event on 13 July. Both are very high figures for this part of the solar cycle.

On 9 August a very weak brief aurora just penetrated to the south long enough for G3IMV to work G4KUX/P (WR). On 12 August a really intense aurora developed with mainly Scottish stations being heard in the south, but what stations! Expeditions in the area for the Perseids found themselves in great demand as many southern stations worked G4KUX/P (WR), GM4IGS/P (YT), GM5EHK/P (ZR) and GM5ENZ/P (WQ), all coming through at S9 and giving many stations the chance of a lifetime to clean up on these rare squares.

Expedition station GB2XM (XM) had many good contacts during the auroras on both 7 and 12 August, among them UT5DL, HG8CE, OK5UHF and the Scottish expedition stations. The aurora was followed by an EA opening at GB2XM on 7 August, and contacts were made with squares VC, VD, WD, XC and YC.

Among the more-recently licensed amateurs, GI6DRK (Co Tyrone) worked his first-ever aurora during this period with contacts into several southern squares not previously worked. On 70MHz GM3TAL was pleased to work GJ3YHU during the 7 August event. This was a "first" for both stations. GM3WOJ/P, in YT was also active on 70MHz where he contacted many stations. Chris commented that there were five auroras in his location during the period 8 to 14 August, but only three reached 144MHz and two were major, embracing the 70MHz band.

It is probably coincidental that after this aurora, and after the one on 7 August, the 144MHz band opened to Spain. G3BDQ reports having "many times" heard signals from SM and LA change from auroral to pure tone after a major aurora, while others insist that there is a connection between sporadic-E and auroras. There is little doubt that we still have much to learn about the various mechanisms of vhf/uhf propagation.

Many stations sent lists of excellent auroral contacts, far too many to print, but they will find their way to the IARU auroral co-ordinator in due course for analysis, as well as being valuable in providing an overall picture of what occurred.

Sporadic E

By the time this appears in print, the Es season will virtually be over. So far it has not been a remarkable one, but apart from the three major openings already reported (25 May, 5 June and 8 June) there have been a few localized events of brief duration. Among them was one on 17 July when, between 1502 and 1632gmt, GI4LKA worked five OHs in squares LU, MU, MV and NU, his best dx being OH5LK at 2,049km.

This event was obviously more widespread than it appeared, because while GI4LKA was working into Finland, G4AOE, near Reading, worked SM2BYC (MZ) with a report of 5 and 9 both ways. Dave had been alerted by Swedish stations on his Band 2 scanning receiver which started up at 1510gmt and continued until just after the SM2 could no longer be heard. G3POI also worked this station but received a lesser report than G4AOE who was running considerably less erp, so the eastern part of the country appeared less favoured in this opening. G4AOE comments on how valuable his scanning receiver is for Es prediction. He also operates in tandem with G3NSM (Oxford) for Es monitoring. GM8OEG (Dundee) also caught the 17 July event, and worked SM0KCR, OH2BWL (MU), OH0NC (KU) and OH2TI (MU).

On 30 July around midday there was a very short Es opening when GW3NYY worked Hungary and Yugoslavia, while across the country G4BAH worked YU. G4OJR (Lowestoft) worked YO7DL (LE) in this same opening.

At the end of the big aurora on 7 August G4IJE noticed that there were many fm broadcast stations around 70MHz, and when listening on 144·300MHz, HG1Z was heard but he disappeared before Paul could get the beam round to his direction. On 9 August ON7EH found a short opening to the southeast and worked an OK on cw, but at this time the Perseids shower was approaching and earlier that day G8VR heard a long CQ call on cw on 144·050 from YU2CCB, probably from a long-duration ms burst, so there must be some confusion as to the propagation mode for these short-lived signal paths.

Stations nearer the Mediterranean in YU, HG, I, 9H1, FC and EA appear to have done better with Es this year than we have in the UK, but this generally appears to be the case. No satisfactory explanation of the cause of Es yet exists, but studies are in progress to find out more about this interesting (but often frustrating) mode. This might be a subject for those long winter days when there is less happening and therefore less pressure on space. There was another brief Es opening to Italy on 15 August.

Meteor scatter

There was plenty of activity on ms as the popular Perseids shower approached, and the squares chasers were kept on their toes in the knowledge that Johannes, LA6HL, was making another of his trips to Iceland. In the period mid-July to 10 August he operated as LA6HL/TF from squares QX, RY, SY, SZ and TY, but proved very difficult to pin down as both the country and the squares were in great demand by ms operators. UK stations known to have worked him are G4ASR, G4DEZ, G4FUF, G4IJE, G4ISM and G8VR. G4ASR had at least three contacts, each in a different square, and he reported that LA6HL/TF received a 60s burst from him at S9.

It has been some time since Icelandic activity on vhf was reported, so it was good to learn that TF3YH (PY) had his interest in ms aroused by the success of LA6HL/TF and is now QRV using his own equipment. He was heard at this location on 17 July in a sked with G4FUF on 144·073MHz.

G4IJE has had his usual high-level of ms contacts, among them two new squares in SM5BEI (JU) and YO7VS (LE). The latter station was active on ms a few years ago, so it is good to know that he is back again, and judging by the reflections G4IJE received from him, he should not be too difficult to work. YO2IS (KF) is another possible, worked by G8VR on sporadic meteors.

An interesting contact reported on the vhf net was between SM3UL (IV) and I6WJB (HC) over a range of 2,100km when the Swedish station was using only 10W. However, I6WJB has full eme capability in his receiving system which no doubt played a large part.

The Perseids shower which peaked sometime on 12 August resulted in tremendous activity on the random calling channels, both ssb and cw. Many stations made their first contacts by the ms mode, and numerous skeds were successfully completed. Several expedition stations operated from rare squares, and to add to the excitement an aurora developed during the ms activity.

Between 11 and 15 August, G4OAE and G8SYE operated from Kokar Island (OH0) in KT square. Their meticulous planning for the trip paid off in the form of 37 completed ms contacts with stations in nine different countries. The equipment was a FT225RD with Mutek front-end, a pair of 4CX25Bs and two 15-element Yagis kindly loaned by the Swedish Cue Dee Products Company. The antennas performed very well, but since the mast brought from the UK was rather slender, some contacts were made using only one Yagi. The party experienced considerable difficulties with Swedish Customs, and several hours were lost in an already long journey which was to Gothenburg by ferry (24h), a drive to Stockholm (7h), ferry to Mariehame (3h) a drive across the island to another ferry (3h), and finally to Kokar. Morale was much boosted when, in setting up the station with the antennas temporarily resting on two deck chairs, they heard bursts of signal from G3VYF calling CQ ms! Their best report came from G4FUF who gave them 49 after copying a 2min burst at S9 plus.

Another notable ms contact during the Perseids was between GM3WOJ/P (YT) and GJ3YHU (YJ) at 2009gmt on 12 August on 70MHz. The distance, in excess of 1,000km, is probably a record for that band. The contact was on ssb, and in a long burst G3IKR was also worked. Looks like some good operating by all concerned. There will probably be more to report on this shower next month when further reports have come in.

G4HUP (Staffs) is another convert to the ms mode. Between 17 April and 13 August he had 20 completed QSOs, most of them on cw, with SM, OK, I, DL, Y22, LA, HG and LA6HL/TF, using only 100W to a six-element quad.

GM8OEG worked I3LGP (GP), DK5MS (GI), F1JG (CD) and YU3ES (GF) on sporadic meteors between 31 July and 7 August. He found the Perseids disappointing but nevertheless worked F6HLD (CG), YU3CAB (HG), OK1DIG (HK) and OE1AFF.

70MHz

July and August saw some considerable activity on the 70MHz band. In the period 8 to 17 August, G4JCC operated from a site near St Tropez (DD63j) using the callsign F0FDB. His equipment was quite comprehensive and provided reception facilities on 50MHz, 70MHz and 144MHz as well as on the hf bands.

G4JCC has submitted a very detailed and informative log of what he heard and worked. Beacon stations GB3ANG (70·060MHz), GB3BUX (70·050MHz) and GB3WHA (70·040MHz) were heard from time to time, sometimes at considerable strengths. GB3SIX (50·020) was also copied at 0745gmt on 9 August. During his stay Steve had crossband contacts (70–28MHz) with G3APY, G4BPY, G3UUT, G4BAO, EI9Q, G4APA, G4IDE, G4IOQ, EI6DT, EI6AS, G4APL, G3UVR, G4FKI, G3GXQ, G3WBQ, EI2CA, GW3LDH and GI3TLT. This emphasizes what a useful band 70MHz would be if our European colleagues were able to use it. Steve also heard GM3FDW/P but could not complete the contact. On 15 August at 1730gmt Steve copied the Cyprus beacon 5B4CY on 70·112MHz, and it was steady at S7 for an hour. G4JCC wishes to record his thanks to Gordon, G4BPY, for the loan of a 70MHz converter, and to G3UUT, G4BAO, G3APY, EI6AS and others for making telephone calls to alert stations to the fact that the path was open for crossband working.

Another station involved in 70MHz crossband is F6FHP who operates from both AE and CE squares. He has a receiving converter for the band and is even contemplating a "really big" antenna. During the period under review F6FHP worked G4IJE and GM3WCS on crossband ms cw, using 144 and 70MHz. Joel says that he often copies the UK beacons on the band, including GB3WHA which is beaming away from him.

DK1PZ has also been active and worked G4ANT crossband (144–70MHz) via tropo on 17 July at 1615gmt with signals S1–2 with S9 ms bursts superimposed. Heinz reported hearing a new Irish beacon on 70·398MHz signing EI4RF; any information on this beacon would be much appreciated. A contact between DK1PZ and EI6AS crossband (144–70MHz) was completed by auroral mode on 13 July during the very big event previously reported. In a very active period Heinz worked G4IJE and G8VR by crossband ms cw on 20 July, and copied bursts of 3 to 7s, although at G8VR the antenna was resting on a step-ladder pointing skywards. In a sked with GJ3HYU on cw ms, however, Heinz was not able to complete. He makes an interesting comparison between the 144 and 70MHz bands based on his crossband experience to date. He estimates that 50W and a four-element on 70MHz are the equivalent of 200W and a 10-element on 144MHz.

During the Perseids GM3WOJ/P operated from YT square with ms capability (though auroras played havoc with his sked list) and worked 34 stations (see "Meteor scatter" for further information). He carried out an ms test with ZB2BL but heard nothing. The distance is a bit long—akin to working deep into Russia from the south of England. In an attempted crossband contact with F6FHP, excellent copy was received from the French station on 144MHz, but no QSO resulted. This was later explained

by problems at the French end of the connection—most unfortunate as but for these problems a contact would definitely have been on the cards.

Another station active on 70MHz during the Perseids was GM4CJG/P in WR square. He worked several stations using ms ssb, and at the peak of the shower was producing some very long bursts in the south.

Taken altogether it was a most interesting period on 70MHz, and it is to be hoped that activity will remain high on the band during the winter months.

Though not a 70MHz topic, now is the time to get the 50MHz converter and an antenna peaked up in the hope that the solar conditions during October and November will give rise to some more transatlantic crossband contacts using 28,885kHz as the talk-back frequency. ZB2VHF on 50·035MHz has been a consistent signal on many mornings lately from 0630gmt often until noon.

Awards

G5UM reports that 4-2-70 certificate No 16 in the 100 squares/20 countries 144MHz category has gone to another overseas operator, following the issue of No 15 to EA1QJ. This time it is F5DE who is the recipient, having submitted cards from 32 countries with his claim. More than half the cards were for cw contacts, six by aurora and 11 for ms contacts.

G8VR has received sticker No 4 in the 144MHz 150/20 category, and the 21 cards submitted to upgrade his previous award were all for cw contacts. Ten were by ms, five by aurora and one for an eme contact with K1WHS.

John Matthews, G3WZT, also claimed the 150/20 sticker for 144MHz, receiving No 5. He also submitted cards for ms contacts, 12 in all, plus a "one and only" confirmation for an eme contact with K1WHS in Maine who has given so many the chance to work the USA on 144MHz.

Two new claimants for the 80/18 award were GM8MBP and G4KMH, and these were the first certificates in this category to have been issued in the past eight months. Getting the cards to support claims is still proving to be difficult.

Miscellany

From F6BST comes news that Tonna plan to introduce a new 17-element Yagi in September to give an extra 1dB gain over their current 16-element model. The reason given for the change is that the 19-element Boomer by Cushcraft has more gain than the Tonna 16-element.

G3EIW is concerned about interference problems which will arise when cable and satellite tv are introduced, because some of the carrier frequencies are in the vhf region—even in amateur allocations. The VHF Committee is well aware of the problem and G3UUT is studying the matter. Any useful input on this subject will be appreciated.

Those wanting to work the Isle of Man should listen out for GD4IOM, the club station which has an activity night every other Monday and operates on both hf and 144MHz. Next probable dates are 11 and 25 October, and fortnightly thereafter.

G3UBX mentions the proliferation of amateur television signals on the 432MHz band, and says it is quite common to find video sidebands at S2-4 right across the dx sector. He pleads with atv operators to filter their transmitter output, and believes that a fairly sharp notch around 432·200MHz should not affect video quality yet would protect the weak-signal operators. Peter has praise for the GB3ANG beacon on 432·990MHz, and likes its proximity to his local repeater output since he can find it easily!

The University of Liverpool club station G3OUL operated from the Lizard between 14 and 25 July, using 144 and 432MHz. They had 784 contacts on 144MHz in 79 squares and 19 countries. On 432MHz they had *only* 97 QSOs with nine countries covering 27 squares. Best tropo dx on 144MHz was SM6NET (1,514km) and on 432MHz Y23BD (1,273km). They also worked meteor scatter, 13 contacts being completed with seven countries. They provided many stations with a first contact with the rarely-activated XJ square. The operators complained of the tactics of some stations who called them, especially those who broke in on ms schedules for "a quick QSO please". For students existing on a grant, expeditions such as these represent a considerable financial outlay, and their efforts are greatly appreciated. Congratulations to all concerned on a well-planned and properly-executed expedition.

GM4LBE (ZU) must take his 144MHz antenna down in October because 100+mph gales hit Shetland in winter, so hurry if you need the square!

EA1TH (ex G3URY) says there *is* a reciprocal licensing agreement operative in Spain. Write (in English) to URE, PO Box 220, Madrid. Also from EA1TH the news that EA2JG in YC square worked an OY station during the second week in August, distance in excess of 2,000km.

Two 70MHz beacons have been off the air for repairs, but hopefully will be operating again by the time this appears in print. They are GB3WHA on 70·040MHz and GB3ANG on 70·060MHz. □

RAYNET

G. Cluer, G4AVV*

GROUPS are still sending reports to RSGB HQ about their involvement with police and county emergency planning officers during last winter's snowstorms. A number of groups reported that they were called out for the first time ever last winter and, with the arrival of autumn, it would be a good idea for members to check that their emergency kit is ready for action should this winter bring similar problems. Controllers, too, may feel that it would be worthwhile to contact their user services again to remind them how to contact the group in an emergency. A number of groups were involved in helping the police during the visit of the Pope to this country at the end of May. Leeds, Leicestershire, Warwickshire and a number of Raynet groups in the Midlands were active, and report that their assistance was much appreciated by the police. Unfortunately, not all groups have had such a successful year. The Home Office's ban on Raynet involvement at charity walks, although hopefully only temporary, prevented a number of groups from providing a useful service. This caused problems to the user services, and removed an excellent opportunity for training under live conditions and furthering public relations.

John Hay, G3TDZ, Alan Bramley, G4NDU, and Peter Gilson, G3WSZ, of the Leeds Raynet group, on station at a first-aid post in York during the Pope's visit. *Photo:* G4HSZ

Groups continue to report exercises, either in conjunction with user services or by themselves, and it is noted that in many parts of the country local groups combine to run county-wide or larger exercises. These involve a great deal of planning if they are to run smoothly, and anyone taking on such a task will need a great deal of local support.

Not all exercises run as smoothly: I was interested to read this report from one group:

"All stations were on site except one of the evacuation centre mobiles which had gone to the wrong site half a mile away despite having a grid reference and a description of the site. The other mobile was a motorcycle and had only a hand portable, which went faulty. The hf link was useless. The vhf relay had great problems copying anything from the evacuation centre until the latter erected a beam and established a link—but only at strength one. More of a disaster than an exercise."

As a London group controller I am always interested to read of some of the problems that other controllers have in differing parts of the country. Exercise reports received from the Highland (Scotland) group talk of group members "travelling 200 miles north and 100 miles south and east for the event", and again for a meeting of Scottish Raynet members held at Newtonmore, "seven groups were represented . . . people travelled between 50 and 150 miles." Despite these difficulties Raynet is very much alive in Scotland and prospective members should contact the Raynet zonal representative, GM3RFA, for details of their local group.

Other groups who have written to say that they are particularly keen to recruit more members include North Wilts, who want members particularly in Trowbridge, Devizes and Pewsey areas; the contact for this group is G8JOJ, QTHR, or on 144·825MHz on Mondays at 8pm. Devon reports some large areas of the county where cover is needed; interested amateurs should contact G4DOQ. In Lincolnshire a new group is being formed in the Lindsey area; the contact here is G3JIN. Anyone interested in finding out more about their local Raynet group should write to their Raynet zonal representative for details of groups in their area. The RSGB or G4AVV (address below) can supply the necessary address. □

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

THE MONTH ON THE AIR

John Allaway, G3FKM*

THE MOST IMPORTANT NEWS of the month for hf operators is undoubtedly the limited release of the new 18 and 24MHz bands on 1 October. For the time being we have 18,068–18,168kHz and 24,890–24,990kHz "on a non-interference basis to all other services operating in conformity with the Convention and Radio Regulations, in strict compliance with Radio Regulation (RR) 342, bearing in mind that use will not be in conformity with the Radio Regulations and that the Final Acts of WARC 1979 give no recognized access until the satisfactory transfer of all assignments in the fixed service operating in the bands has been completed or until amateur primary status is achieved by not later than 1 July 1989 . . ."

In order to achieve compliance the following particular restrictions shall apply to stations operating in these frequency bands:

1. Maximum carrier power supplied to the antenna not to exceed 10W (10dBW).

2. Maximum antenna gain in any direction of radiation not greater than 0dB with respect to a λ/2 dipole.

3. The antenna shall be horizontally polarized.

4. The class of emission shall be limited to continuous wave morse telegraphy by on/off keying of the carrier (A1A).

The allocation will be under continual review and the conditions of use may be altered or the allocation withdrawn if this proves necessary.

Perhaps a more restrictive allocation than already permitted in some other CEPT countries, but a beginning. Potential users must note that *no interference whatsoever* must be caused to other band users.

G4GLM reports that his callsign is being pirated again; he has no hf equipment and does not use cw, but has received QSLs for alleged 7, 21 and 28MHz contacts. G4DLK also reports that his callsign is being used by a pirate; he has been off the air for two years.

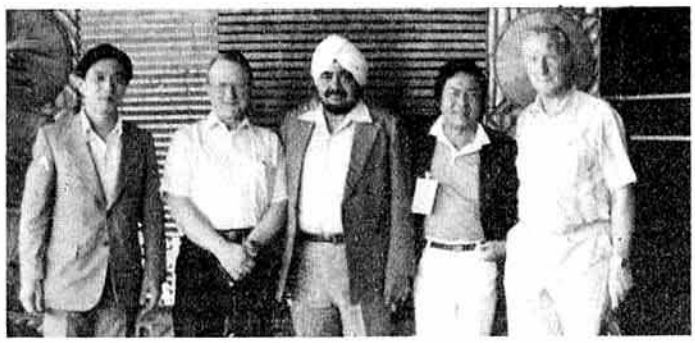
Information on the present whereabouts of XW8CS and FB8WW (December 1968), ZD3M (February 1973), and HR6SWA (March 1975) would be appreciated by VE3EUP (see under VE1SPI in "QTH Corner").

G3PVA has a quantity of ircs for sale at £1 for five, plus sae. He is QTHR.

OZ1U and his wife OZ1BLF are anxious to work into the UK between 0900 and 1000 any day on or around 3,720kHz. Their QTH is Klitvej 58, Fjano, 6990 Ulfborg, Denmark.

Overseas news

G3ATK is acting as QSL manager for Tom Venn, G3RPV, who is currently in Belmopan, Belize, and using the callsign V3TV. Tom will remain there for about two years, and at present is active mainly on 21MHz ssb—usually around 21,345kHz from 2300 onwards on weekdays but earlier at weekends. He had an FT902DM and a dipole at the time of writing but was awaiting the arrival of a beam and other equipment which will signal activity on cw, rtty and ssb on other hf bands. QSLs should be sent to G3ATK (see "QTH Corner") enclosing an sae if direct reply is needed.



A group of visitors to the IARU Region 3 Association Conference in Manila, April 1982. L to r: JA1KAB, director, Region 3 Association; W1RU, president, IARU; 9M2AV, secretary, MARTS; 9M2CM, president, MARTS; and G3FKM

* 10 Knightlow Road, Birmingham B17 8QB

GD3KHE has forwarded an interesting newspaper cutting which describes the disaster which struck Victor Revers, ZK1CG, during his visit to the North Cook Is. Victor had the misfortune to fall from his boat into the sea and at the same time irreparably damage his IC701. QSLs are now being received from ZK1CG/North Cook Is. Total losses are estimated at around US $3,100 plus the value of the equipment.

Dave Gynn, formerly G3SBP/5N2RDG/VP2VD and 8Q7BN, has now left the Maldive Is and is in St Lucia—the last date of operation from 8Q7BN being 15 July. QSLs for all contacts have been despatched via the RSGB QSL Bureau—about 4,000 cards for about six months on the air. He managed to achieve DXCC on 14, 21 and 28MHz, and had just started on 3·5 and 7MHz. Dave is now J6LMT, and anyone who has not yet received a reply to a direct QSL request for an 8Q7BN card is invited to write to the address in "QTH Corner". He apologizes to anyone looking for him who did not make contact, but points out that he had little notice of his move.

David Calderwood, who unfortunately omitted to mention his GI callsign, is in Chile and has acquired the callsign CE3EYN. His wife (who is Chilean) is also now CE3EYO. They have a TS130E and 7MHz dipole. Contacts with the UK (and especially GI) are sought, and all will be QSLd via the bureau.

DX news

There were three Polish stations back on the air at the time of writing—SP5PZK (the club station of PZK), SP5KCR (a civil defence station) and SP5ZHP (a Scout station).

TA1MES has been reported on the air. K3TG was expected to be at the UN building in Vienna late in September using the callsign 4U1VIC. Possible separate country status should cause maximum interest—UN property in Geneva and New York already being counted.

DXpress says that VK0AN will be leaving Mcquarie Is on 24 October. He may often be found in the VK9NS net on Tuesdays on 14,220kHz or the YL net on 14,332kHz. Alan has also been worked by European stations on 7,095kHz around 0600. VK9ZA, on Willis Is, uses ssb only and will be on the island until 16 December. He has been reported on 14MHz around 1600.

VK9YA expects to be moving to Malaysia for two years, and is hoping to obtain 9M2 and 9M8 licences. VK9NYG still represents Cocos-Keeling on 21 and 28MHz. VQ9CI may often be found near 14,210kHz from 1100, and 21,300kHz from 1630.

According to the *Long Island DX Bulletin* a second BY1 station will be on the air this autumn, as well as a BY7. A BY4 is expected to become active in the spring, and it is believed that BY1PK may be preparing for ssb operation.

Anyone still looking for Tristan de Cunha will be interested to know that ZD9BV and ZD9YL are to be found almost daily on 21,335kHz between 1730 and 1900 working into Europe. ZD9BV now has an lf antenna. Another "rare" island is Crozet, and FB8WG's latest operating pattern seems to be an appearance between 14,010 and 14,020kHz on most days around 1200. This is followed by a session in the YL net on 14,332kHz from 1300.

Although not counting separately from ZS for DXCC purposes, S83H is of interest to prefix hunters and may be found every Sunday on 21,345kHz after he has finished his 1500 schedule with G3PVA.

ZS3TL has been active on 21MHz ssb, and at the time of writing was seeking a European QSL manager. He may be reached at Box 22882, Windhoek, Namibia. The future level of amateur activity from Benin may be very low—according to the *DX Bulletin* TYA11 was the last licence to be issued and he left on 22 July. In future it may be almost impossible for anyone to obtain a licence. TR8OIT is a new amateur in Gabon. He is working from the Japanese Embassy and should be there for about one year. TR8IG is often in the 28,010–28,020kHz area after 1400.

9J2WS is planning to be in Sierra Leone this month and on the air on all bands 1·8 to 28MHz as 9L1WS.

GM3YOR reports that all QSL requests for 9L1SL cards have now been answered by his QSL manager N3ADC—direct to those who included postage, otherwise via the bureaux.

DX-NL reports that EA1CGO will be in Nepal this month and on the air as 9N1CGO. Operation was due to commence on 1 August. Stations in India have been using the VU9 prefix to mark the occasion of the 9th Asian Games.

Latest information on 9M8PW is that he is to be found near 14,265kHz daily (except Sunday) after 0830. His equipment now consists of a TS900, Dentron linear, and a TH7DXX beam—all lent to him by generous amateurs in the USA—and his QSO total by June had reached 1,200.

A reminder that the Sinbad Net, led by A4XGY, meets at 1700 every Sunday and Monday on 21,315kHz.

G8PG reports that a new 28MHz beacon is now on the air from Brazil.

This is PY2AMI which commenced operation on 16 May and transmits on 28,399kHz. Its call is sent every 20s on cw and it runs 10W input. Location is Americana, 80 miles from Sao Paulo. It was built by PY2s VRX and FUZ for the purpose of assessing low-power transmission paths. Reports will be appreciated and should go to PY2AMI, Project Beacon, PO Box 31, 13470-Americana-Sao Paulo, Brazil. A QSL card will be sent if an irc is enclosed.

VP8ANT, Antarctica, keeps a schedule each Monday and Thursday with G3ZAY at 2000 on 14,270kHz. He is not active on 1·8MHz at present. VP8LP is believed to have lost all his logs during the recent hostilities—QSLs for contacts after 31 May 1981 should be sent to G3VPW, who also acts as QSL manager for VP8AIB.

Since 1 September QSLs for JW5VAA and JX5VAA have been dealt with by LA4YW (see "QTH Corner").

G3FNJ has reported, via G4GEE, that he is not the QSL manager for SV8CS. QSLs sent to G3FNJ will be sent on to SV8CS in due course.

A news release from ARSI says that Indian stations may now operate on 50kHz of the 3·5MHz band—between 3,500 and 3,540kHz, and from 3,890 to 3,900kHz. Other news is that to commemorate the Ninth Asian Games, VU stations are currently using the VU9 prefix.

Expeditions

ON7XC and ON7OS will be in Liechtenstein and Luxembourg during the period 9-23 October. They will be on all bands on ssb and rtty, and their special QSLs will be sent to all who work them, from their home addresses. Schedules may be arranged with them by writing to Lippenslaan 148, 8300 Knokke, Belgium, or by telephoning 050 601181.

TL8GE hopes to visit Tchad for a three-week stay commencing late in September. When home in the Central African Republic, Michel may be found near 21,287kHz from 2100.

W6GO and K6HHD will be in Tahiti for two weeks from 21 October as FO0OJ and FO0JO. They will spend three days on Bora Bora and the rest of the time on Moorea. QSLs should go to their home addresses.

Steve Lowe, G4JVG, who is at present living in Sweden, has supplied a brief resumé of his visit (with G4IWA) to the Aland Is as G4JVG/OH0 and G4IWA/OH0. Steve was on the air from 7 to 17 August on all bands 1·8 to 28MHz, and G4IWA was on from 10 August. G4OAE and G8SYE were also present but on 144MHz only. Equipment was a Drake "C"-line with NCL2000 linear, and an FT101Z. Antennas consisted of inverted-Vs on 1·8 and 3·5MHz, a Swedish "Cue Dee" V40 7MHz ground plane, and TD33 trap dipole for the hf bands. Operation was from the island of Kokar which is 2·5h by ferry from the main island; this was to give vhf enthusiasts a new "square". A total of 2,000 QSOs was made.

Welcome

The following overseas amateurs joined the Society during July: CT1VV, EA7CAN, F6GJT, JA1JIX, JA7HMZ, N6BPL, OK2GO, SM7JUQ, VK2BJI, VP8PO, VU2JC, W6QYT, 5X5FS, G3TZD/W2, R. Radford (EA8), J. Obstfeld (4X), W. Wimmer (OE), M. Kelly (EI), T. Jones (PA), D. Latter and B. Nitzsce (DL).

Heard Is DX Association

Although there is now discussion of a possible expedition to Heard Is next year by another group, Jim Smith, VK9NS, wishes readers to know that his arrangements are still under way. He has supplied copies of much relevant correspondence and it is clear that permission to land and the callsign VK0JS have already been obtained and much of the preparatory work is done. In a recent release Jim says: "Negotiations are taking place for a vessel suitable for the journey to and from Heard Is, and hopefully an outline contract will be settled in the coming weeks. The point of departure will be Tasmania, and this has a number of advantages as far as HIDXA is concerned. It is hoped that departure date will be the first week of January 1983. Costs are considerable and HIDXA needs any help offered. We stand by our statement—no expedition, money back, and numbered receipts for donations.

Confusion has been caused in amateur radio circles due to other attempts to provide amateur activity on Heard Is as a sideline to a mountaineering attempt on Big Ben. HIDXA considers this to be unsatisfactory in its approach as it splits the resources of the group in a very hostile environment. HIDXA's stated aims (approved in principle at government level) are a six-person amateur expedition remaining together in relative safety at Atlas Cove as an integral unit. With the vessel under discussion at the moment it is hoped that HIDXA will be able to broaden its base to include more than one person with outside interests. This will further research on Heard Is and its environment.

HIDXA is offering a 100-page definitive booklet on Heard Is and the McDonald Islands. A few dollars profit on each sale will help the HIDXA funds and, in addition, will provide the purchaser with a good knowledge of Heard Is. Many excellent facts, figures, references and photographs are contained within the 100 pages. A charge of US $20 includes about $6 airmail postage—the booklet weighs 300g. Donations, correspondence and offers of help and sponsorship should be sent to HIDXA, PO Box 90, Norfolk Is, 2899, S Pacific."

From documents forwarded to G3FKM it is clear that HIDXA has been conducting its affairs in a very business-like manner and that should a suitable ship be chartered there seems nothing in the way of the VK0JS expedition taking place successfully.

Don, G3XTT, during a recent visit to ARRL HQ met K1MEM (centre of Desecheo and Navassa fame. On left is Don Search, W3AZD, who is in charge of DXCC operations. *Photo:* NIRC

DX News Sheet

Readers will be sorry to learn that Geoff Watts, who has been producing this invaluable aid to the dxer for many years (his 1,000th edition appeared on 27 January this year), has had to cease his marathon task due to family illness. The *News Sheet* is now being compiled by G3ZAY and G3XTT who seem to be doing an excellent job. Hopefully Geoff will be able to take over again in the not too distant future.

Dick Spenceley, KV4AA

It is sad to relate that the item about Dick in August *MOTA* was reaching members on 30 July—the day when he suffered a heart attack and died. He was 77 and had been licensed for 55 years, during which time he created the *CQ* magazine prefix programme, was dx editor of the same magazine for eight years, became a founder and president of the YASME programme, and was instrumental in starting Danny Weill, VP2VB, on his famous expeditions. He became the fourth member of the *CQ* Hall of Fame in 1969.

Awards

The J28 Award

The Amateur Radio Association of Djibouti issues this award to licensed amateurs and listeners. All contacts must have been made after 27 June 1977, and all J28 contacts are valid, including those with the special call J27RDD, the expeditions J28A, J20Z, J20D, and the provisional J20 calls. The first-class award is for contact with eight stations in Djibouti on any modes but on a minimum of two different bands; the second class requires 15 QSOs with at least two bands represented and with at least five having been made on cw. The same station may be counted once on each band. Send a list of QSOs/reports plus a photocopy of the QSLs and eight ircs to Award Manager, J28DM, ARAD, PO Box 1076, Djibouti, Djibouti Republic.

Four Points of Scotland Award

Available to licensed amateurs and listeners. Class 1 for confirmed contacts with all four locations from which the Clyde Valley DX Group operated during August, and Class 2 for confirmed contact with one location. Applications should enclose details of date, time and frequency with 60p in stamps (from UK), four ircs (for overseas) or eight ircs (overseas airmail). All QSLs go via RSGB, but the certificate should be applied for through G. Hunter, Publicity Officer (CVDXG), 12 Airbles Drive, Motherwell, Strathclyde ML1 3AS.

QTH CORNER

C30LG	via EA3BDW, C. P. Bertomeus, Transversal 303, Tarrasa, Barna, Spain.
C30LM	via EA3BKZ, S C. Micola, Belchite 69, Tarrasa, Barna, Spain.
C30MK	via EA3WZ, J. B. Subirana, Av Montserrat 57, Martorell, Barna, Spain.
C30MS	via EA3MS, Jose Serres F, Ramon y Cajal 11, Tarrasa, Barna, Spain.
CE3EYN	D. Calderwood, Redland School, Camino el Alba 11357, Las Condes, Santiago, Chile.
FR7CG/T	via F1DYD, Jean-L Maridet, 69111 Haute-Rivoire, France.
HS0HS	Box 2008, Bangkok, Thailand.
JW5VAA JX5VAA	via LA4YN, A. Gjermstad, Marie Sordalsvei 23, 7000 Trondheim, Norway.
J6LMT	D. Gynn, c/o Cable & Wireless, PO Box 111, Castries, St Lucia.
W6IAE/KH0	Box 209, Saipan, Mariana Is.
S83H	PO Box 14, Mount Ayliff, 4850 Transkei, Rep of South Africa.
T2AGD	via SM3CXS (see T30CB).
T30BY	Box 34, Tarawa, Kiribati.
T30CB	via SM3CXS, J. Svensson, Berghemsv. 11, 86021 Sundsbruk, Sweden.
V3TV	via G3ATK, Dr E. Young, Orchard House, Camel St, Marston Magna, Yeovil, Somerset BA22 8DB.
VK9ND	Box 279, Norfolk Is.
VR6KY	via LA7JO, S. A. Lindblom, Myrsnipevegen 38, 7022 Kattem, Norway.
ZK2KH	via DJ9KH, W. Hasemann, Kl. Moorweide 141, D 2819 Riede, F. R. of Germany.
ZK2WM	via DJ1WM, H. Mueller, Gustav-Hoffmannallee 32, D-4190 Kleve, F. R. of Germany.
5W5DQ	via KB6JK, R. Hudgins, 119 Huntington Dr, Vacaville, Cal, 95688, USA.
9M6BE	via VS5TX, Kan Kam Yuen, Box 980, Banrar Seri Begawan, Brunei.

Contests

CQ WW DX Contest

0000 30 October to 2400 31 October (phone)
0000 27 November to 2400 28 November (cw)
All bands 1·8 to 28MHz. Exchanges consist of RS/T plus *CQ* zone number (UK is in 14). One point for contacts with stations in own continent, three in other continents. Own country may only be worked for multiplier credit, no QSO points may be claimed. The multiplier is the total number of DXCC countries and *CQ* zones contacted on each band added together. There are three categories: (a) single-operator single- or multi-band, (b) multi-operator multi-band, single transmitter, and (c) multi-operator multi-transmitter. In category (c) only one signal may be radiated on a band at a time. There is also a QRP section for stations whose power does not exceed 5W output. Entrants must use separate log sheets for each band, and all duplicate contacts must be clearly marked and no points claimed for them. Duplicate sheets are required for all bands on which 200 or more QSOs were made. Logs should have 80 QSOs per page and be 8·5 by 11in in size. Log and summary sheets may be obtained from the sponsors by sending a large sae and ircs to: CQ Contest Committee, 76 N Broadway, Hicksville, NY, 11801, USA. Entries should also be sent to this address and should be postmarked no later than 1 December (for the phone section) or 15 January 1983 (for the cw section).

WA Y2 Contest

1500 16 October to 1500 17 October
3·5 to 28MHz. Phone and cw. Rules should be available from G3FKM (sae please).

The OK DX Contest

0000 to 2400 14 November
1·8 to 28MHz, cw and phone but not crossmode. Exchange RS/T and ITU zone number (UK is 27). A station may be worked once only on each band, and three points are gained for contact with Czechoslovakian stations, one with others. The multiplier is the total of ITU zones worked on each band. There are single-operator single- and multi-band, and multi-operator multi-band categories. Separate logs must be kept for each band and should show date, time, station worked, sent and received numbers, points claimed, and if multiplier. Entries must include a statement that all rules and regulations of the contest and amateur radio in the entrant's country have been observed. They should be posted before 31 December to: CRC, PO Box 69, 113 27 Praha, Czechoslovakia.

Results of the **QRP section** of the **1981 CQ WW DX Contest (CW)** have been supplied by G3VMY. In the multi-band section **G3VMY** scored 37,130 points, G4LMJ 33,900 and G4EBO 7,260. **G3DOP** scored 1,102 points on 14MHz.

In the **22nd All Asian DX Contest (CW)** UK scores were: **G3ESF** (22,736), G3PVA (17,711), **GW3MPB** (4,806) and G2AJB (714) in the multi-band section. On 14MHz **G3DQL** scored 1,624 points and G6NK 629, on 21MHz **GW3GHC** scored 11,210 and on 28MHz **G6GH** 30.

In the **ARRL 10 Metre contest G5CMX** scored 506,080 points, G4JKS 132,090, G3PVA 113,446, G3TXF 95,914, G3ESF 85,510, G4FDC 22,892, G3ZSF 22,156, G3VOF 18,432, G4NCW 13,176 and G5EBA 13,068. **GI6YM** 26,840, **GM4JDU** 96,576 and GM3RAO 91,052. **Multi-operator** entries were **GW8GT** 418,152, and **G3SWB** 86,814 points.

In the **1981 VK-ZL Contest (SSB section) G3UVZ** was sixth European with 3,476 points, followed by G4KIP with 2,840. The only other UK entry listed

An historic picture taken at the last social gathering of HARTS at the China Fleet Club. L to r: (front sitting) VS6EK, VS6CT and VS6BS; (back) VS6BA, VS6XLP, VS6XLX, VS6II, VS6XLA, VS6KV and VS6XLW

was G5MY with 1,938 points. **RS31976** came third in the listener section with 6,786 points. In the **CW section G3WPF** was third European with 3,294 points, G5MY scored 1,248 and G3PVA 702.

Third WW SSTV Contest

0600 9 October to 0600 10 October
This is the second part of this contest, organized by the German Amateur Radio Teleprinter Group. Photocopies of the rules may be obtained from G3FKM—sae please.

Around the bands

G8KG has produced a special extended report this month for the start of the dx season.

"With the 1982–3 dx season upon us, it is a good time to take stock of the progress of Cycle 21. The first thing to emerge may be something of a surprise to some readers, though not to those who have regularly read this column. Using the 2,800MHz solar flux as a criterion, there is no significant difference between the activity averaged over the period October to March for the 1979–80, 1980–1 and 1981–2 seasons. There were of course detailed differences, but the similarities are the outstanding feature; the solar flux averaged over the six month periods being 204, 202 and 203 respectively.

"Users of the higher hf bands were therefore trebly fortunate. Not only was the cycle peak the second highest on record but the period of highest activity lasted over 2·5 years and was so phased as to embrace three successive dx seasons.

"It is now evident that mean solar flux is falling—quite steeply in recent months, though less so recently. The average over the 1982–3 dx season is not likely to be much, if at all, above 170sfu, making the season broadly comparable with 1978–9. This level of activity is still high enough to provide very good winter conditions on the higher hf bands—as a general rule the charts in Chapter 4 of the *Amateur Radio Operating Manual* should still apply.

"There is, however, one way in which hf conditions this winter will differ from those earlier in the cycle. For the past two years there has been a steady rise in the average level of geomagnetic activity, and there are as yet no indications that this has reached its peak. There will probably be more disturbed days than in previous winters, disturbances will tend to be more severe and disruptive, and there will be fewer of those really quiet days which give stable hf conditions."

Thanks to the following for sending in logs for this section: G2HKT, G5JL, G3s, GHY, GIQ, GVV, IMW, KSH, LOL, NWG, XBY, YRM, G4HHQ, G4JVG/OH0, GW4KGR, G4s LDS, OBK, G5CFJ and RS30194.

Stations listed in italics were using A1A.

1·8MHz. 2100 G4IWA/A/OH0, OJ0MA, *OY7ML*. **2200** *C30LM, LX1AC, OJ0MA, G4JVG/OH0, SM5ACQ/OY, SM3FV, SM0AJU, RA1WCP, UK9AAN, ZB2EO*. **2300** *OZ1BYB*.

3·5MHz. 0000 *TR8DX*. **0300** PY. **0400** *CN2AQ*, HC1EA, *HH2VP*, HI8GB/6, W4DR. **0500** CE3CPR, CP5EL, CX7BY, ZL4PO/C. **0600** J6LF, ZL2SN, ZL4AP. **2200** A4XYB. **2300** *CE6COR*, TR8DX, UA9FAT, *UA0ABB*.

7MHz. 0400 *FM7WD, PY1,2,5,7, XE, YS, ZL4*. **0500** *CH3ROW* (=VE3FRA), *CP8AL*, HC2RG, HH2JR, *W6-W7, ZL*. **0600** CO8CP, VK9NS, VK0AN. **0700** ZL4PO/C. **2100** OY1JH. **2200** *UA0SAU, UH8EAA*. **2300** *CN8CY, EA9KN*, TN8AJ, *UM8PAC*, VQ9GD.

10MHz. 0000 *VE1ASJ/1*. **0500** *C31HD, VK* (until 0800). **0600** *VE7IQ. ZL* (until 0800). **0700** *FC8TT*. **1900** *JA* (until 2100). **2000** *DL7TS/HB0, VK*. **2100** *VK, VP2MIX, DL2GG/YV*.

14MHz. 0400 *VP5EE*. **0500** *FK0AF*, KH6, KL7 (until 0800). **0600** JA, *VK9NL*, W6-W7, WB5LBJ/4D6, ZL. **0700** A35JL, AH6AA, *FK8CE* (running 2W), FO8GM, *OY7ML*, TJ1CK, VK, VK9ZA, ZK2WM, ZL, 5W1DG. **0800** *FO8EW*, FW0AG, KH6LW/KH7, T2AGD, VK6, VR6TC, 4J1O,4K0A. **0900** A71AD, KH6BS, 5W1DQ. **1000** ZK1CG. **1100** *FK0AF*. **1400** KX6OB. **1500** VQ9SB. **1700** ON5YA/OY, *9M8JS*.

HF propagation study

Band predictions for October 1982

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 there probability, with 1 meaning 10 to 19 per cent of days, and so on. A plus sign indicates a probability of up to at least 1.

	28MHz	21MHz	14MHz	10MHz	7MHz	3·5MHz
MTG	000001111122 / 024680246802	000001111122 / 024680246802	000001111122 / 024680246802	000001111122 / 024680246802	000001111122 / 024680246802	000001111122 / 024680246802
EUROPE						
Moscow	....45553...	...2899983..	...777778941	533654457897	875322224789	+53.....4++
Malta	....55333...	...1888885..	11.777778973	764754457998	998522225799	+++2....24++
Gibraltar	....13211...	.....687674..	...187778971	552765556897	998742224799	+++4.....4++
Iceland	......21....	.....57652..	....6888884.	22..76567884	884543335688	+++4....235+
ASIA						
Osaka	....53.....	...3873.....	...364444422	...131124774	....1...2561	.....23.
Hong Kong	...27872....	...4888742..	1...44457854	2...11124786	2574	.....25.
Bangkok	...488873...	...4688883..	2...14357874	4....1124798	1.....2576	254
Singapore	...467675...	...4687895..	2...14357974	3....1124797	1.....2575	252
New Delhi	...488871...	...567885...	422.13357766	73....124799	61.....2578	3.....25+
Teheran	...688885...	...76678951.	635312357987	974....24799	851.....2578	+2.....25+
Colombo	...588885...	...55778951.	42...2357987	72.....24799	5.....2578	2.....25+
Bahrain	...6887851..	..1756788621	7552.1347998	973....14799	851.....2578	+2.....25+
Cyprus	...3887761..	...88889971.	534755668986	987422336899	8851...13688	++2.....3++
Aden	...6888872..	1.1655789842	8552..247999	973....14789	861.....2578	+3.....245
OCEANIA						
Suva (S)	.....144....	....367843..	...36545772.	..15321244..	....21....22..	.....
Suva (L)	....21...141	22.46531.574	.1376333573.	..1531.144..	....2....12..	.....
Wellington (S)	....2542....	...1787642..	....56545773.	...43212451.	...11....22..	.....
Wellington (L)	....1.....21	2212531..164	113664222641	..1431.1341.	...11....12..	.....
Sydney (S)	...377652...	...6887873..	...36435785 1	...131124741	.....252.	.....2..
Sydney (L)	....1.....1.	.1..521...53	111264222563	...231.1364.	....1...141.	.....
Perth	...578642...	...67877741.	3..134357885	1....1.24785	2572	.....24.
Honolulu	.....1..	....1...251.	.2115421651.	.145321143..	..341...1...	.....
AFRICA						
Seychelles	...6666521..	1.1555787742	853...347999	961....14789	83.....2578	+.....24+
Mauritius	...5788883..	2...655789853	8631..347999	851....14799	72.....1578	4.....25+
Nairobi	...57778641.	21.755589964	9752...47999	984....14799	861.....1577	+4.....255
Salisbury	...46778762.	32.755589985	9853...47999	985....14799	872.....1578	+4.....255
Capetown	...266788731	42.665679996	99651.126899	9962....3799	873.....1578	+4.....24+
Lagos	...198889841	43.675568996	99673..15899	8995....2799	7872.....478	4+5.....45
Ascension Is	88667521	441186556876	998751..1699	99962....389	7874.....168	4+5.....3+
Dakar	79888841	331197557996	998762..2699	99973....489	77841....168	445.....3+
Las Palmas	....5876761.	99889961	674676556898	999853323699	888621..1479	+++3.....5+
S AMERICA						
South Shetland	15778741	331167777785	898764332357	688731....24	46641.....1	.33.....
Falkland Is	....2788885.	231178766785	898764311257	899731....25	68841.....2	3+5.....
Rio de Janeiro	....1875662.	221.58655773	9986641..268	999731....38	88841.....16	+5.....3
Buenos Aires	....1787774.	221.68755685	8986642..147	999731....15	78841.....3	4+5.....
Lima	.....87774.	.1...2765563	78734431..16	899631.....3	68841.....1	3+52.....
Bogota	.....87774.	4765463	77733431..27	898632.....4	78741.....2	4+42.....
N AMERICA						
Barbados	.....687774.	.1...8755584	7873543...58	998631....27	88741.....4	+542.....
Jamaica	.....87773.	3865563	77623431..27	8986321....4	78741.....2	4442.....
Bermuda	.....287773.	7866773	776145311258	9986421...26	88741.....4	5552.....
New York	.....67762.	3777772	664125332357	8985321...25	68841.....3	4552.....
Mexico	.....7762.	486552	564141341.14	59854211...1	38841.....	.552.....
Montreal	.....67652.	3787772	664.25343367	89843211.136	68841.....3	4552.....
Denver	.....2541.	67641	553.2.244224	588431111..2	26841.....	.352.....
Los Angeles	.....531.	38641	452.2..45212	378431112...	15741.....	.25.....
Vancouver	.....12..	.....573.	441.1..36433	4674311131.2	14741...1...	..4.....
Fairbanks	.....	.....1231.	331143346653	355532124433	12441...11..	..2.....

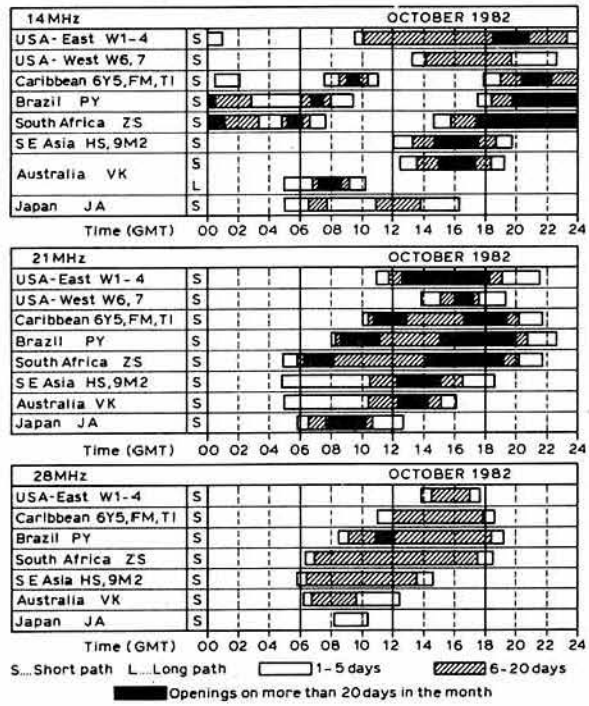
Cycle 21 indicates clearly that the predicted values by the classical Zurich method are systematically below the smoothed values, except during the premaximum period (March-September 1979). While the difference between the mean predicted smoothed values and the mean observed smoothed values is less than 15 per cent, the systematic character of the difference permits a better adjustment of the predicted values by considering the trend of these differences. The SIDC is now able to publish simultaneously the results of the classical Zurich method and the SIDC adjusted values.

Propagation predictions

After a long summer break, conditions on **28MHz** will continue to improve. Traffic with eastern North America will still not be certain; and with western North America it will be almost impossible, but during the course of the month it will steadily improve. Conditions on **21MHz** will improve during daytime, but because of seasonal conditions the band will close about 2200-2300gmt and open again at sunrise. Short-skip conditions will only occur under exceptional circumstances on **28** and **21MHz**. The season for short-skip will recommence in May.

Because of the long nights, 14MHz will lose its position as the night-time dx band. During the second half of the month only traffic with South America and Africa will be possible. The 7MHz band will take the place as the night-time dx band during the winter months, especially during the latter half of the night, but it will often be interrupted by strong QRM. However, this band will be ideal for local and European traffic without interruption by the dead zone. On the whole, distances covered in the daytime will increase on both **7** and **3·5MHz** during October. There will be chances of dx on 3·5MHz when the longer part of the path lies in darkness and QRM permits. Local traffic will frequently be interrupted by the dead zone.

The provisional mean sunspot number for July 1982 was 102·6. The maximum daily number was 272 on 17 July, and the minimum was 19 on 28 July. The predicted smoothed sunspot numbers for October, November, December 1982 and January 1983 respectively are: (classical method) 113, 111, 109 and 107; (SIDC adjusted values) 129, 127, 125 and 123.



1800 SM0MLL/C9, UK9JBD/U8R. **2000** JA, *VE1AWS,* ZL. **2100** *KC6WS,* F6FIC/TZ, *UA0ZAA/U0X, 3V8AL.* **2200** HS0HS, VP8QG.

21MHz. 0700 *BY1PK,* HS0HS, *VQ9GD,* 9M8NL. **0800** LX0JBC, *TR8JD,* 9M8JS. **0900** *FK8KAB,* HL1EJ, JA (until 1500), JW5VAA. **1000** W6IAE/KH0, YB (until 2000). **1100** *CR9BK, J28DP, KH0AC,* T30BY, W (east coast until 2100), YJ8RG. **1200** HL1AQ. **1300** KC6SX, DF3NZ/ST2, T30BY, *TL8ER,* 9V1TS. **1400** FM7WS, JY9RC, KC6IN, *M1C, TU2IE, 9M2OK.* **1500** FR0HIF, KX6OB, JA1DNG/YI, SV5DX, *4W1XW* (?). **1600** *SM0MLL/C9,* VS5s DD, GA. W6-W7, *8J5SUN.* **1700** D68AM, FR7CG/T, HH5CB, *KH6CF,* S79s ARB, WHW, ON6BC/ST4, TA2BK, VP8ALL, VQ9s CI, GD, 7Q7LW, 9M2FR, 9M8NL. **1800** FH8CL, *HS3FN, K5KG/OH0/OJ0,* VP8NY, YC6JW, ZD9s BV, YL, 4D7RLS, *OZ7GI/5N9.* **1900** A4XJQ, A71AD, C53EK, KH6AF. ZD7TW, *5H3FN, 5X5FS,* 9L1MS, 9U5JM. **2000** *KA3BUJ/8R1.* **2100** *A4XHI, KH6IJ, V2AV.* **2200** C53EK, 5Z4CV. **2300** HC8GI.

28MHz. 0700 UJ8JCQ/U8K. **1000** ZS (until 1700). **1200** *EA6NW.* **1500** S America (until 1900). **1600** VQ9CI, 7Q7LW. **1800** E Coast W (until 2000).

Many thanks to all who have contributed this month, and to the following for items extracted: *DXNL* **(DL3RK),** the *DX Bulletin* **(K1IN),** the *Long Island DX Bulletin* **(W2IYX),** *DX News Sheet* **(G3XTT/G3ZAY),** the *Ex-G Radio Club Bulletin* **(W3HQO),** *Long Skip* **(VE3EUP),** *DX'press* **(PA0GAM),** and *CQ Magazine* **(W1WY).**

All items for **December** issue to reach G3FKM by **27 October** please, and for **January** by **25 November.** □

Special event stations

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

5Y4ITU, 28 September-9 November

The Radio Society of Kenya will operate this station to commemorate the International Telecommunication Plenipotentiary Conference to be held in Nairobi. There will also be a special prefix, 5Y4, for all Kenya-licensed amateurs, to be used for the duration of the conference.

GB4NNG, 16-17 October

The station will be run by the 99th Glasgow Scout Group. Operation will be on 144MHz and 3·5-28MHz, from their hq at 166 Kingsbridge Drive, Glasgow G44. Details from A. Young, GM6FJS, 73 Kingslynn Drive, Glasgow G44 4JB.

GB2TSA, 16-17 October

This station will operate from Gil's Cabin, United Reform Church, Bradleigh Avenue, Grays, Essex, as a Jota station for Thurrock Scout Association. Operation will be on 3·5-28MHz ssb, 28MHz fm and 144MHz fm. Special QSL cards available via the bureau. Further details from P. R. Zipzer, 253 Rectory Road, Grays, Essex.

GB4CC, 22-24 October

The station commemorates the 25th anniversary conference of the World Association of Christian Radio Amateurs and Listeners. It is hoped to operate on 144MHz and hf, simultaneously, from 12 noon Friday to 5pm Sunday. There will be a special QSL card. Details from G4NPM, tel Minster 873147, or G3AGX, QTHR.

SSTV SCENE

P. Burnett, G4BLL*

THE INTRODUCTION TO SSTV presented in *SSTV Scene* July 1982 appears to have aroused some not-inconsiderable interest, judging by the number of letters and telephone calls received since then. If that interest translates into activity on the bands then the time and effort in preparing these columns is not spent in vain. However, your sstv correspondent has formed the distinct impression that while sstv obviously appeals to the home-brew fraternity, particularly with the ease of availability of the Robot 400 pcb, the completed equipment—and a large number of units have now been successfully completed—does not appear to be used very much in the transmit mode. *SSTV Scene* would like to be proved wrong on this point, so let me have details of **your** frantic activity on all sstv approved bands from 3·5 to 144MHz.

Colour sstv

An exchange of correspondence with JG1DDT, who compiles the sstv column for the Japanese magazine *CQ Ham Radio*, produced an interesting list of some radio amateurs worldwide with colour sstv capability, and a short description of the equipment used is reproduced here with acknowledgements to JG1DDT:

(1) G3NOX using three Robot 400s.
(2) G3MES and ZS6BTD using Robot 400 with three memory substitute boards (as mentioned in July *SSTV Scene*).
(3) G3GGJ, G3WW, G3CZT and G3JRL using Robot 400 or SC77 with W9NTP-designed memory boards.
(4) VE3EGO's 3000 with a three-memories unit added on to Robot 400.
(5) ZS6BTD, GM3KJF and SM5EEP: SC422a with two or three memories.
(6) G3OQD using computer-controlled homebuilt Robot 400 with three memories.
(7) VK3LM and ZL1IH: two-memories unit homebrewed design.
(8) WA7WOD and ZS6BTD: Robot 400 converted 3,000c, three memories.

Your scribe hopes to add his callsign to this illustrious list some day, having completed one W9NTP additional memory board and very nearly completed the second. However, the main task is installing the two boards and arranging the necessary output switching from one memory to the other. Have we any other "imminent" colour sstvers? Richard Thurlow, G3WW, sent news of the Copenhagen colour sstv group which is operational with a low-cost system using the colour sequence blue, red, green (the green last due to the simplicity of the system). He said that OZ9AV and the group are active on 14, 28 and 144MHz, and are looking for two-way colour sstv contacts. Richard also said that two new countries have appeared on sstv, in the shape of FM7CD, Martinique, and Z21EK, Zimbabwe.

Computer-controlled sstv

Don McLean, G6AWI, wrote with very interesting details of experiments in processing sstv signals through his Z80-based computer, and enclosed several very interesting photographs reproduced here illustrating the end results. He said: "Essentially the method corrects for badly-positioned lines caused by errors in sync detection. . . . The process is written in machine code and corrects the 128 by 128 sample pictures in about 30s/picture typically". He goes on to comment "I feel that not enough experimentation has been done with restoring slow-scan pictures, and I certainly hope that something may interest people enough to blow the dust off their personal computers, put aside their 'Space Invader' cartridges and try something out —anything as simple as picture filtering or the like."

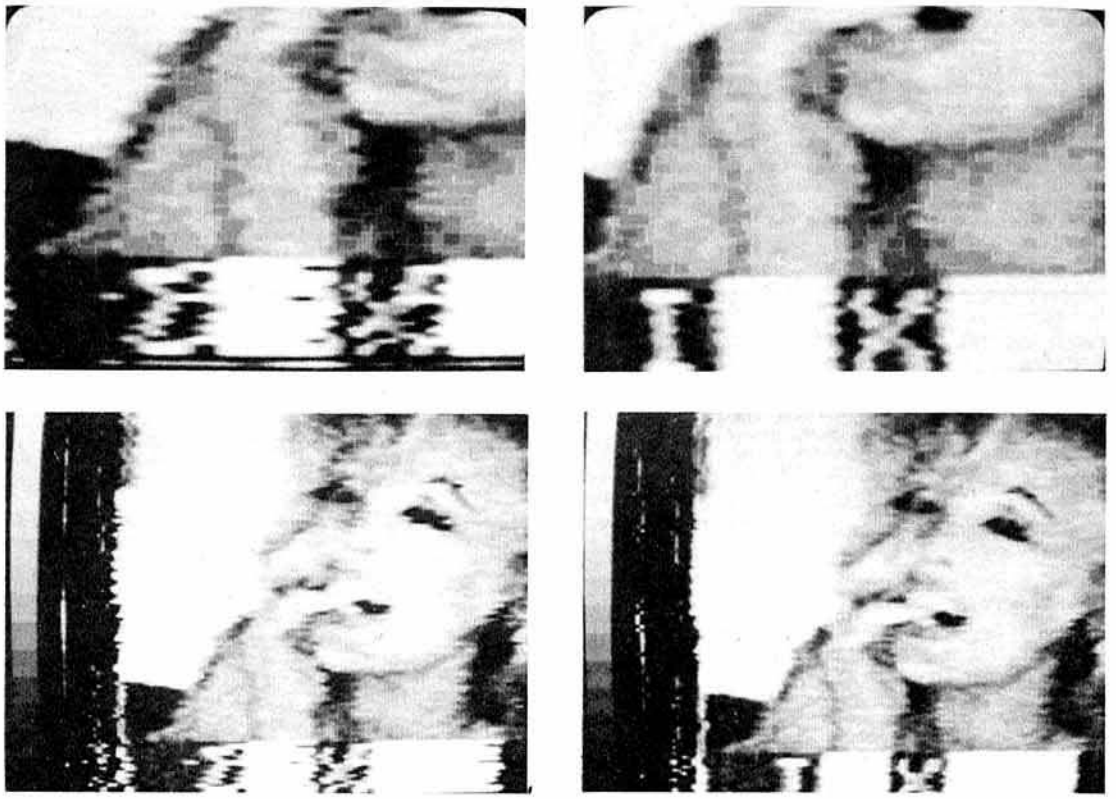
Erratum

In "Starting on sstv", July *SSTV Scene*, it was stated that "The generation of an sstv video signal for inputting to the transmitter can be accomplished in a number of ways . . . (3) Alphanumeric display from a keyboard (or touch pad) such as the Robot 800 Wrasse, Tonna Theta . . ."; in fact the latter piece of equipment mentioned does not embrace the sstv mode within its capabilities. My apologies to the manufacturers of this piece of equipment for attributing it to a mode of transmission for which it was not designed.

New bands for sstv

The suggestion has been put forward that the use of sstv should be permitted within the 10·1–10·15MHz band. A glance at the new licence schedule supplement published in the April 1982 issue of *Radio Communication* shows that footnote No 9 has been omitted for the above band (Footnote 9 simply states that "slow-scan television" may be used in this band). While on this subject, there appears to be no logical reason why the same thinking should not be applied to the 70MHz band. Please write and let *SSTV Scene*

(Continued on page 874)



The top photographs show expanded views of a frame from I3XQW which is one frame from a tri-colour sequence. The original picture as received (l) suffers considerably from line tearing caused by poor sync detection due to multi-path propagation, fading etc. The result of processing this image with the line matching program is shown on the right. The two characters from the callsign can now be read. The full size frames are shown below for reference

*7 Rydings Avenue, Brighouse, W Yorks HD6 2AJ.

MICROWAVES

Charles Suckling, G3WDG*

1,000km exceeded on 10GHz

The 1,000km "barrier" has at last been broken on 10GHz. The record-breaking contact took place on 3 July 1982 between I0SNY/EA5 operating near Valencia on the east coast of Spain and I0YLI, over a distance of 1,101km. The record was broken again, on 6 July, when I0SNY/EA5 worked IW0BFZ at 1,117km. Not satisfied with this apparently, the same pair went on to work a 1,166km path on 10 July!

Once the necessary ratifications have been done, I0SNY/EA5 and I0YLI will presumably be able to claim the prize offered by Microwave Associates for the first contact beyond 1,000km on 10GHz. Congratulations indeed to all the stations involved in these historic contacts.

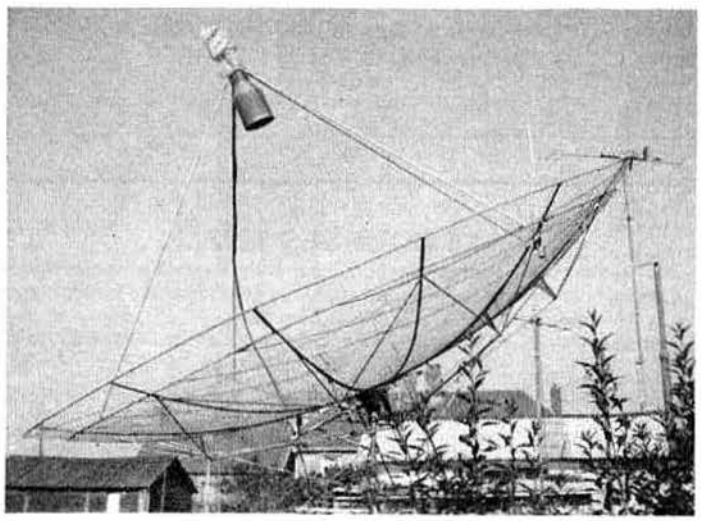
Success on 1·3GHz eme with a 2m dish

The potential of the 1·3GHz band for eme contacts using relatively small antennas was emphasized recently by tests carried out by DL7YC. During the August 1·3GHz eme activity period, a successful contact took place between DL7YC and SM6CKU, following a CQ call by DL7YC. DL7YC's equipment consists of a 2m diameter dish, fed with 400W of rf from two combined 2×7289 amplifiers, and an NE720 gasfet preamp on receive. SM6CKU was using an 8m diameter dish with 125W at the feed.

The reports exchanged were "O" grade, signifying good copy at both ends. This means that contacts could perhaps be made with an even smaller antenna! In addition to working SM6CKU, who admittedly is the strongest signal off the moon on 1·3GHz at the moment, DL7YC has also identified eme signals from G3LTF (5·8m dish), I2COR (6·2m dish), PA0SSB (6·2m dish), W7GBI (7·4m dish), VE7BBG (6·2m dish) and WB5LUA (7·4m dish), and has been heard by DJ4AU (9·2m dish).

1·3GHz eme activity from Wales

Stuart Jones, GW3XYW, has written with details of his 1·3GHz eme activities. He made his first contact on 22 May, with G3WDG (first G-GW 1·3GHz eme QSO), as well as hearing his own echoes consistently. A few days later he worked G3LTF, both contacts were made with his dish at 5·5m diameter. The dish was then extended to 6·2m diameter (to squeeze out another 1dB gain!), and in July Stuart worked SM6CKU, K2UYH and DJ4AU, which are believed to be first contacts from Wales to Sweden, the USA and Germany on 1·3GHz. He continued his run of "first" contacts in August by working PA0SSB and VE7BBG, as well as making contacts with W7GBI and SM6CKU. Stations heard but not worked were WB5LUA, OK1KIR and DL7YC. SM6CKU was worked directly on ssb following a CQ call—55/32 reports were exchanged (ssb contacts are becoming more and more common on 1·3GHz eme, with stations using 6·2m or larger dishes able to hold full conversational QSOs).



A view of GW3XYW's 6·2m dish for 1·3GHz eme

GW3XYW's dish is shown in the photograph. Its f/d ratio is 0·45, and the feed is the W2IMU circularly-polarized dual-mode horn. The dish is mounted on an el/az mount and tracks the moon automatically using a PET 2001 as the controller. The remainder of the equipment consists of an MGF1412 gasfet preamp (SSB Electronics), a homebuilt transverter using modules from SSB Electronics (supplied by Piper Communications), and a 2×7289 pa to the W2CQH design.

GW3XYW mentions that all his contacts have been made with only 100W rf output. His results show very clearly that on 1·3GHz eme one can be successful with much lower power than on 144 or 432MHz, which is one of the main attractions of this band for eme work.

More aircraft scatter tests on 1·3GHz

G4KGC (ZM65d) and GW8TVX (XL30d) recently carried out a series of tests over a highly-obstructed 215km path. GW8TVX was using a 4×23-element Tonna array, and G4KGC a single G3JVL loop Yagi. G4KGC's 150W p.e.p. signal was received just above noise for about 75 per cent of the time at GW8TVX, by troposcatter. GW8TVX's 1W could only be heard occasionally (by aircraft scatter) by G4KGC, so a procedure was adopted using accurately-timed transmit and receive periods (1 and 3min). Their patience was finally rewarded after about 20h worth of skeds, by a complete QSO on 30 July. Reports of 53/53 (peak) were exchanged.

No doubt part of the success of these tests was due to the fact that GW8TVX's Microwave Modules transverter was mounted at the masthead —this would seem to be an excellent idea for anyone owning such a transverter and wanting to achieve the best possible results "barefoot".

Beacon news

The Farnborough 1·3GHz beacon GB3FRS (located at ZL57f) has now been operating successfully for some months on 1,296·850MHz. G8ATK the beacon keeper, is keen to receive reception reports of the beacon, which apparently has a rather wider coverage area than originally anticipated. It has so far been copied from as far away as CH and DH squares. G8ATK keeps envelopes in the QSL Bureau, and will QSL any reception reports. (QSL to GB3FRS).

The Bushey 10GHz narrowband beacon GB3SWH is continuing to be a very useful signal source. Recently it was heard by G3LTF (AL11d) while testing out his narrowband receiver.

Alderney expedition results on 1·3, 3·4, 5·7 and 10GHz

G3YGF, G4BBU, G4KNZ, G4GCM, G8LYB and G8RPV of the Oxford University RS were active from the island of Alderney (YJ30h) during August. Equipment was taken for most of the microwave bands, and a number of very interesting contacts were made.

Microwave operation began on 15 August with a series of tests with G3BNL/P (12km W of Swanage). GU4KNZ/P worked G3BNL/P on 3·4GHz (with 52/54 reports). Both stations were using approximately 1W output, and 60cm dishes. GU3YGF/P then worked G3BNL/P on 5·7GHz; GU3YGF/P was running 2W output, and G3BNL/P had 300mW—signal reports were 319/59. Both these contacts are believed to be firsts between GU and G. Tests were made with G4MBS (Upper Wield) on 3·4 and 5·7GHz, but were negative, although G4MBS may have received a very weak signal on 3·4GHz.

The 10GHz band proved to be very successful. During the expedition GU3YGF/P worked G3BNL/P, G3JVL, G4MBS and G8KHU/P (St Catherines, Isle of Wight—wideband), and was heard by G3FYX/P, G8SHF/P and G8IZD/P (all located at Charterhouse on the Mendips), G8EUQ/P (Dunstable Downs), GW3PPF/P (Mynydd Maen—wideband and narrowband) and G3FYX at home (Bristol). Narrowband was used for most of the tests, except where indicated above. GU4KNZ/P worked G3BNL/P, G4MBS, G8KHU/P and heard G3JVL. The tests with G4MBS and G3JVL were made virtually on a daily basis and the signals were very consistent—averaging 10-15dB above noise in 500Hz bandwidth, with a maximum of 25dB. Conditions were normal for most of the time, apart from a super-refraction opening when GB3IOW was received (and G8KHU/P worked). A number of tests were made with PA2DOL (CL03j) at 528km, but no signals were received in either direction despite 10W of narrowband at both ends, as well as gasfet preamplifiers. GB3ALD was copied a number of times at good strength (it was line-of-sight to the expedition location). The longest-distance contact made was with G4MBS (175km), and the longest-distance reception report was from G8EUQ/P (264km).

Equipment for 24GHz was also taken, and contacts were attempted on narrowband with G3BNL/P, unfortunately with negative results.

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On 1·3GHz, GU4KNZ/P worked approximately 20 stations, using a 4×23-element Tonna array, a 2C39 pa with approximately 20W output, and a gasfet preamp on receive. Most contacts were with stations in the south, although several contacts were made into ZM. The best dx was PA0EZ (CM56b) at 589km. GB3IOW was consistently very strong, and GB3BPO was also audible, at 5–15dB above noise.

More on the July/August openings

Since going to press for September a large number of reports have been received about dx worked during the remarkable spell of good tropo conditions in July and early August.

On 7 July G3ZEZ (Clacton-on-Sea) worked HB9AMH/P at 59+ both ways on 1·3GHz. Later in the month on 29 July he worked SM6HYG at 970km and attempted a contact with LA3FV with nil results, despite good signals on 432MHz. On the next evening he worked SM6HYG on 2,320MHz with 55/559 reports. The 2·3GHz equipment at G3ZEZ consists of a 2C39 mixer feeding two 2C39 amplifiers with 20W output, a 4ft dish and an HP35821E preamp. G3ZEZ now has six squares confirmed on 2·3GHz and 21 on 1·3GHz. He is also active on 3·4, 5·7 and 10GHz (with three separate dishes) and is looking forward to his first two-way contacts on these bands.

G3LQR was operational on these bands during the openings. On 29 August he worked PA2DOL at 215km on 5·7GHz for the first G–PA contact on this band. G3LQR was using a tower-mounted varactor multiplier with 500mW output feeding a *Practical Wireless* dish, while PA2DOL had 8W output into a 50cm dish. Signal reports exchanged were 519/569. The next evening he made a crossband QSO with DK1ZD (EO70g) on 3·4GHz, over a distance of 500km. G3LQR's 0·5W transmission was received at 55 by DK1ZD but faded into the noise; no signals were heard in the other direction. On 10GHz, G3LQR worked PA0EZ at 258km on 2 August. He also spent some time on 1·3GHz and heard a number of stations in SM6, and worked LA3FV in FT square.

G8ATK (Farnham) also found conditions to be excellent on 1·3GHz. Using only 1W into a 15/15 antenna he worked DK8VR (DJ55c) on 8 July with 59 reports both ways; on 15 July he worked DB4LT (EO70e) and DD2EK (DL12c) and on the 25th he managed to work DJ8XO (FN12c) and DF3XU (FN31a).

G4BYV wrote with the news that SM6HYG worked LA3FV/P on 5·7GHz and EI on 1·3GHz (more firsts?). During a QSO with LA3FV on 1·3GHz, G4BYV learnt that LA3FV/P hopes to be regularly active on 5·7GHz. On 29 July G4BYV added two more squares to his 2·3GHz total (now 20) by working SM6HYG (FS) and DC9XG (EN). On 1·3GHz, he worked F1SA (CE16d) on 7 July at 932km. G8MWR also worked F1SA.

GM8BKE was operational during the opening at the end of July on 1·3GHz, and worked SM6ESG and SM6CKU (both in GR square). Everyone was delighted with these contacts—GM8BKE because the contacts make him eligible for a microwave distance award and the others because they worked XP for the first time! GM8BKE was using 30W output from a UPX-6 pa to a single-loop Yagi.

Rain scatter on 5·7GHz

On 26 June at 0930 G4MBS (near Alton) received signals from G8ADC (Luton) during a period of very intense rain at the G4MBS QTH. The signals were copied at 5dB above noise in 270Hz, and had the rough quality now well known on 10GHz rain-scatter signals, but not as noticeable as on that frequency. There was also heavy rain at the Luton end of the path, and a thunderstorm nearby. During the tests an aircraft reflected signal was also heard, which had no roughness.

This was the first instance of rain scatter being observed over the G4MBS–G8ADC path during two years of tests in heavy rain, from which it may be concluded that this mode of propagation is far less effective than on 10GHz. Incidentally, six days previously G4MBS and G8ADC had had their first-ever 5·7GHz contact after four years of tests.

Activity on 10GHz in GI

GI8DMX and GI8GJX recently managed a contact on 10GHz over a 17km path—possibly the first GI–GI QSO on this band. Crystal-controlled equipment was used with approximately 1mW output, and the antennas were a 15in dish and a 30in dish. Narrowband fm was used for the contact, and signals were measured at 20dB above noise; the equipment can also be used to generate ssb, and tests will be made using this mode during the summer. The callsign GI4KKK was used at one end of the path.

Awards corner

Microwave enthusiasts are reminded that an RSGB Microwave Award Claim Form exists for their use. It itemizes the "QTH Squares Requirement" on 1·3GHz up to 24GHz. Its successful use brings the claimant a very handsome certificate, somewhat larger than the well-known FMD and 4–2–70 Squares parchments. Stickers are issued to mark each successful claim as more squares are worked and confirmed. Copies of the claim form may be obtained from G5UM, QTHR.

Back in the older-established "Four Metres and Down" field it is worth recording that by turning in a claim for a 1·3GHz Standard Certificate G4MAW in South Devon automatically qualified for the gold-leaf Supreme Award: Mark Marment already held 144 and 432MHz Seniors, and by winning the 1·3GHz Standard Award No 33 was able to achieve Supreme No 40.

Also on 1·3GHz the two latest claimants for a certificate in recognition of "First contact beyond 600km" are G8MWR who worked DK0VL at 840km, and G8PNN who worked OZ1FEF at 677km. They received the 23cm certificates numbered 38 and 39 respectively.

G8PWX earned his by working DC9XO on the same day, 12 May. He gets parchment No 40. To South Wales went No 41 to GW8TVX near Swansea, to whom a QSL card came from HB9AMH/P for their 1·3GHz contact on 7 July. □

SSTV SCENE

(Continued from page 872)

have your views on this subject—the more support that is forthcoming, the easier it will be to convince the authorities concerned with drawing up and amending the amateur radio licence schedule that this is a case worthy of consideration.

Dayton, Ohio, Hamvention

This was held on 23–25 April this year, and once again heralded a number of innovations and developments in sstv. Pride of place must, once again, go to Don Miller, W9NTP, for his single-frame 8s colour sstv display. (WB4HCV is reported to have conducted a QSO with WA7WOD on 14,230kHz using the 8s colour frame technique.)

Syd Horne, VE3EGO, demonstrated his 403 sstv Colorscan System which features an injected colour bar and an auto servo control for automatically indexing the red, green and blue filters in front of the black and white camera lens. He has also developed a matching colour graphics keyboard system.

Commsoft Inc showed how their "Photocaster" program and interface unit for the Apple 2 computer could be used for high resolution sstv. A high-resolution sstv converter model MSC-1000 was introduced by George Steber, WB9LVI, capable of 256 by 256 by 64 grey levels; the unit uses 64k ram chips to a total of 384k bits.

Tom Hibben, KB9MC, demonstrated moving animated pictures with his converted Robot 400 plus three memories. (The May issue of *A5* carries details for modifying the Robot 400). □

RSGB 1982 IEE LECTURE

"COLOUR SLOW SCAN TELEVISION NOW AND IN THE FUTURE"

See enclosed leaflet for details

RAE COURSES 1982–3

The following RAE courses were notified after the September issue of *Radio Communication* went to press. Although they all commenced in September it is probable that they may still take late entrants.

Aldridge, Walsall. Aldridge School, Tynings Lane, Aldridge. Tuesdays 7-9pm. Commenced 28 September. Details from Mr Winter, Aldridge School, tel 0922 53032; or Mr B. Price, G4DDF, tel 0922 51017.

Bracknell. Bracknell College, Church Road, Bracknell, tel Bracknell 20411. Tuesdays 7-9pm. Commenced 21 September. Details from Mr A. W. Wright, at the college.

Harwell. Vale of White Horse RS, White Hart Inn, Harwell, Berks. Wednesdays 7-9pm. Commenced 22 September. Details from Mr A. Lovegreen, G4FLX, QTHR.

Islington. Starcross School, Rising Hill, London N1. Mondays 6.30-9.30pm. Commenced 27 September. Organized by Grafton RS and Islington Institute. Details from Mr B. C. Bond, G3ZKE, QTHR, tel 01-485 7065.

Loughborough. Loughborough Technical College, Radmoor, Loughborough, tel Loughborough 215831. Tuesdays 6-7pm (morse) 7-9pm (theory). Commenced 14 September. Details from Mr G. M. Allen at the college.

Northampton. Duston Upper School, 7pm Tuesdays, and Kingsthorpe Upper School, 7pm Mondays. Details from Mr B. D. W. Steen, G8LHR, QTHR.

SWL NEWS

Bob Treacher, BRS32525*

SEVERAL READERS have noticed the shift in *SWL news* in recent months from hf to vhf, but this is only a temporary change in emphasis brought about mainly by the poor hf conditions during the summer and the sometimes excellent propagation on 144MHz.

144MHz dx report

Tropo. First, some late reports on the 12/13 July conditions. Dave Whitaker, BRS25429, just missed last month's deadline with an interesting account of the conditions from ZN square: he logged stations from BQ to ZU squares, including EO to ES and FQ to FT. While sending your scribe (and his xyl—BRS62088) a QSL card for ZU square, GM4LBE also commented on conditions—during the same period he worked over 200 Gs, 56 PA0s, 13 DLs, his first F, 3 LAs and 4 ONs.

Dave Whitaker updated the 144MHz dx scene in mid-August and commented on 21 July—SM7DLZ (IQ53h), DC7MH (GM37b), DC5AL/P (FL12c), Y25FG (FM69j) and Y23SB (FN58d) being the best of the bunch. On 24 July there was a mixture of tropo and aurora, while on 28 July the band opened again to Scandinavia—OZ7RD (FQ41h), LA8EW (DS78g), SM6JLZ, SM6KTC and SM6NET all in GS square, SM6BCD/6 (FS79j) and GW6ARL in XM square for Dave's 100th QTH square. These were followed on 30 July by SM6LPH (HS01a), SM5BUZ (HS36e), SM0FMT (IT), SM0EJW (IT50e), SM5LED (HT50f) and SM4KYN (HT51j). Early August was poor by comparison, but GM4DHF/P obliged for XS square. On 7 August EA1RCA and ED1RCF were good copy from WD square, while on the 11th EA2AA was 59 plus from YD55b.

Aurora. A widespread aurora occurred on 7 August. In London, GM8AOB (XQ), G8LZM (ZO), GM4IKT (YP), GI8YWV (XO11b), GI5MPS (WO48c), EI6AIB (WN), GI8YDZ (WP67b), GI6DBN (WO), GM8ZZN/P (XP06c) and GM8OFV (YP05g) were heard, while in Yorkshire F6CKZ (AJ), DH1IAB (EJ), GW8FKB (XN), F1KPW (BK), PE1CMO (CM26e) and GJ8KNV (YJ) were all auroral.

Meteor scatter. The Perseids shower duly peaked late on 12 August, and with it came some excellent reflections. Among the stations copied at the writer's QTH were DD0HR (FN), F1FIH (CE), F1CAL (AF), F1BLL (CD), HG1KYY, HG1YA (IH), I1ANP (EE), I1BEP, I1JTQ, I2FAK (EF), I2FHW, IW3QBC, I4BXN (FE), I5KKW, IW5ABM, I0CUT (GB), OE3OBC (II), OK2BFH/P, OK1DIG, OZ4VV, YU2CCB (IF), YU2RGO (HF), YU3ZV (HG), YU7AR (KF) and Y22ME. Thirty-six stations were heard during the shower using random ssb. To boost the QTH squares total, ms operation is becoming a must, and, hopefully, next year's shower—the major event of the ms calendar—will have even wider participation in G-land from both transmitters and listeners alike.

1·8MHz news

Peter Norris, BRS47513, reported a move of QTH and a new fullwave 1·8MHz wire strung between a barn and two tall trees. He noticed distinctive signs towards mid-August that the band was coming to life again. EA3VY, G4JVG/OH0, DJ2YA and EI8H had been heard. There were also rumours of OJ0MA and several IS0s being active on the band. Peter now has 21 top-band countries verified and is hoping to log more new countries during the forthcoming winter dx season. He queries whether any other listener has heard the Soviet stations using fm on the band?

Newcomers

Lucien Wilder, ARS48637, started his life as an swl by purchasing a DX100 in a surplus sale. He has now progressed to an FRG7, and provided a good list of the dx stations which he has logged. During his school holidays Lucien spent much of his time tuning the bands, and perhaps he may enter a table score before the end of the year.

Peter Rose, ARS48577, found propagation good on 8 August, with ZL, JA and South Americans on 14 and 21MHz. Peter uses an FRG7 and 20m wire antenna via an atu. He had logged 77 countries up to the time he wrote.

John Bramwell, RS49327, is only 13 years of age and enters a table score for the first time. He uses an SRX30D receiver with a 10m long-wire via a preselector, and for vhf a homebrew converter and a six-el quad in the loft. John enquired about the world record for "Heard All Continents": your scribe is not aware of any "official" record, but on a good day on 14MHz, HAC must be feasible in around 5min. *As a challenge,* why not try during October to see how quickly *you* can hear all continents? The best times for HAC on each band and details of the stations heard will be published. HAC is also possible on 7 and 3·5MHz.

Neil Hutton, ARS51037, uses a pocket receiver which covers 4–12MHz and which cost 10p in a jumble sale! He has carried out several modifications and, as a result, can now resolve ssb and has brought 3·5MHz into his tuning range. His best dx on this "unusual" hf receiver is a CT1 on 7MHz.

Anthony Pinnell, ARS50886, is 14 years of age and has been listening since April 1981. He uses a Sony ICF2001 with a long wire, and sent a good list of dx heard.

1982 HF COUNTRIES TABLE

Station	28	21	14	7	3·5	1·8	Total	Mode
BRS8841	186	195	209	130	101	14	835	ssb/cw
BRS47745	165	194	198	119	113	30	819	ssb/cw
BRS25429	163	176	173	140	107	35	794	ssb
BRS44703	129	155	162	106	103	26	681	ssb
BRS46228	115	108	170	134	107	32	666	ssb
BRS25901	121	162	151	84	91	29	638	ssb/cw
ORS46084/7Q7	150	191	186	68	18	0	613	ssb
ORS45992/7Q7	143	190	183	65	24	0	605	ssb
BRS35509	114	127	156	87	92	6	582	ssb
BRS1066	98	143	133	91	65	41	571	ssb/cw
BRS30694	115	135	108	53	51	28	490	ssb/cw
BRS31440	118	85	106	74	67	27	477	ssb
BRS48675	76	109	118	55	38	19	415	ssb
BRS18529	36	71	63	103	107	27	407	ssb
BRS45033	161	96	141	3	6	0	407	ssb
RS45466	46	88	74	46	55	16	325	ssb
BRS30493	47	89	112	40	31	6	325	ssb
ARS50886	63	101	88	30	28	2	312	ssb
RS44984	43	40	106	26	13	1	229	ssb
RS49327	44	43	94	11	10	14	216	ssb

DX swl

John Lord, ORS46084/7Q7, wrote on behalf of Stan Porter, ORS45992/7Q7, and himself. John had removed his doublet and inverted-Vs and replaced them by a delta loop for 7MHz as per G3UML's described in *TT* May 1982. This has given some interesting results. Locally, 7Q7LW, 200 miles to the north was 56 on John's 18AVQ and 59 + 40dB on the loop. Dx-wise, stations are, on average, two S-points stronger on the loop, and the noise level is also reduced. He has also put up a λ/2 centre-fed groundplane at 40ft for 3·5MHz—again an improvement over the 18AVQ has been noted, and in his shack the FRG7700 has been modified to a 7000M. On QSL cards, both John and Stan have noted with interest all the comments which have appeared recently; John has had 55 replies from 93 sent direct since he started to send them. Both have A71AD on their "does not QSL" list—so it does not seem to be only Gs who cannot get cards from him! They are both trying to get A71 confirmed and have now sent cards to A71AU. John reports QSL cards from HZ1HZ and ZE6JL (now ZS2JL).

HF news

Very little of note to report—several regulars must be on holiday. The lower frequency bands were beginning to show some signs of dx life towards the end of August. VU2RAK had been heard at 1734 on 7MHz, 9M8JS at 1818, ZLs at 1915, JAs at 2015, VK at 2035, while at 2147 HS0HS was 57. On 3·7MHz the same station was surprisingly 58 at 2216, and TN8AJ rather poorer copy at 2145. On the higher bands, KH6LW/KH7 and 9M8JS were reported on 14 and 21MHz. VE1AWS/1 was very active on cw from Sable Is, while KC6 was given a good airing by KC6IN and AD1S. Also good to know there is some activity again from SP.

Here and there

G4JLU passes on his grateful thanks to all those who wrote or telephoned with much useful data on frequency allocations, and in particular to BRS30694. Congratulations to John Bishop, ex-RS45292, who is now G6JFA. Colin Watson, BRS46598, wrote from his holiday QTH in western GM; he had a 144MHz fm pocket scanner with him and hoped to hear stations in GI, or further afield on the simplex channels.

Brad Bradbury, BRS1066, reported a QSL card from VK3MR for a 10MHz report, plus cards from JA1DNG/Y1, G6ZY/CN8 and 8Q7BC for reports on their signals on the "more established" bands—he now has 246/276 confirmed. Jim Dunnett, BRS30694, also mentioned 10MHz. He now has 35 countries heard on the band, and was pressing for its inclusion in the 1982 list, but in view of the recent decision by the HF Committee not to allow 10MHz scores in the new *MOTA* table, it would be less than proper to allow its inclusion in *SWL news*.

Ron Thomas, ex BRS15822, is now the holder of G4OKN. Ron, a

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knowledgeable listener, most certainly passed his apprenticeship with flying colours and won many of the RSGB sponsored contests. He is now mainly on cw and would appreciate accurate listener reports. He worked 130 stations in less than three weeks, so was obviously setting off on the right foot. Ron wants "truthful" reports only—weak or strong—as he is assessing the directional properties of the half-size G5RV.

D. J. F. Gordon, BRS43752, would like some help from any reader who may have fitted the FM7 fm board for an FRG7 to an FRG7000, as the diagram does not correspond with the 7000. He would be grateful for a copy of the 7000 manual, as his approaches to various dealers have produced no results. Any expenses will be refunded in full. His address is 6 Oak Close, Chepstow, Gwent NP6 5RL.

Keeping records

Graeme Caselton, ex RS44984, is now G6CSY, but still listens on the hf bands. He uses the following record system.

West Germany (Federal Republic) — **DK0**

			1	2	3	4	5	6	7	8
DJ4SA/P/DK0HA	Hermann Ulm FT227B & dipole	B				X				
DK0LL/A	Dieter Lengo Scout Group JOTA '81 Stn	B				■				
DK0FN	Lake Constance (QRM)					X				

X signifies "station logged", ■ "QSL card received", and B that the report was sent via the QSL Bureau. The bands range from 1 (1·8MHz), to 5 (21MHz), to 8 (432MHz).

Finale

News, views, comments etc for the December issue to reach your scribe by 19 October. Late copy by 27 October. Please support the 3·5MHz slps on 23/24 October (see *Rad Com* March 1982, p233, for details) and the 21/28MHz SSB Contest on 10 October. (Rules in *Rad Com* May 1982, p427). □

Looking ahead

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

7-9 October—11th ARRA Amateur Radio Exhibition, Granby Halls, Leicester. **NOTE CHANGE OF DATES.**
9 October—Midlands VHF Convention, Wolverhampton Polytechnic. Details from J. P. H. Burden, G3UBX.
15 October—RSGB lecture, IEE, Savoy Place, London. Details on loose insert with this issue.
4 December—RSGB AGM, IEE, Savoy Place, London.
15 January, 1983—RSGB Presidential Installation, Bloomsbury Crest Hotel, London WC1N.

Mobile rallies calendar

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

3 October—Great Lumley ARCS Rally, Community Centre, Great Lumley, Nr Chester-le-Street, Co Durham. Open 11am. Talk-in on S22. Usual attractions including bring & buy. Further information from Max Hanaghan, G8HPW, QTHR, tel 078324 3946.
6 November—North Devon Mobile Rally, Memorial Hall, Bradworthy, nr Holsworthy, north Devon. Open 10am-5pm. Talk-in on S22. Details from G8MXI, QTHR, tel Bradworthy (0409 24) 202.
12 December—Leeds & DARS Christmas Rally, Pudsey Civic Centre. Open 11am. Admission free. Licensed bar and full catering facilities. Talk in on S22. Details from G4FIM, G3YEE or G6CNP, all QTHR. Tel 0532 794507.
19 June 1983—Denby Dale & DARS Mobile Rally, The Shelley High School, Skelmansthorpe, nr Huddersfield. More details early next year.
31 July 1983—Rolls Royce ARC (Barnoldswick) Mobile Rally, Sports & Social Club, Barnoldswick. Open 11am. Details from Leslie G. Logan, G4ILG, QTHR.

OBITUARIES

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

Mr R. Adams, G3YCS
Ron Adams died on 9 June, aged 66. He was well known on the hf bands and in particular top band during the 'seventies. He was a member of the Echelford ARS for many years before moving to Climping, when he became a member of the Chichester club.

Mr W. L. Barnes-Rickers, G8LKN
Mr Barnes-Rickers, who died on 8 June, was very active on 144 and 432MHz.

Mr G. A. Bryan, G8BN
Alan Bryan died on 10 August, aged 62. In 1933, at the age of 13, he had the distinction of being the youngest transmitter in the world, with the callsign 2AFV. He obtained a full radiating licence three years later. His experience during the war lecturing at RAF Signals School Cranwell led to the initiation, in 1947, of the first RAE course at Derby Technical College. He was an early member of Derby & DARS and was still an active radio amateur, being one of the very few still operating entirely home-constructed apparatus.

Mr R. P. Cole, G6RC
Reg Cole, the treasurer of Crawley ARC, died on 2 August, aged 81. He was a very active club member, enjoying contest operation and df hunts. He was a member of the Royal Signals ARS, and past-member of the Southampton RSGB Group and the Acton, Brentford & Chiswick Club. Besides his CARC committee work, he acted as a tutor to the CARC morse class and regularly participated in the RSARS 3·5MHz net.

He was an enthusiastic phone and cw dx operator on the hf bands, where he was 300 plus in DXCC listings. He also found time for homebrewing radio equipment using technology ranging from valves to integrated circuits. During the second world war he was first a VI for RSS, and subsequently operator and charge-hand for the Secret Service clandestine radio links with the resistance and intelligence networks in France and the Low Countries.

Mr J. Dauncey, GU8EVH
Jon Dauncey, who was secretary of Guernsey ARS for several years, died on 8 July. He operated on vhf and was a keen constructor.

Mr J. A. Edwards, G3SR
John Edwards died on 22 July, aged 73 years. He was a dedicated cw operator on the dx bands. During the second world war John was one of the now rapidly diminishing group of radio amateurs who operated as "voluntary intercepters", a unit of the Radio Security Service. He was an active member of South Manchester RC, always willing to impart his knowledge and skill to the younger members.

Mr E. W. G. Evans, G3WCN
Ted Evans died on the 29 April, aged 73. His interest in radio started in the 'twenties, and he obtained his amateur radio licence in the mid-'sixties. he was a founder member of the St Helens Electronics Society, later to become the St Helens & District ARC, and was an enthusiastic member up to the time of his death.

Ted operated on both hf and vhf, but in later years more on top band and 144MHz fm, where he was a well-known and liked operator who always enjoyed a good "ragchew" and was keen to assist the newcomer to the hobby.

Mr H. C. Falkner, G8HBO
Harry Falkner died on 31 July, aged 74. He was a keen short wave listener in the 'twenties. As a member of Kingston & DARC since 1949 he participated in many activities, notably NFDs. In recent years he had been a member of a weekday "Grandads net", and had given many talks to pensioners on amateur radio.

Mr L. Frost, G5PF
Leonard Frost died in August. He trained as a Marconi wireless operator and made voyages as such in the 'twenties and early 'thirties. During the second world war he worked on special duties with Royal Signals and then joined the Admiralty Scientific Service. Before retiring he went to South Africa for the government in connection with the first British satellite. He was always interested in experimental work in his amateur radio activities and was keen on homebrew equipment.

Mr J. Lee, G3GYK
John Lee died on 15 August. He was a founder member of the Bournemouth ARS.

Mr R. E. Pragnell, G3WZB
Roger Pragnell died on 14 August, aged 36. Although not active recently he did make friends through amateur radio, particularly in the USA, by rag chewing on the hf bands. He spent some time as a commercial operator in the Merchant Navy and several years teaching in a London radio/telegraphy college.

Mr B. H. Quentin, G6OX
Basil Quentin died on 15 July, aged 81. As one of amateur radio's outstanding old timers he had been continually active since 1922, at first in the Channel Islands and then in Surrey. He was originally licensed in 1922 as 6OX, and was involved in the first two-way contact between Guernsey and Jersey, and between the Channel Islands and England.

He joined the Wireless Society of London in 1919, and was a founder member of the Guernsey RS. He was also a founder member of RAOTA and served as its treasurer. Although working all bands, he was particularly active in the early days of 144MHz and was a news reader for GB2RS. He was an outstanding telegraphist and worked exclusively on cw in his later years.

Mr J. N. Sinclair, GM3HTH
John N. Sinclair died on 22 July, aged 82. He was first licensed in 1952 and was active on 144MHz and on the hf bands until a few days of his death. He was a founder member of the Lerwick RC and for many years was its secretary. John was esteemed for the help and encouragement he gave to RAE students, and for his morse code instruction and practice sessions.

Mr L. M. Stone, VK2LW (G4HAH)
"Lew" Stone died on 26 July. He was well known on 14MHz, and obtained his G-call while visiting the UK in 1978, when he became a member of the Cheshunt & DARC.

Mr R. L. Whittacker, G8TVF
Ron Whittacker died on 3 June, aged 55. He served as committee member and QSL manager for the School of Electronic Engineering ARS at Arborfield.

Also:
Mr K. Ditch, DK8SQ, on 4 January;
Mjr R. N. B. Gatehouse, G3CZI, on 28 April;
Mr A. B. Harrison, RS37582, in May;
Mr B. Marshall, BRS47401;
Mr J. F. Rainford, RS48195, in December 1981;
Mr P. Simmons, G3IZC, on 11 July;
Mr E. G. Spink, on 24 February;
Mr F. W. Tetley;
Mr J. P. Thornicroft, RS39217, in December 1981;
Mr J. Watts, RS10546.

RSGB SLOW MORSE PRACTICE TRANSMISSIONS

Alterations and additions to this list should be sent to the organizer Mr M. A. C. MacBrayne, G3KGU, 25 Purlieu Way, Theydon Bois, Essex

Clock time	Callsign	MHz	Mode	Town	Notes
Sundays					
1015	G3CGD	1·875	A1A/A3E	Cheltenham, Glos	
1100	G2FXA	1·910	A1A/A3E/J3E	Stockton-on-Tees	
1100	G3XJJ	3·535	A1A/J3E	Northampton	
1130	G3BLS	145·250	F2A	Osney, Oxford	[1]
1200	G4BFJ / G4DKK	144·625	F2A/F3E	Banstead, Surrey Tooting, SW London	
1200	G3PER	145·575	F2A/F3E	Heysham, Lancs	[1]
1200	G3HVI	145·250	F2A/F3E	Stoke-on-Trent, Staffs	[1]
1200	G3GNS	1·910 / 3·550 / 144·250	A1A / A1A / A1A	Locking, Avon	[13]
1400	G3LZV	145·250	F2A/F3E	Manchester	[3]
1830	G4GOC	145·250	F2A/F3E	Stoke-on-Trent, Staffs	[1]
1900	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
1930	G3LDW	144·160	A1A/J3E	Halesowen.	[1]
2000	G3LZV	145·250	F2A/F3E	Manchester	[3]
2000	G4JBB	145·425	F2A	Birmingham	[10]
2030	G3ORP	144·250	A1A/J3E	Maidstone, Kent	[6]
2100	G4EWK	144·850	F2A	Burton-on-Trent, Staffs	[7]
2100	GW4LLE	145·525	F2A/F3E	Milford Haven, Dyfed	
Mondays					
1100	G4IRI	3·550	A1A/J3E	Bolton, Lancs	
1830	G3GNS	1·910 / 3·550 / 144·250	A1A	Locking, Avon	[13]
1900	G3TPY	145·275	F2A/F3E	Chester, Cheshire.	[1]
1900	G4ILD / G3ZQS	145·400	F2A/F3E	Rishton, Lancs / Darwen, Lancs	[1]
1900	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
1930	G4BFJ / G4DKK	144·625	F2A/F3E	Banstead, Surrey Tooting, SW London	
1930	GI3SXG	144·100	A1A/J3E	Newtownards, Co Down	
1930	G4JIZ	145·350	F2A/F3E	Bakewell, Derbys.	[1]
2000	G2FXA	145·525	F2A/F3E	Stockton-on-Tees	[1]
2000	G3LZV	145·250	F2A/F3E	Manchester	[3]
2000	G4IRI	3·550	A1A/J3E	Bolton, Lancs	
2000	G4JDL	144·250	A1A/J3E	Solihull, W Midlands	[2]
2030	G3ASR	1·875 / 144·175	A1A/J3E / A1A/J3E (lsb)	Harrow, Middlesex	[1] [12]
2030	G2FKO	145·525	F2A	Bideford, Devon	
2100	G3WOR	144·250	A1A/J3E	Lancing, Sussex	[14]
2200	G3GMS	145·250	F2A/F3E	Whitley Bay, T & W.	[1]
Tuesdays					
1100	G4IAV	145·275	F2A/F3E	Atherton, G Manchester	
1200	G3GNS	1·910 / 3·550 / 144·250	A1A	Locking, Avon	[13]
1830	G4CWN	144·100	A1A/J3E	Stoke-on-Trent, Staffs	
1900	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
1900	G4RS	3·565 / 145·525	A1A/J3E / F2A/F3E	Catterick, N Yorks	[1]
1930	G4BFJ / G4DKK	1·950 / 144·625 / 144·625	A1A/J3E / F2A/F3E / F2A/F3E	Banstead, Surrey Tooting, SW London	
1930	G4IAV	145·275	F2A/F3E	Atherton, G Manchester	
1930	G4DAL	145·575	F2A/F3E	Lancaster, Lancs	[1]
1930	G4HTD	145·550	F2A/F3E	Plymstock, Devon	[5]
2000	G3VHE	145·350	F2A	Swindon, Wilts.	[1]
2000	GM4ELV	144·250	A1A	Arrochar, Strathclyde	
2000	G4FEX	145·250	F2A/F3E	Horsley Woodhouse, Derbyshire	[1]
2030	G3IRM	1·975	A1A/A3E	Bury St Edmunds, Suffolk	
2030	G3OHM/A	144·180	A1A/J3E	Birmingham	
2030	G3KGU	1·910	A1A/A3E	Theydon Bois, Essex	
2030	G2FKO	145·525	F2A	Bideford, Devon	
2100	G4EWK	144·850	F2A	Burton-on-Trent, Staffs	[7]
2200	G3AWL	144·110	A1A/J3E	Easington, Co Durham	[8]
Wednesdays					
1100	G4IAV	145·275	F2A/F3E	Atherton, G Manchester	
1830	G3GNS	1·910 / 3·550 / 144·250	A1A	Locking, Avon	[13]
1900	G3TPY	145·275	F2A/F3E	Chester, Cheshire.	[1]
1900	G4ILD / G3ZQS	145·400	F2A/F3E	Rishton, Lancs / Darwen, Lancs	[1]
1900	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
1900	G2ABC	145·250	F2A/F3E	Truro, Cornwall	
1900	G3ULY / G4EXD	3·583 / 145·475	A1A / F2A	Culgaith, Cumbria	[1]
1930	G4NNS / G4BFJ / G4DKK	144·625	F2A/F3E	Sunbury-on-Thames, Middx Banstead, Surrey Tooting, SW London	
Thursdays					
1100	G4IRI	3·550	A1A/J3E	Bolton, Lancs	
1830	G4GOC	145·250	F2A/F3E	Stoke-on-Trent, Staffs	[1]
1830	G4ILD / G3ZQS	145·400	F2A/F3E	Rishton, Lancs / Darwen, Lancs	[1] [1]
1830	G3GNS	1·910 / 3·550 / 144·250	A1A	Locking, Avon	[13]
1900	G3TPY	145·275	F2A/F3E	Chester, Cheshire.	[1]
1900	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
1900	G4BNA	3·590	A1A	Swindon, Wilts	
1900	G3BLS	145·250	F2A	Osney, Oxford	[1]
1900	G3ZRZ	1·975	A1A/A3E	Blackpool, Lancs	
1900	G4RS	3·565 / 145·525	A1A/J3E / F2A/F3E	Catterick, N Yorks	[1]
1930	G4BFJ / G4DKK	1·950 / 144·625 / 144·625	A1A/J3E / F2A/F3E / F2A/F3E	Banstead, Surrey Tooting, SW London	[15]
1930	G4HTD	145·550	F2A/F3E	Plymstock, Devon	[5]
1930	G3ASR	1·875 / 144·175	A1A/J3E / A1A/J3E (lsb)	Harrow, Middx	[1] [11] [12]
2000	G2ACZ	1·819	A1A	Mablethorpe, Lincs	
2000	G3LZV	145·250	F2A/F3E	Manchester	[3]
2000	G3IRI	3·550	A1A/J3E	Bolton, Lancs	
2000	GM4ELV	144·250	A1A	Arrochar, Strathclyde	
2000	G4JDL	144·250	A1A/J3E	Solihull, W. Midlands	[4]
2030	G2FKO	145·525	F2A	Bideford, Devon	
2100	G3WOR	144·250	A1A/J3E	Lancing, Sussex	[14]
2100	G4EWK	144·850	F2A	Burton-on-Trent, Staffs	[7]
2200	GM4HYF	28·350 / 145·375	A1A / F2A	SE Glasgow	[1]
Fridays					
1100	G4IAV	145·275	F2A/F3E	Atherton, G Manchester	
1830	G4ILD / G3ZQS	145·400	F2A/F3E	Rishton, Lancs / Darwen, Lancs	[1] [1]
1830	G3GNS	1·910 / 3·550 / 144·250	A1A	Locking, Avon	[13]
1900	G4FIM	145·550	F2A/F3E	Leeds, Yorks	
1900	G3TPY	145·275	F2A/F3E	Chester, Cheshire.	[1]
1900	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
1930	G4ILW	145·550	F2A/F3E	Gateshead, T & W	[1] [16]
1930	G4IAV	145·275	F2A/F3E	Atherton, G Manchester	
1930	G4JIZ	145·350	F2A/F3E	Bakewell, Derbys.	[1]
1930	G3HVI	145·250	F2A/F3E	Stoke-on-Trent, Staffs	[1]
1930	G4BFJ / G4DKK	144·625	F2A/F3E	Banstead, Surrey Tooting, SW London	
2000	G3RR	145·525	F2A/F3E	Barnoldswick, Lancs	
2000	G3WOK	144·775	F2A	Hailsham, Sussex	
2030	G2FKO	145·525	F2A	Bideford, Devon	
2200	G3AWL	144·110	A1A/J3E	Easington, Co Durham	[8]
Saturdays					
1100	G3LZV	145·250	F2A/F3E	Manchester	[3]
1200	G3GNS	1·910 / 3·550 / 144·250	A1A / A1A / A1A	Locking, Avon	[13]
1900	G3RLO	144·525	F2A/F3E	West Bridgford, Notts.	[1]
2000	G3LZV	145·250	F2A/F3E	Manchester	[3]
2000	G4JBB	145·425	F2A	Birmingham	[10]
2000	G4FEX	145·250	F2A/F3E	Horsley Woodhouse, Derbyshire	[1]
2030	G2FKO	145·525	F2A	Bideford, Devon	
2100	GW4LLE	145·525	F2A/F3E	Milford Haven, Dyfed	
2200	G3GMS	145·250	F2A/F3E	Whitley Bay, T & W.	[1]

Notes

[1] Omnidirectional
[2] Horizontal to SE
[3] Vertical to S
[4] Horizontal to NW
[5] Vertical to E
[6] Tilted polarization NE to SW
[7] To SW
[8] To S
[9] To NE
[10] To NNE
[11] First and third Thursdays in each month
[12] Horizontal
[13] Reports to RAFARS Locking
[14] Horizontal to E and W
[15] Starting speed 12wpm
[16] Vertical to N

National Field Day 1982 results

Of the 100-plus stations that entered the contest, 14 were unable to finish because of equipment or station damage caused by the severe storms that swept across much of the UK during the 24h of the event. Apart from thunderstorms, some areas experienced gale-force winds and monsoon-like rain, which flooded a number of sites. The violence of the storms was shown in the dramatic photograph that appeared on the front cover of the August *Rad Com*. From information given in the comments from competitors, 61 stations experienced some form of problem and 42 of these were forced to close down for a period. While most managed to get back on again, a few groups had too much damage, or were too badly flooded, to be able to continue the contest. Apart from the western counties and parts of East Anglia, which escaped the worst of the weather, most other areas suffered. Many sites had near or direct lightning strikes which took out front-ends of transceivers, welded coaxial, burnt antenna tuning and switching units, damaged power supplies, keyers, swr bridges and other accessories. On one site an FT101ZD caught fire, on another a generator was struck, while on yet another two of the operators suffered minor burns when their station antenna was struck. Generator failures were legion, as apart from electrical and mechanical failures, a common problem was that rain was sucked into the air intake.

A few groups anticipated trouble and used grounded shunt-fed antennas or connected $\lambda/4$ earthing stubs to their open wire feeders. After one bad thunderstorm one station was fitted with an old fashioned double-pole knife switch to earth the feeder, but when the next storm came they were too scared to use it as it became a "Brocks benefit"! Those who took precautions were the exception rather than the rule, and the majority of entrants had no protection at all. There were a number of lucky escapes and the HF Contests Committee congratulates all those groups who completed the contest under such adverse conditions.

Those lucky groups that missed the storms and were able to work for the whole 24h without a break clearly had the advantage, and this is shown in the results table. In NFD, any loss of operating time is hard to make up and 2 or 3h, which was commonplace, is a complete disaster. There was just no way that the lost points could be recovered and several groups who were well set for a high score slipped down the results table because of the enforced breaks.

In addition to the problems with weather, radio conditions were generally below par with unstable propagation on the hf bands and high levels of static on the lower frequencies. In spite of this, many groups reported their best-ever results, and most seemed to have enjoyed the contest.

NFD Trophy
Racal AR Group 'B' ..... 3,453 points

Bristol Trophy
Great Western Contest Group ..... 3,185 points

Gravesend Trophy
Guernsey ARS ..... 3,358 points

Scottish NFD
Glenrothes & D ARC 'A' ..... 3,006 points

Frank Hoosen (G3YF) Memorial Trophy
Maidenhead & D ARC 'A' ..... 1,898 points

Leading scores on individual bands

Open section		
1·8MHz	Gravesend RS	518 points
3·5MHz	Echelford ARS	902 points
7MHz	Edgware & D RS 'B'	890 points
14MHz	Maidenhead & D ARC 'A'	1,898 points
21MHz	Racal AR Group 'B'	1,082 points
28MHz	Guernsey ARS	848 points
Restricted section		
1·8MHz	Stockport RS 'B'	504 points
3·5MHz	Lichfield ARS	534 points
7MHz	Eccles & D ARS	979 points
14MHz	West of Scotland 'B'	607 points
21MHz	Government Communications ARC	360 points
28MHz	Great Western Contest Group	734 points

Overseas stations giving most points to entrants
Europe: YU7SF/M **North America:** K9BG
Australasia: VK6PG **Asia:** 9K2BE

Open section

The poor conditions on the hf bands seems to have favoured the entrants in this section, who, because of their better antennas, were able to achieve good QSO rates during the limited opening on 14 and 21MHz. The winner of the NFD Shield was the Racal "B" group, G3KLH/P, who made 900 plus contacts for a checked score of 3,453 points. Guernsey, GU3HFN/P, won the Gravesend Trophy, with 3,358 points and a similar QSO total. In third place was Gravesend, G3GRS/P, with 3,294 points from 785 contacts. All three made good use of 14MHz.

Racal "B" used an FT101ZD feeding dipoles and a two-element quad. Operators were G3KLH and G3KOZ, assisted by G6DKO and G8WAM. Guernsey had a TH6DXX multi-band Yagi and dipoles, with GU3AAM, GU3MBS, and GU4EON doing the keying of a TS830S. G4BUO and G4FAM were the operators at Gravesend, and their equipment included a TenTec transceiver, multi-band and separate Yagis, dipoles, and a 7MHz loop. Neither Racal nor Guernsey commented on stoppages, but Gravesend lost 25 minutes due to a nearby thunderstorm, and also had a generator problem. Guernsey was one of the very few groups to use a separate "spotting" receiver to keep watch on other bands. In this section, 49 entrants finished the contest and seven of these were single-band contestants.

Restricted section

Entrants in this section appeared to have suffered from station damage and enforced closedowns to a much greater extent than those in the Open section. Only 38 managed to complete the contest, and many of these took a battering. It seems possible that the use of a fairly lengthy wire and open-wire feeders contributed to the problem as most of the equipment damage occurred to stations in this section. With hf conditions being poor, many groups concentrated on the lower frequency bands, particularly 7MHz, and some very good scores were achieved. The opening on 28MHz at the start of the contest helped a number of groups, who found their wire antennas at 35ft were well suited to the prevailing conditions.

The winner of the Bristol Trophy was the Great Western group, G3NKS/P, who made 725 contacts to give a checked score of 3,185 points. The group reported excellent weather throughout the contest, but found that the static and hf band conditions were not to its liking. Operated by G3NKS and G3MZU, the TS530S fed a 264ft centre-fed wire. In second place with 3,022 points was the Red Dragon DX group, GW8GT/P, with GW3NJW and GW3OAY as the operators. They used a TenTec transceiver and a centre-fed wire of unspecified length.

Stockport "B", G4MCC/P, was third with 2,965 points, made with a TS530S and a 264ft wire. Operators were G3WPF and G4HIU. There were no single-band entrants in this section, and all but seven groups gained points by using 28MHz. The other "bonus" band, 1·8MHz, was not used by 12 contestants, and this was surprising as "top band" is very useful for gaining some quick points during a relatively short operating period. The 10W power limit was a great leveller, and most wire antennas could be made to work on the band, even trap dipoles and the shorter wires. At eight points a contact for inter-G portable QSOs, it was well worthwhile spending an hour on the band.

Scottish NFD Trophy

In previous NFD contests it has become the norm for Glenrothes "A" to win the trophy, and this year was no exception! Once again the group has turned in the highest score from north of the border with 900 contacts, gaining them 3,006 points. There were six groups competing for the trophy, four of which were in the Open section. Both Glenrothes "A", GM4GRC/P, and the runners-up, West of Scotland, GM4AGG/P, operated in the Open section.

Frank Hoosen (G3YF) Memorial Trophy

Awarded for the top score on 14MHz, the G3YF Trophy was won this year by Maidenhead "A", G3WKX/P, with 1,898 points from 598 contacts.

Overseas and UK checklogs

The HF Contests Committee is very grateful to those stations who sent check logs for the contest. This year logs were received from G3WP, G4DAA/P, K9BG, VK6PG, WA2OQE, W8EAO, YU7SF/M and 9K2BE. Certificates are awarded to the stations in each continent that contribute the most points to entrants and details of these awards are given in the results table.

1·8MHz (Report by G3MXJ)

For a multi-band entrant, this band requires careful timing in order to catch as many portable stations in the shortest time. The leaders make their 68–70 double-scored contacts in under 2h of operating in the period between 2130 and 0045. While other entrants test the band at other times, there is little business and even with the ×2 bonus, very few points are scored. To make a leading overall score 1·8MHz operation

The winners of the NFD Shield, Racal AR Group "B" celebrating their victory L to r: Dave Alexander, Graham Weeks, Doug Henderson, Pete Sankey and Ian Trusson

The Great Western Contest Group, winners of the Bristol Trophy. L to r: G4BEZ, G3MZV and G3NKS (who also took the photo)

OPEN SECTION

Posn	Name of club or group	Callsign	Points 1·8MHz	3·5MHz	7MHz	14MHz	21MHz	28MHz	Final score	Contacts made*
1	Racal AR Group 'B'	G3KLH/P	348	219	683	509	1,082	612	3,453	916
2	Guernsey ARS	GU3HFN/P	150	0	331	1,080	949	848	3,358	916
3	Gravesend RS	G3GRS/P	518	530	610	522	496	618	3,294	785
4	Glenrothes & D ARC 'A'	GM4GRC/P	344	94	756	1,419	235	158	3,006	905
5	Bracknell ARC	G4BRA/P	380	316	777	541	81	784	2,879	654
6	Torbay ARS	G3NJA/P	484	218	633	605	335	588	2,863	683
7	Crawley ARC	G3WSC/P	468	471	645	424	254	534	2,796	652
8	Verulam ARC	G3VER/P	480	283	829	758	205	156	2,711	696
9	Scunthorpe ARC	G4FUH/P	480	288	632	502	384	406	2,692	693
10	Addiscombe ARC	G4ALE/P	460	513	574	421	332	372	2,672	646
11	Medway Radio Contest Group	G3ZYV/P	240	70	638	651	561	432	2,592	671
12	Norfolk ARC	G4ARN/P	376	445	705	370	251	408	2,555	600
13	Newbury & D ARS	G3WOI/P	336	316	709	222	243	723	2,549	580
14	Leicester Polytechnic RS	G3SDC/P	464	380	611	537	280	220	2,492	617
15	Hornsea & D RS	G4EKT/P	336	338	661	402	223	490	2,450	572
16	West of Scotland 'A'	GM4AGG/P	368	166	561	687	230	418	2,430	622
17	Scarborough ARS	G4BP/P	228	295	553	469	231	590	2,366	578
18	East Notts Contest Group	G3TBK/P	348	302	545	434	193	526	2,348	651
19	Shirehampton ARC	G4AHG/P	200	310	737	413	130	494	2,284	567
20	Gloucester ARS	G4AYM/P	284	216	544	385	265	558	2,252	532
21	Leicester RS	G3LRS/P	276	370	784	515	216	18	2,179	596
22	Loughborough Falcon	G3RAL/P	368	182	556	580	213	200	2,099	521
23	Leyland Hundred ARG	G3GGS/P	312	304	515	326	285	346	2,088	484
24	Chiltern ARC	G3CAR/P	28	328	618	326	207	580	2,087	514
25	Sutton & Cheam RS	G2XP/P	372	251	551	385	41	346	1,946	459
26	Maidenhead & D ARC 'A'	G3WKX/P	0	0	0	1,898	0	0	1,898	598
27	Harlow & D ARS	G6UT/P	430	603	681	30	0	0	1,744	456
28	Ainsdale RC	G2OA/P	454	292	341	163	170	274	1,694	367
29	Wirral ARS	G3NWR/P	208	148	475	664	158	0	1,653	453
30	Kilmarnock & Loudoun ARC	GM3ZRT/P	182	232	269	462	78	408	1,631	382
31	Chelmsford ARS	G4DAN/P	304	299	620	202	193	0	1,618	402
32	Crystal Palace & D RC	G3VCP/P	0	82	679	279	74	476	1,590	383
33	Grimsby ARS	G3CNX/P	400	307	329	112	107	216	1,471	356
34	Southgate ARC	G3SFG/P	0	0	0	1,461	0	0	1,461	489
35	Ilford RSGB Group	G3XRT/P	228	358	563	216	54	0	1,419	406
36	Thornton Cleveleys ARS	G4ATH/P	226	118	274	325	176	288	1,407	374
37	Hereford ARS	G3YDD/P	0	0	0	1,404	0	0	1,404	430
38	Guildford & D RS	G5OD/P	368	0	823	60	37	48	1,336	360
39	Conway Valley ARC	GW6TM/P	398	44	588	222	78	0	1,330	321
40	Greenock & D ARC	GM3ZRC/P	110	76	100	555	178	194	1,213	331
41	Clifton ARS	G3GHN/P	0	184	630	394	0	0	1,208	352
42	Maidenhead & D ARC 'B'	G3LVW/P	296	194	374	0	105	220	1,189	275
43	Echelford ARS	G3UES/P	0	902	272	0	0	0	1,174	345
44	Edgware & D RS 'A'	G3ASR/P	0	0	0	991	0	0	991	302
45	Bournemouth RS	G2BRS/P	0	120	268	203	0	314	905	241
46	Edgware & DRS 'B'	G4IUZ/P	0	0	890	0	0	0	890	322
47	Sheffield ARC	G4BCQ/P	0	0	0	837	0	0	837	263
48	Salisbury R & ES	G3FKF/P	0	0	719	0	0	0	719	256
49	Mansfield Telecoms	G3XWZ/P	512	8	109	0	0	0	629	125

RESTRICTED SECTION

Posn	Name of club or group	Callsign	Points 1·8MHz	3·5MHz	7MHz	14MHz	21MHz	28MHz	Final score	Contacts made*
1	Great Western Contest Group	G3NKS/P	500	437	813	465	236	734	3,185	725
2	Red Dragon DXers	GW8GT/P	426	302	771	538	279	706	3,022	700
3	Stockport RS 'B'	G4MCC/P	504	270	819	457	359	556	2,965	669
4	Stockport RS 'A'	G6UQ/P	464	368	689	445	343	548	2,857	660
5	East Barnet AR Contest Club	G6KQ/P	420	415	781	519	182	418	2,735	651
6	SRCC Croydon	G6LX/P	360	288	582	588	135	728	2,681	604
7	Worthing & D ARC	G3WOR/P	364	412	679	355	223	590	2,623	656
8	Government Communications ARC	G3SSO/P	420	216	790	432	360	296	2,514	605
9	Lichfield ARS	G3WAS/P	420	534	705	396	164	218	2,437	583
10	Oxford & D ARS	G2DU/P	388	88	659	363	182	560	2,240	488
11	Liverpool & D ARS	G3AHD/P	372	296	349	577	174	396	2,164	411
12	Plymouth RC	G3PRC/P	382	243	325	466	291	406	2,113	488
13	West of Scotland 'B'	GM8MJ/P	0	317	464	607	196	412	1,966	562
14	Thames Valley ARTS	G3TVS/P	360	291	478	408	93	354	1,984	499
15	Cheltenham ARA	G3JJG/P	364	319	568	562	113	0	1,926	488
16	Gloucester Radio Amateurs	G4CRA/P	380	341	694	459	39	8	1,921	513
17	Sunderland RSGB Group	G3RDI/P	344	416	400	331	199	170	1,860	468
18	Reigate ATS	G5LK/P	224	335	654	251	101	204	1,769	438
19	White Rose Contest Group	G3XEP/P	304	228	350	290	173	268	1,613	388
20	Spalding & D ARS	G4DSP/P	352	176	579	203	33	30	1,373	333
21	Blackpool & Fylde ARS	G5ND/P	0	273	610	217	55	202	1,357	381
22	Preston ARS	G3KUE/P	90	402	473	349	29	0	1,343	357
23	Easington & Hartlepool ARCs	G4APN/P	30	48	465	419	173	150	1,285	350
24	Bury RS	G3BRS/P	168	107	397	360	8	236	1,276	303
25	Southdown ARS	G3WQK/P	0	408	414	331	54	18	1,225	428
26	Glenrothes & D ARC 'B'	GM4MTV/P	206	185	221	364	44	152	1,172	280
27	Sedgemoor Contest Group	G3ZRJ/P	0	6	268	411	346	102	1,133	321
28	Vange ARS	G3YCW/P	304	148	271	268	22	24	1,037	345
29	Eccles & D ARS	G3GXI/P	0	0	979	0	0	0	979	323
30	West Kent ARS	G3WKS/P	0	66	598	229	0	0	893	305
31	Havering & D ARC	G4HRC/P	0	246	201	206	29	8	690	207
32	Skegness & D ARS	G2FT/P	0	372	246	0	4	0	622	222
33	Bridgend & D ARC	GW4LNP/P	0	0	247	163	134	0	544	195
34	Chesham & D ARS	G3MDG/P	0	116	99	198	79	24	516	153
35	Ayr ARG	GM3MHG/P	0	12	91	221	50	124	498	125
36	Bury St. Edmunds ARS	G2TO/P	0	0	0	497	0	0	497	143
37	Bromsgrove & D ARC	G3VGG/P	20	62	115	172	71	16	456	148

*Number of contacts made are claimed figures only.

The North Bristol ARC, G4GCT/P were disqualified under Rule 10 (e).
Late entries were received from Leeds & D ARS, G4LAD/P and Shefford & DRS, G3FJE/P.

is a must and as mentioned earlier in this NFD report, Restricted entrants compete on equal terms with stations in the Open section.

With thunder never far away, the static levels severely reduced the prospects for dx contacts, and the number of non-G calls in the logs was very small. During the peak period, inter-G portable working was quite brisk, with many groups achieving a high rate of contacts.

As is usual for the band, the leading positions were determined by the accuracy of the logs, rather than by QSO totals. A number of groups, including the one that would have been the band leader, fell foul of the rule regarding unmarked duplicate contacts. It is worth remembering that on 1·8MHz, each unmarked duplicate contact results in a deduction of 80 points for a normal four point QSO.

After checking, the Open section leader was Gravesend, G3GRS/P, who made 70 contacts, with Mansfield, G3XWZ/P, a few points behind. There was a close finish for the leading position in the Restricted section between Stockport, G4MCC/P and the Great Western group, G3NKS/P.

3·5MHz (Report by G3KKQ)

Conditions on this band were probably the worst for a number of years, especially on Sunday, when heavy static made operation virtually impossible. As reported earlier, many stations were forced to close for a period and there were many reports of damage in the individual band comments. Only a handful of stations used the band during the early part of the contest, and contacts were hard to come by, the best only achieving 25 QSOs in an hour. The majority of the activity was between 2300 and 0400, although there was some contest traffic after this at a much lower level.

Echelford, G3KKQ/P, was the leader in the Open section with 220 contacts. The group used an FT901D, an HW8 for "spotting" and an inverted-V dipole at 40ft. Operators were G2FNK, G3KKQ, G3MCK, G3VFB and G3DOR. In common with many other groups, they suffered from generator problems and lost an hour while rebuilding the electrics. Not being able to repair the alternator, they used the dc section to float-charge a battery and feed their transceiver from 12V dc.

Litchfield was the Restricted section leader with 141 contacts made between 2030 and 0400 in four separate short sessions. G3KDB was the operator and the group used a 260ft doublet fed from a TS830S.

The standard of logs was good compared to previous years, and most points were lost as a result of unmarked duplicate contacts. A number of entrants will note differences between their claimed scores and the totals allowed after checking.

7MHz (Report by G3XTJ)

With the poor conditions on the hf bands, 7MHz carried even more traffic than usual during an NFD contest. At times it was bursting at the seams, and some high QSO rates were achieved by those groups that used sharp filters and had the ears to match! The logs show that 900 different calls were worked by contestants on the band, and that these included 350 different European portable stations.

Conditions were reasonable during the contest period, with the emphasis being on inter-G and inter-EU working. At night the skip lengthened and some dx contacts were possible, but compared to other years, the volume and the number of areas that were contacted were down. VK6PG, ZL2UV, TU2IE and many USA stations were worked, but high QRN and QRM tended to blanket the weaker stations, a point made by VK6PG in his comments with a checklog.

There was a wide variation in both the presentation and accuracy of the logs. Unmarked duplicates appear in about 40 per cent of logs and took a high toll on otherwise good-scoring entries. There were a number of cases of careless logging, especially of suffixes of DL stations, and these may have been due to incorrect transcription from the original logs.

Edgware "B" was the Open section leader with 890 points. G4IUZ/P was a single-band entry, and the operators G4HMD, G4IUZ and G4MLU used an FT101Z with dipole and delta-loop antennas. G3VER/P, the Verulam group, was next with 829 points, made with a TS830S and a dipole at 57ft. In the Restricted section, the clear leader was the Eccles group, G3GXI/P, with 979 points from an FT901 and a dipole. The operators were G8VF, G3LBL, G3XUJ and G4KKI. Stockport "B", G4MCC/P, was second.

14MHz (Report by BRS32525)

The majority of Open section entrants were tempted by the North American activity during the small hours of the night. Come early Sunday morning, the order of the day was to work EU portables, and both sections took advantage of the prevailing conditions, achieving good totals without too much difficulty. During Sunday, conditions for longer dx contacts were generally poor and very little outside the USA was worked. Many groups suffered from thunderstorms and this curtailed activity on the band.

The standard of logs was quite good, but there were a few exceptions, including one in pencil! There were no cover sheets with a number of logs and this made it difficult to identify some entries. While it is appreciated that there was a problem with contest stationery, it would have been helpful if the entrants had included the group callsign on each log page. There were a number of common log errors, and in particular DK0GI/P, DK3GI/HK1, DF0STL/P and DJ4AN/P were shown incorrectly by many entrants. The suffix /P was also logged for /A stations.

In the Open section, three groups operated exclusively on the band, with Maidenhead, G3WKX/P, winning the Frank Hoosen Memorial Trophy with a score of 1,898 from 594 valid QSOs. The group used a TR7 transceiver and a five-element Yagi at 40ft. Operators were G3FVC, G3UKS and G5CMX. Hereford, G3YDD/P, was second, wth operators G3HVX, G3WRQ, G4BOF, G4CNY, G4FFD and G4HKF.

Three stations competed for the Restricted section honours, however one of these did not pay enough attention to log accuracy, and enough points were deducted to take them out of contention. The other two, GM8MJ/P, the West of Scotland "B" with 607 points, and SRCC/Croydon, G6LX/P, with 588 points, finished first and second. West of Scotland had GM3ZDH, GM4GIH and GM4LGM as operators and SRCC/Croydon was keyed by G3BFP, G3JLB, G4GML and G6LX.

21MHz (Report by G4BUO)

This band was used sparingly by most entrants, but some in the Open section achieved high QSO rates by working the USA from around 1900 until after 0200. This was really the only good opening on the band and conditions were generally very unstable. There were spells when EU portables could be worked, and as signals were arriving at a high vertical angle, Restricted section entrants were competing on more or less equal terms with those stations that used beams. There was an almost complete fade-out 30min before the end of the contest.

The standard of logging showed an improvement over last year. Several entrants were understandably confused by the AM prefixes used by EA stations and claimed these as dx with three points a contact. Most lost points due to incorrectly copied calls.

The importance of 21MHz in the Open section is reflected in the score of 1,082 achieved by the ultimate NFD winners, the Racal "B" group, G3KLH/P, who spent just over 8h on the band. GU3HFN/P, the Guernsey group, who were the overall runners-up to Racal, were also second on the band. The group spent 5h to make a score of 949 points. In the Restricted section the majority of contacts in the logs were with DL portables, and there are very few QSOs outside Europe. G3SSO/P, the Government Communications ARC, battled with Stockport "B" for the band award with a final difference of only one point between them. G3SSO/P finished first with 360 points made in 2h 34min, while Stockport "B" had to spend 1h longer on the band.

28MHz (Report by G6LX)

The attraction of double points encouraged most entrants to use 28MHz at some time during the contest. Some tested the water and found it too cold, but the diehards kept coming back again and again! Those who checked the band at the start of the contest had a pleasant surprise as it was full of European portables, and in the south, the band stayed open for over 4h giving many groups a good basis for some very high overall scores, particularly for Restricted section entrants.

On Sunday there were a number of short, sharp openings to Europe, and some dx was worked. The skip to HB and DL seemed to vary from minute to minute, first favouring one part of the UK and then another. The high scorers found the trick was to stay on the band for just a few minutes and to keep checking for the openings, which usually yielded three or four quick contacts before going dead.

Logs were generally of a good standard, but many contained call errors and a number of groups lost points, particularly in regard to contacts with DL stations using an /A suffix. Many of these were logged as /P stations, and there was also some confusion between DL, DJ and DK stations having very similar calls. There were a few unmarked duplicate contacts in the logs, and while many stations liked the ×2 bonus this year, it is doubtful that they liked the ×20 penalty!

Guernsey, GU3HFN/P was the winner of the Open section with 848 points, followed by Bracknell, G4BRA/P, with a score of 784. The best that could be achieved by a Restricted section entrant was 734 points by the Great Western group, the ultimate overall winner in the section. SRCC/Croydon, G6LX/P, was second with 728 points.

Equipment and antennas

Once again the FT101 series of transceivers was the most used by entrants with the TS520/530 and the TS820/830 next in popularity. Several groups used the TR7 and the earlier TR4, but there was only one entrant who used the R4/T4 combination of separates that was once the key to obtaining a high score in NFD. Other transceivers used included the FT1, FT7, FT200, FT901, IC720, TS120, SS105S and the KW2000B.

Beams (Yagi and loop type) and separate dipoles were the preferred combination this year for Open section entrants. Very few stations in this section used the multi-band centre-fed wire for 7, 3·5 and 1·8MHz, and this is a marked change from previous years. The quad and delta-loop beam with individual sections for each of the hf bands has returned to popularity and was used by over half the entrants. Single-band loops for 7MHz were favoured by many groups, but a few went further and erected two- and three-element quads for the band. One group had a two-element quad for 3·5MHz, but reported that the building and erection were not worth the trouble as band conditions were so poor. A substantial number of entrants got their antennas up at 60ft and several used a combination of high and low mounted antennas to obtain different angles of radiation. As in other years, the equipment descriptions make mention of trailer-mounted tilt-over towers, lighting service vehicles, mobile cranes and other specialized structures to permit the easy erection of beams and wire antennas.

Restricted section entrants had the usual variety of centre-fed wires ranging in length from 66 to 550ft. Once again almost every group seemed to favour a particular length, although most opted for wires between 200 and 270ft. Other antennas used included the 102ft 5RV and its double-length version, multi-band trap dipoles using lumped or linear decoupling sections, verticals, end-fed wires and loops. Several groups used a three-wire feeder system to provide a form of directivity switching and to facilitate the use of a trap dipole on 1·8MHz.

Memory keyers and keyboards were widely used in both sections. In addition to the now almost standard "CQ machine", a few groups used more sophisticated keyers which had multiple memories to provide contest exchanges, QRZ ?, worked before, etc. One or two of the keyers had facilities for sending a sequential serial number and a standardized report (599 no doubt!). There were no reports of computers being used on-site, but a number of entrants mentioned that they had used number crunchers to check and prepare their logs. (One of these entrants had two unmarked duplicates!)

COMMENTS FROM COMPETITORS

(Rules)

"Excellent contest, no changes please" — *West of Scotland ARS.*

"Rules absolutely fine. We liked the 10m multiplier this year! (See our comments last year.)" — *Great Western CG.*

"Thanks for all your efforts, no changes please" — *Sedgemoor CG.*

"Rules, timing and organization excellent" — *Guernsey ARS.*

Members of the Glenrothes ARC who won the Scottish NFD Trophy. L to r: GM3ZSP, Jim Robertson, GM4MTV, GM3OLK, GM4IPS, GM6INW, Scott Hay, GM6AOJ, GM4EJI and GM3YOR

Members of the Verulam ARC who took part in NFD. *Photo:* **G3PZF**

"Leave rules as they are"—*Scarborough ARS.*
"How about a change of date to correspond with USA Field Day. This would liven things up a bit!"—*Norfolk ARS.* (The NFD date is well established within IARU Region 1 and any change would be difficult and unpopular—*G6LX*)
"Our thanks to the HFCC whose unselfish labours make this a most enjoyable contest. No changes please"—*Crawley ARC.*
"Since most reports are 599, suggest a rule change making logs unnecessary"—*Maidenhead "B".*

(Conditions)
"Conditions generally poor with QRN S9+ and fade-out Sunday afternoon"—*Gt Western CG.*
"Conditions on 80 and 10 very poor and rig would not receive on 160"—*Sedgemoor CG.*
"Used up our allocation of ionosphere before the end of the contest, please arrange fade-outs to correspond with end of NFD"—*Plymouth RC.*
"Excellent opening on 10 at start of contest, but a struggle at end with partial fade-out causing many rapid band changes and greatly reduced QSO rate"—*Croydon/SRCC*
"Curses, we missed the initial 10m opening. What happened to the hf bands on Sunday?"—*Litchfield ARS.*
"Band conditions became atrocious on Sunday with the only workable band being 40 and then there was a complete fade-out towards the end of the contest"—*Stockport "A".*
"14MHz seemed much harder work than in previous years, especially during Sunday"—*Edgware "A".*
"Disturbed propagation on Sunday afternoon, including a complete fade-out on all bands, kept QSO rate down"—*Guernsey ARS.*
"80m very quiet during daylight hours"—*Echelford ARS.*
"Conditions were about average until Sunday afternoon"—*Scarborough ARS.*
"Our receiver went dead at 1630 Sunday when all we could hear was a local portable station saying 'is anyone there?' "—*Torbay ARS.*
"Static all weekend long"—*Mansfield Telecoms.*
"Thought receiver had quit but finally concluded receiver was ok but a solar flare had flattened propagation on all bands"—*Gravesend RS.*
"Several rapid fade-outs towards end of contest and this combined with very high static levels slowed us down, but otherwise conditions were quite good"—*Kilmarnock & Loudoun ARC.*
"Cond very poor"—*Southgate ARS (and many other entrants).*
"Good old 10m, what a super start to the contest"—*Crawley ARC.*
"Where were all the stations on 160?"—*Leicester Poly.*

(Equipment)
"Generator stripped in early morning. Lost the float chamber pin in the long grass and found that a piece of copper wire works just as good"—*Southgate ARC.*
"After being tested on load every day the week before, the generator failed 1h after the start! Ran the FT901 on 12V from an accumulator"—*Echelfield ARS.*
"Our 40ft mast with beam came down a lot quicker than it went up, but not too much damage"—*Loughborough Falcon ARC.*
"Off the air for 20min as generator misfiring"—*White Rose CG.*
"Problems on 10 with the quad, low voltage from the gene which caused difficulties with the rig"—*Gravesend RS.*
"Both generators failed. Lessons given to helpers on turning petrol tap to 'on' and not 'off'"—*Leicester Poly.*
"Sudden increase of swr due to cow having knocked down the aerial!"—*West of Scotland ARS.*
"Some work necessary on the generator"—*Gravesend RS.*

(Weather)
As is to be expected, many groups have commented on the adverse weather and the consequent damage to equipment. Many of the comments are very similar in content and to conserve space it has been necessary to group these and to edit some of the others—G6LX.
"Wonderful weather"—*Torbay, Bury St Edmunds, Great Western, Sedgemoor, and others, particularly in the western counties.*
"Tropical weather ensured the best turn-out ever for our club events"—*Litchfield.*
"Weather cool and foggy"—*Guernsey.*
"Horrific thunderstorms"—*White Rose, Loughborough Falcon, Spalding, Gravesend and at least 10 others.*
"Had to QRT for 3/4h due thunderstorms"—*Addiscombe (same comment from seven other groups with different time scale).*
"All antennas were at ground potential with λ/4 stubs to earth and this kept us going even though we were surrounded by thunderstorms"—*Southgate.*
"2in of water in tent"—*Mansfield Telecoms. (Same comment from 11 other groups but level varies from 2in to 2ft.)*
"Must have been the hottest NFD on record during Saturday, but come Sunday and the thunderstorms—was off the air a number of times, once for over an hour"—*Echelford.*
"We started well enough, but after an hour we were surrounded by a very slow-moving thunderstorm and the open-wire feeder began to arc over to the metal frame of the tent and to the equipment. This lost us about 1¾h"—*Stockport "A".*
"We lost over three hours because of lightning and associated pyrotechnics. Our tower was hit during the second storm"—*West of Scotland.*
"We were visited by Mother Nature and our station received three strikes which forced us off the air"—*Scarborough.*
"Monsoon-like weather"—*Crawley and many others.*
"Mr Brocks had nothing like the firework display on our site"—*Clifton.*
"Lightning strike melted coaxial and took out receiver front-end"—*CPS.*
"Much damage to equipment due to near strike on site, unable to repair 101ZD which burst into flames, tent and generator flooded, gave up and went home"—*Anon by request.*
"We experienced the worst thunderstorms in living memory (no exaggeration) with sheet and fork lightning illuminating the landscape and rain causing flooding of the station"—*Kilmarnock & Loudoun.*
"We lost a total in excess of 2h as a combined result of a really nasty thunderstorm and cloudburst. Some damage to equipment due to near strikes causing burning of switches in aerial tuning and switching units. Generator sucked in rain through air intake and had to be stripped"—*Croydon (several other groups reported on similar damage to atu and asu and on rain stopping their generators).*
"After one near strike lost our power and found generator on fire with power cable welded"—*AR CG.*
"Storm blew down quad smashing the spider. Hail stones the size of tennis balls. Operator G3RIR and helper Tony struck by lightning. One mast also struck. Tent and equipment flooded with much water in transceiver and keyer. Nothing working so items taken home and dried with hair drier. Lost a lot of time, but finally managed to get back on the air and complete the contest"—*Leicester Poly.*

COMMENTS FROM THE HF CONTESTS COMMITTEE
The rules for NFD this year included penalties for an excessive number of unmarked duplicate contacts. Unfortunately one group exceeded the five contact maximum that was specified in the rules by having 13 unmarked duplicates (12 on one band) and the committee had no alternative but to exclude the entry. The rules also required every entrant to pre-notify their portable location to the committee in order that inspections could be carried out. Three groups came very close to disqualification on this count as they failed to give the required information. As this is the first year that this rule applies the committee decided to accept their entries, but warn that lack of notification will result in disqualification in future years.

Checking of the NFD contest is carried out during a very short time-scale relative to editorial dates and as the individual band logs are distributed among the people responsible for checking it is virtually impossible to accept any entry that arrives after the due date as notified in the rules. Two groups failed to meet the deadline and as their entries were received well after the checking was in process it was not possible to include their entries.

The committee regrets that there were problems with the contest stationery. Some groups modified standard cover sheets to make them suitable for individual band declarations. Others produced home-made cover sheets, while a few entrants did not include any separate band sheets. It is hoped that the problem will be resolved by the time of the next NFD and more detailed instructions about the use and type of cover sheets will be included in the rules for 1983. No entry was excluded because of the lack of an individual band declaration.

As in previous years NFD was organized and checked by a sub-committee of the HF Contests Committee. Entry arrangements were handled by G3KDB and the individual band checking was looked after by G3MXJ, G3KKQ, G3XTJ, BRS32525, G4BUO and G6LX. BRS20249 was responsible for the administration of the contest and provided the tabulations. G6LX supervised the checking and produced this report.

We hope to see all the groups in 1983 and as the Whit holiday does not clash with the first weekend in June, NFD will be held on 4/5 June. Let us hope that the weather and conditions will be more favourable than in 1982. *G6LX*

CONTEST NEWS

Second 1·8MHz Contest 1982 rules

1. The general rules for RSGB hf contests, published in the January 1982 issue of *Radio Communication,* will apply.
2. Eligible entrants. Single-operator stations only. British Isles entrants must also be members of the RSGB.
3. Period. 2100gmt Saturday 13 November to 0100gmt Sunday 14 November.
4. Sections.
(a) British Isles stations.
(b) Overseas stations including EI.
5. Frequencies/Mode. 1·81-2·0MHz cw only. British Isles stations should note that overseas stations may be allocated different parts of the band, eg Austria 1·823-1·838MHz; Netherlands 1·825-1·835MHz; USSR 1·85-1·95MHz.
6. Exchange. RST and serial number commencing at 001. British Isles stations must also send their county/region code as published in the January issue of *Radio Communication.*
7. Scoring
(a) British Isles section. Three points for each completed contact, with a bonus of five points for the first contact with each British Isles county/region, and for the first contact with each country outside the British Isles.
(b) Overseas section. Three points for each completed contact with a British Isles station, with a bonus of five points for the first contact with each county/region.
8. Logs. RSGB hf contest log sheets, written on one side only, or A4 sheets with seven columns headed: date/gmt; callsign; RST/number sent; RST/number received; county code received; bonus; points.
9. Declaration. Each entry must be accompanied by the following declaration, signed and dated: "I declare that this station was operated strictly in accordance with the rules and spirit of the contest, and agree that the decision of the Council of the RSGB shall be final in all cases of dispute".
10. Address for logs. RSGB HF Contests Committee, c/o D. J. Lawley, G4BUO, 220 Shipbourne Road, Tonbridge, Kent TN10 3EL.
11. Closing date for logs. Logs must be postmarked no later than Monday 29 November 1982.
12. Awards.
(a) The Victor Desmond Trophy will be awarded to the winning station in the British Isles section, and certificates of merit will go to the second and third placed entrants in this section.
(b) The Maitland Trophy will be awarded to the Scottish station scoring the highest aggregate number of points in this contest combined with the First 1·8MHz Contest 1983.
(c) Certificates of merit will be sent to the first three stations in the Overseas section and to the leading station in each overseas country.
(d) A certificate of merit will be awarded to the highest placed entry from a station which has not entered a Second 1·8MHz contest before. Candidates for this award should mark their cover sheet "First time award".
(e) A certificate of merit will be awarded to the highest placed British Isles entrant who has achieved pensionable age on or before 13 November 1982. Candidates for this award should mark their cover sheet "Senior citizen's award".

144MHz CW Contest rules

There will be two sections in this event:
Section 1—24h, 1400-1400gmt, 6-7 November 1982.
Section 2—6h, 0800-1400gmt, 7 November 1982.

This contest is timed to coincide with the IARU Marconi CW Contest. Those wishing their logs to be passed on for this contest should enter distance in kilometres in addition to radial ring scoring.

The following general rules, published in the January 1982 issue of *Radio Communication,* will apply: 1, 2, 3, 4d, 5a, 6b, 7a, 9, 10a, 11a, 12a, 13-26.

All entries and check logs to: VHF Contests Committee, c/o Mr G. M. C. Stone, G3FZL, 11 Liphook Crescent, Forest Hill, London SE23 3BN.

144MHz Open Contest May 1982 results

Although a high proportion of the stations operating in the May 144MHz Open Contest reported that propagation conditions were not particularly good, those along the east coast were able to press home their geographical advantage by working hundred-plus series of Dutch and German stations unbroken by a single G contact.

As the majority of Continental stations do not give their full QTH and these contestants do little more than catalogue the incoming dx, at least 15sec is saved on each QSO. This is now equivalent to allowing an additional 2·5h operating time and clearly reinforces the geographical advantage beyond what the less fortunate stations might consider to be fair.

The VHF Contests Committee is well aware that many regular contestants have strong feelings on this and other allied controversial issues, and before next year's general rules are published, these matters will have to be given a thorough airing. Furthermore the voluminous logs (some now costing more than 50p to post first class) are presenting the adjudicator of 144MHz events with something of a nightmare. With more than 500 Continental QSOs per log in so many of the entries, a new dimension is being introduced into adjudication which might benefit from a drastic revision of the rules.

"Par" average points per QSO varied significantly throughout the UK, with AN and YQ squares heading the list with more than 11·5 points/QSO. ZL square returns the most entries in spite of the fact that par for this square was not more than 6·7 points/QSO. This year's 144MHz Open slotted neatly into the general pattern.

The VHF Contests Committee is frequently criticized for not disqualifying stations who persistently radiate signals which cause excessive splatter and interference. Each event brings with it a few isolated complaints but rarely do contestants offer sufficient evidence to enable it to act. This event, however, was an exception, with several complaints on the back of the 427 cover sheet being confirmed by letters and tape recordings. In consequence, stations whose claimed scores have been reduced by a significant factor would be well advised to check their signals before taking part in a future contest. Moreover, every operator taking part in group entries should familiarize himself or herself with the equipment in use before the start of the contest. Too many stations offend because an inexperienced operator is left to hold the fort during slack (?) periods and, carried away by his own enthusiasm, inadvertently puts his group's entry in jeopardy. In this contest, no station has been disqualified, but contacts made during a proved offending period have been disallowed.

The committee acknowledges with particular thanks all those who typed or made fair copies of their "real time" logs and those helpful checklogs from outside the UK. Checklogs were received from PE1FXW, PE1FBB, PE1AAP and from GI4LKA. One BRS entry was also received. Congratulations to all who stayed the course and certificates to the winners of each section.

G2HIF

MULTI-OPERATOR PORTABLE SECTION

Posn	Callsign	Points	QSOs	QTH	Best dx	Km
1	G4LIP/P	13,115	885	AN61	HB9AEN/P	840
2	G4MRS/P	11,361	892	AM67	DB2RR	785
3	G4BWG/A	11,338	807	AL67	DB2RR	745
4	G4DEZ/A	10,760	800	AL34	—	795
5	GW4ERP/P	9,572	777	YN75	DK8VR	817
6	G3EFX/P	9,249	715	ZK10	DB2RR	837
7	G3ZIG/P	8,959	685	AM07	DB2RR	821
8	G4NXO/P	7,417	668	YL29	HB9AEN/P	814
9	G6EKR/P	7,402	609	AL56	DK1KQ	672
10	G6HH/P	7,377	641	AK03	DB2RR	760
11	G3WQK/P	6,907	516	AK12	F1CHR	920
12	G3PIA/P	6,659	620	ZL33	DC1ZN	750
13	G8GBY/P	6,135	444	ZN18	DF9CY	886
14	GW3OXD/P	5,414	578	YM54	DL6YBE	753
15	G8HRC/P	4,723	428	AL17	DG6NO	610
16	G3GHN/P	4,609	495	AL52	DK3UZ	710
17	G3FXG/P	4,266	514	ZL34	DB5VT	613
18	G3SFG/P	3,995	516	ZL29	F6KFN/P	630
19	G8WWI/P	3,383	406	ZL09	DJ9XO	703
20	G8LVQ/P	3,317	415	ZO71	F1FHI	769
21	G8SDS/P	3,299	347	YK28	DJ0IA	733
22	G4NVA/P	3,093	619	ZN53	DK2LM/P	786
23	G6CW/P	3,042	383	ZN74	F1CYB	687
24	GW4CZZ/P	3,009	399	YN64	DB6DC	746
25	G4LIN/P	2,985	368	ZM70	F1EAN	611
26	G4DZO/P	2,853	337	AK11	F1CHQ	653
27	G4MHC/P	2,810	461	YM79	DJ0IA	683
28	GM3ZXE/P	2,602	182	YQ24	G8DPV	703
29	G3WOI/P	2,180	340	ZL53	DL0WW	763
30	G4DAR/P	1,993	366	YM40	F1FHI	603
31	G4MGX/P	1,896	334	YN40	F1DTB/P	665
32	G4NUT/A	1,838	223	ZM77	DK8VR	622
33	GW3GIZ/P	1,630	280	YN65	PA0OOM	687
34	G3TBK/P	1,588	236	ZN78	DB6DC	560
35	G8XDA/P	1,574	331	YL19	F1EQE	690
36	G6BRA/P	1,356	203	YK18	DB5VT	685
37	G3ZVG/P	1,323	234	ZN52	F6GCT	602
38	G5LK/P	1,294	282	ZL60	PA0OOM	514
39	G6OI/P	1,031	247	YM49	F1FHI	596
40	G3IGQ/P	858	186	ZL41	F6CER	454
41	G6GS/P	804	214	ZL69	GM6BIG/A	541
42	G8MRY/A	745	187	ZL29	DL20M	573
43	G6CHE/P	591	135	ZM13	DB6BU	619
44	G8SAD/A	484	139	ZL10	GI8TBQ	450

MULTI-OPERATOR FIXED SECTION

Posn	Callsign	Points	QSOs	QTH	Best dx	Km
1	G8RZP	9,586	762	AL45	DB2RR	781
2	G8ZHP	7,925	545	ZM29	DG9EV	786
3	G3UKC	5,137	471	AL56	GI4LKA	597
4	GD4IOM	2,472	237	XO67	DB6BU	795
5	G3CXX	1,877	309	YN49	F1FHI	705
6	G4GTT	1,717	289	ZL38	DG5IP/P	637
7	G6CHK	1,113	267	ZL27	GI4LKA	484
8	G6CAQ	831	198	ZL39	DK8VR	555
9	G6ECC	813	89	XK57	F5MDE	675
10	G4CDA	723	159	YN58	F6FLB	395
11	G8ZKE	416	95	ZM41	GM3ZXE/P	470

SINGLE-OPERATOR FIXED SECTION

Posn	Callsign	Points	QSOs	QTH	Best dx	Km
1	G4MDZ	6,020	521	AL76	HB9AEN/P	615
2	G8LEF	5,543	507	ZN21	DC1ZN	838
3	GM8YJU	2,470	237	YO05	PE0MAR/P	570
4	GI8TBQ	1,789	145	XO33	PE0MAR/P	685
5	G4ARI	1,176	232	ZM24	F1FHI	615
6	GW3NYY	1,165	117	XL40	PA0CIS	618
7	G8ASA	1,121	103	ZO69	—	—
	G8ABI	996	136	ZK34	GM3ZXE/P	670
9	G3ZLQ	995	150	ZK17	GI8TBQ	539
10	G8RAF	955	153	YL56	GM3ZXE/P	594
11	G8VPE	876	88	AM29	DK2PH	474
12	G6DFE	592	70	AM67	G4MRS/P	513
13	EI8AYB	457	33	WN70	G4MRS/P	503
14	G4ASL	436	110	ZL60	PE1GXU	408
15	G8TBL	424	129	AL51	EI9Q	490
16	G4KDR	381	77	ZL79	GM6HCO/P	499
17	G4FVK	371	68	ZM39	GI8TBQ	410
18	G4NYS	310	133	ZL37	PA0ALK	334
19	G3ORX	314	62	YL49	G8LVQ/P	290
20	G8UYD	307	61	ZN64	PE0MAR/P	382
	G4AGQ	307	93	ZL66	F1BBD	352
22	G8YGW	298	70	ZL56	PE0MAR/P	340
23	G8CKC	293	41	YK23	G3ZIG/P	408
24	G8XWA	280	70	YN19	G4MDZ	370
25	G8XTJ	249	66	ZL27	GJ4JWA	292
26	G8RRC	194	51	ZL40	GW3GIZ/P	275
27	G6COJ	179	51	ZM80	GD4IOM	380
28	G6FUZ	141	49	YN79	GM8YJU	225
29	G8TZJ	136	26	YN07	G6HH/P	402
30	G6CSY	115	21	AL41	GW3GIZ/P	301
31	G8LXY	101	46	ZL09	GW3ZIG/P	162

Contests calendar

2-3 October	IARU VHF *(Rules and amendment in July/September issues)*
2-3 October	RSGB UHF *(Rules in September issue)*
2-3 October	VK/ZL/Oceania (Phone) *(Rules in September* MOTA*)*
3 October	ON (3·5MHz) *(Rules in September* MOTA*)*
9-10 October	VK/ZL/Oceania (CW) *(Rules in September* MOTA*)*
9-10 October	Third WW SSTV *(Rules in October* MOTA*)*
10 October	ON (144MHz) *(Rules in September* MOTA*)*
10 October	21/28MHz Phone *(Rules in May issue)*
16-17 October	WA Y2 *(Rules in October* MOTA*)*
17 October	21MHz CW *(Rules in May issue)*
30-31 October	CQ WW DX (Phone) *(Rules in October* MOTA*)*
October/ December	432MHz Cumulatives *(Rules in September issue)*
October/ December	1,296MHz Cumulatives *(Rules in September issue)*
6-7 November	144MHz CW *(Rules in October issue)*
6-7 November	Marconi Memorial CW
7 November	LF CW (WAB) *(Rules from D. Roberts, G4FQO, QTHR.)*
13-14 November	European DX (RTTY) *(Rules in August* MOTA*)*
13-14 November	1·8MHz (2nd) *(Rules in October issue)*
13-14 November	Esperanto (ILERA) *(Rules in October* MOTA*)*
14 November	OK DX *(Rules in October* MOTA*)*
27-28 November	CQ WW DX (CW) *(Rules in October* MOTA*)*
5 December	144MHz Fixed *(Rules in September issue)*
1983	
5-6 February	7MHz (Phone) *(Rules in September issue)*
26-27 February	7MHz (CW) *(Rules in September issue)*

SINGLE-OPERATOR PORTABLE SECTION

Posn	Callsign	Points	QSOs	QTH	Best dx	Km
1	G4APA/P	3,469	335	ZN28	DB1VY	711
2	G8YYB/P	1,658	311	ZL60	GM3ZXE/P	637
3	G3SXE/A	722	170	ZL40	GI4LKA	525

RECEIVING SECTION

BRS32525 727 points from a log of 153 contacts.

Coventry DF Qualifying Event results

Chesterton, six miles south-east of Warwick, provided the starting point for the Coventry qualifying round for this year's National Final. Twenty-two teams decided to throw caution to the wind and sweat it out in the brilliant sunshine.

Station "A", G2ASF/P, was hidden in a small wood near Stoneton, approximately 7½ miles south-east of the start. Some 500m of antenna wire running diagonally across the hillside managed to slow most competitors down by the uphill struggle through the wood. Not so Brian Bristow. Brian, first on the scene, decided it was much quicker to devastate the undergrowth starting at the top and soon managed to find the transmitter.

Station "B", G4CFG/P, was located in an overgrown quarry near Traitors Ford, approximately 14 miles south of the start. Nearly 400m of wire running across and round the quarry gave some competitors a pleasant afternoon tracking the antenna through the thickest brambles that could be found. Mike Hawkins, however, took the scientific approach and found the transmitter using his receiver, which proved to be very successful.

Fifty-four people sat down for tea after the event, where Mike Hawkins told us how, by expert operating, he had won. Brian, on the other hand, explained that his luck had deserted him at station "B" and the effort of scaling the quarry several times had left him quite tired.

Posn	Name	Club	Time of arrival Station "A"	Station "B"
1	M Hawkins	Chelmsford	1422	1508
2	B Bristow	Mid Thames	1415	1521
3	C Merry	Dartford Heath	1416	1522
4	J Drakeley	Slade	1418	1526
5	W North	Mid-Thames	1415	1527
6	E Mollart	Mid-Thames	1418	1528
7	R Parsons	Burton-on-Trent	1442	1528·5
8	D Holland	S Manchester	1541	1454
9	M Easterbrook	Dartford Heath	1546	1450
10	T Gage	Mid-Thames	1549	1438
11	R Vickers	Slade	1552	1509
12	D Newman	Slade	1603	1521
13	P Williams	Slade	1603·5	1522
14	A Butcher	Chelmsford	1607	1526
15	R Goodearl	Mid-Thames	1609	1523
16	C Plummer	Mid-Thames	1612	1524
17	C Wells	Mid-Thames	1613	1529
18	A Sapsed	Gloucester	1459	1622
19	P Woollett	Dartford Heath	1454	1626
20	T Judd	Oxford	1628	1549

Two competitors failed to find either transmitter
C Merry and J Drakeley qualify for the National Final

Oxford DF Qualifying Event results

The Oxford DF Qualifying Event took place on Map 164 on 25 April, and attracted 25 teams, almost all of whom observed the formality of booking in several days before the contest. The countryside had not yet recovered from the harsh winter, and satisfactory cover was non-existent, so the organizers resorted to simple subterfuge. Station "A", G8IB/P, lay at anchor in a dinghy on the east bank of the Thames near Dorchester, just within wading distance of the shore, thus fulfilling the tradition that competitors in any event run by G3UJO must expect to get wet. Station "B", G3JLE/P, was in a ditch near Noke, surmounted by a bird-watcher who stoutly maintained that he knew nothing of any df operations, and advised the competitors to look elsewhere. A few did so . . .

At the start on Shotover Plain, G8IB/P was clearly audible to all competitors—the river makes an excellent earth—and would have been even stronger had not a fresh breeze prevented him from raising his antenna on a helium-filled balloon. However, station "B", which was much closer to the start, had attenuated his transmission to the point of inaudibility, and the organizer announced an approximate bearing of 000° ±30°, and a distance of not more than 10km. On the advice of the organizer, station "B" subsequently reduced the attentuation, to the evident annoyance of some of the competitors.

Twenty-three teams found the "A" station, four competitors actually swimming across the Thames to reach it (the water temperature was 9°C). First in at 1421 was Brian Bristow, who went on to win the event, a place in the National Final, and a bottle of Bull's Blood to fortify him for future events.

Twenty-two competitors raided the birdwatcher's nest and uncovered G3JLE/P, and here again the indomitable Brian Bristow led the field, arriving at 1453. The other qualifying competitor was Bill North, who found the "A" station at 1422 and the "B" station at 1502. The ladies' prize went to Roger Shepherd's xyl.

A company of 60, plus organizers, operators and birdwatchers sat down to an excellent tea, prepared by Jean Mollart and served with the help of Brenda Knight and Jean Hudson.

Posn	Name	Club	Time of arrival Station "A"	Station "B"
1	B Bristow	Mid-Thames	1421	1453
2	W J North	Mid-Thames	1422	1502
3	R Shepherd	Mid-Thames	1420	1502·5
4	C Plummer	Mid-Thames	1421	1508
5	R Parsons	Burton-on-Trent	1424	1509
6	R Brocks	Chelmsford	1424	1509·5
7	R Vickers	Slade	1421	1510
8	M Hawkins	Chelmsford	1431	1511
9	M Easterbrook	Dartford Heath	1424	1518
10	I Butson	Colchester	1434	1519
11	T Gage	Mid-Thames	1422	1519·5
12	C Merry	Dartford Heath	1544	1457
13	W Pechey	Mid-Thames	1454	1547·5
14	E Mollart	Mid-Thames	1502	1551
15	J Drakeley	Slade	1442	1557
16	D Newman	Slade	1453	1557
17	P Lisle	Mid-Thames	1606	1529
18	G Whenham	Coventry	1608	1529·5
19	A Sapsed	Gloucester	1505	1619
20	D Holland	S Manchester	1621	1547
21	G Harris / G Taylor	Mid-Thames Aerial	1544·5	–
23	D Yorke	S Manchester	1556	–
24	S Carey	Dartford Heath	–	1620
25	M Sheridan	Stratford-on-Avon	–	–

B Bristow and W J North qualify for the National Final

South Manchester Quadruple Night DF results

The first ever Quadruple Night DF was run by members of the South Manchester Radio Club. The date was to have been 16 January but was changed to 20 February due to extremely bad weather conditions.

A total of eight teams arrived at the start on a cold windy night. Not all four transmitters were audible at the start and approximate bearings were given as necessary. The transmitters were so positioned as to reduce driving to a minimum. Competitors appeared to split up when leaving the start between all four transmitters.

Transmitter "A" was located approximately two miles from the start, operated by G3UHF/P from a small wood by Wythenshawe Park. Extra-long antennas caused some competitors to spend over an hour in the area.

The "B" transmitter, G4MYK/P, was situated in the opposite direction to "A", being north-west of the start at Worsley Woods, some eight miles distant. The first arrival here was Dave York, alias the "good doctor", much perturbed about ravenous rhoddedendrons.

Transmitter "C", G4MKN/P, was situated some six miles west of the start on the banks of the Bridgewater Canal, and caused problems to several teams due to the close proximity of pylons. Some teams found themselves on the wrong side of the canal and decided not to swim on this occasion (much to the disappointment of the transmitter crew and those on the right side!).

The fourth transmitter, G3FVA/P, was situated south of the start on the wooded Bolton Valley near Ringway Airport. A long end-fed antenna eventually connecting to a fence caused some competitors to search around a very squalid brook for half an hour or so as signals were so strong at this point.

After the event an excellent supper was laid on at the QTH of Murray Ellis (assisted by John Heath). Having had favourable comments of competitors, the organizers hope to run a similar event next February. Many thanks go to all who organized and ran the event in adverse conditions, especially Dave Bolton who "masterminded" the event, operators Dave, Trevor, Colin, John, Paul and colleague.

Posn	Name	Club	Time of arrival Station "A"	Station "B"	Station "C"	Station "D"
1	G Whenham	Coventry	2224	2314	2051	2136
2	D Holland	S Manchester	2110	2339	2217	2056
3	D Yorke	S Manchester	0000 +	2022	2231	2329
4	M Ellis	S Manchester	2253	–	2343	2109
5	J Laing	S Manchester	–	–	2039	–
6	D E Newman	Slade	–	–	–	2135·5
7	J E Drakeley	Slade	–	–	–	2212
8	M Field & G Dove	S Manchester	–	–	–	2219

White Rose RS 2nd SWL Lower Frequency Bands Contest 1982 results

The leading stations of the 32 in the Phone section were: Chris Vermote (Ypres, Belgium) 125,160 points, Arthur Miller (Bromsgrove, Worcs) 80,004 points, and Marc Domen (Brussels, Belgium) 64,575 points. Of the 11 entrants in the CW section, the first three were: Alex Dodd (Glasgow) 22,896 points, John Goodrick (Bognor Regis) 22,610 points, and Ron Thomas (Clapton, London) 17,664 points. A full results table can be obtained from Mr D. A. Whitaker, 57 Green Lane, Harrogate, N. Yorks HG2 9LN.

There was an increase of 100 per cent in the number of entrants this year, and entries were received from 13 countries and five continents. 3·5MHz carried most of the traffic, with dx audible 75 per cent of the time. 7MHz tended to be more selective, but those listeners with good receiving equipment were rewarded with some nice dx. Anyone with an elementry knowledge of Russian would have had a whale of a time on 1·8MHz. The contest started in the early hours of Sunday morning and produced activity very rarely heard in the phone section of this band.

3·5MHz. Most of the European countries were heard at one time or another. Several JAs were heard from 1600 to 2200gmt. Hans Nilsson enjoyed long path propagation to W6/W7 from 1430gmt and also logged VK9NS on Norfolk Island at 1751gmt. Africa was heard from 1900gmt onwards, the prominent stations being CN8CO, 6W8DY, EL8H and W6YB/3D6. Two hours later DF3NZ/ST made a welcome appearance, followed by some Russian Asiatic activity. From 2300 to approximately 0430gmt 3·5MHz went into a fairly quiet period, with only east coast USA/Canada and European stations being heard. However, by 0430gmt, the skip did move south from North America and this brought a nice selection of stations from Central and South America. New Caledonia was heard at the late hour of 0845gmt on ssb.

7MHz. Japan was the first dx country to be heard on this band, but it took listeners with more favourable QTHs, and better still, more selective receivers, to hear these stations. There was some rare dx to be heard from Africa around 1800gmt. India was also heard about this time. Commercial QRM, mainly from broadcasting stations, makes 7MHz of little use for dx working between 1900gmt and 2200gmt, and little dx was heard during the night. Then at 0700gmt the band opened to the Americas and New Zealand. Pitcairn Island was copied at 0719gmt and the South Shetlands at 0737gmt, and many Ws were still there up to 1000gmt. Again, those listeners with more favourable QTHs were able to hear rare dx which other mortals failed to do.

1·8MHz. There was no *CQ* contest this year to boost the cw scores, but this was slightly offset by a Russian contest starting in the phone section. Regrettably, very few listeners were able to take advantage of this increased activity by the Russians. Several European countries were heard between 2200 and 0200gmt. Only two stations were reported from across the "pond".

CLUB NEWS

Brian Aspinall, G6CJL, and the former Julie Saxton after their wedding in the presence of other members of the Northern Heights ARS, of which they are secretary and committee member respectively. Julie passed the RAE last year and is now working for a G4 licence. L to r: G8SJA, G6CJL, Julie, G3TQA, G8NWK (chairman), and G8WFP

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 January 1983 issue.

RSGB affiliated organizations are requested to report all programmes and news items to their regional representatives regularly. Information for inclusion in the **December** issue should reach them by **16 October** and for the **January 1983** issue by **13 November.**

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 (North Western Repeater Group)—21 October. Globe Bowling Club, Willows Lane, Accrington. Sec Howard Aspinall, G3RXH.

Ainsdale (AARC)—12, 26 October. Scout HQ, Ainsdale. Sec Norman Horrocks, G2CUZ, tel 0704 77604.

Barnoldswick (Rolls-Royce ARC)—6 October ("Latest developments", by Ron Myers, G8LUL), 8pm. Rolls-Royce Sports & Social Club, Barnoldswick. Sec Leslie Logan, G4ILG, tel Barnoldswick 812288.

Blackburn (East Lancs ARC)—5 October (Programme now finalized and will be a talk supported by slides on "Radio Lancashire" by the engineer-in-charge, Mr B. Shields, G3OIH), 2 November (Home construction night), 7.30pm. Shadsworth Leisure Centre, Blackburn. Because of the departure of the last chairman, Norman Jenkin, G4CGT, has been elected to fill the role. It looks as if he is continuing with his pro office as well, tel 0253 75037.

Blackpool (B & Fylde ARS)—5 October, 2 November. Details from Jim Newland, G5ND, tel 0253 64588.

Bury (BRS)—12 October (Construction competition), 9 November ("Test equipment", by Mike Horrocks, G8GTP, and Gordon Cratchley, G3IXC). 5, 19, 26 October (Informal), Mosses Community Centre, Cecil Street, Bury. Pro David Hensby, G8TKD, tel Whitworth 2213, daytime only.

Manchester (South Manchester RC)—1 October (Club quiz or "Call My Bluff", 8 October (Visit to a local telephone exchange), 15 October (An evening for the swl), 22 October ("Enlightenment", by Andrew Cowley, G4CXA), 29 October ("Noise", by David Yorke, G4JLG), and advance notice of the annual dinner to be held on 19 November at the Bowden Hotel, Altrincham. Mondays (Informal), all meetings commence at 8pm, at the Sale Moor Community Centre, Norris Road, Sale. Sec David Holland, G3WFT, tel 061-973 1837.

Preston (PARS)—14 October ("Aviation electronics", by Fred), 25 October (No details available). Lonsdale Club, Fullwood Hall Lane, Fullwood, Preston. Sec George Earnshaw, G3ZXC.

Stockport (SRS)—6 October (Ladies night at the Southlands Hotel, Stockport), 13 October ("Ionization plus", by Jim Tottle), 27 October ("Measurements—real and imaginary", Alan Buxton, G8CZW), 8pm. Blossoms Hotel, corner of Bramhall Lane and Wellington Road, Stockport. Sec Stan Aspinall, G3VSA, tel 061-437 1437.

Thornton Cleveleys (TCARS)—8 October (Sale of surplus equipment), 15 October (AGM and pie and peas supper), 22 October (To be arranged), 28 October (A DIY Great Circle Map), 5 November (Natter night), 8pm. Thornton Cleveleys Sports Centre, Victoria Road, Cleveleys. Sec Mrs Jen Ward, G8YOK, tel Poulton-le-Fylde 890114.

Warrington (UK FM Group Western)—7 October, 4 November, Grappenhall Community Centre, Bellhouse Lane, Warrington. Sec Gordon Adams, G3LEQ, tel 0565 4040.

Wirral (WARS)—6 October (Sale of surplus equipment), 20 October (AGM), 3 November (Chairman's night), 7.45pm. Minto House School, Birkenhead Road, Hoylake, Wirral. Sec Gordon Lee, G3UJX, tel 051-677 1518.

Wirral (W&DARC)—13 October ("Advanced driving techniques", by Fred Welch, president of Wirral Advanced Motorists), 20 October (Visit to Merseyside County Police HQ—number limited. See Frank Kneale, G4DBG, tel 051-339 9623), 27 October ("Understanding receiver parameters", by John Fogg, G8UZZ), 8pm. D & W's on 6 and 20 October at Hotel Victoria, Heswall, and Red Cat, Greasby. Irby Cricket Club, just off Irby Mill Hill Road, on the westerly side, about 2/3 miles north of junction with Thingwall Road, Irby. Visitors are requested to park at the top of the long drive and walk down to the clubhouse. Sec Gerry Scott, G8TRY, tel 051-630 1393.

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

Barnsley (UK FM Group Northern)—3 October, 7 November, 7.30pm. The Royal Hotel, Church Street, Barnsley. Sec G4LUE.

Denby Dale (DD&DARS)—13 October (Talk by G4BLL), 27 October (Film evening), 7.30pm. Pie Hall, Denby Dale. Sec J. Clegg, G3FQH.

Goole (G&DARS)—Mondays, 7.30pm. Junior Chamber Buildings, 17 Boothferry Road, Goole. Chairman, G3VBI. Details from G8IOH or G8VHL.

Halifax (Northern Heights ARS)—6 October (Amateur tv), 13 October ("RSGB", by G4DAX, RR2), 20 October ("Slow scan tv", by G4BLL), 3 November ("Homemade winemaking", by Bernard Halliwell), 7.45pm. Bradshaw Tavern, Bradshaw, nr Halifax. Sec G6CJL, tel Bradford 834442.

Hull (HUR&ES)—Tuesdays, 1.15pm. Room 313B, Union Building. The club is now active on the hf bands and 144MHz ssb. Ex-president G4HXN has now left after a four-year stint, during which time he played a major part in the installation of the antenna farm. Details from G4KWZ or G4EZP c/o Hull Students Union.

Leeds (BYLARA)—With its administration centred in Region 2, the British Young Ladies Amateur Radio Association is open to all interested yls, xyls, oms, and swls. Association net is on Mondays at 7.15pm (with the first half-hour for yls), on 3·690MHz plus or minus QRM. Meetings are held at most local rallies, and a quarterly newsletter is published. Details from Mrs Diana Hughes, G4EZI, 4 Primley Park Crescent, Leeds LS17 7HY (sae please).

Pontefract (P&DARS)—7 October (Visit to Ferrybridge B power station), 14 October ("The energetic electron" by G3ESP), 21 October (Informal), 28 October ("VHF antennas part 2", by G8NDF). The Carleton Community Centre, Pontefract. Sec G4ISU.

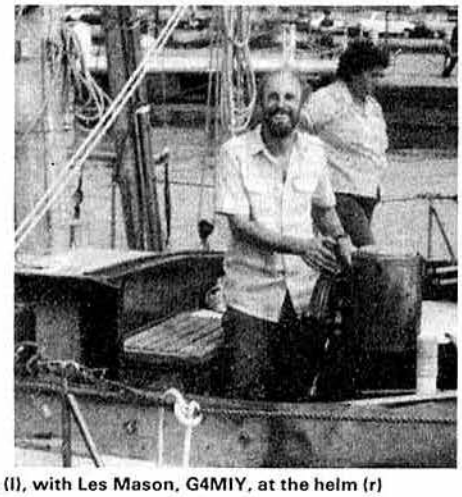
Sheffield (World Association of Christian Radio Amateurs)—Another major group administered from Region 2. WACRAL membership is open to Christian amateurs of all denominations. UK skeds are held each Sunday at 8.30am on 3·777MHz approx, ssb. The association is holding its annual conference at Cliff College, Calver, nr Sheffield, on 22, 23, 24 October. A special call will be used on a 24h station celebrating the 25th anniversary. Sec G3AGX.

Spen Valley (SVARS)—Thursdays, 14 October (Committee/project night), 28 October (Open night), 11 November (Talk by president, G3YPC), 8pm. Old Bank Working Men's Club, Mirfield, W Yorks. Sec G4MLW.

Wakefield (W&DARS)—5 October (Club project), 19 October (On the air/natter night), 2 November (Pie and pea supper), 8pm. Holmfield House, Denby Dale Road, Wakefield. Sec G4BLT. Tel Wakefield 255515. Please check the meeting venues as alterations to Holmfield House may still be going on.

York (YARS)—Fridays except the third in each month. 15 October (Annual dinner). 7.30pm. United Services Club, Micklegate, York. Sec Keith Cass, G3WVO. Despite atrocious band conditions, the stand at the Great Yorkshire Show was a great success, with amateur radio being shown to the public by members of the club.

Les Mason, G4MIY, set sail for the USA recently in his home-built ketch *Meander of York*. York club saw Les (a York member) off from York, and members of Pontefract also wished him *bon voyage* from the ocean lock at



The *Meander* about to set sail from Goole (l), with Les Mason, G4MIY, at the helm (r)

Goole. Sailing via Spain, Portugal, Madeira, the Canaries and the West Indies, he hopes to be on the air most days. The York ARS sec, G3WVO, has kindly offered to supply a list of sked times in exchange for an sae. On behalf of all in the region RR2 would like to wish Les calm waters, fair winds, and safe landfall.

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

Atherstone (AARC)—14 October (RSGB tape "Top band dx"), 21 October (John Arrowsmith and Nick Trotman talk on their visit to OH zero), 7.30pm. Tudor Centre, Coleshill Road, Atherstone. Sec G4IAG, tel Fillongley (0676) 41814.

Birmingham (Midland ARS)—19 October (AGM), 7.30pm. 294a Broad Street, Birmingham B1 2DS. Sec G8BHE, tel 021-422 9787.

Birmingham (South Birmingham RS)—6 October ("New 144MHz repeaters in the Birmingham area, GB3AM and GB3BX", by Ray Withers, G4KZH), 3 November (AGM, all members please attend), 7.45pm. Thursdays (HF night on the air), Fridays (VHF/uhf, morse classes, construction, natter, new communications shack available). Hampstead House, Fairfax Road, West Heath, Birmingham B31 3QY. Contact R. Whitewell, 021-777 4901.

Birmingham (University of Aston ARS)—Welcomes new and returning students and lecturers. G3UOA and G8PGM active on hf, vhf and uhf. Meet in Fresher Fayre. Chairman M. Beach, G8ZEZ, St Peters College, College Road, Birmingham B8 3TE.

Birmingham (University of Birmingham ARS)—Fridays, 7.30pm. Club room, second floor, Students Union (above Midland Bank). RAE classes start 12 October, 7.30pm. Club room open every lunch time. Sec Chris Driver, G6CMD.

Bromsgrove (B&DARC)—8 October (Surplus sale), 15 October (JOTA preparation), 16/17 October (JOTA with Rubery Scouts), 22 October (QRP meeting). Avoncroft Art Centre, Bromsgrove. Sec G4LVK, tel 021-445 2088.

Coventry (CARS)—1 October (AGM), 8pm. Baden Powell House, 121 St Nicholas Street, Radford, Coventry. Sec G4HRY, tel Coventry (0203) 618648.

Hereford (HARS)—First and third Friday in each month, 15 October (Informal club evening), 16/17 October (JOTA), 8pm. Civil Defence HQ, Gaol Street, Hereford. Sec G4CNY, tel Hereford (0432) 3237.

Lichfield (Chad RC)—Alternate Wednesdays, 8pm. The Naval Club, Burton Old Road, Lichfield. Sec G4ESK, tel Lichfield (05432) 23919.

Malvern Hills (MHRAC)—12 October (BBC film show "The Secret Listeners"), 7.30pm. The Red Lion Inn, St Ann's Road, Great Malvern. Sec G4GFX, 9 Wyche Road, Malvern, tel Malvern (06845) 62900.

Much Wenlock (Wenlock ARES)—13 October ("Electronics and electricity in mines", by John Oliver, G8ARS), 27 October ("Basic 'basic' computer programming", by Maurice Hawes), 8.30pm. Raven Hotel club room. Sec Ed Green, G3ZSL, tel Bridgnorth (0746) 861332.

Redditch (RRC)—14 October (Talk on matching circuits and swr by Dave Yates, G3PGQ), 8pm. 28 October (RTTY operating, morse class, natter night), 8pm. WRVS Centre, Ludlow Road, Redditch, Worcs. Sec G3EVT, tel Alcester (0789) 762041.

Rugby (RATS)—Wednesdays, 7.30pm. Cricket pavilion entrance to B Building, Rugby Radio Station, A5 trunk road, Hillmorton, Rugby. Sec G4ECO, tel Rugby (0788) 75935.

Shrewsbury (Salop ARS)—7 October (Natter night), 8pm. 14 October (AGM), 8pm. Albert Hotel, Smithfield Road, Shrewsbury. Sec G6AKE, tel Shrewsbury (0743) 66969.

Solihull (SARS)—19 October (AGM), 7.30pm. Club nets (G3GEI), Fridays, 9.30pm on 1,960kHz and (G8ZLJ), Sundays, 9pm on S19 or next lowest vacant channel. The Manor House, High Street, Solihull. Sec G4JDL, 107 Swallows Meadow, Shirley, Solihull, B90 4PH.

Stourbridge (StARS)—4 October (Constructional evening), 18 October (Meeting with talk/lecture), 1 November (Constructional (rockets) evening) 7.45pm. Longlands School, Brook Street, Stourbridge. Sec G8JTL, tel Lye (038482) 4019.

Sutton Coldfield (SCRS)—11 October (Natter night), 25 October (Talk by Tom Douglas, G3BA), 7.30pm. Club net Mondays, except on meeting nights, 145·2MHz, 8pm. Central Library, Sutton Coldfield. Sec G8TUR, tel 021-353 2061.

Telford (T&DARS)—9 October (Midland VHF Convention, Wolverhampton), Wednesdays, 7.30pm. Phoenix Centre, Webb Crescent, Dawley. Sec G8UGL, tel Telford (0952) 584173.

Walsall (WARC)—6 October (Surplus sale), 20 October (Night on the air), 3 November (Slides evening), 8pm. Forest Community Centre, Hawbush Road, Leamore, Bloxwich. Club net Fridays, 28·025MHz cw, 8pm, 3·70MHz ssb, 9pm. Sec G4FAJ, tel Brownhills (05433) 2169.

Wolverhampton (WARS)—4 October (AGM), 9 October (Midlands VHF Convention, support required). Wolverhampton Chamber of Commerce & Industry, 93 Tettenhall Road, Wolverhampton WV3 9PE. Sec G8EDG, tel Wolverhampton (0902) 76317.

Worcester (W&DARC)—4 October ("Simple aerials and how to tune them", by D. Yates, G3PGQ), 8pm. Odd Fellows Club, New Street, Worcester. Sec G8TZE, tel Tewkesbury (0684) 293890.

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

Derby (D&DARS)—6 October (Junk sale), 13 October (Night on the air), 20 October ("Position & direction-finding", by Prof Chaddock), 27 October (The Sealed Knot), 3 November (Junk sale), 7.30pm. Top Floor, 119 Green Lane, Derby. Sec Jenny Shardlow, G4EYM, tel Derby 556875.

Grimsby (GARS)—4 October (AGM), 18 October (Junk sale), 7.30pm. Cromwell Social Club, Grimsby. Sec Trevor Matthews, G3RGC, tel Grimsby 884060.

Louth (L&DARC)—18 October (Visit to Police HQ at Nettleham), 7pm. Sec Chuck Turner, G8ZVF, tel Grimsby 822482.

Mansfield (MARS)—1 October (ARRL film "World of Amateur Radio"), 19 October (Social meeting), 5 November (Junk sale). Victoria Social Club, Princes Street, Mansfield. Sec Duncan Walters, G4DFV, tel Mansfield 648679.

Newark (N&DARC)—7 October (Social meeting), 4 November ("BCI and tvi", a talk by Fred Ward, G2CVV), 7.30pm. Palace Theatre, Appleton Gate, Newark. Sec Roger Hiscock, G4MDV.

Nottingham (ARCON)—7 October (Forum), 14 October (Activity night), 21 October (Wattmeters), 28 October ("TV", G8MQS), 4 November (Forum). 7.30pm. Sherwood Community Centre, Woodthorpe House, Mansfield Road, Nottingham. Sec Paul Chapman, G4IPL, tel Nottingham 623828.

Spalding (S&DARS)—1 October (Slide show of local shacks by Cyril Parrish), 5 November (Construction contest for G2BQC Memorial Trophy), 7.30pm. White Hart, Market Place, Spalding. Sec Ian Buffham, G3TMA, tel Spalding 3845.

Wigston (WRC)—Fridays, 7.30pm. United Reform Church, Wigston Magna. Sec Alan Faint, G6GWH, 33 Fairway, Market Harborough. Tel Market Harborough 62827.

REGION 5—RR J. S. Allen, G3DOT, 77 Rosslyn Crescent, Luton LU3 2AT. Tel 0582 508515, 0582 21151, ext 303, work.

Cambridge (C&DARC)—1 October (Informal), 8 October ("SSB rigs—using club's as an example", by L. Alexander), 15 October (Informal), 7.30pm. Coleridge Community College. Sec Dave Leary, G8JKV.

Cambridge (CUWS)—5 and 6 October (The club will be at Kelsee Kerridge Hall). Details from T. J. Gleeson, G8TUG.

Luton (Kent Process Control ARC)—6 October (Preparing for JOTA), 8pm. The Club House, Tenby Drive, Luton. Sec G3DOT.

Shefford (S&DARC)—To date only informal and natter nights every Thursday, Shefford Church Hall. Morse classes have started again at 7.45pm. Details from sec G4MEO.

Wellingborough (Nene Valley RC)—6 October ("Norway and amateur radio", G3DOT), 8pm. The Royal Public House, Knox Road, Wellingborough, Northants. Sec G6CPX.

Club secretaries please keep me informed well in advance of the dates given at the beginning of "Club News", just in case I have to go abroad again in a hurry! *G3DOT.*

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

Aylesbury Vale (AVRS)—5 October ("British Telecom—the new challenges", by G6AGE), 2 November (Talk on RSGB by David Evans, G3OUF, general manager and secretary of RSGB), 8pm. Stone Village Hall, Stone, 2 miles west of Aylesbury on A418. Details from sec Mike Marsden, G8BQH, tel 0296 641783.

Chesham (C&DRS)—Second Wednesday in each month. New premises, at "The Stable Loft", Bury Farm, Pednor Road, Chesham. Contact sec J. Alldridge, 15 Whichcote Gardens, Chesham, Bucks, tel Chesham 786935.

Harwell (HARS)—2 and 3 October (432/1,296MHz Contest (IARU)), 19 October (To be arranged). Details from Ann Stevens, G8NVI.

High Wycombe (Chiltern ARS)—7 October (First leg of inter-ARC quiz), Red Cross Hall, Maidenhead, 27 October (Talk by G3YPZ "10m UK FM Group"), 8pm. Sir William Ramsay School, Science Block, Lecture Theatre. Details from G3NCL, tel High Wycombe 712020.

Vale of the White Horse (VWHARS)—October meeting, details to be announced. Sec Ian White, G3SEK, tel 235 812584.

REGION 7—RR Pat Walker, G8HMG, 12 Brownlow Road, Redhill, Surrey, RH1 6AW. Tel Redhill 64035.

Ashford (Echelford ARC)—11 October (Bring & buy sale), 28 October ("Aerial tuning units", by Peter Hale, G2HS), 8pm. The Hall, St Martin's Court, Kingston Crescent, Ashford, Middx. Sec Anton Matthews, G3VFB, tel 892 2229.

Bexleyheath (North Kent RS)—First and third Tuesday in each month, 19 October (Talk by the Kent Repeater Group), 8pm. The Pop-In Parlour, Graham Road, Bexleyheath. Sec Pelham Conduit, G4KCZ.

Biggin Hill (BHARS)—26 October ("The activities of a regional representative", by G8HMG), 8pm. Biggin Hill Memorial Library. Sec Ian Mitchell, G4NSD, tel Biggin Hill 75785.

Coulsdon (CATS)—11 October ("10m mobile", by D. Thrift), 8 November (Construction contest), 7.30pm. St Swithun's Church Hall, Grovelands Road, Purley, Surrey. Sec A. R. Bartle, tel 684 0610. The first half-hour of each meeting is devoted to helping beginners and to morse practice.

Members of Loughborough Falcon RC operating a demonstration station at Woodhouse Eaves, Nr Loughborough, on behalf of the "Friends of Loughborough Hospital" at a fund-raising event at the Ellen Towle Recovery Home, L to r: G8VXG, G6IJA; G6HPM; G4JCH; G8WLO; G4DCE, club chairman; G6HFO; swl Alan; kneeling, G4KGG. *Photo:* G4KGG

Crystal Palace (CP&DRC)—16 October (Junk sale), 8pm. All Saints Church parish rooms, Church Road, South Norwood, SE25. Sec Geoff Stone, G3FZL, tel 699 6940.

Thames Ditton (Thames Valley ARTS)—5 October (Film night), 8pm. Thames Ditton Library, Watts Road, Giggs Hill, Thames Ditton. Sec Julian Axe, G4EHN, tel 946 5669.

Several clubs provided information on their autumn activities a few days after the deadline last month. Would club secretaries please try to write or ring before the date shown at the beginning of this section.

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

Burgess Hill (Mid-Sussex ARS)—7 October (TBA), 21 October (TBA), 7.30pm. Marle Place, Burgess Hill. The club's newsletter will give readers up-to-date information. Details from programme sec Bob Hodge, G4MMI, tel Hurstpierpoint 833559.

Canterbury (EKRS)—7 October (AGM, please attend this important meeting), 21 October (Natter night), 14 November (TBA). The Cabin, Kings Road, Herne Bay, Details from Derek, G8ELS.

Canterbury (U of K ARC)—11 October (Junk sale), 25 October (Rig workshop (spectrum analysers, signal generators available)). Alternate Mondays, (Formal), other Mondays (Informal), 7.30 for 8pm. Electronics Building. Talk-in on S22 or S15. Details from Steve, G4LMX, Darwin College, or S15, evenings.

Chichester (C&DARS)—5 October (Club meets in the Blue Room), 21 October (Junk sale and sale of members' surplus equipment in the Green Room), 2 November ("Satellite broadcasting", by Jim Slater, of IBA, in the Long Room), 7.30pm. *Please note:* all the meetings will now be at the Fernleigh Centre, North Street, Chichester.

Crawley (CARC)—13 October (Informal at G3GBI), 3 November (Junk sale). Fourth Wednesday in each month (Formal meetings), United Reform Church, Ifield Drive, Crawley. Second Wednesday in each month (Informal meetings are held at members' homes and consist of beer, sandwich and rag-chew). The club will again run cw classes. Details from G4IQM.

Dartford Health (DHDFC)—6 October (DF hunt, late night walking hunt), 13 October (Malt Shovel PH, Eynsford), 17 October (DF hunt). for further information contact Steve, G4NKM.

Dover (SEKYMCAARC)—6 October (Natter night and committee meeting), 13 October (RNLI film), 20 October (Construction evening), 27 October ("Raynet", by Dave Roberts), 3 November (Natter night and committee meeting), 7.30pm. YMCA, Godwynne Road, Dover. RAE nights Mondays, contact G4EGQ. Morse classes Thursdays, contact G3VSU.

Eastbourne (Southdown ARC)—4 October (Junk sale), 1 November (Film show), Chasely Home, South Cliff, Eastbourne. More details from sec, tel 0323 643 028.

Gravesend (GRS)—Is there anyone out there or has the club closed down? Surely someone can send me details? *RR8.*

Hastings (HERC)—Third Monday in each month, 20 October (Junk auction), 7.30pm. West Hill Community Centre. Details from Alan Beacher, G8VEM, tel Hastings 216516.

Horsham (HARC)—Club call, G4HRS. 7 October (Autumn junk sale, all visitors and junk made welcome), 4 November ("Direct broadcasting satellites", by Pat Hawker, G3VA), 8pm. Guide HQ, Denne Road, Horsham. Details from Tony Wadsworth, G3NPF.

Maidstone (MYMCAARC)—1 October (RAE course and natter night), 8 October ("HF antennas and equipment", by Louis Varney, G4RV), 15 October (RAE course and natter night), 22 October (Demonstration of vintage radio by Bob Warner), 29 October (RR8 Ken Crouch will attend the meeting), 8pm. "Y" Sports Centre, Loose Road. Details from chairman G4GKW, or sec G4EMC.

Medway (MARTS)—Fridays, 7.30 for 8pm. Main activity is Diamond Celebration station at Leeds Castle, nr Maidstone. Callsigns to listen for are GB8MDJ and GB2MDJ. These will be on during October but especially Sunday 17 October when at castle. Details from Ruby Sivyer, tel Medway 61927, after 6pm.

Tunbridge Wells (WKRS)—1 October (Open evening, beginners very welcome), 15 October (Celebrity lecture: "Radio—my inspiration", by Ted Allberry), 29 October ("Receiver performance testing (bring yours)", by G4BOO), 8pm. Adult Education Centre, Monson Road, Tunbridge Wells. Details from Brian, tel 0732 456708.

Worthing (W&DARC)—5 October (AGM, all members please try and attend), 12 October (Autumn junk sale), 7.30 for 8pm. Pond Lane Amenity Centre, Worthing. Details from Joyce Lillywhite, tel Worthing 63062.

Chepstow ARS members (l to r) swl Dudley Gordon, GW3ATM, GW4LTO and GW4NFM operating the mobile shack GW4LWZ/A at St Lawrence Hospital, Chepstow Carnival, on 3 July. *Photo:* **Bryan Morgan**

Thanet (TRC)—8 October (AGM, please attend. Your support is needed), 22 October (Junk sale), 8pm. Birchington Village Hall. Details from Ian, tel 0843 54154.

From RR8. Many thanks to all the clubs who sent me their newletters or magazines and letters with their club programmes. It is pleasant to read all the articles from such well-produced documents. Also thanks to club secretaries who have sent club programmes up till year-end. If however you have a programme change give me a ring and I will alter your information, this will save you postage. *73.*

REGION 9—RR W. J. Colclough, G3XC, Highview, Indian Queens, St Columb, Cornwall TR9 6LL. Tel 0726 860485.

Camborne (Cornish RAC)—7 October ("Beetling around Africa", by Peter King, G3WKP), 7.30pm. SWEB Room, Poole, Camborne. Pro S. Rodda, G6DFE, 1/2 Penrose Terrace, Penzance, tel 0736 3948, or 3524. Computer section: 18 October ("Speech synthesis", by Bob Currell, G4EIK). Those who had never realised the extent of amateur computing were pleasantly surprised at the task which a computer could undertake. All was divulged at the July meeting, when the computer section entertained. The August meeting heard a lively talk by John Guite, G4FMP, on Braille, which had everybody riveted to their chairs, even the chairman!

Exeter (EARS)—11 October (AGM, all members are requested to attend), informal meetings first and third Mondays. The Scout Hall, Emmanuel Road, Exeter. Pro Geoff Draper, G6EWN, 19 Sunnymead, Copplestone, Crediton, Devon EX17 5NQ.

Plymouth (PRC)—4 October (HF activity night), 18 October (Junk sale, bring out your dead!), 7.30pm. Tamar School, Paradise Road, Millbridge, Plymouth PL1 5QW. Pro Peter Connor, G8XTE, tel 0755 37 319.

Saltash (S&DARC)—1 October (Talk on aeronautical radio), 15 October ("Interference", by Bert Hammett, G3VWK), 7.30pm. Toc H, Burraton, Saltash. Sec Kevin Hall, 12 Rashleigh Avenue, St Stephens, Saltash, Cornwall. The club now possesses some new hf equipment, a Yaesu FT101Z, the older equipment having been recently disposed of. If you should hear the call G4GXK on the hf bands this will come from Saltash. They will appreciate a call. *Pegasus,* the club magazine, does need a permanent scribe. At the AGM on 5 November it is hoped that someone will volunteer to fill this position.

Torbay (TARS)—Fridays, 7.30pm. Last Saturday in each month, special meeting, 7.30pm. Bath Lane, rear of 94 Belgrave Road, Torquay. New sec is Arthur Cooper, 41 Kingsway Avenue, Paignton, tel 0803 843350. The club had a successful VHF/UHF Field Day, resulting in a total of 247 contacts with 1,798 points scored.

If your club wants publicity for its winter programme now is the time to send it to the RR. Let your casual members know what is going on—you never know if something might just catch their eye! *73 de G3XC.*

REGION 10—RR P. A. Jones, GW4HAT, 68 Pastoral Way, Tycoch, Swansea SA2 9LY.

Aberystwyth (ARSGBG)—This club meets on a very informal basis approximately every six weeks at The Bay Hotel, on the seafront, Aberystwyth. Next scheduled meeting 16 November. Interested people are requested to contact sec to confirm date. Further details from Simon Mee, GW4CTV, tel Aberystwyth 828365.

Newport (NARS)—Mondays, 4 October (Film show), 1 November (Video on microwaves), 7pm. Brynglas House, Brynglas Road, Newport. Details from new sec Robert Johns, GW4NXD. Tel Pontypool 56348.

Pembroke (PRSGBG)—29 October ("The 16-element ZL Special", by GW6HMT), 7.30pm. The Defensible Barracks, Pembroke Dock. Sec Martin Shelley, GW3XJQ, tel Pendine 267.

Swansea (SARS)—First and Third Thursday in each month, 7.30pm. Lecture Room 'N', Applied Sciences Block, Swansea University College. Club net each Sunday, 1100gmt (1000gmt when in bst) 28·530 or 28·310MHz if QRM level high. Net controller Cen, GW4BIQ. A coach trip to the ARRA Exhibition at Leicester on 9 October is being run, cost £5 including entry to exhibition. Demand is expected to be high and immediate booking of seats is urged from those interested. Details of club meetings and coach trip from Roger Williams, tel Swansea 404422.

West Wales Repeater Group (GB3WW)—The committee would like to bring to the attention of all users that annual subscriptions are now due (£3). The repeater has now been operational since September 1976 with an enviable operational record, the equipment at present in use being of the highest technology available, with superior performance to that of the original unit. To enable this repeater to remain in service, it is imperative that all users consider becoming members of the group as this is the only way it can remain operational. There has been a considerable increase in users with only a few becoming group members. If this trend continues GB3WW may become a rare callsign in 1983. Further details of membership from sec GW3VPL, tel Briton Ferry 812361.

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

Colwyn Bay (Conwy Valley ARC) (GW6TM)—14 October (Open club meeting, programme being arranged), 7.30pm. Green Lawns Hotel, Bay View Road, Colwyn Bay. Note change of address of sec, J. N. Wright, GW4KGI, 46 The Dale, Woodlands, Abergele, Clywd LL22 7DS, tel 0745-823674.

RR11 wishes to remind club secretaries that information and news must be sent in if you require your club to appear here each month. If your club is not included ask your secretary to inform RR11 before the deadline, see date at the beginning of "Club News".

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

Edinburgh (Lothians RS)—Second and fourth Thursday in each month, 7.30pm. Drummond High School, off Broughton Street, Edinburgh. Details from GM6JAG, tel 031-664 5403.

Glenrothes (G&DARC)—Wednesdays and third Sunday in each month, 9/10 October (Hobbies exhibition, Glen Pavilion, Dunfermline), 17 October ("Falkland Islands", by GM3JDX), 7.30pm. Clubrooms, Provosts Land, Leslie, Fife. Details from GM8ZTV, tel Kirkcaldy 203582.

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

Canvey Island (South Essex RS)—New club: Wednesdays, 8-11pm. Paddocks Community Centre, Long Road, Canvey Island, Essex. Details from G6BYV, tel Canvey 683526.

Colchester (CRA)—7 October (AGM and judging of constructor's competition by RSGB RR and zonal manager), 21 October ("Building equipment for moonbounce", by G3XGS and G3ZEZ), 4 November ("Fast scan tv", by G4MYQ and G4JIE), 7.30pm. Colchester Institute, Sheepen Road. Details from Frank Howe, G3FIJ, tel Colchester 70189.

Southend (S&DRS)—First and third Friday in each month, 8pm. St Michaels Church Hall, Sir Walter Rayleigh Drive, Rayleigh, Essex. Details from A. Adams, G3YOA.

Vange (VARS)—7 October (Junk sale), 14 October (Demonstration of microdot terminal unit), 21 October (Rally report), 28 October ("Rig checks", by G4OFN), 4 November (Junk sale), 8pm. Main Hall, Barstable Tennants Community Association, Long Riding,

Basildon. Details from Mrs D. Thompson, 10 Feering Row, Basildon SS14 1TE.

Club secs: unless details of your club meetings are sent to me, your club will receive no publicity in "Club News". *RR16.*

REGION 17—RR H. G. Cunningham, G8FG, 235 Station Road, West Moors, Wimborne, Dorset BH22 0HZ. Tel Ferndown (0202) 876018.

Basingstoke (BARC)—20 October (AGM), 17 November (Constructor's competition), 7.30pm. Chineham House, Popley, Basingstoke. Sec G6CPA, tel Tadley (07356) 4964.

Bournemouth (BRS)—1 October (AGM), 2 October (Social evening for members, yls, xyls), 16 October ("Amateur television", by G8MCQ), first and third Friday in each month, 7.30pm. Kinson Community Centre, Kinson, Bournemouth. Sec G4EKE, tel Ferndown (0202) 877945.

Fareham (F&DARC)—6 October ("RX measurements", by G8GNB), 13 October ("Historic radio", by G6NZ), 20 October (Natter night), 27 October ("The synthesized approach", by G4ITF), 7.30pm. Portchester Community Centre. Sec G4ITG, tel Fareham (0329) 234904.

Farnborough (F&DRS)—13 October ("Film night", by G4MBZ), 27 October (Natter night), 7.30pm. Railway Enthusiasts Club, Access Road, off Hawley Lane (near M3 bridge). Sec G4BJQ, tel (0252) 43036.

Portsmouth (Marconi EARS)—The AGM resulted in the following being elected: chairman, G3YHJ; sec, G3FWE; membership sec, G4MRW; amateur radio rep, G8XNW. Last Tuesday in each month, 8pm. Broad Oaks Canteen, Portsmouth Airport. Sec G3FWE, tel Portsmouth (0705) 664966 ext 28, during working hours.

Winchester (WARC)—17 October (Junk auction—bring & buy sale), 10am. The Log Cabin, Stockbridge Road, Winchester. Sec G6FBR, tel Winchester (0962) 66764.

REGION 19—RR R. J. C. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ. Tel 01-989 6741.

Barking (BR&ES)—Mondays, Tuesdays, Wednesdays and Thursdays, 7-10pm. Westbury Recreational Centre, Ripple Road, Barking. Monday is RAE class night, Tuesday is morse code, Wednesday is constructional and operational night and Thursday a general get-together. Details from sec Alan Sammonds, tel 01-594 2471.

Cheshunt (CDARC)—6 October ("10m fm operation", by G3YPZ), 13 October (Natter night), 20 October (A grand junk sale), 27 October (Natter night). The Church Room, Church Lane, Wormley, nr Cheshunt, Herts. Details from Bob Gray, G6CNV, tel Dane End 254.

Chiswick (ABCARC)—19 October (Members' holiday activities with slides), 7.30pm. The Committee Room, Chiswick Town Hall, High Road, Chiswick, London W4. Sec W. G. Dyer, G3GEH, tel 01-992 3778.

Edgware (EDRS)—14 October (Informal), 23 October (Demo station at SSAFA Fayre, Stanmore Park), 28 October (To be announced, listen on air, 2200 A on 1·875MHz on Mondays). 145 Orange Hill Road, Burnt Oak, Edgware. Please note sec's new QTH: 11 Batchworth Lane, Northwood, tel Northwood 22776. Details from G4MLU, tel 01-652 7402. This club holds regular morse classes.

Harrow (RSH)—1 October (A talk on microdot terminals), 8 October (Informal), 15 October (Basic lecture on power supplies), 22 October (Film show), 29 October (A talk: "Further stories behind the controls"), 7.30 for 8pm. Roxeth Room, the Harrow Arts Centre (opposite the Alma Pub), High Road, Harrow Weald, Middx. Come up on GB3HR for instant talk-in to the premises on club night. Details from Chris Friel, G4AUF, tel 01-868 5002.

Havering (HDARC)—6 October (Business meeting), 13 October ("You've got to have bypasses", an illustrated talk by G8KAX), 20 October (The Constructor's Cup), 27 October (Informal meeting), 8pm. Fairkytes Art Centre, Billet Lane, Hornchurch, Essex. Details from A. Negus, G8DQJ, tel Upminster 24059.

London (Imperial College RS)—Wednesday afternoons. Morse classes Wednesday lunchtimes. Details of meetings and venue from club sec Chris Gallacher, G4JCX, Imperial College Students' Union, Prince Consort Road, London SW7, tel 01-589 5111, during office hours. The club has recently been active with an expedition to Andorra. The special club call during October will be GB2IC. G5YC may be heard most Sunday mornings on 7·08MHz from 9.30am during term time. Many club members also use 144·725MHz fm.

Southgate (SARC)—14 October ("The 21st century radio control", by G3TZZ), 7.30 for 8pm. St Thomas's Church Hall, Prince George Avenue, Oakwood, London N14. Sec Valerie, G4MCD, tel 01-360 5832.

Stevenage (SDARC)—*Please note:* for details of meetings and other events all members should keep in touch with the sec, Terry Bailey, G6CRF, tel Stevenage 62860. It is not at this date certain that meetings will be held at the usual venue during October.

There has been a marked lack of reports this month, perhaps because of the holiday season or changes in secretaries etc. RR19 would like to say that he is very willing to visit any club to which he is invited, if a convenient date is arranged, and was disturbed at reports that he might have been avoiding some clubs —which of course is not the case!

REGION 20—RR B. L. Goddard, G4FRG, 2 Greenfield Park, Portishead, Bristol BS20 8NQ. Tel 0272 848140.

Bristol (BRSGBG)—25 October, 7.30pm. Queens Building, Bristol University. This month is the home brew competition, with three types of entry. Full details of the competition and of the group's activities from Chris Short, G8GLQ, tel 0272 621253.

Bristol (North Bristol ARC)—Fridays, 7.30pm. c/o Self Help Enterprise, Braemar Crescent, Northville, Bristol. New venture for the club is a programme of lectures on the last Friday of each month, details of which will appear in this column and on GB2RS. Further information from Ted Bidmead, G4EUV, tel 0272 691685.

Bristol (Shirehampton ARC)—Fridays, 7pm. Twyford House, Shirehampton. Topics for October include a talk on "radio interference" and the AGM. Dates for these two items have not yet been fixed but will be given out on GB2RS. Further details from Ron Ford, G4GTD.

Cheltenham (CARA)—First Thursday and third Friday in each month, 7.30pm. Old Bakery, Chester Walk, Clarence Street, Cheltenham. It is hoped to have a visit by Microwave Modules on 7 October but this has yet to be confirmed. Details from John Holt, G3GWW.

Gloucester (GARS)—Thursdays, 7 October ("If you can't buy it—build it", by D. Hollingsbee), 4 November (Talk by Rev G. Dobbs, "Amateur radio on a shoestring"), 7.30pm. Chequers Bridge Centre, Painswick Road, Gloucester. Further details of the club's activities from Tony Martin, G4HBV.

Taunton (T&DARC)—Sec reports that the club has moved from The Barracks, Mount Street, Taunton, and now meets Fridays, 7.30pm. The County Hall, Taunton, (opposite the Crescent car park). Chairman of the club is G4MFD, and the sec is Graham Swetman, G8TJF.

Yeovil (Y&DARC)—Thursdays, 7.30pm. Building 101, Houndstone Camp, Yeovil. 7 October (RSGB tape lecture "Radio bands—modes, etc"), 14 October ("All about the D Region", by G3MYM), 21 October ("How the ionosphere reflects a radio wave", by G3MYM), 28 October (Natter night). Further information from Don McLean, G3NOF, tel 0935 24956.

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 1982 for issues in brackets, are **21 October** (December), **18 November** (January 1983), **16 December** (February 1983).

Post to: MEMBERS' ADS, RSGB, 88 BROOMFIELD ROAD, CHELMSFORD, ESSEX CM1 1SS
Do not post to RSGB HQ or Advertising officer.

FOR SALE

G4MH mini beam, never used, in orig box, £60. GM5DRY. Tel 0224 23553, evenings.

Drake R4A, extra xtals, exc cond, Joymatch Joystick, Drake spkr, £100, no offers. Chris Lee, 315 High Road, Chadwell Heath, Essex. Tel 01-597 7740.

Det bung, three beds, two lounges, one 17 by 12ft integral garage, bathroom, shower, sep wc, large gardens, planning permission for 60ft tower, rural situation yet central for Wigan, Bolton, Leigh, Manchester, near M6, M61, M62, good vhf site, £34,000 ono. G4IAV, QTHR.

Trio TR7500, 2m 40ch fm mobile, £150. Trio TS700G 2m multimode base station, £275. 70cm transverter, £100. 40W 12V 2m linear, £25. Yaesu FT101E (used only to transvert), £385. All in mint cond. G4GSR. Tel Dave, 051-227 1919 or 051-428 1845.

FRG7, mint cond, fine tune, no mods, manual, £140 ono. KW2000A dc psu, £30 ono. G8YLF, QTHR. Tel John, 01-777 2340.

Icom IC245E 2m multimode, fb cond, £200. G3AHB, QTHR.

Trio 7200G 2m 10W tx/rx, £100. Plug-in 80ch synthesizer for 7200G, £20. QM70 2m transverter, £50. BC221, £15. Quad preamp, amp, electro-static spkr, £50. 400W homebrew hf linear, 2 × 4CX250B, comp with power supply, £65. Collins automatic antenna tuner, £50. Eumig 552 tv camera, uhf modulator, offers. G4FJA, QTHR. Tel 0785 780327.

2m mobile gutter clamp, λ/4 antenna CBA311, £4.50. Transistor modulator, 12V Garex, pair OC35, output 15W, suit QQVO310, 3-20A pa, circuit, £7. 4-el beam, suit 4m, ex-Marconi Co, handbook, £5. G3MBL, QTHR. Tel 01-445 4321.

Sony ICF2001, ssb, a.m., fm synthesized rx, psu, mint cond, limited use, unwanted gift, £120. Tel Barrow-in-Furness (0229) 42336.

Suzuki A50P moped, five gears, R reg, 3,800 miles, good running order, £170, or would exchange for hf gear to equivalent value. Prefer personal collection. G3LGX, QTHR. Tel Titchfield (Hants) 42482.

Yaesu FT223 2m mobile, £75. Tempo S1 synth

portable, 144-148MHz, £90. 4-el 10m Yagi, USA made, £45. Homebrew 4CX250 linear, not finished, 2m, £50. G3WUW, QTHR. Tel 073529 3694.

Cowl gill motor, Selsyn motors, four 3-el 10/15/20 beam, 144/28 converter. Buyer collects. G3AUZ, QTHR. Tel 0909 473893.

Kenwood 7850 40W mobile, 15 memories, one month old, unwanted gift, £200. FT207 plus charger, £100. G4MPQ. Tel Hatfield 69157.

FT101E, as new, comp with all optional extras, mic, handbook, £325. Linear 80-10, 2×813, gg tuned input, all power supplies, £75. UC1 converter, perfect, £60. Telequipment DM53A double-beam, comp handbook, circuits, £55. G3OXV, QTHR. Tel Daventry 2265.

Yaesu FRDX400S rx, hf 160-10m, 6m, 2m, multimode, vgc, £125. Yaesu FLDX400 hf tx, 80-10m, matches above, £125. Numerous spare valves etc, Europa B hf/2m transverter, £40. All prices incl Securicor delivery. GW8ZZQ NOT QTHR. Tel 0286 5322, after 6pm.

Trio TR2300 incl nicads etc, seven months old, vgc, only used portable, £140. R1000 gen cov rx, good cond, recently checked, £195. Collect or plus carriage. G8YBF, QTHR. Tel Rochdale (0706) 58229, after 6.30pm.

TA32, £35. 144MHz 10-el Yagi, two available, £10 each. Transformer, 20V, 37·5A, cont rating secondary, £15. Items to be collected. Two 9MHz ssb filters, usb xtals, £10 the pair. Postage extra. G3OXV, QTHR. Tel Daventry 2265.

14AVQ/WB Hygain vertical, £35. AVO CT38 vtm, £15. R1475, £6. Ex-WD scope, newish, £10. Radar test unit, 6in tube, 30 valves, £10. Valve tester, £4. New CT500 pulse generator, £8. TF1064/5, TF144G, s gens, offers. *Wanted:* marine rt. EF97/98. G3DVF, QTHR.

TA33JR, £65, collect. PET computer, morse send and receive programs, £5 each. *Wanted:* Lopass filter. Bencher lever. Thruline elements 250H, 250C, 25C. FV901DM. Fax receiving equipment. FT901 a.m. filter. Channelmaster 9508. Eddystone bug. Microscope slides. G3AZI, QTHR. Tel Preston (0772) 37815.

VHF/UHF equipment: Trio TR7200, xtals for 13 channels, tb, /M bracket, mic, hb 5A psu, manual, PF1 pocketphones on SU8, xtals for RB0, leather case for tx, Pye base charger, three sets batteries, cct/tuning instructions, £100 ono the lot (no split). Carriage at cost. G3ZEG, QTHR. Tel 0526 833430 (Lincs).

Sinclair 15W stereo amp, Ferguson cassette deck, both are defective but easily repaired, OK for bits, £4 pair or will split. Sinclair Cambridge calculator, wkg, £1. G3ZQF, QTHR. Tel Medway (Kent) (0634) 723694.

NAG 2m linear, 400W, with new pa valve, £350, or without valve, £300. MMT432/28S transverter, £95. Floppy discs, £1 each. Ex-RAF automatic atu, circuit details, £50. Europa C 2m transverter, 28-144, £90 ono. G4IGZ, QTHR. Tel 0282 697511, weekdays.

Trio communications rx type JR310, exc cond, spkr, manual, £85. RS50760. Tel Bath (0225) 27256, after 6pm.

Dentron MLA2500 linear amp, in new cond, £520 ovno. G4DRF. Tel 0526 52965.

KW2000B, Shure mic, vgc, £190. KW108 monitorscope, £40. G4MH minibeam, £45. 12AVQ. Buyer collects. G3KIW. Tel 021-705 5249.

Drake TR7, SL500 cw filter, 500Hz, SL6000 a.m. filter, 6,000Hz, £50 the pair or will separate, £28 each. GI4AOD, QTHR. Tel Caledon (N. Ireland) 519, after 6pm.

Kenwood 2400 (USA model), 12V quick charger, incl 110V mains transformer, £155. R. T. Payne, GM4AWA, 70 Spoutwells Drive, Scone, Perth. Tel Perth (0738) 21241, office, 51412, home.

Frequency counter, Heathkit IM2410, G4MM mini beam, Micronta 500W power swr bridge, sensible offers or swop the lot for tribander Yagi. Acorn Atom, fully expanded, rtty progs, offer. G4OIN NOT QTHR. Tel Andy, 021-451 2571.

Yaesu FRG7700, FRT7700, FRV7700D, mint, boxed, £408. Marconi marine 2232A rx, £100. Must sell reluctantly, moving. Tel Burgh Heath 60460.

FTDX401, matching spkr, desk mic, two new pa valves, vgc, £250. G4DNY, QTHR. Tel 0742 482755.

Trio 520SE, mic, mint, orig packing, £349. Deliver N. Shrops, S. Cheshire, N. Staffs. G3XVN, QTHR. Tel 0630 4607.

Xtals tx S18, tx R3, rx R3 for FT202R. *Wanted:* Sinclair PFM200 digital freq meter. G4MQX. Tel Axbridge (Somerset) 732655.

FT107M Yaesu tx/rx, 12ch memory, FP107E psu, FC107 atu, Adonis AM802 mic, nine months old, comp, £650. Tel Luton (0582) 56811.

NRD515 (Japan Radio) gen cov pll synthesized communications rx, exc performance, superb selectivity, stability, signal handling capability, ssb and broadcast bands, six months old, £695. Tel Cushing (05086) 2923, after 1 October.

Trio JR310, Microwave Modules 2m converter, good cond, £90 ono. G4NHB, QTHR. Tel Coventry (0203) 454663.

Icom IC22A fm tx/rx quick release mobile mount, R0-7, S15-23, 10W, 1W, £75 (£80 carriage paid). G3VOO, QTHR. Tel 0258-87 648, after 6pm or at weekends.

HQ1 mini quad AR40 rotator, control box, 25/30yd five-core, stub, balun, all perfect cond, and ready to go, 18 months old, £150. Buyer collects. GM4KLO, QTHR. Tel Glasgow (041) 639 2729.

ZD101D, £410 ono. Apple 2 plus pcb, £25. VDU, new, £100. HP scope, £100. Tel Hatfield (07072) 69157.

Eddystone 770R Mk 1, good cond, re-aligned, incl manual, £75. Buyer to collect, nr Southampton. Tel Romsey 517497.

KW2000E, £275. IC240, £110. CD1014 dual beam scope, £60. Casio FX702 pocket computer plus cassette interface, £80. D. Skye, G3PLR. Tel Harpenden (05827) 66410, between 5.30 and 7.30pm.

Trio TR7500, £140 ono. MM28/144 transverter, £80 ono. Pye hi-band Bantam S21, £20. G8ATB NOT QTHR. Tel 0782 643476, after 6pm.

IC22A, fitted 145, 145·5, 145·525, 145·550, 145·575, R3, R5-7, auto toneburst on repeaters only, manual etc, £85 ono. G4AZD, QTHR.

Several vhf txs with psus, spare valves, all homebuilt, metal cases, xtals alone worth the knockout prices asked. Send sae for list. G5UM, 27 Ingarsby Lane, Houghton, Leicester LE7 9JJ.

Vintage Acoustical Manufacturing Co Quad 22 control unit, 2A, fm tuner, electrostatic spkr, full factory service recently, offers over £200. Tel Jim, Thornbury (0454) 413079.

Airmec wavemeter type 248, £10. Heller Electronics 2m tx, neatly cased, £19. SEM 144-28 converter, £9. 2m ground plane, £4. Unused 6146, £3.50. 10H 100mA choice, £1. 300-0-300 100mA transformer, £2. G3YWX, QTHR. Tel Staines 50947.

Nr Abergele, North Wales: detached modern four-bed house, spacious lounge, dining room, kitchen, hall, cloaks, bathroom, shower, full gas central heating, detached garage, large gardens, fabulous sea views, exc take-off for all bands, £32,000. GW3KYT. Tel 0492 55156.

Heath GR78 0·2-30MHz rx, 230 ac, 12V dc nicad, £55. RT50 12ch marine vhf, £90. Uniden 2030 2m 12ch fm, £75. Eddystone 880/1, £85. Tanberg reel quality recorder, £12. AR88, 840C, sets of valves, others, G3DVF, QTHR. Tel Alnwick 602487.

TS130S, mic, mobile mount, used little, in perfect cond, new bands fitted, normal retail price £529, plus accessories, for quick sale, £420. Will deliver reasonable distance. G3WBC, QTHR. Tel 0582 606187.

Yaesu FC902, £100. MMT70/28, £90. MMC 144/28LO, £10. Wide-spaced split-stator capacitor, £8. Pye Cambridge boards, various. Tel Bob, 0875 813332.

Realistic DX160 gen cov communications rx, makes the world your oyster, range 150kHz-30MHz, all solidstate, mint cond, £63 ono. Practical Electronics Course, incl 20 explicit manuals on basic electronic theory, 18 more with 40 experiments, how to use an oscilloscope etc, all components for experiments new, still wrapped, cost £95, sell for £49. *Radio Communication*, 1978-81 incl, £1 per year or £3.50 the lot. Buyer collects. All enquiries acknowledged if sae enclosed. G4GIG, QTHR.

Yaesu FT101ZD, FC902 atu, YD148 mic, all in perfect cond, comp with boxes, instructions, less than 12 months old, £625 ono. RS49229. Tel Leeds (0532) 694122.

Eddystone EC10 rx, good cond, prefer buyer to test and collect, £60 ono. G4EGB, QTHR. Tel 0723 62537.

FR400 rx, audio amp changed to LM380, otherwise as orig, £100 ono. KDK 2016E 2m fm tx/rx, with mobile mount, £120 ono. Carriage by arrangement. GW8KSF, QTHR. Tel Alan, 0978 759732, after 6pm.

Beam antenna, G4MH, used little, moving QTH, £60. Avometer model 8, as new, £85. G4BG NOT QTHR. Tel Teignmouth 4771.

RTTY Creed 444, 190h only, paper, tape, ribbons, graphic tapes, exc cond, ST5 decoder, hf, vhf home brew, all in constant use, vgc, must sell, £190 ono. RS46917. Tel 01-841 8078.

Marconi TF801B/3/S sig gen, 12-485MHz, Sagem transistorized teleprinter SPEX/5, JXK 2m converter, psu for 28-30MHz i.f., Elgam organ rhythm unit with circuit, Pye 4m a.m. base station, 8k dynamic ram (16 × 4027), offers? G3TGF. Tel Knockholt (Kent) 33296.

Icom 251E 2m multimode base station, desk mic, SEM50, £390 or straight swop, Trio 130S or FT707. G4OLC (G8XZM) QTHR. Tel 0670 813352, anytime.

TS700G piptone, 50W pa, all vgc, £325. Burndept 201 vhf a.m. tx/rx, inverter psu, £25. PF1s on RB0, night call, 19 set, £50 comp. Three Pye vhf rxs, £8 each. All ono. G8SYS, QTHR. Tel 021-358 5474.

Complete home and mobile station in one package: IC730, 15h use only, ICPS20 250V power supply, comp with internal spkr, £588. G3KDH, QTHR. Tel Tring 3505.

10ft Andrew dish with 1,691MHz feed for Meteosat, buyer collects, £200. Jaybeam 20-el crossed Yagi for 136MHz wx satellites, buyer collects, £15. Gerry Kennedy, G3OGK. Tel 026-474 391, after 7pm only.

FRG7 with Microwave Module 2m converter and Burns FMD7 fm detector built in, exc cond, orig box, instruction books, etc, £150 ono. G6CRK, QTHR. Tel Rugby (0788) 813486.

FT207R 2m fm handheld tx/rx, mint cond, comp with orig packing, soft case, spkr, mic, rubber duck, hardly used, £140. G4ILQ. Tel Kidderminster 4930.

Trio digital VFO230 with memories, for TS830S, TS530S, or TS130S, as brand new, £175. Save £40. G3WLX, QTHR. Tel Gt Milton (084-46) 643.

National HRO, coils, book, psu, £30. Yaesu FT7, 160W linear, psu, antenna, swr meter, comp wkg station, £350 ono. Brass morse key, £6. G3XXA, QTHR. Tel West Haddon 656.

Yaesu FT207R, NC2 base, quick charger/power supply, YM24 spkr, mic, spare nicad pack, PA2, car power adaptor, boxed, with free 5-el Yagi, £180. Yaesu YD148 desk mic, £10. Tel 021-742 8850.

FRG7, good cond, £120. MMC144/28LO 2m converter, £18. MMC432/28 70cm converter, £21. Nascom 2 eprom programmer, £25. IC22A mobile, 2m tx/rx, 10ch, £80. Buyers collect. G3RUD. Tel Tamworth (0827) 69386.

Heathkit SB401 tx, SB303 rx, comp with matching swr meter, spkr, full amateur coverage 80-10m (except new bands), 180W, £250 or offer. G4KXF. Tel Leighton Buzzard 376060.

Heathkit HA201 2m amplifier, 1·5W in, 10W out, fm/cw only, £18. Geloso G209 80-10m ham rx, buyer arrange collection, £25. G4LMS, QTHR.

FT225RD, mint cond, no mods fitted, comp with packing, £525. Sony SQA2030 quad decoder, £65. 100pF Jackson C804 capacitors, used, £2 each. G6CSY. Tel Graeme, Orpington (0689) 29230.

Acorn Atom, new, boxed, 8k and 5k random morse program, £120. FET multi meter, £20. GW4EVJ, QTHR. Tel 0792 843948.

FT101ZD, mint, nc mic, fan, £450. Matching FV101Z, £70. Together, £500. Dentron Super Tuner Plus, £50. G4HKL, QTHR. Tel 044-284 3474.

Portable petrol generator, 32V dc, 24V dc, 12V dc outputs at 35A, 1,750W at 1,800rpm, comp wkg order, £90. PX Telomast possible. Plymouth Radio Club. Tel Cornwood 319, or G8XTE, QTHR. Tel 075-837 319.

FT202R 6ch 1W handheld, xtalled S20-23, R3, 144·800, comp with helical whip, case, carrying strap, dummy battery, extras, flexible λ/4 whip, spkr, mic, nicads, vgc, £75 ono. G6CUN. Tel Cheltenham (0242) 515074.

FT101 Mk2, fitted cw filter, new pa, driver valves, £260. Trio TR7200G 2m fm mobile, fitted R0, R3-7, S16-23, £90. Wood & Douglas 70cm tx/rx, 6ch, 2W, £50. G4HZV, QTHR. Tel 0483 811597.

Discone antennas, bandwidth better than 65-500MHz, never assembled, £21, post at cost. Partridge vfa Joystick with tuning unit, £15. BC221AK, comp with regulated power supply, all charts, comp in orig case, £20. G3BDK, QTHR. Tel Towcester 52309.

FT101B tx/rx, 160-10m, mic, dc/ac leads, fan, handbook, etc, £280. SEM 70cm preamp, £5. Poulter, G3WHK. Tel 01-330 5795, after 6pm.

FRG7700 cw MM144/28, both exc cond, less than 20h use, consider exch 2m multimode, FT290R, M750E or similar. Would consider comp vhf station (cash adjustment either way). RS49100. Tel 0952 583784.

TS520, mint cond, used mostly as rx, mains or 13·8V dc, all systems go, healthy pas, £295. HF5 vertical antenna, 10-80m, radials unnecessary for ground post mounting, £25. Both carriage at cost. G2KF, QTHR. Tel 072-681 2337.

B40C Murphy Admiralty 1961 rx, 0·64-30·50MHz, manual, buyer collects, weighs 110lb, any offers. G8FWJ. Tel 01-253 0329.

IC202E 2m ssb, 144·0/144·4 mic etc, speech processor, all in good cond, F9FT 16-el Tonna rotator, good cond, R101 needs work but working, all open to offers, going hf. G8MGT, QTHR. Tel Mark, Leeds 892852, after 6pm.

Atlas 180 with AR230 console, £200. Atlas 206 remote vfo, £100. Olivetti TE300 ASCII printer, needs attention, £40. Datong FL1, £45. Rough BC221 with psu, phones, £4. Will accept best offers. G4CIN, QTHR. Tel Bilston 403416, after 7pm.

Kenwood TS520SE, immac cond, £375. Datong morse tutor, £30 ono. Tel Doncaster 884651.

FRG7000, mint, £195. Yaesu YC305, £55. MM2000 rtty converter, £125. Yaesu CPU2500RK 25W fm, £170. Standard marine handheld, Ch5, 6, 9, 16, 25, case, base charger, £100. Copley-May, G3AAG, Flat 21, 17 Clarges Street, London W1Y 7PG. Tel 01-499 0264.

Realistic PR047 10ch scanner rx, covers 68-88, 144-174, 430-490MHz, new, never used, still in box, some xtals, £75. BRS50390. Tel Farnham (Surrey) 723400.

MMT432/28S, as new, 28MHz input, 432MHz output,

ideal for video tx, also when driven by suitable modulator, video modulator supplied free, £100. G3UDV, QTHR. Tel Peter, 01-998 6225, 7-9pm.

TS820, £425. CD1400 scope, £75. MM432/144R transverter, £110. TR2300 and psu, £130. MM4000 rtty tx/rx, £220. 18-el Parabeam, 70cm, £10. Ferguson 14in b&w portable tv, £60. Prefer buyer collects. Thompson, G3WQM, QTHR. Tel 0904 793672, after 7pm.

QTH: four bed villa, Solihull area, two reception, breakfast room, car access rear, 2min shops, 5min train, antennas installed—80m dipole, 5-el Yagi for 2m, rotator, 3-el vert for 10m, rotator, 110ft end fed, freehold, £28,000. G4GSJ, QTHR. Tel 021-706 3171.

Icom 260E 2m multi, FT101ZD six-band, cw ssb only, £230 and £425 respectively. Sensible offers considered. UK101 micro, 16k extension, offers over £125. G3HEZ, QTHR. Tel 0223 833350, weekends.

Sony 6700, £155. Grundig 3000, £195. National 5000, £150. Tandy DX302, £150. Drake SSR1, £110. Panasonic DR29, £145. SR9, £34. Grundig 1400, £140. All mint. Good Hammarlund HQ145X, £115. *Wanted:* Sony CRE320. Andrews, 12 Malton Way, York. Tel 0904 59035.

Yaesu Musen FRG7 with manual, Sky Coupler KX2 tuner, mint cond, £150 ono. M.M. Hill, RS48264, 46 Mallard Road, Darlington DL1 1BN.

1155 war time rx with df antenna, USA R210 rx, seven bands, hf, both wkg with own power supply, £30. Telequipment oscilloscope, double trace, as new, £85. *Wanted:* good mobile hf tx/rx, new bands not important. G4HRT, QTHR. Tel 0532 665568.

Heath SB104A solidstate 100W tx/rx, 400Hz filter, HP1144 psu, SB644 remote vfo, noise blanker, £400. SB301 rx/SB401 tx/mic, £250. G3VLT, QTHR. Tel Chris, Wokingham 786305.

Mobile antenna, 80-10m, separate coils for each band, adapter for multiband operation, adapter for gutter mounting, special bumper mount designed and manufactured by the Scalar group of Australia, price in Australia approx £130, £75. G3KDH, QTHR. Tel Tring 3505.

FT150 Sommerkamp, vgc, agent realigned, spare valves, first reasonable offer. *Wanted:* ssb/cw portable 2m tx/rx. G2CYN, QTHR. Tel Bedford 711538, weekends.

TR2400, spare nicads, handbook, orig packing, £110 ono. G3XHY NOT QTHR. Tel 021-777 3563.

IC202S ssb/cw tx/rx, 144-144·4, 144·8-145, exc, £105. G4GMA, QTHR. Tel Kidderminster (0562) 515405.

Trio 1000, good cond, £195. Trio 830S and SP230, £550. Daiwa CN620A power swr cross meter, £40. G4BXR. Tel 0908 566266.

Yaesu FT901DM, matching FC901 atu, YO1901 monitorscope, two years old, used little, orig packing, handbooks, etc, new cond, £800 ono. G4IQH NOT QTHR. Tel Peter, Leeds 553820.

Eddystone 958 professional comms rx, 10kHz-30MHz, £435 ono. National NCX3 hf ssb/cw tx/rx, 180W, £120 ono. *Wireless World* Dolby noise reduction, £30. Heathkit OS2 scope, £20. All exc cond. Many other items. *Wanted:* 18AVT. Tel 021-745 1861.

Trio JR500S hamband rx, incl 160m, £50. USB and lsb xtal filters, £10 pair. Rough BCC45 2m portable tx/rx, many spares, £15. Colton MC101 hi-fi pickup arm, £10. Ortofon FF15E cartridge, £5. G8IZV, QTHR. Tel 0235 816968.

Sell my Sommerkamp FTDX150 or exchange for 2m multimode/gear. All items are/must be in good wkg order. B. Nicholson, 28 Wood Street, Norton, Malton, N Yorks YO17 9BA. Tel Malton (0653) 4646, anytime.

TS520SE 160-10 mic, mint cond, £350. GEC Courier, 4ch a.m. on 2m, xtalled S14, S17, manual, £40. GEC Envoy, uhf fm single channel, board facility for 10ch, manual, £25. G4HUX, QTHR. Tel 0632 372798.

FV101 vfo for Yaesu FT101, £35. Mount for Yaesu FT480, brand new, £5. Xtals for TR7200, Quartz 16 for transverting to 70cm, £3 pair. Service manuals Trio TR7200, TR7010, Hallicrafter SX28, £3 each. *Wanted:* heavy duty rotator. Meddings, 106 Goldthorn Hill, Wolverhampton.

G-whip tribander antenna, 20-15-10m, comp with base, used very little, £18 ono. G4ANW. Tel 0903 866687.

Trio R1000 communications rx, 200kHz-30MHz, a.m., ssb, cw, Yaesu FRT7700 atu, Microwave Module MMC144/28 2m converter, all with manuals, 10 months old, perfect cond, £265. RS49444, 464 Whippendell Road, Watford, Herts. Tel Watford 20774.

Yaesu FT707, FP707, FC707, FV707DM, rack, Shure 444, five-band amateur antenna, six months old, £750 ono. Sommerkamp TS788DX tx/rx, covers 26-30MHz, £225 or exchange w.h.y? Tel 01-556 9588.

Nascom 2, 32k ram, Naspen, Nasdis, debug, £250. IC22A, 10ch, £80. G3RUD. Tel Tamworth 69386.

Comdel speech processor CSP11 with inbuilt psu, £25. Fisher tuner/amp a.m./fm, 15wpc, £40. Goldring GL75 turntable, Ortofon arm, Shure V15/3 cartridge, £25. G4GHG, QTHR. Tel Torquay (0803) 37050.

TR2200GX 2W fm, R0, R3-5, R7, S20-22, cw case, nicads, charger, helical, £90 ono. Liner 2 8W ssb, 144·15-144·38MHz, cw preamp, mobile bkt, £80 ono. Prices include carriage. GM8PEV, QTHR. Tel Balallan (0851 83) 378.

40ft two-section tower, comp with heavy duty ground post, £150. G3VQL, QTHR. Tel Shrewsbury 55179.

Star SR550 double conversion amateur bands rx, £40. HB copy KW Vanguard a.m. cw 50W, £20. Panda Cub a.m. cw, 50W, £10. Heathkit HW17A 2m a.m. tx/rx, HWA171 mobile psu, £35. G4FQW, QTHR. Tel Accrington 391682, after 6pm.

Trio TR9000, exc order, 3SK88 front end, optional piptone, front panel, listen repeater input facility, not £359 but £259 for quick sale. Going homebrew. G8PIN NOT QTHR. Tel Roy, 0679 20793 (Kent).

Sommerkamp TS802 80ch 2W/2m fm handheld tx/rx, two sets nicads, mic, vg, £100. SEM 2m lin amp, preamp, 3W in, 30W out, vg, £28. AR22XL Bell type rotator, new, comp, £45. KW103 swr/power meter, £10. GM3TBV, QTHR. Tel 0250 2520.

DX160 rx lw, 30MHz, spkr, good cond, £65 ono. MMC144/28, converts 2 to 10m, bnc sockets fitted, mint cond, £17. Philips A4 tv, 18in colour, good wkg order, ok for uhf/dxing, 5yr old, £65 ono. G6GGE. Tel George, 01-747 1506.

Swan Astro 102BX, solidstate hf broadband tx/rx, digital frequency display, dual vfos, 235W input, passband tuning, notch filter, speech processor, narrow cw filter, full break-in etc, matching psu/spkr, service manual, only £400. FC301, Yaesu 500W atu, 160-10m, features power and vswr meters, four switched antenna inputs, direct/atu switching, manual. G3XHX, QTHF Tel Liskeard (0579) 43749.

SEM 2m 40W preamp linear, £15. Datong active antenna, £15. Aluminium pole, 5m by 5cm, two wall brackets, £10. SWR meter, £5. Three-way coaxial changeover switch, £3. Buyer collects. G8OVQ, QTHR. Tel Tiptree 816677.

Sinclair ZX80, ZX81 rom psu, manual, £30. Sanyo VTR2000 0·5in video recorder, as new, 14 by 14 by 9in, £120. Sony 20in video monitor with sound, £40. G8ETI, QTHR. Tel Nick, Swindon (0793) 22380, day, or 41988, evening.

Solartron oscilloscope model AU557, dc 1MHz, very fair cond, needs slight attention, £20. Buyer collects please. BC348 rx, wkg order, £25. Collect please. Tel Mr Wells, Northwood (Middx) 24246.

MZ80K computer tapes, rtty tx/rx, £7.50. Morse rx, £5. Both comp with simple i/o circuit, new basic incl autonumber, renumber, etc, 12 new commands, £10. Communications tape, £10. See July *Rad Com* for further details. A. Sinclair, 35 Prestonfield Avenue, Edinburgh EH16 5EG.

Swan 350, 400W p.e.p., spare valves, buyer to try and collect, £180. G3GXX. Tel 05873 679.

Satellite 3000 digital readout, 21 bands, fm, 30MHz-150kHz, mains/battery, charger inbuilt, world wide reception on a.m./cw/ssb, three audio filters, lcd clock inbuilt, orig Grundig manuals/handbooks, cost £325 in 1980, offers around £190. G-whips 10/160m, £25. G3IES, QTHR. Tel Bristol 500742.

Monitorscope, Yaesu YO100, rf input 10-1,000W, monitor your signal, built-in two-tone generator, ssb adjustment, useful as oscilloscope, used little, mint cond, manual, orig packing, gift at £55, post free. GD3TIU, QTHR. Tel 0624 3417.

Drake T4XB, R4B, MS4, spkr, AC4 power unit, MN4, atu, Burns xtal calibrator, CC10, Omega antenna noise bridge, £250. Tel Basingstoke 770421.

FT480R multimode, purchased 23-4-82, like new, boxed, £325. G6CYK NOT QTHR. Tel Jake, 01-803 6678.

Heath GR78 rx, 190kHz-30MHz, HS24 spkr, GD396 phones, hbs, £60. Rama SW006 power/swr meter, £5. 200mV dc dvm, psu on pcb, 230V ac, £5. Used 6146s, £1 each. *Rad Com* 1975-7, offers. Shaw, 16 Deansfield, Cricklade SN6 6BP. Tel Swindon 750130.

HW100, HP23A, in sb cabinet, £125. TA33JR, AR22, comp, need overhaul, £40. G2DAF rx components, Kokusai filter, xtals, elec coils, 898 dial, variable caps. Details G3NDK, QTHR. Tel Northwood (09274) 23977, evenings.

Ex-computer psu, cased, fused ratings of −5V/3A, +5V/20A, 12·5V/10A, 24V/4A, 49V/6A, 48V/1A, 34V/3A, comp with cooling fan unit, manufactured in 1974, in wkg order, ideal for spares or mod, £40 ono. G4KKG, QTHR. Tel 0935 823475.

Elderly Airmec rx C864, 12-valve double superhet, 15kHz-30MHz, xtal cal, inbuilt psu, spkr, var selectivity/bfo/avc/S-meter, ideal for young swl, £25. G4GHG, QTHR. Tel Torquay (0803) 37050.

Standard C58 2m portable multimode, comp with nicads, case, charger, exc cond, £205. G4KXR, QTHR. Tel 0392 75858.

Three QQV026, brand new, unused, £6.50 each. Two QQV0320A, used, £5 each. Pye W15U 6ch osc boards (two off), £4 each or £7 pair. All prices incl postage. GW8KSF, QTHR. Tel Alan, 0978 759732, after 6pm.

Clearance: 70cm, 2m equipment, components, atv gear, lenses, cameras, monitor, preamps, converters, sstv monitor, gear, meters, books, magazines, ex-govt gear, vintage radios etc. SAE enquiries please. Heavy gear buyer collects. G8AXC, QTHR. Tel 0723 85252.

FT107M, FP107E, FC107, new bands, boxed as new, £750. MM4000KB rtty terminal, used little, boxed as new, £230. Burndept 3ch uhf tx/rx, requires converting to 70cm, £65. G8PRF, QTHR. Tel 0484 651374, after 6pm.

RTTY Creed 444, convert these machines from 50 baud speed to 45·45 bauds by changing one gear, instructions supplied with gear, £9.25 incl postage. G3PPD, QTHR. Tel 01-422 4153.

Icom IC240 fm tx/rx, late model, hi-lo power, rev repeater facility, good cond, £105 ono. Diawa SR9 2m rx, fitted S10, S20 xtals, £30 ono. Tel Coalville (0530) 223308.

FT101Z Mk2 six-band, cw mic, fan, manual, exc cond, used very infrequently, £450 ono. G4IWA, 16 Mancetter Road, Mancetter, Atherstone, Warwickshire CV9 1NZ. Tel John, Atherstone (08277) 3670, after 6pm.

Lowe SRX30 comm rx, 0·5-30MHz, nbfm detector, 2m converter, £99. Acorn Atom 12k and 16k rom, fully expanded, incl V1A toolbox, various programs, book, 3A psu, £200. G8YHF, QTHR. Tel 0202 698015, evenings and weekends.

KW Vespa Mk1, spare valves, power unit, mic, 160-10m, good cond, £55. G8PB, QTHR. Tel Peter, 024366 3584.

Test generator. ex-American 1941 type No3, 10S B/5, teak cased, approx 58/78MHz, needs 2/150V, £8. Class D wavemeter, £6. Homebrew 6·3/12·6V power supply, £4.50. Various lengths ex-American 50Ω coaxial, approx 0·5in dia, 35p/yd. Collect or carriage extra. G3EJD, QTHR. Tel Sunderland (0783) 367217.

IC211E, ICRM3 keyboard, mint, orig packing, £325. Datong up-converter UC1, £75. G4NNS (G8AZU, QTHR). Tel Sunbury 89036.

Trio TS520SE, fitted cw filter, immac cond, accessories, £330. Tel Rushden (Northants) 59169.

Mosley Mustang 3-el triband beam, £60. Collectors' items: HMV463, mains portable (1933); Philips 745A; Ekco bakelite (1936); all restored. Would exchange for Marconi 276, Philips 634 or sell. G2ACK, QTHR. Tel 0342 21221.

Trio TR2300, charger, telescopic whip, case, manual etc, mint cond, orig packing, comp with nicads, flex λ/4 whip, £130. Buyer collects to ensure satisfaction. *Wanted:* bits for hf linear and psu. W.H.Y? Tel Chris or Steve, 04243 5384.

Complete hf station: FL50B, FR50B, FV50B, spare valves etc, mint cond, £175 ono. Will split if necessary. Pye black box record reproducer, suit collector, fine cond, £10. Technical Associates audio speech processor, £12. G4BNB, QTHR. Tel 01-504 3260.

Pye Cat eight-band marine rx, spkr, power unit, £40. HRO, good cond, 2V, heaters, five bs coil packs, power unit, £30. Pye Cambridge AM10D 6ch, fm, 2m, spare rf board, £30. Marconi sig gen 20kHz-8MHz, £10. All ono. Pye uhf F460 base tx/rx, remote, local, tt operation, control box, mic, offers. Prefer buyers inspect. GW8KSE, QTHR. Tel 0978 759732.

MM2000 rtty to tv converter, as new, £90 ono. Tel Atherton (0942) 891140.

FT227RB 144-148 scanner handbook, £125. PF1 pocketphones for 70cm conversion, £10 pair. Get on 70cm for less than £15! G4OII. Tel 0472 813450.

2m colinear, approx 15ft height, £25. 7λ/8 whip, fold over gutter mount, £15. Valve voltmeter No2, five ranges, 1·5-150V, £10. G3BDK, QTHR. Tel Towcester 52309.

FT101EE, exc cond, fm conversion kit, manual, £320. Trio 7200G fm 2m mobile, car mount, £110. Buyer collects. Microwave Modules 2m converter, i.f., 2-4MHz, £15. G4ABT. Tel Nottingham 234797.

Oscilloscope Dynamco type 72, twin channel solidstate, used little, £130 or exchange 3-el triband beam. G3HLG, QTHR. Tel 0636-72621, work, 0636-892384, home.

TRS80 software, 17 commercial games on tape incl Hellfire Warrior, Invasion Orion, FS1 flight simulator, D-ship, Pyramid etc, cost over £120, £40 ono. G8HBW. Tel 09655 466.

Yaesu FRG7, orig packing, 2K40 filter mod, manual, £125. Trio TR7010 144·1-144·35, ssb/cw, orig packing, manual, mobile mount, vgc, £110. Marconi TF1152 p/meter, 10/25W, 0-470MHz, £25. Storno Viscount, xtalled S20, £20. Pye Vanguard AM25B, 2m, no xtals, £12. Joystick vfa, with atu, £20. BCC sig gen, CT53, 9-300MHz, charts, £10. Marconi TF762C sig gen, 250-600MHz, £10. D type wavemeter, 2-18MHz, phones, manual, £7. Solartron AS516 psu, 250V, 50mA, 6·3V, 4A, £5. Collins mechanical filter, F45525

8V2, ssb, £5. ITT 10·7MHz 12·5kHz filter, £3. Quartz xtals, 6MHz, 9-10MHz, 14MHz, 16MHz, all 50p each. PA pst blowers, 117V, £1.50 each. Remington office typewriter, £15. Shack clear out. SAE brings list. All collect or pay carriage. G8CUG, QTHR. Tel Byfleet 45859.

FRG7, ssb filter, outboard digital display, £120. 46 Evington Parks Road, Leicester. Tel 737977.

Surplus to collection: T1154, R1155, 24V psu, no mods, offers. Remnants of shack clearance: cased, metered psus, R1475, scope, 1,000 valves, meters etc, your offer accepted. View and collect. Doppler speed log unit, £50. Echo sounder, £10. G3DVF, QTHR. Tel Alnwick 602487.

70cm handbag portable Trio 3200, 12ch, 7FTD, SU8, SU20, SU18, RB0, 0, – 6, – 10, – 14, noise cancelling mic, nicads, case, ant, £120 or swap for FRG7, SRX30 or similar, or Jumbo 430, Liner 430, possible cash adjustment, offers. G8VDP, QTHR. Tel Ken, Barnsley 297365.

Shack clearance: Redifon GR286 vhf tx/rx, marine, £30. Two QQV0640A, unused, £10 each. Command rxs, 1·5-3MHz, 3-6MHz, valves, £8 each. 6-9MHz without valves, £3. Command txs, 7MHz, 21MHz, £8 each. Collins TCS12 tx, offers. Carriage extra. GM3MAS, QTHR. Tel 041-956 4897.

FRDX400, FLDX400, 160-10m incl 2m rx, fitted with fm, both immaculate cond, YD844 matching mic for above incl, £325. Tel Brenton Medway (Kent) 364158.

88mH toroids, American, suit BARTG, ST6 etc, £2 each plus 25p p&p. *Wanted:* Hygain 18AVT or 14AVQ. Chris Pedder, G3VBL, Thorncliffe, 5 Royalty Lane, New Longton, Preston, Lancs PR4 4JD. Tel Preston (0772) 612289.

Trio TS820 cw filter, not digital, service manual, exc, boxed, £380 ono. Daiwa CN620A power swr meter, £35. Heathkit SA2040 antenna tuner, 3·5-30MHz, roller coaster tuning, modified with antenna switch, 2kW p.e.p., balanced and unbalanced, £95. J. W. Garrett, G3YOU, QTHR.

Murphy a.m. rt, £5. SCR522, £5. Jacel 331 sig gen, £40. Large ht psu, 19in by 5ft rack, £10. Many small components, valves, 19in cases, eight-bit punch. Tel Cholesbury 678.

Microtan 65 computer, Tanex expansion board, 10k microsoft basic, 3k monitor, mc assembler, Apple ASCII keyboard, hexpad, psu, graphics, manuals, magazines, 6502 programming manual, some software, £150 ono. Tel Wrexham 265325, after 5pm.

Pye uhf Westminster, 25kHz, dashmount, toneburst, wkg RB14, £100 ono. Trio TR2200, six xtal channels, toneburst, all accessories, £65. 2m 5λ/8 magnetic mount whip, £10. 70cm colinear magnetic mount whip, £15. G4KRO NOT QTHR. Tel Wythall (0564) 823938.

Trio TS830S, fitted 500Hz first i.f., 250Hz second i.f. filters, £625. Take Drake R4C or suitable tx, ie Vespa, LG300, Panda, Drake T4 series in part exchange for above. G3YRQ, QTHR. Tel Ian, Leigh (0942) 679948.

Drake SPR4, solidstate gc rx, 24-500kHz, bands between 150kHz-30MHz, ssb, a.m., cw, notch filter, £200. KW204 160-10m tx modified stabilized solidstate vfo, 100W out, £100. Panasonic RF3100 32-band portable solidstate digital rx, ideal swl, £165. GM3TBV, QTHR. Tel 0250 2520.

FRG7, digital readout, good cond, comp with manual, headphones etc, all as new, bargain at £125 ono. C Garton, 4 Yonge Close, Radcliffe-on-Trent, Nottingham. Tel 060-73 2027, evenings.

Kenpro KR250 rotator, brand new, in box, £35. G6FHE. Tel Nottingham (0602) 892046, evenings.

FT221R, £250. Trio 2200GX with accessories, 7ch, 15W amp, £90. Trio 2300 with charger, £120. Yaesu cpu 2500R, 30W, mic, kbd, £150. All vgc. ICL Termiprinter, RS232, 300 baud, £170. Tel 01-890 2535, day, 078-42 51409, after 8pm.

Yaesu FT902 dm hf tx/rx, comp with SP901 spkr, YH55 headphones, only four months old, used only for reception, change of QTH forces sale, £750. G6CHB. Tel 0632 462606.

FT707, FP707, FC707, £600. FT480R, 5-el Yagi, £300. G3VLQ, QTHR. Tel Reading 599591, after 7pm, or Aldershot 29911, 9am-4.30pm.

TR2400, ST1 base stand, quick charger, BC5 12V quick charger, spkr/mic, carrying case, belt clip, nicads, used little, exc cond, £190. G3ZNI, QTHR. Tel Oxshott (037 284) 3321.

RTTY TD960 data system, DM170 demodulator, Mish electronic keyboard, 45-300 bauds, just connect vdu and tx/rx, fully wkg, £135 or swop for computer. G8WSK. Tel Cosham 377607.

R1000, manual, leads, £195. TF144G Marconi sig gen, 85kHz-25MHz, £30. D300 Solartron scope, all instructions, £30. CT54 valve voltmeter (multimeter), needs valves, £10. Carriage extra. Cartwright, 1 Patshull Road, Albrighton, Wolverhampton. Tel Albrighton (090722) 2611.

Trio TS700G 2m, multimode, piptone, preamp fitted, vgc, £260 ono, or exchange for hf rig. Tel Weymouth 786930.

TR2300, nicads, accessories, homebrew psu, charger, £130. Wood & Douglas 2m synthesizer, 10W pa, built, tested, offers. Various rf bits including 2m, 12 and 45MHz xtals. G8VXK NOT QTHR. Tel 01-747 1702.

MM2000 rtty/ASCII to tv converter, used little, STE Arac 2+10m vfo rx, first reasonable offer each. G8APX, QTHR.

Complete hf/vhf Trio station, comprising TS520 tx/rx, VFO520 remote vfo, SP520 spkr, TV502 2m transverter, LF30A lpf, all immac cond, £430 for the lot. G4BSW, 39 The Street, Adisham, Canterbury, Kent. Tel Nonington 840989.

TX/rxs: two GEC ex-Civil Aviation Authority, professionally converted to 2m, valves, wkg but no xtals, £30 pair. Tel 0624 22342, evenings.

TR2200G, helical antenna, carrying case, nicads, charger, mobile mounting brackets, xtalled for S16, S20-22, R3-7, together with VB2200 10W linear and λ/8 mag mount, exc cond, £105. G3ZNI, QTHR. Tel Oxshott (037 284) 3321.

Exchange complete set of archery equipment for 2m single 4CX250B linear amp with possible cash adjustment. G8LLJ, QTHR. Tel 0794 40700 for details.

Marconi TF801D sig gen, £50. Tektronix scope 545A ca plug-in unit, £45. FDK700E, mobile mount, orig packing, £140. Buyer collects. G4HHB, QTHR. Tel 04446 45182.

Noise diodes CV2398 (wire ends, 6V heater, spec to 500MHz otherwise similar to CV2171), £6.50. Other valves: 4CX350A, £20. CV1905 (4-65A), £12. D3A, £12. TT15, £10. CV408 (vhf triode), £6.50. CV2721 (6CJ6), £1.50. All boxed and unused. G3UYD. Tel Chandlers Ford 2309.

Kenwood TS120S with MC35, £330, or including PS30, £395. Would consider exchange for 2m multimode TS700S, FT221, or similar, but not a TR9000. G2VJ, QTHR. Tel 021-706 0744.

Yaesu FRG7000 rx, £199. MM2000 rtty to tv converter, £98. MMC144/28, £18. Hygain 12AVQ 20/15/10m vertical, £20. All exc cond. Tel Harding, Ingrebourne (Romford area) 45374.

Yaesu FT224 tx/rx, fitted 145m, S19-23, RO-7, £95. Pye Cambridge 70·260/375, £30. AR22 rotator, comp, £25. Burns wavemeter TC101, £30. Datong rf speech clipper, £25. G2HKW, QTHR. Tel Chandlers Ford 65566.

Racal MA942 hf antenna tuning unit, range 1·6-30MHz, built-in rf current indicator, digital indication of tuning control for dipole whip or long wire, as new, £50. Iambic keyer, professionally built to G4EJA spec, *PW* March 1982, incl hi-mound iambic key, mounted on heavy base, £40. Hi-mound bug key model BK100, unused, £15. Buyer collects or pays p&p. G3OFK, QTHR. Tel 0734 733674.

ITT2020, 48k, Green vdu, single disc drive, manuals, books etc, £600. G4KPN, QTHR.

Mosley TA33JR tribander, approx 20/25m coaxial supplied by Mosley, £55. Buyer collects. G3YDZ, QTHR. Tel Lowestoft 65922.

Marconi test equipment, hf standard sig gen TF867, 15kHz-30MHz, 40μV-4V into 75Ω, a.m., ac valve voltmeter, TF899, 20μV-2·5V, both good wkg order, reasonable offers. Tel Crawley (Sussex) (0293) 30591.

Interested in 2m fm? Can't quite afford new? Then it's the KDK2025E, 25W, 10 permanent memories, 144-148MHz possible, any rx/tx split, 12.5 or 25kHz steps, full scanning, mic, etc, good cond, only £140 ono. G6BHP, QTHR. Tel 061-969 4873.

FR400DX, FL500DX, spkr, £210 ono. IC22A, six repeaters, seven simplex, £70. Variable capacitor, wide-spaced, pair QY2100s, bases, offers. Works master time clock, 5ft high, oak, heavy pendulum, electrically wound, every minute, offers. G4BZQ, QTHR. Tel Telford 727024.

RX80 Mk2, 3·5MHz i.f. gen cov rx, converters for 21 and 14MHz only, lcd freq disp, mech filter, 12V supply, added features, £55 ono. Philips transistor analyser, wkg, good cond, £10. Hewlett Packard microvolt ammeter, £15. 15A 5V power supply (large), £20. Realistic 80W stereo power booster, stereo preamp module, £60. Casio FX601 programmable calculator, guarantee, £40. G6HKA. Tel 061-439 7710.

12AVQ, as new, only up for 24h, genuine reason for sale, £30. G4JLU, QTHR. Tel David, 01-954 6728.

Yaesu FT101ZD Mk2, a.m., cw filter, fan, WARAC bands, 18 months old, mint, £465. ATU FC10Y twin meters, £75. G4KHL, QTHR. Tel Fleetwood 71586.

B40 rx, 0·6-30MHz, £45 ono. Very heavy! Buyer collect. G. Brice, GW8FJS, QTHR. Tel 0222 890665.

FT107M, perfect cond, all options, internal psu, memory, cw and a.m. filters, scanning mic, offers about £600. G4JQI, QTHR. Tel 025482 3366.

Pye Cambridge AM10D, fitted xtals R5, S20-23, S32, £40 ono. G3OHE, QTHR. Tel 0429 61186.

MMT432/144R transverter, power supply, £139. PF70 pocketphone, SU8, spare nicads, £30. Tel Whitehaven (0946) 61389, after 6pm.

FT480R, used little, exc cond, £325. Colour camera national Panasonic WV3300E, bargain, £175. ATV tx, homebrew, as per WD ATV1, £55. ATV linear BLW82, £13. PAL colour coder, £16. G4NAJ (ex-G8XSC, QTHR). Tel Hadlow Down (Sussex) 243.

Bargains: FT290R, £180; MM 25W linear, £30; MM 430/144 converter, £20; Wood & Douglas microwave drive source (kit), £15; SWR meter, £10; 70cm log periodic ant, £15. Plugs, coaxials, books, etc. All in good cond. Garex 2m tx/rx, ideal starter, £40. G6ECY (Tony) currently abroad, but all items can be viewed at Stratford-upon-Avon. Tel 0789 298093.

TA33JNR, good cond, £60. Buyer collects. G3XFM, QTHR (York).

Icom IC260E 2m multimode, in perfect cond, would like to swap for Trio TS700G or sell for £240. Reason? Mobile tx/rx too good as base stn only. Not used in car. G3SRT NOT QTHR. Tel Shrewsbury (0743) 66969.

Collins mech filters (75A4) types F455, JO5, J15 (500Hz), (1·5kHz) B9A plug-in, £12 each type, plus postage. G3UFI, QTHR. Tel Hastings (0424) 753949.

FT707, eight-band, 100W out, never mobile, orig case, manual, mic, vgc, £460. HW8 80/15m, QRP, Heathkit aligned, £70. G4HQV NOT QTHR. Tel 059069 5718.

Yaesu FT221RD multimode tx/rx, all fixed channel xtals, YC221 digital display, mint cond, mic, £345. MMA144V switched preamp, new, boxed, £18.50. Prefer buyer collect. Drake 6MHz and 1·5MHz filters for R4C. G4LW, QTHR. Tel Trowbridge 3166.

NCX5 10-80m, tx/rx, psu, £90. Atlas 210X 10-80m tx/rx, psu console, £275. 12V 5A psu, £6. All ono. G3XMA, QTHR. Tel Coventry (0203) 410208.

Trio JR500S communications rx, loudspkr, instruction manual, £65. Ideal beginner's set, in good cond, full wkg order, buyer collects (S. Bucks). Tel Mike, Princes Risborough 3269, after 6.30pm.

Will swop Qualcast EP30 chain-driven lawnmower, grassbox, handbook, used twice only from new, £75. Azden PCS300 2m handheld, comp, £170. Datong FL1 audio filter, £40. All mint. Tel 0373 64694 (Warminster area).

Complete station: good cond, TS120S, £297. VFO120, £56. Power supply PS30, £58. ATU AT130 WARC, £53. Daiwa active filter AF306, £19. Sell as complete station at a bargain, £450. G4EMX, QTHR. Tel W Germany Kit DA2WN (5141) 36569.

Kenwood gold line T599S tx, R599S rx, a.m., fm ssb, cw, all filters, 10MHz capability, separate or tx/rx, 2m, 4m converters, fitted sockets for DG5, digital display, matching spkr, £395. DG5 digital display, £80. G4LW, QTHR. Tel Trowbridge 3166.

SSTV Spacemark, monitor exc picture, £50. 5FP7 crts, one sh, good, £3. One new, tested, £8. Scan coils for 5FP7, one set, £2. PM focus magnet on bracket, £2. Prefer collect or carriage extra. G8AJI, QTHR. Tel 021-544 6171, after 6pm.

70cm fm mobile Pye Europa, solidstate, approx 5W rf, good audio, aligned on 70cm, uses Westminster xtals, fitted toneburst, comp with mic, mobile mounting bracket, £69 ono. G8DAY. Tel Penn (049481) 5361.

FT101E, 160-10m, cw filter fitted, exc cond, first £325. G4JYY. Tel 0202 874467.

16-el Tonna, one year old, cond as new, £25. Nine-el portable Tonna, one year old, only been used once, hence mint cond, £15. Buyer inspects and collects. G6GGE. Tel George, 01-747 1506.

FT200B tx/rx, FP200 psu, FV200 external vfo, mic, homemade af compressor, vgc, £240. Microwave Modules MMA144 2m preamp, £5. Simpson, G3XQZ, QTHR. Tel Bedford (0234) 781149.

Datong D70 morse tutor, perfect, £35. Creed 7B teleprinter (24V motor), £12. Buyers collect, cash only. Tel Waterlooville (07014) 58093.

FT101, cw filter, fan, 12V, 230V, 160-10m, incl 30m, new final valves, nice cond, unmarked, matching YC601 digital display incl, bargain, £300. G3IRW, 51A Main Road, Hundleby, Spilsby, Lincs. Tel Spilsby 53050.

Racal RA17 communication rx, £150 ono. H. Jeffery, 37 Cranham Square, Marden, Tonbridge, Kent.

Generator, portable 240V, 800W, £125 ono. G4JYY. Tel 0202 874467.

HRO dial and gear box, unused, £10. Bantam hb/fm, two nicads, charger, vgc, £65. Six new xtals for three marine channels for Bantam, £15. Dash Cambridge lb/fm, 12·5kHz, vgc, £50, or exch for hb/a.m. model. GU3HKV, QTHR. Tel 0481-47278, 6-7pm only.

FRG7700, 0-30MHz, comm rx, a.m., fm, ssb, one year old, cond immac, £260. G4OCH NOT QTHR. Tel Keith, 0543-376366, evenings/weekends.

FT7 80-10m mobile tx/rx FL110 linear for base use, PW speech processor, hardly used, £250. 12AVQ antenna, £10. Buyer collects. G3ZN, QTHR. Tel Blackpool (0253) 853172.

B&O stereo record player, stereo tuner, stereo tape recorder, reel to reel, offers. G4JYY. Tel 0202 874467.

IC202, 144·0-144·6, 145·8-146·0, 25W linear, rx preamp, Jaybeam 5/5 antenna, low loss coaxial, exc cond, ideal first rig for 2m ssb, £125 the lot. Tel Keith Barnes, 01-440 9354, office.

Transverter, Valradio, 12V ip, 240V/400W 50Hz op, perfect for rigs, drills, rotators, hair dryers etc from

caravans, boats, cars etc. £150 ono or swap/part ex for 2m rig, transverter, Yaesu FC902, SP901, DCT101Z, 10-80m trap vertical, atu or w.h.y? Tel Luton 581545, evenings.

Barlow Wadley XCR30MII, fair cond, cheap, £50. Buyer collect. Direction finder model 6140, exc, 12V dc, suitable portable or boat, internal psu if required. A lot of junk. Buyers please collect. GW4XF, QTHR. Tel 0291 23514.

TS820 dr cw filter, £400 ono. On the air for £75: KW Viceroy HRO bs coils. Building a linear? HT41 for parts 572s, £45. Preselectors, Codar, £15. DB20, £15. 4in 0-100μA meter, £5. G2QT, QTHR.

Yaesu FT290R, mobile mount, carry case, nicads, spkr mic, rubber duck antenna, worth £310, bargain at £250 ovno. Jaybeam 2m 4-el quad, £10. Buyer collects. G6ETA. Tel Chestfield (Kent) (022779) 3262, evenings.

Icom IC255E, £195 ono. Trio TR2300, £110 ono. Both comp and as new, in orig boxes. AKG D900E rifle/shotgun mic, comp set of accessories, £150 ono. G8YUR, QTHR. Tel 01-804 0734.

TRS80 computer, 16k model I, level 2, keyboard/cpu, b&w monitor, green filter, CTR80 cassette, 80-col dot matrix printer, manual, self teaching guide, 12 months old, £375. P/ex 2m multimode and linear. Consider other 2m equipment. Tel 0704 893803 (Lancs), after 6pm.

IC260E with up/down mic, good cond, £240. FT202R, S20-23, R0, R5, ext mic, charger, £69. Dymar 880, S15, S20, R5, 6ch switch, driver stage fitted, giving 1W plus, manuals, £40. G4DOV, QTHR. Tel 0922 414927.

Gould & Farnell switched mode stabilized psus, 13·8V, 25A, 5V, 60A, high quality, fully protected as new, orig packing, £50 each. G6BAN, QTHR. Tel Glossop 65752.

Sony monochrome video recorder CV2100CE, service manual, 140 reels tape, £120. Photocopier Eskofot 626, uses coated paper, very compact, £60. Carriage on above by arrangement. S.G. Brown type K earpieces, six, but no headbands, offers? Tillotson. Tel Bath (0225) 317940.

Grundig Satellit amateur, all bands to 30MHz, bfo, mains units, case, circuits, £110. *Wanted:* info on AR77E, will pay postage and return sae for details. Buyers collect. Books all dates 1902-70. Buyer pays postage. Valves, meters, etc. Tel Maidstone (0622) 61327.

SEM Sentinel 50 linear power amplifier, just over one year old. Good cond, £50 ono. G8TVV, QTHR. Tel Gosforth (0632) 842495.

Sharp PC1500 portable colour computer, CE150 printer, extra CF151 4k ram, mains charger, two months old, cost £350, accept £250 or exchange TR9000 or similar 2m multimode. Tel Ripley (0773) 872278, evenings after 7pm.

Icom IC24G, fully synthesized 2m mobile base, tx/rx, 10W fm 12·5kHz shift, reverse repeater operation, comp with mobile mount, boom mic, orig packing, £130 ovno. UKW Technik 23cm transverter, £130 ono. G5BUJ, QTHR. Tel Thorne 813713.

Drake R4C, T4XC, AC4, MS4, 4NB, FL500, QM70 transverter, Shure desk mic, £500. G4FOR, QTHR. Tel 0582 25745.

FT290R, modified, MMB11, nicads, case (2), flexi, helical, £195. Datong D70 morse tutor, £35. Samson RTM3 electronic iambic keyer, £25. Tel Yves, London (01) 200 1839.

PET 2001-8K integral tape recorder/vdu, manuals, Liner 2, old, stable, reliable, radio control gear, aircraft needs completion, one piece motorcycle leathers, large top box, portable typewriter, Spanish guitar, moving Germany November, no sensible offers refused. PX selection for hf/vhf multimode. G8KJI, QTHR. Tel 0946 832127.

FRDX400, all options fitted, vgc, orig packing, comp with Trio HS4 phones, Joymatch atu, £130. Coaxial, 50yd RG12, £10. *Rad Com* April 1973 to September 1981 (October 1980 missing), £2/year or £10 the lot, plus p&p. All ono. G3VYE, QTHR. Tel Poynton 876850.

Coaxial relays Totsu (Ambit) unused, two at £8.50 each. G8ATA, QTHR. Tel 04488 513.

FT707 Wayfarer, hf home or portable tx/rx, in good cond, mobile mount, mic, £450. Available only with above: 160m transverter at less than component cost, £50. G3TSO. Tel Tetbury (0666) 53425.

Trio TR9000 2m multimode, £260 ono. Microwave Associates 10GHz Gunnplexer tx/rx, £90 ono. Tel 0453-83 3411.

Icom IC701, power supply, mic, £450. Yaesu FT101 Mk2 with cw filter, fan, spare valves, £250. FV101 remote vfo, £50. Buyer collects. G3FPQ, QTHR. Tel 0420-23168.

KW202 rx, handbook, £100. Back issues of *Rad Com* and *Short Wave Magazine* available. G4AVL, QTHR. Tel 0206 230774.

FT101ZD, mint, £500. IC202, nicads, £120. 30ft aluminium lattice mast, £150. Microwave Modules 4m transverter, 28-70, 40W linear, £125 or split. Trio TR8400, £190. G3XXN, QTHR. Tel Worksop (0909) 730128.

Complete 2m base station: TR9000, BO9 adapter, SP120 spkr, 5A psu, two five-el Yagis, rotator, 25m control cable, two lengths (25m) UR67, many odds and ends, £375. G8ROC, QTHR. Tel 0272 877789.

FT707, FP707, FC707, vgc, no mobile use, only little base use, £500. HF5 antenna and radial kit, £50. Buyer collects or carriage at cost. G4ODK, QTHR. Tel 01-470 5620, evenings, weekends.

Lafayette HA600 gen cov rx, instruction manual, £35. Marconi CR300/1, instruction manual, psu, £30. G4FSM, QTHR Essex. Tel 037-45 2983.

Trio 2200, fully xtalled, nicads, charger, £85 ono. Tel 026-02 4882, evenings or weekends.

Collins radio, exc cond. Tel Derby 557705.

FT101Z Mk3 fm, mic, fan, manual, orig packing, as new, £490. FT7B mobile/base hf rig, good cond, no mods, Yaesu digital readout, £320. Microwave Modules 10-2m transverter, £60. All units ovno. G4HOJ, QTHR. Tel 0793 771153.

Trio 3200 70cm tx/rx, nine channels fitted, comp with case, mic, nicads, charger, £130. FDK Multi 700EX 2m mobile tx, £130. Both in good cond. GEC RC650M six channel hi-band mobile boot mount tx/rx, comp, £20. G8YBD, QTHR. Tel 0706 67153.

Trio TS180S, dfc memory unit, cw filter, £520. PS30, £60. Both mint cond, carriage extra. G3UEN, QTHR. Tel 0262 850258.

Racal RA17L, ssb adaptor, manuals etc, £155. Racal/Airmex 201A sig gen, calibrated freq and attenuation, 30kHz-30MHz, £40. Portable operation? Make up your own supply, compact 1·25V 16AH, nicads/busbars etc, £1.30. Ditto but 23AH, £2 each. B2K mark Heliwhips, 80, 40, 20, 15, 10m, unused, £25 the lot. *Wanted:* Bird Thruline elements, any power and freq Icom 251E. GW3JUV, QTHR. Tel 0656-3875.

Heathkit tx/rx SB102, comp with HP23B, psu, SB600 spkr, £225. SB610 monitorscope, £75. HM102, swr/pwr meter, £30. Yaesu FT227R mobile mount, full scan mods, £185. FT202R Handi, full set xtals, nicads, charger, £110. All equipment in good, clean wkg order, all prices ono. G4JA, QTHR or c/o Sgts Mess, RAF Odiham, Hampshire.

Trio R1000, used little, communication rx in orig box, all accessories included, £300. G6BLK. Tel Medway 61887.

Murphy hf rx, made in about 1960 for Royal Navy, superb cond, bargain, incl psu, but weighs 64lb so buyer collects, £90. Daiwa SR9 2m fm rx, 14 months old, vgc, £38. Tel Kevin, North Walsham 404373.

Tektronix 545A oscilloscope, CA dual-trace preamp, dc-24MHz. gwo, £85 ono or swop for R278/GR uhf rx in similar cond. Cabinet with crt and psu, ok scope, £10. Cintel pulse generator, £5. Buyers collect please. G8LIU, QTHR. Tel Uxbridge 30006.

FT225RD, £450. Capacitors paper 10μF 2kV, £5 each. Datong clipper, £15. Two Marconi Mk5 picture and waveform monitors, faulty, £5. Box suitable for big linear (RS Z-G diagraph), £5. Tel Chelmsford 66776.

Icom 701 tx/rx, 160-10m, all solidstate, fb cond, £435. Power supply extra. GD2KHE, QTHR. Tel 0624 6636.

Belcom Liner Two ssb tx/rx, 12V, internal preamp, good wkg order, mobile mount, accessories, £55. Buyer collects or can deliver 30 miles. G3KRT, QTHR. Tel Ruislip 38287.

PET program (8k) converts between QTH locator and OS grid reference (and vice versa) and gives latitude/longitude, distance, bearings, points, cassette, £2.50. B. West, 54 Torquay Road, Chelmsford.

Drake TR4, MN4, MS4, power unit, exc cond, £250. Electronic Developments 70cm linear, £50 ono. Carriage and inspection by arrangement. G2LL, QTHR. Tel 04243 4645.

Trio JR599 2-160m, perfect order, £170 ono. KW500 linear amplifier, 813 valve, £120 ono. *Wanted:* TS120S or similar. TC240. G4JFE, QTHR. Tel Newbury 41613.

TR9000 2m multimode, £265. Yaesu FP12 psu, 13·5V, 12A, £55. MM 2m 40W linear, £55. All mint cond, or £350 the lot. Carr extra. Tel 0202 522796, after 6pm.

HW101, psu, £200. VGC KP202, nicads, charger, spare xtals, £80. Trio 9R59DS, exc, £45. Buyer collects or Securicor. G3ZLX NOT QTHR. Tel 01-794 6615, evenings.

MMT 1,296/144 23cm transverter, together with Jaybeam D15/1,296 double 15 slot-fed 23cm Yagi, £150. G8BWR, QTHR. Tel 0926 498388.

TS520SE, £350. 14AVQ, £20. Canadian 58 sets, pair, £5. Buyer collects. G4GOX, 33 Liversedge Hall Lane, Liversedge, West Yorks.

Yaesu FR50B rx, 10-80m, a.m., ssb/cw, manual, good cond, no mods, works well, £55. G6DZL NOT QTHR. Tel Derby 700336.

Johnson Viking Matchbox atu, swr bridge, manual, not required with my 18AVT so disposing, £40, plus carriage. G5LH, QTHR. Tel 0632 662490.

Microwave Modules MML144/25, 2m linear, preamp, 25W out, for 2·5W in, £35. MM Oscar preamp 28MHz band, £15. ZX81 computer with input/output port, £60. *Wanted:* radio mast. 2m preamp (rf switched). G6ASA. Tel Oxford 863333.

RTTY converter, brand new MM2000, £145. Multibeam 432MHz ant, MBM88/70, never used, £39 ono. Buyer collects. Mag mount, 144MHz whip, £5. Above property of late G8RUW. Contact G4DYC, QTHR. Tel Dereham (Norfolk) 858164.

Standard C8600 12ch 2m fm mobile, six repeater, six simplex, boxed, perfect, £85. Trio TR2300, mint, boxed, manual, charger, £125. FM pocketphone, R6, S23, S21, spare nicad, charger, £60. G8LGB, QTHR. Tel 0223 248650, after 6pm.

KW204 tx, new pa valves, immac cond, £145. SP600 rx, recently realigned, and retubed, exc cond, £130. Vibroplex semi-automatic key, £30. Datong active antenna model AD370 (outdoor type), psu, £38. G4OEP. Tel Bristol 427954.

For sale or swop: FT707, FC707 atu, used little, £525. Just passed RAE, want 2m multimode. W.H.Y? RS50171. Tel Eastbourne (0323) 840209.

G2DAF Mk3 tx, five gang variable capacitors, sm drives (ex-lm freq meters), as specified, £7.50 per pair. Set of seven fundamental xtals, HC6U 3·5-30MHz, £10. Collins 455kHz lsb filter, xtals, £4. G2LL, QTHR. Tel 04243 4645.

Yaesu FT101Z (a.m.) comp with fan, exc cond, used little, may be seen operating, £390 ono. Tel Kings Langley (09277) 62201, after 7pm.

Creed 54 printer, two Creed 6S6 tape readers, Creed 86R printing reperf (new), 80 + 80V psu, tape for 86R, speed strobe forks, manuals etc, suit training establishment, sale by arrangement. G8LT, QTHR. Tel 0327 860321.

Yaesu FT901, exc cond, used little, all mode incl fm, orig packing, £585. SP901 matching spkr, as new, £20. Shure 444 mic, £17. *Wanted:* VHS video recorder. G3UKM, QTHR. Tel St Anne's (0253) 711536.

FTDX500, £150. Pye Europa RB12/14, £80. Europa R6-7, S20, S22, £35. Westminster a.m./hb, £20. Teletype ASR33, good cond, £90. 80 × 24 char vdu, keyboard, printer, £75. 40 × 13 char vdu, keyboard, £30. All ono. GM3LJR, QTHR. Tel 0383 860462.

FL2100Z, mint, £325. TS820, £425. ZX81 16K, £60. FV520 vfo, £60. Leader atu, £50. G4DYR, QTHR. Tel 0902 343068.

FT7, mobile mounting bracket, mains psu, manuals, orig packing, never used mobile, vgc, £250 ono. 1·8kHz eight-pole xtal filter for FT101ZD, FT107, FT707, FT901, FT902, £15. Bauer single-paddle key unit, £6. Tel 04536 3994, after 6pm.

WANTED

SEM Tranzmatch with Ezitune or KW 1K. Tel 0235 20180.

Second world war radio equipment for private collection. No19 sets, incomplete units considered. RS40042. 2 Park Road, Amersham, Bucks. Tel Amersham 6881.

Joystick vfa, Joymatch atu, not Super Match or similar system for mobile use. Antenna must fold up for carrying in hand luggage. G8YLF, QTHR. Tel John, 01-777 2340.

R1155, in good order, with psu if possible. Keen to get hand on key after long absence and want familiar rig. HRO SX25 etc also suitable. Will collect 50 mile radius Andover. G3DSX. Tel 0264 52603, after 5pm.

KW103 meter. G3STT, QTHR. Tel Southport (0704) 29137, evenings and weekends.

For the National Wireless Museum: old radio mags, books, catalogues, service sheets, QSL cards, components, valves, keys, Gamages catalogue, any knobs! Voight mc pickup, Tractrix horn, 150 mile xtal set. Collection arranged. Details please to hon curator, G3KPO. Tel Ryde 62513.

1919/1920s *Wireless World*. Exchange for 1920s *Modern Wireless*, or purchase. G2PA, 60 High Street, Sandridge, via St Albans, Herts. Tel St Albans 55128.

FRG7 shortwave rx, ssb Toko 2·1, MFL455 filter mod, or similar mod. Must be in exc cond. Buyer will collect. Tel Cushing (05086) 2923, after 1 October.

Plug-in coil formers with or without bases. What have you? G6DZ NOT QTHR. Tel Colaton Raleigh (Nr Exeter) 68779.

Labgear 160 twin or KW160 or Minimitter, or any other good commercial tb rig considered. G4KUN, QTHR. Tel 0424 420359.

Drake TR7, Yaesu FT1 or similar. Yaesu FT101D. No faults please. 13·7V psu, 5A or more, fully regulated and protected. HF trap dipole. 2m mobile ant, 5λ/8 or 7λ/8. Slim Jim. Details G3BDK, QTHR. Tel Towcester 52309.

Coaxial relay, 50Ω, 400W, prefer 12V coil. G3KAU, QTHR. Tel Crawley (0293) 22428.

P40/60 Versatower, complete. G4EGB, QTHR. Tel 0723 62537.

Urgent: Yaesu 101ZD Mk3, not more than year old, would consider accessories, cash waiting, would collect. A. F. Bradbury. Tel Banbury (53802) 810372.
Exchange my nearly new 2m FDK1200 tx/rx, orig packing, for quality rx valve or solidstate. Complete RAE course, 20 books, cost £60, sell £20 or swop good key. Tel 0495 270900, evenings.
KW109 Z-Match. Elements for model 43 Bird power meter. G8DDW, QTHR. Tel 01-858 3579.
Antenna rf ammeter, thermocouple type, 350mA or 500mA, about 2·25in diameter, ex-WD black Bakelite case, wkg order, xtal mic for AT5 tx, vintage xtal sets. Osram valves DER, P240, L2, HL210, S625. N. Richardson, 2 Edna Road, Maidstone, Kent ME14 2QJ.
Mini beam HQ1 in good cond. Suitable rotator or heavy duty model. G4ILQ. Tel Kidderminster 4930.
70cm fm handheld tx/rx. W.H.Y? 2m miniature monitor rx. Colour video camera for JVC7700 (10 pin). VHS tapes. All letters answered. P. Morgan, 36C Highcroft Villas, Brighton, East Sussex.
Books! A good, clean copy of *Ham's Interpreter*. Tel details to 0382-580 593, after 6pm.
Yaesu FT221R/RD or FT225. Mutek front-end preferred but not essential. Non-wkg model considered. Collection arranged. Cash for the right model or FT480R and psu offered in p/exchange. Chris Allen, G6ATH, QTHR. Tel 0473 643667, day or 0473 623157.
Urgent: circuit diagram for Star 700A rx. borrow or pay for photocopy. Return if loaned guaranteed. Would purchase defunct 700A if any offered. G2WI. Tel Orpington 29716, any evening between 9-10pm.
Help please: RAIBC member seeks hf or 2m equipment, can only exchange HW8 QRP cw tx/rx, small cash adjustment, anything like HW100, KW series, HW8 used daily with only indoor tv aerial. Europe no problem. GI4LXL. Tel 0266 2698, anytime.
Tx/rx, 2m, modern, all mode. Large linear amplifier for above. Morse tutor, preferably Datong. Tel 0624 22342, evenings.
Drake TR3 or 4 and ac psu. TS520SE or similar hf tx/rx. Collect West Country, possibly N London. G3DSV, QTHR. Tel Crediton (03637) 324.
Rotator for hf mini beam, but will also consider heavy duty model. HQ1 mini beam in good cond. G4ILQ. Tel Kidderminster 4930.

KW107 Supermatch atu. 2m 25W linear. GM6FUR, QTHR. Tel 056-387212, evenings.
HW101 400Hz cw filter SBA3012. El-bug paddle. GM4EFR, QTHR.
Trio AT130 antenna tuner. DFC230 digital controller. Both for use with TS130S. GW2HCJ, QTHR. Tel 0766-770637, evenings.
Eddystone EC10 Mk2, must be exc cond. *For sale:* IC202S, mint cond, xtalled for Oscar and beacons as well as usual ssb band, orig packing, £120. G4AYV, QTHR. Tel Coventry 465328.
Electroniques transistorized coilpack, hamband or gen cov. G3WIF, QTHR. Tel 0272 293738.
Triband 3-el beam. Cash or exchange oscilloscope Dynamco type 72. Twin channel solidstate, new cond. G3MLG, QTHR. Tel 0636-72621, work, 0636-892384, home.
For school radio club: back issues of *Rad Com* 1970s to 1980, state price. Can collect Borders, Central Scotland, Merseyside. Chris Ladds, Jedburgh Grammar School, Jedburgh, Roxburghshire, Scotland.
1932-7 mains radios. Murphy A8, Marconi 276, 274, Philips 634A and others similar. G2ACK, QTHR. Tel 0342 21221.
R4C serial Z100 or more. Trio SM220 station monitor, MM432/144R transverter. Datong FL2 audio filter. Equipment for 23cm band. G4DED, QTHR. Tel 08675-2215.
Heathkit SB200 or KW1000. G6KI, QTHR. Tel 021-458 3892.
Drake L4B lin amp and MN2000. Collins tx/rxs. Must be in working cond. Tel Derby 557705.
Tono 7000 rtty/cw computer, full QSK cw rig such as Astro 102 or Tentec Omni, not QRP. GM4KGJ, QTHR. Tel Sid, 0224 872521, work, 0224 24774, home.
Yaesu FL2100B linear amp for FT101E, comp with leads, instruction manual. Write or tel price and details. G2BQY. P. Woodhouse, 69 Chantry Gardens, Southwick, Trowbridge, Wilts BA14 9QT. Tel Trowbridge 66381.
AR88D manual: sale or loan—prompt return. Parkman, RS50133, 9 Ryehill Close, Middlesborough, Cleveland TS7 0LU. Tel 317969.
Valves type TT21, would consider TT22 as alternative. Reasonable price paid. *For sale:* CRT VCR139, offers? G3GOT, QTHR. Tel Terling 229.

P.W. Helford, comp, part built or any components/boards etc. Tel Portland (0305) 822753.
Sharp MZ80K, must be mint, no mods, with/without software, exchange FT290R plus MML144/100LS linear (100W). Letters only to GW3KLU, QTHR.
RX for WS A510, also other parts. Complete or incomplete WS58s canvas items, accessories for WS38 Mk2, Mk3, manuals for wireless sets 58, Mk128 38, need many others also. Please write w.h.y? Tony Grogan, WA4MRR, 5 Rollingwood Drive, Taylors SC, 29687, USA.
RTTY keyboard for local copy, 50 baud Murrey code, not ASCII. For use with 75, tty and tu. many thanks for help. Paul Bown, c/o 11 Bayview Crescent, Cromarty, Highland IV11 8YP, Scotland.
Drake T4XB and R4B, in good wkg cond. Will consider as a pair or separately. Steve Ireland, G3ZZD. Tel 0892 34117.
Yaesu spkr console SP101 to match FT101 series of tx/rxs. G3XSI, QTHR. Tel Sheffield (0742) 51417.
Still required for use, clean wartime USA metal valves type 6A8, 6F5, 6F6, 6X5. Valve type 45 and 10XJ xtals for 80 and 40m tx. G4IMT. Tel Marshfield 254.
30-line tv set or components by ex-Baird employee. Scanning disc, motor etc. G2KU, QTHR. Tel 01-657 1126.
50μA meter for Marconi valve voltmeter TF899 or perhaps us TF899 if meter OK. GU8GGC, QTHR.
SSB adaptor unit for Grundig Satellit 2100 portable rx. Jenkins, 2 Dunvegan Close, West Molesey, Surrey KT8 0ND. Tel 01-979 3591.
1,296MHz linear amplifier, about 50W. Must be wkg or nearly wkg. G6ELH NOT QTHR. G8WJF, QTHR. Tel 01-950 5334.
Original plug-ins WB4, WB/D1/2 or HS6 for Hughes Memoscope 104 storage oscilloscope. Would accept dead scope with wkg or comp plug-in units. Details and price please to G8LIU, QTHR. Tel Uxbridge (0895) 30006.
Would the person who exchanged a Yaesu FT207R for an IC202S with the CQ Centre at Longleat please contact me. I purchased it from them on the understanding that you would forward the manual, charger, etc to them. Tel 0225 314865.
KW107 Supermatch or KW109. G8LHB, QTHR. Tel Hornchurch 54570.

WATERS & STANTON ELECTRONICS

18-20, MAIN ROAD, HOCKLEY, ESSEX TEL: (0702) 206835/204965

		Price Inc. VAT	Carr. & Ins.
FDK RANGE			
M.700EX	2m FM 25 watt.	169.00	n/c
M.750E	2m FM/SSB/CW 10w.	289.00	n/c
Expander	70cm transverter	199.00	n/c
PS750	230v AC power supply	66.00	n/c
Palm II	2m FM 6 channel	109.00	n/c
Palm IV	70cm FM 6 channel	125.00	n/c
TB1	1750Hz tone burst	10.00	0.50
TM56B	2m FM 230v/12v DC scanner	89.00	n/c
TM56B	Marine version	89.00	n/c
FDK	12v DC leads	2.75	0.65
CC2	Case for Palm II/IV	6.75	0.75
BC2	230v AC charger	4.50	0.75
BB2	"AA" size battery case	5.00	0.75
BT2	Ni-cad battery pack	12.00	0.75
Xtals	for Palm II and Palm IV	3.00	0.25
Xtals	for TM56B	3.00	0.25
T1200	2m synthesised handheld	159.00	n/c
SNAP-1	Joining plates. M750/Expander	7.95	1.00
AZDEN RANGE			
PCS3000	25w 2m FM trans.	199.00	n/c
PCS300	2m synthesised handheld	179.00	n/c
ECK	5m cable kit	25.00	n/c
AS006	Mobile extension speaker	8.95	1.00
DX-354	Deluxe base station mic.	29.00	1.50
WELZ PROFESSIONAL POWER/ SWR METERS & ACCESSORIES			
SP200	1-8-160MHz 20w-200w-1kw	59.95	n/c
SP300	1-8-500MHz 20w-200w-1kw	79.95	n/c
SP400	130-500MHz 5w-20w-150w	59.95	n/c
SP15M	1-8-160MHz 5w-20w-200w	29.95	n/c
SP380	1-8-500MHz 200w	49.95	n/c
SP10X	1-8-160MHz 200w	£19-95	n/c
AC38	3-5-30MHz Coax ATU	59.00	n/c
CT15A	50w dummy load	6.95	0.75
CT15N	15/50w dum load. N Plug	11.95	0.75
CT150	150/400w dummy load	31.00	n/c
CT300	300/kw dummy load	43.00	n/c
CH20A	2 way coax switch	15.95	n/c
CH20N	2 way coax switch "N"	27.95	n/c
ADONIS MICROPHONES			
MM202S	Safety mic. Lapel type	20.95	1.00
MM202HD	Safety mic. head band	29.00	1.00
MM202HM	Headphone & Mic.	39.00	1.00
NEW AM303	Base station mic.	27.00	1.00
NEW AM503	Base station mic.	35.00	1.00
AM802	Base station mic.	49.00	1.00
TRIO			
NEW TS930S	Solid state transceiver	1,078.00	n/c
TS830S	160-10m transceiver	694.00	n/c
VFO230	Digital VFO	215.00	2.00
AT230	All band ATU	119.00	2.00
SP230	External speaker unit	34.95	1.75
DS2	Optional dc pack	43.95	1.75
DFC230	Digital remote controller	179.00	1.75
YK88C	500Hz CW filter	29.60	0.75
YK88CN	270Hz CW filter	32.60	0.75
SM220	Station monitor scope	198.00	5.00
BS8	Panoramic display module	44.85	1.50
TS530S	160-10m transceiver	534.00	n/c
VFO240	External VFO	92.50	5.00
TS130S	8 band 200w pep mobile	525.00	n/c
TS130V	8 band 20w pep mobile	445.00	n/c
TL120	200w pep linear for TS120V	144.00	2.00
MB100	Mobile mount for TS130	17.00	1.50
VFO120	External VFO	85.00	2.00
SP120	Base station speaker	23.00	2.00
SP40	New mobile speaker unit	12.40	1.00
AT130	100w antenna tuner	79.12	1.50
PS20	AC power supply 4 amps	49.45	3.00
PS30	AC power supply 20 amps	88.50	5.00
MA5	Trio 5 band mobile aerial	88.75	3.25
MC50	Deluxe desk mic.	25.75	1.50
MC35S	Fist microphone 50k	13.80	0.75
MC30S	Fist microphone 500ohm	13.80	0.75
MC40S	Up/down microphone	13.80	0.75
LF30A	HF low pass filter	17.90	1.00
RD300	1kw dummy load	52.20	2.00
NEW TS780	2m/70cm transceiver	748.00	n/c
TR9000	2m multimode transceiver	359.00	n/c
TR9130	2m multimode 25w	395.00	n/c
BO9	Base plinth for TR9000	34.95	1.50
TR7730	Compact 25w 2m FM tcvr	247.00	2.00
TR7800	2m FM 25w transceiver	257.00	2.00
TR2300	2m FM portable tcvr	166.75	2.00
VB2300	10w amplifier for TR2300	58.00	1.50
MB2	Mobile mount	17.70	1.00
RA1	Rubber flexible antenna	6.90	0.75
PS1200	AC power supply unit & charger	29.50	1.50
NEW TR2500	Compact 2m FM h'held	207.00	2.50
ST2	Base stand charger	46.00	1.75
SC4	Soft case	12.00	0.75
MS1	Mobile stand/trickle chgr	28.00	1.25
SMC25	Speaker microphone	14.50	0.75
PB25	Spare battery pack	22.30	0.75
LH2	Deluxe leather case	21.30	0.75
TR8400	70cm FM mobile tcvr	299.00	2.00
PS10	Base station power supply	64.00	2.50
TR9500	70cm multimode tcvr	449.00	n/c
PL1	Charger lead for TR2300	1.30	0.75
R1000	Synthesised 200kHz-30MHz receiver	297.00	n/c
SP100	External speaker unit	26.90	2.00
HC10	Digital station clock	58.75	1.50
HS5	Deluxe headphones	21.85	1.25
HS4	Economy headphones	10.35	1.25
NEW R600	Synthesised 150kHz-30MHz receiver	235.00	n/c
DM81	Dip resonance meter	60.00	1.50
DL705	Digital multimeter	80.00	1.50
MC76	Case for DL705	4.95	1.00

SERVICE

"YES IT DOES GO WRONG SOMETIMES"

Even the best equipment goes wrong and you want to be in a position whereby you are assured that any faults can be rectified quickly and efficiently. At Hockley we have a well equipped, full-time service department to give you just that re-assurance. It's only when things go wrong that you begin to tell the "men from the boys" in the retailing world. Our policy is quite simple. We will service any equipment that we sell both in and out of warranty and do our utmost to get the work completed as fast as is humanly possible. Minor faults we will try and do whilst you wait but do please telephone before making a journey to us so that we can make sure it can be fitted into our day's schedule.

YAESU			
NEW FT102	All band transceiver	725.00	n/c
KEYT901	Curtis keyer	23.00	0.75
DCT1	DC lead	6.50	0.75
RAMT1	Memory board	10.00	0.75
FMUT1	F.M. Unit	t.b.a.	0.75
XF8.9KCN	300Hz CW filter	15.35	0.75
XF8.9KC	600Hz CW filter	15.35	0.75
XF8.9KA	6kHz AM filter	15.35	0.75
XF10.7KC	CW filter	13.80	0.75
FT902DM	9 band AM/FM transceiver	885.00	n/c
FT902DE	9 band transceiver	790.00	n/c
FC902	9 band atu SWR/PWR etc	135.00	5.00
FTV901R(2)	Transverter fitted 2m mod	285.00	5.00
FTV901R	T'verter main frame only	195.00	5.00
430TV	70cms module for tvtr	185.00	2.00
144TV	2m module for transverter	100.00	2.00
70TV	4m module for transverter	80.00	2.00
YO91P	Monitor scope with pan. adaptor	330.00	5.00
FV901DM	Remote vfo for 901	260.00	5.00
SP901	External speaker	31.00	2.00
FL2100Z	160-10m 1200w linear	425.00	n/c
FT101ZFM	160-10m 9 band transc.	590.00	n/c
FT101ZDFM	As above with digital readout	665.00	n/c
DCT101Z	12v DC adaptor	42.50	1.50
FV101Z	Remote VFO for FT101Z/ZD	112.00	5.00
FV101DM	External Digital VFO	249.00	5.00
FANT101	Fan for 101 series	13.80	1.00
FT707	80-10m 8 band transceiver	569.00	n/c
FP707	230v AC for FT707	125.00	5.00
MR7	Metal rack for FT707	15.70	2.00
MMB2	Mobile mounting bracket	16.00	1.50
FV707DM	Digital VFO	203.00	5.00
FL110	100w linear amplifier	155.00	5.00
FRG7	General Coverage rcvr	199.00	n/c
FRG7700	Gen. co. receiver	329.00	n/c
MEMGR7700	Memory module	90.00	1.00
DCRG7700	DC modification kit	1.15	0.50
FRT7700	Antenna tuner	37.00	1.50
FF5	Low pass filter	9.95	0.75
VHF Converters for FRG7700:			
	FRV7700 'A' 118-130; 130-140; 140-150MHz	69.75	1.50
	FRV7700 'B' 118-130; 140-150; 50-59MHz	75.50	1.50
	FRV7700 'C' 140-150; 150-160; 160-170MHz	65.95	1.50
	FRV7700 'D' 118-130; 140-150; 70-80MHz	72.45	1.50
	FRV7700 'E' 118-130; 140-150; 150-160MHz	71.30	1.50
	FRV7700 'F' 118-130; 150-160; 170-180MHz	71.30	1.50
FT208R	2½watt 2m h'held tcvr	209.00	1.50
FT708R	1 watt 70cms h'held tcvr	219.00	1.50
FNB2	Nicad battery pack	17.25	0.75
NC9C	Slow charger unit	8.00	0.75
PA3	12v charger unit	13.40	0.75
MMB10	Mobile bracket	6.50	0.75
FT290R	2m all-mode portable	249.00	n/c
FT790R	70cms all-mode portable	t.b.a.	1.00
NC11C	Charger for FT290R	8.00	1.00
CSC-1	Carrying case	3.45	0.75
MMB-11	Mobile mounting bracket	22.25	1.50
FL2010	10 watt linear	64.00	2.00
NC/WSE	2amp hour ni-cad pack	20.00	1.75
FT480R	2m 10 watt SSB/CW/FM transceiver	379.00	n/c
FP80A	230v AC power supply	63.25	2.00
FL2050	50 watt linear	126.50	2.00
FT780R	70cms all-mode tcvr	449.00	2.00
YAESU ACCESSORIES			
YM21	Hand mic. 600ohm 4 pin	13.80	0.75
YM24A	Hand mic. 2K ohm 6 pin	16.85	0.75
YM34	Desk mic. 500/50K ohm 8 pin	21.45	1.50
YM35	Hand mic. 8 pin scanning. 600ohm	13.80	0.75
YM36	Hand mic. 8 pin n/c. 600ohm	13.05	0.75
YM37	Hand mic. 600ohm 8 pin	6.90	0.75
YM38	Desk mic. 600/50K ohm 8 pin	24.90	1.50
YM39	600ohm 7 pin hand speaker/mic.	14.95	0.75
YE7A	Hand mic. 600ohm 4 pin	6.90	0.75
YD148A	Desk mic. 600/50k ohm 4 pin	21.10	1.50
YD844A	Desk mic. 600/50k ohm	25.30	1.50
FP4	230v/4 amp 12v psu	42.95	2.00
FP12	230v/12 amp 12v psu	86.25	5.00
YH55	8ohm communication headphones	10.00	1.00
YH77	Lightweight headphones	10.00	1.00
QTR24D	24 hour World clock	28.00	1.50
FF501DX	Low pass filter 2kw	23.00	1.50
YP150Z	Dummy load/wattmeter	92.00	1.50
ICOM			
IC730	HF Mobile tcvr 100W	586.00	n/c
FL30	SSB Pass band tune filter	24.70	0.75
FL44	Hi Q 455kHz xtal filter	t.b.a.	0.75
FL45	CW Narrow xtal filter	34.20	0.75
EX202	LDA unit for above	t.b.a.	0.75
EX203	CW Audio filter	11.60	0.75
EX205	Transverter controller	10.50	1.00
IC720A	HF transceiver + Gen. Cov. Rcvr.	883.00	n/c
PS20	PSU for above with speaker	130.00	5.00
PS15	PSU no speaker	99.00	5.00
FL32	CW narrow filter	29.30	0.75
FL34	AM filter	23.40	0.75
BC10A/E	Mains memory backup	5.30	0.75
IC2KL	Matching HF linear 500W	839.00	n/c
IC2KLPS	PSU for above	211.00	5.00
ICAT500	1-8-30MHz auto tuner	299.00	5.00
ICAT100	3-5-30MHz auto tuner	249.00	5.00
IC45IE	70cm FM + SSB base stn	630.00	n/c
IC25IE	2m FM + SSB base stn	499.00	n/c
IC290E	2m Multimode mobile 10W	366.00	n/c
IC490E	70cm multimode mobile	445.00	n/c
IC25E	2m FM mobile 25W	259.00	n/c
IC2E	2m FM handy talky	159.00	n/c
IC4E	70cm hand portable	199.00	n/c
ICML1	10 watt mobile booster	49.00	1.00
BP5	11 volt battery pack	30.50	0.75
BP4	Battery box for 6 × AA	5.80	0.75
BP3	Standard battery pack	17.70	0.75
BP2	6 volt pack	22.00	0.75
BC30	Base charger for above	39.00	0.75
BC25	Mains charger as supplied	4.25	0.75
DC1	12 volt adaptor pack	8.40	0.75
HM9	Speaker/Microphone	12.00	0.75
CP1	Mobile charging lead	3.25	0.75
LC1/2/3	Cases each	3.50	0.75
IC202S	2m SSB portable tcvr.	169.00	n/c
IC402	70cm SSB portable tcvr.	245.00	n/c
ICSP2/3	External speaker	29.00	1.50
IC3PE	3 amp psu + speaker	64.90	1.50
ICSM2	Desk mic. 4 pin plug	29.00	1.50
ICSM5	Desk mic. 8 pin plug	29.00	1.50
ICHM3	Hand mic.	12.00	0.75
ICHM5	N/C mic. as above	20.00	0.75
ICHM7	Hand mic.	12.00	0.75
ICHM10	Scan mic.	20.00	0.75
LOWE RECEIVERS			
SRX-30	General Coverage HF receiver	158.00	n/c
SRX-30D	SRX30 with dig readout	195.00	n/c

MICROWAVE MODULES RANGE

MML28/100-3	10m 100w linear/preamp	129.95	2.00
MML70/50S	4m 50 watt linear/preamp	85.00	1.25
MML70/100-S	4m 100 w linear/preamp	139.00	2.00
MML144/30L-S	1-3 w I/P 30 w O/P	69.95	1.75
MML144/50S	2m 50 w linear/preamp	85.00	1.25
MML144/100-S	2m 100 w linear/preamp	139.95	2.00
MML144/100LS	2m 100 w (1 or 3w i/p)	159.00	2.00
MML432/20	70cm 20 w linear/preamp	85.00	1.25
MML432/50	70cm 50 w linear/preamp	109.00	2.00
MML432/100	70cm 100 watt linear	228.65	2.00
MML1296/10	23cm 10 watt linear	199.00	1.25
MMC435/51	70cm ATV converter	37.90	0.75
MMC435/600	70cm ATV converter	27.90	0.75
MTV435	70cm ATV 20 watt tx	149.00	1.25
MM1000	ASCII to morse converter	69.95	1.25
MM1000KB	Morse converter with keyboard	99.95	2.00
MM2001	RTTY to TV converter	189.00	1.25
MM4000	RTTY transceiver	269.00	1.25
MM4000KB	with keyboard	299.00	2.00
MMS1	The MORSETALKER	115.00	1.25
MMS2	Advanced morse trainer	169.00	1.25
MMT28/144	10m transverter	109.00	1.25
MMT70/28	4m transverter	119.95	1.25
MMT70/144	4m transverter	119.95	1.25
MMT144/28	2m transverter	109.95	1.25
MMT432/28-S	70cm transverter	159.95	1.25
MMT432/144-R	70cm transverter	184.00	1.25
MMT1296/144	23cm transverter	184.00	2.00
MMC28/144	10m to 2m converter	29.90	0.75
MMC50/28	6m to 10m converter	29.90	0.75
MMC70/28	4m to 10m converter	29.90	0.75
MMC70/28LO	4m to 10m converter	32.90	0.75
MMC144/28	2m to 10m converter	29.90	0.75
MMC144/28LO	2m to 10m converter	32.90	0.75
MMC432/28-S	70cm to 10m converter	37.90	0.75
MMC432/144-S	70cm to 2m converter	37.90	0.75
MMC1296/28	23cm to 10m converter	34.90	0.75
MMK1296/144	23cm to 2m converter	69.95	0.75
MMK1691/137.5	1691MHz Meteosat converter	129.95	1.25
MMA28	10m low noise preamp	16.95	0.75
MMA144V	2m RF switched preamp	34.90	0.75
MMA1296	23cm low noise preamp	34.90	0.75
MMDO50/500	500MHz digital meter	75.00	0.75
MMD600P	600MHz prescaler	29.90	0.75
MMDP1	Counter amplifier/probe	14.90	0.75
MMF144	2m bandpass filter	11.90	0.75
MMF432	70cm bandpass filter	11.90	0.75
MMR15/10	15dB, 10 watt attenuator	11.90	0.75

DATONG

PC1	General Cov. Converter	137.42	n/c
VLF	VLF converter 28-29MHz coverage	29.90	n/c
FL1	Agile audio filter	79.35	n/c
FL2	Multi-Mode audio filter	89.70	n/c
ASP/B	Automatic r.f. clipper (Trio)	82.80	n/c
ASP/A	Automatic r.f. clipper (Yaesu)	82.80	n/c
D75	Manual r.f. speech clipper	56.35	n/c
D70	Morse Tutor	56.35	n/c
MK	Keyboard morse sender	137.42	n/c
RFA	Broad band pre-amplifier	33.92	n/c
AD270	Active dipole (indoor mounting) 12v DC	47.15	n/c
AD370	Active dipole (outdoor mounting) 12v DC	64.40	n/c
MPU	Mains power unit	6.90	n/c
DC144/28	2 metre converter	39.67	n/c
Codecall 'A'	4000 link programmable codes	32.20	n/c
Codecall 'B'	4000 switch programmable codes	33.92	n/c

JAYBEAM ANTENNAS

10, 15 & 20 metre antennas			
TB3	HF 3 el tribander 1kw	181.70	5.00
VR3	HF Vertical triband 1kw	46.00	4.00
4 metre antennas			
4Y/4M	4 element beam	22.42	4.00
PMH2/4M	2 way phasing harness	13.22	1.50
2 metre antennas			
DC1/WB	Wide band discone (100-470MHz)	41.40	3.00
LR1/2M	Colinear 4·3db	25.87	3.00
LR2/2M	Colinear 2·8db	21.85	3.00
C5/2M	5db glass fibre colinear	47.72	4.00
5Y/2M	5 element yagi	12.07	3.00
8Y/2M	8 element yagi	15.52	3.50
10Y/2M	10 element yagi	33.35	4.00
PBM10/2M	10 element parabeam	39.67	4.00
PBM14/2M	14 element parabeam	48.30	4.00
5XY/2M	Crossed 5 element yagi	24.72	3.50
8XY/2M	Crossed 8 element yagi	31.00	4.00
10XY/2M	Crossed 10 element yagi	40.82	4.00
X6/2M/X12/70cm	dual band crossed yagi	41.40	4.00
PMH/2C	Harness for circular pol.	8.00	1.50
Q4/2M	4 element quad yagi	25.87	3.00
Q6/2M	6 element quad yagi	33.90	4.00
Q8/2M	8 element quad yagi	39.10	4.00
D5/2M	Double 5 slot-fed yagi	21.85	3.00
D8/2M	Double 8 slot-fed yagi	29.32	4.00
SVMK/2M	Kit for vertical pol.	8.00	3.00
UGP/2M	Ground plane	10.90	2.00
HO/2M	Mobile 'halo' head only	5.15	2.00
HM/2M	Mobile 'halo' with 24" mast	5.75	2.00
PMH2/2M	2 way phasing harness	10.90	1.50
PMH4/2M	4 way phasing harness	25.30	1.50
70cm Antennas			
C8/70cm	8db glass fibre colinear	54.00	4.00
D8/70cm	Double 8 slot-fed yagi	22.40	3.00
PBM18/70cm	18 element parabeam yagi	27.60	3.00
PBM24/70cm	24 element parabeam yagi	36.80	4.00
MBM28/70cm	28 el multibeam yagi	18.40	3.00
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PMH2/70cm	2 way phasing harness	9.20	1.50
PMH4/70cm	4 way phasing harness	19.55	1.50
23cm Antennas			
CR23cm	Corner reflector array	39.00	3.00
D15/1296	Double 15 slot-fed yagi	36.80	3.00
PMH2/23cm	2 way phasing harness	27.60	1.50
JAYBEAM Sundries			
DL	Double lashing chimney kit	10.78	3.00
W6	6" wall bracket (1½" mast)	3.00	2.00
W21	21" wall bracket (2" mast)	10.80	3.50
W24HD	24" wall bracket (2" mast)	15.45	4.00
SPM	16' × 1" portable masts	16.35	3.00
PME	4' extension	2.75	3.00
A4	4'6" × 1½" straight	4.30	3.00
A5	5' × 1" straight	2.80	3.00
A9	9' × 1½" straight	8.65	3.00
A10	10' × 2" straight	13.55	3.50
A12	12' × 2" straight	16.20	4.00
A14	14' × 2" straight	18.85	4.00
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JBL59/15	15" jointing sleeve	6.05	2.00

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250 Hirschmann (3 core) suits VHF aerials up to 8 el.	43.00	2.50
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Mosley "Mini-Beam" 20/15/10m 2 el. beam 600 watts	99.00	4.00
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HF5 80-10m vertical 200 watts	48.50	3.50
Radial kit for HF5	30.50	3.00
Jaybeam TB3 HF 3 el tribander beam 2kw	181.70	5.00
Jaybeam VR3 HF vertical 2kw	46.00	4.00
Western DX-5V 5 band 2kw vertical	89.00	3.00
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SX200N	Scanning receiver	260.00	5.00
BEARCAT 220	Scanning receiver	229.00	5.00
TM56B	FM Scanner 12v DC/230v AC	89.00	2.00
Sound Air 008	8 channel FM monitor	39.00	2.00
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ASP3677	Deluxe 2m 3db gain 5/8th wave	15.95	3.00
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20SE	14MHz whip	15.35	3.00
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Crystals for R517		3.00	0.25
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R3	4·0298	8·0597	12·0895	14·9972	18·1343	44·9916
R4	4·0305	8·0611	12·0916	15·0000	18·1375	45·0000
R5	4·0312	8·0625	12·0937	15·0027	18·1406	45·0083
R6	4·0319	8·0638	12·0958	15·0055	18·1437	45·0166
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S11	—	—	12·1062	14·9572	18·1593	44·8583*
S12	—	—	12·1083	14·9555	18·1625	44·8666*
S13	—	—	12·1104	14·9583	18·1656	44·8750*
S14	—	—	12·1125	14·9611	18·1687	44·8833*
S15	—	—	12·1145	14·9638	18·1718	44·8916*
S16	—	—	12·1167	14·9667	18·1750	44·9000*
S17	—	—	12·1187	14·9694	18·1781	44·9083*
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	Price Group	Adjustment Tolerance ppm	Frequency Ranges	Price and Delivery A	B
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	3	200 (total)	30 to 159·999kHz	—	£10.50
	4	200 (total)	160 to 999·999kHz	—	£6.00
	5	50	1·00 to 1·499MHz	£10.50	£6.00
	6	10	1·50 to 1·999MHz	£4.75	£4.40
	7	10	2·00 to 2·599MHz	£4.75	£4.40
	8	10	2·60 to 3·999MHz	£4.55	£4.10
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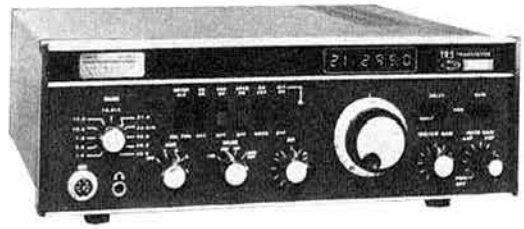

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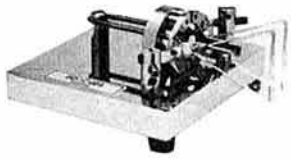

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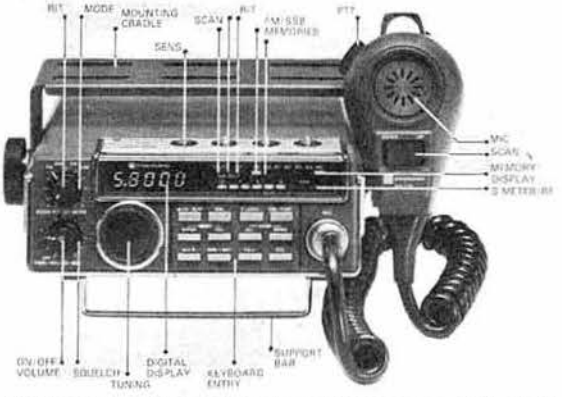

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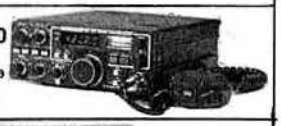

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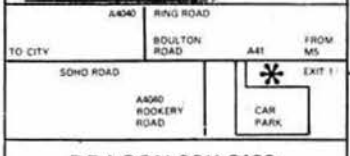

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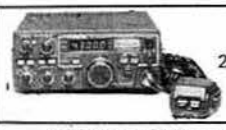

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A NEW AUDIO FILTER FROM DATONG MODEL FL3

Model FL3 gets it all together! It combines all the power of the FL2 which continues in production with a remarkable new automatic notch filter - a concept which we pioneered with our FL1.
In one stylish case Model FL3 offers the complete solution to receiver audio processing. We believe that such a powerful combination of filtering capabilities has never been offered before in one package.

NOTCH FILTER SCANS CONTINUOUSLY

User of our FL1 will confirm the practical advantages of an automatic notch filter. With absolutely no help from you the operator the automatic notch tirelessly scans the receiver's audio output until a continuous audio tone is received. When it is the notch filter locks on and removes it. If the tone changes in frequency the auto-notch follows.

SHOOTS DOWN TUNE-UP WHISTLES AND HETERODYNES

Imagine the benefits. A tune-up whistle no longer causes any problem; after a second or two it simply drops out of ear shot. Those tiresome whistles that occasionally descend on a QSO become a thing of the past. Only the "LOCK" lamp on the FL3's panel reminds you of what you are thankfully missing.

PLUS LOW PASS, HIGH PASS AND MANUAL NOTCH

While all this is happening you still have three other independent filters at your disposal. Imagine, for example that another SSB station starts up 2 kHz high. Instead of trying to copy through all that high-pitched monkey chatter simply wind down the low-pass filter (the right hand knob) and wipe it out.
Then perhaps a teleprinter starts up 300 Hz above your carrier frequency; a touch on the high-pass filter knob (the middle one) cures that.
Finally maybe a second whistle appears. Since the auto-notch is busy, just bring in the manual notch as well and tune it out (left hand knob).

PHENOMENAL SKIRTS WINKLE OUT CW

For CW and RTTY the low-pass, high-pass and manual notch filters combine to give a 12 pole fully variable filter with remarkable skirt selectivity.
Compared with lesser filters you can use a much wider bandwidth for a given interference suppression - this makes tuning easier and reduces ringing effects.

ATTENTION FL2 OWNERS!

At Datong we don't believe in "planned obsolescence". There's no need to throw away your FL2 to get an FL3. Instead you can convert it to an FL3 using our conversion unit, Model FL2/A.
This is a fully assembled PCB module with its own board-mounted "IN/OUT" switch and "LOCK" lamp. Installation involves four soldered connections to the existing FL2 PCB and one track cut.
Model FL2/A is also suitable for building into other equipment where an automatic notch function is required.

FREE HARDWARE KIT

As an introductory offer Model FL2/A will be supplied complete with a punched and printed FL3 front panel to replace the FL2 panel, plus PCB mounting hardware.

TECHNICAL REPRINT OFFER

The filtering in Model FL2 and now in Model FL3 has been carefully conceived to give maximum possible benefit in real life reception conditions. The thinking behind the product design has been described in depth by the designer, Dr D A Tong in "Ham Radio", November 1981. A limited number of reprints of the article are available free on request.

DATONG ELECTRONICS LIMITED

ALL DATONG PRODUCTS ARE DESIGNED AND BUILT IN THE U.K.

PRICES

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

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FL2/A	34.50	(39.67)	AD270 + MPU	45.00	(51.75)	Codecall (Linked)	28.00	(32.20)
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FL2	78.00	(89.70)	MPU	6.00	(6.90)	Basic DF System	149.00	(171.35)
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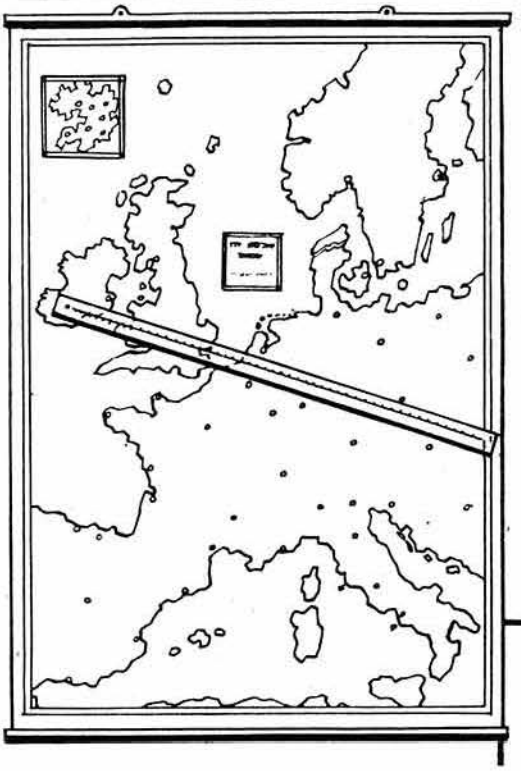

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The following speeds of transmission can be decoded by the MM2001:

RTTY: 45·5, 50, 75, 100 baud
ASCII: 110, 300, 600, 1200 baud

The input stage of this unit is a digital frequency discriminator having two centre frequencies of 1360Hz and 1700Hz, switch selectable. This facility allows reception of all transmissions and standard frequency shifts. The inclusion of a printer output socket (Centronics compatible) allows hard copy of received signals.

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FEATURES:

- ★ 20 Watts PSP output power
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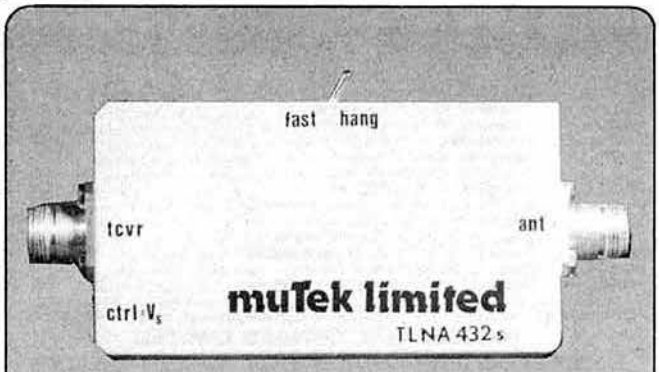

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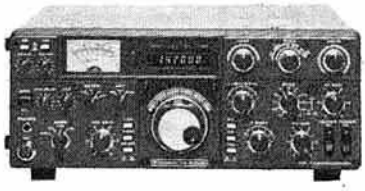

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The FT707 "The Wayfarer" is an ultra-compact solid-state transceiver ideally suited for the home station or as a travelling companion, providing performance previously proffered only by the "Top liners".

For further details of this exciting new system, please contact any authorised sales outlet for a free colour brochure. Better still: *see it for yourself—try one out today!!!*

The FT707 is THE radio of the eighties: 80, 40, 30, 20, 17, 15, 12, 10 metres—100W output (10W 'S' model) 50% developed in 3:1 VSWR—Digital, bright orange LEDs in mode sensitive counter plus analogue readout—Transceiver status at a glance from string LED and 5 single displays—16 poles of crystal filtering provides continuously adjustable IF bandwidth 2·4kHz to 300Hz (N.B. This is true "variable bandwidth" that minimises much of the adjacent channel interference not "IF shift")—Noise blanker of most advanced design using local AGC loop—Schottky diode ring module, power transistor buffers, ultra clean and low noise local oscillator are all combined to produce, size and price notwithstanding a most remarkable receiver.

The illustration to the left shows part of the FT707 System, here neatly mounted in the MR7 rack unit along with a YM35 fist microphone with scanning controls. Alternatively there are two other 600 ohm fist mics, the noise cancelling YM36 or the larger YM37 and the choice of two 50K/600 ohm swan neck desk mics, the standard YM34 or the scanning YM38.

The FC707 ATU can transform loads between 10 and 250 ohms to 50 ohms. An accurate illuminated power meter (15 and 150W FSD) and SWR bridge (to 5:1) plus an inbuilt 150W dummy load complete this attractive package.

The FP707 20 amp supply with inbuilt loudspeaker permits operation from 100-117/200-234V 50/60Hz of the FT707.

The FV707DM is an external digital VFO that uses an advanced twin loop PLL to provide 10Hz tuning steps with excellent spectral purity. The addition of this 1" high package, with its 12 channels of memory with receiver independent tune and internal/external (mic), up/down, fast/slow scanning, perfects the FT707 for mobile or contest use.

The FTV707R transvertor, not shown, takes any one of the standard transvertors for 6, 4, 2 or 70cms.

FT707 Star Features

- ★ 80–10 metres (including 10, 18 and 24 MHz bands)
- ★ USB—LSB—CWW—CWN—AM (Tx and Rx operation)
- ★ All solid state—including "advanced" final amplifier
- ★ 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 from the front panel
- ★ VOX built-in and adjustable from the front panel
- ★ Semi-break in with side tone for excellent CW
- ★ Digital (100Hz) plus analogue frequency display
- ★ LED Level meter reads: S, PO and ALC
- ★ Convenient concentric AF/RF gain controls
- ★ Indicators for: calibrator, fix, int/ext VFO
- ★ Receiver offset tuning (RIT-clarifier) control
- ★ Advanced noise blanker with local loop AGC
- ★ 25kHz crystal calibrator feature
- ★ Internal, xtal or external VFO control

**Option*

WORKING FOR OUR COMMON INTERESTS—at Yaesu Musen communication equipment is not a sideline but the only business. Over 130 licensed amateurs proudly produce the most diverse product line available, SSB, CW, AM or FM for mobile, portable or base use.

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