

July 1983

RADio COMmunication

RSGB NATIONAL MOBILE RALLY

Woburn Abbey, Beds
(Coach Park Site)

From 10am Sunday
7 August 1983



*Photograph of Woburn Abbey reproduced by
kind permission of the Marquis of Tavistock*

- Large trade exhibition
- RSGB bookstall and enquiries stand
- Bring-and-buy stand
- Raynet stand
- BARTG stand
- (All under cover)

Bring-and-buy this year will be charged at £3 per hour per table, which will enable members to sell direct. Tables will be offered on a first-come first-served basis but will not be available before 10am.

The RSGB makes no charge for entrance to the rally but all visitors must pay for entrance to Woburn Park, in which the rally takes place, at £1.70 per car including passengers.

All the normal Woburn attractions will be available at small extra charges. Various bars and cafés are available nearby.

HOW TO GET THERE

Via the M1—Leave the M1 from north or south at intersection 13, not 12 as signposted. After leaving the motorway follow signposts through Husborne Crawley to Woburn Abbey.

From the south via the A5—Turn right at Hockliffe and follow the A50 to Woburn.

From the north via the A5—Turn left at A418, five miles south of Fenny Stratford, and follow to Woburn.

From other directions make for the points indicated above and proceed as indicated.

Avoid routes signposted to "The Wild Animal Kingdom" or "Game Reserve". The rally takes place in Woburn Park and correct routes are signposted to "Woburn Park" or "The Abbey". Also watch for RSGB signs.

Usual talk-in facilities will be in operation by Dunstable Downs RC on 1.8, 70, 144 and 432MHz.

All enquiries regarding this event should be made to Norman Miller, G3MVB, "Avon", Gardiners Lane North, Crays Hill, Billericay, Essex.

Journal of the Radio Society of Great Britain

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1983



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JULY 1983

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Technical articles on subjects of amateur interest are always welcome and should be sent to: The Editor, *Radio Communication*, 88 Broomfield Road, Chelmsford, Essex CM1 1SS.

All articles received are reviewed for technical merit by the RSGB Technical & Publications Committee, or an acknowledged expert on the subject, before acceptance. Payment at high competitive rates will be made for all articles published.

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

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GREAT BRITAIN 1983

the **TR 3500** handheld for those seventy centimetre contacts.

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

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

£250.70 inc VAT carr £6.00



and the **TR 7930** for the two metre mobile operator.

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

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

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

£305.21 inc VAT carr £6.00

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Now from Trio, the R2000 general coverage receiver. By taking all the superb features of the R1000 and combining them with the latest in microprocessor control Trio have, in one step, completely revised the standard by which short wave receivers are judged. Among the many features provided for the discerning listener are programmable scan, memory scan, memory retention of the mode set for a particular frequency and last, but not least, Trio have included an FM mode—why FM after all this time and our repeated comment that for a shortwave broadcast receiver FM is not really necessary. Take a look at the rear panel of the R2000: a socket marked VHF converter. Wouldn't it be superb if Trio produced a VHF converter covering from 118 to 174MHz—then you would require FM, you would also require AM. Study the features and I am sure you will agree the Trio R2000 is the receiver for you.

Continuous Coverage from 150kHz to 30MHz

Front panel up/down band switches allow easy selection within the full coverage of the receiver. The VFO is continually tunable throughout the full 150kHz-30MHz range.

All Modes SSB, CW AM and FM

Ten Memories Store Frequency, Band and Mode Data

Each of the ten memories can be tuned by the VFO, thus operating as ten built in digital VFOs. The original memory frequency can be recalled by simply pressing the appropriate memory channel key. All information on frequency, band, and mode is stored in the selected memory.

The "auto M" switch allows two types of memory storage: when the "auto M" switch is off, data is memorized by pressing the "M in" switch; when the "auto M" switch is on the frequency being used at that time is automatically memorized.

Memory Scan

Scans all memory channels or may be user programmed to scan specific channels. Frequency, band and mode are automatically selected in accordance with the memory channel being scanned.

Programmable Band Scan

Scans automatically within the programmed bandwidth. Memory channels 9 and 0 establish the scan limit frequencies. The hold switch interrupts the scanning process. However, the frequency may be adjusted using the tuning knob whilst in the scan hold position.

Clock Display with Integral Timer

Three Built In Filters with Narrow/Wide Selector

In the AM mode 6kHz wide or 2.7kHz narrow may be selected. In the SSB mode 2.7kHz is automatically selected. In the CW mode 2.7kHz is again chosen and if the optional YG455C filter is installed then 500Hz in the narrow position. In the FM mode 15kHz bandwidth is automatically selected.

Other important features are: squelch on all modes, noise blanker, a large 4 inch front mounted speaker, tone control, RF attenuator, AGC switch, high and low impedance antenna terminals, 13.8 V DC operation, record jack and, of course, provision for a VHF converter. All in all, a truly remarkable receiver.

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"memorable"
the new receiver from Trio.



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 **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.

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

JRC *Japan Radio Co., Ltd.*



The JST100 from the Japan Radio Company is a solid state transceiver built to the high standards as set by JRC for their complete range of products. The JST100 is first and foremost an "Amateur Bands" only rig. Having an extremely high class receiver, the JST100 enables the enthusiast HF operator to clearly hear weak signals under even the poorest of conditions. Having located the weak DX station or your sked contact out of the QRM then the high quality of JRC transmitted audio produces a first class contact.

Those familiar with the Japan Radio Company's previous items of equipment—the NRD505 and 515 general coverage receivers, the NSD515 matching amateur band transmitter, the NDH518 96 channel memory unit and the NCM515 remote controller—will know that the equipment is designed to provide the ultimate in operating satisfaction. The JST100 is built in the same tradition.

JST100 £998.00 inc VAT carr £6.00
NFG97 ATU £150.00 inc VAT carr £6.00
NVA88 SPEAKER £37.50 inc VAT carr £6.00

we recommend the DAIWA range.

		Price inc. VAT	Carr.
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CN540	50-150MHz mini cross needle power/SWR meter	39.50	1.50
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CN620A	1-8-150MHz cross pointer power and SWR meter. Up to 1kW	57.00	2.50
CN630	140-450MHz cross pointer power and SWR meter. Up to 200W	85.00	2.50
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CNW419	1-8-30MHz 200W gen. cov tuning unit	130.00	6.00
CNW919	2M power meter and antenna tuning unit	92.00	2.25
CNA1001A	Fully automatic all band ATU. Includes cross pointer power meter	156.00	6.00
CNA2002	As for CNA1001A but 2kW rating for tuner and power meter	228.00	6.00
ANTENNA ACCESSORIES			
CS201/TW2	Two way 50 ohm coax switch. 0-500MHz	13.95	2.00

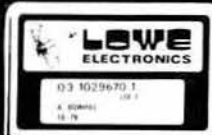
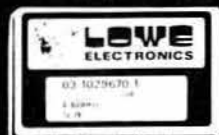
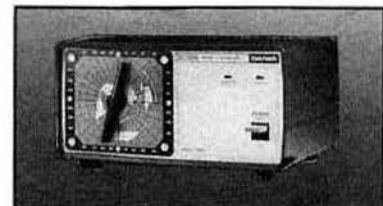
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DR7600R	As for DR7600X but using the DAIWA round controller	176.29	6.00
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PSR1250	Daiba 50A max	338.00	6.00



INFRA-RED MICROPHONE RM940			
S9	New mobile mic with no connections between mic and rig	45.00	2.00
M9	Spare sensor for RM940 mic system	6.50	0.50
F4	Extra mic for RM940 system	13.00	0.50
	Set of four windshields for RM940 mic. Available singly at 75p	3.00	0.50



OBITER DICTA

Good morning

Well, that's another **Low Electronics' shop** complete and on air. Lowe in the North East, as I am sure you are now aware; 56 North Road, Darlington to be precise. Many of you dropped in to see us over the first weekend and, if I say it myself, **seemed pleased**—pleased with the fact that the entire, well almost, Trio range of gear was on show. **So no longer is a photo** and mail order the way for the lads and lasses of the North East. **Drop in and see Don G3GEA** and try the Trio equipment, plus the rest of our products, yourself.

Trio have at last produced the rig for which I have been patiently waiting: **the new Trio TW4000A**. A dual band, 70 centimetres and 2 metres FM mobile. Imagine a rig no bigger than a TR7930 but having both VHF and UHF bands. Using the same green display as the TR7930 and giving 25 watts of Trio perfect audio **for the keen mobile operator** and a dual band FM base station for the HF operator who wishes to keep in touch with the local scene. **For the blind operator** and to aid safer motoring whilst operating, Trio have produced a voice synthesizer to **announce the frequency**. No, the rig will not yet hold a contact for you but those days are, I am sure, not far off.

I have heard a rumour that **the Japanese home market model** actually gives the **frequency in Japanese**—not very good for we English operators. The British version has, I understand, a delightful Japanese young lady with a most **sensual voice**. For XYLS operators no doubt a male voice option will be available. You think I am joking. The voice synthesizer module is an optional extra, the accessory number, I understand, is **VS1**. The TW4000A has one major feature: the controls are each illuminated so no more fiddling in the dark.

What a triumph for Trio. Not only do they have the "affordable" dual band all mode rig they now have an FM dual band mobile. Trio, the amateur radio company producing professional equipment **designed by radio amateurs for radio amateurs**.

More news on the R2000 receiver. The VHF internal converter, 118 to 174 MHz continuous, is almost with us. I would suggest that if you have an R2000 and require the additional frequency coverage then you **ring Anne here at Matlock** and she will put you on the list. No price for the unit is yet known so if it proves to be more than you consider reasonable then you are under no obligation to purchase. But remember many R2000's have been sold, **most people** have expressed a desire for the converter and **initially demand will outstrip supply**.

The JST100 amateur band transceiver is now on display in Matlock, London, Glasgow and Darlington. An absolutely superb piece of equipment giving the enthusiast HF operator a piece of professional equipment. **The receive quality of the JST100 is difficult to describe**. As with other pieces of JRC equipment words cannot convey the feel of the equipment—only by using the rig can the quality be discerned. The transmitted audio is above comment. The speech processor can be used continually and I doubt if anyone listening to your signal could perceive that one was in circuit. **Operating the rig is a joy**: the controls fall to hand with an ease that does not seem possible. Tuning, memories, mode retention by memory, all are designed to make operating a joy. You tune over the band, you hear a station and within a moment you are in QSO. QRM disappears and a satisfying contact is yours. I am surprised that JRC have been able to produce such quality in a rig for the price. **The JST100 by the Japan Radio Company costs £998.00, including VAT**. The power supply costs £145.00, including VAT and is a perfect match in both quality and appearance. In my opinion, for the amateur who wants a transceiver which will give him the ultimate satisfaction in HF operating, **then the JST100 is the rig**.

Just a thought: why do we not have a **novice licence** similar to that of America? I mean, all those G8s and G6s sending morse to themselves seems unhealthy to me. Why not let them use CW on 2 and 70 centimetres. Wouldn't even have to change the band plan and what about

low power novice CW on certain HF bands—**this would seem to me an encouragement to all**. Let us even have a compulsory six months CW only when the Class A ticket is finally in one's possession. As I said, just a thought but what do you think and if you agree, what have you and what are you doing about it.

New from Trio: the MC55 microphone. For mobile operation a goose neck mic and a control box that fits on the gear lever. But not the normal crude metal box with nasty sharp switches with which to remove skin in the event of a mishap. Trio have designed the neatest mobile accessory that I have seen for some time. **The MC55 has mic switch, up down shift and a mic gain control** all built in. The MC55 from Trio at £37.26 including VAT.

The GP23 5/8 over 5/8 over 5/8 2 metre colinear which I mentioned last month, priced at £39.00, is superb. First batch is all sold out, more on the way. **A good quality aerial** at a very reasonable price. 7.8 dB gain over a quarter wave.

I speak to many, many people on the telephone, **and it disturbs me** to find that there are still unfortunate people around who are looking for someone to advise them on servicing their "Kenwood" rig. We've tried to make it as clear as possible that the factory in Japan produces "Trio" brand equipment for sale in the UK, and whilst it's true that some accessories such as loudspeakers may have the Kenwood brand name, the transceivers themselves, HF or VHF or UHF, sold by the approved Trio dealer network all have the brand name "Trio" on the panel. The entire **approved dealer network** has access to all the spares, service, and factory information, via the sole distributor (that's us folks). The dealer who offers you "Kenwood" or "Kenwood-Trio" equipment must be buying rigs designed for some other market, imported via the back door and sold without any factory backing at all. Believe me, if the rig says "Kenwood" on the front panel, don't buy it. Just ask the man who bought a TS830M (which we never import) and tried to fit a CW filter (can't be done), or the man who was amazed to find a 7.6 MHz repeater shift on his back door TS780 or, or, or... Finally, if you have any doubts about who is your nearest approved dealer, just look at the list in all our ads. Anyone not on this list has **no connection** with the factory approved dealer network.

Let me tell you a story. John, our Technical Director, yes the laugh's on him, bought a German car from a genuine trader. Unfortunately, he drove it into the back of another German car. Woebegone he took it back to the place from where it had come. "Sorry sir", the salesman said, "don't repair bent motors only sell them and, of course, do the occasional service" and proceeded to direct John to a mate of his who specialized, under a railway arch, in straightening bent motors. Unbelievable thought John. So the moral of the story is simple: never mind where you bought the rig, **ask to see the service department**, talk to the service chaps, see the spare parts and convince yourself that should your rig fail then assistance is at hand. Our shops in London, Glasgow and Darlington use the now well-known centralized workshop facilities at Matlock. So don't be afraid to ask to see behind the scenes and if you are refused or things don't seem quite right, **then don't buy**.

Before I forget, **the 1983 Open Day is on Saturday, 20th August**. All the usual features—the **RSGB** in the entrance hall with a cheerful smile, **Strummech** on the forecourt, **Practical Wireless** giving away free magazines, **Matlock Band** on the lawn, **Birkett's** bits from Lincoln, **Club 24 girls**, etc. etc. Of course our own girls will be on hand to give you the Lowe Electronics' welcome. Bring the family along for the complete day out.

Anyway, that's about it for now as I've just heard a rumour that David is about to eject **Phil, G6MHT**, for being improperly dressed in the showroom. I know he only came for a PL259 but dressed in a track suit and slippers is not good enough!

Until next time, Gud DXes 73es FBLYS, XYLS, esFBOM, etc.

David

P.S. Thank you Norman in Potters Bar for your recent letter on the FIM 1. Please contact me as somebody will have to write Obiter Dicta whilst I am on holiday.



ANTENNA SWITCH



AF-606K

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PLEASE SPECIFY ANY PARTICULAR INTEREST AND WE WILL SEND FULL INFORMATION

DATONG

New



AUTOMATIC WOODPECKER BLANKER MODEL SRB2

All too often in the past the appearance of the Woodpecker has wiped out that elusive DX, just when it was within your grasp. Now for the first time there is a really effective antidote, and at a highly competitive price.

With Model SRB2 fitted in series with the antenna and loudspeaker of your receiver or transceiver everything is the same until the Woodpecker appears. Then after a few seconds a magical difference becomes apparent; the receiver comes back to life again and you can copy the original signal. What happens is that the receiver's antenna and loudspeaker are momentarily disconnected during each Woodpecker pulse.

No synchronisation, pulse width, or 'in/out' adjustments are required. Instead the blanker's exclusive circuitry (patent applied for) analyses the Woodpeckers signals, and produces blanking signals to suit. It can even remove multiple Woodpeckers at the same time (a situation which occurs fairly often.)

Because blanking occurs at both RF and AF, serious receiver desensitisation is avoided and yet the unit is also effective on AM broadcast signals as well as SSB and CW (of course, if the Woodpecker pulses are very wide then fast CW may become uncopiable).

A built in r.f. activated transmit relay will handle the output for normal HF transceivers and three push button switches are fitted for: power on/off, selectable 10 or 16 Hz pulse rate, and before-and-after comparison. The unit uses the same case design as Model ANF (see this ad.), and a panel LED tells you when the unit is actually blanking. Price: £75.00 plus VAT (£86.25 total). Expected availability early July.

AUTOMATIC NOTCH FILTER MODEL ANF

Model ANF is a unique dual-mode audio filter designed to connect in series with a receiver's loud speaker.

As an automatic notch filter it will make a continuous tone disappear within about half a second. You just leave it permanently in circuit and forget about problems from 'tuner-uppers'.

As a CW filter its 4 pole tunable filter dramatically pulls out weak signals from noise.

At all times the 10 LED bargraph-type display shows the filter's centre frequency. In auto-notch mode for example, you can see the notch filter sweeping over the full tuning range every second, until it finds a tone to notch out.

Performance is independent of receiver volume setting thanks to a built-in compressor chip, and the notch depth is typically well over 40 db. Price: £59.00 plus VAT (£67.85 total). Available now. Free data sheet on request.



AUDIO FILTERS MODELS FL2, FL3, FL2/A

Model FL3 represents the ultimate in audio filters for SSB and CW. Connected in series with the loudspeaker, it gives variable extra selectivity better than a whole bank of expensive crystal filters. In addition it contains an automatic notch filter which can remove a 'tuner-upper' all by itself.

Model FL2 is exactly the same but without the auto-notch.

Any existing or new FL2 can be up-graded to an FL3 by adding Model FL2/A conversion kit, which is a fully tested auto-notch module in P.C.B. form.

Datong filters frequently allow continued copy when otherwise a QSO would have to be abandoned.

Prices: FL2 £78.00 with VAT £89.70, FL3 £112.50 with VAT £129.37, FL2/A £34.00 with VAT £39.67



COMPACT RECEIVING ANTENNAS MODELS AD270/370

Datong Active Antennas solve the age-old problem of finding space for a 'good' receiving aerial. Model AD370 mounted on a roof top or Model AD270 in a loft will give similar sensitivity to much larger conventional aerials yet are only 2 1/2 and 3 metres long respectively. Moreover they do not suffer from interference picked up by the feeder cable; such pick-up can be a problem with conventional dipoles because it is hard to maintain good balance over a band of frequencies.

Although active antennas were introduced to the amateur market by Datong only a few years ago they have long been used by military and commercial receiving stations. The performance specifications achieved by the Datong AD270/370 are very close to those of 'professional' active antennas selling for ten times the price - a point which is not lost on our many professional customers.

The advanced design ensures two things: that you don't miss signals through inadequate sensitivity and that the antenna does not invent signals which are not there.

Datong Active Antennas represent an advanced solution to a common problem and so far as we know have no serious competition in terms of performance at the price. (Reviewed in Rad. Com., June 1982).

AD270 £41.00 with VAT £47.15 AD370 £56.00 with VAT £64.40



MODEL AD370 HEAD UNIT

commercial receiving stations. The performance specifications achieved by the Datong AD270/370 are very close to those of 'professional' active antennas selling for ten times the price - a point which is not lost on our many professional customers.

The advanced design ensures two things: that you don't miss signals through inadequate sensitivity and that the antenna does not invent signals which are not there.

Datong Active Antennas represent an advanced solution to a common problem and so far as we know have no serious competition in terms of performance at the price. (Reviewed in Rad. Com., June 1982).

AD270 £41.00 with VAT £47.15 AD370 £56.00 with VAT £64.40

GENERAL COVERAGE RECEIVER CONVERTER MODEL PC1

Once upon a time it was the norm to use a ten metre receiver to receive the two metre band. Now, large numbers of special purpose two metre SSB rigs are in use and conversion the other way becomes a very attractive possibility.

With the addition of Model PC1 each of these two metre SSB rigs becomes a really good general coverage receiver (from 50 kHz to 30MHz!).

Two metre SSB rigs are not cheap and it makes good sense to get the most out of them. They also tend to have very good performance in terms of sensitivity, selectivity, and big signal handling. Each of these features is just as vital for short wave reception and Model PC1 is designed not to degrade them at all. The result, your two metre SSB rig receives below 30 MHz as well as it receives on two metres. And compared to many medium cost general coverage sets, that is saying a lot!

Try this test. Listen on twenty metres after the band goes dead in the evening. With many general coverage receivers the band never dies. It remains populated with phantoms generated by the receiver from the many very strong signals on forty metres. This is the kind of effect that the higher quality receivers minimise, and that goes for PC1 plus a good two metre rig. Reviewer: Rad. Com., April 1982.

MODEL PC1



PC-1 £119.50 with VAT £137.42



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.

FL3	112.50	(129.37)	AD370	56.00	(64.40)	Codecall (Linked)	28.00	(32.20)
FL2/A	34.00	(39.67)	AD270+MPU	45.00	(51.75)	Codecall (Switched)	29.50	(33.92)
FL1	69.00	(79.35)	AD370+MPU	60.00	(69.00)	Basic DF System	149.00	(171.35)
FL2	78.00	(89.70)	MPU	6.00	(6.90)	Basic Mobile		
PC1	119.50	(137.42)	DC144/28			DF System	159.00	(182.85)
ASP	72.00	(82.80)	Module	28.00	(32.20)	Complete Mobile DF System	214.00	(246.10)
VLF	26.00	(29.90)	Keyboard Morse	119.50	(137.42)	PTS1	39.99	(45.99)
D70	49.00	(56.35)	Sender			Model ANF	59.00	(67.85)
D75	49.00	(56.35)	RFA	29.50	(33.92)			
RFC/M	26.00	(29.90)	Model SRB2	75.00	(86.25)			
AD270	41.00	(47.15)						

Access Orders
Tel: (0532) 552461

Data sheets on any products available free on request -

DATONG ELECTRONICS LIMITED

Dept R.S.G.B., Spence Mills, Mill Lane, Bramley, Leeds LS13 3HE, England. Tel: (0532) 552461

Than E.T.

COMMUNICATION AT YOUR FINGER TIPS



IC-R70

As we expected, the R70 is a real winner.

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

Other R-70 features include: input switchability 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.

The R-70 also has separate antenna sockets for LW-MW with automatic switching, and a large, front mounted loudspeaker with 5.8W output. The frequency stability for the 1st. hour is ± 50 Hz, sensitivity-SSB/CW/RTTY better than $0.32 \mu\text{V}$ for 12dB (S+N)-N, Am-0.5 μV , FM better than 0.32 for 12dB Sinad. DC is optional on the R-70. It has a built-in mains supply.

The IC-R70 measures 286mm x 110mm x 276mm and weighs 7.4Kg., making it a very attractive package indeed. Are you ready for this truly excellent receiver? You must hear it, we know you will be impressed!



IC-740

This 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.

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. 10 independent receiver and 6 transmitter front panel adjustments.

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

Options include:

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

Accessories:

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

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Than E.T.

YOU'LL MEET THE MOST INTERESTING PEOPLE

IC-25E



The FM mobile of choice has to be the ICOM IC-25E. It is amazingly small yet has a powerful voice (25 Watts) and a sensitive receiver. There are five easily programmable memories and facilities for changing the repeater shift from the default value of 600kHz. You can tune the VFO while in a memory without losing or changing the memory. Of course you can instantly listen on the input and there are also priority channel facilities should you want to be sure of not missing that private message. The HM10 scanning mike is supplied as standard, but the HM11, with tone call on the mike, can be used.

290H . 490E



The recently introduced IC-290H has proved so popular that we have decided to concentrate on this (25W) model 2m multimode. With its bright green display, 5 memories, scan facilities on either memories or the whole band, tone-call button on the microphone and instant listen input for repeaters, this little box really is a beauty. The 70cm version, the IC-490E has similar features (although the output is only 10W in this case). These two multimodes make an ideal pair.

IC-2E . IC-4E

A full range of accessories in stock.



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 1/4 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.

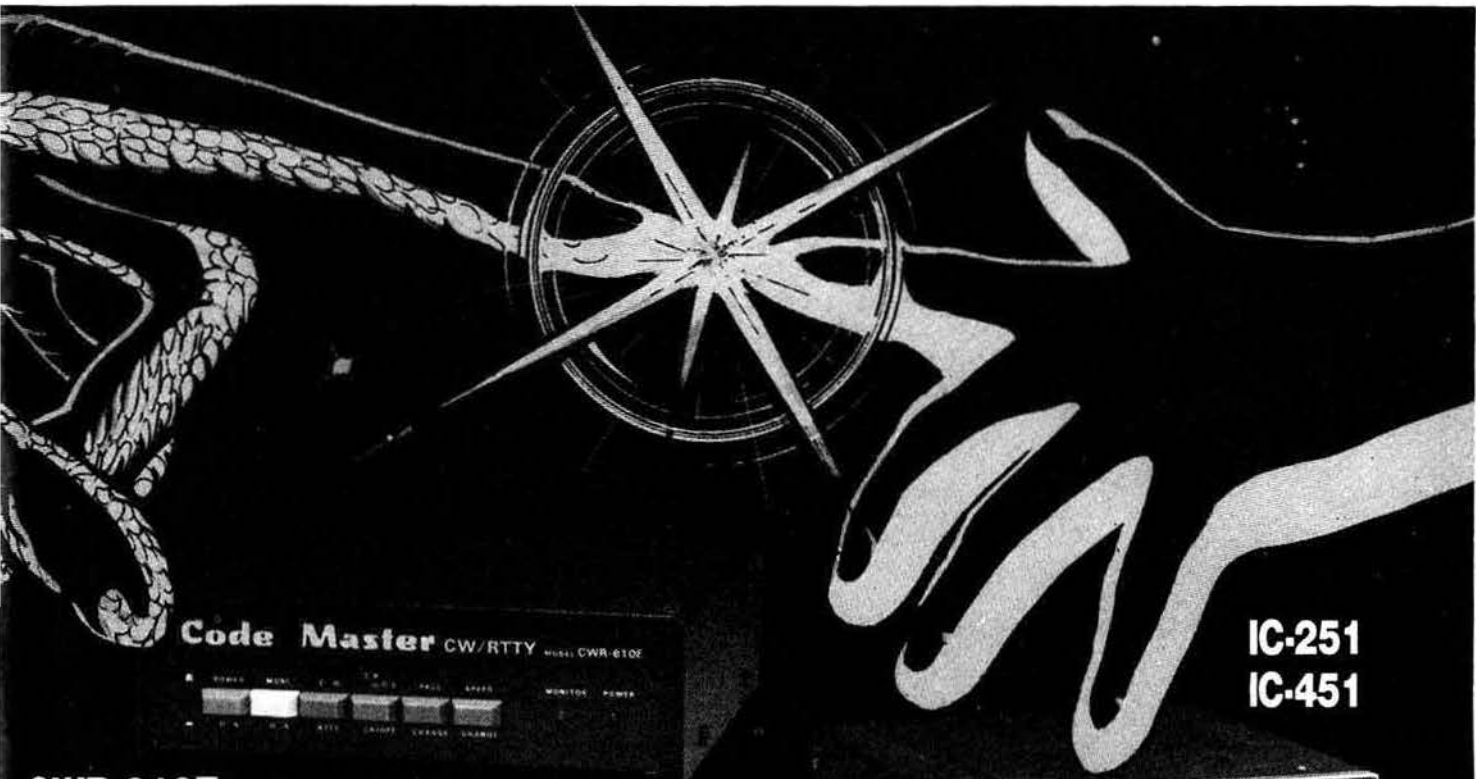
Duplex simplex switch – gives simplex or plus 600KHz or minus 600KHz transmit (1.6MHz and listen input on 4E).

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.

Thanet ICOM Thanet ICOM Thanet ICOM Thanet ICOM Thanet ICOM Thanet ICOM Thanet ICOM



Code Master CW/RTTY MODEL CWR-610E



IC-251
IC-451

CWR-610E

As UK importers of TELEREADER and TONO products we can offer you a wide range of devices from a simple morse and RTTY reader which can be plugged into your TV to complete send and receive systems with memories and built-in displays or outputs for a high definition VDU. MR-250, 9000E, CWR-670, CWR-685E and CWR-610E. Please call us for further details or visit us or your dealer for a demonstration.



9000E

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

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

Listed below are other sets available from Thanet Electronics, a more detailed specification of these will appear in future advertisements, prices are inclusive of VAT IC-730, IC-720, IC-2KL + PSU, IC-PS15, IC-ML1, IC-505, IC-SP3, IC-AT500, IC490, IC-AT100, IC-551, IC-PS20.



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 2 Meter station and the 451E for 70 cms.

Agents (phone first — all evenings and weekends only except Scotland)

Scotland — Jack GM8 GEC (031 665 2420)

North West — Gordon G3LEQ Knutsford (0565) 4040 Ansalone available

Dealers

Tyrone Amateur Electronics N Ireland (0662) 2043
Bredhurst Electronics Sussex (0444) 400786

Photo-Acoustics Ltd Bucks (0908) 610625 LAM Electronics Glos (0242) 43891

S & S Amateur Radio Lancs (07) 744 22239 Leeds Amateur Radio (0532) 782224

Radcom Electronics Co Cork 021-632725 Booth Holdings Avon (02217) 2402

Dial operator from U.K. Axdon Perth Scotland (0738) 23753

Alyntronic Tyne & Wear (0632) 761002 Telecom S Yorks (0226) 5031

Fanthorpes Humberside (0482) 223096 Gemini Lancs (0204) 652233

Wisbech Amateur Radio (0945) 581099 Poole Logic (0202) 683093

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Same day if possible

Thanet Electronics
143 Reculver Road, Herne Bay, Kent
Tel: (02273) 63859/63850

NEW!

Standard C110 handheld

AT LAST we can give you details



Specification

General

Frequency:	144-146MHz
Frequency Steps	25/5KHz
Size:	65 x 167 x 32mm
Weight with battery	420gm
Operation Voltage:	5.5-11VDC
Batteries:	AA Drycell/AA Nicads or Nicad Pack CNB110

Power

Consumption:	20mA standby Max: 650mA Transmit
--------------	--

Receiver

Sensitivity:	-6dB at 20dB S/N
Squelch sensitivity	-8dB at 12dB SINAD - 12dB
Audio Output	300mW

Transmit

Low Power	150mW
High Power	See chart

Type of Battery

6-AA Duracells	2.5W
6-AA Dry Cells	2.2W
6-AA Nicads	2.0W
*CNB110 High Power Pack	3.5W

RF Output

Accessories

6 x AA Nicads + Wall Charger	£12.50
CLC110 Carry Case	£6.75
12 Volt Car Adaptor	£7.95
CSA Base Charger (for CNB110)	£30.00
*CNB110 High Power Nicad Pack	£30.00

Special Features

- *Battery/Signal on receive/RF Power/Meter
- *Meter illumination for night use
- *Automatic Tone Burst on repeater Shift
- *Compact size
- *Large range of accessories

£139.95!! (inc VAT + Carriage)

The above unit is supplied complete with wrist strap, helical antenna + battery holder for either drycell or rechargeable batteries.

Available from stock NOW

400 EDGWARE ROAD,
LONDON W2
01-723 5521 Tlx 298765



Please allow up to
14 days for delivery

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9.30am-1pm Thurs.
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When you buy from Amateur Electronics UK you are dealing with a **FACTORY APPOINTED IMPORTER** with the largest stocks of equipment and spares in the country. Our delivery and after-sales-service is second to none and for your convenience we offer the following facilities ● On-the-spot credit sales (against recognised bank or credit cards) ● Interest free finance (50% deposit - balance over 12 months) ● Free Securicor delivery on all major items ● **FACTORY BACKED EQUIPMENT** - write or phone for all the details.

YAESU - Latest...

Latest news from YAESU - Expected in August is the new FT-757GX all-mode HF transceiver - 160 thru ten

of course plus general coverage RX. FM and all options fitted including dual VFO's, eight memories, programmable memory scan, full break-

in on CW, 100 watts PEP/DC output at 100% duty cycle and all this in a package measuring 238W x 93H x 238Dmm!

KEEP AHEAD WITH THE YAESU FT-102!

- Better Dynamic Range ● Total IF Flexibility
- New Noise Blanker
- Commercial Quality Transmitter
- Transmitter Audio Tailoring ● New VFO Design
- IF Transmit Monitor ● New TX Purity Standard

ANCILLARY EQUIPMENT

SP-102 EXTERNAL SPEAKER/AUDIO FILTER
FC-102 1.2 KW ANTENNA COUPLER
FV-102DM SYNTHESIZED, SCANNING EXTERNAL VFO



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.

FT-780R/208R SYNTHESIZED UHF/VHF TRANSCEIVERS

- NC-7 - Standard charger
- NC-8 - Standard/quick charger/DC Power supply
- NC-9C - Compact charger (220-234V)
- PA-3 - Car adapter
- YM-24A - Speaker/microphone
- FL-2010 - 10 watt power amplifier for FT-208R
- FL-7010 - 10 watt power amplifier for FT-708R



FT-290R/790R 2m & 70cm PORTABLES

10 memories, 2 VFO's, LCD display, C size battery, easy car mounting tray. FT-290R 0.5 low/2.5 high watts out FT-790R 0.2 low/1.0 high watts out (incorporates speech compressor).



FT-230R/730R 2m & 70cm FM MOBILES

- Two independent VFO's ● 10 memories
- Priority function ● Memory and band scan
- 12.5/25KHz steps (25/100KHz FT-730R)
- Large LCD readout.

FT-480R/780R 2m & 70cm MOBILES

The most advanced 2 metre and 70 cm mobiles available today — USB, LSB, FM, CW full scanning with priority channel, 4 memory channel, dual synthesized VFO system.





AMATEUR ELECTRONICS UK

Your number one source
for YAESU MUSEN



THE SYMBOL
OF TECHNICAL
EXCELLENCE

FT-980 ALL MODE HF CAT *

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

Additional controls include IF Width and Shift on concentric controls, AMGC (Automatic Mic Gain Control) to set microphone input threshold, RF Speech Processor, ALC Meter Hold function, IF Notch and Audio Peak filters, Transmit Monitor, Noise Blanker and CW Full Break-in. Controls



* Computer-Aided Transceiver

are also provided for FM Squelch and CW Keyer Speed when the optional FM and Keyer Units are installed.

The most important feature of the FT-980 is that practically all of the above features can be controlled by the user's separate personal computer, when connected through an optional Interface, also available from Yaesu. Where up to now the

few amateur transceivers that offered any kind of computer interfacing at all permitted only frequency control, the FT-980 permits almost total control of all functions from a separate micro-computer, including Mode; IF Width and Shift; Scanner Step, Speed and Limits; and switching of most other functions. (Microcomputers are not available from Yaesu.)

FT-77 THRIFTY HF TRANSCEIVER



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

Thrifty

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

Simple

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

Reliable

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

Expandable

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

*Computer Aided Design/Computer Aided Manufacture

FT-726R VHF/UHF Multi- bander



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

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

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

AGENTS

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

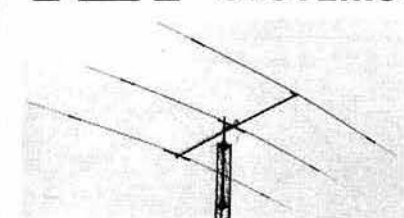
For full details of these new and exciting models, send today for our latest SHORT FORM CATALOGUE. All you need do to obtain the latest information about these exciting developments from the World's No.1 manufacturer of amateur radio equipment is to send 36p in stamps and as an added bonus you will get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

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fast sure service right through -

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BY CREDIT CARD OR CHEQUE

TET ANTENNA SYSTEMS



AX210N	10 ele. yagi for 2m crossed	74.95	(n/c)
HB10F2T	2 ele. 10m mono band beam	51.50	(n/c)
HB10F3T	3 ele. 10m mono band beam	74.95	(n/c)
HB15F2T	2 ele. 15m mono band beam	60.66	(n/c)
HB15F3T	3 ele. 15m mono band beam	93.46	(n/c)
HB15M25P	VP mini size 15m 2 ele.	69.50	(n/c)
HB15M35P	VP mini size 15m 3 ele.	102.30	(n/c)
HB34D	4 ele. tri band beam 10/15/20m	222.90	(n/c)
HB33SP	3 ele. tri band beam 10/15/20m	192.50	(n/c)
HB35C	Tri band array 10/15/20m	283.95	(n/c)
HB35T	5 ele. 10/15/20m	278.50	(n/c)
MV38H	Vertical for 10/15/20m	37.99	(n/c)
MV48H	Vertical for 10/15/20/40m	48.90	(n/c)
MV58H	Vertical for 10/15/20/40/80m	63.95	(n/c)
MLA4	Loop antenna 10/15/40/80	105.60	(n/c)
SO22	Phased 2 ele. swiss quad 2m	58.95	(n/c)
SOY06	6 ele. quagi 2m	45.75	(n/c)
SOY08	8 ele. quagi 2m	52.75	(n/c)
HB210S	10 ele. dual driven yagi 2m	47.99	(n/c)
TE214	14 ele. long yagi 2m	74.40	(n/c)
SSL720	9 x 2 ele. (18) slot fed 70cm	77.20	(n/c)
HB23SP	2 ele. tri band beam 10/15/20m	135.60	(n/c)
SSL218	9 x 2 ele. (18) slot fed 2m	144.79	(n/c)
TPH2	Phasing harness 2m	17.25	(n/c)
QYU10	10 ele. quagi 70cm	67.90	(n/c)
SOQ07	70cm 2 ele. phased swiss quad	66.99	(n/c)
SO10	Swiss quad 10m	97.50	(n/c)
SO15	Swiss quad 15m	106.90	(n/c)

YAESU ANTENNAS

Besa			
RSL145GP	1/2 wave base ant. 2m	21.20	(1.50)
RSL435GP	1/2 wave co-linear 70cm	31.60	(1.50)
HF Mobile			
RSL3.5	3.5MHz resonator & whip	12.21	(0.50)
RSL7.0	7.0MHz resonator & whip	11.80	(0.50)
RSL14.0	14.0MHz resonator & whip	11.45	(0.50)
RSL21.0	21.0MHz resonator & whip	11.20	(0.50)
RSL28.0	28.0MHz resonator & whip	11.00	(0.50)
RSL2A	Mast to suit above	5.00	(0.50)
RSM2	Gutter mount/Feeder/PL259 suit above	10.94	(0.75)

VHF Mobile			
RSL145	2m 1/2 wave fibreglass whip	12.10	(0.50)
RSL145S	2m 1/2 wave steel whip foldover	9.25	(0.50)
RSL150SS	2m 1/2 wave PL259 shock spring	3.90	(0.50)
RSM2	Gutter mount/Feeder/PL259 (RSL145)	10.94	(0.75)
RSM4M	Heavy duty mag/Feeder/PL259	13.25	(1.00)

UHF Mobile			
RSL453S	1/2 wave antenna	15.50	(0.50)

ANTIFERENCE ANTENNAS

VHF Mobile			
TAP3009	1/2 wave 3db snap-in hinged whip	13.00	(3.00)
TAP3677	1/2 wave 3db snap-in shock coil	14.56	(3.00)
TAP3002	1/2 wave unity gain snap-in hinged whip	9.96	(3.00)

UHF Mobile			
TAP3462	1/2 over 1/2 wave 3db	16.86	(3.00)
TAP3697	1/2 over 1/2 wave 5db	20.00	(3.00)
K220	Mag mount/Feeder to suit above	11.96	(2.00)

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504-516 Alum Rock Road · Birmingham 8
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Antennas Various/Accessories

HQ1	Mini beam 10/15/20m 2 ele. 1kW	139.00	(4.00)
C4	Vertical 10/15/20m	48.50	(3.00)
G4MH	Mini beam 10/15/20	88.00	(4.00)
KTLM-4	Gutter mount/Cable assy. SO239	6.90	(0.50)

DATONG PRODUCTS

PC1	50KHz to 30MHz receive converter	137.42	(0.50)
VLF	Very low freq. converter	29.90	(0.50)
FL1	Frequency agile audio filter	79.35	(0.50)
FL2	Multimode audio filter	89.70	(0.50)
ASP/A	Auto RF speech clipper (YAESU)	82.80	(0.50)
ASP/B	Auto RF speech clipper (TRIO)	89.70	(0.50)
D75	Manual RF speech clipper	56.35	(0.50)
RFC/M	RF speech clipper module	29.90	(0.50)
D70	Morse tutor	56.35	(0.50)
AD270	Active dipole RX ant. (indoor)	47.15	(0.50)
AD370	Active dipole RX ant. (outdoor)	64.40	(0.50)
MK	Morse keyboard	137.42	(0.50)
DC144/28	2m converter	39.67	(0.50)
RFA	Broadband preamplifier	33.92	(0.50)
MPU	Mains power unit	6.90	(0.50)

MICROWAVE MODULES

Transverters			
MMT28/144	10m transverter	109.95	(2.50)
MMT70/144	4m transverter	119.95	(2.50)
MMT432/144R	70cm transverter	184.00	(2.50)
MMT1296/144	23cm transverter	184.00	(3.00)
MMT70/28	4m transverter	119.95	(2.50)
MMT144/28	2m transverter	109.95	(2.50)
MMT432/28S	70cm transverter	159.95	(2.50)

Linear Amplifiers

MML28/100S	10m 100W linear amp.	129.95	(3.00)
MML70/50S	4m 50W linear amp.	85.00	(2.50)
MML70/100S	4m 100W linear amp.	139.95	(3.00)
MML144/30LS	2m 30W linear amp. 1-3W in	69.95	(2.50)
MML144/50S	2m 50W linear amp.	85.00	(2.50)
MML144/100LS	2m 100W linear 1-3W in	159.95	(3.00)
MML144/100S	2m 100W linear 10W in	139.95	(3.00)
MML432/50	70cm 50W linear amp.	109.95	(3.00)
MML432/100	70cm 100W linear amp.	228.65	(4.00)
MML1296/10	23cm 10W linear amp.	199.00	(2.50)
MML432/30	70cm 30W linear amp. 1-3W in	99.00	(3.00)

Converters

MM1000KB	ASC11 morse converter with keyboard	99.95	(3.00)
MM4001	RTTY to TV converter	189.00	(2.50)
MM4001KB	RTTY transceiver	269.00	(2.50)
MM4000KB	RTTY transceiver with keyboard	299.00	(4.00)
MMC28/144	6m to 2m converter	29.90	(1.00)
MMC50/28	4m to 10m converter	29.90	(1.00)
MMC70/28	4m to 10m with LO	32.90	(1.00)
MMC70/28LO	4m to 10m with LO	37.90	(1.00)
MMC432/28S	70cm to 10m converter	37.90	(1.00)
MMC432/144S	70cm to 2m converter	27.90	(1.00)
MMC435/600	UHF ATV converter	34.90	(1.00)
MMC1296/28	23cm to 10m converter	69.95	(1.00)
MMC1296/144	1296MHz low noise converter	129.95	(2.50)
MMK1691/137.5	1691MHz meteorite converter	129.95	(2.50)

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MMS2	Morse tutor (advanced) 6-32WPM + speak back	169.00	(2.50)

Amateur TV

MTV435	70cm 20W (PSP) transmitter	149.00	(2.50)
MMC435/600	Converter ATV UHF output	27.90	(1.00)

Preamplifiers

MMA144V	2m preamp RF switched	34.90	(1.00)
MMA28	10m preamp	16.95	(1.00)
MMA1296	23cm preamp	34.90	(1.00)

Frequency Counters

MMD650/500	500MHz digital meter	75.00	(1.00)
MMD600P	600MHz pre scaler	29.90	(1.00)
MMDP-1	Probe	14.90	(0.50)

Filters

MMF144	2m band pass 40W max.	11.90	(1.00)
MMF452	70cm band pass 40W max.	11.90	(1.00)

Various

MMS384	384MHz signal source	29.90	(1.00)
MMR15/10	15db 10W attenuator	11.90	(1.00)

HI-MOUNT MORSE KEYS

HK702	Up down keyer marble base	24.50	(0.50)
HK704	Up down keyer	16.88	(0.50)
HK705	Up down keyer	12.50	(0.50)
HK706	Up down keyer	13.75	(0.50)
HK708	Up down keyer	11.96	(0.50)
HK808	Up down keyer marble base	39.57	(0.50)
MK704	Twin paddle keyer	10.95	(0.50)
MK705	Twin paddle keyer marble base	22.00	(0.50)

MOULDINGS

IK	Iambic keyer	19.95	(0.50)
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HC150	HF ATU SWR/Power meter	200W PEP	62.50	(n/c)
HC2000	HF 2kW ATU SWR/Power meter	6 POS ant. switch. 6 to 1 vernier high Q coils 2kW peak 1kW continuous	276.55	(n/c)

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9502	Channel master med duty up to 8 ele.	57.00	(3.50)
9523	Alignment bearing for 9502	15.81	(1.25)
KR400	Med/Heavy duty 180° meter	90.85	(3.50)
KR400RC	Med/Heavy duty 360° meter Load 200Kg 1 1/2"-2" masts	114.94	(3.50)
CASTING	Lower casting set	15.00	(1.25)
KR600RC	Heavy duty 360° meter Load 200Kg Rot600Kg/cm Blake 4000Kg/cm 1 1/2"-2" masts	163.30	(3.50)

Antenna Switches

SA450	SO239 connectors 1 in 2 out	9.75	(0.50)
SA450N	"N" type connectors 1 in 2 out	12.75	(0.50)

Baluns

BL50A	RAK 50 ohm ferrite BALUN 1:1 1.8-38MHz 1kW	12.88	(1.50)
BL-40X	Balun 2K PEP 1.1	11.52	(1.50)

Dummy Loads

T30	30W DC 500MHz PL259	6.61	(0.50)
T100	100W DC 500MHz SO239	20.12	(1.00)
T200	200W DC 500MHz SO239	31.36	(1.50)
T210	Wide band 10W 1.2G-2.4G	24.50	(0.75)
AW05	Pocket RF wattmeter 5W up to 500MHz BNC	19.75	(1.00)

DRAE PRODUCTS

DRAE4	4 amp PSU	30.75	(2.00)
DRAE6	6 amp PSU	48.00	(2.50)
DRAE12	12 amp PSU	74.00	(3.00)
DRAE24	24 amp PSU	105.00	(4.00)
DRAE WM	135-450MHz wavemeter	27.50	(1.00)

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N58	"N" Male connector RG58	2.25	(0.25)
N8	"N" Male connector RG8	2.40	(0.25)
N308	"N" T adaptor (three female)	2.40	(0.25)
N307	"N" L adaptor (1 male 1 female)	2.40	(0.25)
N306	"N" Double female adaptor	1.90	(0.25)
N310	"N" Double male adaptor	2.50	(0.25)
NB304	"N" Female to BNC male adaptor	2.10	(0.25)
N402	"N" Plug to SO239	2.05	(0.25)
N403	"N" Socket to PL259	2.00	(0.25)
N404	"N" Socket to SO239	1.80	(0.25)

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HL32V	VHF 30W linear 1-5W drive HI-LOW output	53.50	(n/c)
HL82V	VHF linear preamp output meter 2-12W in 35-85+ out	144.50	(n/c)
HL160V	VHF linear preamp output meter 1-10W in 160W+ out	242.40	(n/c)
HL45U	UHF linear preamp 2-15W in 10-45W out	119.75	(n/c)

YAESU

YH55	Headphones Low Z	10.00	(0.50)
YH77	Lightweight headphones Low Z	10.00	(0.50)



SWR/Power Meters

YAESU			
YS200		52.90	(n/c)
YS2000		69.79	(n/c)
Other Makes			
RF2000	Twin meter 3.5-150MHz F/Scale 200/2000W	18.25	(1.00)
YM1X	Twin meter 3.5-150MHz F/Scale 12 or 120W	14.99	(1.00)

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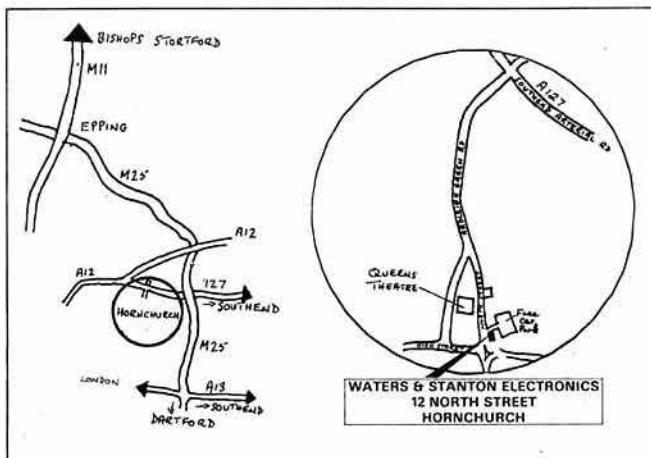
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- Remote control microphone with priority memory call.
- Comprehensive scanning facility. One or both memory banks may be scanned. In addition each 1MHz segment can be scanned or upper and lower limits may be set within that 1MHz segment all with 5 second pause.
- High power output of 25 watts with 5 watts low power position.
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NEW

- Full coverage of 144 to 148 MHz in 5kHz steps
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All solid state.
9 bands + Gen.
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* A new generation of HF transceivers from TRIO ★ SSB, CW, AM plus FM option ★ All mode squelch control ★ Gen. coverage on receive and transmit 150kHz-30MHz ★ Dual VFO's and 8 memory channels ★ programmable band scan ★ IF shift and tuneable notch filter ★ speech processor etc, etc. We could go on but maybe you should send for full details or come and see our demo model in action.

THE ULTIMATE TS930S HF RIG



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250 watts input.
9 bands + Gen.
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AC Variable
selectivity

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150kHz-30MHz
12v DC/230v AC
10 Memories
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Model	Output voltage	Continuous current	Max current	Price inc VAT
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RS-655	DC 3-15V variable	DC 6A	DC 6-5A	£59
RS-1100	DC 13-8V	DC 10A	DC 11A	£75
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SP200	1-8-160 MHz 0-20, 200, 1000 watts 2 ant inputs	£69.95
SP400	130-500 MHz 0-5, 20, 150 watts N connectors	£69.95

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CA-35A

£10.75
(post 75p)

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★ Trios latest all-mode transceiver for 2m is proving a real winner
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★ 25W FM - SSB - CW ★ 25, 12½ and 1kHz steps on FM ★ 5kHz and 100Hz steps on SSB.
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9 bands
100 watts output
230V AC

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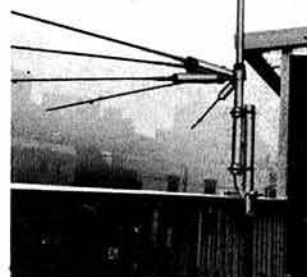
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Receiver 1.8-30MHz
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MML144/100-HS

**100 WATTS OUT FOR
25 WATTS IN**
To suit the many New Generation
transceivers having 25 Watts output
Phone for further details



MML144/100-S

INPUT POWER	OUTPUT POWER (R.M.S.)	MODES OF OPERATION	PRODUCT	PREAMPLIFIER		POWER REQUIREMENTS	RF VOX	CONNECTORS
				GAIN	N.F.			
1 or 3W	30W	SSB	MML144/30-LS	12dB	< 1.5dB	13.8V @ 4A	✓	SO239
10W	50W	FM	MML144/50-S			13.8V @ 6A	✓	SO239
10W	100W	AM	MML144/100-S			13.8V @ 12A	✓	SO239
1 or 3W	100W	CW	MML144/100-LS			13.8V @ 14A	✓	SO239

PRICES (inc VAT)

MML144/30-LS	: £69.95	(p + p £2.50)
MML144/50-S	: £85.00	(p + p £2.50)
MML144/100-S	: £139.95	(p + p £3.00)
MML144/100-HS	: £145.95	(p + p £3.00)
MML144/100-LS	: £159.95	(p + p £3.00)
MML432/30-L	: £99.00	(p + p £3.00)
MML432/50	: £109.95	(p + p £3.00)
MML432/100	: £228.65	(p + p £4.00)

This advertisement represents a cross-section of our extensive range of linear power amplifiers currently available for the 144 and 432 MHz band.

We offer the widest choice of superb quality, British-made products, to suit virtually all transceivers, from hand-held to base station models, and provide guaranteed value for money. **ALL OF OUR PRODUCTS ARE FULLY GUARANTEED FOR 12 MONTHS—INCLUDING PA TRANSISTORS.**

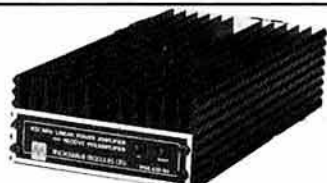
Although cheaper amplifiers have appeared on the market, we seriously advise the potential buyer to consider the following points:

- 1 Has the Company manufacturing the product been in business since 1969?
 - 2 Is the product manufactured solely in the U.K.? If not what happens when you need service facilities?
 - 3 Does the amplifier you are considering have a "realistic" power output specification? Be sure to check if the power rating is RMS or PEP!
 - 4 Is the product fully guaranteed for 12 months—INCLUDING PA DEVICES?
- If the answer to any of these questions is No, then you should telephone us immediately for help!

INPUT POWER	OUTPUT POWER (R.M.S.)	MODES OF OPERATION	PRODUCT	PREAMPLIFIER		POWER REQUIREMENTS	RF VOX	CONNECTORS
				GAIN	N.F.			
1 or 3W	30W	SSB	MML432/30-L	12dB	< 2dB	13.8V @ 6A	✓	INPUT—BNC OUTPUT—BNC
10W	50W	FM	MML432/50	12dB	< 2dB	13.8V @ 8A	✓	INPUT—BNC OUTPUT—'N'
10W	100W	SSTV AM CW	MML432/100	—	—	13.8V @ 20A	✓	INPUT—BNC OUTPUT—'N'



MML432/30-L



MML432/50



MML432/100

OUR ENTIRE RANGE OF PRODUCTS WILL BE EXHIBITED AND ON SALE AT MOST OF THE 1983 MOBILE RALLIES BY OUR OWN SALES TEAM, COME AND TAKE A CLOSER LOOK

ALL MICROWAVE MODULES PRODUCTS ARE FULLY GUARANTEED FOR 12 MONTHS (INCLUDING PA TRANSISTORS)



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- ★ 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.

- ★ Notch filter in TF (AGC immune to heterodynes).
- ★ Full break in keying. 500/600/700Hz beat.
- ★ Unique analogue scale of digital type.
- ★ Comprehensive twin meter metering.
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- ★ Rx 150kHz-30MHz.
- ★ Tx 160-10m 9 bands + 3 × 500kHz Aux bands.
- ★ All modes AM, CW, LSB, USB, AFSK, FM standard.
- ★ IF shift + variable bandwidth 2-6kHz-300Hz.
- ★ Inbuilt keyboard operation + Scanning.
- ★ Switchable attenuator 10, 20, 30dB.
- ★ Audio peak + notch filter -40dB.
- ★ RF process or Auto mic gain control.
- ★ 3rd order IMD -40dB at 100W PEP.
- ★ AFSK shift 170, 425, 850Hz selectable.
- ★ Multi channel memory + programmable scan limits.

FT980 £1,215 inc. VAT @ 15%
& SECURICOR



INSTANT
FINANCE

FT102 £839 inc. VAT @ 15%
& SECURICOR



2 YEAR
GUARANTEE

- ★ 1.8-3.5-7-10-14-18-21-24.5-28MHz
- ★ All modes: LSB, USB, CW, AM, FM, (10Option 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-14R: -4 way waterproof antenna selector

- ★ 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 included.
- ★ 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 included.
- ★ 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.**

SPECIAL
OFFER

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

FT902DM £885 inc. VAT @ 15%
& SECURICOR



*Option.

**D & DE Models



URGENT

Then use
HOTLINE
numbers

URGENT ORDERS	0703 867330
SERVICE ENQUIRIES	0703 861829
NORMAL CALLS	0703 867333

SMC SERVICE
Free Securicor delivery on major equipment.
Access and Barclaycard over the phone.
Biggest branch agent and dealer network.
Securicor 'B' Service contract at £4.49.
Biggest stockist of amateur equipment.

FREE FINANCE
On many regular priced items SMC offers.
Free Finance (on invoice over £100).
20% down and the balance over 6 months or
50% down and the balance over a year.
You pay no more than the cash price!

GUARANTEE
Importer warranty on Yaesu Musen products.
Able staffed and equipped Service Department.
Daily contact with the Yaesu Musen factory.
Tens of thousands of spares and test equipment.
Twenty-four years of professional experience.

Communications Ltd.

MAIN DISTRIBUTOR—FACTORY BACKED



FT707 £515 inc. VAT @ 15% & SECURICOR



SPECIAL OFFER

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

- ★ 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 blanket with local loop AGC.

*Option

SMC FM MODIFIED VERSION AVAILABLE; £40 EXTRA

- ★ 80-10 metres including WARC allocations.
- ★ Multimode LSB-USB-CW (W) CW (N)* and FM.
- ★ 100W PEP output (IOW "S" version).
- ★ No tune design—inbuilt SWR meter.
- ★ Only 3½ x 9½" — Less than a foot deep!
- ★ Dual selectable pulse width noise blanker.

FT77	Transceiver 100W output	£515.00
FT77S	Transceiver 10W output	£435.00
MARK 7	Crystal Marker board	£9.60
FMU77	FM Unit	£25.30
XF8.9HC(N)	600Hz or 300Hz (N)	£26.05
FV707DM	Digital Memory VFO	£200.00
FC700	Antenna Tuner	£99.65
FP700	Mains P.S.U.	£110.00
FTV707	Transverter, frame only	£79.00
Modules: 432	£195.00	144 £109.65
		70 £84.70

FREE CREDIT COVER

FT77 £515 inc. VAT @ 15% & SECURICOR



FT726R MULTIMODE £699 inc. VAT @ 15% & SECURICOR



**AVAILABLE SOON
HF MODULE
21, 24, 28MHz**

- ★ 3 Bands 2 metres, 70cms* (10MHz) & 6M* plug-ins.
- ★ Full Duplex*! Cross band Tx & Rx simultaneously.
- ★ SSB-CW-FM! all optimally catered for.
- ★ Variable bandwidth and IF shift! SSB & CW.
- ★ Processor! Front panel mic gain and drive.
- ★ Two main VFO's! A & B with 20Hz steps.
- ★ Separate channelised VFO! (for FM operation).
- ★ Scanning! Over the band and the 10 memories.
- ★ Repeater splits! Programmable and preset.
- ★ Instant reversal and + & - splits and A/B.
- ★ Twin meters; PO/DISC, S/ALC. Duplex switchable.
- ★ Switchable; AGC, CW bandwidth, dial lock.
- ★ Noise blanker, impulse interference tuned

*Option

FT726R(2)	Transceiver c/w 144MHz	£699.00
430T726	430-440MHz module	£230.00
50T726	Six meter module	£170.00
SAT726	Full duplex unit	£90.00

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

- ★ 30MHz down to 150kHz (and below).
- ★ 12 Channel memory option with fine tune.
- ★ SSB (LSB/USB), CW, AM, FM.
- ★ 2.7kHz, 6kHz, 12kHz, 15kHz @ -6dB.
- ★ 3 Selectivities on AM. Squelch on FM.
- ★ Up conversion, 48 MHz first IF.
- ★ 1kHz digital, plus analogue, display.
- ★ Inbuilt quartz clock/timer.
- ★ No preselector, auto selected LPF's.
- ★ Advanced noise blanker fitted.
- ★ Antenna 500Ω to 1.5MHz, 50Ω to 30MHz.
- ★ 20dB pad plus continuous attenuator.
- ★ Switchable A.G.C. Variable tone.



**'7700 THE ONE WITH FM!
NON-MEMORY VERSION £325**

- ★ 110 and 240Vac, 12Vdc option.
- ★ Signal meter calibrated in "S" and SIMPO.
- ★ Acc; Tuners, Converters, LPF, Memory.
- ★ FR7700; 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.

**SEND US
AN 'A5'
S.A.E. FOR**

26 page catalogue and price list,
information on Yaesu radio equipment,
data on tower antennas, masts etc.



SOUTHAMPTON
SMC Ltd.
36/38 Rumbidge Street,
Totton, Southampton.
Southampton (07031) 867333
9-5.30 Mon-Sat

GRIMSBY
SMC (Humbly) Ltd.
247A Freeman Street,
Grimsby, Lincolnshire.
Grimsby (0472) 59388
9.30-5.30 Mon-Sat

STOKE
SMC (Stoke)
76 High Street,
Talks Pits, Stoke.
Kidsgrove (07816) 72644
9-5.30 Tue-Sat

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

CHESTERFIELD
SMC (Jack Tweedy) LTD.
102 High Street,
New Whittington, Chesterfield.
Chesterfield (0246) 453340
9-5.30 Tue-Sat

BUCKLEY
SMC (T.M.P.),
Unit 27 Pinfold Workshops,
Pinfold Lane, Buckley.
Buckley (0244) 549563
9.30-5.00 (Lunch 1-1.45) Tue-Sat

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

BARGAIN CORNER



CPU2500RK	FM25W Keyboard Mic Scanner	£189.00
CPU2500RKS	25KHz FM10W Keyboard Mic Scanner	£179.00
FT227RKS	FM10W Scanner 25KHz	£179.00
FT2025	FM25W Scanner ect	£179.00
FTV107	Transverter Frame only (grey)	£49.00
FV107	Remote VFO (grey)	£59.00
FC107	Matching ATU for FT107 (grey)	£99.00
DMS107	Digital memory unit for FT107	£69.00
FT207R	FM2.5W Handheld keyboard, Scanner set	£149.00
FTV650B	Matching 6m transverter FT101 'B' E	£99.00
YK901	Keyboard	£89.00
AMO101Z	AM unit MK3 101Z	£10.00
DIGT225	Digital modification kit for FT225	£55.00
OSC225		
Mobil mount FT101 series to E, FR, FL101		
Mobil mount for FTs 107, 901, 221, 225		
301, FRG7, 7000		£12.00
MML144/100	10-100W amplifier	£99.00
MML144/25	3W-25W amplifier-preamp	£49.00
MMC70/4	Converter 70MHz to 4MHz	£19.00
MC70/18	Converter 70MHz to 18MHz	£19.00
MMC1296/28	Converter 1296MHz to 28MHz	£25.00
MMC1296/144	Converter 1296MHz to 144MHz	£25.00
MMC156/28	Converter Marine band to 28MHz	£27.00
Bearcat 220	Scanning Receiver	£169.00

NB. PRICES INCLUDE VAT AT 15% and carriage by post or Securitor



ROTATORS

The finest range: be it Kenpro, C.D.E., Channel Master, SMC, has over 19 models to choose from. Ask the experts for the right model to suit your requirements—it should save you money. Write, phone or call.



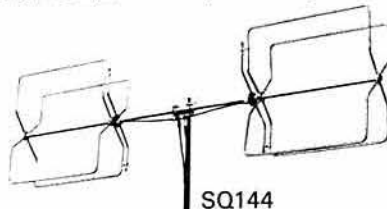
RLD3	Bell	5 Core	Light Duty	£40.25
505	Bell	5 Core	Light Duty	£40.25
AR30	Offset	5 Core	Light Duty	£50.35
KP250	Bell	6 Core	Lighter Duty	£54.91
9502B	Offset	3 Core	Lighter Duty	£56.92
AR22	Bell	4 Core	Medium Duty	£67.85
9508	Offset	3 Core	Medium Duty	£80.21
AR40	Bell	5 Core	Medium Duty	£90.85
BT1	Bell	5 Core	4 Preset medium	£91.43
KR400	Bell	6 Core	Matches KR500	£97.75
KR500	Thro	6 Core	Elevation	£97.75
AR50	Bell	5 Core	5 Position Medium	£113.85
KR400RC	Bell	6 Core	Medium Duty	£114.94
CD45	Bell	8 Core	Heavy Duty	£136.85
KR600RC	Bell	8 Core	Heavy Duty	£163.30
HAM IV	Bell	8 Core	Heavy Duty	£258.75
KR2000RC	Bell	8 Core	Heavy Duty	£314.52
T2X	Bell	8 Core	Very Heavy Duty	£327.75
H300	Bell	8 Core	Digital Readout	£493.35
Control Cable				
RC4W	4 Way	28p/mtr	Carriage	£1.80
RC5W	5 Way	33p/mtr	Carriage	£1.80
RC6W	6 Way	51p/mtr	Carriage	£1.80
RC8W	8 Way	55p/mtr	Carriage	£1.80
9523	Support Bearing	£15.81	Carriage	£2.50
9502				
KCO38	Lower Mast Clamp	£12.07	Carriage	£2.50
KR400 600				

Prices including VAT and Carriage, but accessories are extra unless sent with rotators.

SMC-HS

HF, VHF, UHF, BASE STATION ANTENNAS

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



SQ144	2M Swiss Quad Vertical Mounting	£57.60	£2.50
	2M 1/2 c/w ground plane		
GP2M	3-4dB 1	£18.00	£2.50
GP144W	2M 2 x 1/2 colinear 6-5dB 1	£27.60	£2.50
GP23	2M 3 x 1/2 colinear 7-8dB 1	£39.85	£2.50
GP432	70cm 3 x 1/2 colinear 6-8dB 1	£29.90	£2.50
70N2V	2M/70cm colinear 2-8dB 1/5-7dB 1	£29.90	£2.50
HS770	2M/70cm Duplexer 50W 30dB isolation	£15.35	£1.50
VHFL	65-520MHz Discone Rx only	£15.70	£2.50
GDX1	80-480MHz Discone 3dB 1	£40.25	£2.50
GDX2	50-480MHz Discone 3dB 1	£49.45	£2.50
GDXA	100-480MHz Discone 3dB 1	£33.75	£2.50
LT606	50-500MHz Log Periodic 7-8dB	£115.00	£2.50
HF5V	Trapped Vertical 10-80M 5 bands	£54.80	£2.50
HF5R	Loaded Radial Kit	£34.90	£2.50
3Y1015D20	3 ele 10, 15M Dipole 20M	£144.90	£5.00

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

ANTENNA ACCESSORIES

2M ASCOT ANTENNAS MOBILE

(The keenest prices)			
Complete with bases and cable			
340COM	1 x Standard	£6.10	£1.50
310COM	1 x Swivel	£8.10	£1.50
344COM	1 x Sprung	£10.38	£1.50
440COM	1 x Standard	£7.71	£1.50
330COM	1 x Swivel	£10.00	£1.50
341COM	1 x Sprung	£12.31	£1.50
092	Magnetic Mount	£10.75	£1.50
350	1 x Standard	£14.26	£1.50
351	1 x Sprung	£15.01	£1.50
091	Magnetic Mt 1 x	£10.75	£1.50

MASTS & TOWERS

TT24	79' Tower c/w rigging	£626.00	DIST
TT30	101' Tower c/w rigging	£730.00	DIST
SMC16	16' Portable c/w rigging	£21.28	£2.20
SMC24	24' Portable c/w rigging	£25.88	£2.20
SPK16	16' Light duty portable	£17.25	£2.20
10P30	30' Telesc. Versatower	£388.00	DIST
13P40	40' Telesc. Versatower	£436.00	DIST
13P60	60' Telesc. Versatower	£534.00	DIST
16P40	40' Telesc. Versatower	£650.00	DIST
16P60	60' Telesc. Versatower	£739.00	DIST

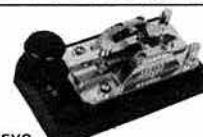
COAXIAL CABLE (per metre)

UR43	50 ohm 5mm	£0.27	£2.00
UR76	50 ohm 5mm Stranded core	£0.29	£2.00
UR67	50 ohm 10-2mm low loss	£0.67	£2.40
LDF2	50 ohm 1/2" Foam Helix	£2.85	£2.50
LDF4	50 ohm 1/2" Foam Helix	£3.58	£2.50
307EP	75 ohm Economy	£2.21	£2.00
UR70	75 ohm 6mm	£0.30	£2.00
UR39	75 ohm 7.8mm	£0.44	£2.40
UR57	75 ohm 10.2mm low loss	£0.69	£2.50
302	75 ohm Galv. twin	£0.17	£1.50
306	300 ohm Galv twin	£0.23	£1.50

ANDREWS HELIX CONNECTORS

L42W	'N' Plug male LDF2/50	£12.07	£0.65
L42N	'N' Jack female LDF2/50	£12.07	£0.65
L42P	UHF Plug (PL259) LDF2/50	£12.07	£0.65
L44W	'N' Plug male LDF4/50	£12.42	£0.65
L44N	'N' Jack female LDF4/50	£12.42	£0.65
L44P	UHF Plug (PL259) LDF4/50	£11.09	£0.65

MORSE EQUIPMENT



MORSE KEYS			
BKU1	Squeeze Key	£30.30	£1.20
HK703	Straight Key	£25.70	£1.20
HK704	Straight Key	£17.65	£1.20
HK706	Straight Key	£14.60	£1.00
HK707	Straight Key	£13.75	£1.00
HK710	Straight Key	£36.40	£1.75
HK808	Straight Key	£45.60	£1.75
HK711	Key Mounting	£29.50	£1.50
BK100	Mechanical Bug	£22.25	£1.75
MK701	Single Lever Paddle	£25.25	£1.60
MK702	Single Lever Paddle	£26.45	£1.60
MK703	Squeeze Key	£25.95	£1.75
MK705	Squeeze Key	£22.60	£1.75
MK706	Squeeze Key	£19.50	£1.75
IKP60	Iambic	£9.95	FOC
SR1	Straight Key	£12.65	FOC

MORSE EQUIPMENT

KP100	Squeeze CMOS 230/13-8V	£69.00	£2.00
KP200	Memory 4096 Multi Ch Mem Back Up 230/13-8V	£155.25	£2.50
D70	Morse Tutor (Datong)	£56.35	FOC
MMS1	Morse Tutor (M/M)	£115.00	FOC
MMS2	Morse Tutor Advanced	£155.00	FOC

MICROWAVE MODULES - RTTY EQUIPMENT

MM2001	RTTY to Demod./Converter	£189.00	FOC
MM4001	RTTY Transceiver		FOC
MM4001KB	RTTY Transceiver c/w keybd	£299.00	FOC
MM1000	ASCII to Morse Converter	£69.95	FOC
MM1000KB	ASCII - CW conv c/w keybd	£89.00	FOC

PRICES INCLUDE VAT AT 15% Carriage as shown

J-BEAM

4 METRES			
4Y/4M	Yagi 4 element	7dBd	£29.90 £2.20
PMH2/4M	Phasing harness 2 way		£16.10 £1.50

2 METRES			
H0/2M	Halo head only	0dBd	£5.98 £1.20
HM/2M	Halo with 24" mast	0dBd	£6.55 £1.50
C5/2M	Colinear omni vert	4-8dBd	£54.62 £2.50
LW5/2M	Yagi 5 element	7-8dBd	£14.37 £2.50
LW8/2M	Yagi 8 element	9-5dBd	£17.82 £2.50
LW10/2M	Yagi 10 element	10-5dBd	£24.15 £2.50
LW16/2M	Yagi 16 element	13-4dBd	£35.07 £3.20
14Y/2M	Yagi 14 element	12-8dBd	£36.23 £3.20
PBM10/2M	10 ele Parabeam	11-7dBd	£44.85 £3.20
PBM14/2M	14 ele Parabeam	13-7dBd	£55.77 £3.20
Q4/2M	Quad 4 element	9-4dBd	£29.32 £2.50
Q6/2M	Quad 6 element	10-9dBd	£39.10 £2.50
Q8/2M	Quad 8 element	11-9dBd	£44.85 £2.50
D5/2M	Yagi 5 over 5 slot	10dBd	£23.30 £2.50
D8/2M	Yagi 8 over 8 slot	11-1dBd	£25.40 £2.50
5XY/2M	Yagi 5 ele crossed	7-8dBd	£28.17 £2.50
8XY/2M	Yagi 8 ele crossed	9-5dBd	£35.65 £2.50
10XY/2M	Yagi 10 ele crossed	10-8dBd	£46.00 £2.50
PMH2/C	Harness cir polarisation		£9.77 £1.50
PMH2/2M	Harness 2 way 144MHz		£12.65 £1.50
PMH4/2M	Harness 4 way 144MHz		£28.75 £1.50

SEVENTY CM

C8/70	Colinear Omni Vertical	6-1dBd	£62.10 £2.50
D8/70	Yagi 8 over 8 slot	12-3dBd	£25.87 £2.50
PBM18/70	18 ele Parabeam	13-5dBd	£32.20 £2.50
PBM24/70	24 ele Parabeam	15-1dBd	£42.55 £2.50
LW24/70	Yagi 24 element	14-8dBd	£27.02 £2.50
MBM28/70	28 ele Multibeam	11-5dBd	£21.27 £2.50
MBM48/70	48 ele Multibeam	14-0dBd	£35.65 £2.50
MBM88/70	88 ele Multibeam	16-3dBd	£48.87 £2.50
8XY/70	Yagi 8 ele crossed	10dBd	£42.55 £2.50
12XY/70	Yagi 12 ele crossed	12dBd	£52.90 £2.50
PMH2/70	Harness 2 way		£10.35 £1.50
PMH4/70	Harness 4 way		£22.42 £1.80

1296 MHz

CR2/23CM	Corner reflector	13-5dBd	£40.25 £2.50
PMH2/23CM	Harness 2 way		£31.05 £1.50

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

STOCK-CARRYING AGENTS WITH DEMONSTRATION FACILITIES

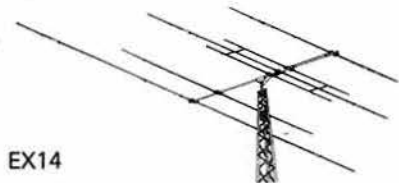
Edinburgh Jack GM8GEC (031-657 2430 Day
031-665 2420 Eve)

Bangor John GI3KDR (0247) 55162
Tandragee Mervyn GI3WVY (0762) 840656

Neath John GW4FOI (0639) 52374 Day
Stourbridge Andrew (0639) 2942 Eve
(038 43) 72632

HF ANTENNAS

SMC have the greatest range of HF antennas eg. Multi Beams/Quads, over 20 models. Shown below is the sensational new Explorer 14—contact us for full details.



EX14

MULTIBAND BEAMS

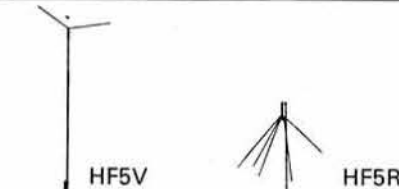
		Inc VAT	P.O.A.	P&P
EX14	Explorer 10-20m			
TH3JN	3 Ele 10-20m	£202.40	£3.50	
TH2MK3	2 Ele 10-20m	£169.05	£3.50	
TH3MK3	3 Ele 10-20m	£274.85	£5.30	
TH5DXX	5 Ele 10-20m	£419.75	£6.70	
TH7DXX	7 Ele 10-20m	£511.75	£8.75	
TB3	3 Ele 10-20m Jaybeam	£181.70	£5.40	
HQ1	Mini Quad 10-20	£139.00	£4.00	
G4MH	Mini Beam 1-20	£82.50	£4.00	
TA33JNR	3 Ele 10-20 Moseley	£161.00	£3.40	
Mustang 2	2 Ele 10-20 Moseley	£177.10	£3.50	
Mustang 3	3 Ele 10-20 Moseley	£220.80	£3.70	
GO2E	2 Ele 10-20 Quad	£189.75	£5.40	
GO3E	3 Ele 10-20 Quad	£313.95	£9.20	
GO4E	4 Ele 10-20 Quad	£446.20	£10.00	
Hyquad	2 Ele 10-20	£171.35	£6.70	
LP1007	Log Periodic 13-20 MHz	£1474.30	DIST	
3Y1015D20	3 Ele 10-20m	£134.95	£5.00	
DB10/15A	3 Ele 10-15m	£198.95	£4.80	



TB3

MONO BAND BEAMS

103BA	3 Ele Yagi 10m	£67.85	£3.50
105BA	5 Ele Yagi 10m	£155.25	£3.75
153BA	3 Ele Yagi 15m	£90.85	£3.50
155BA	5 Ele Yagi 15m	£236.90	£5.90
203BA	3 Ele Yagi 20m	£178.25	£4.90
204BA	4 Ele Yagi 20m	£286.35	£7.30
205BA	5 Ele Yagi 20m	£396.75	£9.40
402BA	2 Ele Yagi 40m	£247.25	£6.50
18TD	Dipole Tape 10-80m		



VERTICALS

12AVQ	Vertical 10-20m	£50.60	£2.75
14AVQ	Vertical 10-40m	£64.40	£2.75
18AVT/WB	Vertical 10-80m	£113.85	£2.75
18V	Vertical 10-80m taped	£36.22	£2.75
C4	Vertical 10-20m	£59.00	£2.50
SMCHF5	Vertical 10-80m	£54.80	£2.50
SMCHF5P	Radial Kit for above	£34.90	£2.50

TRAP DIPOLE

SMCTD/	High Power 10-80m	£43.41	£2.50
HP			
SMCTP/P	Portable inc coax	£59.80	£2.50

MOBILE

Tribander	10-20m Slide sw.	£25.88	£1.50
Multiband	10-20m	£30.48	£1.50
Flexiwhip	10m only	£18.11	£1.85
Extra coils	For above to 160m	£5.70	£1.00
Flexiten	10, 15, 20, 40, 80m	£49.00	£2.00
Bases	For above	£5.75	£1.00

NB: PRICES INCLUDE VAT AT 15%
Carriage extra. Mainland rate shown.



HANSEN

POWER/SWR BRIDGES P.E.P., R.M.S. 1-8-440MHz

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

FS710:
PEP
AUTO-SWR
RMS LEVEL
FS710 £89.70



FS500 £69.75



FS600 £51.35



FS300 £46.40



FS7 £41.00



FS711 £36.80



FS5E £37.20



FS300M £35.65



SWR3S £26.45



SWR50B £26.45



8 new models in stock. See for details

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

FS710M: 1-8-60MHz, 20, 200, 2kW
50-150MHz, 20, 200W
V.S.W.R.: 4:1 and to 20:1
Accuracy: $\pm 7\%$ of FSD
Impedance: 50-52 Ohms
Connectors: SO239
Power: 240 Volts AC 50Hz
Weight: 3-lbs (1.5Kgs)
Size overall: $8 \times 4 \times 5\frac{1}{2}$ "
Size Meter: $2 \times 3\frac{1}{2}$ "
Time Const: PEP follow 4 second

PEAK READING LEVEL RESPONSE

FS500M 1-8-60MHz 20, 200 & 2kW
FS500V 50-150MHz 20 & 200W
Power $\pm 7\%$ FSD. SWR 1:1-5:1
Size: $8 \times 4 \times 5\frac{1}{2}$ "

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 $\pm 10\%$ FSD. SWR 1:1-3:1
Size: $6\frac{1}{2} \times 2\frac{1}{2} \times 4\frac{1}{2}$ "

LEVEL RESPONSE, LARGE METER

FS300H 1-8MHz 20, 200 1kW
FS300V 50-150MHz 20, 200W FSD
Power $\pm 10\%$ SWR 1:1-3:1 $\pm 10\%$
Size: $8 \times 4 \times 5\frac{1}{2}$ "

VHF/UHF WATTMETER & BRIDGE

FS7 145MHz & 432MHz 5, 20, 200W
Power average $\pm 10\%$. SWR 1:1-3:1
Power Max: 144MHz, 200W
432MHz 20W
Size: $6\frac{1}{2} \times 2\frac{1}{2} \times 4\frac{1}{2}$ " 'N' type sockets

REMOTE INDICATOR TYPE

FS711H 1-8-30MHz 20 & 200W
FS711V 50-150MHz 20 & 200W
FS711U 430-440MHz 5 & 20W
Power $\pm 10\%$ SWR 1:1-3:1 $\pm 3\%$
Indicator $5 \times 2\frac{1}{2} \times 1\frac{1}{2}$ "
coupler $3\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$ "

INDEPENDENT TWIN METER

FS5E 3-5 150MHz 20, 200 & 1kW
Power average $\pm 10\%$. SWR 1:1-5:1
Power Max: 1kW 3-5 30MHz
50W 50 150MHz
Size: $7 \times 3 \times 3\frac{1}{2}$ " 'On the Air' LED

LEVEL RESPONSE, POWER & SWR

FS301M 1-8-30MHz 20, 200W
FS301MH 1-8-30MHz 200, 2kW
FS302M 50-150MHz 20, 200W
Power $\pm 10\%$ SWR 1:1-3:1 $\pm 3\%$
Size: $6\frac{1}{2} \times 2\frac{1}{2} \times 4\frac{1}{2}$ "

WIDE RANGE POWER & SWR

SWR3S 3-5 150MHz 20 & 200W
Power average $\pm 10\%$. SWR 1:1-3:1
Power Max: 200W 3-5 30MHz
50W 50 150MHz
Size: $6 \times 2\frac{1}{2} \times 2\frac{1}{2}$ " Antenna/switch

TWIN METER, RELATIVE POWER

SWR50B 3-5 150MHz Scaled 1kW
Power average $\pm 20\%$ SWR 1:1-3:1
Power Max: HF 1kW 1:1-300W 3:1
VHF 50W
Size: $6 \times 2\frac{1}{2} \times 2\frac{1}{2}$ " 'On the Air' LED



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		(1)	100W	1-72m	£17.65
17SE	17m		(1)	200W	1-92m	£15.70
15SE	15m		(1)	130W	1-72m	£14.55
12SE	12m		(1)	200W	1-92m	£14.20
10SE	10m		(1)	100W	1-72m	£13.80
4E	4m	0dB	(1)	150W	1-03m	£7.65
2H/PL	2m		(1)	50W	0-17m	£3.45
20W	2m	0dB	(1)	200W	0-49m	£2.30
2VF	2m	3dB	(1)	50W	1-06m	£11.50
2NE	2m	3dB	(1)	150W	1-30m	£6.90
78SF	2m		(1)	100W	1-42m	£13.80
78F	2m	4-5dB	(1)	100W	1-75m	£13.80
78B	2m	4-5dB	(1)	150W	1-72m	£13.80
88F	2m	5-2m	(1)	100W	2-03m	£18.80
70N2M	2/70	2-7dB 5-1dB	(1)	100w	0-89m	£16.85
258	70cm	5-5dB	2 x (1)	100W	0-91m	£12.65
358	70cm	6-3dB	3 x (1)	100W	1-36m	£16.85

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

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

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

Stop press: $\frac{1}{2}\lambda$ ultra low radiation angle, typ. 30° below $\frac{1}{2}\lambda$. Substantial improvement on DX (in clear).

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

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

S. M. HOUSE, RUMBRIDGE STREET, TOTTEN, SOUTHAMPTON SO4 4DP, ENGLAND

Tel: Totton (0703) 867333, Telex: 477351 SMCMM G, Telegram: "Aerial" Southampton

See preceding pages for complete addresses and phone numbers

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY REPRESENTING ALL UK RADIO AMATEURS

Founded 1913

Incorporated 1926

Limited by guarantee

A member society of the International Amateur Radio Union

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

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

Headquarters and registered office: **Alma House, Cranborne Road, Potters Bar, Herts EN6 3JW**

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

Secretary and general manager: **D. A. Evans, G3OUF**

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Correspondence to RRs and honorary officers should be addressed directly to them (QTHR), not to RSGB HQ

ANNUAL SUBSCRIPTION RATES

UK corporate member: £14.50 (incl VAT)

Associate member under 18: £5.80

Family member: £5.80

Overseas member: £14.50

Students over 18 and under 25: £8.70 (Applications should give applicant's age at last renewal date and include evidence of student status)

Affiliated societies: £14.50 (including *Radio Communication*) £8.70 (excluding *Radio Communication*)

RSGB QSL BUREAU

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

A list of QSL Bureau sub-managers was
published in the January 1983 issue of *Radio
Communication*, and amendments are
published under "Amateur Radio News".

RSGB NEWS SERVICES

Headline News

Telephone 0707 (77 from London) 59312 for a recording of the latest amateur radio news.

GB2RS Broadcasts

Sunday news broadcasts from stations throughout the UK using the callsign GB2RS on frequencies
in the 3-5, 7 and 144MHz bands.

Details of frequencies, locations and times were last published in the June 1983 issue.

Amendments are published under "Amateur Radio News". A full schedule can be obtained free on
request from RSGB HQ by sending a large sae.

Local Amateur Radio

The administration of amateur radio must function at two levels at least. There are obviously many jobs that need to be organized at the national level to be effective, and some form of centralized administration is essential to achieve this. Ours consists of the professional headquarters staff, Council, the 15 committees, and a large number of honorary officers and managers. At a rough estimate, the time spent by these people, including the "out-of-hours" effort, must be in the region of 80,000 man-hours each year—of which the major part is staff effort. Clearly, this organizing is a very time-consuming effort and reflects the work required to maintain amateur radio in good running order. The results of all this effort percolate down to every member in one form or other by way of operating facilities, a host of indirect and direct services and in material things such as magazines and books.

But there is also a need for a strong organization at the local level. Amateurs, who until fairly recently had a virtual monopoly of radio transmitting among members of the general public, no longer hold this privileged position. Virtually everybody—butcher, baker and candlestick maker—can and does transmit these days, and there seems a real risk that amateur radio may lose its identity. The consequences? Well, one manifestation could be that any further loss of status in the community by amateur radio would lead to more and more local community problems being decided on a local basis, for example, interference and antenna planning, which are already causing great concern (and expense) to the Society.

Clearly there is a need to generate the best possible image of amateur radio at the local level. This must be a job comparable to the huge task faced by the central administration. The question is: who has the resources to cope with this? The answer cannot be the central administration of the Society—there is no way with its present resources that it could begin to tackle the problems by direct action at the local level. Nor perhaps should it even consider doing so. Surely the right bodies with the manpower available for this task are clubs and groups, and, in particular, affiliated societies and nationwide organizations such as Raynet. These represent a vast resource of amateur radio throughout the country.

There are over 450 clubs affiliated to the RSGB, each of which has been shown in a recent analysis of returned membership questionnaires to have on average 26 licensed and eight swl RSGB members. Surely among these there exists a considerable expertise which, with the proper backing of the club organization, could not be better placed to influence the local community in the best interests of amateur radio.

Hitherto, the Society has been able to do little to help affiliated societies in their efforts. With the move to the new headquarters and consequently the potential to expand the staff effort in these areas, the opportunity is being taken to review the links with affiliated societies with a view to strengthening them. In this, the local representatives, of which the Society already has over 150 in the form of area representatives, together with the regional representatives already active in this work, will play an even more crucial role. Immediate plans by the Membership & Representation Committee are to extend the circulation of the *Council Letter*, which is a highly valued information sheet, together with other information, to all affiliated societies. It is hoped that this will be just the start of a highly effective dialogue.

D.A.E.

Amateur Radio News

Sharing the 432MHz band

A brief report on the status of the amateur service in the 430MHz band was published in *Rad Com* October 1982. Since then it has become apparent that there is still some confusion, particularly since the advent of a Ministry of Defence communication system known as MOULD. This occupies frequencies between 433 and 433.5MHz, with some others outside this band also in use.

Prior to the 1979 World Administrative Radio Conference, there was a footnote in the appropriate section of the ITU Radio Regulations which defined the status of the amateur service as far as 432MHz was concerned—this was Footnote 319, which stated that "In the United Kingdom, the band 420–450MHz is allocated on a primary basis to the radiolocation service, and on a secondary basis to the amateur service". The current (ie post-WARC 1979) Radio Regulations, which are the 1982 edition, contain no such footnote, and the corresponding frequency table shows that the amateur service has an equal primary status with the radiolocation service in this band.

However, the most important point to bear in mind is that individual administrations are not bound by the Radio Regulations, and indeed may make whatever arrangements they wish provided that no interference is caused to primary or secondary services in other countries. In the UK all amateur bands from 430MHz to 24GHz are only available on a secondary basis and are, in fact, shared with a number of civil and Governmental primary users. In the band 430–440MHz, radiolocation—which encompasses position-fixing systems such as Syledis and Maxiran—is a primary service and, as such, amateurs should not cause it harmful interference. This situation has been the case for many years, and indeed ever since there has been an amateur allocation at 430MHz. However, it is only relatively recently that the Ministry of Defence usage in this area of the spectrum (and, for that matter, in others) has resulted in any problems for the amateur service, and the practical result of this as far as the amateur service is concerned is that the sector 433–433.5MHz is to be shared with the MOULD system. This implies something of a new situation for radio amateurs insofar as some hf bands have been shared for many years and we have become used to co-existence with other users: for the first time, however, this is now the case in practical (as opposed to theoretical) terms on 430MHz. Users will be aware that 433–433.5MHz falls within the repeater output sub-band, and in fact MOULD appears to be using 25kHz channels spaced 12.5kHz away from the repeater outputs. What appear to be constant carriers may be heard on these frequencies, as well as a few others not in this sub-band, and it is understood that this

situation may continue for an unspecified period. Various other types of transmission may also be heard.

The amateur service must, therefore, observe the normal rules which apply to secondary users. It is not possible for a secondary user to claim protection from interference caused by a primary user, whereas the secondary user—which in this case is the amateur service—must not cause interference to the MoD system. The Society does not envisage that problems will occur in practice, since MOULD is predominantly in that part of the 430MHz band which is already channelized and used for the repeater network, and normal operation should mean that amateurs can co-exist with MOULD without mutual difficulties. Members are asked to observe the 432MHz band plan and to change frequency if interference occurs rather than attempt to over-ride what might seem to be deliberate jamming. If prolonged problems do occur, they should be reported in writing to either the Society's vhf manager, Keith Fisher, G3WSN, or the general manager at RSGB headquarters.

It is worth mentioning that there is little possibility of the situation changing and of the amateur service becoming primary users in the UK: the Ministry of Defence has always had priority on this band and the amateur service has to respect that fact. However, the Society must stress that it regards the 430MHz band as a most important one (the recent membership survey suggested that a large number of members are either active in this band or intend to be) and has the situation under constant review: a good consultation mechanism exists between the Society, the Home Office and the Ministry of Defence, and any further developments will be reported as and when they occur.

It should also be remembered that civil land mobile services will shortly be used in the band 431–432MHz in the London area, and amateurs are reminded not to use this part of the band within 100km of Central London.

As a rider to this report, the Society notes that a certain amount of information about MOULD has appeared elsewhere in the amateur radio press. Unfortunately, the majority of it is either misleading or, simply, wrong. The Society's difficulty is that the actual frequencies and sites used by MOULD are classified "restricted", and indeed much of the purposes and function of the system remain classified "secret". In these circumstances, although the RSGB is suitably well informed, it is felt that publication of precise details would contravene both the spirit of the D-Notice system and also Section 1 of the Official Secrets Act.

Members may rest assured that the RSGB will continue to act as far as possible both in the best interests of its members and of amateur radio as a whole, and also in a manner which befits the national society.

Telecommunications Bill

The dissolution of Parliament and the calling of a general election for 9 June meant that the Telecommunications Bill which had been making its way through Parliament has lapsed.

By the time this appears in print, the result of the general election will be known. If the Conservative party has been returned to office, the Society feels that there is a good chance of the Bill being re-activated, but the procedure will have to be restarted since committee members will have changed—however, it may have a relatively straightforward passage up to the point it had reached before Parliament was dissolved. If any other political party, has come to power, the future of this legislation is much less clear, but we understand that the Home Office would wish to put forward legislation of this type for consideration in the future.

Change in the amateur licence fee

With effect from 1 June 1983, the fee for the issue and renewal of the amateur licence was increased to £12. The Home Office hopes to be able to utilize the increased revenue to provide an improved service.

We have asked the Home Office why the increase appears to be so large, and we are awaiting a reply. However, it is worth making the point that even in IARU Region 1 this new fee still compares favourably with those in many other countries. The latest information we have suggests that in Austria a licence costs approximately £18.75, in Belgium £15.30, in France approximately £16.25, in the Netherlands approximately £15, and in Switzerland £16.80. In Region 1, several countries, including the USSR, Czechoslovakia and Bahrain, have no licence fee at all, and the lowest fee is that of Bulgaria at about 81p. The most expensive licence is that of Jordan, which has a fee of around £37 – incidentally, this seems to be the most costly licence in the world. The world average for licence fees, taking all IARU societies (in excess of 100) as a sample, is about £6, so our new fee on a worldwide basis is double the average.

Morse test news

There are still occasional misunderstandings concerning the present status of the amateur morse test in the UK. Some small changes have been made recently—there is now a new style of application form which includes a declaration to be signed by the candidate, and the list of the examination centres now includes the telephone numbers. Enquiries and provisional bookings can be made by telephone, but completed applications, together with the fee, must be in the hands of the centre prior to the date of the test. The fee, which remains at present at £15, can be paid by

stamps, or by cheques made payable to British Telecom International with the name of the candidate written on the reverse.

All candidates will be required to show a passport or some other means of positive identification to the examiner—a birth certificate will NOT meet this requirement. Handicapped persons who are unable to travel to one of the test centres should contact their nearest centre, which can make special arrangements for them. Radio clubs and similar organizations may be able to arrange for a visit by an examiner to conduct a mass Morse test—this facility requires a minimum number of 12 candidates.

CW in America

Although not strictly relevant to the British scene, it was interesting to note from the ARRL that their membership has been overwhelmingly opposed to the concept of a "code-free" amateur licence. This proposal was made by the Federal Communications Commission, without consultation with ARRL, and would have provided for a type of licence roughly equivalent to the UK Class B but with limited allocations in other bands. The ARRL's own stance was neutral, but the opinion of its membership appeared overwhelmingly opposed to such a change.

A statement by the Board of Directors of ARRL said, among other things, that "... any tolerance for a no-code licence appears to arise more from acceptance of its presumed inevitability than acknowledgements of any intrinsic benefits perceived for the amateur radio service. ... the ARRL has found little evidence that the requirement for a knowledge of Morse code is a significant barrier to ... entry into the amateur ranks of additional persons. ... Board discussions in depth have led to the conclusion that no satisfactory formula for a codeless licence can be established in the foreseeable future. Considering the obligation of the amateur radio service to its public service commitments and disciplined use of the radio spectrum, the Board has no alternative but to reject the proposal."

New equipment at Dayton

Some interesting items of new equipment were shown at the Dayton '83 Hamvention—this is a major exhibition which takes place in Dayton, Ohio, each year. It is rather like the NEC event, but on a typically American scale—ie enormous!

Icom had a new multimode base-station 430MHz transceiver, the IC471A, with 10Hz readout and 32 memories, and they were also showing a complete repeater with all necessary facilities. Most innovative of all was a 1.3GHz fm mobile transceiver, the IC120, which has an output of 1W and will tune from 1,260 to 1,300MHz in three selectable tuning rates of 10kHz, 20kHz or 1MHz. The equipment has the same facilities as the 144MHz mobiles in the same range, namely six memory channels, scanning and two vfos. A complete 1.3GHz repeater package is also available to go with it!

Yaesu showed the FT726R with additional modules for the 14, 21 and 28MHz hf bands, and the FT980 hf-band transceiver with very advanced microprocessor-controlled facilities. The FT726R allows full duplex or crossband working with the optional SU726 satellite unit.

Eimac had a new power triode on display, the 3CX800A. This has an anode dissipation of 800W and will deliver 1,000W of cw and 2,000W p.e.p. ssb with only 40W of drive—it can produce this order of power on all bands up to and including 144MHz. It is air cooled, and requires less than 20 cubic feet of cooling air per minute: this is of the same order as a pair of 4CX350s. The price in the UK would probably be in excess of £200, however.

Trio-Kenwood showed a compact 144/432MHz transceiver, the TW4000A, and also the VC10 converter for the R2000 receiver. This covers 118–174MHz.

Various new antennas were on show, including a broadband triband Yagi, the "Explorer 14", from Hy-Gain. The boom is only 14ft long, and the turning radius 17ft 3in. Mosley Electronics showed a conversion kit for the TA33 and TA36 to enable them to be used on 10MHz in addition to their normal three bands.

Region 7 representative

As announced in *Rad Com* March, the position of Region 7 representative is vacant, and up to going to press no nominations have been received for a successor. We therefore repeat the request made in the March issue for nominations to fill the vacancy.

Any five corporate members resident in Region 7 (Greater London south of River Thames, Surrey including that part of London north of the Thames administered by Surrey) may nominate any other qualified corporate member resident in Region 7 for the office of Region 7 representative. Each nominator may not nominate more than one person to fill the vacancy.

All nominations must be made in writing and be delivered together with the written consent of the nominee to accept office if elected to: Mr D. A. Evans, Secretary/General Manager, RSGB, Alma House, Cranborne Road, Potters Bar, Herts EN6 3JW, on or before Monday, 22 August, 1983.

In the event of more than one person being nominated, a ballot will be held, details of which will be published in the October 1983 issue of *Radio Communication*.

Region 8 representative

Mr K. A. Crouch has resigned from the post of Region 8 representative because of pressure of work. An election will therefore be necessary to fill the vacancy.

Any five corporate members resident in Region 8 (Kent, East Sussex and West Sussex) may nominate any other qualified corporate member resident in Region 8 for the office of Region 8 representative. Each nominator may not nominate more than one person to fill the vacancy.

All nominations must be made in writing

and be delivered together with the written consent of the nominee to accept office if elected to: Mr D. A. Evans, Secretary/General Manager, RSGB, Alma House, Cranborne Road, Potters Bar, Herts EN6 3JW, on or before Monday, 15 August, 1983.

In the event of more than one person being nominated, a ballot will be held, details of which will be published in the October issue of *Radio Communication*.

Region 16 meeting in Norwich

On 14 May an interesting and successful meeting took place between the Society's Membership & Representation Committee and local representatives in Norwich. The Society's President, Don Baptiste, was present, and the session was led by the chairman of the Membership & Representation Committee, Bob Barrett, GW8HEZ. Members of the committee, assisted by members of other committees and headquarters staff, answered questions and outlined the work of the Society—in particular, a long discussion took place on spectrum abuse and the implications of the dissolution of Parliament and the loss of the Telecommunications Bill (see earlier item). An audience of about 40 enjoyed the meeting and looked forward to the next one.



Membership & Representation Committee members W. J. McClintock, G3VPK; I. J. Kyle, G18AYZ; and R. G. Barrett, GW8HEZ, chairman, also executive vice-President, in jovial mood at the Region 16 meeting

QSL Bureau

G4GAA-G4GZZ series. Mr R. Maskill, G4JDL, has relinquished the post of sub-manager for this series, and we thank him for his services. His successor is Mr J. C. Terry, G4GEU, 126 Dawberry Fields Road, Kings Heath, Birmingham B14 6NZ.

G8S and G4J series. Mr K. J. Baker, G3WTV, sub-manager for these series, has changed his address to 7 Long Butlers, Harpenden, Herts.

G0 series. The sub-manager for this next Class A series will be Mr K. Plumridge, G4BYV, 26 Woodlea Gardens, West End, Southampton SO3 3GA.

G1 series. The sub-manager for this next Class B series will be Dr R. J. Nash, G4GEE, 135 Farren Road, Wyken, Coventry CV2 5EH.

GU series. Mr W. E. Butt, GU2FZC, has had to relinquish the post of sub-manager of this series on account of ill-health, and we thank him for his services. The new GU series sub-manager is Mr M. Allisette, GU4EON, Springbank, Les Ozouets Road, St Peter Port, Guernsey.

Radio interference statistics

The latest issue of the Home Office *Technical Bulletin*, which is published by the Directorate of Radio Technology, had some interesting things to say about interference caused by cb. In February 1983 there were 303,000 fm cb licence holders, and British Telecom estimates that about 70 per cent of users possess a licence—this would suggest a figure of about 433,000 in all. Of the interference investigations conducted in 1982, a.m. cb was the cause of about one case in 10, whereas fm cb was the problem in one case in 52. BT inferred that a.m. cb was about five times more likely to cause interference than fm. Approximately one case in 235, which equates to a total of about 250 cases during the year, was traceable to amateur transmissions. In all, 85,155 complaints were cleared in 1982, compared with 60,571 in 1981.

During the period from January 1981 to December 1982, 2,141 users were convicted of unlicensed use of 27MHz, whereas one user was convicted of a similar offence on the amateur bands.

NEC '84

Now that the dust has settled, there is no doubt that the RSGB National Amateur Radio Exhibition & Convention which took place at the NEC in March was a great success. More people attended than ever before, and the event was universally popular with the amateur radio trade. Accordingly, it has been decided that the NEC exhibition in Birmingham will now become an annual event, taking place in April, and the date to insert in your 1984 diary is the weekend of 28-29 April. Provisionally, a larger hall will be used, but more information will be published in *Radio Communication* and on GB2RS.

National honour for the vice-president of VERON

The Society congratulates Mr Ph. J. Huis, PA0AD, vice-President of VERON, on having the honour to be awarded the "Ridder in der orde van Oranje Nassau" by the Queen of the Netherlands. This is a decoration which was awarded to "Flip" on the Queen's birthday and which is given to those who have provided at least 40 years service to the community. Flip has been very active for many years on behalf of many charitable causes, and his work for the amateur radio service in the Netherlands is well known. He recently retired from the office of president of VERON—a position he filled with great distinction, and his award is another recognition by authority of the value of amateur radio to the community.

"Flip", PA0AD, left, being congratulated by Jan Hordijk, PA0AJE, the new president of VERON. Photo: PA0JNH



Have you received a licence reminder lately?

From feedback received at headquarters, we get the impression that individual amateurs occasionally fail to receive reminders from the Home Office that their licence is due for renewal. Usually there is some administrative reason for this, and it is suggested that if members do not receive a reminder by the time of their renewal date they should contact the Home Office to ensure that everything is in order. We understand that this section of the licensing administration is now up to date.

Questions in the House

Some discussion on the civil defence role of the radio amateur took place in the House of Commons on 5 May. Sir Anthony Kershaw asked the Secretary of State for the Home Department when he expected Raynet operators to be allowed to participate in local civil defence exercises without prior approval of the Home Office—this is a matter which has been the subject of discussion between the Home Office and the RSGB for some months. The Minister of State, David Waddington, replied that the role of the radio amateur in civil defence was under review, and he expected that a decision would be made soon. He believed that amateurs could make an important contribution at local level. Sir Anthony Kershaw asked Mr Waddington to give every encouragement to radio amateurs in view of the great help which they could give in an emergency, and Mr Waddington replied that he would.

New GB2RS reader needed

GM8MBP is unable to continue as one of the GB2RS newsletters in the Aberdeen area, and the Society would like to thank him for his services. A successor is needed, and any offers would be gratefully received at RSGB Headquarters.

UOSAT, Oscar 8, RS3-8

The AMSAT-UK satellite predictions are now very accurate over the two-month period of the bi-monthly orbital calendar.

The next calendar starts on 1 August and will cost £1.50 per copy, or £8 for a year's supply as printed. The price includes packing and postage to UK addresses only. Order from: AMSAT-UK, London E12 5EQ, which is the only address required.

Historic callsign relaunched

The callsign used to introduce Britain's first scheduled radio entertainment broadcast, 2MT, will be heard on the amateur bands this month after a 60-year break in transmissions. Home Office approval has been granted for the use of the callsign G2MT by the Marconi Radio Society, formed recently by radio amateurs employed at the Stanmore headquarters of Marconi Space & Defence Systems Ltd and at other company sites in the locality.

The callsign will be used at Stanmore for the first time at 1200bst on Saturday 2 July 1983, using equipment owned and operated by members. The frequencies used will depend on the prevailing propagation conditions.

Mobile Rallies Calendar

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

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

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

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

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

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

24 July—McMichael ARS Mobile Rally, Bells Hill, Stoke Poges, nr Slough. Open 11am. Trade stands and flea market. ATV exhibitions, hf station, S22 talk-in. Details from David Cochrane, G8IHF, c/o McMichael Ltd, Wexham Road, Slough, Berks SL2 5EL.

31 July—Rolls Royce ARC (Barnoldswick) Mobile Rally, Sports & Social Club, Barnoldswick. Open 11am. Details from Leslie G. Logan, G4ILG, QTHR.

31 July—Pembroke RSGB Group Bucket & Spade Party, Regency Hall, Saundersfoot. Open 11am. Talk-in on 144MHz. Details from GW3XJQ, QTHR, tel Pendine (09945) 267.

7 August—RSGB National Mobile Rally, Woburn.

14 August—Derby Mobile Rally. Lower Bemrose School, Derby. Further details nearer the date. Details from G4EYM, tel Derby 556875.

21 August—RAIBC/FRARS Hamfest '83, Wimborne, Dorset. Open 11am-5.30pm. Bournemouth & DRAIBC will be promoting the event, and the RAIBC Committee will be holding their agm there. A large number of national and local traders will be present. There will be a special demonstration station, GB2FRH, and talk-in will be available on vhf and uhf. Details from Bob Burrows, G6DUN, QTHR.

28 August—BARTG Rally. Sandown Park Racecourse, Esher, Surrey. Details from Edward Batts, G8LWY, 27 Cranmer Court, Richmond Road, Kingston-upon-Thames, Surrey.

28 August—Preston ARS 15th Annual Mobile Rally. Note new venue at Lancaster University. Easy access, ample free parking, and free admission. Leave M6 at junction 33 and proceed north on A6 for 2 miles. Open 11am. Talk-in on 144MHz fm S22. Cafeteria. Licensed bar on

campus. Bring & buy. All enquiries to Mrs D. Stevens, 13 Arrowsmith Close, Hoghton, Preston PR5 0DV, tel Hoghton (025485) 3304.

28 August—Torbay Mobile Rally. ITT Social Centre, Old Brixham Road, Paignton. Talk-in on S22 from 1000h. Ample free parking. Trade stands and used equipment stalls. Draws and general goods stalls. Hot meals in dining room, bar facilities, RSGB book stand. Further details from TARS secretary, Mrs M. Rider, 7 Kingston Close, Kingskerswell TQ12 5EW, tel 08047 5130.

11 September—Telford Mobile Rally. Extensive venue as before: Town Centre Malls, Telford, Shropshire. Varied attractions, full catering,

licensed premises on site, plus about 80 trade stands. Free entrance and parking. Further details from G8DIR, tel Shrewsbury 64273; G8UGL tel Telford 584173, or G3UKV, tel Telford 55416.

11 September—Vange Mobile Rally. St Nicholas School, Nicholas Lane, Basildon. Open 10am. Talk-in on 144MHz (S22). Details from Mrs D. Thompson, 10 Feering Row, Basildon SS14 1TE.

18 September—Peterborough R&ES Mobile Rally. Wirrina Sports Stadium, Bishops Road, Peterborough. Situated on the river embankment with good car parking, good food, and bar meals, with bar in the adjacent Gildenburgh rooms. Open 10.30am–5pm. Details from D. T. Wilson, 4

Conway Avenue, Peterborough, tel Peterborough 76238.

25 September—Harlow Mobile Rally. Harlow Sportcentre, Hammarjold Road, Harlow. Doors open 10.30am. Bring & buy stall, refreshments and licensed bar, good parking, special interest stands. Talk-in on vhf/uhf. For further details contact G8FRG, QTHR.

2 October—Great Lumley ARES 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 Ian Blackman, G4OCQ, QTHR, or tel 0385 45425.

COUNCIL PROCEEDINGS

A brief report on the Council meeting held on 24 March 1983

Present: Mr D. E. Baptiste, CBE, (President, in the chair), Dr E. J. Allaway, Messrs R. G. Barrett, J. Bazley, P. F. D. Cornish, G. Griffiths, F. D. Hall, L. N. G. Hawkyard, H. M. Holmden, G. R. Jessop, I. J. Kyle, T. I. Lundegard, W. J. McClintock, H. S. Pinchin, K. E. V. Willis (members of Council), D. A. Evans, secretary/general manager, A. W. Hutchinson (editor) and Ms H. M. Allin (minutes secretary).

Apologies for absence had been received from Mrs Heathershaw and Messrs Fisher and Pratt.

The President welcomed Mr Griffiths to his first meeting of Council and presented him with his Council member's badge.

Mr Baptiste then spoke of the sad loss of Mr John Graham, G3TR, who had been the Society's President in 1968. Council stood in silence for a minute as a mark of respect.

Council was pleased to hear that Mr Fred Ward, G2CVV, was making satisfactory progress following his recent heart attack. The President would write, expressing Council's best wishes.

Financial report

Mr Cornish commented on a detailed report he had circulated to accompany the management accounts and balance sheet for the six months ended 31 December 1982.

He suggested that future budgeting be done on a new basis, by looking at costs of necessities, rather than basing figures on comparisons with previous expenditure. The facility whereby expenses could easily be "departmentalized" would enhance this proposed new approach.

He pointed out that any subscription increase must be made well in advance, as the full benefit would not be gained for some months; there not being a common renewal date. He stressed the importance of looking ahead and keeping the question under constant review.

Mr Lundegard raised the topic of monitoring the average length of membership. Mr Barrett replied that the Membership & Representation Committee was very much involved with the problem of members resigning, and added that the committee would welcome any comments.

Mr Cornish answered several more questions arising from the accounts.

It was agreed that consideration should be given to presenting income/expenditure information to the members in a simplified way.

The secretary noted the shift in costs from administration to amateur radio. He added that in 12–18 months the expenditure side of the Society's accounting would be put on the data processor.

Mr Baptiste thanked the hon treasurer for the detailed accounts and his helpful report.

Secretary's report

The secretary reported:

- (i) The new IBM38 central processor unit would become operational ahead of schedule on 28 March.
- (ii) The Presidential installation had been recorded on video and the President held a copy.

This would form part of a 1983 news-reel at a later stage.

- (iii) The members had judged the first NEC event to be a success, and from the cost point of view the exhibition had broken even.
- (iv) Three new staff were being sought: another membership services officer, a membership services officer to specialize in planning matters, and a technical officer.
- (v) The following matters regarding Home Office liaison: progress with the schedule; 50MHz; the development of greetings messages to certain overseas countries; morse tests; the use of cw by Class B licensees; new prefixes.
- (vi) IARU proposal 174, concerning the admission of Club Oceanien de Radio et d'Astronomie — Council voted in favour.

Radio Communication

Dr Evans, G3RPE, as chairman of the Technical & Publications Committee, had been asked to attend the discussion on the style and content of the magazine. He opened the discussion by emphasizing his deep concern for the Society's publications, which he considered to be the lifeblood of the Society. The entire subject had been referred to the Forward Planning Group late last year and their work was not yet in an advanced stage allowing comment. He spoke of the need to recognize the likely high costs involved with re-styling, involving extra staff to cope with technical writing and reviews, sponsoring of articles etc. At present *Radio Communication* was trying to be all things to all people.

Dr Evans raised the possibility of following the pattern of other societies in producing a main magazine containing news and technical aspects of amateur radio of general interest, together with optional specialist supplements. He had proposed to the FPG the re-establishment of an editorial panel having as an immediate objective the generation of editorials, and dealing with readers' letters to be published with replies. There was also a need to "personalize" articles, perhaps by the inclusion of the author's photograph and brief biographical details. He would now put this to Council. This was agreed.

The President added the possibilities of expanding "QTC" and including more articles on construction of simple equipment.

In the ensuing discussion it was apparent that the majority of those present did not favour the idea of supplements to the main journal. However, the concept of occasional "special subject" issues was considered to be popular among the membership.

It was agreed that an editorial board be convened, comprising: Mr D. A. Evans, general manager (chairman); Dr D. S. Evans, chairman, T & P Committee; Mr A. W. Hutchinson, editor, and Mr J. P. Hawker, G3VA (to be invited). This board would produce topical editorials on a six-month experimental basis, with the secretary/general manager having the final say for content.

Mr Bazley drew Council's attention to a booklet

of simple constructional articles produced by the G-QRP Club, which had also raised the possibility of space in *Radio Communication* for a column devoted to QRP enthusiasts.

The style was then discussed. Mr Hutchinson pointed out that many technical articles were later published in the Society's books and therefore should not be written in an informal style. He compared the style with that used in several other magazines, most of which adopted the third-person style. The President agreed that technical articles should be written in a formal and consistent manner, but felt that other items should be personalized and less formal.

Committee recommendation

Raynet. Council agreed to the inclusion of 144.85–144.875MHz in the band plan, subject to the vhf manager being informed.

Membership and representation

Council noted:

- (i) reduced subscriptions in respect of 15 members;
- (ii) waived subscriptions in respect of 11 members;
- (iii) the appointments of the following area representatives:
B. A. Hancock, G4NPM, Swale area, Kent
D. A. Yorke, G4JLG, Gtr Manchester, west and south.
- (iv) the affiliation of the following societies:
Amateur Radio Caravan & Camping Club, Leics;
Axe Vale ARC, Axminster, Devon;
Black Isle Repeater Group, Inverness-shire;
Bourne ARS, Lincs;
Fylde ARS, Lancs;
GI YL Group, Antrim, Northern Ireland;
Jackie's Contest Club, (G4RZO) Kent;
Mount St Mary's Radio Club, S Yorks;
Tiverton (SW) Radio Club, Devon;
West Mercia Contest Group, Worcs;
Yaesu Owners' Club UK—International, W Yorks.

Forward Planning Group

The President remarked that the meeting of the FPG and committee chairmen on 5 February was the first occasion at which all the committee chairmen had met. It was suggested that this be an annual event.

A short discussion followed, relating to the particular needs of various committees. In particular, Council agreed that because of the need to establish the delegation for the triennial IARU Conference in April 1984, the proposed designation of back-ups to the spectrum managers should proceed immediately.

The President pointed out that the standing orders could be amended to suit each committee as appropriate.

50MHz permits—crossband contacts

Mr Willis pointed out that Class B licensees were not allowed to operate crossband to 50MHz, and he felt that this should be changed if possible.

Mr Evans agreed that there were anomalies relating to crossband contacts, and clarification was being sought from the Home Office.

Special Event Stations

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

1-28 July, GB2CAV and GB8CAV

The Southampton ARC will operate the station on behalf of HMS *Cavalier*, a destroyer at present a museum in Southampton. Special QSL cards will be issued. Details from R. W. F. Stanley, G6LOB, 22 Creighton Road, Millbrook, Southampton, Hants, tel 771251.

2 July, GB4WCR

The Nene Valley RC will operate this station at the Wellingborough Charities Carnival, this year being the carnival's 25th anniversary, from the Bassetts Park, Wellingborough, Northants. Special QSL cards will be issued. Operations will be on both vhf, hf and rtty.

8, 9, 10 July, GB2SOU and GB8SOU

The station will be operated by Southampton ARC at the Southampton Show, on the common. Details from R. W. F. Stanley, G6LOB, 22 Creighton Road, Millbrook, Southampton, Hants, tel 771251.

10 July, GB2MAM

Verulam ARC will operate this station at the Mosquito Aircraft Museum, Salisbury Hall, London Colney, Herts, from 10am to 6pm, to celebrate their gala day. There will be an exhibition of second world war equipment. The station will be active mainly on 3-5 and 14MHz ssb. Details from Derek Purchase, G3LXP, QTHR.

12, 13, 14 July, GB2GYS

The station will be operated by York ARS at the Great Yorkshire Show, Harrogate. Operation will be on all bands (conditions permitting) and special QSL cards will be available. Visitors to stand 567 at the show will be welcome. Details from K. R. Cass, G3WVO, QTHR.

15 July, GB2SDJ

Southend & DRS will operate this station as part of the club's diamond jubilee celebrations. Special QSL cards will be available. Operation on all bands 1-8-432MHz. Details from G3YOA, QTHR.

15, 16, 17 July, GB2TCF

A group of Oldham and Tameside amateurs will be operating the station from on board a cabin cruiser. The cabin cruiser will be moored on the Lower Peak Forest Canal adjacent to the main site of the 1983 Tameside Canal Festival (TCF83).

The station will be operating on 3-5, 7, 14, 21, 28MHz cw and ssb, 144 and 432MHz fm. The station will be open to the public between 11am and 5pm on 16 and 17 July. A special QSL card will be available. These will be sent via the RSGB. Talk-

in will be given on vhf if required. Details from G6TIZ, 19 Lincoln Close, Ashton-under-Lyne, tel 061-428 0771, ext 268, 9am to 4.30pm.

16 July, GB2CHC

This station will operate from Camp Hill Boys School in Birmingham commemorating the centenary of the school. Contacts with old boys of the school will be especially welcome. Details from D. A. Cooknell, G4HPQ, QTHR.

16 July, GB2SJS

The station will operate from the playing field adjacent to Saint Joseph's School, Stanford-le-Hope, Essex. A special QSL card will be available. Details from G4LTH, tel Stanford-le-Hope 674301.

23 July, GB4WYP

The station, organized by West Yorkshire Metropolitan Police ARC, will operate as part of World Communications Year at a "Police Community Year" display at Greenhead Park, Huddersfield. It will be operational from 1300-1800h, and will be open to the public. Special QSL cards will be available. Details from West Yorkshire Metropolitan Police ARC, PO Box 9, Wakefield WF1 3QP.

23-30 July, GB4FES and GB8FES

These stations will be operating during "Festival 83", a Christian festival to be held at the County Showground, Stafford. The operation will be on cw and ssb on hf, and cw, ssb and fm on vhf. Details from G6CZM or G4LOF (both QTHR).

6 August, GB2PF

The Radio Club of Thanet will operate this station from the Phoenix Fair, Ellington Park, Ramsgate. HF and vhf rigs will operate from 10.30am to dusk. Details from K. R. Lown, 119 Sea Road, Westgate-on-Sea, Kent CT8 8QE.

12 August, GB2IRC

This station will be operated by Ipswich RC from the site of the Ipswich Carnival in Christchurch Park. Details from J. Tootill, G4IFF, QTHR.

13 August, GB2TS

The station will be operated at the Tollerton Show by the York ARS. Operation will be on all bands. Details from G3WVO, QTHR.

13-14 August, GB2YFT

The station will operate from Yeovil Festival of Transport, Barwick Park, Yeovil, Somerset, on A37 road to Dorchester. Operation on 3-5-432MHz by members of the Yeovil ARC. Details from the sec G4JBH, QTHR, tel 0935 23873.

20 August, GB2MSS

The station will operate from the Mid-Somerset Show, Shepton Mallet, Somerset. Operation on 3-5-432MHz by members of Yeovil ARC. Details from sec G4JBH, QTHR, tel 0935 23873.

20 August, GB4WYP

The station, organized by West Yorkshire Met-

ropolitan Police ARC, will operate as part of World Communications Year at a "Police Community Year" display at Woodhouse Moor, Leeds. It will be operational from 1300-1800h, and will be open to the public. Special QSL cards will be available. Details from West Yorkshire Metropolitan Police ARC, PO Box 9, Wakefield WF1 3QP.

Other Events

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

27 August - Scottish Amateur Radio Convention. Cardonald College, Mossbank, Glasgow, followed by dinner/dance in Bellahouston Hotel, organized by West of Scotland ARS. Details from GM4JDU, QTHR.

25 September - Welsh Amateur Radio Convention, Oakdale Community College, Blackwood. Details from R. B. Davies, GW3KYA, QTHR.

6-8 October - ARRA 12th Amateur Radio & Electronics Exhibition, Exhibition Centre, Doncaster Racecourse.

8 October - Midlands VHF Convention, British Telecom Training School, Stone, Staffs.

15-16 October - El-GI Convention, Ballymascanlon.

10 December - RSGB AGM, IEE, Savoy Place, London.

28-29 April 1984 - RSGB National Amateur Radio Exhibition, National Exhibition Centre, Birmingham.

RAC Courses 1983-4

Leamington Spa. Dept of Engineering, Mid-Warwickshire College of Further Education, Warwick New Road, Leamington Spa CV32 5JE. Enrolment 8 and 9 September. Thursdays, 7-9pm. First class 22 September. Details c/o the college, tel Leamington Spa 311711.

Loughborough. Dept of Electrical Engineering, Loughborough Technical College, Radmoor, Loughborough, Leics LE11 3BT. Tuesdays, 6-7pm, morse; 7-9pm, theory and regulations. First class 13 September. Course tutor Doug Doughty, G3FLS. Course fee £16.50. Details c/o the college, tel 0509 215831.

Princes Risborough. Adult Education Centre, Merton Road, Princes Risborough, Bucks. Wednesdays, 7.30-9.30pm. First class 21 September. Course tutor G3INN. Details from G3INN, QTHR, or Mrs S. Wallace, Princes Risborough Adult Education Centre, tel Princes Risborough 4977.

OBITUARIES

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

Mr A. W. Allan, G2AWA

"Sandy" Allan died on 22 April. He was first licensed shortly after his 18th birthday in 1931. He qualified for a full licence in 1948 and was active for many years on the 3-5MHz band. Latterly he was a member of the Thames Valley RTS.

Mr G. Bartlett

George Bartlett, who died on 18 April, was a keen listener of many years. He had passed Part 1 of his RAE and was hoping to take Part 2 in May. He was known for his helpful reports and his practical help in erecting antennas.

Mr E. F. A. Collins, G3IMA

Jim Collins, who died on 13 April, aged 73, had been a keen home constructor, although in recent years had only been active on 144MHz. He was a past member of the South Hants TS and later the Portsmouth RC. Although not connected with radio professionally, he was always willing to apply himself to other amateur radio problems.

Mr A. Fascoine, G4OVQ

Anthony Fascoine, who died on 6 April, was a member of the RSGB with a keen interest in Raynet. He was an enthusiastic member of North Wakefield RC.

Mr F. G. Ingleton, G6FI

Fred Ingleton, who died on 17 April, in his mid-eighties, learned his morse code in the forces in the first world war. He had been a member of RSGB since 1926, although increasing ill-health in recent years had compelled him to relinquish both his call sign and his membership. He had operated on bands from 1-8MHz to 144MHz.

Mrs M. Mills, G3ACC

Megan Mills died at the age of 74 on 12 May. She will be remembered for her skill as a cw operator on the hf bands and for her handbook *Morse for the radio amateur*, published by the RSGB. Meg obtained her licence shortly after the second world war in which she served as a signals officer in the WAAF. After the war she became one of the very few women engineers in the CEBG. During her early years as a radio amateur she constructed much of her equipment.

Dr I. C. Murfitt, GJ2CYZ

Ian Murfitt died in March. He was interested in all aspects of amateur radio, especially rtty operation.

Miss J. Peters, G4MYO

Jill Peters died on 3 May. She was at one time a marine wireless operator and transferred in later years to Decca Surveys Ltd as a senior engineer. G4MYO was active on top band both on cw and on phone. It is reported that her first two QSOs after receiving her licence were trans-Atlantic cw top band contacts. She was a particularly active participant in the AMPSS net and in the local club top band net. Jill was also active on 144MHz and was well known to many on fm in the London area.

Capt J. Watt, GM4FAC

Captain John Watt is now missing, presumed drowned, after his ship M.V. Nesam sank 60 miles off Lands End on 15 November 1982.

Mr S. Weaver, MBE, GW3ITQ

Sam Weaver died on 1 March. He was a white-stick operator who took up amateur radio at the end of the second world war. He was well known on 3-5MHz. Over the years he had held office as chairman of Rhondda ARS, and later as president. He was honoured for his services to the blind.

Mr P. Wolins, G4JZW

Phillip Wolins died on 20 October 1982. He was a very keen dxer on all bands and enjoyed the hobby very much.

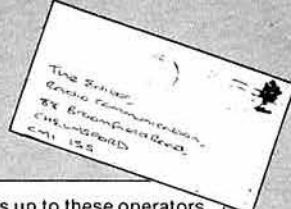
Mr E. Womack, G3LZR

Ted Womack died on 12 September 1982. He was licensed in 1957 and had always been active in amateur radio.

Also:

Dr D. W. Bennett, G3ZHD;
Mr R. Ede, G4IWM, on 17 March;
Mr L. Hales, RS43095;
Mr F. G. Jarvis, G3HIW, on 26 March;
Mr W. H. Maddison, G4JZX, on 25 December 1982;
Mr H. H. P. Messam, G3DDM;
Dr J. L. Novaes, PY1AZ;
Mr R. A. Sharp, G3EQH, on 25 February;
Mr C. F. P. Stevens, RS27528, on 23 March;
Mr G. R. Stuart, G4AUO, on 25 September 1982, aged 53;
Mr D. Todd, RS50459, on 4 January;
Mr T. E. Turner, RS43726, on 7 January;
Mr A. Wade, G6SRI, on 18 March; and
Mr R. Wilson, G14CIE, on 26 April.

Members' Mailbag



EDUCATING THE MEDIA

Sir—It was with disgust that on 21 March I again read an article in the popular press which bracketed amateur radio with cb. The article, published in *The Sun* newspaper, reported that a vicar in Port Talbot had purchased a cb set in an attempt to bring the fear of God to the cb sex fiends. The article states that the Rev Bill Rees has always been interested in amateur radio and that the call sign of the Rev Bill Rees, Britain's first chaplain of amateur radio, is Pontius the Sky Pilot.

The inference in articles of this nature is that amateur radio is used by sex fiends to establish a relationship with young girls for immoral purposes.

There are many ways in which such articles can have a detrimental effect upon our very fine hobby. First and foremost they can destroy the image of the radio amateur in his community; second, by creating a bad impression with local councillors, any application made for planning permission to erect antennas may be adversely affected by what the councillors and general public read in the press.

The RSGB and we as members must at every opportunity bring to the notice of the press and general public: (a) the great divide which exists between the radio amateur and cb, (b) the many ways in which radio amateurs have assisted the British people by, among other things, the use of Raynet; (c) contact with the people of Poland and the Falkland Islands during difficult times, and (d) the many hours spent by wartime amateurs monitoring the bands for enemy messages between 1940 and 1945.

Alan Bleas, G4PDX

This particular newspaper article was brought to the Society's notice by several people: unfortunately, it is a fact that newspapers, in particular, seem to have great difficulty in understanding the distinction between cb and amateur radio. In fact headquarters writes, on average, to one or two news editors per week in an effort to clarify the differences. In addition, an information sheet which sets out the basic aims and principles of the hobby has been circulated to newspapers and other media—this has produced quite positive results. In this specific instance the Society protested to the newspaper in question by telex on the day the article appeared. This was followed up by two telephone calls to the news desk and a letter to the editor. It is hoped that the epithet "radio ham" will not always be so indiscriminately used as it is at present!

RTTY ON 144MHz

Sir—The increasing number of new stations being licensed, and the home computer becoming a common feature of amateur stations, are leading to an influx of rtty enthusiasts on 144MHz. This is good news, of course, in that no longer does one warble a plaintive "CQ" and only imagine those sought-after tones in the noise but there is usually a quick reply from a local station. So far so good. Unfortunately the Region 1 band plan only specifies two spot frequencies for rtty, 144.600MHz and 145.300MHz—the latter being for local working (afsk). The obvious answer is to use 145.300MHz as a calling channel (afsk) and, once a contact is made, QSY to an adjacent channel, say up to 50kHz either side of 145.300MHz, leaving the recognized channel free for others to use in the same manner that S20 is used for fm phone operation.

Suggestions made on the air to this effect have been met with little enthusiasm and even less co-operation, for reasons that I fail to understand. We are using fm, simplex, and modulating with audio frequencies, so why not use the adjacent channels? To monopolise the only designated (afsk) rtty channel, where everyone listens to obtain a contact, for maybe an hour at a time (rtty QSOs invariably take a long time), denies anyone else in a wide area

the chance to establish a QSO, and seems to me to be a highly selfish action, unusual on other modes!

So how about moving over and give someone else a chance. The days of the few are past, and the days of the many are here—all trying to get on to 145.300MHz.

B. A. Johnson, G3XIB

A good point. We have passed a copy of this letter to the vhf manager and the chairman of the VHF Committee for their comments. They will no doubt be writing to G3XIB in due course, and it does seem as though this area of the band plan needs further consideration. The original proposal for 145.300MHz afsk was accepted at the 1975 IARU Warsaw Conference, and admittedly rtty activities at that time were somewhat lower than they are now.

UK PREFIXES

Sir—Arthur Milne, G2MI, is right (as he frequently is) about British call signs. There's no sign of any shortage of available prefixes for many years to come. Heaven defend us from being compelled to change our calls as some countries seem to do almost weekly. The RSGB computer might agree! And while Heaven is about it, defend us from getting the UK calls in the terrible mess the USA calls are in just now. However, here's an easy rule. If you come across an unfamiliar prefix, Ladbroke's will offer you 10 to 1 on it being USA.

The original purpose of a prefix was to make instant identification of a country easy. Now there are times when it is made harder. It is understandable that the deficiencies of the alphabet may force outlandish prefixes on to emerging countries, but it is some time since Britain arose from out the stary main.

Let's stick to "G" while we can; and if we use the "M" series in due course I hope they arrange to give M1MI to Arthur.

Jack Maling, G5JL

This, and other letters making the same point, were received before the allocation of G0 and G1 to the amateur service. It is understood from the Home Office that there is no intention of a mass change-round of call signs—G3NAP will remain G3NAP, for example—and there is also no intention to re-issue lapsed or disused call signs in view of the chaos which would inevitably result!

THE MORSE TEST

Sir—I would like to express my complete agreement with the views on the qualifications for an amateur licence, especially the morse test, expressed by Pat Hawker in "Technical Topics" May. This is certainly the best and most well-balanced reply to the "revolutionaries" which I have seen.

I suggest it is reprinted and issued to every new or potential new member—and to the editorial staff of certain other amateur radio magazines!

John Butcher, G4GWJ/DA1DC/F0HVE

Sir—While one accepts that Pat Hawker possesses considerable technical ability, it does not give him ("Technical Topics" May) and others the right to suggest that only an elitist society with worthy personal and national aims should have the privilege of using the air-waves. Of course amateur radio is a hobby, though it may also be a comfortable resting place for retired and frustrated professionals, and why not? In these times of greater leisure, and the importance of international communication between individuals to counter the ravings and propaganda of politicians, any means of encouraging greater understanding and peace should be supported.

If the admittance of more, technically efficient, stations to the available spectrum does cause congestion, which to some extent I doubt will occur for some time due to self-

limiting factors, then it is up to these operators to present an equal or stronger case and lobby to the ITU to counteract the commercial and political interests, who desire to swamp all others.

My sentiments are entirely with your correspondent, J. H. Beardall, G6ITX, and it would seem that the only way to force the RSGB Council to act is through a proposal passed at the next AGM.

W. Meakin, RS43872

Sir—Having read with interest the letter by G6ITX in your May issue, it seems he feels that no sensible reason has been given for the retention of the morse requirement in the Class A licence, but in his letter he, himself, gives the reason, ie the requirement is not a national one but an international one.

When some 30 years ago, as the licensing officer for the (then) newly-independent Kingdom of Libya, I applied to the ITU for the allocation of a national prefix, I asked, merely as a matter of curiosity only, whether it was necessary to include a cw requirement in the licences to be issued for the amateur service. I was then advised that this was essential, as in the event of interference to other traffic, particularly on shared bands, instructions could be issued by an authorized governmental station requiring the amateur station to clear the channel, and that in most instances such instructions could only be issued by the use of cw telegraphy. To meet this requirement it was necessary, therefore, that individuals operating amateur stations should be capable of receiving cw telegraphy at a speed of not less than 12wpm.

I am sure that G6ITX realises that on the hf bands, the interference could be caused not merely in his home area, but possibly in areas a thousand or more miles away.

It does seem, however, that the Home Office places unnecessary difficulties in the way of Class B licence holders struggling to pass the morse test by denying them the opportunity to use cw telegraphy on the bands they are already authorised to use. I am sure that were the Class B licence to be modified to enable holders to make cw contacts even at 4 to 5wpm, practice of this nature would make the passing of the obligatory 12wpm test much less of an annoyance than it now is.

J. T. Blackwood, BA, MSc, G3TG

These and other letters suggest that the controversy over the morse test is still some way from being resolved. There is no real evidence to suggest that anyone who has enough motivation cannot meet the comparatively simple requirements of a 12 wpm morse test. We know of a number of cases where people have sat the morse test several times and failed but, with proper tuition, they have passed the test and never looked back. In other words, part of this problem is undoubtedly the method of learning.

Nevertheless there are those who claim complete lack of ability in this area despite a high degree of motivation—Mr Meakin seems to be one, according to correspondence received in the past—and as far as the RSGB can ascertain they are in the tiny minority. Most remain impervious to arguments for the retention of the morse test, as might be expected! G3TG's point remains very valid even in 1983, and indeed another correspondent mentioned that he had to QSY from a frequency he was using in the 3.5MHz band by a commercial user quite recently—in morse.

As one correspondent jokingly said, perhaps there should be less letter writing and more morse practice! As mentioned last month, there are currently internal discussions taking place within the Society concerning a morse practice facility on the bands allocated to Class B licensees. This will help to provide additional incentives to those who have problems in passing the test. We hope to have more news of this in a subsequent issue.

13·8V POWER UNITS AN AMATEUR'S APPROACH

by E. J. HATCH, CEng, FIEE, G3ISD*

Introduction

Judging by the frequent references in *Technical Topics* etc, low-voltage regulated power supplies are popular items for home construction. This is not surprising, as they are relatively straightforward, and should show a fair saving over commercial units, depending on the source of components. The writer became involved as a result of deciding that the cheapest route to a 144MHz base station was a secondhand mobile rig and a home-made power supply.

Various experiments and measurements have been made over about two years on three units of 13·8V output, and nominally 6A, 12A and 25A continuous ratings. It is of course possible to throw together almost any collection of components that result in a unit which will work after a fashion. Nevertheless, although some of the following may appear to be described in tiresome detail, this will enable the intending constructor to predict the effect of using whatever components come most readily to hand. It will allow a selection to be made where alternatives are available, and is a better approach than the one that says "let's throw it together and see if it works". The main questions are likely to be:

1. Which regulator arrangement to be used?
2. What transformer secondary voltage is required?
3. What capacitance and voltage rating of reservoir capacitor is required?
4. How is the heatsink sized?
5. How is overvoltage and overcurrent protection arranged?

The answers to some of these questions are to a certain extent interdependent, as will be seen.

The regulator

There are of course many possible regulator systems, and old hands will have their favourites. The writer suggests, with some temerity, that almost all amateur applications can be satisfied using one or other of two circuits, both of which are well known and entirely unoriginal.

As a substitute for a vehicle battery, and for currents up to say 10A, the simple circuit in Fig 1 is entirely satisfactory. This makes use of a 7812 12V regulator, the output of which is applied to the base of a 2N3055 used as a "pass transistor". The transistor emitter will be approximately 0·6V below its base potential, so to provide an output of 13·8V it is necessary to raise the output of the 7812 to $13·8 + 0·6 = 14·4\text{V}$. This is done by means of the 5k Ω variable resistor in its common terminal. The 0·22 and 0·47 μF capacitors are tantalum bead type mounted directly at the 7812, and may not be omitted, or instability will surely result. Although the 2N3055 is rated at 15A it will be found in practice that 10A is about the limit due to heatsinking limitations, unless one resorts to forced (fan) cooling. It is possible to increase current capability by paralleling two or more 2N3055 transistors, but in order to encourage current sharing it is necessary to connect a resistor in series with each transistor emitter. Such current sharing resistors are usually sized to drop 0·5–1V when carrying full current. Unfortunately with this circuit it is not possible to compensate for this voltage drop, and regulation suffers as a consequence. The basic circuit,

E. J. (Ted) Hatch is a chartered electrical engineer without professional connections in electronics or telecommunications. He spent the greater part of his working life in the papermaking and petro-chemical design industries, retiring in 1982. His interest in radio dates from boyhood, and he obtained the callsign G3ISD in 1953. His amateur radio interests are varied, but he finds constructional work particularly enjoyable and satisfying, the latest outlet for which has been provided by a recently awakened interest in rtty/Amtor.

using a single pass transistor, can be expected to have a regulation of around five per cent, which is quite acceptable, and better than that of a vehicle on the move.

Improving the regulation

Much better regulation will result if a regulating system is used that senses the output terminal voltage, and thus can apply correction for any change in output voltage, including voltage drop in the current sharing resistors. Such a system is shown in Fig 2. Its increased component count is justified for power units from, say, 10A up to around 25–30A rating. A 723 is used as the regulating element, with an appropriate number of 2N3055 pass transistors (not more than, say, 10A per transistor). In this circuit an additional transistor TR1 is interposed between the 723 and the pass transistor. This increases the gain of the control loop considerably, with a consequent improvement in regulation. In any case, this transistor cannot be omitted since the current output of the 723 is limited, and is not sufficient to drive the pass transistors directly. The effect of TR1 is to reduce the current demand

from the 723 by a factor of $\frac{1}{\text{transistor TR1 current-amplification-factor}}$.

In the interests of standardization and convenience, TR1 is also a 2N3055, as its relatively modest gain is quite adequate. The intending constructor is warned against the temptation to use another device with higher gain in this position in an effort to obtain "perfect" regulation, as excessive gain may cause oscillation under some conditions of loading. In most applications a regulation of up to 0·5V is sufficient. It is strongly recommended that the 723 be soldered into circuit instead of using a dil socket, as this will result in a more effective dissipation of heat.

The load sharing resistors are likely to range in resistance from about 0·05 to 0·1 Ω depending on requirements, and may be difficult to obtain. They are conveniently formed from pieces of 16swg nickel chrome wire bent into hairpins and mounted in connector blocks as in Fig 3. The resistance is given in tables as 0·164 Ω /ft, so that each resistor will consist of around 4–8in of wire.

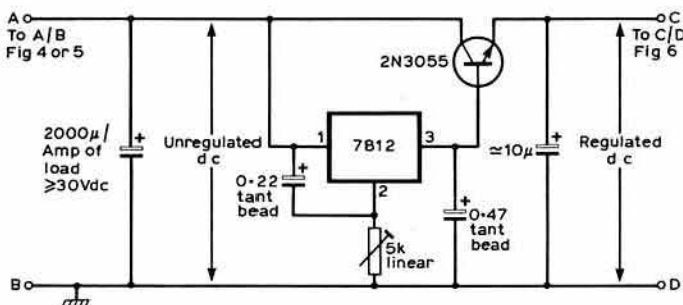
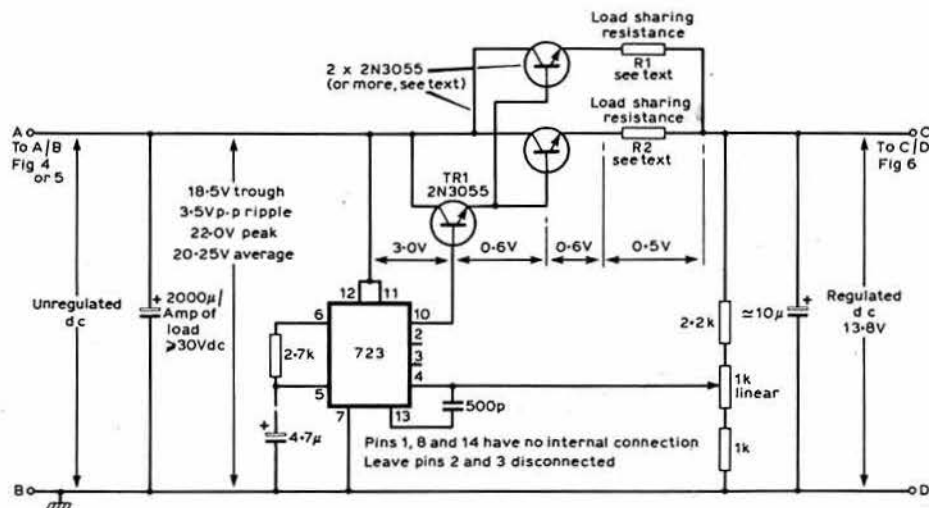


Fig 1. Simple regulator circuit

*147 Borden Lane, Sittingbourne, Kent ME10 1BY.

Fig 2. Voltage distribution



The transformer

Irrespective of the source of the transformer, whether surplus or specially made, one must determine the ideal secondary voltage. If the voltage is too high, then extra volt drop and, therefore, power will have to be dissipated in the pass transistors. Not only does this extra (wasted) power have to be supplied by the transformer but it may prove impracticable to dissipate it in reasonably-sized heatsinks. Conversely, if the voltage is too low, then a lower regulated voltage will have to be accepted.

unregulated input voltage, the peak-to-peak input ripple must also be added. Assume for the moment that this is 3.5V, making a total of 20.4V. To arrive at the transformer on-load output voltage add 2V bridge rectifier drop, plus, say, 2.5 per cent for drop in mains supply voltage, resulting in $22.4 \times 1.025 = 22.96$. Converting this to rms, $\frac{22.96}{\sqrt{2}} = 16.23V$ on load.

Now consider Fig 2. Similar reasoning as for Fig 1 applies, but allowing a differential voltage of 3V for the 723, adding 0.6V for the base emitter potential of TR1, and another 0.5V for current sharing resistor drop, as follows:

Output voltage	13.8V
Load sharing resistor volt drop	0.5V
Pass transistors base/emitter potential	0.6V
Driver transistor base/emitter potential	0.6V
723 minimum input/output differential	3.0V
Ripple peak to peak, say,	3.5V
Bridge rectifier volt drop	2.0V
Total	24.0V

Plus 2.5 per cent for mains voltage fluctuations, $1.025 \times 24 = 24.6V$.

Converting to rms, $\frac{24.6}{\sqrt{2}} = 17.39V$ on load.

As has already been said, these are the ideal input voltages to the regulator system. They are based on an assumed ripple voltage of 3.5V peak-to-peak at full load, which of course depends on the reservoir capacitor value, of which more later.

The question of transformer VA rating is not as straightforward as would at first appear. Assume that a transformer is to hand—marked, for

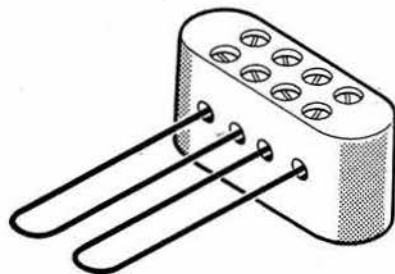
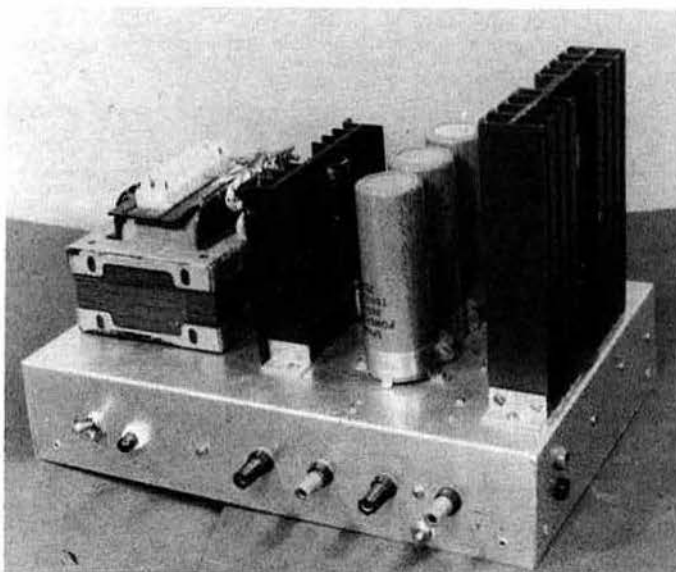
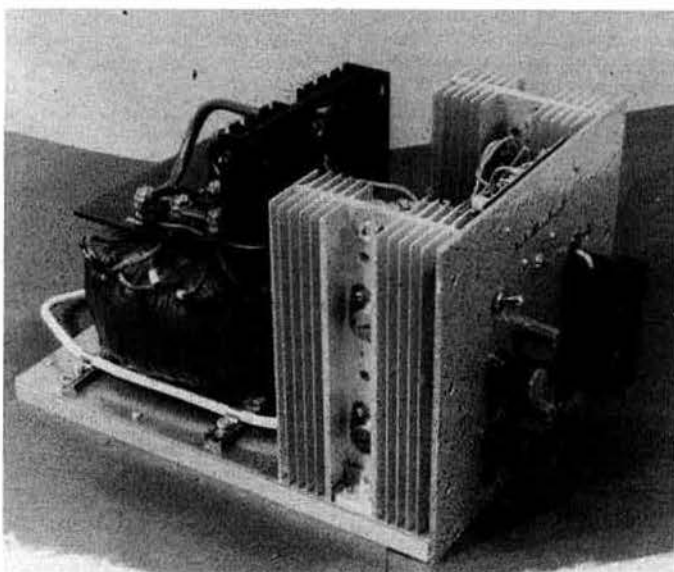


Fig 3. Current sharing resistors

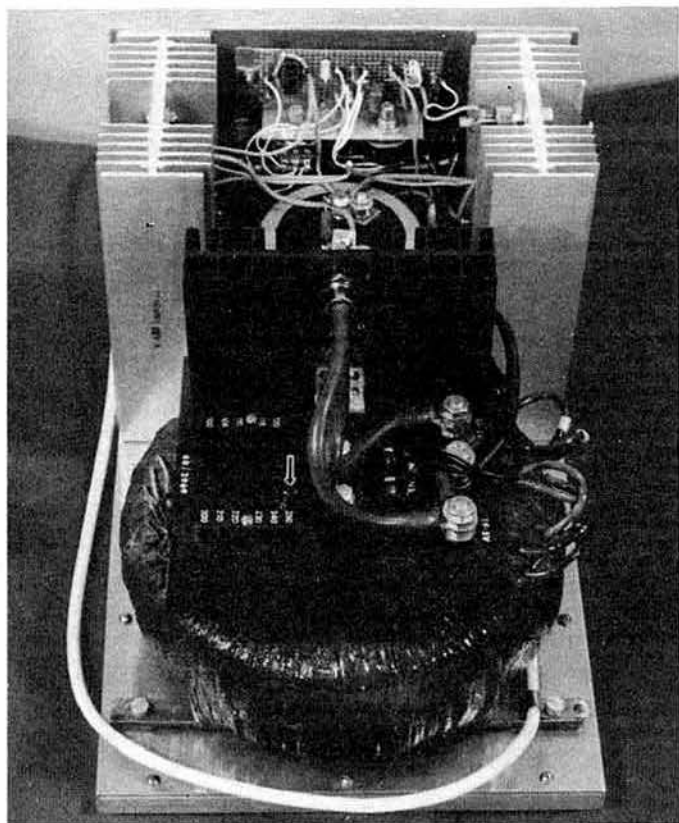
Consider Fig 1. To function properly the 7812 must have a minimum input/output differential of 2.5V. If the required output voltage of 13.8V plus the pass transistor base/emitter potential of, say, 0.6V is added to this, the resultant is 16.9V. However, as this is the *minimum* value of



Nominal 12A unit



Nominal 25A unit



Rear view of nominal 25A unit. The 723 regulator and control network are visible at top rear of front panel

instance, 17V 5A, equal to $17 \times 5 = 85\text{VA}$. The primary of this transformer will be appropriately sized for this rating. Further assume that the secondary is rectified, smoothed with a large capacitor of, say, $10,000\mu\text{F}$ and supplies a load of 5A via a regulator system. The average voltage across the capacitor would be

$$(17 \times \sqrt{2}) - \frac{3 \cdot 5}{2} = 22 \cdot 3\text{V}$$

(3.5V is assumed peak-to-peak ripple). But $22 \cdot 3 \times 5 = 111 \cdot 5\text{VA}$! Thus the primary would be overloaded unless the transformer were specifically designed for this application. Alternatively the secondary should be derated, but by how much? It is not, as might be thought,

$$\frac{17}{22 \cdot 3} = 76 \text{ per cent.}$$

Because of the nature of the waveform with capacitor load, it is usual to derate to approximately 65 per cent. In this case, the 5A transformer would supply only $5 \times 0 \cdot 65 = 3 \cdot 25\text{A}$, for approximately equivalent transformer heating.

This perhaps makes depressing reading, especially if it appears that the chunky 25A transformer you have just bought is good only for $25 \times 0 \cdot 65 = 16 \cdot 25\text{A}$. It all depends on the basis of transformer design, and if the purchase of an expensive purpose-made transformer is contemplated, this is a point to raise with the supplier. Yet another factor to consider is the duty cycle, ie the level of loading related to time. In amateur service it is not often that a transformer is required to operate continuously at full load. The duty cycle of fm transmissions may be speculated upon, but with equal lengths of "overs" is 50 per cent. The operating duty cycle of ssb is less than 50 per cent without speech processing, and this is reduced further by "overs". This being the case it would appear that in amateur service the calculated continuous rating could be increased by some amount, but again, by how much? The author suggests that an additional 25 per cent is reasonable and practicable for transformers, but the regulation must be watched.

Thus the proof of the transformer pudding is in the heating, and with modern insulation a transformer may feel uncomfortably hot to the touch, and still operate satisfactorily and safely.

In the above calculations an allowance of 2.5 per cent has been made for a fall in mains voltage. The question of whether a greater allowance should be made is a matter for the individual.

Note that in all cases the "on-load", meaning full-load, voltage is referred to. The difference between no-load and on-load voltage (the "regulation") of a transformer depends on a number of factors, mainly the following:

1. Size of transformer (rating).
2. Load power factor.
3. Type of construction (conventional or toroidal).
4. Quality (ie, one usually gets what one pays for).

Some idea of regulation can be obtained from the figures given in the RS Components catalogue, and the advertisements of ILP Electronics Ltd. Failing that, and as a very rough guide, one can assume 10 per cent for a 100VA unit, falling to five per cent for a 500VA unit.

Some adjustment of voltage is possible if the transformer has a tapped primary. For instance, 240V applied to a 250V tap will reduce the secondary volts by four per cent. A more wary approach is needed when going the other way. Two hundred and forty volts applied to a 230V tap will increase secondary volts by 4.3 per cent, but will also increase the iron losses. Whether the latter can be tolerated is a matter of trial and error.

The rectifier

Generally speaking, the rectifier configuration will be either the bridge, or bi-phase, Figs 4 and 5, and that used will depend on the transformer available. In both cases the rectifier combination rating in amperes will be nominally twice that of individual diodes, but because of the high peak capacitor charging currents, and possible lack of detailed data, it is advisable to derate bridge rectifiers by 50 per cent, and to consider a rectifier combination to have the same rating as its component diodes. Where a transformer is available with two secondaries for series or parallel connection, only 1V diode voltage drop need be allowed in the arrangement of Fig 5. At the low voltages under consideration, this could be significant in borderline cases.

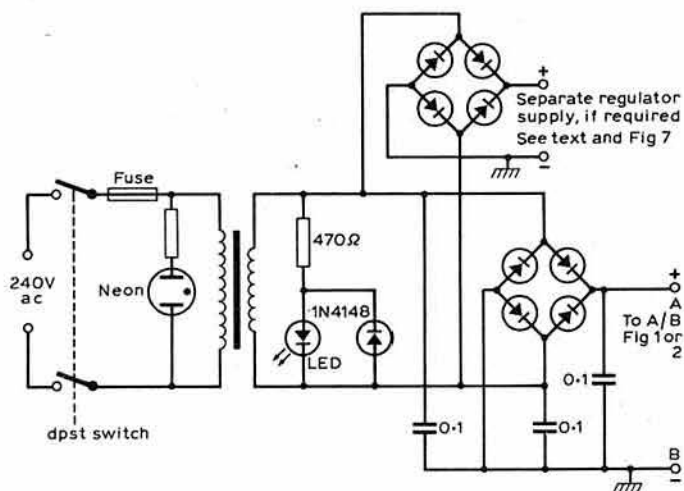


Fig 4. Circuit of system using bridge rectifier. Primary neon and l.e.d. are alternatives

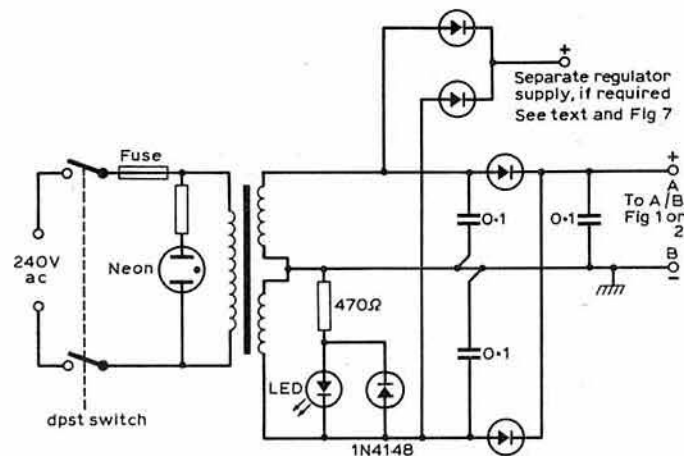


Fig 5. Circuit of system using bi-phase rectifier. Neon and l.e.d. are alternatives

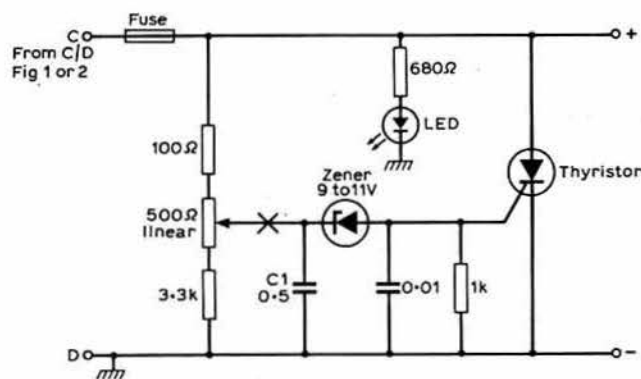


Fig 6. Crowbar circuit. If a value of C1 greater than 1.0μF is necessary to prevent "nuisance" tripping, insert a resistance at point X. Values between 22 and 100Ω are suggested. Thyristor rating may be 6A for power supplies up to 10A rating, and 12A for larger units

Whether individual diodes or "potted" bridges are used, thought must be given to rectifier heating in the higher current ranges. For example, a continuous 10A through a bridge rectifier can represent a power loss of as much as 20W, which must be effectively dissipated.

Reservoir capacitance and ripple

At this point some will be wondering what justification there is for assuming a peak-to-peak ripple voltage of 3.5V. The answer is that somewhere along the line the writer picked up a rule of thumb which said "use 2,000μF/A of dc load". Oscilloscope measurements indicate that this value of capacitance results in a ripple voltage of approximately that value, which is an acceptable compromise. Lower values of capacitance are not recommended because of the resulting increased ripple, and significantly higher values are an illustration of the law of diminishing returns.

The capacitor voltage rating should be equal to or greater than the peak value of the transformer *no load* voltage. In practice this means a 30V dc rating, 25V dc being just a little on the low side.

The best type of capacitor to use is undoubtedly the computer grade with screw terminals, not only for their increased reliability, but also for their higher ripple current ratings. They are horrendously expensive in the catalogues, but seem to be available cheaply at all the rallies, albeit often in used condition.

Heatsink considerations

The question of heatsink size is often glossed over, although the calculations are quite simple. The size of a heatsink is defined in terms of its thermal resistance to atmosphere. Just as ohmic resistance can be defined as volts dropped per amp

$$(R = \frac{E}{I}),$$

so thermal resistance may be defined as degrees C temperature rise per watt dissipated. Reference to a catalogue will show that each size of heatsink is given a °C/W figure. The function of the heatsink is to dissipate the power loss across the pass transistor(s) in the form of heat, to prevent the base/emitter junction of the transistor(s) exceeding the safe maximum temperature. In the case of the 2N3055, this is 200°C.

First, consider the power to be dissipated by summing the volt drops as follows, and then multiply by the load current:

	Fig 1	Fig 2
Pass transistor(s)	0.6	0.6
Driver transistor	-	0.6
Regulator	2.5	3.0
0.5 × ripple	1.75	1.75
Total volt drop	4.85	5.95

Under "the transformer", we added 2.5 per cent to allow for a modest fall in mains voltage. Let us add a further 2.5 per cent for occasional *increases* in mains voltage. The above figures now become: for Fig 1, 5.1V, and for Fig 2, 6.25V.

It would do no harm to emphasize here that these particular volt drops would apply only when using transformers with ideal secondary on-load voltage. Transformers with lower than ideal secondary voltage would entail settling for a lower regulated voltage. Transformers with a higher than ideal voltage would entail increased dissipation in the pass transistor/heatsink

combination. As will be seen, this latter condition could be difficult to fulfill in high current power units.

Consider a 5A supply using the arrangement of Fig 1, and a 25A supply using that of Fig 2. In the first case, the power to be dissipated would be 5.1 × 5 = 25.5W, and is no problem. In the second it would be 6.25 × 25 = 156.25W, and it is evident that another 2V to drop would increase this to 206.25W. To revert to the thermal calculations; by using the following formula, it is possible to calculate how many watts a particular heatsink can dissipate.

$$\text{Watts} = \frac{(1) \text{ Max transistor junction temp } ^\circ\text{C} - (2) \text{ ambient temp } ^\circ\text{C}}{(3) \text{ thermal resistance junction to case} + (4) \text{ thermal resistance case to heatsink} + (5) \text{ thermal resistance heatsink to atmosphere}}$$

- (1) for 2N3055 is 200°C
- (2) say 25°C
- (3) for 2N3055 use 1.5°C/W
- (4) for 2N3055, using mica insulator and silicone grease use 0.5°C/W
- (5) will depend on heatsink.

It is suggested that a practical approach would be to take two well-known and widely available heatsinks of known thermal resistance, and see what they will dissipate. These two heatsinks, of 1.1°C/W and 2.1°C/W, have in the past been purchased cheaply at rallies, and may be recognized as 401-807 and 401-403 in the RS Components catalogue, and as 10DN and 6W-1 in the Maplin catalogue. The available dissipation per heatsink is then as follows, with 10 per cent derating for contingencies:

1. 1.1°C/W heatsink

$$(a) \quad W = \left\{ \frac{200 - 25}{(1.5 + 0.5 + 1.1)} \right\} 0.9 = 50W = 9.8A \text{ (Fig 1)}$$

or with two transistors on same heatsink

$$(b) \quad W = \left\{ \frac{200 - 25}{1.5 + 0.5 + 1.1} \right\} 0.9 = 75W = 12A \text{ (Fig 2)}$$

2. 2.1°C/W heatsink

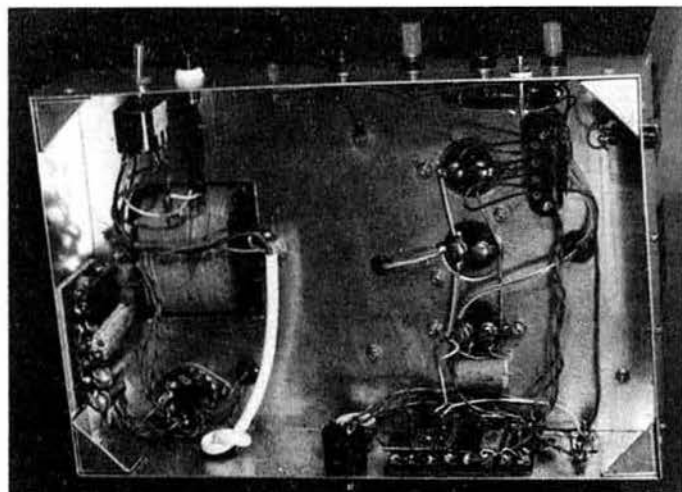
$$(a) \quad W = \left\{ \frac{200 - 25}{(1.5 + 0.5 + 2.1)} \right\} 0.9 = 40W = 7.8A \text{ (Fig 1)}$$

or with two transistors on same heatsink

$$(b) \quad W = \left\{ \frac{200 - 25}{1.5 + 0.5 + 2.1} \right\} 0.9 = 50W = 8A \text{ (Fig 2)}$$

Note that if more than the bare minimum voltage drop as calculated previously needs to be dropped across the pass transistors, these values of current will be reduced. Bearing in mind that the 1.1°C/W heatsink is physically fairly large, and perhaps can be considered as a practical maximum size in amateur use, the following conclusions can be drawn:

1. On a large heatsink, (No 1 above) a useful increase in dissipation capacity is obtained by using two transistors, even if one would be enough to carry the required current.
2. Two 1.1°C/W and four pass transistors would be needed to satisfy the 156W dissipation requirements of the 25A power unit considered above.
3. In these examples, no pass transistor is required to carry more than 9.8A (1(a) above).



Under chassis view of nominal 12A unit. The components and relay socket at lower left form a "soft" switch-on circuit

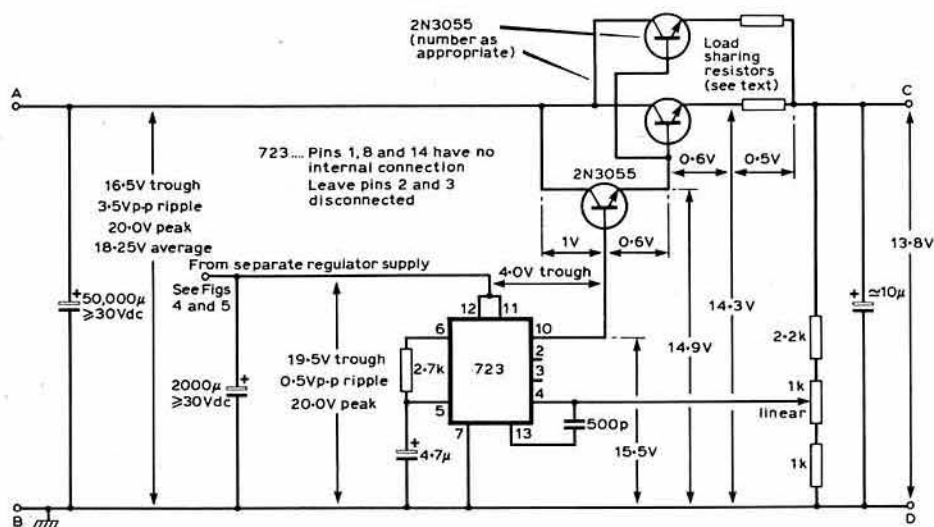


Fig 7. Voltage distribution of 25A power supply regulator with separate control supply

The foregoing substantiates the writer's view that in general there is no need to look further than the cheap and widely available 2N3055 as a pass transistor, rated at 15A, 115W.

Of course, all ratings could be increased by the use of a cooling fan with its attendant noise, but such applications are outside the writer's experience. Also, these are continuous ratings and no cognizance has been taken of the duty cycle in the above, which is a matter for individual judgement. In any case, do not be surprised if the pass transistors feel extremely hot. With a junction temperature approaching 200°C, the case is going to be hotter than 100°C, ie hotter than boiling water.

Reducing power dissipation requirements

It is obvious that if, somehow, the pass transistors' voltage differential could be reduced, so also would be the power dissipated in the pass transistor/heatsink assembly.

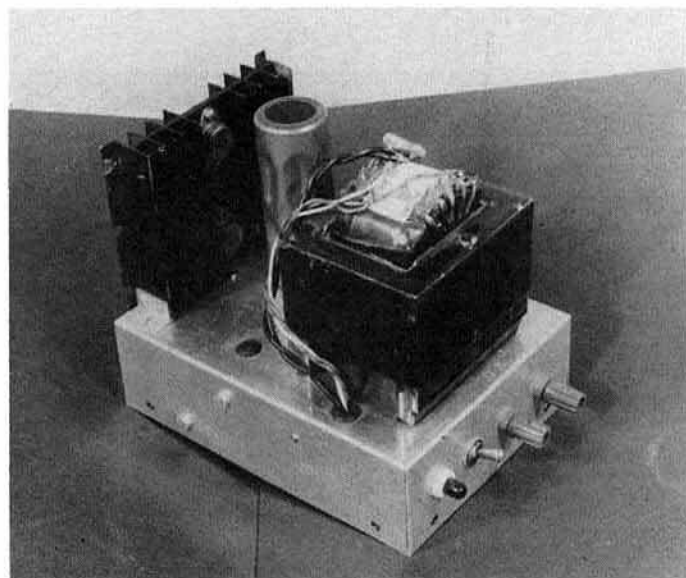
It is possible to do this by supplying the regulator from a slightly higher voltage source. The latter is derived from a separate rectifier/reservoir capacitor combination fed from the same transformer. Because of the low current requirement of the 723 (less than 100mA) the voltage input to the regulator will be almost the peak value of the transformer secondary voltage, even with quite modest values of reservoir capacity.

For a hypothetical 25A supply, and calculating as before, the power to be dissipated in the heatsink is reduced from approximately 150 to 100W, a saving of 33 per cent. Fig 7 shows the theoretical voltage distribution for a 13.8V 25A supply using this method. It would also enable a transformer with a full load voltage as low as 15V to be employed if a final voltage of around 12.5V is acceptable.

Transformers with excess secondary voltage

It is evident from the above that even one or two excess secondary volts can be an embarrassment, particularly at higher currents. The fortunate possessor of a variac will have no problem, but what are the alternatives available? Reducing the value of reservoir capacity is not as attractive as it at first appears. One reason is that with decreasing capacity and therefore increasing ripple, the voltage at the trough of the ripple (on which correct operation depends) falls twice as fast as the average voltage (on which heatsink size is based), so that any advantage would be marginal. Another reason is that electrolytic capacitors usually have a tolerance of the order of -10 per cent +50 per cent, and any attempt at close control of ripple value is not really practical.

The other obvious alternative is resistance in primary or secondary, and before or after the pass transistor(s). The advantage of primary resistance is that transformer loading is reduced, and vehicle lamps may be a convenient form of resistance for this purpose. If the lamp current approximates to the mains load current required, the volts applied to the primary of the transformer will be reduced by say 12 or 24V, according to lamp voltage. At the transformer ratios concerned, 12V less on the primary



Nominal 6A unit

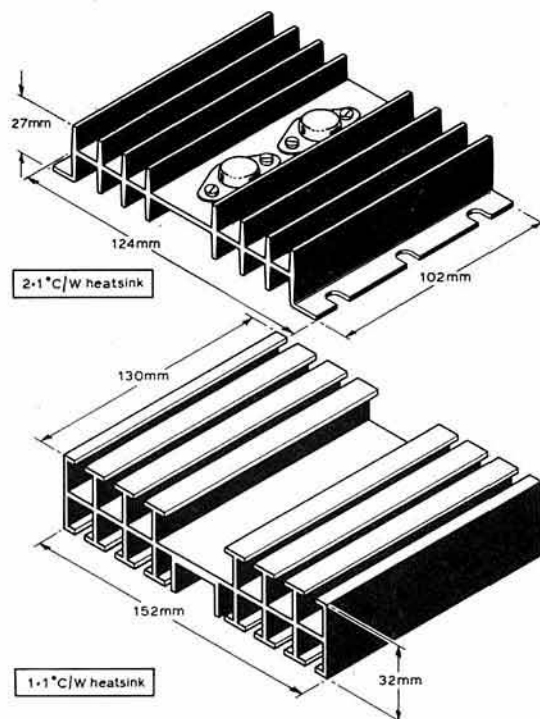


Fig 8. Above, 2.1°C/W heatsink; below, 1.1°C/W heatsink

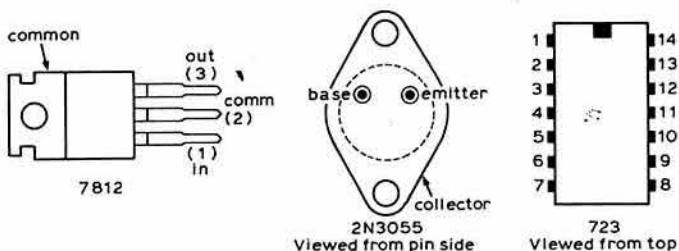


Fig 9. Device connections

approximates to 1V less at the secondary and a reduction of 1V ac approximates to a reduction of 1.4V dc.

Volt dropping resistors on the secondary side of the transformer are not recommended, as any power to be dissipated has first to be supplied by the transformer. This power can be appreciable, especially at higher currents. The most that would be suggested is 1V (instead of 0.5V) across the load sharing resistors. However, if it is decided to proceed in this way, suitable low value resistors can be formed from nickel chrome resistance wire previously referred to, see Fig 3.

Current rating, free air		*Resistance Ω /ft
16swg	10-15A	0.164
18swg	5-8A	0.292
20swg	2-5.5A	0.52

*May vary between manufacturers

These current ratings are arbitrary, they depend on the degree of ventilation, and are for guidance.

Overvoltage and overcurrent protection

The case for overvoltage protection is easily made when it is realised that a short-circuited pass transistor could result in the application of up to 25V to an expensive transceiver designed for an absolute maximum of about 15V. The circuit shown in Fig 6 is the one favoured by the writer, and has appeared in *Rad Com* at least twice in the past. It operates by placing a short circuit (a "crowbar") across the supply if the voltage rises above a predetermined level, thus blowing a fuse. Simpler circuits could be used, but it is felt that the ability to preset the operating voltage with reasonable accuracy has advantages. Note the capacitor C1, without which the crowbar fired whenever the rig was switched from simplex to duplex operation, indicating a voltage surge. No amount of capacity across the power supply effected a cure, but the relatively small value of C1, which does not appear to be critical, together with the decoupling effect of the potentiometer chain, has made blown fuses a thing of the past.

Unlike overvoltage, overcurrent is largely in the hands of the operator, and would usually take the form of an accidental short circuit. For this reason the writer has not seen fit to build in any special circuitry, but is quite content to rely on a fuse. The usual objection is that the pass transistors would be destroyed before the fuse blew. This has not proved to be the case, as a number of fuses were blown during experiments with the crowbar circuit. In any case, with 2N3055 transistors costing only around 50 pence each, is the additional circuitry worthwhile?

However, for those who wish to pursue the question of overcurrent protection other than by a simple fuse, reference may be made to the *Rad Com* bibliography at the end of this article.

Applying "amateur service" ratings

Although the question of duty cycle has been touched upon, all calculations above have been based on continuous rating. There is no doubt that in amateur service, ratings thus calculated may be increased to take advantage of a duty cycle somewhat less than unity. It has already been suggested that the rating of a transformer in these circumstances may exceed its continuous rating by about 25 per cent. The writer is of the opinion that the appropriate figure for heatsinks should not exceed 10 per cent. From the foregoing sections on rectifiers and regulators, it can be seen that these items already have a fairly generous "built-in" allowance.

The two things to bear in mind, are that:

1. The transformer secondary voltage must hold up under the increased current.
 2. The reservoir capacitor must be sized in accordance with maximum load currents (at 2,000 μ F/dc load amp).
- Failure to take these factors into account will result in ripple on the output and hum on the signal.

Conclusion

It may seem to the practically-minded amateur (among whom the writer counts himself) that the foregoing makes rather a song and dance about a fairly straightforward piece of equipment. If nothing else, it shows that there is more in it than meets the eye, and should assist in making use of whatever is available. Nothing has been said about construction techniques, and for hints in that direction, together with other circuit arrangements, the reader is referred to the bibliography which follows. These references, all from *Rad Com*, make absorbing reading, and illustrate the considerable surge in interest in this subject over the last four years or so.

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THE BEER MAT Mk2



Trevor Hopkins worked for a year with Cambridge Scientific Instruments on leaving school, then went to Manchester University. Acquired a BSc in physics and computer science and an MSc in computer engineering, and has completed two years' research work on computer communications. Hopes to gain his PhD in the near future. Employed for six months by GEC Hirst Research Centre. Has recently been appointed as lecturer in the Computer Science Department, University of Manchester.

Major outside interest is amateur radio; committee member of the South Manchester RC, and the UK FM Group (Western). Particularly interested in 23 and 13cm equipment, especially hand-portable operation on these bands.

David Bolton was born in 1958, and eventually graduated from Manchester University with a degree in physics and electronics, and the callsign G8UQC. On graduating, spent a year working for Sperry Gyroscope (Bracknell), then set up an electronics consultancy in Cheshire. When not involved in electronics, likes to sing in Gilbert & Sullivan operettas, church choirs and any other music with a choir involved. Not adverse to the odd pint or two, especially if electronics and/or music can be done at the same time!



A 14MHz direct-conversion receiver

by *TREVOR P. HOPKINS, MSc, G8TYY**,
and *DAVID R. BOLTON, BSc, G8UQC*

FOR A JOINT PROJECT at a local radio club, a beginner's direct-conversion (d-c) receiver was chosen. A design was selected from a nationally-known wireless publication, and several receivers were constructed by club members. At a subsequent "radio clinic" session at the same club, a number of these projects were brought along for diagnosis. After much work these receivers were made to work, after a fashion, but the difficulties were so great that we decided to design a direct-conversion receiver which could be made to work successfully even by inexperienced constructors.

The "Beer Mat" receiver was the initial solution, and worked well; a Mk2 version using fewer components and a smaller printed circuit board was subsequently produced. A number of these receivers have been constructed and all have performed well.

Why is it called the "Beer Mat"? Two reasons: some of the initial ideas were sketched on the back of the proverbial beer mat, and the completed printed circuit board is approximately the same size as an average beer mat!

Design requirements

The object was to design a direct-conversion receiver for an amateur hf band which had reasonable performance, and which could easily be constructed. The following points were observed:

1. As few components as possible, especially semiconductors, were to be used. The Mk2 uses three ics, two transistors and three diodes. All the components used should be readily available. It was decided on the grounds of economy and availability to avoid ready-wound coils. However, the coils are wound on readily-available formers with screening cans, and have a maximum of two windings (no taps).
2. A printed circuit board should be used for the receiver, and as many components as possible should be mounted on this. In the Mk2 receiver, even the volume and rf gain controls are mounted on the pcb, so that the only parts to be assembled into the case are the pcb, loudspeaker, tuning control, on/off switch and the batteries.
3. Plenty of gain and ample audio output are required to make loudspeaker reception easy. In the Mk2 the total gain is well over 100dB, and the maximum audio output is 500mW. Adequate audio filtering is to be provided.

4. A voltage-controlled oscillator (vco) is to be used for the local oscillator, so that a standard potentiometer with a reduction drive (or a multi-turn potentiometer with a turns-counting dial) can be used as the tuning control to minimize the mechanical engineering requirements. The oscillator is to be adequately stable for ssb reception.

Principles of operation

Almost all radio receivers rely on *mixing* and, in general, this is a property of any non-linear device (diode, transistor etc). If such a device has, as its input, a frequency f , then its output will be, in general, a mixture of frequencies at f , $2f$ (ie, twice the frequency), $3f$, $4f$ etc. Note that the higher frequencies (harmonics) are usually weaker than the original frequency.

If our mixer has at its input a mixture of *two* frequencies f_1 and f_2 , the output will contain f_1 , $2f_1$, $3f_1$ etc, and f_2 , $2f_2$, $3f_2$ etc (harmonics of the original input), as well as $(f_1 + f_2)$, $(f_1 - f_2)$, $(2f_1 + f_2)$, $(2f_2 - f_1)$ etc. The

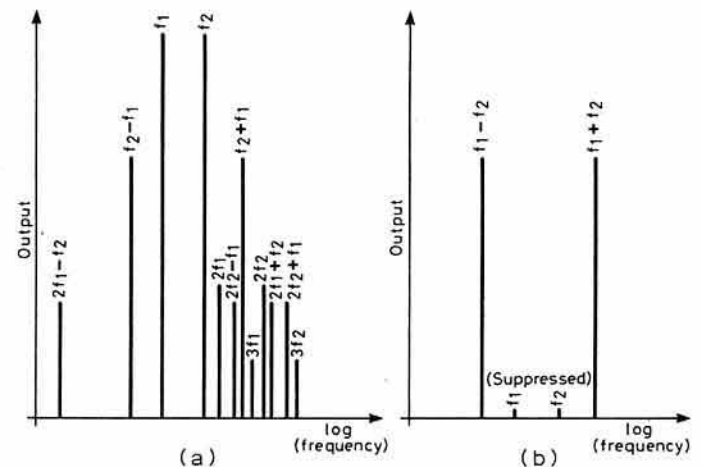


Fig 1. (a) Typical (unbalanced) mixer products. (b) Ideal output from double balanced mixer

*46 Brook Venue, Levenshulme, Manchester M19 3DQ.

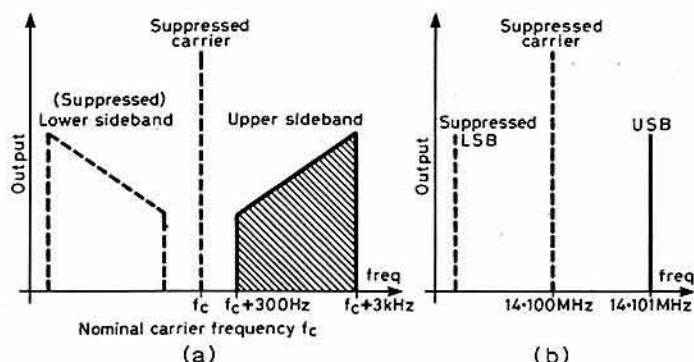


Fig 2. (a) Typical ssb signal (usb shown). (b) Single tone transmission

latter outputs are known as mixing products, see Fig 1(a). Usually, we require either $(f_1 + f_2)$ or $(f_1 - f_2)$, and all the other frequencies are undesirable. A double-balanced mixer (dbm) is used in the "Beer Mat" receiver, and this has the desirable property of suppressing from its output the original frequencies and their harmonics (see Fig 1(b)), so the only significant outputs will be $(f_1 + f_2)$ - the sum frequency, and $(f_1 - f_2)$ - the difference frequency.

In a superhetrodyne receiver a mixer is used to mix the desired frequency with a tunable local oscillator to produce an intermediate frequency (i.f.) which is amplified and subsequently detected (converted to audio frequencies). In a direct-conversion receiver, such as the "Beer Mat", the desired frequency is detected directly using a mixer, and most of the amplification is at audio frequencies.

The spectrum of a typical single-sideband (ssb) transmission is shown in Fig 2(a). Note that upper sideband (usb) has been shown; as this is the conventional sideband in use on the 14MHz band. However, the principle of operation is very similar for lower sideband (lsb). For ease of understanding, consider that the transmission has a nominal frequency of 14,100kHz and the transmitter is modulated by a constant tone of 1kHz (Fig 2(b)). This means that the radiated output will be a single frequency of 14,101kHz, and the carrier frequency (14,100kHz) and the lsb signal are suppressed. If we mix this with a local oscillator signal of 14,100kHz in a dbm, the sum frequency of 28,201kHz and the difference frequency of 1kHz will be produced. Note that the latter frequency is the modulation frequency, and the sum frequency can be readily filtered out and the audio frequency recovered.

However, the same output would have been obtained with the local oscillator set to 14,102kHz; the difference frequency is also 1kHz. This phenomenon is known as the "audio image" response, and means that a signal will appear twice close together in the tuning range of the receiver. However, the tuning is not made particularly difficult by this, as it is impossible to resolve ssb signals with the local oscillator set to the wrong side of the transmission.

Circuit description

A block diagram for the complete dc receiver is shown in Fig 3. The antenna is connected to a mosfet rf amplifier with bandpass tuned circuits at input and output. The output is fed to an ic dbm, and mixed with a local oscillator signal from a vco. The resulting audio signals are fed to a preamplifier, then to a pair of simple active filters (highpass and lowpass). This is further amplified by a second preamplifier and fed to an audio power amplifier via the volume control. Note that the audio preamplifiers and filters use only one ic.

The full circuit diagram is shown in Fig 4. Transistor TR1, a dual-gate mosfet type 3N204 (or 40673), forms the rf amplifier and RV1 is the rf gain

Components list

R1,4	18kΩ	C1, 3, 7	18pF
R2	270kΩ	C2, 4, 5, 6, 8,	
R3, 5, 25, 26, 28	1.5kΩ	12, 15, 20, 21	10μF electrolytic
R6, 7	3.3kΩ	C9, 26	33pF
R8, 13, 14,		C10	100pF
17, 18, 22	47kΩ	C11	47μF electrolytic
R9, 28	1kΩ	C13	22nF polyester
R10	330Ω	C14	220μF electrolytic
R11, 12	2.2kΩ	C16, 25	1μF electrolytic
R15	10kΩ	C17, 23	1nF
R16	68kΩ	C18, 19, 22	1μF tantalum
R19, 20	120kΩ	C24	47nF polyester
R21, 24	56kΩ	C27	100μF electrolytic
R23	5.6kΩ	C28	
R27	22Ω		

All resistors 0.33W 10%

RV1	47kΩ linear	D1	BA102
RV2	47kΩ or 50kΩ linear with reduction drive (or multiturn, with turns counting dial)	D2	BZY88 C6V2 or similar 6.2V 400mW zener diode
RV3	10kΩ log		
IC1	SO42P		
IC2	LM328		
IC3	LM380		
TR1	3N204 or 40673		
TR2	2N3819	D3	1N4148
		S1	SPST min toggle

Miscellaneous

3 off coil formers, Denco type 722/1, with bases, cans, and tuning slugs
 2 off 2mm sockets (1 black, 1 red)
 2 off 4 × HP7 size battery holders with clips
 9 off PCB pins
 8 off HP7 batteries
 1 off 3.5mm jack socket
 1 off 8Ω loudspeaker
 Two knobs to suit
 Metal case
 Printed circuit board (see text)
 Rubber or plastic feet
 Wire
 Nuts, bolts, washers

Component availability

Most components are readily available from many suppliers. The SO42P integrated circuit is stocked by Electrovalue, as are the coil formers and cans. The coil formers are also available from Maplin. A suitable multiturn potentiometer is available from Ambit International; this firm also stocks a potentiometer with a reduction drive built into the shaft. This latter potentiometer is unfortunately 20kΩ resistance, but may be suitable. A printed circuit board will be available from the authors at cost price (approximately £1.60); contact either of them for details.

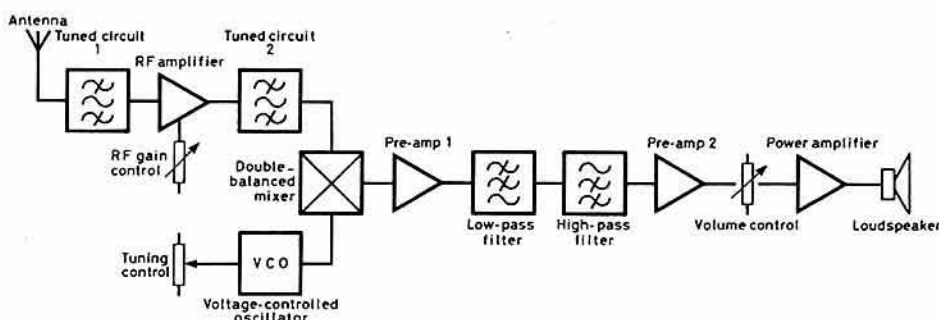
control. Tuned circuits L2/C1 and L3/C3 are slightly damped by resistors R1 and R4 respectively to give a sufficiently broad response to cover all of the 14MHz band. Resistor R5 and capacitor C5 provide decoupling.

Transistor TR2, a junction-fet type 2N3819, forms a Colpitts oscillator tuned by L5, C7 and the variable capacitance (varicap) diode D1. A variable tuning voltage is provided by the potential divider R6-R8, RV2. A stabilized supply for the voltage-controlled local oscillator is provided by a zener diode D2.

Signals from the rf amplifier and local oscillator are inductively coupled into the dbm IC1 type SO42P. The "sum" frequencies are filtered out by C14, and the remaining audio is fed to the audio stages by C15. Capacitors C12, C13 provide substantial decoupling to ensure stability.

The preamplifiers and filters are constructed from a quadruple operational amplifier ic type LM348. IC2a forms a non-inverting amplifier with a gain of 18dB, and this feeds a lowpass Sallen and Kay filter with a nominal cutoff frequency of 3kHz, constructed around IC2b. IC2c forms a highpass filter with a cutoff frequency of 200Hz. The filtered signal is fed to a passive lowpass filter R22, C22, and then to a second non-inverting

Fig 3. Block diagram of the d-c receiver



MEASURED PERFORMANCE

Unless otherwise stated, all measurements were taken with the volume and rf gain controls at maximum, the signal generator set to 14,100kHz, and the receiver tuning set to produce a beat note of 1kHz.

Frequency range	14.0 to 14.4MHz with some overlap. (Other ranges possible, see text)
Sensitivity	4μV for 20dB signal + noise/noise ratio 35μV for 500mW into 8Ω Power gain 103dB Final signal + noise/noise: 65dB (at -6dB points, ref 25mW into 8Ω)
Frequency response	220-2,800Hz -20dB points: 60Hz, 6kHz
Stability	Frequency drift (after 15min warm-up) less than 100Hz/min
Audio output	Greater than 500mW into 8Ω
Current consumption	30mA at 12V (controls at minimum)

amplifier IC2d with a gain of 21dB. This is fed to an audio power amplifier IC3 type LM380 via the volume control RV3. This has a maximum output of 500mW into an 8Ω loudspeaker. Decoupling is provided by C25, and stability is ensured under all load conditions by the addition of a zobel network R27, C27.

PCB construction

It is thoroughly recommended that the printed circuit board layout given in Fig 5 be used. For those with some experience, this pcb is easily constructed at home. The circuit has a very high gain and is extremely stable using the layout shown; nonetheless, stability problems could arise if an alternative construction technique were used, such as stripboard etc. Step-by-step instructions will be given for the pcb assembly, coil winding and the final assembly.

1. Start the pcb assembly by inserting terminal pins for the connections to the loudspeaker, antenna, earth, batteries, and the tuning control. The use of pins rather than soldering wires directly to the board is strongly recommended. If the volume and rf gain controls are to be mounted off the pcb, then pins should be fitted for these connections as well.
2. Insert and solder the fixed resistors (there are 28 of these). Also insert the one wire link.
3. Insert the capacitors; there are 14 miniature ceramics, two polyester, one tantalum bead and eight electrolytic capacitors. Note that three ceramic capacitors C1, C3 and C7 (all 18pF) are fitted on the coil bases and should *not* be fitted now. All ceramic capacitors should be of the

Fault

Set dead, nothing from loudspeaker

Slight hiss from loudspeaker; not affected by volume control

Low level of hiss from loudspeaker; affected by volume control, but not rf gain control

High level of hiss from loudspeaker; affected by volume control but not rf gain control

High level of hiss from loudspeaker; affected by both volume and rf gain controls, but no signals heard

Signals heard, but not tunable by RV2

Table 1. Fault diagnosis

Possible causes

Batteries not connected or flat
Loudspeaker faulty or not connected
Fault in circuit around IC3

Volume control faulty or not connected
Fault in circuit around volume control

Fault in circuit around IC2 a-d
Fault around IC1 or L3/L4

Fault around IC1
Faulty coil L3/L4
Fault around TR1
Faulty oscillator; TR2 and associated components

Faulty in coil L1/L2
Faulty oscillator; circuit around TR2, D1-D3, L5/L6

Fault in coil L5/L6
Fault in RV2 or connections
Fault around varicap diode
Poor screening around oscillator, especially coil L5/L6

miniature-plate type, and all electrolytic capacitors should be vertical-mounting types. Capacitor C24 is a 1μF tantalum bead type. Electrolytic and tantalum capacitors are polarized, and the orientation should be carefully checked.

4. Insert the three ics. Note that IC1 is oriented in the opposite direction to the other two ics. IC sockets are *not* recommended for any of the ics, particularly IC1.
5. Insert the remaining semiconductor devices: one zener diode D2, one varicap diode D1 and one ordinary diode D3; one dual-gate mosfet TR1 and one junction fet TR2. The orientation of all these devices is important, and should be double-checked.

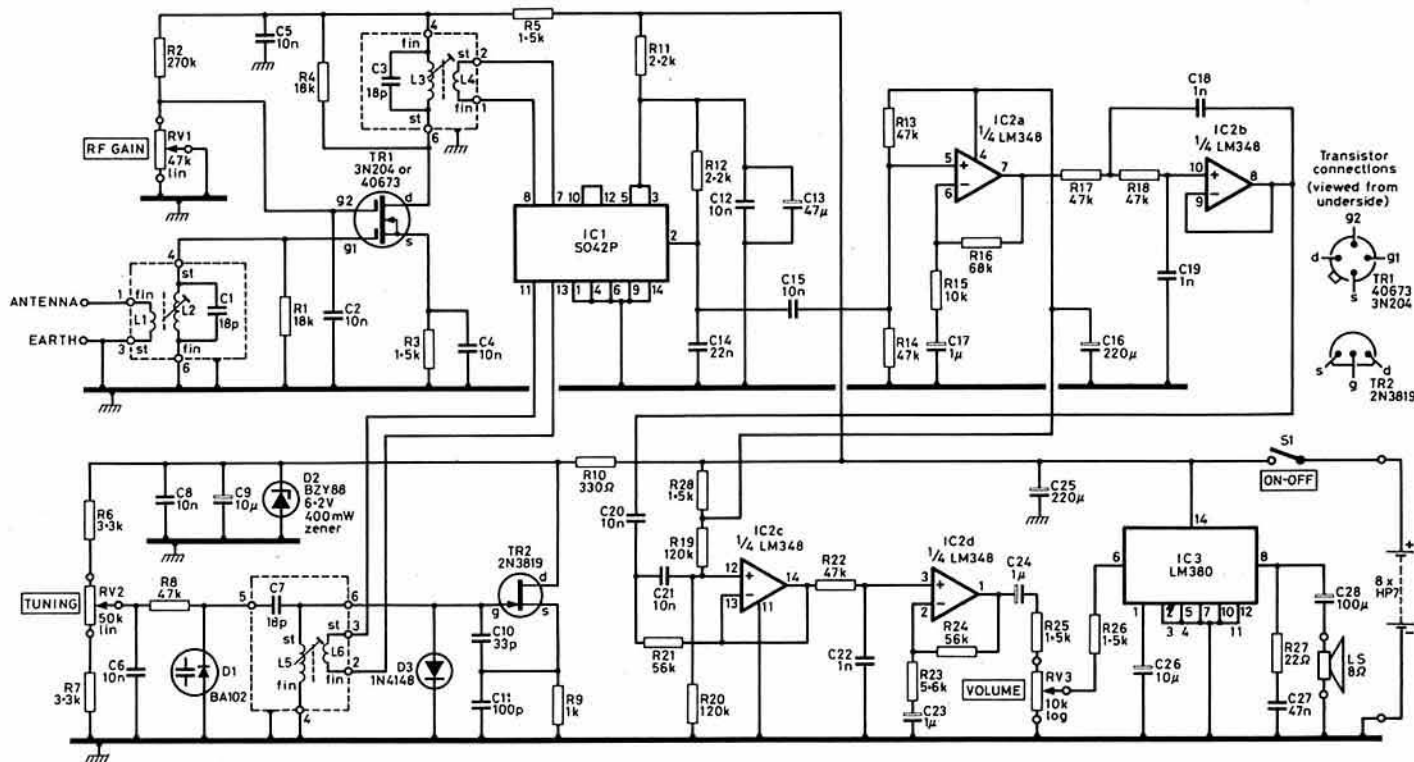


Fig 4. Complete circuit diagram of the "Beer Mat" receiver

Fig 5 (a). PCB track layout (track side), shown full size

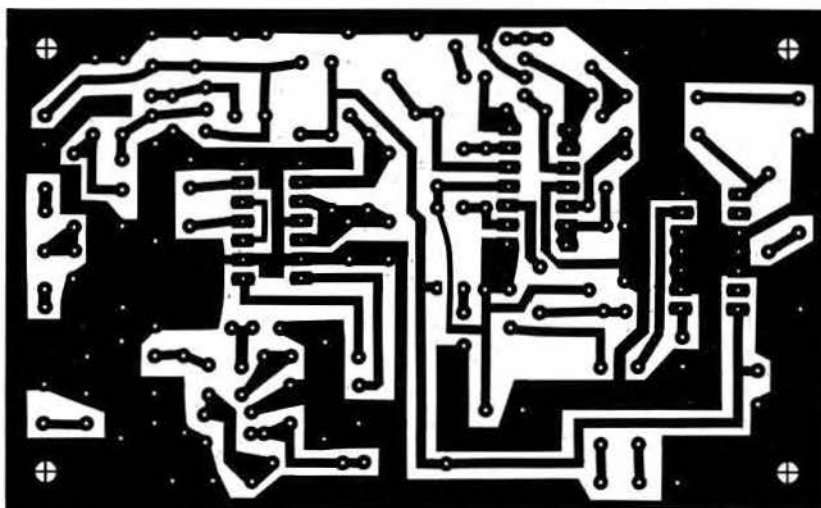
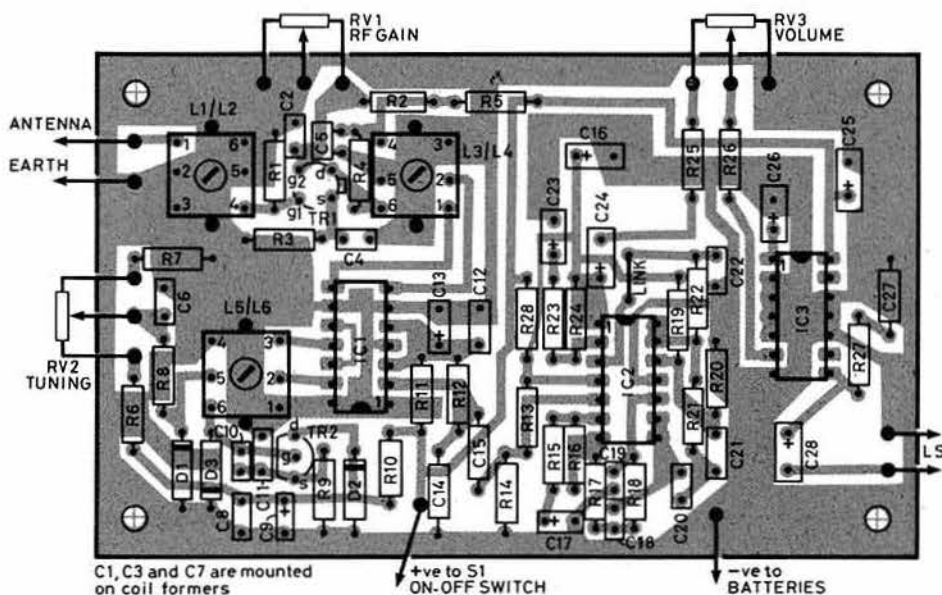


Fig 5 (b). PCB layout diagram for d-c receiver.
NB: Pin 1 of coil formers marked 1; — C1, C3
and C7 mounted on coil formers



6. If the volume and rf gain controls are to be mounted on the pcb, they should be inserted now.

The printed circuit board should now be complete, except for the coils. Check the component placing and orientation *again* to avoid expensive mistakes. The audio stages can be tested at this point by connecting a loudspeaker and batteries (and the volume control if not already done); a gentle hiss should be heard from the loudspeaker with the volume control at maximum.

Coil winding

The construction of the coils used in the "Beer Mat" Mk 2 receiver will be described in some detail, so that they may be constructed by even the most inexperienced constructor.

The wire used for the coils should be 38swg enamel covered. It is strongly recommended that "self-fluxing" enamelled wire be used; this means that the insulation is removed and the wire tinned simultaneously by the application of a hot soldering iron and solder. Wire produced by Vero Ltd for their "Verowire" wiring system is especially suitable for this, and replacement reels are available from retailers.

The coil winding details are shown in Fig 6. Each coil has two windings, a main tuned winding and a coupling winding. Each main winding has a tuning capacitor associated with it, and this is also mounted on the coil former. All three coils have the same number of turns on each winding, although the pin connections are different; therefore, the construction of coil L1/L2 will be described in some detail.

Construction should start by forming the leads of the ceramic capacitor C1 so that they fit easily into the holes in the connecting pins 4 and 6 in the

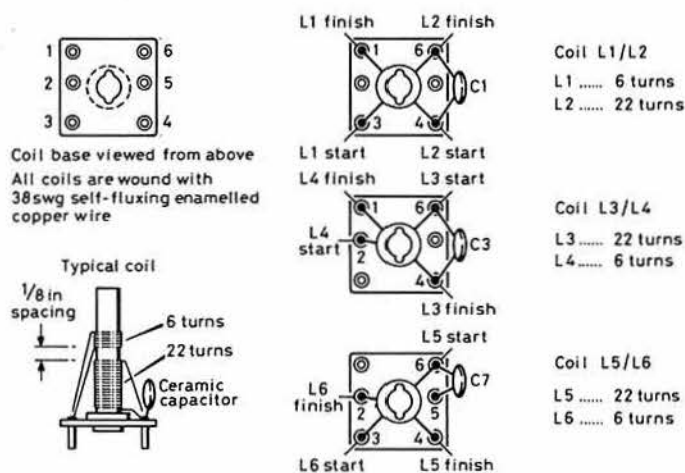


Fig 6. Coil winding details

coil base. The capacitor should now be inserted but not yet soldered. The end of the enamelled wire should be inserted into pin 4 (the wire is thin enough to fit in with the capacitor lead); now solder pin 4 only. Note that if self-fluxing enamelled wire is *not* used, it will be necessary to clean the end of the wire of the insulation first. One end of the coil and capacitor should now be firmly fixed.

The wire should be wound on the former clockwise, as seen from above. The windings should be arranged neatly, side-by-side, on the former. After 22 turns have been wound, an extra 2in of wire should be left before cutting off. The free end of the wire should be inserted into pin 6 with the capacitor lead and pulled through to hold the wire tight. Pin 6 may now be soldered, and the remaining wire snipped off. The winding may be held in place with a little polystyrene (modelling) cement or similar glue; do *not* use cyanoacrylate adhesives ("Superglue"), as they have a very poor rf performance. The main winding is now complete.

The coupling winding L1 should be wound about 0.125in (3mm) above the top of L2. Start by soldering the wire into pin 3 and then wind six turns above L2. The remaining end should be inserted into pin 1 and drawn tight, and then soldered in place. More cement should be applied to this winding. This completes coil L1/L2; the process should be repeated (with minor differences, see Fig 6) for coils L3/L4 and L5/L6.

When all three coils are completed, they should be soldered into the appropriate positions in the pcb. The cores should be inserted, and set so that the top of the core is flush with the top of the coil former. The screening cans should be placed over the coils and soldered to the pcb. The receiver is now ready for initial testing.

Testing

Connections for the loudspeaker, batteries and the tuning control should be made and, after a final check on the pcb layout, the batteries should be connected. With both the volume and rf gain controls at maximum, a loud hiss should be heard. Connect an antenna (a few tens of feet of wire should be sufficient at this stage); the noise level should increase, and some signals should be audible. It should be possible to tune-in signals with the tuning control and peak the strength by adjusting the cores in coils L1/L2 and L3/L4. Note that the peaks are quite broad. If all is well, go on to assemble the pcb into the case before attempting to finally align the receiver. If all is *not* well, refer to Table 1 for a fault-finding guide.

Final assembly

The final assembly will depend on the exact case and components available to the constructor, so that no detailed instructions can be given. However, a few general remarks are appropriate.

For optimum stability, an all-metal case should be used, and the components (especially the pcb) should be mounted rigidly in the case. If a reduction drive is used on the tuning control, this must be fitted carefully to ensure that the tuning is smooth and free from backlash. The batteries (eight HP7s or similar) should be fitted in the appropriate holders, and these held in place with plastic foam. Sockets for the antenna, earth connection and (if desired) headphones may be fitted on the rear panel, while the volume, rf gain, on/off and tuning controls should be fitted to the front panel. The loudspeaker can be fitted to the lid of the case and suitable holes to allow the sound out should be drilled.

Alignment

Assuming that the receiver appears to be operating and some signals can be heard, the alignment can proceed as follows. First, it is necessary to check that the oscillator is set to cover the correct frequency range. In order to do this, access to either a frequency meter or another calibrated receiver covering the 14MHz band is necessary. Most radio amateurs will have access to such equipment, and people are often to be found who are willing to loan equipment and/or assist with the alignment. If a digital frequency meter is available, it should be connected across coil L6 (IC1 pins 11 and 13). The tuning control RV2 should be set to its central position, and the core of coil L5/L6 should be adjusted until the meter reads 14,200kHz. The tuning range should be checked by rotating the tuning control over its entire range; it should be possible to tune from below 14,000kHz to above 14,400kHz.

If a calibrated receiver is available, a wire connected to its antenna input should be placed near IC1, and the calibrated receiver set to 14,200kHz. The d-c receiver tuning control RV2 should be set to mid-travel, and the core of coil L5/L6 adjusted until a signal is heard from the calibrated receiver.

Having aligned the oscillator, remove the connection to the other receiver or frequency meter, and connect an antenna to the "Beer Mat". With a signal tuned-in near the centre of the tuning range, adjust the cores in coils L1/L2 and L3/L4 for maximum received signal strength. This completes the alignment. The cores should be locked in position with candle wax or similar material; if this is done, and a rigid constructional technique has been used, it should be possible to jar the receiver without changing the tuning.

It is possible to construct a "Beer Mat" receiver to cover other amateur bands. In general, it will be necessary to alter the coils and the associated tuning capacitors, and the resistors R1 and R4. It may also be necessary to change the values of C10 and C11 in the oscillator circuit.

Operation

In practice, the "Beer Mat" receiver has proven to be surprisingly easy to use, despite the audio image. The receiver is sensitive enough to receive a great many signals, and stable enough to allow ssb signals to be readily resolved. With a 30ft wire outdoor antenna, strong signals from much of Europe, as well as the USA and Canada, were heard, although an even shorter antenna indoors provided very surprising results.

One problem which can occur in the "Beer Mat" receiver, as well as with other direct-conversion receivers, is the breakthrough of strong a.m. broadcast-band signals. The effect of this is the reception of signals unaffected by the position of the tuning control. This problem has only very occasionally been noticed with the prototype "Beer Mat" receivers, and good screening of the complete printed circuit board has noticeably improved the performance in this respect.

An effect which can also occur in the receiver design, in common with almost any hf receiver, is the overloading of the mixer, with the consequent production of intermodulation distortion and spurious mixer products. These effects can be minimized by operating the receiver with the volume control set to near maximum, and the rf gain control advanced only as far as necessary. It is also recommended that an antenna tuning unit be used when large antennas (longer than about 100ft) are employed. This will also reduce broadcast-band breakthrough.

Other problems encountered with this receiver project have largely been associated with "flat" batteries. One effect is to increase the rate of tuning drift; this is a sure sign of failing batteries. Low batteries can occasionally give rise to a noticeable "chirp" on strong cw signals.

In conclusion, the receivers constructed have been both sensitive and stable, and many signals have been received. Many "Beer Mats" have been constructed, all to the satisfaction of their builder.

Acknowledgements

The authors would like to thank various members of the South Manchester Radio Club, and others, who have constructed receivers and commented on the design, construction and the constructional information. They would also like to thank the RSGB technical reviewers for their helpful comments on the design and article. □

BOOK REVIEW

Radio Antennas by Stephen Gibson, WB4NBI, 165 + X pages. First edition, 1983. Published in USA by Reston Publishing Company, US\$13.95, and in the UK by Prentice/Hall International, price £11.85. Limp covers.

There has recently been a spate of new books directed towards newcomers, and written in simple non-mathematical, almost non-technical language, presumably on the assumption that the long-established American and British handbooks, manuals and guides are pitched at too advanced a level. Simple books for simple people can often provide a useful introduction—but only if in simplifying the subject the author does not introduce too many gross oversimplifications or downright misleading ideas and concepts. This reviewer well recognizes the constraints and problems of publishers in this area, but nevertheless can find little to say in praise of this new book: it succeeds in collecting together in one place virtually all the myths that surround the subject of radio antennas, decked out with some simplistic fundamentals. Seeking some way of praising it, I will admit it is attractively printed and laid out in large legible type with few misprints (though the fact that a "stylized" quad should be described as three-element on page 42 and (correctly) as two-element on page 101 suggests some lack of care). I started out listing some of the incorrect text statements but gave up in despair. Not a book to be recommended either in terms of value for money or technical merit! Somebody ought to tell WB4NBI that a balun is not an impedance matching transformer—and a lot else besides!

Contents What is an antenna? Propagation. Types of antennas. Transmission lines. Matching devices. Antenna design. Antennas for the lower frequency bands. Antennas for 20, 15 and 10 metres. Antennas for more than one band. Limited space antennas. Antennas for emergency, mobile and field use. VHF antennas. After the antenna is up.

G3VA

A MODERN HF TRANSCEIVER

(PART 4)

by G. N. FARE, G3OGQ*

ALC board

The track layout is shown in Fig 20 and the component layout in Fig 21. No difficulties should be encountered with this board. If it does not work, check for a constructional error.

When all components are mounted and checked, connect the forward and reflected pins to the wattmeter board. Connect a wire between the output pin and the alc pin on the pre-driver board. Apply 12V and check that the voltages are similar to those shown on the component layout.

Switch on the transmitter and, while monitoring the output either with an oscilloscope or using the wattmeter, key the cw oscillator. Adjust the potentiometer R1011 until the power output begins to drop. The l.e.d. should light up at this point.

AF filter

The track layout is shown in Fig 22 and the component layout in Fig 23. Construction is quite straightforward and should present no difficulties. Connections to the switch (which will be mounted on the front panel) are made with shielded wire.

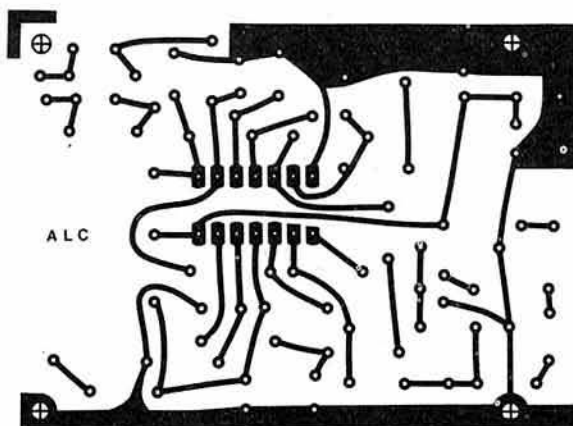


Fig 20. ALC board track layout. Single-sided board

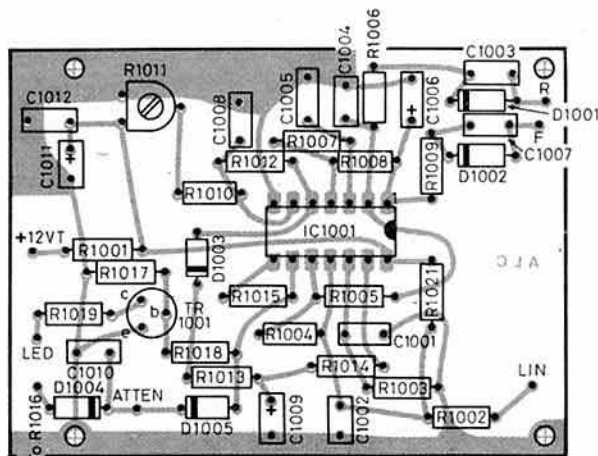


Fig 21. ALC board component layout

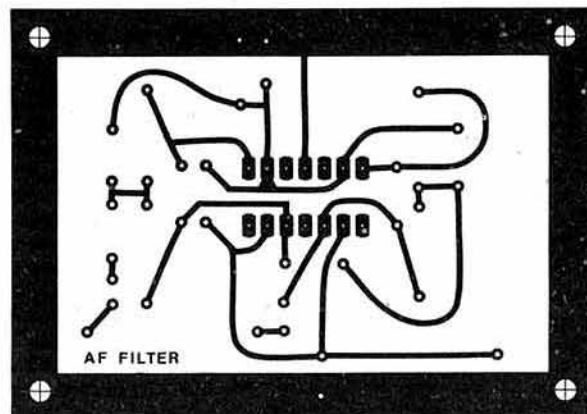


Fig 22. AF filter track layout. Single-sided board

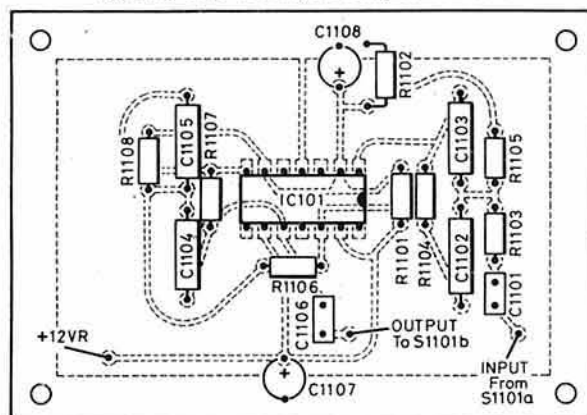


Fig 23. AF filter components layout

To test the filter, in the absence of a tunable audio oscillator, make connections to the filter switch as shown. Tune in a cw signal on the receiver with the filter switched out of circuit. Switch in the filter and tune the vfo over the signal. The signal should tune in and out much more sharply than when the filter is out of circuit and the receiver noise should be considerably reduced. The signal when peaked should be almost as loud as it was without the filter but without the accompanying noise.

Cabinet

The cabinet can of course be a proprietary article, but these are quite expensive, and a perfectly good cabinet can be tailor-made quite easily using mainly double-sided pcb material. The photographs give an idea of the professional appearance of the finished article. It is well worth spending a little extra time and effort to finish the job properly.

The first task is to make the front panel, the layout of which is shown in Fig 24. After drilling holes as shown, cut out for the meter and frequency display. A piece of 1.5mm perspex is cut to the size shown and the size and shape of the meter and display are lightly scribed on the front while temporarily holding the perspex in place. Mask the two openings by means of masking tape cut to size, and spray the perspex with two or three coats of car spray paint. Removing the masking tape will reveal clear perspex over the meter and display. The surround to the perspex on the prototype was made by means of plastic striping normally used for lining cars, with mitres cut at the corners.

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

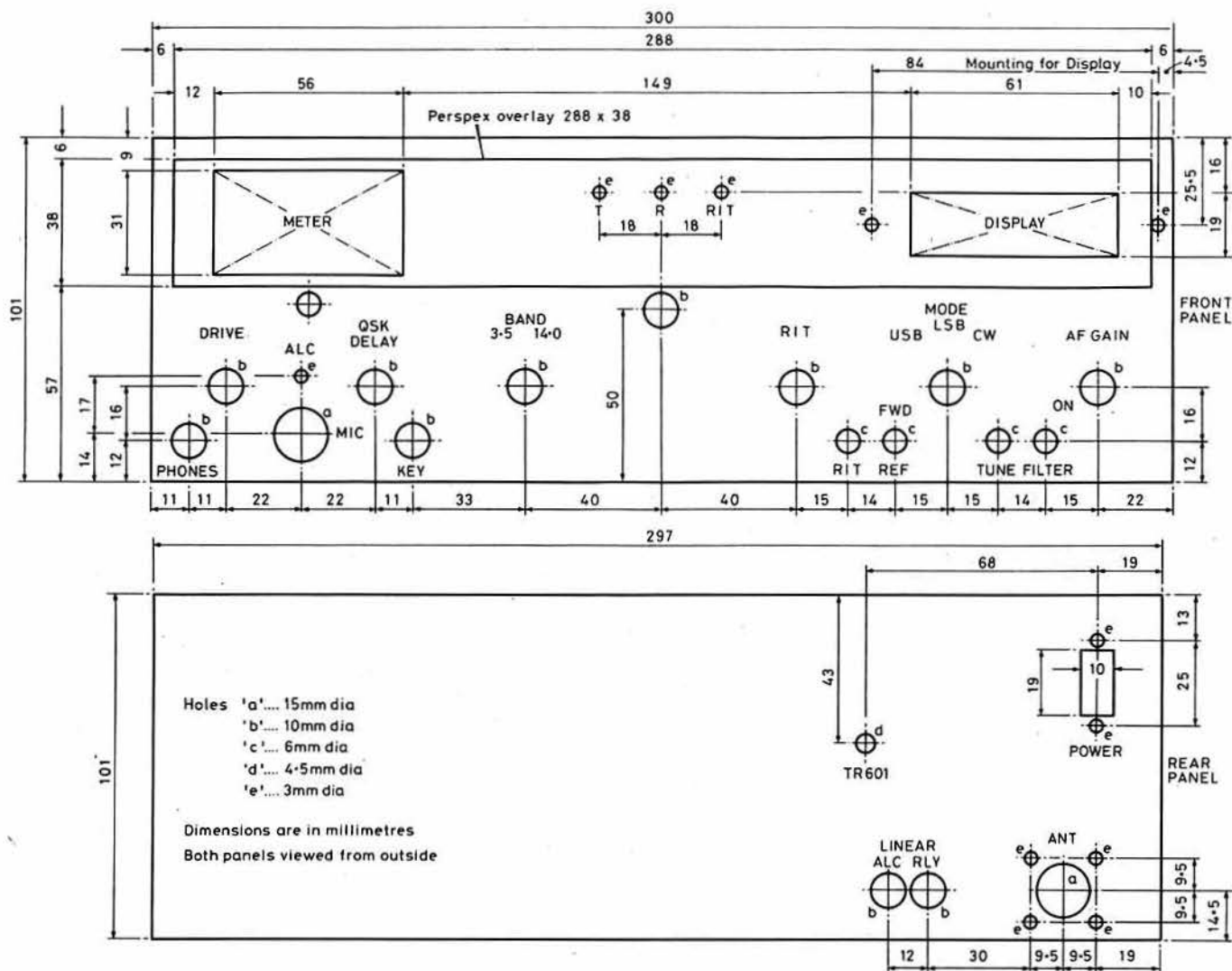


Fig 24. Details of front and back panels

The front panel is now sprayed with two or three coats of paint and is lettered using Letraset. Spray the panel with Letraset lacquer to protect the lettering. When the panel is finished, fix the display in position and then glue the perspex panel in position. Use Araldite or similar adhesive for this, as Super Glue affects the perspex. Drill 3mm holes through the pcb and perspex for the three l.e.d.s. The assembly of the remainder of the cabinet should now follow, as shown in Fig 25.

The two sides are prepared to the sizes shown, drilled for the angles and af filter board, and holed for the loudspeaker. After painting, the sides are soldered to the ends of the front panel using a flat table with wooden blocks to hold the sides and front panel upright.

The back panel is drilled and the aluminium angles fixed to all four sides. After spraying, it is temporarily bolted in position to make sure everything fits. While the back is in position, the three internal screens are cut to size and soldered into position without soldering the long screen to the back. The back is removed while the boards are fitted.

The main board together with the vfo is offered into position with the front of the board up against the back of the front panel and with the tuning spindle through the central hole in the front panel. Fixings to the front, screen and sides are made with small pieces of tin bent to an L shape and soldered to the board and cabinet. The vfo is also bolted to the screen. A piece of double-sided pcb is fitted in the space behind the pa compartment to form a chassis, being drilled for the alc and pre-driver boards and the antenna relay. The alc board is fitted to the top of the chassis, and the pre-driver to the bottom, using four 25mm 6BA bolts with 6mm spacers under each board.

The remainder of the box for the lowpass filters is now made to the sizes shown. Keep the switch wafers on the sides of the box as shown. The third wafer is fitted to the front screen. The completed box is soldered in position and the spindle is positioned. It is a good idea to connect the input and

output coaxial cables before installing the box as these may be hard to fix later. The wattmeter board is bolted to the inside of the rear screen.

The pa is fixed by bolting 12 by 12mm aluminium angles to the heatsink which fit inside the angles at the top and bottom of the left side. The driver is mounted on the rear panel with the pcb flush against the panel and the heatsink on the outside. Fit the power input socket and the twin phono socket before fixing the back in position.

Fit the switches and sockets to the front panel. LED connections are made by first glueing the l.e.d.s in position and then fixing a small pcb pad alongside. The current limiting resistor is soldered between the l.e.d. and the pad and the other lead is grounded.

The antenna changeover relay has its chassis filed down to 25mm and is bolted to the chassis alongside the pre-driver board. The wire to the moving contact is disconnected from the base pins and the antenna and ground leads are connected direct to the moving contact blade.

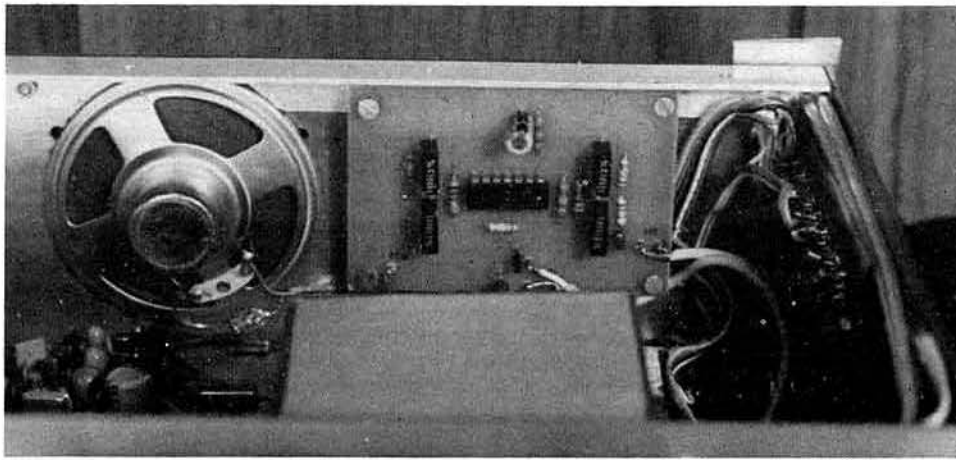
The meter is fixed by fitting short pieces of 20swg wire to the fixing bolts, which are then bent and soldered to the back of the front panel. Components for the linear relay changeover are wired around the socket on the rear panel. The af filter is bolted to the right hand side near the loudspeaker.

The interconnecting wiring can now be completed and the operation of the whole transceiver checked.

The top and bottom are made of 18swg aluminium sheet with cut-outs for the heatsink. A piece of 19 by 3.5mm polished aluminium is bolted to the top and the two sides, and the bottom plate projects 3.5mm to complete the surround to the front panel.

Power supply unit

The circuit is shown in Fig 26 and the construction in Fig 27. Construction of this unit is in no way critical, and layout is not important. The only things



View of inside of right hand side showing loudspeaker and AF filter board with the display board mounted on the front panel

to remember are to allow free air flow to heatsinks and to use heavy gauge wiring (at least 16swg) between the transformer and the output. This applies to both positive and negative lines. The case constructed by the author and the parts layout probably represent one of the simplest ways of building a psu of this size.

The baseboard, of 19mm blockboard, has all components screwed to it. The use of this material gets over the insulation problem, as some heatsinks are above ground potential. One end is formed from a similar piece of

blockboard and the 6W1 heatsink forms the other end. Aluminium angles fixed to the heatsink take the U-shaped cover which is screwed to the sides of the baseboard and the end. Make sure to drill holes in the cover to ventilate the internal heatsinks.

The rectifier diodes are common anode or common cathode. Make sure that these are not confused. The heatsink for each pair consists of two 3 by 1.5in 18swg aluminium plates, drilled 13mm diameter and with the flanges of the diodes sandwiched between them. Other diodes of equal or higher

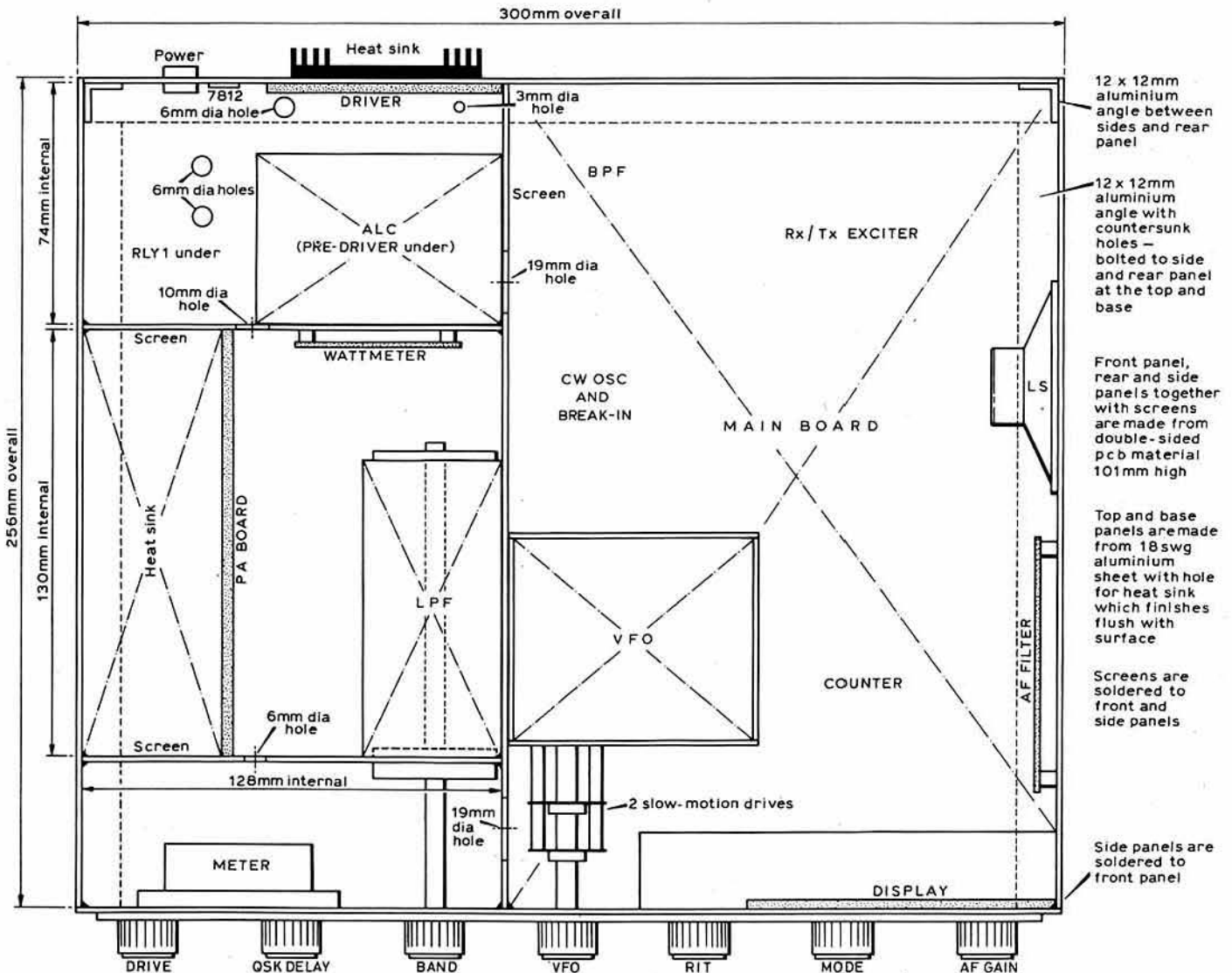


Fig 25. Cabinet details and general layout

current ratings may, of course, be used, but a heatsink of some sort is mandatory.

The transformer must be rated at least 175VA and with a secondary of at least 17V. Suitable transformers are the ILP toroidal rated at 225VA with the two 18V secondaries wired in parallel or the Davtrend 17V 12A transformer. Transformers with higher secondary voltages can be used, but their use will mean that the pass transistors will have to dissipate more power in the form of heat. The transformer used in the prototype was taken from a surplus Lion power supply unit and is marked 17V \pm 3%.

The single-sided pcb is prepared, and after mounting all components is fixed to the baseboard by means of a small aluminium angle. R1204 is made by winding 120in (3m) of 24swg enamelled wire on a 2W resistor. Transistors TR1201, 1202 and 1203 must be insulated from their heatsinks using insulating sets. Resistors R1208 and 1209, which each consist of three 0.47 Ω 2.5W resistors in parallel, are fixed between the emitter pins and a small stand-off insulator mounted on the heatsink.

On completion of construction, mains voltage is applied and the output voltage monitored. Adjusting R1205 should enable the voltage to be set at 13.8V. Before connecting to the transceiver, check the power supply by feeding the output into two 36W 12V car headlamp bulbs or similar load and ensure that the output voltage does not vary by more than a small amount. Heavy cable must be used for low-voltage supplies between the psu and the transceiver.

Notes on components

It is generally understood that the hardest part of any large project such as this is obtaining the necessary components. This has been borne in mind in the design, and most, if not all, components are readily available from current advertisers in this and other magazines.

Plessey ics can be obtained from Ambit. The MC3401 is obtainable from Watford Electronics. The 7216C can be obtained through Radiospares (Stock No 308-837) or any Intersil distributor. The 2N5590 can be obtained from Modular Electronics. The MRF450A can be obtained from several sources, and it is worth shopping around as the price varies from £9.80 to £24.10 plus VAT. The author's were obtained from PM Components Ltd, at £11.50 plus VAT, and Sursu Ltd are advertising them at £9.80 plus VAT.

MRF449A can be used without any modification but will result in slightly lower output. Other transistors designed for operation below 175MHz can also be used, but some modification to the input and output transformers and gain compensation networks may be necessary.

Amidon toroid cores are obtainable from TMP Electronics Supplies, who will supply a complete set for £20 including postage and VAT.

Most of the other components can be obtained from Electrovalue. One exception is the band-switch, which has to carry the full output of the transmitter. The standard imperial switch mechanism (Radiospares 327-894) with two-way wafers (Radiospares 327-816) is suitable.

The 78L06 and 7806 seem to be hard to get at times. Ambit sometimes has them. If they are unobtainable, a 7805 can be used with a 180 Ω resistor between the common pin and ground.

A lot of double-sided pcb is used and is most cheaply obtained at exhibitions and rallies, especially in large sheets. PCBs may be obtained from the author, from whom a price list may also be obtained (please send sac).

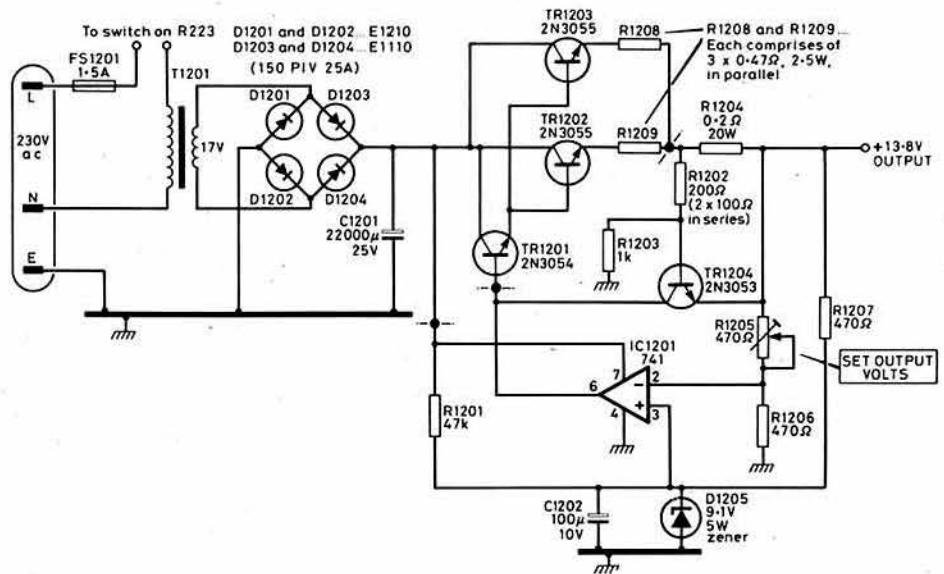


Fig 26. PSU circuit diagram

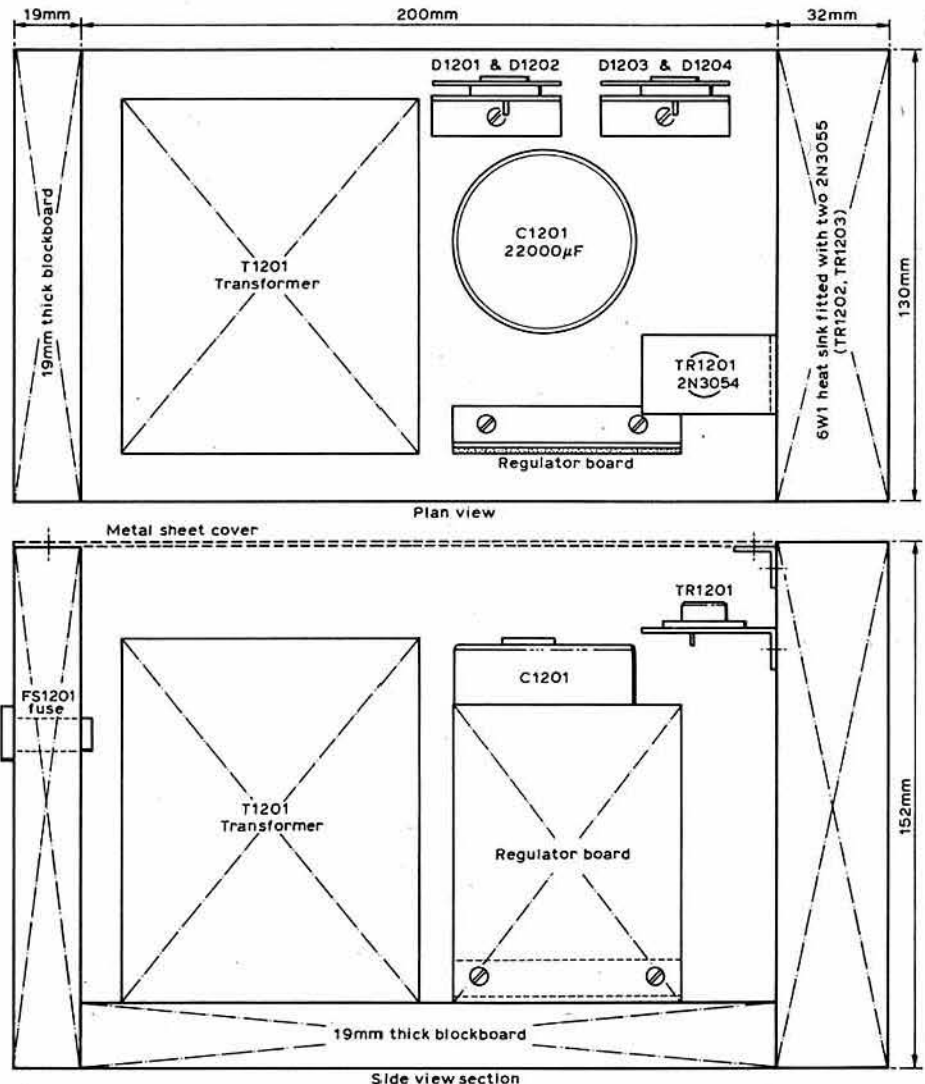


Fig 27. PSU construction and layout

Components list ALC

R1001	390Ω	R1011	50kΩ preset variable
R1002, 1005, 1017	33kΩ	R1016	10kΩ log pot
R1003, 1021	47kΩ		
R1004	100kΩ	C1001-1005, 1007,	0.01μF ceramic
R1006	5.6kΩ	1008, 1010, 1012	0.22μF ceramic
R1007, 1012, 1014,		C1006	1μF 35V tant elect
1015	1MΩ	C1009	10μF 16V tant elect
R1008	3.3kΩ	C1011	1N4148
R1009, 1018	22kΩ	D1001-1005	Green l.e.d.
R1010	68kΩ	D1006	Electrovalue CQV13/
R1013	10kΩ		5G
R1019	330Ω	TR1001	2N3904
R1020	1kΩ	IC1001	MC3401

All resistors 0.33W

AF FILTER

R1101, 1102	27kΩ	C1101, 1106	0.01μF ceramic
R1103, 1106	680kΩ	C1102-1105	1,000pF silver
R1104, 1107	1.8MΩ		mica 1%
R1105, 1108	24kΩ	C1107	47μF 16V elect
	All resistors 0.33W 5%	C1108	10μF 16V elect
		IC1101	747C14

S1101 Min toggle dpdt Type S7201 (Electrovalue)

POWER SUPPLY UNIT

R1201	47kΩ 0.33W	C1201	22,000μF 25V
R1202	200Ω 0.33W		elect
	(2 × 100Ω in series)	C1202	100μF 10V tant
R1203	1kΩ 0.33W		bead
R1204	0.2Ω 20W (see	D1201 1202	E1210 (150piv
	text)		25A)
R1205	470Ω preset	D1203, 1204	E1110 (150piv
	variable		25A)
R1206	470Ω 0.3W	D1205	9V1 1.5W zener
R1208, 1209	3 × 0.47Ω 2.5W in	TR1201	2N3054
	parallel	TR1202, 1203	2N3055
IC1201	741	TR1204	2N3053
Transformer	Mains 17V, 175VA minimum (see text)		
Fuse	1.5A anti-surge, with holder		
Heatsink	Redpoint 6W1		

GENERAL

Metering	100μA meter type T22 Electrovalue 580Ω with illuminating kit
Power	Nine-way connector, socket DS9, plug DP9
	Cover and retainer DC9
	Double phono socket
	7812 regulator
	Three 1N914 diodes across relays 1, 3 and 4
	C1: 0.22μF polyester. C2: 0.47μF polyester
	Socket SO239
Cabinet	Double-sided pcb: six-off 300 by 101mm
	18swg aluminium sheet: two-off 300 by 259mm
	Aluminium angle 12 by 12mm: 2m
	Polished aluminium strip 19 by 3mm: 1m
	Perspex: 288 by 38 by 1.6mm
	Large knob
	Small knobs: six
Linear relay	R1301: 2.2kΩ 0.33W. C1301: 0.01μF ceramic. TR1301:
control	N2102. D1301, 1302: 1N914.

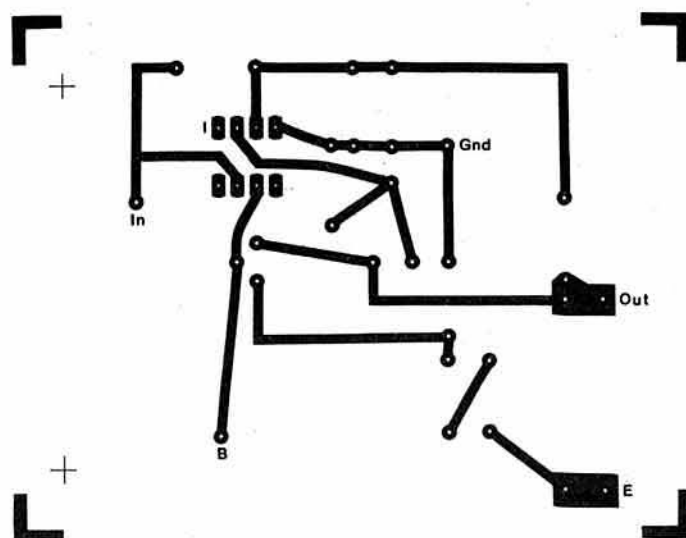
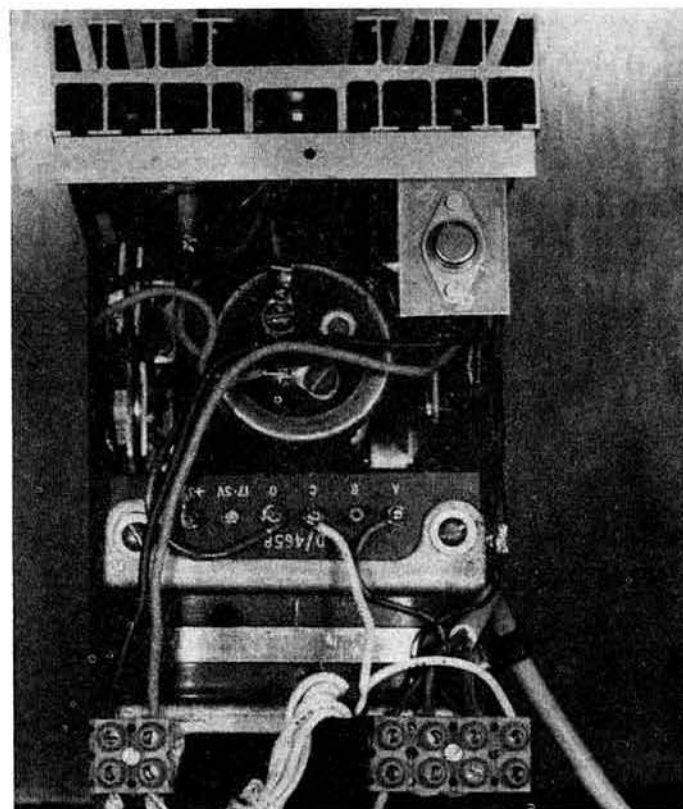


Fig 28. PSU regulator board track layout



Top view of power supply unit. The 2N3055 transistors are mounted on the large heat sink and the 2N3054 is shown mounted on a small piece of aluminium bolted to the heat sink. Underneath this transistor, mounted vertically, is the regulator board and beyond the smoothing capacitor can be seen the rectifier diodes mounted on their heat sinks

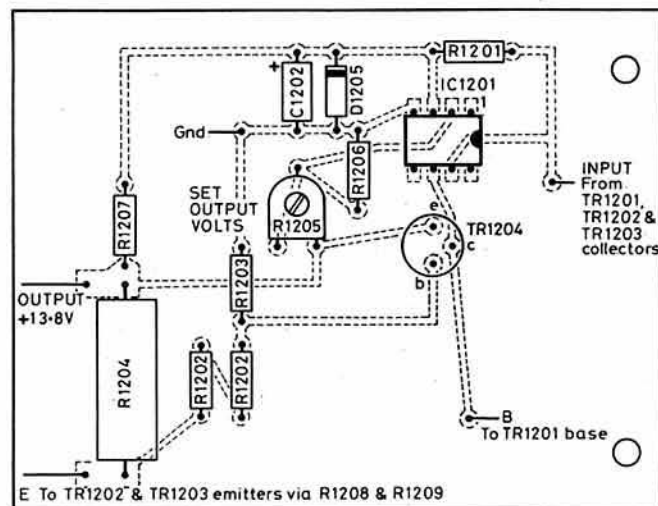


Fig 29. PSU regulator board component layout

The total cost of construction (assuming you etch your own boards) is about £250 including the psu, using all new components, but a considerable saving can be made by judicious shopping around. If there is sufficient demand, complete kits may be marketed, details of which will appear in *Radio Communication*.

Acknowledgements

The author would like to thank G5CKZ and G8HLZ, members of the staff of Racal, for their helpful advice; G4JYP for constructing a copy to prove it could be done, and VP9CP who unwittingly over several skeds helped to iron out the bugs.

A roof seal for an attic-mounted rotating mast

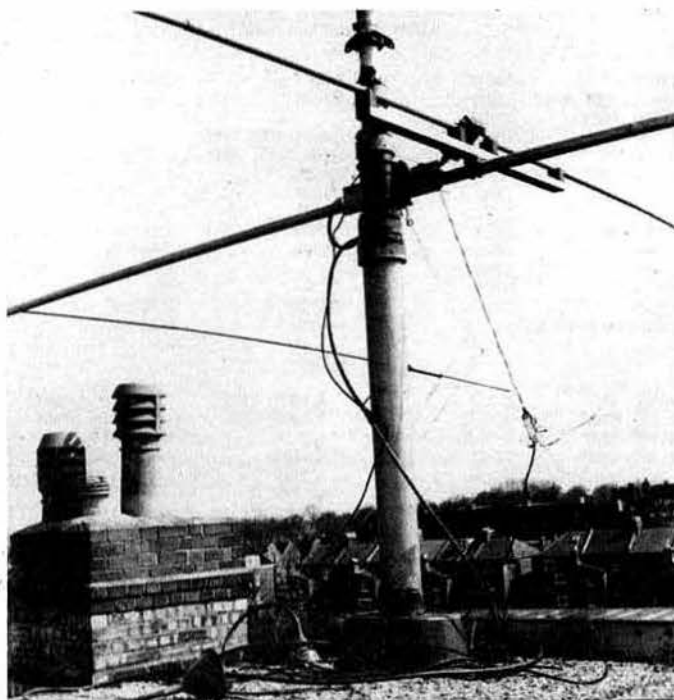
by S. J. M. Whitfield, BSc (Eng), MSc, CEng, MIEE, G3IMW*

THIS ARTICLE describes the construction of a weatherproof seal for a rotating telescopic mast [1]. The mast is mounted on the attic floor and is sealed where it passes through a flat roof. (A general view of the arrangement was shown diagrammatically in a previous article [2].) As well as being weatherproof the seal provides for rotation and rf insulation, enabling the mast itself to be used as an antenna. Although flat roofs are relatively uncommon, it will be seen later how an adaptation for pitched roofs could be made.

The assembly is shown in Fig 1. A rotating "hat", which is sealed to the mast, excludes water coming from above, and covers a "wall" fixed to the roof which excludes water coming from the side. The main problems were to find suitable, easily obtainable, items for the hat and wall, and to devise a good seal between the hat and the mast. The hat and wall were made from plastic bowls, and the seal was fabricated from tinplate steel (tinplate) cut from a one gallon motor-oil can. Fabrication of tinplate is very easy when using resin-cored solder. It was not easy to seal the wall to the uneven surface of the roof, so the roof covering was made to slope upwards to the edges of the hole by stuffing in newspaper, as shown.

Fabrication of the tinplate parts was carried out in the stages shown in Fig 2. Each half was assembled around a former of the same diameter as the mast. The junction between the flanges and the semicylindrical shells was checked visually for pinholes, and any holes found were covered with more solder.

Final assembly proved to be quite easy. The screw holes in the flanges and in the rim of the wall were predrilled. After mounting the mast, the wall and hat were placed roughly in position. The shells were fitted loosely round the mast, using two wormdrive pipe clips. The hat was very carefully centered by measurement and the fixing-screw holes were drilled using the holes in the flange as guides. Fixing screws and nuts were fitted. The hat was pushed down until it automatically positioned the wall on the roof. Raising the hat without moving the wall, the positions of the fixing holes were marked through on to the roof. Raising the wall, the holes were drilled where marked. The wall was then screwed down using brass screws coated with sealant (silicone rubber). Finally the hat was positioned on the mast to give



External view of the seal showing the mast fully retracted

a small clearance between the two bowls as shown in Fig 1, and the wormdrive clips were fully tightened. The newspaper stuffing was added.

All possible leakage spaces were thoroughly covered with silicone rubber (bath tile) sealing compound. The tinplate parts and pipe clips were rust proofed with plenty of automobile internal body spray (believed to be a wax in a volatile solvent).

Few people are lucky enough to have a flat roof, but a nearly horizontal surface for the seal could be provided by building a dormer or wedge-shaped structure on to a pitched roof where the mast has to pass through, possibly by modifying a plastic roof-light. A hatch built into the roof close to the mast would also be useful for access to the seal.

The photograph shows an external view of the seal with the mast

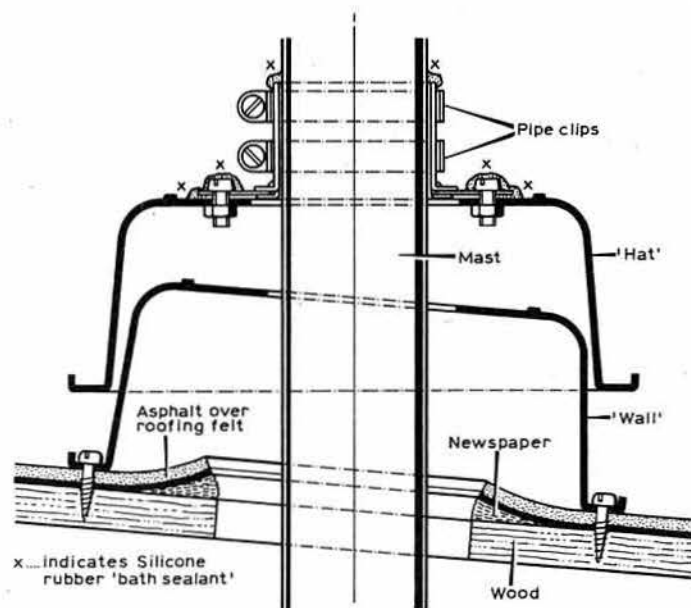


Fig 1. General assembly view of the mast and seal

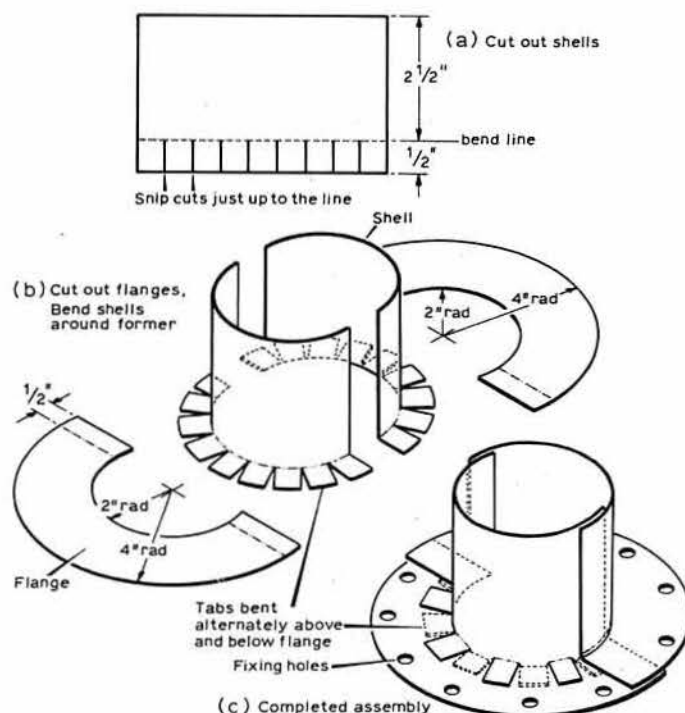


Fig 2. Stages in the fabrication of the tinplate parts

*100 Stapleton Hall Road, London N4 4QA.

retracted. In this position the antennas are inconspicuous and easily accessible. Compared with a mast or tower mounted on the ground, it is easier to reach a good height because one is starting from the ceiling level of the upstairs rooms.

There are two potential problems with the use of plastics outdoors which should be considered. Some plastics become brittle at sub-zero temperatures. Also, plastics can develop cracks after prolonged exposure to sunlight. Neither of these effects has occurred with the bowls used, although the temperature fell repeatedly to -5°C . The bowls used are of brown plastic as sold in multiple stores.

In cold climates it would be a wise precaution to test the strength of a bowl left out of doors in cold weather, or while in a "deep-freeze", bearing in mind that the bowls have to support only their own weight, and perhaps that of a small build-up of snow. They should be assembled so that they do not touch one another. As a further precaution a heater could be used to

provide an outward flow of warm air through the space between the bowls.

Yearly checks for cracks would be a good idea.

The seal has proved completely water, snow and windproof over a period of four years. The results have thoroughly justified the work involved.

Acknowledgement

Grateful thanks are due to Derek Thewlis for his help throughout this project.

References

- [1] The mast is a Hilomast Type NK15. The current model is type NK. For more details see sales literature from Hilomast Ltd, The Street, Heybridge, Maldon, Essex CM9 7NB.
- [2] "3.5MHz dx antennas for a town garden," S. J. M. Whitfield, G3IMW. *Rad Com* August 1980, p773, Fig 2.

SSTV Scene

by Peter Burnett, G4BLL*

APOLOGIES are due once again for the late appearance of this column. I can only plead pressure of business commitments—which, taking an opposite stand point, fortunately, do not show any signs of going away. Reluctantly, therefore, I have no alternative but to advise all readers of the column—all two of you—that this contribution represents the last from my pen.

An interesting letter was received from GJ4ICD, resident in St Saviour, Jersey, who is now QRV on sstv using a Wrase SC422A scan converter; among stations worked so far are FM7, ZL and VO1. Geoff concluded by saying that he "should have colour in a few weeks", so by the time this appears in print he will probably already have exchanged his first two-way colour QSO. Another correspondent, Ralph Boshier, ZL4AG, reported that he had very nearly completed his homebuilt Robot 400 scan converter—he too will probably be active on sstv by this time.

G3YCV, Ramsgate, says that sstv "is a bit thin on the ground" at his end of the UK with only himself and G3VID in northeast Kent active. He has been operating sstv for about 10 years with a W6MXV (5FP7 type) monitor and DL2RZ fast-to-slow converter. Over the last two years he has had very good results with a SC160 scan converter, which he has now converted to colour. In return for an sstv G3YCV will supply details of the conversion to anyone interested. He would like details of the supply of suitable filters (red, green, blue) for his Pye Lynx camera—can anyone help?

Don McLean, G6AWI, attended the IEE chat on colour sstv, but wrote mainly with information on single-frame colour sstv signals which he received from W0LMD. He said: "Being interested in seeing what the quality was like I programmed my computer to unravel the colour information and photographed the result through green, and blue filters on Polaroid." G6AWI worked out that the format was as shown in Fig1, and

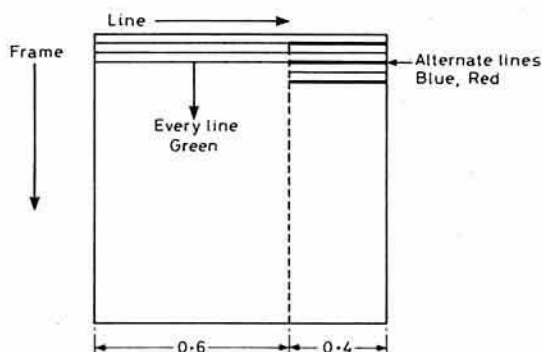


Fig 1. G6AWI's interpretation of the colour format of W0LMD's signals

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New contributor wanted

Any active sstver who would like to try his hand at writing about this aspect of the hobby is invited to contact the editor by letter or telephone to discuss details.

went on to say; "I expect he used the 'green' in the high resolution part of the picture as most luminance energy is in the green part of the spectrum. He (W0LMD) transmitted various other formats which had all the colour information on one line (of varying length!) . . . I was really interested to see what 'single-frame colour' was really like." Don's final comment was; "I think I'll stick to '25-second' colour!" My comment—don't write it off that easily!

A letter received from Gerald Klatzko, ZS6BTD is reproduced here more or less in its entirety: "Like all sstvers, I suffer from the constant irritation of phone QRM, and I have found that during contests or expeditions I may just as well go QRT as the QRM virtually wipes out any possibility of two-way video. With the advent of the 10MHz band for amateur radio use between the frequencies of 10,100MHz to 10,150MHz, a total bandwidth of 50kHz, would it be possible to set aside a fixed bandwidth and frequency exclusively for sstv? As we utilize a bandwidth of 3kHz for an sstv QSO, it may be practical to allocate 10kHz, say from 10,125MHz, to conduct three QSOs simultaneously. All sstvers are well versed and fully experienced in operating in nets and thus the suggested 10kHz bandwidth would allow two to three large groups to operate simultaneously without causing QRM to each other. A further suggestion could be to limit the use of phone on these frequencies strictly for station identification, technical commentary and discussion of the video; any resultant 'rag-chewing' to be transferred to a frequency outside the above-mentioned sstv band. I hope that these suggestions may help towards the creation of such a band, and that my thinking is in line with that of many other long-suffering sstvers."

This appears on the surface to be an ideal solution, from an sstver's point of view, to the problem of phone QRM on video, but it should be remembered that at present an sstv QSO can legally be carried out on any frequency within the phone allocation of the amateur spectrum (and where sstv is authorized).

The individually recognized sstv frequencies are there only as a point of focus and represent an informal arrangement only, as a phone-only QSO may equally be carried out on these frequencies. One danger might be that if one part of the spectrum, however small, is officially set aside exclusively for sstv use we may then lose other parts: eg, sstv not allowed in this part of the phone band—official! What do you think?

Dick Hunter, G3LU1, has asked me to mention that a vhf sstv net takes place in Essex every Wednesday evening on 144.5MHz fm or ssb horizontal polarization. Call-ins are always welcome and stations to look for are, G4BGH, G4IMO, G4KXN, G3NOX, G8UUL and G3LU1. Three stations are active on colour—G3NOX, G4IMO and G3LU1. Dick would be interested to hear if anybody else has attempted to convert the SC140 to colour, as he has achieved this for under £45, with very good results.

Finally, sincere thanks to all readers who have taken the trouble to write or phone with their sstv news and views over the past few years. Please keep up the good work, and to those who have not found the time to communicate give my successor a break—let him know what you are "up to"!

Good luck to all sstvers.

Technical Topics *by Pat Hawker, G3VA*

AMATEUR RADIO OPERATING means different things to different people, though a few seem to find time to squeeze in a remarkably wide range of diverse activities. For some it is still the traditional pounding of brass (or more often now one of the electronic analogues); for others speaking into a microphone; yet others have become keyboard communicators, and a few concentrate on the transmission of visual images. But even within these main categories—and the division between hf and vhf and above—there are distinct strands to the hobby. Some chase dx and scorn all medium- and short-distance contacts; others seek strong clear signals from no matter where; some now devote most of their attention to mobile operation through repeaters. Some still welcome the excitement of “contests” almost every weekend—a growing number switch to another mode or another band as soon as they copy the dreaded “test”. Still others prepare themselves for emergencies, specializing in field-day and portable operation.

All are part of amateur radio. Similarly, this month we take another brief look at a form of operating that is becoming increasingly popular yet does not quite fit into any of the above categories—the traveller who seeks equipment light and compact enough to be carried anywhere, as just part of his luggage, but who counts on finding the invaluable electric-power socket at his destination, so overcoming the major weight and cost problem of other forms of “portable” operation, but still presenting the handicap of setting up temporary but effective lightweight antennas.

Suitcase stations—the traveller’s friend?

In an article “Portable QRP: some unscientific lessons learned” (*QST* January 1983, page 52) Wayne Sayles, N9AKM, discusses some of the problems encountered by those radio amateurs who travel around a good deal by air (or other form of transport that imposes limits on luggage) and wish to take along a compact hf rig for operation from hotel rooms, holiday accommodation and the like. The difference between this form of operation and what we tend to associate with other forms of portable or mobile operation is that electrical power for the rig can be derived from ac supply mains: remembering of course that the ac mains on the Continent are often 220V 50Hz, rather than the UK 240V 50Hz or the North American 110V 60Hz.

The availability of compact ssb/cw hf transceivers with an rf output of about 10W has given a considerable fillip to this type of operation, although it is interesting to note that “suitcase” and “miniature” equipments were being made and used by radio amateurs in the mid-thirties. For example, Ted Cook, ZS6BT, in travels around South Africa, took with him a 30W transmitter (double-triode 6A6 driving an 812 pa) built into a Burndept portable-radio carrying case about 18 by 18 by 8in with an 0-v-2 receiver in a similar case, contacting stations over relatively long distances from such locations as a seventh-floor flat in the centre of Johannesburg. In 1936, G. B. Hunt, 2ABH (“artificial aerial” licence) described in the *T&R Bulletin* “a pocket portable receiver” which, complete with batteries, was built into an aluminium box 6 by 6 by 2½in, using a single earphone and three of the Hivac midjet valves (two type XD triodes and one XY output pentode) mentioned in the June 1983 *TT*. With four plug-in coils the 0-v-2 receiver covered 1.7 to 28MHz, achieving a performance that “compares favourably with many larger receivers”.

During the following decade, the genre of “suitcase transmitter-

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FT480R multimode 144MHz transceiver

receivers” developed rapidly, primarily for non-amateur applications. Although ex-military, ex-para-military and ex-clandestine equipments such as the A3, B2, Mark 123 (see June 1983 *TT*) are still in operational use by amateurs, they have little built-in harmonic suppression, and care has to be taken not to cause tvf or rfi, particularly in areas where vhf tv is the norm. One suspects also that using, for example, the Mark 123 outside the UK under reciprocal licensing agreements could present some difficulties from customs and other officials looking out for the smuggling in of clandestine equipment by Intelligence services!

Antennas are often considered the major problem for temporary locations; this is fair comment for ssb operation but hardly for cw for which,

with a 10 to 25W transmitter, almost any random piece of wire should bring plenty of contacts, even when the wire has to be draped around a room or dropped out of an upstairs window (in urban areas electrical interference can prove the most intractable problem). For random-length antennas, the older valved equipments have the advantage that they were usually designed to operate with almost any type of antenna, and there is no need to worry about damage due to a poor match. It is *always possible to match any antenna to any transmitter with the aid of one coil and one capacitor* using just a neon bulb, but few people would feel happy about using a solidstate rig with voltage-fed antennas without a transmatch and swr meter.

N9AKM uses a 14MHz $\lambda/4$ “monopole” made from a telescopic aluminium base section on the end of which is a resonator section taken from a mobile antenna, using a C-clamp to fix an insulated end (wooden dowel) to metal window frames etc to provide a multiband antenna. The element can be at any angle from horizontal to vertical. In the absence of metal window frames for use as “radials”, any large metal objects, including air conditioners, balcony rails, even metal furniture, can be pressed into service.

With cw/ssb transceiver, regulated power supply, transmatch, $\lambda/4$ centre-loaded monopole, transmission line, accessories and suitcase, the complete four-band station used by N9AKM weighs 23lb, or roughly about twice the weight of a cw-only rig such as a Mark 123 with a wire antenna, or using the original spool of braided copper wire which pulls out like a long tape measure.

N9AKM offers a number of operating tips for suitcase operators in the recognition that, when putting out a weaker-than-average signal, the difference between success and failure is often a willingness to persevere, and operating know-how. While the dyed-in-the-wool QRP enthusiast would consider 10W or more rf output as virtually QRO, it must be remembered that a temporary indoor or balcony antenna can be equivalent to a power reduction of many decibels!

To summarize a few of his tips, as applicable to European working:

Identify yourself as QRP, since most stations will then be prepared to cope with weak signals.

Learn to “tail-end” at precisely the right moment, without butting in or leaving too long a gap.

If you have a low-pitched voice, tune slightly off-frequency so that the pitch rises at the receiving end and penetrates interference better.

Listen around for the first “CQ” call being put out by a distant station—pile-ups seldom develop immediately.

If at first you don’t succeed in raising anybody, try again before putting the rig back in its suitcase!

Unobtrusive antennas

An amateur operating from his home station, or as a well-equipped portable field-day station from a carefully selected site, can usually erect a good antenna. The travelling amateur or the amateur operating under contractual or local-authority restrictions, or from sites where it is virtually impossible to put a decent antenna, often has to make do with indoor, roof-space or "invisible" antennas.

I can still recall an account in the *RSGB Bulletin* in the post-war period by Eric Cole, G2EC (incidentally the only British amateur to have held a two-letter callsign containing an "E"), of how, when living in a Mayfair flat, he had to creep out, under the cover of darkness, on the flat-roof of the high seven-storey building in order to put up his antennas before he could begin to operate. Objections had been made to his antennas by his landlords, so General Cole devised three systems, including a 28MHz rotary beam, that could all be erected and dismantled in a few minutes during darkness or when he was unlikely to be observed by censorious eyes. At other times all poles and wires were dismantled and could not be seen from the ground 80ft below. In this case, ingenuity was rewarded by excellent antennas!

In the USA many radio amateurs are finding their activities increasingly restricted by local statutes, zoning restrictions etc, that seek to forbid the erection of antennas. *QST* has recently reviewed some techniques that can be used by those seeking "hidden" or "invisible" antennas, and some of which can also provide unobtrusive "temporary" antennas for the traveller.

A well-tested technique is to use a fixed outdoor long-wire antenna using very thin enamelled wire (24 or 26 gauge) supported by nylon kite string. Such an antenna can be efficient yet almost impossible to spot from a distance. Provided that it is fixed to an end support that does not move with the wind, it should last a reasonably long time, unless broken by an unwary bird to whom, it must be admitted, such antennas do represent a hazard, and *vice versa*. Another traditional technique is to use an aluminium-wire "clothesline" or to conceal a wire in a cord clothesline, or indeed in any form of rope or cord that does not look out-of-place. Wires can also be concealed in flagpoles or similar structures; then again it is possible to use the braid of the feeder cable of a television or vhf/fm broadcast antenna. Metal gutterings or drainpipes are rather more difficult since they tend to be less conveniently reached, may not be easy to make good conductive contact with, and are tending to disappear in favour of plastics.

Concealment, however, may come to naught if the transmitter causes tvi, bci or the many other forms of present-day rfi—and this indeed can be a major problem when using older "suitcase" transmitters.

Indoor antennas

Quite a large number of European amateurs successfully use "indoor" antennas even for their main installation, and there have been quite a few articles in *Radio Communication* in recent years giving useful advice.

In *ART* it is noted that rolls of household aluminium foil can be used to form short wideband hf dipole antennas suitable for use in lofts or for mounting on indoor walls: Fig 1. Suggested lengths for 3-5MHz are two by 12m; 7MHz two by 6.2m; 10.1MHz two by 4.4m; 14MHz two by 3.4m etc.

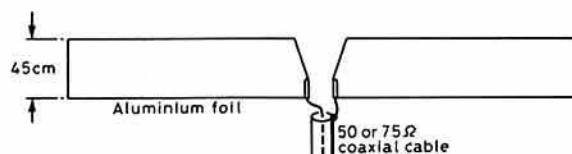


Fig 1. Indoor broadband dipole antenna using aluminium foil

For vhf operation, particularly from a high apartment or hotel room, a surprisingly effective antenna can take the form of a single-element "quad loop". A 1971 design by W8AP for 144MHz is shown in Fig 2 and can also be found in *ART*. This is another antenna based on the use of aluminium foil, mounted on a sheet of cardboard and taped to the inside of a window. In Canada some experiments have been reported on receiving 12GHz direct-broadcast-satellite signals with indoor dish antennas. Provided that the dish can be placed looking towards the satellite through a window-pane, satisfactory results can be expected. However, pictures were *not* received when the dish was put in a roof-space without a suitable window. It is worth remembering that some types of glass offer relatively little attenuation even to microwave signals. At low frequencies roofs often offer little attenuation but there is the problem of water-tanks, electric conduits, water-pipes etc.

In the manual for the para-military Mark 123 transmitter/receiver (see *TT* June 1983)—originally a "confidential" document but now

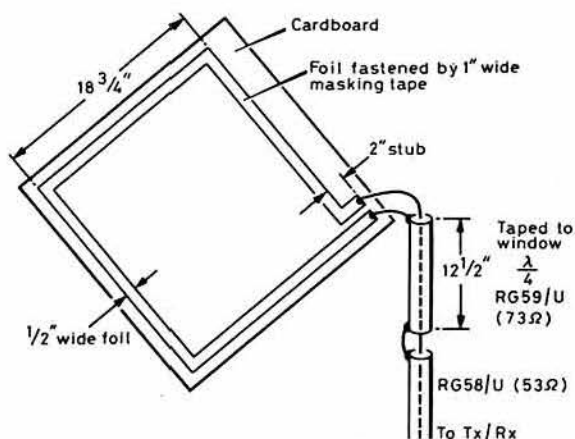


Fig 2. 144MHz single-element quad suitable for use on windows and made from household aluminium foil mounted on cardboard

"unclassified"—it is stressed that the efficiency of any antenna, particularly within buildings, depends on many factors not easily measured or described, and that the greatest efficiency is obtained from an antenna of adequate length installed out of doors away from buildings or other tall objects. Few would disagree, but the manual does go on to illustrate various ways in which random-length wire antennas can be installed in quite small rooms (provided always that these are not basement rooms) or in a roof space; Figs 3 to 5 are derived from the manual.

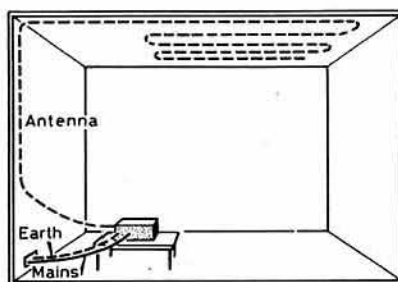


Fig 3. Random-length Marconi antenna in a room preferably high in the building using "mains earth"

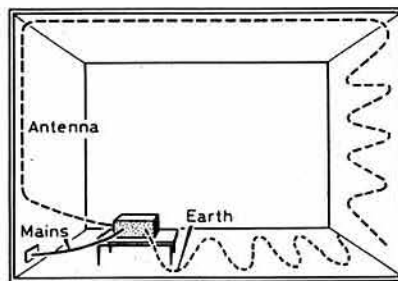


Fig 4. Alternative arrangement using wire counterpoise on the floor

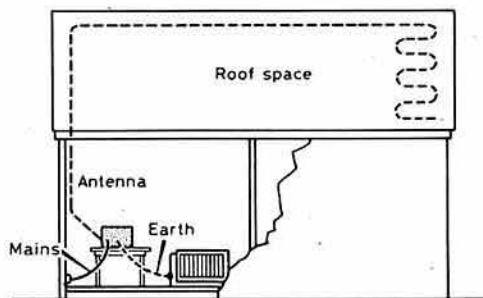


Fig 5. Antenna in roof space with central-heating radiator used as "earth"

Fig 3 shows an antenna mostly draped under the ceiling and using a "mains socket" earth, suitable for use in the highest available room and stated to provide reasonably low angle radiation.

Fig 4 shows an alternative arrangement of an antenna plus counterpoise, providing rather more high-angle radiation than the previous example. Fig 5 shows an antenna in a loft or roof space, usually capable of considerably better performance than room antennas. In this case the earth consists of a connection to the radiator of a central-heating system.

All such systems should prove capable of providing medium-distance contacts on, say, 3.5, 7 or 10.1MHz. Many newcomers wrongly believe that antenna elements *must* be resonant, forgetting that it is the whole antenna system that matters. Random lengths of wire can be effectively tuned as a classic Marconi antenna against an earth or counterpoise, provided that you can cope with voltage (parallel tuned) or current (series tuned) situations, or, for example, use a pi-network or z-match.

For several years I operated from a first-floor flat (what Americans and others would call a second-floor flat!) in Central London using initially a wire draped around the room, though afterwards achieving much improved results when I managed to get a dipole out on to the balcony.

Balcony dipole

My balcony dipole was of the folded variety made from 300Ω line with the ends hanging down. However, in *cq-DL* (1/82, pp18-20) Helmut Spieler, DL6FY, describes what is claimed as "a highly efficient balcony mini-dipole for 7MHz" effective over a bandwidth of some 50kHz and of relatively simple construction. An unusual feature is the method of end-feeding the inductance-loaded element through a capacitance built into the system. He uses an L-network between the coupling "capacitor" and the 50Ω coaxial cable connected to his transceiver.

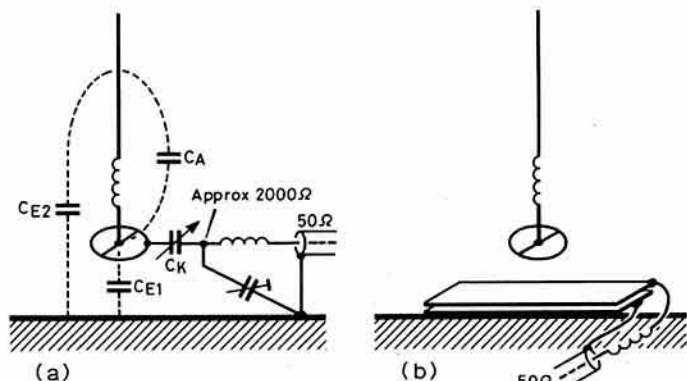


Fig 6. (a) Principle of the 7MHz mini-dipole used by DL6FY. (b) Test-rig used to adjust loaded dipole for resonance

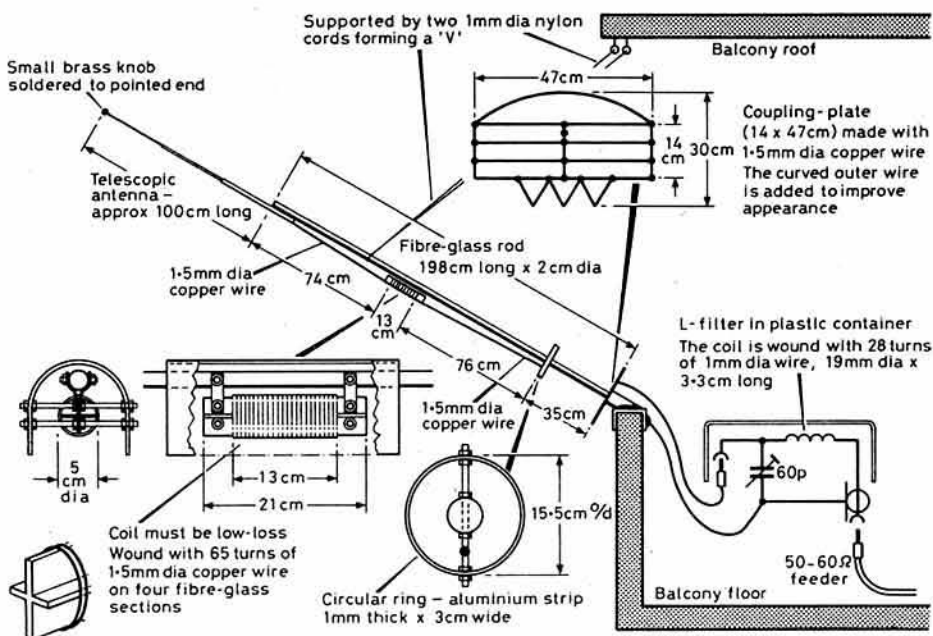


Fig 7. Constructional details of the DL6FY balcony-mounted mini-dipole

Fig 6 shows the principle of his dipole and how this can be adjusted for resonance by means of capacitive coupling plate. Constructional details are shown in Fig 7, though the system could be implemented in other ways provided that due regard is paid to the need for a low-loss loading inductance, and that the loaded element is carefully resonated.

Heavy-duty transmitters

The "average" amateur (always supposing that one could locate or define such an elusive creature) probably operates his equipment for not more than about 15h/week, and unless he is an "alligator operator" (ie all jaw and no ears) his transmitter is unlikely to be called upon to deliver its output for more than a very few hours per week, except possibly during contest periods. The main reliability problems are thus likely to arise from switch-on surges or excessive ambient temperatures due to poor ventilation. This is rather different from transmitters used in 24h/day broadcasting, or those now increasingly used as amateur radio beacons.

Ray Cracknell, Z22JV, notes that while 28MHz beacon stations have proliferated in recent years, they often seem to run only for a month or two, then breakdown and often disappear permanently, or produce increasingly poor notes and unreadable callsigns—not to mention those commercial "one-letter" beacons just outside the 21MHz band that frequently have strong spurs within the band!

Z22JV believes that there are useful lessons to be learned both about and from the construction of reliable beacon installations—and his comments are based on many years of building and maintaining them; from ZE2JV on 50 and 29MHz for the original IGY and IQSY periods; and ZE2TEP for the valuable American-financed transequatorial (tep) propagation experiments on 32, 39, 48, 72 and 84MHz in conjunction with a large number of automatic receiving-terminals. He was also concerned with ZE1AZC, the highly-effective 50W, 50MHz beacon transmitter which was mounted in its antenna structure and was built by ZS1LA (now ZS6PW). Z22JV also built ZE1AZB, the 70MHz beacon located at Bulawayo that was received in the UK, and a 1.8MHz beacon erected on a magnificent hill-top site some 80 miles north of Harare.

There can be no doubt that these beacons, together with the operation of his own station on 29, 144 and 432MHz for the highly-successful tep work with stations in Cyprus, Greece etc, have uncovered a wealth of information about the tropical ionosphere, much of it previously unknown and unsuspected by both professional and amateur researchers. I cannot refrain from mentioning that, because of the "political" disagreement over reciprocal licensing between the UK and Zimbabwe, Ray Cracknell, formerly G2AHU and ZE2JV for well over 40 years, soon to return permanently to this country, has been flatly refused a renewal of his UK licence unless he sits an RAE and takes a Morse test. Just how crazy can officialdom get?

But to return to the subject of beacon and heavy-duty transmitters. His latest constructional effort has been Z21ANB, a 28.250MHz 25W rf output beacon that will form a memorial to the late Thomas Short, Z21AN, who,

at the time of his death in April 1982, was chairman of the Matabeleland branch of the Zimbabwe Amateur Radio Society.

The following notes on the subject of transmitter reliability of heavy-duty units are taken from a detailed report he has prepared on this project:

Beacon transmitters have to be built to very different and much more stringent specifications than are used for most transmitters in the amateur radio service. For ssb and cw the duty-cycle, that is to say the percentage of total time when the transmitter is operating at peak power, is low. Even fm commercial-grade transmitters, such as the RCA "Carfone", many parts of which have been used in this beacon transmitter, are designed for only a 25 per cent duty cycle. The beacon, using frequency shift keying, has to function with a 100 per cent duty cycle. This means, for instance, that the cumulative heat that has to be dissipated by the power amplifier is roughly four times greater than for the commercial fm unit and very much greater than for ssb, even when this involves heavily processed speech. Additionally, a beacon transmitter has to continue to function unattended throughout thunderstorms, survive transient voltage surges on the mains power cable of up to at least 100 per cent of nominal peak voltages, and to work in ambient temperatures that may rise to 45°C or more.

It will be appreciated that the requirements for beacon transmitters operating in some parts of the world are much higher than in others: southern Africa, for example, is particularly prone to frequent thunderstorms and is prolific in lightning strikes. Nevertheless, even in the UK, lightning can be a difficult problem where continuous, unattended operation is required. The strikes do not need to be direct strikes on the antenna to cause damage; it should also be noted that lightning is one of the prime causes of mains transient overvoltages, particularly where a remotely-sited transmitter is fed from overhead mains cabling. Similarly, even in the UK, a transmitter running continuously in a confined space on a sunny day is likely to encounter ambient temperatures much higher than would be expected in domestic operation.

For the Z21ANB beacon, Z22JV has taken the following precautionary steps:

(1) The power amplifier (two 6146) is very conservatively rated in supplying 25W of rf output. Anode and screen voltages are only about half normal values.

(2) The power supply is required to deliver only about half of its rated maximum current; the peak inverse voltage of the diode rectifier strings (six 1N4007) is 6,000V (Note: a further precaution would be to connect high-value equalizing resistors across each diode-G3VA).

(3) The transmitter was designed and thoroughly tested to ensure that it would survive indefinitely both open-circuit and short-circuit conditions on the antenna transmission line and work through all but a direct lightning strike on the antenna. The recommended antenna system is an all-metal beam of "plumber's delight" form, with the entire system very thoroughly earthed.

(4) All the exciter stages operate at reduced voltage. The 5·25V supply to the ttl logic keyer (diode matrix) is from a conservatively-rated regulator.

(5) The cabinet and chassis of the original "Carfone" base transmitter have been retained in spite of their bulk and weight by modern standards. The 490 by 263 by 460mm cabinet is robust, well-screened and has very good through-ventilation.

The transmitter consists of a BC108A transistor as 7,062·5kHz crystal oscillator; 6BH6 amplifier; 6AK6 doubler; 6AQ5 doubler-driver and the 28MHz final which is neutralized and has separate parasitic suppression choke/resistors in each 6146 anode circuit. The original 5R4G rectifiers have been replaced by silicon diodes mounted on plug-in bases; Z22JV concedes that the decision to replace readily available rectifier valves (virtually immune against mains transients) with silicon diodes may be considered questionable, but the saving of 20W of heat tipped the scale in arriving at a decision; nevertheless the heater wiring is left connected and valves can be immediately substituted should the silicon diodes prove unreliable in lightning-prevalent conditions. The power supply provides: ht1 200V at 100mA; ht2 300V at 250mA; heaters 6·3V at 3A; bias 35V negative; keyer 5V at 110mA regulated to within five per cent; pilot lamps 6·3V at 0·6A; crystal oscillator 7V at 10mA. All these requirements could, in fact, be met using the two low-voltage transformers taken from the Carfones with secondary windings in parallel.

New equipment—plusses and minusses

From time to time I have ventured, both in *TT* and elsewhere (eg *IERE Conference Publication No 50* "Radio Receivers and Associated Systems", July 1981, pp287-97, "Effect of receiver specifications on practical performance") to cast a critical eye at current trends in receivers and transceivers, recognizing both the good and bad points of modern designs, and stressing that while these often represent good value for money the

budgetary limitations imposed on the designers inevitably result in compromises. I have, therefore, been reading with great interest the long article "Modern receivers and transceivers: what ails them?" by Doug DeMaw, W1FB, and Wes Hayward, W7ZOI, (*QST* January 1983, pp11-16) two authors who, over the years, have earned worldwide respect.

The article underlines that as the technology advances some performance characteristics of equipment improve, but others worsen. The cynic may note that they quickly dispose of "the good features" in less than a column but find enough "not-so-good trends" to occupy some 14 full columns! Some less-than-ideal performance is ascribed to economic considerations, some to fundamental limitations, but they also highlight a problem that is seldom mentioned. This is that many of those engineers who now design factory-built equipment for the amateur radio market are not themselves active radio amateurs and are not sufficiently familiar with the realities of operating on the hf bands today to appreciate just what facilities are really useful to an operator and not just grist to the mill of the advertising copywriters.

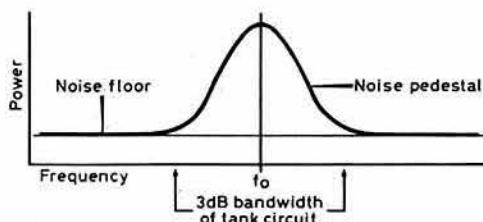


Fig 8. Noise sidebands around a carrier (f_0). At the frequency corresponding to the 3dB points of the tank circuit, the noise spectrum begins to rise out of the noise plateau (-174dBm/Hz degraded by the amplifier noise figure) at the rate of 6dB/octave, ie the noise power/hertz of bandwidth increases by four times each time the offset from the carrier is halved. For a single-stage oscillator the noise power in a 1Hz band at a frequency δf from f_0 is equivalent to $174 - \text{NF} + \text{Pin}$ (dBm) + $20 \log 2Q\delta f/f_0$ dB/Hz, provided $2\delta f$ is less than the 3dB bandwidth of the tank circuit, and $174 - \text{NF} + \text{Pin}$ (dBm) outside this region. Pin represents the power driving the base-emitter of the oscillator in decibels with respect to 1mW. A carrier plus one sideband is mathematically equivalent to simultaneous amplitude and angle modulation (*IBA Technical Review No 17*)

Many of the not-so-good trends noted by the Americans should come as no surprise to those who have read *TT* over the years. Much attention is given, for example, to the problem of oscillator/synthesizer phase noise and jitter (Fig 8). Incidentally, *TT* was probably the first amateur radio column to draw attention in May 1968, thanks to Walter Schreuer, K1YZW, to the basic problem of oscillator noise sidebands and how this could give rise to what has since become known as "reciprocal mixing". This subject has become of much greater practical significance since the coming into widespread use of frequency synthesis, with wideband voltage-controlled oscillators and the consequent return of "general-coverage" rather than "amateur-bands-only" designs.

W1FB and W7ZOI point out that in this respect the best (lowest phase noise) oscillators are those that run at appreciable power level—it is also worth pointing out that for optimum dynamic range, mixers (preferably doubly-balanced) need to be driven hard. They warn that in some current general-coverage equipment, with vco and pll synthesizers, the noise and spurious responses from the synthesizers are sometimes so bad that it is difficult to identify front-end intermodulation distortion (imd) products for two-tone dynamic measurements, adding: "This negates design efforts toward an improved front-end!" Yet how often does one see advertisements claiming simultaneously both superb frequency synthesis and a wide-dynamic-range front-end! It can be done but not in low-cost equipment.

They are also far from convinced that all is well with current agc systems, with insufficiently fast "attack" characteristics to prevent thumps and pops, brought about by the finite time delays introduced by the components. For this reason they rule out altogether the use of audio-derived agc. They put forward the view that agc is necessary for all modes of operation, including cw reception on headphones. In this respect, I beg to differ, having yet to be convinced that any agc is really necessary for this mode, and believing that no agc is better than poor agc; for this reason I wish more designs still made provision to switch agc "off". My personal cw preference is no agc, but really effective audio output limiting (eg back-to-back diodes) to remove all crashes from headphones. This can result in considerable harmonic distortion of the audio, but then that is no disadvantage (and can actually be an advantage) when receiving cw through a narrowband filter.

A point well made by the American writers is that where agc is used the

Table 1. Necessary characteristics suggested by W1FB and W7ZOI

Noise figure: not more than 10 to 12dB.
Blocking from gain compression: 110dB above minimum detectable signal (mds) in cw bandwidth for casual applications; 125dB for contest/dx.
Two-tone dynamic range: 80dB (cw b/w) for casual; 95dB for contest/dx.
Local oscillator noise: carrier-to-noise ratio in excess of 125dBc/Hz at 10kHz for casual; 140dBc/Hz for competitive applications.
AGC: overshoot from keying carrier into antenna jack, 60dB over mds, not more than 3dB. Decay: 100ms or less for "fast" recovery; 0.5s or more for "slow" recovery; no more than 100 per cent difference for signals of various amplitudes. AGC threshold - 100dBm or less; but at least 20dB over the mds.
Output: at least 1W into design load, with less than 10 per cent total harmonic distortion.
Frequency drift: 300Hz or less in first 30min in a stable temperature environment; 100Hz/30min or less thereafter (or much less in synthesized system).
Frequency resolution: 100Hz in a counted system; 1kHz in an analogue system.
Frequency accuracy: within twice the quoted resolution.
Coherent spurious responses: none to exceed mds by more than 10dB.
Reliability: mtdf of three years, assuming four hours use per day (ie roughly 4,500h).
I.F. stopband attenuation: greater than 100dB.
Image/I.F. rejection: equal to the two-tone dynamic range in ssb bandwidth or better.
(Characteristics relating to "transmission" have been omitted from this list.)

operator should have control over the recovery time (fast or slow), substantially independent of the strength of the incoming signals.

They also note that, for loudspeaker reception, particularly for mobile operation in relatively high ambient-noise situations, modern transceivers often lack audio punch, partly as a result of the general use of low (12V) supply rails. They suggest that stereo-type ic devices driving the speaker differentially would permit a 6dB improvement in af output power. No mention, however, is made of another problem affecting current equipments: the limited ultimate signal-to-noise ratio of the af signal output, even on strong signals. They do, however, point out the advantages of cascaded crystal filters; one cause of poor ultimate snr is high wideband gain after a single narrowband filter placed early in the receiver. Their advocacy of two or more filters is primarily on account of the improved stopband attenuation that this makes possible, though it should be noted that crystal filters themselves can be the limiting factor in terms of dynamic range. They also note leakage of signals around crystal filters (Fig 9).

W1FB and W7ZOI draw attention to lack of i.f. gain that sometimes leads to deficient sensitivity on the 21, 24 and 28MHz bands regardless of the noise factor of the front-end. High gain is required within the stages covered by the agc system. They note how the classic test for sensitivity can be adapted to check whether there is lack of gain. This test is carried out by replacing the receiver antenna by a 50Ω resistor, then advancing the gain control until receiver noise can be heard clearly; the waveband switch is then operated and checked to see whether the receiver noise sounds significantly louder on the lower frequency bands (1.8 or 3.5MHz) than on the higher frequency bands. This type of test can also reveal whether a receiver has sufficient sensitivity on 28MHz provided that there is an antenna trimmer control; if noise can be peaked by the trimmer with the resistor in place, then one can be confident that the receiver has maximum usable sensitivity. Most modern equipment will pass such sensitivity checks easily, and it is worth noting that where excessively good sensitivity is designed into a receiver this is often at the expense of good strong-signal performance. Noise figures around 10dB are sufficient.

The Americans provide what they consider should be a "minimum" specification for a modern high-performance hf receiver (Table 1) and

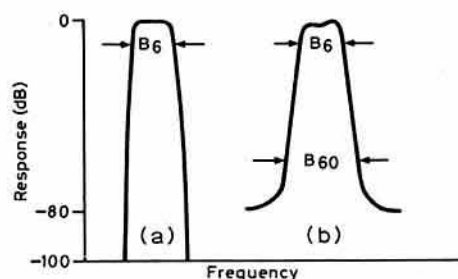


Fig 9. Passband responses for two different crystal filters. Filter A shows more-or-less ideal response with very steep skirts and functioning for attenuations in excess of 100dB. Filter B is more typical of performance with a good filter actually installed in the receiver i.f. While skirt response provides a good 6-to-60dB shape factor, the stopband attenuation is limited to about 80dB

sensibly distinguish between requirements for the more demanding contest-type operation and what would prove entirely satisfactory for normal "casual" operation. There does indeed seem a tendency these days to assume that every amateur needs to invest in the highest affordable grade of equipment, the best possible low-angle antennas, "legal" (and above) power linear amplifiers etc, when all they wish to use them for most of the time is for medium-distance, strong-signal contacts! This was brought home to me the other day on 7MHz cw when I found myself working a German amateur who proudly told me he had 600W rf output from his linear/TS830s combination!

Operability

W1FB and W7ZOI rightly stress that "specifications" in manufacturers' and suppliers' promotional material rarely tell the whole story—there is more to a receiver than a set of measured performance characteristics, or a "review" based on a single specimen.

The best test is to use the rig. The American writers suggest asking to try the equipment at home for a few days before deciding to buy—though one doubts if many suppliers would willingly agree to that! They propose "equipment rental" as another possibility, with initial rental fees to be set against later purchase—again a rather optimistic expectation, although long-term rental of amateur radio equipment may become more common in future.

Personally, I feel that more attention should be paid to the mechanical aspects and general "operability" of a receiver than would be gathered from the QST article. To quote from my 1981 paper (*IERE Conference Publication No 50*):

"If an operator finds a receiver pleasant to use, even where this requires the cultivation of skills based on an awareness of circuit functions, this can be every bit as important to him as the finer details of a paper specification that may only marginally be concerned with the ergonomics or human engineering factors. Unfortunately, while electronics becomes relatively cheaper, good mechanical design becomes increasingly expensive.

"We are still, for hf, in the era of the tuning knob rather than the keypad. Solidstate technology promises eventually to eliminate the expensive mechanically-ganged variable capacitors. But while electronic tuning is beginning to appear in some designs, it needs to be recognized that there remain significant problems to be overcome before the voltage-variable-capacitance diode becomes suitable for use in the highest performance receivers: not so much a question of Q as the effect of signal and oscillator voltages on the devices. In the interim period, mechanical tuning remains important. In the classic designs, the useful lifespan of a receiver was often determined largely by the gradual deterioration of the tuning mechanism or the rotary waveband switch. It was surely no accident that one of the longest-lasting designs, the National HRO (1934 until the 'sixties) was conceived initially by a designer whose training had been as a mechanical engineer (James Millen).

"Amateur hf transceivers were developed initially (Collins KWM-1 in the late 'fifties) for mobile rather than domestic use. For this reason emphasis was placed on producing equipments that were very compact, and this trend was enhanced by the resulting lower cost of the enclosures. Yet the value of 'miniaturization', at least for domestic use, is questionable; it renders servicing by non-professionals extremely difficult; it also seems at times that designers in the Far East must all have very small fingers to operate the current generation of models."

FT480R multimode 144MHz transceiver

Arising out of the "equipment review" by G4BAO and G3UUT last November of the FT480R and IC290E multimode 144MHz transceivers, M. G. Pritchard, G3VNU, has provided some additional comments on the FT480R. He writes:

"Normally the FT480R will not re-start scanning once a signal has been found. The facility of pause-on-signal followed by resumption of scanning can be obtained by cutting the wire link adjacent to the cpu ic device on the pll control unit. This link can be seen in the photograph on page 950 of *Rad Com* November 1982, close to the white spot on the largest ic.

"Variation in the S-meter reading with modulation while receiving fm is due to the agc control signal being derived from the ssb/cw i.f. strip. The meter responds only to a signal within the passband of the ssb filter, and any deviation of the carrier beyond the passband causes a reduction in meter reading. An fm signal where the S-meter increases with modulation indicates that the carrier is off-frequency.

"The FT480R 10Hz synthesizer steps on ssb/cw are a valuable asset for transceiver operation on narrowband fsk (rtty). The fm synthesizer steps and band coverage can be varied by changing internal diode links." □

Microwaves

by Charles Suckling, G3WDG*

Expedition news

David Hardy, G8ROU, has sent details of a forthcoming expedition to XM square by the Derbyshire Hills Contest Group, which will take place over the period 6 to 19 August. The site which will be used is Mynydd Llanybydder, 25km west of Cardigan, Dyfed (QTH locator XM80f), which is 1,300ft asl. Microwave operation will be on 1,296·225MHz, using 100W into four 15/15 Yagis and a GaAs fet preamplifier. If there is sufficient interest, operation may also take place from XL10h, which is about 5km south of the main site, 1,150ft asl, on the afternoon and evening of 14 August only.

Skeds may be arranged in advance via G8ROU (QTHR or tel 062983 2620), or during the expedition by contacting the 144 or 432MHz stations (144·225MHz and 432·225MHz).

Rainer Bertelsmeier, DJ9BV, has sent in details of an expedition to the island of Heligoland (DO70j), which will take place over the period 2-8 July. The callsign to be used is DK0IK/P. The 1·3GHz equipment will consist of a 130W output transmitter, an MGF1402 preamp, and a 4 by 29-el array. The primary operating frequency will be 1,296·190MHz. On 2·3GHz (which is being activated for the first time from DO square) the expedition will be using a 10W transmitter, an MGF1402 preamp and a 1·3m dish. Skeds may be arranged during the expedition by telephone (01049 472 5310), or by contacting the 70cm station (432·225MHz).

Beacon news

Since the announcement in the May column that the GB3LES beacon had become operational (frequency 2,320·955MHz, location ZM24j), two more reception reports have been received. Operating portable from near Brill in Oxfordshire, G8FMK received the beacon a few decibels above noise, using a 22-el Yagi feeding an anti-parallel diode mixer. From his home QTH (Felixstowe), G4FRE has also heard GB3LES, with a 4ft dish balanced on his windowsill. Dave also heard PA0QHN. Any further reception reports of GB3LES would be welcomed by the beacon keeper, G8CAC, QTHR.

As mentioned last month, GB3LES is the first UK beacon to operate in the 2,320MHz band. At the time of writing, the Andover beacon, GB3NEW, is still operating in the old band, but will be moved within the next six months. The other UK 2·3GHz beacon, GB3LDN, is currently off the air due to difficulties with the site, and it is not known when it will be back on the air. When it does reappear, it will be in the 2,320MHz beacon band.

3·4GHz equipment

A 3·4GHz receive converter was described in this column in February. Since this was published, the writer has had the opportunity to try different mixer diodes in an attempt to improve the noise figure. The best diode proved to be the MBD102, which gave a noise figure of 13dB (3dB better than with the diode specified in February).

There appears to be a need for a good design for a varactor tripler for 3·4GHz. Reports of the various published designs indicate that good performance is rather difficult to achieve. I would therefore be delighted to hear from anyone who has a design working, which gives useful power output (say 0·5 to 1W).

More aircraft scatter results

Following G4KGC's reception of the DB0JO beacon by aircraft scatter (see *Microwaves* May 1983), G3LTF monitored this beacon and also found that, on average, signals can be received several times per hour; the signal strength was approximately 6dB above noise.

During the May contest, aircraft reflected signals were heard on 2·3GHz over the 70km path between G3BNL and G3WDG. This is a particularly difficult path, and for most of the time no signals could be heard at all. The best aircraft "opening" lasted for about 30 seconds, when G3BNL's signal

was received at G3WDG's QTH a few decibels above noise. Equipment in use by G3BNL was an 18in dish fed with 1·5W of rf; G3WDG was using a 35-el loop-Yagi, and a 1·8dB noise figure receiver (with about 6dB of feeder loss). The test was unfortunately interrupted when a lightning strike near G3BNL's QTH blew his varactor doubler, which was however repaired in record time!

Waveguide for sale

Mike Adcock, GW8CMU, has recently acquired a quantity of WG16 waveguide, which he is prepared to sell off (in small quantities) at very reasonable prices. He can be contacted at 7 Channel Close, Rhoose, S Glamorgan (tel 0446 711426).

DX tv on 1·3GHz

Looking at the 1·3GHz dx record mentioned below, it is interesting to learn that the European 1·3GHz record distance was exceeded last December in Australia, using television! During a good opening across the Great Australian Bight, 1·3GHz tv signals were received by VK6WG, over a 1,872km path, from VK5QR. The signal quality was good enough for VK6WG to see the needle of the Bird wattmeter measuring the outgoing signal at VK5QR! VK5QR was running about 100W to a 6ft dish.

During the same lift, they also managed to work again on 2·3GHz (VK5QR and VK6WG currently hold the 2·3GHz world record). VK5QR's 2·3GHz transmitter is somewhat unconventional, in that it uses frequency division of the basic ssb source prior to mixing, followed by frequency multiplication to 2,304MHz. In detail, an ssb signal at 28MHz is divided by six, mixed to 20MHz, and fed into a Microwave Modules 432MHz transverter retuned to give an output signal of 384MHz. This signal is then multiplied to 2,304MHz by two varactor multipliers. Two 2C39BA amplifiers in series complete the transmitter, which produces 30W p.e.p. output. The first amplifier can also be cathode modulated for tv, and VK5QR is looking forward to crossing the Bight soon using this mode on 2·3GHz. He and VK6WG are also equipped for 3·4GHz and hope eventually to work each other on this band.

Operating news

Dave Robinson, G4FRE, has sent in details of some recent 3·4GHz and 5·7GHz tests on the east coast. On 3·4GHz, operating portable from Felixstowe, he had a good two-way contact with G3LQR over a 30km obstructed path, and also heard very strong signals from G3ZEZ. Using his G3JVL type transverter, he also received signals from G3LQR and G3ZEZ on 5·7GHz. No signals were heard in the reverse direction.

Dave then set about trying to improve upon the 0·5mW output from the transverter, in readiness for his 5·7GHz expedition to Belgium, and built a $\times 5$ multiplier from 1,152MHz. This produced 120mW, and enabled a two-way contact to be made with G3LQR over the same path, only four days after the first tests. His multiplier uses a BXY28 diode, which is not an optimum device at 5·7GHz, and Dave is planning to try a BXY39 to improve the performance. It is hoped to publish details of this multiplier in the near future.

IARU Region 1 VHF/UHF/SHF DX Record Table

OH0NC has pointed out an error in the IARU VHF/UHF/SHF DX Record Table, which shows the current 1·3GHz record as being held by two Italian stations. This is incorrect: the current record is believed to be held by OH0NC and G4KDH for their 1,537km contact made on 15 September 1982.

Late news

The UOSAT 2,401·0MHz beacon was switched on for the first time on 19 May. It was heard by G3WDG and G4KGC at good strength on the first pass. More details next month. ☐

*46 Windsor Close, Towcester, Northants.

RSGB NATIONAL VHF CONVENTION 1983

by JOHN MORRIS, G4ANB;

CHARLES SUCKLING, G3WDG; and

KEN WILLIS, G8VR

Photos by Malcolm Appleby, G3ZNU

THE RSGB National VHF Convention 1983 was held at Sandown Park racecourse on Saturday 26 March. It proved to be the most successful such convention to date, and a record number of visitors and trade organizations attended.

The official attendance was 1,599, an increase of some 16 per cent on last year, and the spacious hall left plenty of room for amateurs to walk around freely to inspect the trade stands or to meet and chat with friends. One of the attractions of conventions is the opportunity to put a face to the call which has become so familiar over the air, and how seldom it is that one's mental picture is ever remotely like reality!

The trade stands at a vhf convention tend to differ from those at hf events or exhibitions in that they cater much more for the home-constructor. Consequently there was a fine array of components and accessories available, plus the usual flea-market (organized by Echford ARS) which was marked by layers of visitors endeavouring to get close to the more obvious bargains.

To cater for the large number of amateurs coming by road with mobile equipment on board, an efficient talk-in service was provided by a mixed group comprising the Echford ARS, the SW London Raynet Group and members of Hadrabs, all co-ordinated and arranged by Robin Hughes, G3TDR.

When the doors opened at 1030am on a mercifully sunny day, there was already a large crowd gathered outside ready to enjoy the day's programme, which included afternoon lecture streams and a social evening at which a meal billed as a "substantial knife and fork supper" was served. One of the attractions of Sandown Park as a venue is that it offers much in the way of facilities such as bars, snack bars and good parking. Unfortunately, however, it is some distance from the nearest railway station, and during the day several perspiring visitors were to be seen carrying heavy pieces of military-looking equipment to the trains.

The more formal afternoon sessions commenced at 2pm when the RSGB President, Mr D. Baptiste, CBE, gave his address in which he welcomed visitors to the convention, the 28th to be held by the Society, saying that it was in January 1953 when the first was held, the guest of honour on that occasion being the late John Clarricoats, G6CL. Mr Baptiste pointed out that the allocation of amateur frequencies for space communication had been first authorized following a meeting of IARU delegates in Geneva, and it was G6CL's eloquence on the subject which had done much to achieve the facilities we now enjoy. In providing some statistics relevant to our

hobby, Mr Baptiste referred to the obvious popularity of the Class B licence, there now being more Class B than Class A licences in force, and he emphasized that the Class B permit is in no way to be regarded as inferior to the Class A version but simply reflects an interest in vhf/uhf techniques rather than in hf-bands communication.

Mr Baptiste also spoke of the growing interest in microwave communication, and commented on the excellent lectures being presented on this part of the spectrum at the convention. He welcomed the overseas lecturer, M Serge Canivenc, F8SH, who would speak on a highly technical subject which was an indication of the role played by amateurs in furthering the knowledge of radio propagation, and which supported the international scientific programme of the CCIR. He paid tribute also to the work of two of the Society's members, Ray Flavell, G3LTP, and Charles Newton, G2FKZ, both recognized authorities in their fields.

The President said that the recent approval of the Home Office to permit a limited experiment on 50MHz was to be welcomed, and it was hoped that this would lead to a permanent allocation at this frequency in due course. Meanwhile he hoped that other IARU Region 1 societies would follow the lead of the RSGB and attempt to get an allocation in this band also. In conclusion, Mr Baptiste thanked all those who had worked so hard to make the convention possible and so obviously successful.

Lecture Stream A

In the first lecture in this stream, Tony Whitaker, G3RKL, described the concept and design of an experimental pilot talkthrough repeater which he has under construction at Sheffield. He began by outlining the current repeater organization throughout the world, and pointed out that the available channels are really too few for co-channel interference to be avoided, especially when conditions were enhanced to provide longer-distance coverage by average stations. Since extra channels cannot easily be provided, and a conversion to a 12.5kHz specification probably not generally acceptable, some other solution must be found. By using the inherent narrow bandwidth of the ssb mode, coupled with the fact that amateurs as a body probably have the most experience in the use of vhf simplex, it would seem sensible to explore the possibility of using the mode for repeater operation. With 5kHz channels there could be no fewer than 40 channels accommodated in the space currently required for eight.

For proper control, a repeater logic requires to know that there is a station on the input, even if no information is being transmitted (eg during speech pauses), to have perfect demodulation in terms of frequency and a constant modulation level (ie excellent avc for an amplitude-modulated system). These criteria introduced many design problems for an ssb repeater. Since the familiar suppressed-carrier (J3E) mode does not fulfill any of the three criteria, a known reference signal must be introduced into the transmission. The pilot carrier mode (R3E) has been chosen for the experimental repeater since it would require a minimum modification to existing equipment. The pilot carrier would be some 10 to 16dB below peak output.

Dr Whitaker described each circuit function, and illustrated his lecture with excellent slides. Many who had attended believing that there was no case for the use of ssb in the repeater networks, must have gone away recognizing that this is a most significant project which may well shape at least one aspect of our hobby in the future.

The second lecture was on the subject of rf radiation hazards, and was a joint presentation by two professionals in this field, Ian White, G3SEK, and Roger Blackmore, G4PMK, both from the National Radiological Protection Board. In the first part of the lecture, G4PMK defined some of



(Left) Martlesham Radio Society receiving the VHF Contests Committee Cup for the 1982 1296MHz Trophy Contest. L to r: G4SWX, G4FRE, G3XDY, G4FZZ, G3ZNU, President. (Right) G8IMC, of the Parallel Lines Contest Group, receiving the Council Cup for the 1982 432MHz Trophy Contest. The group also received the Mitchell-Milling Trophy for the 1982 144MHz Trophy Contest





(Left) Serge Canivenc, F8SH, the IARU Region 1 sporadic-E co-ordinator, with the President, Don Baptiste, F8SH gave a lecture on "144MHz field-aligned scatter propagation" at the convention. (Right) Westmorland VHF Group receiving the Arthur Watts Trophy for VHF Field Day 1982, Restricted Section. L to r: G3JYP, G3FDW, G4RCE, President, and G4RCD

the units associated with this branch of science, and went on to describe the specialized instrumentation which has been developed for this somewhat new subject. G3SEK then discussed many typical amateur situations and related them to the hazard levels worked out by the NRPB. Fortunately for the health of the amateur fraternity, there appear to be few situations when an amateur is at risk from radiation from his own equipment unless he should be unwise enough to peer down a waveguide carrying rf energy (the soft tissue of the eye being particularly vulnerable) or stand at the focus of a large dish antenna when rather more than legal powers were being fed into the antenna on 432MHz. The lecturers provided some fascinating information based on typical Yagi antennas and effects at varying distances and heights, and it is hoped that they will be persuaded to publish their material shortly since it needs to be on hand for reference.

Both lectures in Stream A were characterized by not only excellent presentation but also really professional illustrations and displays which helped greatly in putting over some of the very technical matters which were dealt with.

The final session in Stream A was a "meet the public" appearance by the VHF Committee, whose members sat on stage to receive a barrage of questions from a large audience. The topics covered a very wide range, though unfortunately the majority of issues raised were related to vhf contests. Next year it will be the turn of the VHF Contests Committee to take the stage, but on this occasion the VHF Committee did its best to satisfy the demands of a vociferous audience.

Stream B

Lecture Stream B was opened by Serge Canivenc, F8SH, the IARU Region 1 sporadic-E co-ordinator, with a talk entitled "144MHz field-aligned scatter propagation". This propagation mode is quite unfamiliar to most amateurs, but it looks likely to have been responsible for several dx contacts which have been ascribed to other modes.

In both the E and F layers, regions of ionization can become aligned with the magnetic field and can reflect rf over certain well-defined paths. Signals are characterized by fading with a period of about 10s and a path deviation of around 60°. Unless path data are available, it is very easy to confuse field-aligned scatter with sporadic-E. It occurs at about the same time of year, roughly May to August, and favours southern Europe.

Signals are usually weak, an eirp of 100kW giving around 10 to 20dB above noise at the receiver. They come from about 10° above the horizon, so tilting the antenna upwards should help.

There was a change of programme for the second lecture. The advertised talk on AMSAT Phase 3b had to be cancelled because setbacks in the launch schedule meant that the information was not available. Instead, Richard Limebear, G3RWL, described techniques for tracking and working through the present generation of low-orbit amateur satellites, such as Oscar 8 and the RS orbiters.

Finding out when a particular satellite can be raised turns out to be quite easy, using readily available orbital data and special maps and overlays sold by AMSAT-UK.

An odd feature of satellite working is that it is usual to transmit and receive at the same time, as the uplink and downlink frequencies are on different bands. This means that full duplex operation is the rule and makes it easy to check whether the satellite has been accessed. A good 28MHz receiver is essential, most sets needing a preamplifier. On 144MHz 100W erp is adequate. It is not necessary to be able to elevate the transmit antenna, although fixing it about 10° above the horizon is useful and does not seriously degrade the tropo performance.

The final lecture in Stream B was by John Morris, G4ANB, who described some of the applications of computers for vhf and uhf operators.

One of the favourite uses of computers is for scoring vhf/uhf contests from locators, and many programs to do this have been produced. In devising such a program it is always important to remember that the person using it is human, and liable to make typing mistakes, so the computer should always do as much as possible to detect illegal inputs, and to let errors be corrected. A couple of programs showing these features were run.

Several other programs were demonstrated, including a practice cw generator, an rtty terminal emulator, national grid to locator conversion, satellite tracking, and a real-time sun and moon azimuth and elevation display. The important point about these programs was that they were all run on a single machine. A computer can, by virtue of being programmable, emulate many different pieces of hardware at little or no extra cost.

Stream C

Once again, the microwave lecture stream was very well attended, with near capacity audiences. The first lecture, "An introduction to microwaves and microwave operating" was given by Petra Suckling, G4KGC. She began by describing the important types of microwave propagation: available at all times are line-of-sight, knife-edge diffraction and tropospheric-scatter propagation; whereas ducts/inversions, aircraft scatter and rain scatter, which can give good dx contacts, are only available sporadically. She related the path losses associated with the "regular" modes of propagation to the path loss capability of amateur equipment, in order to show what ranges can be expected, and demonstrated that the large antenna gains on the higher microwave bands can offset the greater path losses and lower power levels. A number of tape recordings were played to demonstrate the signal characteristics associated with different types of propagation. She explained how operating practices have to be adjusted to different propagation modes. Finally, she stressed the importance of high accuracy in pointing the high gain/narrow beamwidth antennas used on microwaves.

The second lecture was given by Heath Rees, G3HWR, on the subject of the new microwave bands. Of all the new bands which have now been allocated above 24GHz, 47GHz was considered to be the most likely candidate for initial amateur operation. Equipment for 47GHz was discussed, and one of the major problems seemed to be that of coupling rf power into diode detectors and mixers. There appeared to be no problem

(Continued on page 619)



South of Scotland Group receiving the Tartan Trophy for the leading Scottish station in VHF Field Day 1982. L to r: GM3WOJ, GM4COX, GM4CXM, President, and GM4IGS

THE POOR CONDITIONS which prevailed throughout the wettest April on record continued into May as one after another low-pressure system moved across the British Isles to prevent any stable atmospheric conditions forming which might yield some good tropo. Taken as a whole, it has been a very poor period indeed for the vhf fraternity, though it is surprising what some operators find to do even when conditions are at rock-bottom.

This month there is quite a long list of expeditions. Some of them will already be active, or about to be so, when this copy arrives at your QTH, so make some diary entries to ensure that the main dates, operating times and frequencies are not overlooked. There were some expeditions reported in the June issue which will be operating during August, so look back to those also to compile a full listing for what promises to be an interesting period ahead.

Finally, it is not too late to comment that July can be a very good month for sporadic-E propagation, nor too early to remind readers that the popular and effective Perseids meteor shower is due to peak sometime around 12 August, so now is the time to prepare for those events, neither of which depends on the weather, so even if it is still raining, some help can be expected from these modes of propagation.

Expeditions

Telford & DARS will be out portable during the first week of August. They plan to operate on 70·225 and 144·325MHz cw/ssb from the Grampian region of Scotland in squares ZR and YR. Operation will actually commence on 31 July using callsigns GM3UKV/P (4m) and GM3ZME/P (2m). GM4AUY/P will monitor 7·050kHz (approx) from 1200bst daily for co-ordinating schedules. Meteor-scatter skeds on 70·225MHz can be arranged in advance by contacting G3UKV, QTHR, or tel 0952 55416. This is an excellent opportunity to work some rare squares, especially on 4m. This will be the fifth successive year that this society has operated from a portable site.

Seventy-centimetre enthusiasts will be glad to hear of an expedition to Heligoland (DO70j) from 2 to 8 July inclusive. Callsign will be DK0IK/P, and skeds can be arranged by telephoning Rainer, DJ9BV, on 04725310. However, for those who prefer to take "pot luck", operation will be on 432·225MHz, using both cw and ssb, with 700W of rf into four 23-element Yagis (21dB gain claimed). They will also monitor 432·200MHz. The group will also be operating on 23 and 13cm, the first time that 13cm has been activated from DO square according to Rainer.

GM3WCS, his wife GM4COO, and G3WOH will be operating portable from YS72j from 16 to 30 July using callsign GM4COO/P. Operation is planned mainly for 144MHz cw ms to activate this rare square by that mode, but if aurora or good tropo develop, they will revert to "normal" operation. European operators can arrange ms skeds in advance by contacting either GM3WCS or G3WOH on the vhf net, or by telephoning 0383 726456. The group will also be taking 4m equipment with them, but they regret that the special permit held by GM3WCS for 50MHz operation will not allow operation on that band from a portable site. The frequency used on 2m will be 144·088MHz, and although it is expected that much time will be taken up meeting skeds, they will listen on that frequency for random calls, and will always transmit "second" period (ie 05, 15, 25 etc minutes past the hour). They will also monitor the vhf net during their stay in the area.

Some further details are now available in connection with the proposed Hadrabs expedition to Andorra, first mentioned in the May 4-2-70. A most ambitious operating schedule has been worked out which embraces all modes of operation, including eme and meteor scatter, while the group hope also to have video recording equipment with them to provide lecture material for use on their return.

On all bands above 30MHz, the callsign will be C31XV/P, and the same call will be used for hf talk-back; although a separate call, C31YR/P, will be used on 3·5 to 28MHz for normal hf band contacts. The list of

frequencies to be used includes the 50MHz band, and at the height of the Es season, this should prove very interesting. The following list will indicate where the group can be found:

- 14·345MHz VHF net, with daily sked with the UK at 0900gmt
- 28·885MHz 50MHz talk-back
- 50·433MHz SSB and cw contacts
- 144·033MHz EME operation, both skeds and random
- 144·133MHz MS cw skeds
- 144·233MHz SSB/cw tropo and random ssb ms
- 432·233MHz SSB/cw

Operating times

- 17 to 24 July incl 144MHz tropo and random ms from 0400 to 1100gmt
- 18 to 23 July incl 144MHz tropo from 1800 to 2300gmt.

The group will be active at other times during the expedition, which should start up at 1600gmt on 16 July and terminate at 1100gmt on 24 July, but they wish to retain some flexibility over choice of band and mode. As the weather there can be electrically unstable, they may be forced to close down at short notice, and for this reason prefer all skeds to be made on the vhf net on a day-to-day basis rather than before they leave the UK. EME skeds should be made through VE7BQH.

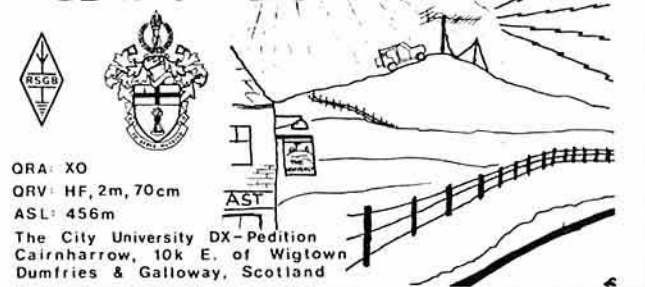
C31XV/P will give priority to sporadic-E should an opening occur during the expedition, and if tropo is good, 432MHz will take priority over 144MHz. Listener reports and, in particular, cassette recordings of their signals will be greatly appreciated. QSLs will be sent to listener stations and all recordings returned. If further information is required, write to G8APZ, QTHR, to whom QSL cards or other reports should also be sent.

Another expedition will be mounted by the Falcon Contest Group from Leicestershire. Operating as G4SGK/LX from the Duchy of Luxembourg, they plan to be on site from 26 July until 14 August, running about 100W to (probably) two 17-element Tonnas on 144MHz. All the usual modes will be operated, but priority will be given to ms skeds during the Perseids shower. Anyone wishing to arrange a sked should contact G4NPX, PO Box 30, Shephed, Loughborough, Leics. The group will also operate on the vhf net. Squares CK, DK, CJ and DJ will be activated, but it has not yet been decided which square will be the centre of main activity. Luxembourg, of course, counts as a country for awards, so this will be a good chance to work it from the UK. The address of G4NPX given above should also be used for QSLs, and saes would be greatly appreciated since group finances will be somewhat strained by this sortie abroad.

ON1ASN, ON5EX and ON7RB will be QRV from LX, 8-17 July, carrying a 2m eme rig (8 × 11). Skeds can be arranged by letter or on the vhf/eme net.

The City University expedition will this year be to Dumfries and Galloway, operating from XO square. Operation will be on all hf bands, 2m and 70cm from 30 July until 6 August. The callsigns will be GM6AHX/P (70cm) and GM6ASH/P (2m), with GB4XO as the probable hf bands call. Skeds can be arranged by writing to the City University Amateur Radio Club, Northampton Square, London. This expedition will be sponsored by Microwave Modules and the special QSL card to be used is pictured here.

- ☐ GM6AHX/P
- ☐ GM6ASH/P
- ☐ GB4XO



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

Repeater news

The Sudbury (Suffolk) Group's repeater is ready to go on channel RB15, but the necessary documentation must be received from the licensing authority before the system can become operational. The feeder cables were pressurized in October 1982, and they have held up well during this waiting period. The callsign will be GB3SU. Further information and requests for membership of the group should go to G41ZA, QTHR.

GB3PW, the repeater located at Newtown, Powys, came on the air on channel R3 on 16 April 1983. It runs 10W erp, and after a week or so of "Murphy's", settled down and is now working well. Reports on its reception would be welcomed by GW4NQJ (G4NQJ), QTHR.

"Aspiring" Scottish repeater groups in Paisley (GB3PA), Shetland (GB3LU), Orkney-Caithness (GB3OC) and Black Isle (GB3BI) have expressed their dissatisfaction with the slow pace of paperwork associated with their proposals which are part of VHF Phase 6. Some letters of intent were in the hands of the RWG as long ago as November 1981. They make the point that Scotland experiences harsh winter weather (especially in Shetland), so if site work is not completed during summer months, a whole year can be lost.

(The RWG points out that these are Phase 6 units, and Phase 5 was not licensed by the Home Office until February 1983. Delays since then have been caused by the need to negotiate new repeater licensing guidelines with the Home Office, as it appeared that there would be no new licences after this year. As we go to press, a meeting with the Home Office is imminent.)

The European VHF Net

The function of this net was described in 4-2-70 November 1982, and there is evidence that the net is being used by more and more UK operators, especially as interest in meteor-scatter propagation is on the increase.

GM3WCS has commented, however, that the frequency (14,345kHz) is virtually useless during the hours of darkness, and this severely limits the use of it by those who have to earn their daily bread by day. In discussions with GM4CXM, another frequent net user, the suggestion has come forward that an alternative net be established on the 3-5MHz band for use when skip rules out the use of 14,345kHz by European vhf operators. A frequency of 3,645kHz is proposed, coupled with the idea that the UK might take the lead in Europe in establishing this alternative spot. Any views and other suggestions on this topic would be welcomed.

Micros and the radio amateur

John Branegan, GM4IHJ, (Fife) has had his usual heavy postbag since he became identified with computer software dealing with the needs of the radio amateur (see 4-2-70 March and May 1983). Many of his correspondents request listings, for various types of micro, of graphic map programs. John regrets that he has none to offer, but AMSAT-UK will shortly publish details of how they intend to offer his Spectrum 48k high-resolution graphics programs on cassettes. He much prefers writing his own programs to translating to other people's micros, and indeed, only the BBC and Spectrum machines will handle these graphics. However, John has almost completed a new moonbounce program aimed at settling some of the current ideas about this form of propagation. Having received requests for programs giving lunar footprint coverage maps, he has decided, after discussion with eme operators, to go for programs which provide much more detail: such as the state of the ionosphere, the angle of incidence on the ionosphere, the presence of major celestial noise sources in the vicinity of the moon, doppler effects, earth-moon distance, lunar angular diameter etc. This will be a most comprehensive series of programs, and John says that this is how he sees the role of the micro in amateur radio—in building up patterns of what matters and what does not. He has a particular dislike of the "computer talks to computer" scenarios so popular in some circles.

Meteor scatter

Some minor showers during April and May provided the opportunity for dx to be worked on ms, though on most days it has also been possible to use sporadic meteors. There must always be some doubt during minor showers whether the reflections are caused by meteors in the shower proper, or by random meteors, but whatever the cause the results have been most worthwhile for those who took advantage of this mode. Just for the record, the showers concerned were the Ursae Majorids (1-2 April), the Lyrids (22 April), the Eta Aquarids (5 May) and the Piscids (7 May).

Between 2 and 23 April, operating on eight separate occasions, GM4CXM worked OK1OA (HK), OH1ZAA (KV), DL1MBG (GI), OK1FM (GJ), OH5LK (NU), 14MKN (GE), SM1BSA (JR), UQ2GFZ (NR), OE3CEW (II) and RQ2GGS (LQ). All were on 144MHz cw except for the contact with 14MKN which was on sideband, and they were mostly skeds between 0400 and 0900gmt. On 23 April GM4CXM had a sked with

UA3IDQ (QQ) over a path of 2,278km and copied seven bursts from him although the contact was incomplete. One of the bursts was of 3s duration.

On 22 April, GM3WCS had ms cw contacts with SP6GZZ (IL), OK1MAC (HJ) and SP6FUN (IL). The significance of these contacts was that it marked the reappearance of Polish amateurs after their enforced closedown in December 1981.

On 5 May GM3WCS worked YU3FM (HG), 11JTQ (DF), DL9MCC (GH) and OK0WCV (GK), all on 144MHz cw. On the same day G8VR, who much prefers the cw mode, worked IW5AVM (FC) on ssb ms, with some excellent reflections enabling the contact to be completed in under 30min. GM4CXM worked UC2AA (NN) on the same day, followed by a very good one, UC2AAB (ON)—this being a short-term expedition to a rare square and probably Ray's best-ever dx by any mode. The following day provided DK1PZ (EL) and UQ2GCG (LR) for GM4CXM, both on cw, while on 7 May, Ray worked SP6FUN (IL) and F8CS (CH).

Also on 7 May, G4IJE worked SK5AJ/0 in JS square on 144MHz ms cw. This was a new square for Paul, who took advantage of a weekend expedition by a Swedish group who had announced their intentions and operating frequency on the vhf net prior to departure. Thus Paul knew where to look for them, and hearing them call CQ on a longish burst, replied, and completed in minimum time.

G4IJE had further successes on ms later in the month. On 18 May he worked F9HS in BD square, the French station having just moved there and glad to make his first contact with AL. On 19 May, Paul worked two new squares in contacts with EA6FB (AY) using ssb, and SM3AZV (IX) on cw.

There were several other ms contacts made in the period under review by the 50MHz permit-holders, several of whom have been quick to recognize the value of the mode for making long-distance contacts on both ssb and cw when conditions were otherwise flat. More than one of these operators has admitted to being converted to ms virtually overnight as a result of hearing the length and strength of bursts received.

I have sometimes been criticised for devoting too much space to the meteor scatter mode. I defend this by commenting, as I have done before, that ms is very easy, requiring patience and the observance of certain simple well-tryed procedures to ensure success. Many readers tell me that they have never heard an ms burst or even a ping. If you tune any evening to the 144-050MHz cw calling channel with the beam to the southeast and simply sit and listen, you will almost certainly hear reflections from quite far away, even if tropo conditions are totally flat. It is like the flying saucer syndrome: if you don't spend much time looking at the sky, you'll probably never see one! However, unlike ufos, there is nothing doubtful about meteor reflections. They occur all the time, more at some times than others, and if an experienced ms operator hears nothing within two or three periods of a sked he assumes that the operator at the far end is either not QRV or off-frequency. The next big chance for trying ms if you have not done so is in the Perseids, 12 August or thereabouts. Look again at those squares listed above and compare them with what has been heard by other modes during this very poor period of conditions on the vhf bands. It says a lot for meteor scatter.

In the early hours of 23 May, G4IJE and G8VR both worked OY5NS on 144MHz by ms cw. Skeds were arranged on the vhf net, and both stations completed their contacts within 45min. This was the 297th square and 51st country worked on 2m by G4IJE.

G4BAO has had some good 2m ms contacts with OE, F and UC2. Since he is a keen 50 and 70MHz operator, however, he suggests random calling frequencies for ms on 50-150 and 70-150MHz. This seems to be a very good idea, and since activity is still restricted to the UK for such operation, the random channel could accommodate both cw and ssb initially. Why not give it a try?

G4BAO can offer ms skeds on any of the bands 2/4/6m, with any crossband combination required (perm any two out of three!).

50MHz

The main 50MHz news is the contact between G5KW, from a site near Land's End, and ZB2BL, the Gibraltar beacon keeper, which took place in the early morning of 6 May. First of all, 339 cw reports were exchanged, but as things improved, ssb was used with reports of 5 and 2 both ways. This was on 50-035MHz, and the contact arose from a sked arranged by G3COJ. This is believed to be a first ZB2-G contact on 50MHz, and in the absence of any other claims, will constitute a distance record for the IARU Region 1 listing in 4-2-70 April 1983. It is assumed of course that the contact was by sporadic-E propagation. This will be a source of great pride to G5KW who for months has isolated himself in Cornwall, first to be as far west as possible for possible F2 openings across the Atlantic on 50MHz, and more recently to provide some dx for the special permit holders. However, this was not all. On 23 May G5KW worked GI3ZSC on 50MHz to become the first of the permit holders to work six countries two-way on this band;



Cards confirming a 50MHz contact between two of today's special-permit 50MHz operators, when G5KW, operating as MD5KW from the Suez Canal Zone, worked G6XW (Hants) in November 1947

the countries being G, GW, GM, GI, GJ and ZB2. This is not the first time that G5KW has figured in unusual contacts on the band, as the accompanying photograph shows.

Activity outside tv hours continues apace on the band, with a mixture of tropo and ms contacts taking place, and many skeds being maintained to provide statistical information on the propagation characteristics at these frequencies.

GM3WCS comments on the growing number of operators resorting to ms, especially to cover the long haul to GM from the south. He and GM3WOJ run regular skeds with G4IJE which are generally completed, but Ken has also worked G4HUP (YM) via ms using slow-speed cw, and although the distance (350km) is really too short for this mode, they completed easily, and a 23s burst was copied from G4HUP who runs only 10W! Ken comments on the value of a high vertical component in the antenna polar diagram on this band if the distance between stations is short. Following one ms contact with G4IJE, GM3WCS "tail-ended" with G3LTF and again completed. Ken has also worked GW3MHW via tropo with 419 reports both ways, and in a crossband sked with OK1OA (50-144) they completed in 30min even though the OK was using an indoor dipole. To complete his "bag", Ken also worked GI3ZSC via tropo on 14 April with 559/539 reports which may be the first GI-GM contact on 50MHz.

Another interesting tropo contact was made between G4IJE and GJ3YHU on 7 May.

G4BAO (Cambridge) reminds us that HB9QQ is fully equipped for reception on 70 and 50MHz with four-element antennas, and it will be remembered that he worked G3UVR crossband on 4m last year, so look out for him on 28,885kHz. John also comments on a very good auroral indicator on 52.757MHz, a tv station sound channel which he says goes auroral at the slightest sign of such an event.

GM4IHJ (Fife) has noted several instances of early-morning Es on 50MHz, none of them very intense, and his many CQ calls both direct and on crossband frequencies brought forth a chorus from his family of "I took my harp to a party" since no-one called back to ask John to play! He persists in monitoring each morning, however.

On 22 May G4IJE worked YO2IS crossband 50-144 using ms cw. A

previous sked was not completed, but this time it went through well. YO2IS is keen to listen on 50MHz for other UK stations, and he is often on the vhf net during the late afternoon to arrange skeds. G4GLT is another who has been experimenting with the ms cw mode on the band in tests with GM4IHJ and GM4FZH (Caithness). Using only hand-speed cw, around 20wpm maximum, one or two letters at a time are normally copied, but, after 10 days of regular skeds, a contact was completed with GM4FZH on 26 April with 27 reports both ways. The longest burst received by G4GLT was 50s. No complete contact with GM4IHJ has been possible to date, though John has received both call signs on several occasions. G4GLT has also worked GM3WOJ via ms ssb on two occasions and received a burst of 130s from him. Dave only uses 10W of ssb on the band. G4GLT has now had contacts with 31 of the permit holders, including GI3ZSC, GI3RXV and GJ3YHU, the last three on tropo.

From his location in France operating F0FDB, Steve, G4JCC, heard bursts of cw and ssb from the UK on 50MHz on 15 and 16 May. On 16 May there was a big opening and ZS6PW was copied between 1600 and 1615, while later ZB2VHF and 49.75MHz tv were heard at good strength. ZB2VHF was copied from Steve's home QTH on 20, 21 and 22 May, very weakly, but on 21 May GU2HML could hear the beacon at S9 plus 20dB, so the Es season seemed well advanced by that date.

On 21 May, which appears to have been a very good day, G4GLT worked EI9Q crossband (50-3.7MHz) for what is believed to be the first such contact ever made. Dave used ssb, EI9Q was on cw. Later G2AOK and G5KW also worked the Irish station.

GM3MHW is now up and going on 50MHz and carrying out some very interesting tests with GW4HXO to compare propagation on 50 and 70MHz. They are using as nearly identical systems as possible on the two bands, including antennas, and so far the results obtained have thrown up a number of controversial points. It is hoped next month to print some graphs of these tests supplied by GW4HXO. Meanwhile GW3MHW has been operating from about 0500gmt daily and has so far worked two-way on 6m with G, GW, GM and GJ, and crossband with EI9Q and GJ3YHU using ssb. John keeps an ear on 70.195MHz where he has had crossband contact with GU2HML, and he also checks 3.718kHz where many crossband contacts have resulted. He is anxious to receive listener reports on his 50MHz signals.

G3COJ had a crossband contact with PA0XMA (see 4-2-70 April 1983) using 144MHz as the talkback frequency on 15 May using cw. There were some noticeable ms enhancements on the tropo signal.

G4JLH (10W) sent in his complete log covering the period 8 July 1982 to date. When this has been studied, the most interesting points will be published in a future 4-2-70. Harold uses 25W of rf into a three-element beam on 50MHz from a site 170ft asl. The rig is an FT650B with a 6146 amplifier.

Finally for this month, G5KW wishes to make it known that each Sunday at 6pm, 50MHz operators will gather on 3.718kHz to exchange news and information. GM3MHW adds his plea to other operators to leave this frequency clear, especially during non-tv hours as well as at "net" times, so that crossband contacts can be set up and conducted using this channel.

Beacon information

The paperwork for the proposed 6m beacon to be sited at RSGB headquarters is now complete and the application can go to the Home Office, though it will be some time before such a beacon can become operational.

The frequency of beacon GB3ANG on 432MHz has *not* changed as reported in 4-2-70 May 1983, though it is still intended to make such a change eventually.

70MHz

An interesting crossband contact, 70-144MHz, took place on 1 May between CT1WW and G4IJE. A previous sked had not resulted in a complete contact, but this time 26 reports were exchanged on ms cw, and during the contact CT1WW copied a burst of 4min duration from Paul. Immediately after the sked the stations checked 28MHz to see if any Es was in evidence which might have accounted for such a long burst, but none was noted. As previously mentioned here, CT1WW is very keen to make crossband contacts with UK stations on both 50 and 70MHz. G4IJE uses the same QQVO6-40 amplifier on both 50 and 70MHz, since it will tune both bands quite comfortably.

G4BAO wishes it to be known that when Es is about he operates his keyer on 70.185MHz announcing whether he is listening on 28,885 or 14,345kHz. (On 50MHz he operates on 50.112MHz, looking for crossband on the same hf frequencies).

When operating F0FDB from France in May, G4JCC often copied bursts from GB3BUX on 70MHz, notably on 10, 11, 12, 14 and 15 May.

Miscellany

Shaun, G4MDZ, from near Folkestone, Kent, reports that his callsign is being pirated by someone believed to be in the London area. The pirate is using the call on 14, 28 and 144MHz, and reports have also been received about fm contacts on the satellite channel using this call. He gives his name as John and QTH "the London area". Shaun is a well-known vhf dx operator, mostly on cw, and he works ms also. He naturally wishes to dissociate himself from any activities which involve illegal or poor operating and mis-use of the band plans. Any information to G4MDZ, QTHR, please.

From Frank, G4IEY (Cheltenham) comes the news that the callsign G6QM has been re-issued, the licence holder being G4IEY himself, with G8ML, G3IER, G4JKY and G4LXU as authorized operators. All were personal friends of Bert Matthews, the original holder of the call, and the Queen Mary Contest Group will use it in contests and at other times. The group is anxious to work as many as possible of those stations who worked Bert over the years between 1935 and his death. There are several old-timers on the vhf bands who will remember the callsign with nostalgia, recalling the days when one had to "roll one's own" equipment, especially for vhf, and black boxes were things for keeping money in!

Harry Wilson, EI2W, who was a key figure in vhf circles for many years, wrote to say that he is currently operating on the hf bands and is inactive on the higher frequencies! He says that in any case, the pages of our journal contain too many references to EI2W on 2m and 70cm relating to his past operations, but there are many stations who owe much to him for providing the country and square on those bands as well as on 50MHz. Harry recently gave a lecture to the Limerick Radio Society which dealt with 70 years of amateur work, including what he terms "the magnificent work of the RSGB". He also draws attention to an error in the book *The World at Their Fingertips* by John Clarricoats, G6CL (page 286) where the record of 651 miles covered by G3KEQ in a contact with SM6ANR should have been quoted as a 432MHz contact and not one on 144MHz.

Those who have come into the hobby more recently might find this particular book very interesting since it is an historical account of events which led to present-day operation and equipment. Some of the dx worked with simple equipment in the early days is remarkable, and taking into account the lesser technology of the era, the achievements were every bit as commendable as those of recent years (see photograph on facing page).

G4IJE has received listener reports which check with his log from stations in Bulgaria (LD) and the Ukraine (MJ) when he was active during auroras last autumn.

GM4FUI (Lanarkshire) has received a card from OK2VMD (IJ54g) for a claimed contact on 144MHz on 30 July 1981 at 2357gmt using cw. However, Martin did not work this station, and thinks this is a genuine misreading of callsign by the Czechoslovakian station, so anyone wishing to claim this contact should write to GM4FUI, QTHR.

G3NAQ has asked me to correct my statement that 4U1ITU is operated by amateurs on the United Nations staff. He says that it emphatically is not the case. The International Radio Club which runs 4U1ITU is open to all licensed amateurs and swls. Anyone holding a valid licence can operate the station according to the class of their national licence without formalities; that is, no reciprocal licence is required. Visitors to IARC pay a small charge to cover maintenance. In my copy I was confusing 4U1UN, the United Nations station in New York City. Geoff has sent me a copy of the club rules, so anyone who needs further information, please write to G8VR enclosing an sae.

James O'Hara, EI8EV, says that it was he who worked GM4IPK (see 4-2-70 for February) and not EI8BV. James says that he is the only licensed operator in UO square. He also QSLs all stations who need a card from that location.

South West Aerial Systems is another company to offer antennas for the 50MHz band. They have a two-element array with a claimed gain of 4.7dB and a front-to-back ratio of 9dB, offered at an attractive price. Models for both 50Ω and 75Ω feed are available. The longest element is 9ft 7in, and the boom length only 4ft 9in. For details of this and several other antennas offered by the company, write to them at 10 Old Boundary Road, Shaftesbury, Dorset, or telephone 0747 4370.

G4DZU has drawn attention to an excellent monthly publication *The Lunar Letter Magazine*, of American origin. Although ostensibly for eme enthusiasts, the magazine contains much of general interest to weak-signal vhf operators, and includes considerable practical information, especially in the fields of antenna and preamplifier design. Anyone wishing to receive copies of this publication can obtain further information from Doug Parker, G4DZU, QTHR, who is the UK distributor.

G3UUT, well known for his work on 70 and 50MHz, is at present in Holland where he signs G3UUT/PA/A. He is frequently to be found on 3,718kHz talking to the Six Metre Group. □

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with obtaining waveguide for the band, since suitable rectangular brass tubing (0.25 by 0.125in) is readily available in model shops. Homemade 'flanges' for this tubing could be made from modified bnc/tnc connectors.

Signal sources for the band were discussed next. One alternative to the use of a 47GHz Gunn oscillator could be to use the second harmonic of a 24GHz Gunn oscillator, retuned to 23.5GHz. Filters might be necessary to reject the fundamental signal, and various types were described. Finally, propagation was discussed. It appeared that operation during frosty weather might help to avoid the extra losses due to humidity, which might otherwise be a serious problem on long paths.

The final lecture, "Microwave eme from the backyard" was given by Charlie Suckling, G3WDG. The major problem with moonbounce operation from the average garden seemed to be the large size of antenna required. With the use of the smallest practicable antenna in mind, 1.3GHz was shown to be the optimum band for eme operation, after considering link budgets and performance of available equipment for a number of bands. On 1.3GHz, echoes can be heard using only 100W rf to a 12.5ft dish (or 400W to a 9ft dish). Contacts have been made by stations using dishes as small as 2m diameter.

Constructing dishes for eme use was discussed next. The importance of accurate construction was emphasized, since with a small dish every last decibel of gain must be extracted! Even a small dish, eg 10-12ft diameter, could prove difficult in some neighbourhoods, and one way of reducing this problem was to hinge the dish mount so that the dish lies on the ground when not in use.



Norfolk VHF/UHF Contest Group receiving the Surrey Trophy for VHF Field Day 1982, Open Section. L to r: G8GTZ, G8NGD, G3ZIG, G8VLL, President, and G4LOJ

Round-up

During the convention the 6 Metre Group took advantage of the gathering of vhf enthusiasts to hold its annual general meeting, at which the following officers for the year ahead were elected: G5KW, chairman; G4JCC, secretary; and G4ILL, treasurer.

At the social evening, 69 attended, a slightly smaller gathering than last year, but an evening of rag-chewing, interspersed with food and drink made it a festive occasion. The opportunity was taken to present the various vhf-related awards gained during the year, some of which are recorded in the accompanying photographs.

Altogether a very successful event, and thanks are due to numerous people for their hard work to ensure this success. Mention must be made of Geoff Stone, G3FZL, who was the convention organizer; Norman Miller, G3MVB, who was responsible for the exhibition and trade side of the convention; with special thanks to G3TDR and G4NNS for their work in providing talk-in and other facilities, and to the members of the VHF Committee who carried some 150 tables into the hall on a wet Friday prior to the convention and set them up for the trade exhibitors—not to mention carrying them out again after the show! There were in fact many who assisted in various ways, so if any have been neglected in this report, please accept the authors' apologies.

We hope to see you all again next year. The VHF Committee is already making provisional bookings for the same venue for sometime next March. If there was anything you found lacking, now is the time to write in and say so and perhaps it can be rectified for next year. But all in all, it seems to have been a very good day out and enjoyed by all. □

Contests and competitions

From comments received recently, it seems that a few more listeners are becoming interested in the contests organized by the RSGB and several affiliated societies. The rules of the Cray Valley Radio Society's 13th SWL Contest will appear in "Contest News" next month. Last month's issue included the results of the White Rose Radio Society's 3rd LF Band Contest which attracted 38 entries, including 12 from G-land. Last year's CVRS event attracted 39 entries. The Society's Town & County Contest also attracted more entries than usual, and from comments received it is apparent that several are keen to enter RSGB vhf contests in future. To encourage even greater participation, the following vhf contests will have listener sections: 2/3 July, VHF NFD; 31 July, 432MHz Low Power; 14 August, 70MHz Trophy; 3/4 September, 144MHz Trophy (coincides with European event); and 10/11 September, CVRS SWL Contest.

Set listening periods, although not exactly contests, have also proved successful over the past few years, with both Dave Whitaker, BRS25429, and Paul Crankshaw, BRS48909, organizing events. In view of the declining conditions on 28MHz, I have decided to run a series of slps on the band during August and September. The rules are quite simple: one point per station logged multiplied by the number of different DXCC countries heard. The slps will be held as follows (all times GMT):

Saturday 13 August 0600-0900 Sunday 11 September 1500-1800
 Sunday 21 August 0900-1200 Saturday 17 September 1800-2100
 Saturday 3 September 1200-1500

Separate logs for each slp should be sent to the address shown at the foot of this page to arrive no later than Monday 3 October.

For those who entered the 1f challenge back in January, I can now reveal that there will be a similar event (this time on all bands) on ssb at the end of October to coincide with CQWW, and a further challenge on cw to coincide with the cw leg of CQWW at the end of November. Rules will be published in due course.

Plenty here for every listener who enjoys contests or competitions. Hopefully, entries to all the events listed will show that there is a resurgence of listeners who are keen on such events, which will prompt the organizers to continue to include listener sections in their activities.

DX review

Not too much on offer under this heading, which reflects the generally poor state of the hf bands during May. Harold Moss, BRS18529, managed to locate some interesting happenings at the top end of 3-7MHz, with VK6HD and VK6LK consistently audible at around 2250. 7P8CM logged at 2303 on 3,794kHz was a new country for Harold. On 14MHz the best catches were an OA and TL8 in QSO with each other.

Peter Lincoln, BRS42979, lost a week of listening when the roof above his equipment started to leak badly. The equipment was hastily moved to another part of the shack and after some work with a hair dryer everything was ok! He has received the RTTY Quarter Century Award from BARTG, and at the time of writing had 32 countries confirmed on rtty from 106 heard.

Andy Smith, BRS50134, thought the month had not been too disastrous, as he picked up five new countries in the shape of F6FDK/CE0Z, TZ6FIC, ZD9BX, 1S1CK (when QSLing, dollar bills only with no mention of call sign on the envelope), and FO8JE. Also logged were 5W1EJ on 21MHz, ZK1CG, 5W1DZ, 7P8CR and 9V1VP on 14MHz, while 7MHz produced HZ1AB and PY1EFM/PY0T.

Paul Crankshaw, BRS48909, also seemed to have found some dx. The 21MHz band provided H44SA, JT1AN, KB7IJ/KH2, P29NSF, S79WHW, T30DB and OA4ML/8 (engaged in oil exploration in the Amazonian jungle), and on 7MHz A22BW, HH2BM and ZD9BD were heard.

Robert Small, BRS8841, found conditions during May rather mixed. Good one day, poor the next. He also mentioned 21MHz as providing some interesting signals—A81LC (Liberia), JT1KAA, J6LMT, C21RK and BY8AA being the best. On 14MHz there were plenty of stations using special World Telecommunications Year prefixes—4U8ITU and PF2WCY (via PA0ATG) being just two. Also heard were KD4VC/HH2

ALL-TIME COUNTRIES LIST

(Entry score 750)

Station	28	21	14	7	35	18	Total	Mode
BRS25429	277	308	331	246	225	71	1459	ssb
BRS32525	268	303	318	246	249	60	1444	ssb
BRS25901	256	291	325	201	227	31	1331	ssb
BRS8841	252	280	311	205	186	40	1274	ssb/cw
BRS48909	210	240	252	160	122	43	1027	ssb
BRS1066	189	202	261	163	104	61	980	ssb/cw
BRS44703	191	211	216	152	145	48	963	ssb
BRS47745	178	201	213	146	123	42	903	ssb/cw
GW4RGA(ex BRS30694)	182	242	244	114	75	33	890	ssb/cw
BRS18529	130	188	232	142	108	40	860	ssb
BRS31440	173	183	215	112	96	31	810	ssb
BRS50134	149	182	216	110	119	32	808	ssb
ORS45992/7Q7	196	234	238	75	32	0	775	ssb
ORS46084/7Q7	182	224	229	97	41	1	774	ssb
BRS44395	139	194	216	107	62	45	763	cw

1983 UHF/VHF SQUARES/COUNTRIES TABLE

Station	QTH	loc	70MHz Squares	144MHz Squares	432MHz Squares	Total	Via
BRS25429	ZN	0	0	77	10	87	Tropo
BRS32525	AL	0	0	29	7	46	Tropo
BRS62088	AL	0	0	9	3	12	Tropo

1983 HF COUNTRIES TABLE

(Starting score 150)

Station	28	21	14	7	3-5	1-8	Total	Mode
BRS8841	126	167	185	127	118	31	754	ssb/cw
BRS48909	119	168	176	107	96	29	695	ssb
BRS50134	88	128	137	95	97	26	571	ssb
BRS25429	66	129	133	105	113	25	571	ssb
BRS44395	78	122	131	85	57	29	502	cw
BRS44703	100	84	75	68	106	34	467	ssb
BRS1066	69	82	99	99	67	36	452	cw
RS49327	69	107	139	64	43	12	434	ssb
BRS25901	73	84	101	52	67	10	387	ssb
BRS46084/7Q7	82	116	124	42	18	0	382	ssb
BRS48975	48	90	131	50	21	5	345	ssb
RS53844	24	56	79	51	51	9	270	ssb
BRS42979	43	48	69	37	52	20	269	ssb/rtty/ssst
ORS45992/7Q7	25	77	112	8	0	0	222	ssb
BRS18529	14	17	38	46	87	17	219	ssb
BRS25429	0	0	0	82	104	28	214	ssb
G6TEP (ex BRS35509)	39	35	34	36	59	2	205	ssb
EL835	21	46	89	22	23	3	204	ssb
BRS62088	11	19	45	42	48	8	173	ssb

and G4FAM/J6L (QSL via home call), plus many SP stations who are now back on the bands in large numbers.

From my QTH, activity on the hf bands was extremely sparse during May, but my xyl was delighted to receive QSL cards from PY0SA, PY0ZSE (3-7MHz), JX1CY (3-7MHz), VP8MT, 9H3AM, 9K2BE and TT8/DL9ZAX.

The tables

Following the early publication of the all-time table in May and the fact that so many listeners sent their scores in at the correct time (ie for June publication) an up-to-date table is published this month.

As we enter the second half of the year it might be worth repeating, for the benefit of newer members of the Society, the rules governing entry to the countries table. It reflects the number of countries in the ARRL Countries List (obtainable from RSGB HQ) heard on each of the six bands (not 10, 18 or 24MHz) between 1 January and 31 December 1983. Each new country should be noted and details as shown in the table sent to me by the first deadline date quoted each month. Remember, entries from G6s will also be accepted. So check through your logs and drop me a line.

VHF corner

With so much wet weather and with "low" after "low" sweeping across the UK, we have no exotic reports of dx this month. However, in the hope of a good dx season, I have commenced a QTH squares and countries table this month covering the main uhf/vhf bands. Please submit your scores on a regular basis. QSL cards are not required.

Several listeners monitored the 144MHz European contest on 7/8 May and the RSGB Low Power event on 8 May. Martin Parry, BRS2543, (YN square) mentioned French stations in AK and ZJ squares, and an ON in BK square, even though GB3VHF at Wrotham was inaudible.

Joan, my xyl, BRS62088 (AL square) also listened that weekend and copied TO2YT(BK), F6KAW/P(ZJ) and F1CDX/P(BJ); the om caught F6EKG/P(CH) and DF0OK/P(DK).

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Andy Smith, BR550134, (YJ square) summed up 144MHz conditions: "My report can be dismissed in a few words". His best dx was a French station in ZG square, and the FX0THF beacon from AI square which was audible for all of five seconds!

Dave Whitaker, BR55429, reported a string of new QTH confirmations: Y21DK (FK25j), DK0AD (EJ14h), DD7OC (EM70a), Y23OO (GM38e), OE2CAL (GH16j), DC5AL (FL12c) and F1EHQ (BF01c). He now has 95 QTH squares confirmed and hopes to claim the 100/20 QTH squares award from the Society before too long. Other 144MHz QSLs mentioned include DF1CF (FH23j), OZ3ZW (FO18e), GM3XOQ/A (ZT04d) and LA1EKO (BQ37g).

It is nice to report an swl with equipment for 70MHz. Martin Parry has added a converter for the band from kit form, and has constructed a homebrew ZL-Special. With 70MHz not allocated to most of Europe, he is anxiously waiting for an Es opening to the south to pull in ZB2BL in XW square.

Newcomers

Geoffrey Burton, BR554133, uses an FRG7 and a long wire, and is new to the wide sphere of swling. He is hoping to learn quickly, but has no thoughts of tackling the RAE for a few years.

Martin Parry, BR552543, entered the lower frequency challenge and wrote again to update his countries table and give some more information about himself. He uses a Trio JR500S with an assortment of antennas, and has capabilities for 144 and 432MHz—a homemade converter, BF981

preamp and 12 element ZL for 144MHz, and a converter and 18-element Parabeam for 432MHz. His QTH is only 8m asl in YN15c, so vhf listening outside of the big events is sometimes difficult, but he can copy most of near Europe. On 432MHz his best dx so far has been G3TDG (AL51g), who has a very fine set-up on that band.

David Strange, BR584323, held the call G3NYA from 1959 to 1977 and has recently rejoined the Society as a listener member. David thought it would be worth passing on some helpful information concerning the American cw bands on 3.5 and 7MHz. In the USA, the cw bands clash with the ssb portion of the band in Europe. Technician and Novice class operators over there are not permitted in the European cw bands and can often be heard in QSO higher up the band using cw. David explains that these operators are surprised, yet delighted, when they receive an swl report on their signals in Europe, and he considers that more listeners ought to concentrate on sending reports in such circumstances.

Andy Bartram, BR553959, wrote from Diss in Norfolk. He has been keen on the hobby for two years and has an AR88 and long wire. He is studying for the RAE and acknowledges the help given by G4PFG. On the dx bands, Andy considers his best catches to date have been 8Q7AZ and YB2BJM on 21MHz.

Finale

News, comments, table scores (including the all-time table and entries for the vhf QTH table) for September should reach your scribe no later than Monday 11 July. □

Two of our yesteryears

by D. A. WHITAKER, BR55429*

ASSUMING that we are now about four years past the sunspot maximum, it might interest dxers to know what the dx bands were producing 10 and 20 years ago this month. From records kept by the author, the following resumé of happenings has been prepared.

July 1963

There were two major expeditions during this month. The Hammarlund Group signed F9RY/FC on ssb and F9UC/FC on cw and made over 8,000 QSOs; they were QRV from 2 to 18 July. The second major expedition was made by that remarkable man Gus Browning, W4BPD, who continued his marathon travels into the Kingdom of Bhutan. There he signed AC5A from 16 July and was QRV mainly on 14MHz ssb and cw. UK stations known to have worked Gus were G6XL, G2DC and GW3AHN.

There were smaller expeditions in the first week of July, one by HK3LX, who signed HK9LX in Rio Amazonas, and another by PX1IK in Andorra. PY1BCR/0 (Trindade Is) was reported with drifting chirpy cw on 14MHz, and there was some confusion about the signals coming out of Christmas Island. Bill, VK3AHO, went to Nauru Is and signed VK9BH and made over 3,000 QSOs; his signals were well received in the UK, and G13CDF and G6XL were known to have worked him. ZM7AD was activated by Gerry, ZL2BCH, throughout July, but his signals were weak into G.

Some interesting individual callsigns were heard during the month. CR8AC in Portuguese Timor was noted on 7 and 14MHz cw. AP5DC was QRV on 14MHz ssb from East Pakistan, W6FAY/KP6 was mainly on 14MHz cw, VS9MB (Maldives Islands) was on 14MHz ssb and cw, ZL1ABZ (Kermadec Is) on 14MHz ssb, and ZS2MI, Marion Is, on 14MHz cw. CR5AA, Portuguese Guinea, was operated by W9JIF on 14MHz ssb, while VK4JQ was reported very QRV from Willis Is. Of the countries and prefixes which are not QRV any longer, it was interesting to see YA and XW8 very active, also ZD6OL. There was activity from China in 1963 by way of BY1PK and BY9SX, who were both reported on 14MHz cw.

Modes of operation were mainly cw and ssb in 1963, but a.m. was still used, and stations known QRV using a.m. on 21MHz were CR5SP (Sao Thomé), MP4QDA (Qatar), TL8AC and VP3EFG. On 14MHz a.m., AP2MI, FG7XP, OD5BH and PY7AKW (Fernando de Noronha) were known to be active.

The lower frequency bands did not get much of a mention 20 years ago, but on 7MHz cw the following were to be heard: FB8XX, UM8KAA, VP8GQ (S. Orkney), 9Q5TJ, FP8CB and 5N2ACB. On 3.5MHz VK2AVA

reported the VK-EU path open from 2045 to 2130 on 3,680-3,685MHz ssb, while on 1.8MHz VS1LP was making plans for the winter dx season, and VE3BGV/SU was hoping to be QRV too.

Having sent hundreds of dxers off to the darkest corners of their shacks to find logs going back that far, we now move on 10 years.

July 1973

This month did not produce any major expeditions, but nevertheless many interesting stations were heard. Pradham, A51PN, was active on 14MHz, especially in the "SEANET"; GW3AHN and G3ZAY are known to have worked him. Nauru Is was activated by Tack, JE1CKA/C21, and also JA1OCA/C21 on 14MHz ssb, and Yvon came on from St Martin signing VP2WV/FS7. Gene was very QRV from Kure Is on 14MHz ssb/cw signing K5LTH/KH6, and many Gs worked him. Three W6s activated Tongareva using the call ZK1TA from 4 to 21 July, and considering that they only had wire antennas many G stations worked them on 14MHz ssb/cw. VR1AC (British Phoenix Is) became fairly active on 14MHz and occasionally signed KB6CU to give dxers two countries for the price of one.

Other rare stations known to have been QRV in July 1973 were Jacques, XU1AA, who worked G3ZAY and G3YSV on 14MHz ssb; 8Q6AC, ex 4S7YL; PY7ZAH/0 and PY0AH on Fernando de Noronha; Kadre, TA1MB, QRV on 14MHz cw; Dave, XV5AC, also QRV on 14MHz cw; Kevin, VK9ZC, on Willis Is; and Geoff, 4W1BG, who worked G3YSV on both 14 and 21MHz ssb. Several YA stations were on the bands that year—what a pity we don't see them any more.

As one would expect, most of the rare dx was to be found on 14MHz and occasionally on 21MHz. The 28MHz band was poor throughout the month, but the lower frequency bands were holding up well. On 7MHz, cw produced KX6EB at 2050, and VU2OA at 0425, while the ssb mode gave us HR1RF, PJ2CW and 9G1HE at 2140. The 3.5MHz band produced CX2AX at 2303, ET3USF at 2135, and UJ8SAJ at 2200, all on ssb. Top band surprisingly was producing all kinds of exciting dx, mainly from South America, in the shape of LU5HF1, PY1DVG, VP8KF, ZP9AY, CP1EU and CX3BH. EP2BQ was very QRV too, and Andre, 5Z4KL, also had good signals into G.

Miscellaneous items of interest in July 1973 included a "most wanted countries" poll conducted by Geoff Watts, of *DX News-sheet* fame. Bouvet Island was given 126 votes out of the 138 who submitted lists. Clipperton Is came second with 122 votes, and South Sandwich Is third with 115 votes. The 1972 CQWW Contest (Phone) results were announced this month, and it was good to see several G stations mentioned in the top six categories. G3HCT was first in the 21MHz section, with G3WJN placed fifth. G3FXB was fourth in the 14MHz section, while GM3YCB came second in the 1.8MHz section. G3WYX was world fifth in the multi-operator single-transmitter category.

Hopefully this potted history of the dx band 20 and 10 years ago will set a few minds thinking back into the past, and they will probably consider that dx working then was not the rat-race that it is now. □

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The Month on The Air

by John Allaway, G3FKM*

ACTIVITY allegedly from the United Arab Emirates is quite often mentioned in this column, and recently it was announced that some A6 QSL cards are being accepted for DXCC credit. Unfortunately it seems that amateur radio in the UAE is not allowed, and G3LEW (presently in Dubai) reports via G2CKM that in spite of careful and correct applications for licences he and others have been told very firmly, after strict questioning by the authorities, that under no circumstances will a licence be issued, that no radio club may be formed, and that in fact it is forbidden to listen to amateur transmissions. Two A6 nationals have also recently been refused licences. The amateur radio service needs the support and understanding of the Arab nations, and it seems to me to be very unwise to encourage illegal activity from any of them at present.

Dave, G4OER, reports that his call is being used on 14MHz ssb by an operator calling himself John. The real Dave operates mainly on cw on 14, 21 and 28MHz. Another case of piracy is happening on 3.5, 7 and 14MHz cw where G4PLA's call is being used by "Len" who appears to be in north London. Mike, G4PLA, suggests that it might be a good idea to ask those who work pirates to try to persuade them to obtain a licence!

Anyone visiting the Brest area on 24 July might like to visit the Assemblée Internationale being organized by the Club Radio Amateur Brestois on that day. Events begin at 1000 and there is a lunch at 1230 (price F80). Those interested should contact FIGXB, Rene Floch, Le Four Neuf, 29239 Gouesnou, France (Tel: 98 07 83 07). The meeting is at Perros Guirec (Cotes du Nord).

DX news

Dan, GW3HCL, QTHR, still has all logs for his overseas activities since 1946, and is able to help out with confirmations for LI2CL, MD1D, VRIAA, VRIAA/3, ZC1CL, 9M2LO and 9M6CL contacts.

According to *DX News Sheet*, novice licensees in Botswana now use the A24 prefix and are required to have made at least 100 cw contacts before receiving a higher grade licence. A22BW is said to be active daily near 14,140kHz at 1700, 7,070kHz from 2100, and 3,645kHz from 2200. TT8AD is often on cw in the 050-075kHz segments of 14, 21 and 28MHz at odd times between 1000 and 2000. From Kenya 5Z4CM is reported by the *Long Island DX Bulletin* to be on the air almost daily on 21,350kHz at 2200, and on 7,004 or 7,012kHz at 0400 on Tuesdays and Thursdays. She is willing to QSY to 3.5MHz on request. ZD9BX is said to be around 21,310kHz quite often at 1900.

Four special call signs were expected to be heard from Colombia during the IARU Region 2 conference in Cali last month. These were 5J5LR, 5K5LR, 5K5IARU and 5K5UIR. Colombian amateurs will be using other unusual prefixes this year to celebrate the LRCA 50th Anniversary. These will include several in the 5J and 5K series. 4T5N was the call sign of a special expedition station which operated from the "lines" of Nazca, Peru.

EK9E/M and EK9D/M are the call signs of an overland expedition in the USSR which is travelling from Murmansk to Kamchatka. They have been reported on 14,120kHz between 1000 and 1430. Those who worked W6LAS/SVA at the end of April will be pleased to know that Gus was in fact at the Simon-Peter Monastery at Mt Athos using a TS430S and 14MHz dipole. QSLs should go via the W6 bureau only. HW83 was the call sign used by F3BZ, F3CO, F5MO, F6ADV and F6BFI during June from Annonay in France to celebrate the bicentennial of the first hot-air balloon flight on 4 June 1783.

LASNM has returned to Svalbard and will be JW5NM now until 1985. He is QSL manager for JW5J, JW7FD, JW8KT, JW5SB, JW0A, JX7FD, EA6ET, HSIAMB, HSIUX, S2BTF, 9V1VV, HM1TR, HM9A and OX3SG.

A long-term project to establish amateur radio in Albania is under way under the guidance of UNESCO and SRAL with OH5NW and OH2BH. Two Albanians are visiting Finland for basic training, and it is hoped to present them with some amateur radio equipment for an educational institution. A Finnish group will return to ZA to complete the training, and in due course there may be some permanent activity from Albania.

S2BTF has been reported active again and taking part in SEANET on 14,330kHz from about 1200. He will probably leave in the middle of this month. However, VE3JKD will be at the Canadian Embassy in Dacca for two years and will be trying to get a licence. BY7AA has been worked in the UK on 21MHz cw in the morning—the main activity by BY1PK and BY8AA apparently being on the low end of the 14MHz cw band after 0100.

According to *DX News Sheet* 457PVR owns a guest-house, and visiting amateurs are welcome. He can help with licensing and other information, and anyone interested is invited to write to P. Perera, "Spangles", 84 Templars Rd, Mt Lavinia, Sri Lanka.

The DXAC is recommending that Peter I Island (in the Bellinghousen Sea) be counted for DXCC purposes. Landing would not be easy, but it is believed that at least one group is awaiting a favourable decision. The prefix KP5 has been allocated to Desecheo Is.

YI1BGD is now to be found in the 14,205-14,215kHz area several days a week from 0500 and after 1730.

ZL1AMO still has logs and cards for his VR6H1, ZK1MB, ZK2EA, A35EA, 5W1CW, H44RW, VK4ANS/LH, YJ8RM, 3D2RW, ZK1CQ and ZL1AMX/C operations. C21RK should be looked for on 14,240kHz or on 21MHz ssb between 1100 and 1400. C21BD is on every weekend near 14,220kHz from 1130, and on Tuesdays and Thursdays on the Open House Net on 14,332kHz after 1030. The only station active from Niue at the time of writing was ZK2RS, who is often to be found on 14MHz ssb around 0800. VK9NC (who is VK6VZ) will be on Norfolk Is a little longer and is operating from the station of VK9NW. He seems to like the area around 14,012kHz from 0600 to 1000. From the Solomon Is H44CF is said to be looking particularly for UK stations daily at 1100 on 21,300kHz.

Another dx station looking for UK contacts is 7P8CT (G3ABK) who is on the air on Saturdays and Sundays at 1500 on 21,160kHz.

Overseas news

Mike Townley, who was first issued with his ZC4MT call in 1961, returned to England last month and is now G4JJK from his home in Berkhamsted. He hopes to have the opportunity of meeting many of the friends he made over the air from Cyprus, and mentions that he still has his ZC4MT logs for the period 1977-1983 and a supply of QSLs, so anyone still requiring one might apply to him at the address in "QTH Corner". Mike operated briefly as VP8APB last year, and was expecting to do so again during June.

Dave Jelley, A4XIJ, secretary of the Royal Omani ARS, has pointed out that the comment in May *MOTA* concerning a change of the Oman prefix to A44 is not correct and that ROARS is not aware of any imminent change from A4X. He would also welcome information on QSOs made with A4XFF (please send details via G3FKM).

Expeditions

Stephen Lowe, G4JVG/SM0, reports that OH0NA, OH0NC, OH0RJ, PA0GAM, and he will be going to Market Reef (OJ0) from 22 July to 1 August. Callsigns will most likely be OJ0MA, G4JVG/OH0/OJ0 and PA0GAM/OH0/OJ0, as although both G4JVG and PA0GAM have applied for OJ0 callsigns it seems unlikely that these will be issued. OH0NC/OJ0 and OH0RJ/OJ0 may also be used. Activity will be on all bands 1.8 to 144MHz cw and ssb—1.8MHz frequencies in Finland are 1,820-1,845 and 1,915-1,955kHz. Equipment will include a Drake TR7, Yaesu FT902DM, and appropriate linears with TH3, and 402BA beams and dipoles for 3.5 and 1.8MHz. QSLs should be sent to the addresses in "QTH Corner", but direct QSLs (with return postage) for QSOs with G4JVG for this operation only may be sent to S. Lowe, Styrmansgatan 9 Tr 1, S-114 54 Stockholm, Sweden.

The HADRABS Contest Group will be visiting Andorra again this year and although primarily a vhf expedition they will be on all bands 3.5 to 28MHz using the callsign C31YR/P. Activity will start at 1800 on 16 July and finish at 1100 on 24 July. Hours of operation will be 0400 to 2300. All QSLs should be sent to the address in "QTH Corner".

Advance notice was given by K3ZO (formerly HS1ABD and now living in Colombia) during the Visalia convention that LCRA will be mounting an expedition to Malpelo Is during October to celebrate the society's 50th

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anniversary. It will last for five days and cover 1.8 to 30MHz (as well as 144MHz and Oscar). All operators will be Colombians, and will probably include HK1QQ, HK3RQ, HK3BAU, HK3TF and HK0BKX. It is hoped to set up four stations, two of which will be air-lifted to the top of the island if this proves to be possible.

NJDXA was due to be active from French St Martin as FG0DDV/FS starting from 23 June for two weeks. All bands 1.8 to 28MHz were to be operated on both phone and cw (including 10MHz). QSLs go to the address in "QTH Corner".

Honor Roll

March QST listed those who have been credited with at least 306 countries confirmed out of the present list of 315. The second number given is the total of all-time countries confirmed, many of which no longer exist.

Mixed modes: 315-G3FXB (358), GW3AHN (360); 314-G2FSP (351), G3AAE (359), G3FKM (357); 313-G3HCT (350), G4CP (360), G13IVJ (353), GM3ITN (347); 312-G2FYT (348), G3JAG (333), G3LQP (330), G5VT (357); 311-G3JEC (334); 310-G3IOR (345), G13OQR (339); 308-G2BOZ (351), G3HTA (330), G5RP (335); and 306-G3KDB (322), G3MCS (322) G3RUX (322).

Phone: 314-G3FKM (353); 312-G5VT (357), G13IVJ (350); 311-G3JEC (334), G3NLY (335), G3UML (335); 310-G3TJW (327), G5AFA (328); and 308-G3ZBA (325).

Top band

Interest in the "firsts" claims seems to be escalating! New claims are as follows:

EA8QO-G6HD (26.2.79)	UA3CU-G6HD (1.5.50)	W3EIS-G3CFV (14.10.65)
F8WQ-G6HD (12.1.35)	UK2RDX-G6HD (26.1.80)	W4BGO-G3CFV (27.3.66)
HB9T-G6HD (25.9.54)	UQ2PM-G6HD (25.1.80)	W8HGW-G3CFV (15.3.66)
HB0NL-G6HD (23.20.76)	VE1ZZ-G3CFV (30.1.65)	K9YWO-G3CFV (11.12.66)
IS0LYN-G6HD (17.1.77)	VE2UQ-G3CFV (24.10.65)	YU3EY-G6HD (29.1.77)
OH3NY-G6HD (25.11.51)	VE3BWY-G3CFV (11.12.66)	ZB2AM-G3CFV (3.10.65)
OK1AA-G6HD (25.5.46)	W1BB-G3CFV (2.1.65)	
OZ1W-G6HD (30.11.47)	W2IU-G3CFV (26.9.65)	

VP8ANT is working into the UK regularly—GM3WTA reporting QSOs at 0150 and 2320. FG7AM has been worked on 1,824kHz around 0500, and HZ1AB is on every Thursday and Friday at 0200, transmitting on 1,827kHz and listening at the low end of the band (now 1,810kHz in Region 1).

1983 28MHz countries table

Scores (to 26 May) were as follows:

G3VOF—154	G3KDB—85 (cw)	G4EHQ—34
G3XQU—131	G4OBK—60	G3JFF—23
G3KHZ—129 (cw 122)	G4MUW—58	G3XBM—18
G3GIQ—128	G4PKP—49	G3KSH—16
G3XBY—101		

Contests

The results of the 1982 CQ WW WPX Contest (CW section) have appeared in CQ UK scores were as follows:

Single-operator					
Callsign	Band	Points	Callsign	Band	Points
G82FXB	All	1,487,990	G3UKS	28MHz	97,601
G5CFJ	All	427,950	G3RRS	28MHz	80,192
G3ESF	All	311,372	G4CNY	14MHz	757,620
G2AJB	All	75,842	G3SXW	7MHz	303,252
G4MVA	All	61,864	G3TXF	7MHz	193,292
G6NK	All	8,084	G3XWZ	1.8MHz	72

In the QRP Section G5CMX scored 1,196 points in the all-band category, and on 28MHz G3VMY scored 2,006.

YO DX Contest

2000 6 August to 1600 7 August

3.5 to 28MHz, cw and ssb according to IARU Region 1 band plans. Single-operator single- and multi-band, and multi-operator multi-band categories. Exchanges consist of RS/T and ITU zone (UK is 27). YO stations will also send two letters indicating their "country"—a maximum of 41. These are (in YO2) AR, CS, HD, TM; (YO3) BU; (YO4) BR, CT, GL, TL, VN; (YO5) AB, BH, BN, CJ, MM, SJ, SM; (YO6) BV, CV, HR, MS, SB; (YO7) AG, DJ, GJ, MH, OT, VL; (YO8) BC, BT, IS, NT, SV, VS; and (YO9) BZ, CL, DB, GR, IL, PH, TR. QSOs with Romania count eight points, with other stations in own continent two points, and those outside own continent four points. The multiplier is the sum of YO counties and ITU zones worked on each band added together. QSOs with own country do not count. Submit separate logs for each band indicating band, date, time, report sent and received, if multiplier, and points claimed. Indicate own zone at beginning of each page. Enclose summary sheet and signed declaration that licence and contest rules have been observed. Post before 7 September to Romanian Amateur Radio Federation, PO Box 05-50, R-76100 Bucharest,



Mike Townley, ZC4MT, now in England as G4JJK, operating from Berkhamsted, Herts

Romania. Stations making 50 or more contacts (including at least 20 with YO) will be sent an attractive award.

1983 IARU Radiosport Championship

0000 9 July to 2400 10 July

1.8 to 144MHz, cw only, phone only, or mixed-modes. Single- or multi-operator (the latter may use mixed-mode single-transmitter only). Each station may be worked once only on each band. Single-operator entrants may operate for 36h only, off periods being at least 30min long and clearly indicated in the log. Multi-operator stations must remain on a band for at least 10min at a time. Exchange RS/T and ITU zone. QSOs with own zone count one point, with those in same continent in other zones three points, and others five. The multiplier is the sum of different zones worked on each band. Certificates will be sent to top scorers in each ARRL section, ITU zone and DXCC country. Achievement awards are available to those making 250 or 1,000 QSOs or working 50 zones (single-operators only). Official log and summary sheets are available from ARRL, and forms CD-77, CD-175 and an ITU zone list are also available. Please send a large self-addressed envelope and sufficient return postage. Entries must be posted before 30 July to IARU HQ, Box AAA, Newington, Ct, 06111, USA.

Colombian Contest

1800 16 July to 1800 17 July

1.8 to 28MHz. CW and phone. Exchange RS/T and serial number—HKs will send RS/T plus "173"—denoting the 173rd year of Colombia's independence. QSOs with HK count 10 points, with others three, with own country one. Multiplier is number of DXCC countries worked on each band. Final score is total QSO points multiplied by the sum of different countries worked on each band. Use separate logs for each band and include summary sheet with scoring details and declaration. Post by 30 August to LCRA, Contest Manager, Apartado 584, Bogota, Colombia.

SEANET DX Contest

0000 16 July—2359 17 July (CW)

0000 13 August—2359 14 August (Phone)

Exchange RS/T and serial number (from 001). QSOs with the Net area (DU, HS, YB, 9V, 9M2, 9M6, 9M8) count 20 points on 1.8MHz, 10 on 3.5 and 7MHz, and four on higher bands. The multiplier is three for each net country worked. Final score is total QSO points from all bands times the sum of multiplier points. Logs must reach 9M2FK, PO Box 13, Penang, Malaysia, before 31 October. Send an irc for copy of results.

Venezuelan Contest

0000 2 July—2400 3 July (Phone)

0000 30 July—2400 31 July (CW)

3.5 to 28MHz. Exchange RS/T and serial number. QSOs between stations in different countries count two points—with own country no points but multiplier credit only. Multiplier is one for each YV call area, USA call area and DXCC country on each band. Use separate log for each band and post before 15 August or 15 September respectively. European and African stations working 15 YVs and 10 different countries may apply for a certificate—please include US \$2 or equivalent with application. Post logs to RCV, PO Box 2285, Caracas 1010-A, Venezuela.

Awards

WANT—Worked All Norwegian Territories

For contacts or listener reports since 1 January 1975 with: Class 1—10 LA stations south of the Arctic Circle and three north of it, plus one each with Bear Is, Svalbard, Jan Mayen, Morokulien, Bouvet Is, Peter 1 Is and Norwegian Antarctica. Five stations with JX or 3Y calls may be substituted for the last two. Class 2 needs five LAs south and one north of the Arctic Circle, Bear Is, Svalbard, JX, LG5LG and a 3Y station. Class 3 needs three LA stations, a JW, LG5LG and JX (or any 3Y). Send certified list of QSOs plus Nkr15 or 7 irls to: University RRL, Postboks 88, N-5014 Bergen University, Norway.

QTH CORNER

C21RK
C31YR/P
CN30FIC
FB8XAB
FB8XAB
FB8XAB
FG0DDV/FS
H44CF
HC1JB
G4JVG/
OH/OJO
OJOMA
PA0GAM/
OH/OJO
PY1OL
S2BTF
VK9NC
ZC4MT
ZD8FX
4T5N
4X4 QSL
Bureau
9V1VP
9V1VP

PO Box 139, Republic of Nauru,
via G8APZ, QTHR.
BP 299, Rabat, Morocco.
(Normal operation) via F6GXB.
(Op'n by K8CW) via K8CW.
(Op'n by VK3HDF) D. Shaw, 9 Milton St, Heathmont, Vic 3155, Australia.
via W2QM, 151 Whitney Ave, Pompton Lakes, NJ, 07442, USA.
PO Box 498, Honiara, Solomon Is.
Casilla 691, Quito, Ecuador.
Via G4JVG, QTHR.

Kee Eriksson, SF-22430 Saltvik, Åland, Finland.
G. A. Menting, Oldenoort 152, 9351 KT Leek, Netherlands.

(also ZY1OL) Box 70048, 22422 Rio de Janeiro, Brazil,
via W5RU.
Box 27, Norfolk Is, Australia.
now M. Townley, G4JJK, 61 Covert Rd, Berkhamstead, Herts HP4 3SS.
via G3VBY, F. Hindley, "Cliftonville", Fotherby, Louth, Lincs LN11 0UH.
via OA9K, PO Box 538, Lima, Peru.
now c/o 4X4FU, PO Box 3500, Haifa, 31034 Israel.

Direct only.
Op'n by K5YY, 15-17/3/83 only to K5YY.

WALA—Worked All LA Award

For confirmed contacts since 1 January 1950, with one station in each of the 19 Norwegian "counties". Any mode but not crossband. The counties are as follows: A—Oslo; B—Østfold; C—Akershus; D—Hedmark; E—Oppland; F—Buskerud; Z—Vestfold; H—Telemark; I—Aust-Agder; K—Vest-Agder; L—Rogaland; R—Hordaland; S—Sogn og Fjordane; T—Møre og Romsdal; U—Sør-Trøndelag; V—Nord-Trøndelag; W—Nordland; X—Troms; Y—Finnmark. Contacts with JW or JX may be counted in place of counties W, X or Y. Send QSLs (or certified information from QSLs—including date, time, call sign, signal reports and QTH of station worked, certified by a national society awards manager) plus Nkr20 or 10 ireds to: NRRL Award Manager, LA7AJ, Eric Jahnsen, Kaupangruta 21, N-3250 Larvik, Norway.

IJsselmeer Polders Certificate

Class A (vhf), B (hf), and C (cw/rtty). Requires confirmed QSOs since 1.1.78 with any five of PAs 0LEY, PAN, RQS, CWS, PA2HBL, P14YPO, PA3s AED, AER, AHO, AVM, CER, CJJ, PD0s CDD, EBW, HFL, LSG, LTR, LKO, MIO, PE1s CWA, DOV, EDR, FEI, FNO, GEB, GFI, GKE, HBG, HRR, HTU and HUH. Send list, certified by two other licensed amateurs, plus 10 ireds to Postbox 199, 8200 AD Lelystad, Netherlands.

European Community Award

Details of this were previously given in February *MOTA*, but Mill Reiff, LX1CC, the award manager, has written to say that "old type ireds are not valid since 1975 in every post office in the world". This does not seem to apply to the UK but applicants are advised to send only the new type ired when applying for Luxembourg awards.

All Surrey Award

For certified log details of contacts with Surrey stations. Issued by the Surrey Police RS. Full details from Richard Hook, G8LVB, Secretary, Surrey Police Radio Society, c/o Operations Room, Surrey Police HQ, Mount Browne, Sandy Lane, Guildford, Surrey, in exchange for a sae.

Worked All Scottish Regions

For those who have proof of contact with one station in each of the Scottish Regions. Borders, Central, Dumfries & Galloway, Fife, Grampian, Highland or Islands, Lothian, Strathclyde and Tayside, since 1.5.1975. A QSO with GM3BSQ may be used as a substitute for one region. Send certified log extracts (showing regions) plus £1 or 10 ireds to S. Sutherland, GM4BKV, Secretary, Aberdeen ARS, 67 Greenfern Rd, Mastrick, Aberdeen.



Mark Lowry, ZL1BMU, visiting Cyprus. He has also operated as JY8ML



Mick and Lin Orchard, ZL1AXU and ZL1BJC, at home in Whakatane, New Zealand

The LX Award

For contacts with Luxembourg since 1.1.1951. European applicants need 30 points (not less than 20 per cent of which were on 3-5 or 7MHz), each contact on 3-5, 7, 14, 21 and 28MHz counts one point. Non-European applicants need 20 points, and in their case 3-5 and 7MHz QSOs count two points, others one. Any station can be worked once on each band, and if a station is worked on five bands 10 points can be claimed (15 by non-Europeans). Send detailed list of stations worked (and from whom QSLs have been received) showing date, time, band, reports exchanged, and signed as accurate by two other licensed amateurs, plus USAS2 or 10 ireds to Jules Toussaint, LX1TJ, 31 rue du Cinquantenaire, 4060 Esch-sur-Alzette, Luxembourg.

Ganta Leprosy Colony Award

The award was mentioned in May *MOTA*. Further information has been received from LRAA, and the requirements are the possession of "satisfactory evidence" of having worked all six special call signs—two of which must have been on cw. The special calls will be on the air until the end of the year.

Worked Liverpool Award

Stations in the UK require contact with 20 Liverpool stations, in Europe 15, and elsewhere 10. Listeners may also apply for the Heard Liverpool Award under the same conditions. Any bands/modes may be used, and applicants should send certified log details plus 12 ireds to: G3XSN, 7 Thurne Way, Liverpool 25.

Drenthe Award

Drenthe stations send QSLs bearing a letter, and those who collect those which make the word Drenthe have the silver award (cw contacts count as "jokers" and may be used for a missing letter). The gold award requires two contacts with each letter. On hf, for the present, only three letters are needed. The award is free—please send QSLs to the award manager, Richard de Lange, PA2RDL, Postbus 419, 9400 AK Assen, Netherlands.

Around the bands

John, GJ3EML, suggests that the period covered by loggings in this section might be more accurately dated rather than left to the reader's imagination! I have always assumed that it covers the period between a few days before the last date for the previous month's copy and the same for this month, but it might be useful to try to restrict reports to this period anyway.

A general falling off of interest, usual at this time of year, has meant a complete absence of any reports on 18 or 24MHz—or is this due to the very small number of countries workable on these bands?

Stations listed below in italics were using A1A.

1-8MHz. 0200 VP8ANT. 2100 UA9CBO. 2300 UK6LEZ, UK9FER, VP8ANT.
3-5MHz. 0300 W6. 0500 AD8J/KP2. LU7KAT, XT2AW, ZS2WV. 0600 ZL4FT.
2200 JY9CL, 5Z4DR. 2300 TR8DR.
7MHz. 0500 KH6GS, AD8J/KP2, PY, W6-W7, ZL (to 0700). ZS6BPJ. 0600 CN8AD, G4FAM/J6L, XT2AW, YS9RVE. 0700 KP4DEX/V2A. VK. 1900 5Z4DR.
2000 HZ1AB, UK1PGO. 2100 EL7M, FM7CW, PS8AM, PY7SA, ZS4PV, 4K1s A.F.QAV. 2200 JY9CL. 2300 ZD7WT, 3V8AA, 5Z4DR, 8P6KY.
10MHz. 1300 OY1R. 1500 K9DC. 2100 4Z4FR. 2200 FY7BC, VK3MR.
14MHz. 0400 HC1SK. 0500 VK9NC. 0600 FO8JP, KH6DQ, G4HZI/5N0. 0700 A92CE, AL7DN, FO8JP, HS1BD, KH6, KH0AC, VK, W6-W7, ZK1CG, 5W1DQ.
0800 KC4AAA, VS5GA, 5W1DZ. 0900 P29VH, ZL1AMO/C. 1000 C21RK, V2AO.
1200 T77J, IS1DK. 1300 VS6FG. 1400 KC6IN. 1500 JA. 1600 J28BG, KC4AAA.
1700 CN30FIC. HL1MV, HS1KO, VS5PP, 8J1WCY. 1800 VS5DD, 4S7PVR.
7X2AP. 1900 NOZ0/DU2, JY9CL. PY1EFM/PY0T, S83H, UK1PGO, IS1CK.
3V8AA, 5H3JR, 9N1MM. 2000 C53DF, Y11BGD, ZL1BJC (LP), 5H3s BH.MI.
2100 HL1EJ, TR8MYA, VK2BZA (LP), 9L1DR. 2200 A4X, FG0EQC/FS7, TR8DR.
TZ6BMA, VU2GI, 9M2HB. 2300 HH2VP, JT2AB, VP9DR.
21MHz. 0700 JA, JT1AN, TR8JL. 0800 BY8AA, ZK2JS, 3B8FG. 0900 JA, ZL7WCY, DL5DRB/3X. 1000 KB7J/KH2, TA1UA, 5Z4CI, 9N1MM. 1100 EK9DI,

KC6IN, T30DB, YK1AO. 1200 C21RK, JA, P29MF, KC7UU/5N6. 1300 H44SH, TL8CK. 1400 G4DUW/DU1, HZ1TA, KC6IN, P29GO, 3B8FK, 8J1WCY. 1500 OX5JM, ST2FF, 4K1F, 6U1WCY. 1600 DU1AU, S79WHW, VS5GA, IZ9B, 3B9CF, 9V1TL. 1700 D44BC, HH2VP, VP2MRA, VQ9CI, YB8AX, 9M2TE. 1800 LA8UX/OD5, VP8AQT, ZD9BX. 1900 A87LC/7L, VP8s ANT, AQA, YB8VL0, LA2EX/3X, 7Q7LW, 8Q7AV, 9X5WP. 2000 CY1YX, J73HA, OA8ML/8, W6. 2100 CE, CO, CP, OA, PZ, ZL1JJ. 2200 JY9RV, TI0RC, 5H3DM. 2300 K7NHV/VP2V, VP2EUQ, VU2BIC, W1-W4.

28MHz. 0700 LA, OF9SV. 1000 FB8ZP, 3B8FK. 1100 TT8AD, ZD8LM, 4S7RR, 9N1MM. 1200 D44BC, TR8JD, 5Z4DR. 1300 JY9CL, PY, 5V7WI. 1400 JY8CO, LU, ZD7WT. 1500 S83H, TR8IG, VP2EW, ZS3C, 3B8CF, 9X5MB. 1600 CE0ZAD, HH2VP, KG4DX, VP8ALD (S. Orkney), VP8ANT, ZD7s BW, CW, 6W8EX, 7Q7LW. 1700 A22BW, J73AJ, TZ6FIC, 5T5AP, 9Q5CF. 1800 FM7CT, 5H3FN. 1900 ZP5XDW. 2000 CE0ZAD. 2300 TF3YH.

Logs from which the above were extracted were received from G2HKU, G3HB, G4QK, G5JL, G3s BDQ, GIQ, GVV, HCT, GM3ITN, G3KHZ, GM3WTA, G3s XBY, YRM, G4EHQ, GW4KGR, and G4s LDS, OBK and SLR and RS44083—for which, many thanks.

Thanks also go to the editors of the following from which items have been extracted: *DXNL (DL3RK)*, the *DX Bulletin (K1IN)*, the *Long Island DX Bulletin (W2IYX)*, *DX News Sheet G3XTT/G3ZAY*, the *Ex-G Radio Club Bulletin (G13OEN/W6)*, *Long Skip (VE3EUP)*, *Lynx DX Group Bulletin (EA2JG/EA3CBQ)*, *DX'press (PA0GAM)*, and *CQ Magazine (W1WY)*.

Items for September issue must reach G3FKM no later than 19 July and for October by 2 September.

HF propagation predictions for July 1983

Using the table

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

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

GMT	28MHz				21MHz				14MHz				10MHz				7MHz				3-5MHz			
	000 024	001 060	111 246	122 802	000 024	001 060	111 246	122 802	000 024	001 060	111 246	122 802	000 024	001 060	111 246	122 802	000 024	001 060	111 246	122 802	000 024	001 060	111 246	122 802
EUROPE																								
Moscow							11	1 33	424	556	556	897	866	544	444	689	753	211	112	368	42			35
Malta							11	1 34	523	666	666	898	987	654	445	789	886	322	122	478	†13			41
Gibraltar								12	31	365	444	786	865	765	555	789	987	532	223	478	†14	2		24
Iceland									2	123	222	465	744	555	445	678	776	532	223	356	443	2		23
ASIA																								
Osaka									1 1	132	123	454		1	1 36	2				13				
Hong Kong							111	1 1 21	2 1	122	224	675	2		1 465					142				
Bangkok							122	112 32	311	112	224	686	3		1 477				1	145				2
Singapore							1 222	11	311	122	223	563	4		1 467				1	146				3
New Delhi							1 222	113 53	432	111	224	687	62		1 478				4	146				3
Teheran				11			1 333	224 652	645	211	224	688	852		1 478				63	146	4			3
Colombo							1 223	224 11	432	112	224	576	73		1 478				5	146	2			3
Bahrain				21			2 333	324 752	755	211	224	689	862		1 478				73	146	4			23
Cyprus				21			1 1 445	435 773	867	655	556	799	985	322	233	589	863	1	1 257	53				24
Aden			1 1 1				1 1 323	445 643	865	211	224	689	873		1 478				751	146	42			24
OCEANIA																								
Suva (S)									2	322	1	452	2	32	1 33				1	11				
Suva (L)						21	1	43	224	51		64	3	41	231				1	11				
Wellington (S)								1	113	321		63	113	31	1 152				1	12				
Wellington (L)						21		3	555	3		46	224	41	153				1	131				
Sydney (S)							11		213	542	111	115	1 1	31	1 344				1	141				
Sydney (L)						2		2	432	51		26	112	42	54				1	31				
Perth						1 332			533	342	11		52	1	1 34				2	143				3
Honolulu									2	222	112	411	3	32	1 2				1					
AFRICA																								
Seychelles			1 1			1 323	445 31		43	211	224	676	863		1 478				74	146	4			24
Mauritius			1 111			1 334	445 411		4 6	312	224	688	834		1 478				751	146	42			24
Nairobi			112 2			1 423	456 721		736	411	224	688	885	1	1 478				762	146	44			24
Salisbury			122 3			1 333	556 831		835	622	224	688	976	3	1 478				774	146	44			24
Capetown			121			243	455 4		642	423	65		43	31	1 376				772	1	146	44		4
Lagos			123 51			1 242	456 872		875	631	113	688	986	41	1 378				774	1	146	44		4
Ascension Is			1 32			42	235 872		52	42	113	688	872	22	368				774	1	146	44		3
Dakar			11 33			21	142 344 784		986	652	112	589	987	42	268				774	1	46	44		3
Las Palmas			11			2	143 343 674		975	776	556	799	997	643	333	579			886	311	257	113		24
S AMERICA																								
South Shetland			11 1				245 51		3		1 123	671	2 1		366				754	1	146	44		3
Falkland Is			11 21				345 65		3		2 123	687	854	21	368				774	1	136	442		3
Rio de Janeiro			11 22			2	3 344 674		874	12	122	579	885	22	258				774	1	26	442		3
Buenos Aires			12			31	1 244 674		975	3 2	123	479	887	4	148				774	1	15	442		2
Lima			1			2	122 2 4		963	442	221	137	886	42	4				674	1	1	34		
Bogota						2	1 111 244		863	332	221	126	786	42	13				574	1	1	24		
N AMERICA																								
Barbados			1			3	2 121 254		963	442	211	147	886	42	5				774	1	2	44		
Jamaica						2	111 124		852	212	111	115	686	42	3				474	1		4		
Bermuda						2	1 111 134		852	222	111	136	786	42	3				574	1	1	24		
New York						1		13	742	112	121	125	685	32	3				364	1		3		
Mexico						1		12	42	1	121	112	375	31					154	1		2		
Montreal						1		12	642	112	111	135	575	32	3				364	1		3		
Denver									432	1	111	112	355	31					34	1				
Los Angeles									322	1	12	111	145	31	1				24	1				
Vancouver									222	21	11	111	135	32	1				13	1				
Fairbanks									112	221	111	111	123	32	1				1	1				

The provisional mean sunspot number for May 1983 issued by the Sunspot Index Data Centre, Brussels, was 100.2. The maximum daily sunspot number was 132 on 13 May, and the minimum was 60 on 31 May. The predicted smoothed sunspot numbers for July, August, September, October and November are, respectively: (classical method) 77, 75, 73, 72 and 70; (SIDC adjusted values) 77, 75, 73, 72 and 70.

EPHEMERIS

Satellite news and views

by R. O. Phillips, G4IQQ*

Satellite status reports

Efforts continue to overcome the problems with UOSAT. Towards the end of May the satellite was described as being in a flat spin, a consequence of which is that half of the spacecraft is in constant sunlight whereas the other half is shielded. This produces a very large temperature difference between both sides. In addition, the attitude of the spacecraft has caused some problems in loading data into the on-board computer due to nulls in the antenna radiation pattern. RS3-RS8 continue to operate very well; however, the health of Oscar 8 appears to have deteriorated quite dramatically. The situation at the beginning of June was that the satellite was not operating to any defined schedule, and if operating could either be in mode A or mode J.

Erratum. Under this section in the June issue, the callsign on line 7 should have been G4JJ.

Phase 3

At the time of writing, the flight readiness review for the Ariane L6 launch had been completed and a launch window around 16 June had been selected. Whatever the situation, pre-launch and post-launch nets will be operated by AMSAT and AMSAT-UK. Details of times and frequencies can be obtained from the Sunday morning (1015 local) nets operated by AMSAT-UK on 3,780kHz.

Getting started—4

In spite of trying to cater for those amateurs without prior experience of satellite working in the "Getting started" series, some are still feeling neglected. In describing operation through the Oscar 8 mode J transponder, I will bear this very much in mind.

First of all, what is mode J as opposed to mode A? Quite simply the letter is used to identify the particular combination of input and output frequencies for the satellite transponder. Mode A refers to those transponders with an input frequency at around 145.8MHz and a corresponding output at around 29.5MHz. Mode J also uses input frequencies around 145.8MHz, but in this case the output frequency is around 435MHz (within the 435-438MHz frequency allocation to the amateur satellite service). The transponder frequency plan is indicated in Fig 1. As can be seen, the overall transponder bandwidth is 100kHz, but what is perhaps of more significance is that if the input frequency is increased by, say, 10kHz, the corresponding output frequency is reduced by 10kHz. One immediate effect of this is that for ssb transmission, if upper sideband is used on the satellite uplink this will appear as lower sideband on the downlink. Unlike the mode A transponders, there is only a single mode J type transponder in operation at present. This is carried on the AMSAT Oscar 8 satellite which was launched in March 1978 and has an orbital height of around 900km.

As mentioned on previous occasions, the requirements for transmitting and receiving equipment are quite modest, and many amateurs with capabilities on both 144 and 430MHz are likely to be able to start operation with little or no modification or addition. Starting with the transmitting

side, this can be identical to that used for the uplink to mode A transponders. An effective radiated power of no more than 100W is quite adequate to operate through the satellite; in fact since the use of the transponder is very much lower than the mode A transponders, it is possible to use values considerably lower than this. As before, the preferred modes of working are cw or ssb, but there is some activity on the more specialized modes such as rtty and sstv. The general considerations for antenna and transmitter (*Ephemeris* March 1983) are equally appropriate here; however, there is one additional factor to be taken into account. Since the downlink frequency is approximately three times that of the uplink, it is very important that the transmitter output should have a low level of third-harmonic product in order to avoid overloading the receive amplifier. Most transistor amplifiers have adequate performance in this respect if operated correctly; however, if problems are encountered these can usually be overcome by use of a suitable filter (eg *VHF/UHF Manual*, 4th edn, chapter 7).

For the 435MHz receiving antenna there is a conflict between, on the one hand, using high gain to increase the received signal strength while, on the other, wishing to have a broad beamwidth to minimize antenna pointing problems. Of course, if full azimuth/elevation control is available this problem is not so significant, but this is by no means essential. If you are prepared to suffer loss of access to the satellite at high elevation angles (greater than about 40°) then very satisfactory results can be achieved by using a 14- or even 18-element parabeam as commonly used for terrestrial communications. There are a number of options open for the choice of a receiver. Clearly the length of feeder between the antenna and receiver should be kept as short as possible, and coaxial cable with loss characteristics suitable for use at 435MHz should be used (RG58 is really not good enough). A low-noise preamplifier is desirable, though not essential, and will produce maximum benefit if mounted as close as possible to the antenna. The main receiver itself can either be a converter down to some other convenient frequency, or a receiver specifically designed for 435MHz. In the latter case many of the current uhf amateur transceivers cover 430-440MHz; however, if a converter is used these usually only cover 2MHz of bandwidth (usually 432-434MHz) unless provision is included to switch in a different mixer oscillator crystal to cover 434-436MHz. A further point to be considered when using a converter is that if 144MHz is used as an i.f., problems are likely to be encountered by direct breakthrough from the 145MHz transmit frequency into the tunable i.f. A less troublesome choice would be to use an i.f. of 28-30MHz in conjunction with an hf communications receiver.

Operation through the mode J transponder is basically similar to that for mode A transponders. Data concerning antenna pointing direction throughout a useful satellite pass are obtained using the methods described in *Ephemeris* May, June 1983. As mentioned above, the operating schedule for Oscar 8 is not well defined at present. However, the telemetry beacon (435.0965MHz) should be operational at all times, and it is very useful to check out the orbital predictions and the receiving system without having to worry about working out translation frequencies etc. If you have already listened to signals from satellites, either beacons or transmissions from other amateurs, you will be aware of the gradual decrease in frequency throughout the satellite pass. This effect, known as doppler shift, depends on the velocity of the satellite (relative to the receiving station) and the frequency of transmission. For the 29MHz beacons on the mode A transponders the total frequency change amounts to only about 1.37kHz, whereas for the 435MHz mode J beacon the resulting change in received frequency is more than 20kHz. The practical effect is that the beacon will initially be heard at around 435.106MHz; the frequency then falls to the nominal value as the satellite passes at its point of closest approach, then continues to fall to around 435.086MHz as the satellite falls below the horizon. If a high-gain antenna is used it will be necessary to make fairly frequent changes to its direction depending on the position of the satellite track relative to the receiving station.

When sufficient familiarity has been achieved with antenna pointing and the effects of doppler shift, it is time to attempt to access the transponder. Assuming ssb modulation is to be used, a downlink frequency of around 435.175MHz would be appropriate, requiring an uplink frequency of 145.925MHz. When the beacon can be heard, tune the transmitter to the selected frequency and the receiver to the corresponding downlink frequency, then tune up a further 6 or 7kHz to allow for doppler shift. Make a short test transmission while adjusting the receiver tuning around the expected frequency, not forgetting to set the receiver to lower sideband. If you find that your downlink signal is significantly stronger than the beacon, you should reduce your transmitter power accordingly. One of the major differences in using the mode J transponder is that, in general, it is necessary to make adjustments to the receiver and the antenna more frequently. For those who feel the mode A transponders are becoming rather like 14MHz, a spell of operation on mode J can be refreshing. □

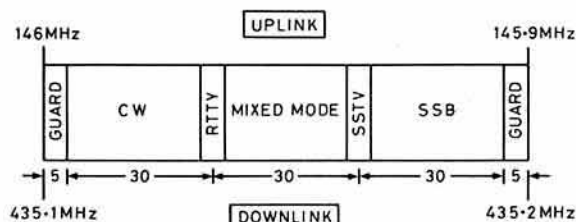


Fig 1. Transponder frequency plan

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

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

Time	Callsign	MHz	Mode	Town	Notes	Time	Callsign	MHz	Mode	Town	Notes
Sundays											
1015	G3CGD	1.875	A1A/A3E	Cheltenham, Glos		1930	G4NNS	144.625	F2A/F3E	Sunbury-on-Thames, Middx	
1100	G2FXA	1.910	A1A/A3E/J3E	Stockton-on-Tees			G4BFI			Banstead, Surrey	
1100	G4PUD	145.425	F2A	Birmingham	[1]		G4DKK			Tooting, SW London	
1100	G3BLS	145.250	F2A	Osney, Oxford	[1]	1930	G4IAV	145.275	F2A/F3E	Atherton, G Manchester	
1130	G4BFI	144.625	F2A/F3E	Banstead, Surrey		1930	G4FKH	3.550	A1A	Chelmsford, Essex	[1]
	G4DKK			Tooting, SW London		1930	GW4OXB	145.275	F2A/F3E	Swansea, West Glam	[1]
1200	G3PER	145.575	F2A/F3E	Heysham, Lancs	[1]	1930	G4SXU	145.250	F2A/F3E	Harrogate, N Yorks	[1]
1200	G3HVI	145.250	F2A/F3E	Stoke-on-Trent, Staffs	[1]	2000	G4INM	145.250	F2A/F3E	Chelmsford, Essex	[1]
		1.910				2000	G2FXA	144.250	A1A/J3E	Stockton-on-Tees	[1]
1200	G3GNS	3.550	A1A	Locking, Avon	[13]	2000	GW4KDP	145.550	F2A/F3E	Barmouth, Gwynedd	[1]
		144.250				2000	G3SWP	145.250	F2A/F3E	Doncaster, S Yorks	[1]
1830	G4GOC	145.250	F2A/F3E	Stoke-on-Trent, Staffs	[1]	2000	G4BPA	145.475	F2A/F3E	Scarborough, N Yorks	[3]
1830	G3RLO	144.525	F2A/F3E	West Bridgford, Notts	[1]	2000	G4PYR	144.550	F2A/F3E	Solihull, W Midlands	[4]
1930	GW4OXB	145.275	F2A/F3E	Swansea, West Glam	[1]	2030	G4LHI	145.250	F2A/F3E	Huntingdon, Cambs	[1]
1930	G3LDW	144.160	A1A/J3E	Halesowen	[1]	2030	G2FKO	145.525	F2A	Bideford, Devon	
2000	G4OJD	145.250	F2A/F3E	Brixham, Devon	[1]	2100	GW4LLE	145.525	F2A/F3E	Haverfordwest, Dyfed	
2005	G3OLU	145.375	F2A/F3E	Braintree, Essex	[1]	2130	GM4HYF	28.350	A1A	SE Glasgow	[1]
2030	G4NRO	144.525	F2A/F3E	Atherton, G Manchester	[1]			145.375	F2A		
2100	G4EWK	144.850	F2A	Burton-on-Trent, Staffs	[7]	Thursdays					
2100	GW4LLE	145.525	F2A/F3E	Haverfordwest, Dyfed	[1]	1100	G4IRI	3.550	A1A/J3E	Bolton, Lancs	
2130	G3ORP	144.250	A1A/J3E	Maidstone, Kent	[6]	1830	G4GOC	145.250	F2A/F3E	Stoke-on-Trent, Staffs	[1]
Mondays						1830	G4ILD			Rishton, Lancs	[1]
1100	G4IRI	3.550	A1A/J3E	Bolton, Lancs			G3ZQS	145.400	F2A/F3E	Darwen, Lancs	[1]
		1.910				1830	G3GNS	3.550	A1A	Locking, Avon	[13]
1830	G3GNS	3.550	A1A	Locking, Avon	[13]			144.250			
		144.250				1900	G3TPY	145.275	F2A/F3E	Chester, Cheshire	[1]
1900	G8QR	145.250	F2A/F3E	Norwich, Norfolk	[1]	1900	G3RLO	144.525	F2A/F3E	West Bridgford, Notts	[1]
1900	G3GC	3.562	A1A/J3E	Yeovil, Som	[1]	1900	G3BLS	145.250	F2A	Osney, Oxford	[1]
1900	G3TPY	145.275	F2A/F3E	Chester, Cheshire	[1]	1900	G3ZRZ	1.975	A1A/A3E	Blackpool, Lancs	[1]
1900	G4ILD	145.400	F2A/F3E	Rishton, Lancs	[1]	1900	G4RS	3.565	A1A/J3E	Catterick, N Yorks	[1]
1900	G3ZQS	145.400	F2A/F3E	Darwen, Lancs	[1]	1930	GW4OXB	145.275	F2A/F3E	Swansea, West Glam	[1]
1900	G3RLO	144.525	F2A/F3E	West Bridgford, Notts	[1]						
1930	G4BFI	144.625	F2A/F3E	Banstead, Surrey		1930	G4BFI	1.950	A1A/J3E	Banstead, Surrey	[15]
1930	G4DKK	144.100	A1A/J3E	Tooting, SW London			G4DKK	144.625	F2A/F3E	Tooting, SW London	
1930	G4JSQ	144.160	A1A/J3E	Newtownards, Co Down							
1930	G4LLU	144.160	A1A/J3E	Wolverhampton, W Midlands	[1]	1930	G3ASR	1.875	A1A/J3E	Harrow, Middx	[1][11][12]
1930	G4SXU	145.250	F2A/F3E	Harrogate, N Yorks	[1]			144.175	(lsb)		
1930	GW4OXB	145.275	F2A/F3E	Swansea, West Glam	[1]	2000	G2ACZ	1.819	A1A	Mablethorpe, Lincs	
2000	G2FXA	145.525	F2A/F3E	Stockton-on-Tees	[1]	2000	G3IRI	3.550	A1A/J3E	Bolton, Lancs	
2000	G4IRI	3.550	A1A/J3E	Bolton, Lancs	[1]	2000	GM4ELV	144.250	A1A	Arrochar, Strathclyde	
2000	G4JDL	145.250	F2A/F3E	Solihull, W Midlands	[2]	2000	G4OJD	145.250	F2A/F3E	Brixham, Devon	[1]
2000	G4INM	145.250	F2A/F3E	Chelmsford, Essex	[1]	2000	G4INM	145.250	F2A/F3E	Chelmsford, Essex	[1]
2030	G4ICC	3.535	A1A/J3E	New Dunston, Northants	[1]	2030	G2FKO	145.525	F2A	Bideford, Devon	
2030	G4NRO	144.525	F2A/F3E	Atherton, G Manchester	[1]	2030	G4NRO	144.525	F2A/F3E	Atherton, G Manchester	[1]
						2100	G3WOR	144.250	A1A/J3E	Lancing, Sussex	[14]
2030	G3ASR	1.875	A1A/J3E	Harrow, Middx	[1][12]	2100	G4EWK	144.850	F2A	Burton-on-Trent, Staffs	[7]
		144.175	(lsb)			2100	G3AVJ	145.250	F2A/F3E	Huyton, Merseyside	[1]
2030	G2FKO	145.525	F2A	Bideford, Devon		2200	G3GMS	3.583	A1A	Whitley Bay, T&W	[1]
2100	G3AVJ	145.250	F2A/F3E	Huyton, Merseyside	[1]			145.250	F2A/F3E		
2100	G3WOR	144.250	A1A/J3E	Lancing, Sussex	[14]	2200	GM4HYF	28.350	A1A	SE Glasgow	[1]
2200	G3GMS	3.583	A1A	Whitley Bay, T & W	[1]			145.375	F2A		
		145.250	F2A/F3E			Fridays					
Tuesdays						1100	G4IAV	145.275	F2A/F3E	Atherton, G Manchester	
1100	G4IAV	145.275	F2A/F3E	Atherton, G Manchester		1830	G4ILD			Rishton, Lancs	[1]
		1.910					G3ZQS	145.400	F2A/F3E	Darwen, Lancs	[1]
1200	G3GNS	3.550	A1A	Locking, Avon	[13]						
		144.250				1830	G3GNS	3.550	A1A	Locking, Avon	[13]
1830	G4CWN	144.100	A1A/J3E	Stoke-on-Trent, Staffs				144.250			
1900	G3RLO	144.525	F2A/F3E	West Bridgford, Notts	[1]	1900	G3TPY	145.275	F2A/F3E	Chester, Cheshire	[1]
1900	G3WQK	144.775	F2A	Eastbourne, E Sussex	[1]	1900	G3RLO	144.525	F2A/F3E	West Bridgford, Notts	[1]
1900	G4RS	3.565	A1A/J3E	Catterick, N Yorks	[1]	1930	G4RLW	145.550	F2A/F3E	Gateshead, T & W	[1][16]
		145.525	F2A/F3E			1930	GW4OXB	145.275	F2A/F3E	Swansea, West Glam	[1]
1930	G4BFI	1.950	A1A/J3E	Banstead, Surrey		1930	G4IAV	145.275	F2A/F3E	Atherton, G Manchester	
	G4DKK	144.625	F2A/F3E	Tooting, SW London		1930	G3HVI	145.250	F2A/F3E	Stoke-on-Trent, Staffs	[1]
1930	GW4OXB	145.275	F2A/F3E	Swansea, West Glam	[1]		G4BFI			Banstead, Surrey	
1930	G4IAV	145.275	F2A/F3E	Atherton, G Manchester		1930	G4DKK	144.625	F2A/F3E	Tooting, SW London	
1930	G4DAL	145.575	F2A/F3E	Lancaster, Lancs	[1]	2000	G3RR	145.550	F2A/F3E	Barnoldswick, Lancs	
2000	G3VHE	145.350	F2A	Swindon, Wilts	[1]	2000	G4INM	145.250	F2A/F3E	Chelmsford, Essex	[1]
2000	GM4ELV	144.250	A1A	Arrochar, Strathclyde		2030	G4NRO	144.525	F2A/F3E	Atherton, G Manchester	[1]
2000	G4FEX	145.250	F2A/F3E	Horsley Woodhouse, Derbyshire	[1]	2030	G3CAR/A	144.625	F2A/F3E	High Wycombe, Bucks	[1]
						2030	G2FKO	145.525	F2A	Bideford, Devon	
2000	G4INM	145.250	F2A/F3E	Chelmsford, Essex	[1]	2100	G3AVJ	145.250	F2A/F3E	Huyton, Merseyside	[1]
2000	G4OJD	145.250	F2A/F3E	Brixham, Devon	[1]	2200	G3AWL	144.110	A1A/J3E	Easington, Co Durham	[8]
2030	G4NRO	144.525	F2A/F3E	Atherton, G Manchester	[1]	Saturdays					
2030	G4PDP	144.250	A1A/J3E	Biggleswade, Beds	[1]	1200	G3GNS	3.550	A1A	Locking, Avon	[13]
2030	G3IRM	1.975	A1A/A3E	Bury St Edmunds, Suffolk	[1]			144.250			
2030	G3OHM/A	144.180	A1A/J3E	Birmingham		1900	G3RLO	144.525	F2A/F3E	West Bridgford, Notts	[1]
2030	G3KGU	1.910	A1A/A3E	Theydon Bois, Essex		1930	GW4OXB	145.275	F2A/F3E	Swansea, West Glam	[1]
2030	G2FKO	145.525	F2A	Bideford, Devon		2000	G4JBB	145.425	F2A	Birmingham	[10]
2100	G4EWK	144.850	F2A	Burton-on-Trent, Staffs	[7]	2000	G4FEX	145.250	F2A/F3E	Horsley Woodhouse, Derbyshire	[1]
2100	G3AVJ	145.250	F2A/F3E	Huyton, Merseyside	[1]	2030	G2FKO	145.525	F2A	Bideford, Devon	
2200	G3AWL	144.110	A1A/J3E	Easington, Co Durham	[8]	2030	G4NRO	144.525	F2A/F3E	Atherton, G Manchester	[1]
Wednesdays						2100	GW4LLE	145.525	F2A/F3E	Haverfordwest, Dyfed	
1100	G4IAV	145.275	F2A/F3E	Atherton, G Manchester		Notes					
		1.910				All times are clock time					
1830	G3GNS	3.550	A1A	Locking, Avon	[13]	[1] Omnidirectional	[7] To SW	[14] Horizontal to E and W			
		144.250				[2] Horizontal to SE	[8] To S	[15] Starting speed 12wpm			
1900	G3TPY	145.275	F2A/F3E	Chester, Cheshire	[1]	[3] Vertical to S	[9] To NE	[16] Vertical to N			
1900	G4ILD	145.400	F2A/F3E	Rishton, Lancs	[1]	[4] Horizontal to NW	[10] To NNE				
1900	G3ZQS	145.400	F2A/F3E	Darwen, Lancs	[1]	[5] Vertical to E	[11] First and third Thursdays in each month				
1900	G3RLO	144.525	F2A/F3E	West Bridgford, Notts	[1]	[6] Tilted polarization NE to SW	[12] Horizontal				
1900	G2ABC	145.250	F2A/F3E	Truro, Cornwall	[1]		[13] Reports to RAFARS Locking				
1900	G3JULY	3.583	A1A	Culgaith, Cumbria	[1]						
	G4EXD	145.475	F2A								

Contest News

Affiliated Societies Team Contest 1983 results

G4BUO's report on behalf of the HF Contests Committee last year began with "The success of AFS continues". Team entries numbering 76, and 300 individual entries made 1982 a record-breaking year. This remarkable trend has continued this year with a staggering 97 team entries and 352 individual entries received. It goes without saying that record club and individual scores were submitted, partly helped by the requirement to send "AFS" having been removed for this year's contest.

The now regular battle between East Barnet and Stockport continued, with East Barnet coming out on top again this year. As last year Leicester Polytechnic crossed the line in a very creditable third place. Crawley moved up from sixth to fourth, and GCHQ "A" from seventh to fifth. Maidenhead came home sixth, three places better than in 1982.

Many operators will notice that their claimed scores have been reduced to take account of unmarked duplicates, wrongly copied callsigns or wrongly copied reports or serial numbers. With so many sending "599", there were very few who copied their reports wrongly, but the boredom which the adjudicator had to suffer checking so many 599s was relieved by someone who sent everyone 579—well, it makes a change!

It is worth reminding would-be entrants to any Society contests that cover sheets (Form HFC2) must be sent with each entry. A number of entrants decided that a cover sheet was not necessary this year. Just as well the contest committee felt in a generous frame of mind otherwise the number of check logs might have been greatly increased. Please, please remember to complete and submit a cover sheet next year—you have been warned! Two other pet hates of the adjudicator are logs written in pencil, and logs not written on standard RSGB logsheets (Form HFC1). It is hoped that these minor faults can be remedied in time for next year!

Subject to the approval of Council, East Barnet will receive the Edgware Trophy, as leading affiliated society, and certificates of merit will be sent to G3SSO (highest individual score), and to East Barnet, Stockport, Leicester Polytechnic, GCHQ and Glenrothes, RNARS Belfast and Conwy Valley (leading affiliated societies in each RSGB zone).

The HF Contests Committee would like to express their pleasure at receiving such a mammoth entry for the contest, and look forward to continued support in 1984.

BRS32525

Comments from entrants:

"Contest enjoyed by all, and the non-requirement of AFS in the exchanges was welcomed"—SRCC;
 "We have not won "our" cup this year, but will try again next year"—Edgware;
 "Could only get one station on for the B team"—Hereford;
 "Despite working no Gs for the first hour, we enjoyed ourselves and will be back next year"—Aberdeen;
 "Worked the stations I could read. All but one slowed down to my speed!"—G4KAL;
 "Hope to stir up the Yeovil club so we can enter a full team next year"—G3GC;
 "The QRM was terrific"—G8VF;
 "Good contest, right length and plenty of activity"—G4LYA;
 "Listened on 80m on Saturday night and had a few QSOs with reports of 569 and 579, but during the contest signals were 59 + 20dB—what a fortuitous 'lift'!"—G3CSG;
 "Wish everybody would send both callsigns. It would avoid much confusion in a hectic contest like this one"—NW Ireland;
 "Dropping AFS just makes for a free-for-all. We are not in favour"—Worthing;
 "Present scoring gives large societies an unfair advantage. The contest should be for affiliated societies to work affiliated societies"—Thames Valley;
 "Amazing how busy the band became. I'm too old for this at 76 years of age"—G8AV;
 "Found it rather galling—every QSO I had gave me a higher number than mine"—G4UVA;
 "All reports received were 599—why was I asked to repeat so much?"—G3LPN;
 "Had a lot of fun, but got sore fingers"—G4GVJ;
 "Murphy struck—el-bug packed up at 1301"—G8JD;
 "Didn't get a single reply to a CQ call"—G3HIS;
 "My first contest, realised you need a log keeper"—G4LGD;
 "Thoroughly enjoyed it. I had to chuckle. Never expected to use my adventure training gear for sending cw. Headphones over woolly hat, two pairs of socks in my boots. Very successful, the cold didn't penetrate until 1655"—G4CQI;

INDIVIDUAL SCORES

Posn	Callsign	Score	Society	Posn	Callsign	Score	Society	Posn	Callsign	Score	Society
1	G3SSO	2,427	GCHQ(A)	58	G3OGP	1,510	Thames Valley (A)	114	G3AIV	1,100	Thames Valley (A)
2	G3PEK	2,397	Stockport (A)	59	G4FNL	1,500	Worthing	115	G3PSP	1,100	Edgware (A)
3	G3TR	2,310	Crawley	60	G3KKQ	1,500	Ariel	116	G3DNJ	1,100	Sutton & Cheam
4	G3WKS	2,250	West Kent	61	G3SNX	1,490	Stockport (A)	117	G3AYC	1,090	Ariel
5	G3RPB	2,170	East Barnet (A)	62	GM3YOR	1,480	Glenrothes	118	G3OHP	1,090	Gravesend
6	G3UKS	2,160	Maidenhead (A)	63	G3IAS	1,480	SRCC	119	G4KRS	1,090	Leicester Poly (B)
7	G4CNY	2,120	Hereford (A)	64	G3UVR	1,470	Wirral	120	GM3OXC	1,080	Aberdeen (A)
8	G3OAY	2,100	Leicester Poly (A)	65	GM3ZSP	1,470	Glenrothes	121	G2FFO	1,070	RNARS Liverpool
9	G3FXB	2,010	Worthing	66	G4GVC	1,460	Leicester (A)	122	G3VTV	1,060	Leeds (A)
10	G3GRO	2,000	Crawley	67	G3PGM	1,450	Racal (Reading)	123	G3JNB	1,050	Thames Valley (B)
11	G3XTJ	1,987	East Barnet (A)	68	G4HVC	1,430	Newark	124	G4AMT	1,050	RNARS Cudrore
12	G3VER	1,980	Verulam (A)	69	G3LIK	1,430	RNARS Portsmouth (A)	125	G3NJA	1,050	Torbay
13	G3XTT	1,970	East Barnet (A)	70	G3JFF	1,420	RNARS Portsmouth (A)	126	G3MA	1,037	Gloucester
14	G3SJJ	1,970	Leicester Poly (A)	71	G3VVI	1,420	Addiscombe	127	GW3JI	1,030	Conwy Valley
15	G3RTE	1,950	East Barnet (A)	72	G3ASR	1,390	Edgware (A)	128	G4HYH	1,020	Leicester (A)
16	G3UFY	1,950	Addiscombe	73	G3RSD	1,380	Grimsby (A)	129	G4ODP	1,020	Hornsea
17	G4MCC	1,930	Stockport (A)	74	G4MIA	1,370	Wirral	130	G3SWC	1,010	Horsham
18	G5CMX	1,910	Maidenhead (A)	75	G3BFP	1,370	SRCC	131	G3MCK	1,010	Echelford
19	G3RFS	1,897	East Barnet (A)	76	G4FAD	1,370	Hereford (A)	132	G3KTZ	1,010	Southgate
20	G3NOM	1,890	Stockport (A)	77	G3UJV	1,370	Verulam (A)	133	G4FAS	1,010	Stockport (B)
21	G4BUO	1,880	Gravesend	78	G4IBA	1,360	Bromsgrove	134	G4OEC	1,010	RNARS Yeovilton
22	G3SXW	1,880	Thames Valley (A)	79	G3XRX	1,360	Cray Valley	135	G4ITP	1,000	Leicester (A)
23	G3TXF	1,870	Thames Valley (A)	80	G3RWL	1,340	Southgate	136	GW3MPB	1,000	Hereford (A)
24	G8DV	1,830	GCHQ (A)	81	G3YAJ	1,330	Colchester	137	G13SXG	1,000	Bangor
25	G3HVX	1,820	Hereford (A)	82	G3LDI	1,330	Norfolk (A)	138	G4KRG	1,000	Stockport (B)
26	G3RVM	1,820	Racal (Reading)	83	G3SYA	1,280	Preston (A)	139	G4LNA	1,000	RNARS London (A)
27	G3RQZ	1,810	Addiscombe	84	G3VAA	1,280	Farnborough (A)	140	G4ISK	990	Farnborough (A)
28	G3IGW	1,797	Halifax	85	G3CSG	1,260	Wirral	141	G3TTH	990	RNARS Nottingham
29	G3ORY	1,790	Leicester Poly (A)	86	G3SJV	1,240	Southdown	142	G3AUU	980	GCHQ (A)
30	G3SDC	1,740	Leicester Poly (A)	87	G4DBL	1,230	Crawley Court	143	G3SXE	970	Cray Valley
31	G3PSM	1,740	White Rose (A)	88	G4FJW	1,230	Gravesend	144	G4EYD	960	South Birmingham
32	G3WYK	1,740	Maidenhead (A)	89	G3FVC	1,230	Maidenhead (A)	145	G4JKS	960	Verulam (B)
33	G4BUX	1,730	Stockport (A)	90	G3SHY	1,220	Edgware (A)	146	G3COQ	950	GCHQ (B)
34	G3PDH	1,730	Norfolk (A)	91	G5BM	1,210	Gloucester	147	G3TZL	950	RNARS Portsmouth (A)
35	G3XVF	1,730	Norfolk (A)	92	G3BBR	1,210	Reigate	148	GM4LGM/P	950	West of Scotland
36	G3FJE/A	1,710	Sheffield	93	G4BOU	1,210	Verulam (A)	149	GM4GRC	940	Glenrothes
37	G3JKF	1,690	Crawley	94	G3TIR	1,190	Torbay	150	G3LPN	940	RNARS Portsmouth (A)
38	G3FXA/A	1,690	GCHQ (A)	95	G4KGG	1,180	Loughborough	151	G3HTI/A	940	Grimsby
39	G4DJX	1,690	Verulam (A)	96	G4BLX	1,170	East Barnet (B)	152	G4KDL	940	Pye
40	G5EBU	1,670	GCHQ (A)	97	G4EBK	1,160	Grimsby (A)	153	G4IUX	930	Bromsgrove
41	G4FIM	1,670	Leeds (A)	98	G2FOS	1,150	Wirral	154	G3TNO	930	Horsham
42	G3PDL	1,670	Scunthorpe	99	G3ZYY/A	1,150	Plymouth	155	G3VKM	930	Norfolk (A)
43	G4BYG	1,650	Hornsea	100	G4IOM	1,150	Crawley	156	G4JFN	920	Farnborough (A)
44	G3VZT	1,650	Norfolk (A)	101	G4HFT	1,150	Gloucester	157	G8VF	920	Eccles
45	G3LSL	1,640	Leicester Poly (A)	102	G3COJ	1,140	Ariel	158	GM4EJI	920	Glenrothes
46	G3JEQ	1,640	Thames Valley (A)	103	G2MI	1,140	Cray Valley	159	G3LQI	910	Worthing
47	G6LX	1,630	SRCC	104	G3PJS	1,140	Grimsby (A)	160	G4HMD	910	Edgware (A)
48	G4CDY	1,630	Addiscombe	105	G3DOT	1,130	Sheffield	161	G3ZDJ	910	Edgware (A)
49	G3FKH	1,620	Hereford (A)	106	G4GRU	1,130	Stockport (B)	162	G3RUG	910	Stockport (B)
50	G3RIR	1,610	Leicester Poly (B)	107	G3AAQ	1,130	Leicester Poly (B)	163	G4NBD	910	Preston (A)
51	G3YVR	1,590	Crawley	108	G4DXA	1,120	White Rose (A)	164	G4CZB	910	Leicester Poly (B)
52	G4DUS	1,580	Verulam (A)	109	G3JZV	1,120	RNARS Portsmouth (A)	165	G4JRE	910	RNARS Harrogate
53	G4ARI	1,560	Leicester Poly (B)	110	G3GC	1,120	Yeovil	166	G4FRN	890	RNARS London (A)
54	G4AAL	1,560	Bromsgrove	111	G4HZV	1,120	Farnborough (A)	167	G4IUX	890	Edgware (B)
55	G3SJK	1,550	Addiscombe	112	G3ZOA	1,110	Newark	168	G3EUE	870	SRCC
56	G4HMS	1,550	RNARS London (A)	113	G4ECI	1,110	Stockport (B)	169	GM4KGJ	870	Aberdeen (A)
57	G4CEB/A	1,540	Maidenhead (A)	114	G3TWG	1,100	Maidenhead (B)	170	G4FAM	870	Gravesend

Posn	Callsign	Score	Society	Posn	Callsign	Score	Society	Posn	Callsign	Score	Society
169	G4IUF	870	White Rose (A)	229	GM3VEY	620	Aberdeen (A)	293	G4NOV	370	Leicester Poly (C)
173	G4BJQ	860	Farnborough (A)		G3ZVW	620	Southgate		G3PYC	370	Horsham
	G4LYA/P	850	Leeds (A)		G3YGR	610	Racal (Reading)	296	G4MQC	360	RNARS London (B)
174	G3YEE	850	Leeds (A)		G3VFB	610	Echelford		G4MCUZ	350	Kingsway Tech.
	G3IOR	850	Norfolk (B)		G4CWY	610	Leicester (A)		G4KLO	350	Verulam (B)
	G4FOT	840	Bury	235	G4MVA	610	RNARS Stockton	297	G4BPE	350	Newark
177	G4EEV	840	Maidenhead (B)		G4GLC	610	Leicester Poly (C)		G3KKB	350	South Birmingham
	G3WSZ	840	White Rose (A)		G3LFB	610	RNARS Chatham		G3DOR	350	Echelford
	G3TLI	830	Hornsea		G4BJU	600	Stockport (C)		G3CIK	340	Ariel
	G4BOF	830	Hereford (B)	241	GM4LCP	600	West of Scotland	302	G3TOF	340	Leicester (B)
180	G4INI	830	Farnborough (B)		G3KAX	600	Reigate		G4CZD	340	RNARS Chatham
	G3RSM	830	Bury		G3RDQ	600	Crawley Court	305	G3KWT	330	White Rose (B)
	G3LHJ	830	Torbay		G3HQX	590	Crawley Court		G8SC	330	Southdown
186	G4KTH	830	RNARS Stockton	245	G3HIS	590	RNARS Yeovilton		GM4MUZ	320	Kingsway Tech.
187	G3UJX	820	Wirral		GM4GIF	580	RNARS Faslane	307	G8AV	320	RNARS Plymouth
	G4CXT	800	Racal (Reading)	247	G4KFT	580	GCHQ (B)		G2CLN	320	Bromsgrove
	G4IZB	790	Farnborough (B)		G4DYC	580	Norfolk (B)	310	G3GHS	317	Thames Valley (B)
188	GM3DZB	790	Aberdeen (A)		G4HCK	570	Colchester		G4JRZ	310	Verulam (B)
	G3SVL	790	Southdown	250	G4DNB	570	Halifax	311	G3WFM	310	Verulam (B)
	G3GTR	790	RNARS Belfast		G4EUG	560	Horsham		G4BIA	310	West Kent
192	G3BPM	780	Thames Valley (B)	252	G4KJD	560	RNARS Yeovilton		G4IXF	300	Stockport (C)
	G3GRS	770	Gravesend		G3FJI	550	Colchester	314	G4HDP	300	RNARS Nottingham
193	G4RKL	770	Norfolk (B)		GM3HUN	550	RNARS Rosyth (A)		G4EYN	300	RNARS Nottingham
	G3YYF	770	Southdown	254	GM4MTV	550	Glenrothes	317	G4EOI	290	Sutton & Cheam
	GM3UM	760	RNARS Rosyth (A)		G3ZPK	550	Maidenhead (B)	318	G4KMC	280	Preston (A)
196	G4OBO	760	Leicester Poly (C)		G8IB	540	RNARS London (A)		G4OYC	270	Torbay
	G4KZD	760	Southgate	258	GM4JHG	540	RNARS Rosyth (A)	319	G3WRY	270	Leicester Poly (C)
	G3VCT	750	Maidenhead (B)		G4NXY	540	Leeds (A)		G4HSD	260	Sutton & Cheam
199	G3AQM	750	RNARS London (A)	261	G3LVW	530	Maidenhead (B)	321	G4OWM	260	Sutton & Cheam
	G3LMH	740	Crawley Court		G4HZF	520	Grimsby (A)		GM4BKV	260	Aberdeen (B)
201	G3SGQ	740	RNARS Liverpool	262	G4JUL	520	Sheffield		G4PYW	250	Leeds (B)
203	G4NDL	730	Plymouth		G4GPX	500	Worthing	324	G4GFN	250	Leicester Poly (D)
	G4KAR	720	Southdown	264	G4IGY	500	Hornsea		G8JD	250	RNARS Newcastle
204	G4KKZ	720	RNARS Plymouth		G4OOS	480	Leicester (A)	327	G4REH	240	Bristol
	G4GOP	710	White Rose (A)	266	G4KKO	480	Leeds (B)		G3ZXC	240	Preston (B)
206	G3JTG	710	GCHQ (B)		G4NNS	470	Echelford	329	G4LEP	230	Norfolk (B)
	G4GSC	710	Echelford		G4HWK	470	RNARS Inskip	330	G4OCU	220	Scunthorpe
209	GM3YTS	700	RNARS Faslane	268	G4ATZ	470	White Rose (B)		G4MWE	200	Hornsea
	GM3KPD	700	RNARS Rosyth (A)		G4KWN	470	Bury	331	G4KAL	200	Grimsby (B)
	G3TZM	690	RNARS Inskip		G4OTV	460	West Kent		G4CRI	200	RNARS Cudrose
211	G3LGF	690	GCHQ (B)	272	G3WP	460	RNARS Chatham	334	G4FUB	190	Verulam (B)
	G4KHM	690	Worthing		G4KNM	460	RNARS Cudrose	335	G4HXB	160	Stockport (C)
	G3KXT	690	SRCC	275	GM4JCM	450	Kingsway Tech.	336	G4FCH	150	RNARS Stockton
215	GM4AGS	680	Kingsway Tech.		G3ZGA	440	White Rose (B)	337	GI3CFH/A	140	NW of Ireland
	GW3MDK	670	Conwy Valley	276	GI3TNK	440	RNARS Belfast	338	G3ANK	130	Cray Valley
216	G5BQR	670	Sheffield		G4COI	440	RNARS Bristol		GM4LFA	120	West of Scotland
	G4DIVIA	660	RNARS Portsmouth (B)		G4FFW	440	Stockport (C)	339	G4POY	120	Preston (B)
218	G3VNO	660	Bury		GM3ZBE	440	Aberdeen (A)		G4RNF	120	Preston (B)
	G3NKL	650	Preston (A)	281	GM4JLY	430	Aberdeen (B)		GI3NQH	120	RNARS Belfast
	G4EOP	650	Leicester Poly (C)		G4FCO	420	South Birmingham	343	GM4FGD	100	RNARS Rosyth (B)
220	G4LGD	650	RNARS Portsmouth (B)	282	G4FMI	420	RNARS Liverpool		G4NCK	100	White Rose (B)
	G4HJV	650	Gloucester		G3AWR	420	RNARS Newcastle	345	GI3VQ	90	RNARS Belfast
	G2UG	650	Halifax		G4JAG	420	Bury	346	G3VNG	80	RNARS Plymouth
225	G4GYP	640	Southgate	286	GM4GVJ	410	RNARS Rosyth (A)		G4JHS	80	Halifax
	G3GMM	640	Stockport (C)		G4IVJ	410	Bromsgrove	348	G4BWW	60	Cray Valley
227	G4CIB	630	Gloucester	288	GM3UU	400	Aberdeen (B)		G4PKW	50	Bromsgrove
	G3CWL	630	Sutton & Cheam		G4OGB	400	Scunthorpe	349	G3FBP	50	RNARS Harrogate
	G3KOJ	620	RNARS Portsmouth (B)		G3XUJ	400	Eccles		G3WTD	50	Leicester Poly (D)
229	G4FKS	620	White Rose (B)	291	G3KCC	390	Preston (A)		G4PBF	50	West Kent
	G3AIO	620	West Kent	292	GW4KVJ	380	RNARS Cardiff				
	G3TDL	620	Ariel	293	G3JZI	370	RNARS Liverpool				

Check logs: G2DHY, G2FNK, G4BWS, and G4GPR.

TEAM SCORES

Posn	Society	Total points	Stations contributing to score	No of entries	Posn	Society	Total points	Stations contributing to score	No of entries
1	East Barnet ARCC A	9,974	G3RBP G3XTT G3RTE	5	50	RNARS Liverpool	2,600	G2FFO G3SGQ G4FMI G3JZI	4
2	Stockport RS A	9,437	G3PEK G4MCC G3NOM	5	51	Sutton & Cheam RS	2,540	G3DNJ G3CWL G4EOI G4HSD	5
3	Leicester Poly ARS A	9,240	G3OAY G3SJO G3ORY	5	52	Colchester RA	2,450	G3YAJ G4HCK G3FJI	3
4	Crawley ARC	8,740	G3TR G3GRO G3JKF	5	53	Norfolk ARC B	2,430	G4RKL G4DYC G4LEP	4
5	GCHQ A	8,597	G3SSO G3DV G3FXA/A	5	54	Scunthorpe ARC	2,290	G3PDL G4OGB G4OCU	3
6	Maidenhead & D ARC A	8,580	G3UKS G5CMX G3RQZ	5	55	RNARS Yeovilton	2,160	G4OEC G3HIS G4KJD	3
7	Addiscombe ARS	8,360	G3UJY G3TQZ G4CYD	5	56	Thames Valley ARS B	2,147	G3JNB G3BPM G3GHS	3
8	Thames Valley ARS A	8,000	G3SXW G3TQZ G3JEQ	5	57	Stockport RS C	2,140	G3GMM G4BJU G4FFW	5
9	Hereford ARS A	7,930	G4CNY G3HVX G3FKH	5	58	Verulam ARC B	2,120	G4JKS G4KLO G3WFM	5
10	Verulam ARC A	7,830	G3VER G4DJX G4DUS	5	59	White Rose ARS B	1,960	G4FKS G4ATZ G3ZGA	5
11	Norfolk ARC A	7,370	G3PDH G3XVF G3VZT	5	60	RNARS Portsmouth B	1,930	G4DIV/A G4LGD	3
12	Leicester Poly ARS B	6,300	G3RIR G4ARI G3AAQ	5	61	Plymouth RC	1,890	G3ZY/A G4NDL	2
13	Wirral ARS	6,070	G3UVR G4MIA G3CSG	5	62	Reigate ATS	1,810	G3BBR G3KAX	2
14	Surrey RCC	6,040	G6LX G3IAS G3BFP	5	63	Kingsway Tech. College RAC	1,800	GM4AGS GM4JCM GM4CUZ	4
15	RNARS Portsmouth A	5,860	G3LIK G3JFF G3JZV	5	64	South Birmingham RS	1,730	G4EYD G4FCO G3KKB	3
16	Gravesend RS	5,840	G4BUO G4FJW G3OHP	5	65	RNARS Cudrose	1,710	G4AMT G4KNM G4CRI	3
17	Worthing & D ARC	5,610	G3FXB G4FNL G4KHM	5	66	Conwy Valley ARC	1,700	GM4JL GM3MDK	2
18	Edware & D RS A	5,530	G3ASR G3SHY G3PSP	5	67	West of Scotland ARS	1,670	GM4LGP GM4LCP	3
19	Glenrothes & D ARC	5,360	GM3YOR GM3ZSP GM4GRC	5	68	Farnborough & D RS B	1,620	G4INI G4IZB	2
20	White Rose ARS A	5,280	G3PSM G4DXA G4IUF	5	69	RNARS Nottingham	1,590	G3TTH G4EYN G4HDP	3
21	Farnborough & D RS A	5,170	G3VAA G4HZV G4ISK	5	70	RNARS Stockton	1,590	G4KTH G4MVA G4FCH	3
22	Stockport RS B	5,160	G4GRU G4ECI G4FAS	5	71	RNARS Belfast	1,440	G3GTR G3TNK G3NQH	4
23	Grimsby ARS A	5,140	G3RSD G4EBK G3PJS	5	72	RNARS Chatham	1,410	G3LFB G3WPM G4CZD	4
24	Leeds & D ARS A	4,970	G4FIM G3VTY G3YEE	5	73	Eccles & D RS	1,320	G8VF G3XUJ	2
25	RNARS London A	4,730	G4HMS G4LNA G4FRN	5	74	RNARS Faslane	1,280	GM3YTS GM4GIF	3
26	Ariel RG (BBC)	4,690	G3KKQ G3CQJ G3AYC	5	75	Loughborough Falcon	1,180	G4KGG	1
27	Racal (Reading) ARS	4,680	G3RVM G3PGM G4CXT	4	76	East Barnet ARCC B	1,170	G4BLX	1
28	Gloucester ARS	4,677	G5BM G4HFT G3MA	5	77	RNARS Inskip	1,160	G3TBM G4HWK	2
29	Leicester RS A	4,570	G4GVC G4HYH G4ITP	5	78	RNARS Plymouth	1,120	G4KKZ G8AV	3
30	Crawley Court ARG	4,520	G4IBA G4DBL G3LMH	5		Yeovil ARC	1,120	G3GC	1
31	Southgate ARC	4,370	G3RWL G3KTZ G4KZD	5	80	Aberdeen ARS B	1,090	GM4JLY GM3UU	3
32	Hornsea ARC	4,200	G4BYG G4ODP G3TLI	4	81	Bangor & D ARC	1,000	GI3XJG	1
33	Sheffield & D RS	4,030	G3JEJA G3DOT G5BOR	4	82	RNARS Harrogate	960	G4JRE G3FBP	2
34	Southdown ARS	3,850	G3SVJ G3SVL G3YYF	5	83	Pye ARC	940	G4KDL	1
35	Aberdeen ARS A	3,800	GM30XC GM4KGJ GM3DZB	5	84	Edware & D RS B	890	G4IUZ	1
36	Maidenhead & D ARC B	3,770	G3TWG G4EEV G3VCT	5	85	Hereford ARS B	830	G4BOF	1
37	West Kent ARS	3,690	G3WKS G3AIO G4OTV	5	86	Leeds & D ARS B	730	G4KKQ G4PYW	2
38	Cray Valley RS	3,660	G3XRX G2MI G3SXE	5	87	RNARS Newcastle	670	G3AWR G8JD	2
39	Preston ARS A	3,510	G3SYA G4NBD G3NKL	5	88	Preston ARS B	480	G3ZCX G4POY	3
40	Torbay ARS	3,340	G3TIR G3NJA G3LHJ	4	89	RNARS Bristol	440	G4CQI	1
41	Bromsgrove & D ARC	3,270	G4AAL G4IUX G4IVJ	5	90	RNARS Cardiff	380	GW4KVJ	1
42	Bury RS	3,220	G4FOT G3RSM G3VNO	5	91	RNARS London B	360	G4MQC	1
43	Echelford ARS	3,150	G3MCK G4GSC G3VFB	5	92	Leicester RS B	340	G3TFN	1
44	Halifax & D ARS	3,097	G3IGW G2UG G4DNB	4	93	Leicester Poly ARS D	300	G4GFN G3WTD	2
45	RNARS Rosyth A	2,960	GM3UM GM3KPD GM3HUN	5	94	Bristol ARC	240	G4REH	1
46	GCHQ B	2,930	G3COQ G3JTG G3LGF	4	95	Grimsby ARS B	200	G4KAL	1
47	Newark & D ARC	2,890	G4HVC G3ZOA G4BPE	3	96	Northwest of Ireland ARS	140	GI3CFH/A	1
48	Horsham ARS	2,870	G3SVC G3TNO G4EUG	4	97	RNARS Rosyth B	100	GM4FGD	1
49	Leicester Poly ARS C	2,660	G4OBQ G4EOF G4GLC	5					

7MHz Contest 1983 results

The HF Contests Committee is pleased to report an increase of some 25 per cent in the logs received for this year's cw event. Unfortunately this trend was not apparent in the ssb section, with only eight entrants from the British Isles. Unless there is a marked improvement in the number of logs received for the sideband section next year, this section will be discontinued. On the question of adding 3.5MHz to this contest, the vast majority of comment received was against the inclusion.

Each year the committee suggests that entrants familiarize themselves with the ARRL DXCC multiplier list, yet many people try to claim I and IT, and UC2 and UK2A as separate countries!

Ian Frith, G4GIR, completed the double this year by winning both the ssb and cw sections, and will be awarded the G6QB Trophy. Winners and runners-up in the other sections will be awarded certificates.

Equipment used by leading stations:

G4GIR—TS830, L4B (ssb) dipole at 20ft, four sloping dipoles.

G3UOF—IC720, TL922, 3-el rotatable inv-V at 70ft.

G3SJJ—TR7, 80m delta loop, x2 sloper, x4 vertical.

DX worked and breakdown of leading entrants' scores:

G4GIR—A7, CE, CN, CT, DL, EA, EA8, EI, F, FM, HA, HB, HK, I, IS, JA, LA, LZ, OE, OH, OK, ON, OZ, PA, PY, PZ, SM, SV, TL, TR, UA1, UA9, UB, UH, UI, UM, UP, UQ, UR, VE2, VK2, VK5, VP8, W2, Y, YO, YU, YV, ZS3, ZS6, 3A, 3B8, 4Z, 5T, 5N, 6W, 9H, 9K, (264 QSOs, 1,575pts, 59 mults).

G3UOF—CN, CT, DL, EA, EA8, EI, F, FM, HA, HB9, I, LA, LZ, OE, OH, OK, ON, OZ, SM, SV, TR, TU, UA1, UA9, UB, UH, UM, UP, UQ, UR, W3, W4, Y, YO, YU, ZP, ZS5, 3A, 4X, 5N, 5T, 6W, 9H, (233 QSOs, 1,345pts, 43 mults).

G4GIR—(CW) CN, CT, DL, EA, EA8, EI, F, HA, HB, I, JA, LA, LZ, OE, OH, OK, ON, OZ, PA, PY, SM, UA1, UA9, UB, UC, UD, UF, UH, UI, UL, UM, UP, UQ, UR, VE1, VE2, VE3, VK2, VK3, W1-0, XE, Y, YO, YU, YV, ZB2, ZL1, ZL2, ZL3, 6Y, 9K (630 QSOs, 5,741pts, 61 mults).

G3SJJ—CO, CN, CT, DL, EA, EA8, EI, F, HA, HB, HH, I, JA, LA, LZ, OE, OH, OK, ON, OZ, PA, PY, SM, TA, UA1, UA9, UB, UC, UD, UF, UH, UI, UL, UM, UP, UQ, UR, VE1, VE2, VE3, VK3, VK5, VK7, W1-0, XE, Y, YO, YU, ZB2, ZL1, ZL2 (524 QSOs, 4,826pts, 61 mults).

G3KDB

BRITISH ISLES CW TRANSMITTING					
Posn	Callsign	Points	Posn	Callsign	Points
1	G4GIR	350,201	23	G4IQM	80,300
2	G3SJJ	294,386	24	GM3OXC	79,077
3	G3SXW	293,818	25	G4KKG	76,860
4	G3PDL	283,620	26	G4NDL	75,280
5	GM3YOR	258,302	27	G3PEK	65,692
6	G3IGW	253,288	28	G4FFW	56,734
7	G3UFY	248,178	29	G3NKS	45,254
8	G4CNY	237,916	30	G3XBY	45,150
9	G4BUO	203,232	31	GW3ZDW	44,208
10	G3TXF	184,228	32	GW3JI	38,675
11	G5MY	162,486	33	GM4PXX	28,416
12	G2QT	159,720	34	G3AWR	24,896
13	G3ZZD	138,542	35	G4EBK	24,795
14	GM3RAO	138,210	36	G4OKN	22,688
15	G3SWH	112,840	37	G3APN	18,592
16	G4ANH	108,836	38	G4BOU	13,250
17	G4HMS	108,630	39	G3GMM	12,826
18	G4FNL	103,740	40	G2AJB	9,856
19	G3HRY	100,572	41	G3JJZ	6,000
20	G3CCZ	99,287	42	G4KPE	5,280
21	G3WPH	83,776	43	GM8SQ	4,142
22	G3ESF	82,755	44	G4OHL	2,768

REST OF WORLD CW TRANSMITTING					
Posn	Callsign	Points	Posn	Callsign	Points
1	UH8EAA	16,830	20	W2ND	3,024
2	UA9FAL	11,160	21	UA9KAI	2,760
3	UA9FGO	10,440	22	PY1AJK	2,688
4	K1KI	7,866	23	W2XO	2,628
5	UM8MDX	7,272	24	UF6FAL	2,394
6	UF6FIT	6,588	25	K5LZO	2,331
7	UJ8JAS	6,480	26	K3VW	2,088
8	K9BG	6,024	27	UD6DKW	2,025
9	UA9FGJ	5,904	28	N3KZ	1,962
10	UA9SJJ	5,472	29	VK3AEW	1,365
11	VE3KOY	5,292	30	W4KO	1,320
12	UA9AFO	4,632	31	JH4JLZ	1,275
13	W1END	4,368	32	KW2J	1,095
14	VE3FGU	4,032	33	VE1CCM	768
15	CN8CY	4,014	34	KM2X	675
16	UA9FDW	3,465	35	VK2AYD	672
17	HH2VP	3,423	36	KH6CP/3	120
18	W3OG	3,330	37	W7OK	90
19	EA5YU/EA8	3,240	38	9K2BE	15

EUROPE CW TRANSMITTING					
Posn	Callsign	Points	Posn	Callsign	Points
1	UP2BHC	8,582	21	OE5JDL	3,590
2	YU1KQ	7,956	22	LA1IE	3,555
3	LZ2RS	7,150	23	{OK1AGA	3,510
4	HA5KDB	7,111	24	{UP2OX	3,510
5	UP2BCR	6,890	25	DL9LAI	3,375
6	YU4EDO	6,006	26	Y30BUB	3,294
7	YU4EJC	5,830	27	PA3AMA	3,260
8	UB5IOK	5,643	28	PA0XAW	3,240
9	UP2BEI	5,350	29	PA2DXY	3,150
10	OK2BMA	5,250	30	UP2BLW	3,132
11	EI5DI	4,850	31	UB5TBM	3,060
12	EI7CC	4,785	32	SM0DJX	2,968
13	UA6LCN	4,250	33	OH6AK	2,928
14	Y22YO	4,122	34	PA0WKI	2,799
15	DJ3XK	3,960	35	Y53UN	2,736
16	DL8QS	3,880	36	OH1HS	2,704
17	HA8KUX	3,825	37	{UA3AGX	2,680
18	DL5JQ	3,789		{UA6AUZ	2,680
19	UB5EDJ	3,660	39	HA1SB	2,664
20	UK2ABC	3,600	40	Y5IVE	2,648

Posn	Callsign	Points	Posn	Callsign	Points
41	Y39YD	2,610	92	UB5FFZ	1,275
42	PA3AWI	2,560	93	OZ4UN	1,246
43	YU2SXS	2,496	94	Y30UE	1,230
44	DL100	2,485	95	UA1QBV	1,225
45	HB9AOS	2,480	96	Y2IEA	1,208
46	UC2AFF	2,430	97	Y38YE	1,200
47	DL1EAL	2,424	98	UB5VK	1,188
48	SM6DED	2,268	99	UR2RLR	1,176
49	UA1OET	2,261	100	Y59ZA	1,140
50	Y30CCM	2,184	101	SM7LSU	1,134
51	Y26JD	2,170	102	OZ1CCB	1,106
52	HB9DX	2,160	103	OZ4HW	1,100
53	Y46UF	2,152	104	OZ8ZB	1,098
54	DF5OS	2,142	105	SM0MLL	1,086
55	HA3GA	2,128	106	EA2CR	990
56	PA2CHM	2,079	107	OK3CPN/P	984
57	UC2AAD	2,064	108	UA4NCB	980
58	Y43ZI	2,051	109	UB5ENV	980
59	PA0DIN	2,040	110	OK1KZ	965
60	OH3OS	2,030	111	SM5ALJ	960
61	UP2BJM	2,030	112	Y04DCF	900
62	ON6NL	2,000	113	Y30UFJ	864
63	SM0CCE	1,995	114	Y36UE	826
64	UA4PNX	1,960	115	YU1KL	815
65	PA2JDB	1,890	116	YU1EA	768
66	PA0CF	1,880	117	Y23TD	750
67	UB5QBC	1,848	118	PA0MTJ	738
68	DL9CE	1,820	119	DF3QN	655
69	Y30AY	1,820	120	OK1AIA	630
70	OK2SLL	1,792	121	LA9PCA	575
71	ON5WL	1,750	122	UB5AER	575
72	SM3CBR	1,736	123	Y06ADW	575
73	Y54ZL	1,687	124	OZ8AE	511
74	HB9AAQ	1,640	125	OK2PAW	490
75	LA7SI	1,600	126	SM5CSS	475
76	OH5LD	1,575	127	Y64YG	415
77	YU7SF	1,500	128	PA0GVK	412
78	ON5AZ	1,491	129	YU3TE	405
79	Y37SB	1,477	130	DL1AM	405
80	Y47ZL	1,477	131	HA5KRV	400
81	Y2IGH	1,456	132	OK3PO	384
82	UB5UKH	1,421	133	OH1MQ	350
83	Y37UF	1,407	134	OZ2E	325
84	YU5XEC	1,395	135	DJ8SG	320
85	Y59KA	1,365	136	UB5EEP	240
86	Y67ZG	1,365	137	HA5JK	220
87	OK1AHQ	1,337	138	Y23HN	180
88	PA0SOL	1,320	139	UA4PWE	140
89	UA4CEQ	1,320	140	OK2BFX	105
90	LA2MA	1,308	141	SM7BNG	90
91	HA8CH	1,302			

BRITISH ISLES CW RECEIVING			REST OF WORLD CW RECEIVING		
Posn	Station	Points	Posn	Station	Points
1	BRS1066	96,195	1	UD6-001-220	4,560
2	BRS44395	44,200	2	JA6-9330/JA1	660

EUROPE CW RECEIVING			REST OF WORLD CW RECEIVING		
Posn	Station	Points	Posn	Station	Points
1	UA4-148-362	6,825	8	Y2-8580-A	2,200
2	UA3-142-198	5,070	9	UB5-065-480	1,575
3	OK1-11861	4,095	10	Y2-9757-B	1,485
4	UB5-060-654	2,980	11	Y2-18589-A	720
5	HA2-013	2,920	12	Y2-10626-O	660
6	NL-7798	2,660	13	Y2-EA-18636-A	648
7	Y2-8983-F	2,440			

Check logs: GM4KGJ, HA5KDO, HA5KZ, LA7XB, OH6DZ, OZ1NF, OZ8JD, PA0ADT, PA0VSS, UA1SW, UA6LDF, UB5CBA, UB5SBM, UB5UCE, W4DGJ, Y24VF/A, Y30ABF/A, Y3ION, Y33UK, Y35ZK, Y67XL.

BRITISH ISLES SSB TRANSMITTING			REST OF WORLD SSB TRANSMITTING		
Posn	Callsign	Points	Posn	Callsign	Points
1	G4GIR	92,925	1	UH8EAA	18,225
2	G3UOF	57,835	2	CN8CY	7,480
3	G4OSY	14,326	3	UA9FAL	4,440
4	G3XBY	13,350	4	UV9FN	1,890
5	G4NDL	11,726	5	UM8MBW	495
6	G3FNM	11,336	6	UA9QCCQ	15
7	G4FVK	990		9K2BE	15
8	G3PEK	300			

EUROPE SSB TRANSMITTING			REST OF WORLD SSB TRANSMITTING		
Posn	Callsign	Points	Posn	Callsign	Points
1	OK3CSC	10,425	22	YU7SF	365
2	DA2ER	8,000	23	HB9DX	350
3	UA4FCM	6,594	24	DL3ME	280
4	OK1AMS	4,970	25	OZ4LX	280
5	OK1AGN	4,260	26	UA3EAL	275
6	UQ2GFN	3,960	27	OZ1DAF	270
7	HB9AAQ	3,780	28	OZ4HW	270
8	YU5XE	3,300	29	OZ6EI	270
9	OK1AOZ	2,365	30	Y05CAL/5	260
10	YU7RA	2,250	31	LA10BA	250
11	UB5ITU	1,980	32	OH3EX	220
12	UB5MNO	1,610	33	Y59ZF	200
13	OK1KZ	1,240	34	Y24YH	184
14	Y44XF	1,215	35	LA1IE	120
15	Y67XL	990	36	LZ1KKZ	98
16	OK1HCH	945	37	Y42TC	80
17	UP2ND	805	38	OK1OPT	60
18	OK3PQ	690	39	YO4BXX	52
19	EI7CC	525	40	UK3WAF	50
20	CT4MS	390	41	OH1UR	30
	SM5ALJ	390	42	OK3YK	26

BRITISH ISLES SSB RECEIVING			REST OF WORLD SSB RECEIVING		
Posn	Station	Points	Posn	Station	Points
1	BRS32525	40,915	4	BRS1066	5,985
2	BRS28198	13,640	5	BRS20249	5,800
3	BRS44395	6,000			

REST OF WORLD SSB RECEIVING

Posn	Station	Points	Posn	Station	Points
1	UB5-073-3135/UBV	4,185	3	UM8-034-1	1,200
2	UA9-154-5	2,430	4	JA6-9330	360

EUROPE SSB RECEIVING

Posn	Station	Points	Posn	Station	Points
1	UB5-066-181	10,005	9	UA6-150-994	1,395
2	Y2-18589-A	4,950	10	Y2-15127N	1,250
3	SP-3003-LG	2,915	11	Y2-6383A	1,200
4	UA3-160-845	2,700	12	Y2-EA-13112E	1,188
5	UA4-148-363	2,639	13	Y2-16835G	1,170
6	NL-4483	2,600	14	UA1-169-656	840
7	UB5-070-603	2,200	15	Y2-16870G	160
8	UA3-142-198	1,450			

Check logs: G2AJB, G4JVG/SMO, UK3ABT, Y23NL, Y3IWI/P, Y5ITG.

First 1.8MHz Contest 1983 results

Plenty of activity in noisy conditions was the main feature of the contest this year. Many contestants commented on the static interference, which was more reminiscent of the summer event, and with two other contests in full swing (PACC and OK SSB) a busy evening was ensured for all who took part. The British Isles entry was down from last year's total, but the overseas logs were the highest since that section was introduced in 1976, thanks largely to the number of entries received from USSR.

The clear leader and winner of the Somerset Trophy was R. Stone, GW3YDX, who achieved a record score, made from 185 contacts, which included 45 county and 22 country bonuses. His station used a TR7 transceiver to a dipole antenna. Joint runners-up were Al Slater, G3FXB, and Walt Davidson, GW3NYY. Al used a T4XC/R4C combination to a half-wave inverted-V at 55ft to make 166 contacts with 60 bonuses; Walt's station used a modified FT901DM to a 270ft long-wire at 200ft for his 160 contacts and 65 bonuses. William Strachan, GM3ZRT, won the Maitland Trophy, with an aggregate total of 998 points when combined with his score in the second 1.8MHz Contest 1982.

The leading first-time entrant was Phil Catterall, G4OBK, who narrowly beat G. Collins, G4DKG, after a double scrutiny.

Gunter Schwarzbek, DL1BU, had a comfortable lead over his nearest rival DJ3XK, to win the overseas section, in spite of not being able to operate between 1,835 and 1,850kHz.

The standard of logs was good except for one photocopy and one typed entry. Those who lost a large number of points should check for unmarked duplicates which carry a heavy penalty.

Comments with the logs were remarkably consistent in that they were satisfied with the method of scoring and the duration. Several entrants included duplicate check lists which were most helpful, and G3TXF also sent a graph showing his contact rate per quarter hour.

The committee thanks all those who sent in logs and hopes to see increased activity, especially from G, in future contests.

G3KKQ

UK SECTION

Posn	Callsign	Points	Posn	Callsign	Points
1	GW3YDX	884*	23	G3SWH	471†
2	G3FXB	794*	24	G4BXT	464
3	GW3NYY	759	25	G4KGG	461
4	G8UT(G3WUX)	733	26	G4ARI	459
5	G3SSQ(G3NKS)	717	27	GM4KGJ	448
6	G3XTJ	694	28	G4EBK	412
7	G3SXW	689	29	G4BOU	403
8	G3PDL	689	30	G4LAD	382
9	G3PEK	686	31	G4ONL/A	379†
10	G4BUO	683	32	G4CWH/P	375
11	G3SJJ	659	33	G2FNK	366
12	G4GIR	603	34	GM3OXC	363
13	G3TXF	569	35	G4PTP	336†
14	G4HMS(G3HZL)	567	36	G4ANH/A	306†
15	G3RSD	565	37	G3KSH	286
16	G3KXZ	543	38	G3BGM	283
17	G3KZR	540†	39	G3GMM	265
18	G4OBK	537*	40	G4KKZ	252
19	GM3ZRT	535†	41	G3AWR	244
20	G4DKG	508†	42	G3ZRZ	230
21	G4MBC(G4DRS)	482	43	G3AIO	162
22	G2MJ				



Walt Davidson, GW3NYY, a past winner of top band contests and always among the leaders, seen here keying his FT901DM with an "old faithful" Eddystone bug key. Photo: GW8TVX

OVERSEAS SECTION

Posn	Callsign	Points	Posn	Callsign	Points
1	DL1BU	469*	20	OK3CQA	140
2	DJ3XK	342*	21	OK1DEK	133
3	DK6PB	334*	22	UA3TGX	131
4	OZ1W	326*	23	RA9AKM	123*
5	OK3CZM	312*	24	UP2BKN	122
6	EZ2BAV	307*	25	UA3TGB	107
7	UR2REE	306*	26	UM8MAZ	94*
8	OL1BBR	257	27	UB5VK	90
9	OL4BDY	245	28	OK1KZ	75†
10	UB5PBA	200*	29	OK2BQU	74
11	ZB2EO	178*	30	LZ2RF	70*
12	UA3DFO	174*	31	OK2BTW	67
13	UA4HBW	170	32	OL8COS	62
14	UA3RLF	167	33	UC2LX	47*
15	HB9AQS	166*	34	OK1OPT	40
16	UB5WCQ	164	35	UA3TGY	32
17	F6HYR	161*	36	UP2BLF	24
18	UB5UGO	156	37	OK2BAS	8
19	UA3AGX	143			

Check logs received from: G3IGW; G3RBP; OK2BMU; UB5UKH; UD6DKW; UK3ABT; UK90AE.

*Certificate winners. †First-time entrants

1.8MHz Town and Country Contest 1983 results

This was a new contest which had been devised to provide a short inter-G phone contest with a certain degree of information exchange apart from the customary serial and signal report.

Well over 150 stations were active during the contest, and it was encouraging to hear many newly-licensed amateurs enjoying themselves. It was also interesting to hear the cw contest stations on phone, as well as some counties such as the Western Isles and the Highlands which are rarely found during the cw 1.8MHz contests.

The number of entries appears not to reflect the popularity of this contest, with the following comments being received: "Well done on the operating frequency restrictions"—G4BXT; "Amusing to hear the voices of many familiar 1.8MHz cw contest participants, perhaps we should exchange names as well!"—G3KZR; "Activity higher than expected"—G3SJJ; "Always welcome a contest with an swl section"—BRS44395; "Contest exchange needs tighter definition, with the use of three-letter codes rather than variable county names"—GW3YDX.

The winner this year is Ron Stone, GW3YDX, who made 158 contacts, with 54 counties. Second place goes to G4NUT/A, operated by G4BJM, with 134 contacts and 52 counties. Third came G3SJJ with 129 contacts and 48 counties. The standard of log-keeping was generally good, although four stations submitted logs with duplicates—and the subsequent penalty of loss of 10 times the claimed points!

Check logs received from G3XTJ and G4KNE are gratefully acknowledged by the contests committee.

G4DJX

TRANSMIT SECTION

Posn	Callsign	Score	Posn	Callsign	Score
1	GW3YDX	738*	16	G8RZ	374
2	G4NUT/A	626*	17	GM4PXX	333
3	G3SJJ	621*	18	G4MET	304
4	G4GIR	612	19	G4NDL	300
5	GU3HFN	610	20	G4RZP	298
6	G4JXS/A	573	21	G4BUO	295
7	G4MHF	529	22	G4LRV	295
8	G4OBK	517	23	G4FKI	288
9	G2MJ	497	24	GW4BLE	257
10	G3KZR	491	25	G4NMS	232
11	G4BXT	471	26	G3TSK	219
12	G4IQM/A	447	27	G6HC	215
13	G4FIT	444	28	G3ZRZ	200
14	G2FNK	425	29	G3CCZ	170
15	G3BPM	422	30	G3VLX	110

RECEIVE SECTION

Posn	Station	Score	Posn	Station	Score
1	BRS32525	427*	5	BRS20249	354
2	BRS48909	418*	6	BRS44000	353
3	BRS44395	364*	7	BRS1066	258
4	RS28198	363	8	ARS49070	185

(*Certificate winner)

432MHz Trophy Contest results

Once again 432MHz lived up to its well-established reputation of being a "gentleman's band". Conditions were not particularly good and several stations complained about severe QSB and the lack of Continental activity. Most contestants, however, appeared to enjoy the event.

Unlike recent 144MHz contests, it was not dominated by any significant geographical bias, and only one complaint was received about stations on the east coast failing to beam towards the UK dx. It is not clear, however, whether this was due primarily to Continental dx not being active or to propagation conditions being below average.

The signals radiated by stations were generally good and only one report of bad signals was acknowledged. Since this was reported to the station in question and immediate remedial action was taken, the deduction of penalty points was not even considered. (Those stations who just complain to the committee, demanding disqualification, please note!)

Log-keeping was of a higher standard than the committee have come to expect on 144MHz, although a few contestants did lose points through carelessness; particularly by omitting to record the /P for stations operating portable, and by discrepancies between the QTH as transmitted and as recorded on their 427 cover sheet.

Many regular and familiar callsigns were conspicuous by their absence and it is not immediately obvious if this was due to the date being

inconvenient or to a disillusionment with current trends more commonly associated with the more heavily populated bands.

This year the 1951 Council Cup goes to the South Bucks Contest Group who operated GW8TFI/P from a site near Newport, S Wales. G4BVY was the leading station in the single-operator section, and congratulations and certificates go to both stations.

G2HIF

SINGLE-OPERATOR SECTION

Posn	Callsign	Score	QTH loc	Best dx	Km	QSOs
1	G4BVY	542	YM79a	G4RFG/LX/P	628	90
2	G8FUO	493	ZL47b	DL2KBB	470	91
3	G8FEZ	366	AL56b	G4PEC/P	482	58
4	G6GMW/P	335	YO79c	G8AGU	353	58
5	G4RNL	321	YN47d	G8FEZ	344	56
6	G8PNN	294	ZP52d	G3SHK	477	36
7	G8KAX	211	AL32g	PA3BYI	363	61
8	G4DDL	188	ZL47f	G4PEC/P	433	46
9	G6CSY	181	AL51a	G8BQO/P	305	68
10	G4MUT	176	ZL46j	DB1DP	595	46
11	G3PBV	116	YK32b	G4PEC/P	518	10
12	G8CZZ	89	ZL38e	G4BOH/P	214	34
13	G4LPD	55	ZM05j	G8KQW/P	205	23

MULTI-OPERATOR SECTION

Posn	Callsign	Score	QTH loc	Best dx	Km	QSOs
1	GW8TFI/P	1,970	YL25j	DK8VS	752	197
2	G4LIP/P	1,496	AN61i	DB2VY	647	167
3	G4MRS/P	1,337	AM67f	DB2VY	516	159
4	G8KQW/P	1,096	AL53j	DG1BP	522	166
5	G4SIV	923	ZM29h	DF3EE	533	123
6	G4PEC/P	829	YP69c	PE1DCD	579	73
7	G4BOH/P	729	ZN53g	PA0CIS	430	127
8	G3JGL	531	YM58b	DL2KBB	642	81
9	G8BQO/P	483	YN38g	G8FEZ	353	78

Check log received with thanks from G2DHV.

G6JFN: Late entry, postmark 3 May 1983.

Station equipment

GW8TFI/P TX: Belcom LS707 + 2 x 4CX250B, 400W output
RX: Belcom LS707; AE: 4 x 16-el Yagis; Site, 1,550ft asl.
G4BVY TX: FT7 + MM trans + MM linear, 40W output
RX: DJ7VY + MM trans + FT7; AE: 2 x 21-el; Site 675ft asl.

1,296MHz Trophy Contest results

Conditions for this contest were very poor, nevertheless most entrants found the event enjoyable. As a result of the conditions the number entering was down on 1982, in the single-operator section nine instead of 16, and in the multi-operator section seven instead of nine. Another reason for the reduced entry was probably that the contest was held over bank holiday weekend. In addition, a number of stations were operating that did not enter the contest, which was a pity.

The first weekend of April is not an IARU Region 1 co-ordinated date so few Continentals were operational, although East Anglian stations did quite well with PA0s, including our good friend, Ari, PA0EZ.

Overall it was a worthwhile contest in spite of the weather conditions. G3TQF/P described conditions—"Snow and ice made our dish perform like an 'ice-tropic'"—enough said! The VHF Contests Committee Cup goes to G4HWA/P. In the single-operator section the winners and runners-up certificates go to GW4NBS/P and G8GTZ respectively.

G3FZL

MULTI-OPERATOR

Posn	Callsign	Points	QSOs	QRA	Best dx	Km	Power
1	G4HWA/P	4,921	32	AN61	G3GNR	387	150
2	G4MRS/P	3,972	31	AM67	PE1AKJ	337	200
3	G3TQF/P	3,766	37	AL56	G8FEZ	201	300
4	G3VER/P	958	17	ZM26	G3TQF/P	102	80
5	G6BSE/P	791	11	AM64	G3TQF/P	114	4
6	G6AWM/P	555	11	ZL60	G3TQF/P	164	1

SINGLE-OPERATOR

Posn	Callsign	Points	QSOs	QRA	Best dx	Km	Power
1	GW4NBS/P	3,475	21	YL25	G4MRS/P	301	1
2	G8GTZ	2,474	20	AM36	PA0EZ	281	100
3	G8GP	2,143	29	ZL50	GW4NBS/P	213	50
4	G8FEZ	2,001	21	AL56	G8GDZ	246	25
5	G8GDZ	1,981	17	ZM41	G8FEZ	245	35
6	G8DKK	1,683	23	AL56	G3DAH	126	50
7	G4NVA	1,609	15	ZN53	GW4NBS/P	208	1
8	G8FMK	1,060	15	ZL26	G4HWA/P	162	40
9	G8BHD	593	8	AL41	G4HWA/P	193	1
10	G8ZOB	542	9	ZM35	G4NVA/P	111	3
Unplaced (Rule 7b)	G8CTT	Radial	19	AL41	G3TQF/P	154	1

Score 39

432MHz Cumulative Contest rules

1930-2200gmt 7 October 1983

2030-2300gmt 23 October 1983

1930-2200gmt 8, 24 November 1983

2030-2300gmt 10 December 1983

The following general rules, published in the January 1983 issue of *Radio Communication*, will apply: 1, 2, 3, 4a, 5a, 6a, 7a, 9, 10a, 12a, 13-26.

One contact may be made with a given station (as defined in general rule 11a) during each activity period. Only three out of five activity periods will count towards the final score. However, all available logs should be sent to the adjudicator for the purpose of checking. To be eligible for an award an entrant must take part in a minimum of three activity periods. Serial numbers start at 001 for each activity period and advance by one for each contact.

All entries and checklogs to: VHF Contests Committee, c/o Dr D. A. Yorke, G4JLG, 40 Edge Fold Road, Worsley, Manchester M28 4QF.

Contests Calendar

2-3 July	Venezuelan (Phone) (Rules in July MOTA)
2-3 July	VHF NFD (Rules in April issue)
9-10 July	IARU Radiosport Championship (Rules in July MOTA)
10 July	DF Qualifying Event Salisbury (Details in June issue)
16-17 July	Columbian (Rules in July MOTA)
16-17 July	SEANET (CW) (Rules in July MOTA)
17 July	3.5MHz FD (Rules in June issue)
24 July	Bridgend & DARC Castles Competition (Rules in July issue)
30-31 July	Venezuelan (CW) (Rules in July MOTA)
31 July	432MHz Low Power (Rules in June issue)
31 July	DF Qualifying Event Mid-Thames (Details in July issue)
6-7 August	YO DX (Rules in July MOTA)
13-14 August	SEANET (Phone) (Rules in July MOTA)
14 August	70MHz Trophy & SWL (Rules in June issue)
21 August	DF Qualifying Event Slade
27-28 August	24th All Asian (CW) (Rules in June MOTA)
28 August	ROPOCO 2
3-4 September	144MHz Trophy & SWL (IARU) (Rules in June and July issues)
3-4 September	SSB Field Day (Rules in May issue)
10-11 September	Cray Valley RS 13th SWL
11-12 September	International ATV (Rules in May issue)
18 September	DF National Final South Manchester
October	432MHz Cumulative (Rules in July issue)
November	
1-2 October	432-24GHz & SWL (IARU) (Rules in June and July issues)
9 October	21-28MHz Phone (Rules in May issue)
16 October	21MHz CW (Rules in May issue)
16 October	1,296MHz Cumulative (Rules in July issue)
5-6 November	144MHz CW
6 November	LF CW (Rules in April issue)
12-13 November	Second 1.8MHz
4 December	144MHz Fixed

1,296MHz Cumulative Contest rules

1930-2200gmt 15 October 1983

2030-2300gmt 31 October 1983

1930-2200gmt 16 November 1983

2030-2300gmt 2, 18 December 1983

The following general rules, published in the January 1983 issue of *Radio Communication*, will apply: 1, 2, 3, 4a, 5a, 6a, 7a, 9, 10a, 13-26.

One contact may be made with a given station (as defined in general rule 11a) during each activity period. Only three out of five activity periods will count towards the final score. However, all available logs should be sent to the adjudicator for the purpose of checking. To be eligible for an award an entrant must take part in a minimum of three activity periods. Serial numbers start at 001 for each activity period and advance by one for each contact.

All entries and checklogs to: VHF Contests Committee, c/o B. J. Morton, G4HWA, 39 Green Lane, Blackwater, Hampshire GU17 9DG.

144MHz Trophy & SWL Contest rules

1400-1400gmt, 3-4 September 1983

The following general rules, published in the January 1983 issue of *Radio Communication*, will apply: 1, 2, 3, 4g, 5a, 6a, 7a, 9, 10a, 11a, 12b, 13-26. See also June 1983 *Radio Communication* for IARU rules.

If the concurrent IARU event is also being entered, please complete an extra cover sheet 427, and score contacts in accordance with rules 7a and 7b.

The Mitchell Milling Trophy will be awarded to the leading multi-operator station; the Thorogood Trophy to the leading single-operator station; and the GM4HAM Trophy to the leading Scottish station.

All entries and checklogs to: VHF Contests Committee, c/o J. H. Quarmby, G3XDY, 12 Chestnut Close, Rushmere St Andrew, Ipswich IP5 7ED.

RSGB UHF/SHF Contest rules

1400-1400gmt 1-2 October 1983

Bands: 432MHz to 24GHz

This contest is timed to coincide with the IARU Region 1 Contest. Each band will be tabulated individually and no multipliers will be used. Contestants wishing to have their logs forwarded to IARU should clearly state this on Form 4422. On 2-3GHz and above crossband contacts will count for half points. Crossband contacts must be clearly marked in the logs.

The following general rules, published in the January issue of *Radio Communication*, will apply: 1, 2, 3, 4g, 5a, 6a, 7b, 9, 10b, 11a, 12b, 13-26. All entries and checklogs to: VHF Contests Committee, c/o Mrs P. Suckling, G4KGC, 46 Windsor Close, Towcester, Northants NN12 7JB.

DF Qualifying Event Mid-Thames

Date: 31 July 1983

Map: OS Sheet 186, 1:50000 series, Aldershot and Guildford.

Assembly: 1300bst for start at 1320bst

Location: Car park to east of Blackbushe Airport, ngr 818591

Competitors requiring tea should notify Mr C. Plummer, 27a Thorn Lane, Four Marks, Nr Alton, Hants GU34 5XB, tel 0420 62839, home, or 0256 61211, Ext 2513, office, not later than 24 July 1983.

Bridgend & DARC Castles Competition

24 July, 10am-6pm.

All bands 1.8MHz-432MHz, all modes

The competition will form part of the celebrations for "International Communications Year", and in Wales, "The Year of the Castle".

One point per band per castle station. The highest scoring Welsh station will receive a prize from B&DARC. Any other station contacting five castles will receive a certificate of merit on receipt of an aae.

Details in full from Peter Lynn, GW4RMI, 38 Mervyn Way, Pencoed, Mid-Glamorgan.

Club News

The following is the latest information received by RRs from RSGB affiliated societies, clubs and groups in time for inclusion in this issue, plus basic unchanged information on other affiliated organizations which was last published in the January 1983 issue. Unchanged details will be published again in January 1984.

RSGB affiliated organizations are requested to report all programmes and news items to their regional representatives regularly. Information for inclusion in the September issue should reach them by 9 July and for the October issue by 20 August.

Club programmes are given in order of date, subject, time and place of the meeting. All callings 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 members.

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

Area representatives in Region 1

G. L. Adams	G3LEQ	Knutsford
E. C. Baines	G6CQZ	Bacup
A. M. Cooper	G3TKD	Chester
B. Donn	G3XSN	Liverpool
I. F. M. Duthie	G8TCJ	Carlisle
D. Fleet	G8MAI	Stoke-on-Trent
J. R. Fogg	G8UZZ	Wirral
F. Harrison	G3XII	Leyland
J. Heywood	G4IAL	Hazel Grove
N. Horrocks	G2CUZ	Ainsdale
N. Jenkin	G4CGT	Darwen
G. Lancelfield	G3DWQ	Walton-le-Dale
A. B. Langfield	G3IOA	Manchester
A. Leaver	G4ECB	Colne
R. J. B. Morgan	GD3KGC	Douglas
R. F. Redhead	G4FXG	Poulton-le-Fylde
E. A. Thorne	G3ART	Crosby, Nr Maryport
D. A. Yorke	G4JLG	Worsley

Accrington (North Western Repeater Group)—21 July, 8pm. Globe Bowling Club, Willows Lane, Accrington. Sec Howard Aspinall, G3RXH.

Ainsdale (AARC)—5, 19 July, 8pm. Ainsdale Scouts HQ. Details from sec John Wollaston, G6JOE, tel 0704 27219.

Barnoldswick (Rolls-Royce ARC)—First Wednesday in each month, except July, 8pm. Rolls-Royce Sports & Social Club, Barnoldswick. Sec Leslie Logan, G4ILG, tel 0282 812288.

Blackburn (East Lancs ARC)—5 July (Talk on satellites by a member of Amsat), 2 August (No meeting), 7.30pm. Shadsworth Leisure Centre, Blackburn. Pro Graham Pountain, G4MWY, tel 0254 678933.

Bolton (B & DARS)—Wednesdays, 8pm. Horwich Leisure Centre, Horwich. Pro Keith Pope, G6CGZ, tel 0204 62443.

Bolton (BTC ARC)—Details from sec, c/o Electronics Dept, Bolton Technical College, Manchester Road, Bolton.

Bolton (Edbro RC)—Details from A. L. Brown, c/o Edbro Ltd, Lever Street, Bolton.

Bolton (Norweb ARC)—Information from C. J. Moulding, G4HYG, c/o Sports & Social Club, Norweb Electricity, Manchester Road, Bolton BL3 2QN.

Bolton (Red Rose RS)—Details from sec Geoff Mollison, G8VCW, tel Bolton 21424.

Bury (BRS)—19 July (Surplus equipment sale), 26 July (Informal meeting). Note: there are no meetings this month on the 5 and 12 July. Newcomers are invited to contact sec Brian Tyldsley, G4TBT, (ex-G6OKE), 4 Colne Road, Burnley, tel 0282 24254. Pro Malcom Pritchard, G3VNU, tel 0706 355922.

Carlisle (Border Television ARC)—Details from sec, Border Television Ltd, Television Studios, Carlisle, Cumbria.

Chester (C & DRS)—Tuesdays except the first Tuesday in each month, 8pm. Chester RUFC, Hare Lane, Vicars Cross, Chester. Sec Chris Hopley, G8ICT.

Congleton (CARC)—Details from RS42758, 156 Holmes Chapel Road, Congleton, Cheshire CW12 4QB.

Crewe (South Cheshire ARS)—Second Monday

in each month. RAOB Social Club, Earle Street, Crewe. Sec B. G. F. Roe, G4LVR, tel 0270 665661.

Eccles (E&DRC)—Tuesdays, 8.30pm. White Swan, Worsley Road, Swinton. Clubs calls are G3GXI and G8GRI. President, Arnold Moss, G8VF; chairman/acting sec Chris Harrison, G8KRG, tel 061 797 0031.

Fylde (FARS)—5 July ("Computers in the home", a talk), 19 July (Informal meeting), 7.45pm. Kite Club, Blackpool Airport. Sec Wally Poupard, 14 Beach Street, Lytham, tel 0253 734596.

Isle of Man (IoMARS)—Mondays, 8pm. Keppel Hotel, Creg-Ny-Ba. Note the new sec is Mrs Anthea Matthewman, G4GWQ.

Leyland (LHARG)—11 July, 8 August, 7.30pm. Astley Park Sports Club, Hallgate, Astley Village, Chorley. Sec Arthur Jolly, G4JCO.

Liverpool (L & DARS)—5 July ("HF inquest", by Al Neilson, G4CVZ), 12 July ("Solidstate devices", by G. Andrews, G3DWW), 19 July (Subject to be announced), 26 July (Visit by the Regional Representative, G3FNM), 2 August (Natter night), 8.15pm. Note the Club has moved to temporary premises at the Childwall Community Centre, Hartsbourne Avenue, Childwall, Liverpool. Sec Gordon Purslow, G6MHG, tel 051-263 5837.

Liverpool (Riversdale ARS)—Details from sec, c/o Dept of Elect & Rad Engineering, Riversdale College of Technology, Liverpool L19 3QR.

Liverpool (Sefton ARC)—Alternate Wednesdays, 14, 28 July. Liverpool Prison Officers Social Club, Hornby Place, off Hornby Road, Walton, Liverpool. Sec Mike Webb, G6ICR, tel 051-487 0756.

Liverpool (UoLARS)—Informal meetings in the shack each lunch time at the top of the Old Union Building, 2 Bedford Street North, Liverpool 7. Sec Chris McGuire, G8XEB, c/o UoL Students Union.

Macclesfield (M & DRS)—Second and fourth Tuesdays in each month, 7.30pm. St Andrews Old School Hall, St Andrews Road, Brough Street West, Macclesfield. Sec Dave Lucas, G6HIQ, tel Macclesfield 28610.

Manchester (ICLR&ES)—Information from sec, c/o 4TB, International Computers Ltd, Wenlock Way, West Gorton, Manchester M12 5DR.

Manchester (M & DARS)—Wednesdays, 7.30pm. Newton Heath Community Centre, 203 Droydsden Road, Newton Heath, Manchester. Sec John Dent, G4LRR.

Manchester (MUARS)—Informal meetings most lunch-times and Wednesday afternoon in the shack on the first floor on the north side of the Students' Union Buildings. Sec c/o Amateur Radio Society, University Union Buildings, Oxford Road, Manchester M13 9PR.

Manchester (Openshaw TCRC)—Information from the college, Whitworth Street, Openshaw, Manchester M11 2WH.

Manchester (South Manchester RC)—8 July ("Samuel Morse", by Geoff Royle, G4FAS), 15 July (Mini lecture contest), 22 July ("Transistor power amps", by Trevor Hopkins, G8TYY), 29 July (HF night on the air), 8pm. Sale Moor Community Centre, Norris Road, Sale. Informal meetings Mondays in the club shack. Sec David Holland, G3WFT, tel 061-973 1837.

Manchester (UMIST RS)—During term time, Wednesday afternoons in the shack on L floor in the main building. Thursdays, 8pm, in the Union Bar. Contacts are Dave Crye, G6BSK, or Dave Brooke, G6GZH, c/o Shack, tel 061-236 3311, ext 2945, or c/o Radio Society, UMIST Union, Box 88, Sackville Street, Manchester M60 1QD.

Manchester (West Manchester RC)—Wednesdays, 8pm. Atherton & Tyldesley Scout HQ, Shuttle Street, Tyldesley. Sec Dennis Tennant, G4KCB.

Maryport (Solway RC)—The Education Settlement, Castle Hill, Maryport. Contact sec S. R. Miles, 6 Mill Street, Maryport, for dates and times of meetings.

Ormskirk (ORC)—Contact sec Kevin Higgins, G4IGX, 8 Delf Top, Greetby Hill, Ormskirk L39 2DX, tel Ormskirk 75546, for further information.

Penrith (Eden Valley RS)—Third Thursday in each month, 7.30pm. Two Lions Hotel, Great Dockray, Penrith, Cumbria. Club net 7pm, Thursdays, 3-650MHz. Sec Stuart Marsh, G4JHV, tel 0768 88260.

Preston (PARS)—6 July (Visit to Heysham Nuclear Power Station), 14 July (Fox hunt), meetings also on 7, 21 July, 4 August. Lonsdale Club, Fulwood Hall Lane, Fulwood, Preston. Contact George Earnshaw, G3ZXC, for details tel 0772 718175.

Rossendale (Rossendale Valley ARC)—Wednesdays, 8pm. 4 Bacup Road, Rawtenstall. Sec Mrs Celia Adams, G6GZM, tel 0706 220935.

St Helens (StH & DARC)—Thursdays, 7.45pm. Conservative Rooms, Boundary Road, St Helens. Pro Alan Manchester, G6FJU, tel 0744 56889.

Salford (Dial House RS)—Wednesdays, 5.30pm. Dial House, 21 Chapel Street, Salford. Details from sec, Manchester Central Area Sports & Social Club, c/o M43, Dial House.

Salford (UoSCS)—Wednesday afternoons from 1.30pm. Shack on the top floor of the Clocktower, The Pavilion, Castle Irwell Students Village. Contact Paul Wells, G4GMV, c/o SUCS, Students Union, University of Salford, University Road, Salford M5 4WT.

Skelsmersdale (S & DARC)—Thursdays, 8.30pm. Dunlop Sports & Social Club, (near the football ground), Skelsmersdale. Sec Joe Singleton, RS47778, 3 Willows Drive, Skelsmersdale, tel 0695 22242.

Stockport (SRS)—Second and fourth Wednesdays in each month, 8pm. Blossoms Hotel, corner of Bramhall Lane and Wellington Road, Stockport. Sec Stan Aspinall, G3VSA, tel 061-437 1437.

Tarporley (Mid-Cheshire ARS)—Wednesdays, 8pm. Cotebrook Village Hall, Sadlers Lane, off the A49, Tarporley. Sec Rick Dodd, G8PNL, tel Winsford 57766.

Thornton Cleveleys (TCARS)—4 July ("Ordnance survey", a talk by Mr R. Trotter), 11 July (Visit by the Regional Representative, G3FNM), 18, 25 July, 7.30pm. Norbreck 1st Scout Hut, Carr Road, Bispham. Details from sec Mrs Jen Ward, G8YOK, tel 0253 890114.

Wallasey (St Dunstan's ARS)—Information from E. C. John, G3SEJ, 52 Broadway Avenue, Wallasey, Merseyside L45 6TD.

Warrington (Racal Communication RS)—Information from sec, c/o Racal Communications Ltd, Chesford Grange, Warrington, Cheshire W81 4RH.

Warrington (UK FM Group Western)—7 July, 4 August. Grappenhall Community Centre, Bellhouse Lane, Warrington. Sec Gordon Adams, G3LEQ, tel 0565 4040.

Warrington (WARC)—5 July ("Intermodulation distortion", by B. Green, G8HLZ), 12 July ("The G3OGQ transceiver", by G. Fare, G3OGQ), 19 July (Beginners' night), 26 July ("ATUs for the hf bands", by B. Sparks, G8FXB), 2 August

Members of Salford University ARS operating club station G4GSU during a contest on 5 December 1982. L to R: G8VGM, G4OPC, G6NNA and G6DTM. Photo by G4JBF



("Working dx with 2m", by E. Ged, G8XVJ), 7.30pm. Grappenhall Community Centre, Bellhouse Lane, Warrington. Sec Bill Green, G8HLZ, tel 0925 814740.

Warrington (10th Warrington Scout Group ARC)—Information from sec, c/o 41 Highfield Avenue, Great Sankey, Warrington, Cheshire WA5 2TW.

Wigan (Douglas Valley ARS)—Thursdays except the second in each month. Shevington Conservative Club, Shevington, Wigan. Sec Dave Harrison, G4NDJ.

Wigan (WCTARC)—Information from J. R. Hesford, Dept of Electrical Engineering, Wigan College of Technology, Parsons Walk, Wigan WN1 1RR.

Wirral (WARS)—6 July (Sale of surplus equipment), 20 July (Trouble shooting micro-processors), 2 August (No meeting), 7.45pm. Minto House School, Birkenhead Road, Meols, Birkenhead. Sec Cedric Cawthorne, G4KFY, tel 051-625 7311.

Wirral (W & DARS)—13 July (Visit of the Regional Representative, G3FNM), 27 July (DF revenge), 10 August (Junk sale), 8pm. Irby Cricket Club, Irby Mill Road, Irby. Sec Gerry Scott, G8TRY, tel 051-630 1393.

Woodford (RATEC)—Mondays, 8pm. The British Legion, Moor Lane, Woodford, Cheshire. Sec Bob Marsh, G8TYH, tel 061-439 1422.

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

Area representatives in Region 2

S. A. Berry	G4IWR	Hull
P. N. Butterfield	G4AAQ	Pontefract
K. R. Cass	G3WVO	York
K. M. Cleary	G4ATZ	Wetherby
J. Clegg	G3FQH	Huddersfield
B. Crisp, MA FRSA	G5PWF	Cleckheaton
I. R. Firth	G3WWF	Leeds
J. R. Simpson	G3CAA	Scarborough
M. J. Topham	G8NUC	Bradford

Barnsley (B&DARS)—Mondays, 7.30pm. The Warren, Warren Quarry Lane, off Park Road, Barnsley. Sec G4JKW.

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

Denby Dale (DD&DARS)—Second and fourth Wednesday in each month, 13 July (G5RV), 20 July (Visit to Moorside Edge Station), 27 July (G4DAX, RR2), 7.30pm. Pie Hall, Denby Dale. Sec J. Clegg, G3FOH.

Doncaster (DMiofHEARC)—Mondays, 8pm. Gertrude Bell Hall, Church Street, Armthorpe, Doncaster. Sec Brian Coupe, G8GTG, tel Don, 770663. Club call is G3UER.

Goole (G&DARS)—Mondays, 12 July (Outside operating), 8pm. The Junior Chamber Buildings, Boothferry Road, Goole. Sec Richard Sugden, G8IOH, Details, G8IOH or G8VHL.

Halifax (Northern Heights ARS)—First and third Wednesday in each month, 13 July (Junk sale), 27 July ("Interference", by G4DXA), 7 September (Lowe Electronics), 8pm. Bradshaw Tavern, Bradshaw, Halifax. Sec G6CJL, tel Bradford 834442. Club net frequency is 145-275MHz.

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

Harrogate Repeater Group—Chairman G4ATZ.

Hornsea (HARS)—Wednesdays, 8pm. The Mill, Mill House, Atwick Road, Hornsea. Sec M. Willerby, G4MWE.

Hull (H&DARS)—Fridays, 8pm. RAE classes are held at 7pm, Tuesdays and Thursdays, West Park Recreation Centre, Walton Street, Hull. Sec G6UOM, 85 Albert Avenue, Anlaby Road, Hull HU3 6PG.

Hull (HUR&ES)—Tuesdays, 1.15pm. Room 313B, University Union Building, Cottingham Road. Details from G4KWZ or G4ECP, c/o Hull Students' Union.

Leconfield (Army School of Mechanical Transport, ASMT/RTARS)—Fridays, 7pm, and coffee at lunch times. Signals Division, Normandy Barracks, Leconfield. CW classes, 7pm, Fridays. Sec G4NQL, address as above.

Leeds (British Young Ladies Amateur Radio Association)—Sec G4EZI, Mrs D. Hughes, 3 Primley Park Crescent, Leeds LS17 7HY.

Leeds (White Rose RS)—Wednesdays, 8pm. Moortown Rugby Football Club, Moss Valley, Alwoodly, Leeds 17. Club net, 8pm. Thursdays,

3-775MHz, or 21-35MHz, depending on propagation. Sec G6HBY, tel 0532 576887, pro G4OAT.

Leeds (L&DARS)—Mondays, 8pm. Old Hall Golf Club, Woodhall Lane, Calverly, Leeds. Sec G6CJL, tel Dewsbury 455516.

Mexborough (M&DARS)—Fridays, 8pm. Harrop Hall, Dolcliffe Road, Mexborough. Sec Mrs G. Drohan, 5 Swinburn Avenue, Adwick-le-Street, Doncaster.

Otley (OR&ES)—Tuesdays, 8pm. Back of Court-house Street, Otley. Sec Jack Annakin, G4KDV, tel 0943 463083.

Pontefract (P&DARS)—Sec G6PEX.

Ripon (R&DARS)—Thursdays, 7pm. St John Ambulance Hall, Ripon. Sec G6CUG, tel 0845 24945. Club call G4SJM.

Scarborough (SARS)—Mondays, 7.30pm. Scarborough Cricket Club, North Marine Road, Scarborough. Sec G6CXX.

Sheffield (SARS)—First and second Monday in each month. Firth Park Pavilion, third Monday (Informal). Sheaf House Hotel, Bramell Lane, Sheffield. Sec G8VQS, tel 0246 31696.

Spenn Valley (SVARS)—Thursdays, 8pm. Old Bank Working Men's Club, Mirfield, W Yorks. Sec G4MNV.

UK FM Group Northern—3 July, 7 August, 7.30pm. The Royal Hotel, Church Street, Barnsley. Sec G4LUE.

Wakefield (NWRC)—Thursdays, 7 July (Radio and air navigation), 4 August (Farnel Components rep), 7.45pm. Carr Gate Working Man's Club, Wakefield. Sec G4RCH, tel 0532 536633.

Wakefield (W&DARS)—12 July (On air/natter night), 26 July (Car treasure hunt), 8pm. Holmfild House, Denby Dale Road, Wakefield. Sec G8BPE, tel Wakefield 378727.

Wharfedale Repeater Group—Sec G3KKP.

York (YARS)—Fridays, 7.30pm. United Services Club, Micklegate, York. Sec Keith Cass, G3WVO.

Halfway through the year already, and a lot of rallies over. Winter projects coming to mind and some clubs preparing programmes following the summer break. Don't forget that apart from visits from the RR to explain the running of the Society, headquarters can help with programme items such as films/videos etc.

Once again we have the six-monthly complete list of clubs and groups in the region. If your details are not correct please let me know so that my records can be updated.

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

Area representatives in Region 3

W. F. M. Hahn	G3UOL	Coventry
J. K. Harvey	G4IVJ	Birmingham
S. H. Jesson	G4CNY	Hereford
B. A. Jones	G8ASO	Worcester

Atherstone (AARC)—Second and third Thursdays in each month, 14 July ("VHF then and now", VHF, uhf awards system", by G5UM), 21 July (Informal), 7.30pm. Tudor Centre, Coleshill Road, Atherstone. Sec G6IQM, tel Fillongley (0676) 40946.

Birmingham (Midland ARS)—19 July ("Recording methods", by Bob, G4KVC), 7.30pm. 294a Broad Street, Birmingham B1 2DS. Sec G8BHE, tel 021-422 9787.

Birmingham (Slade RS)—First Friday in each month, 7.45pm. Kingsbury Road Community Centre, 75 Kingsbury Road, Erdington, Birmingham B24 8QH. Sec G4GFG, tel 021-770 3474.

Birmingham (South Birmingham RS)—6 July (Surplus sale), 7.45pm. 10 July (Droitwich Rally, club will have a stand there). Thursdays (HF night on the air); Fridays (Construction and Morse classes), 7.30pm. Hampstead House, Fairfax Road, West Heath, Birmingham B31 3QY. Sec G8RGQ, tel 021-459 8312.

Birmingham (University of Aston ARS)—Society active on hf, vhf and uhf. Club rigs available. Callsigns G3UOA and G8PGM. Meets Fresher Fayre, 1pm. Chairman M. Beach, St Peters College, College Road, Birmingham B3 3TE.

Birmingham (UoBARS)—Clubroom gatherings lunchtimes during term, also Fridays, 7.30pm. Second floor, Students Union (above shop). Sec Dave Thomas, G4HHJ.

Bromsgrove (B&DARC)—Fridays, 8 July (To be announced), 8pm. Avoncroft Art Centre, Bromsgrove. Sec G4NWQ, tel 021-476 9665.

Burton-on-Trent (B-on-T&DARS)—Wednesdays, 8pm. Stapenhill Institute, Main Street, Stapenhill,

Burton-on-Trent. Sec G3ACR, tel Burton (0283) 43118.

Cannock Chase (CCARS)—Thursdays, 8pm. Bridgtown War Memorial Club, Union Street, Bridgtown, Cannock Chase. Sec G8HJP, tel Cheslyn Hay (0922) 416419.

Coventry (CARS)—Fridays, 8pm. Baden Powell House, 121 St Nicholas Street, Radford, Coventry. Sec G4HRY, tel Coventry (0203) 618648.

Coventry (CTARS)—Mondays, 7.30pm. Winfray Annexe, Coventry Technical College. Sec G8MFP, tel Coventry (0203) 542877.

Droitwich (DARC)—First Monday in each month, 8.30pm. Scout HQ, Station Road, Droitwich. Sec G4HFP, tel Stourport-on-Severn (02993) 3818.

Dudley (RARC)—Second and fourth Tuesdays in each month, 7.45pm. Central Library, Dudley. Sec G4NRA, tel Kingswinford (0384) 278300.

Halesowen (Midland Electricity Sports & Social Club—Radio Section)—Newly affiliated. Second and fourth Tuesdays in each month, 8pm. Club also open to non-MEB staff. Short net on MH repeater (2m) Monday prior to club meetings. MEBHQ Social Club, Mucklow Hill, Halesowen. Sec G4RWH, tel 021-747 8784.

Hereford (HARS)—1 July ("A new approach to direction finding", by G4HHJ), 8pm. Lord Scudamore School, Friar Street, Hereford. 15 July (Informal club meeting at Antelope Inn, Barton Road, Hereford), 8pm. Sec G4CNY, tel Hereford (0432) 273237.

Kidderminster (K&DARC)—2 and 3 July (VHF NFD, Clee Hill), 5 July ("HF night on the air—G4GXP"), 19 July ("VHF on the air—G6KRC"), 8pm. Aggborough Community Centre, Hoo Road, Kidderminster. Sec G8WVOX, tel Kidderminster (0562) 61584.

Lichfield (Lichfield Chad RC)—Mondays, 8.30pm. Naval Club, Burton Old Road, Lichfield. Sec G4ESK, tel Lichfield (54) 23919.

Malvern Hills (MHRAC)—Second Tuesday in each month. Morse classes prior to meetings, 7.30pm. Red Lion Inn, St Anns Road, Malvern. Sec G4GFX, tel Malvern (06845) 62900.

Much Wenlock (Wenlock ARS)—Second and fourth Monday in each month, 8.30pm. Raven Hotel, Much Wenlock. Sec G3ZSL, tel Bridgnorth (0746) 861332.

Redditch (RRC)—Second and fourth Thursday in each month, 8pm. WRVS Centre, Ludlow Road, Redditch. 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)—Thursdays, 8pm. Albert Hotel, Smithfield Road, Shrewsbury. Sec G3UQH, tel Shrewsbury (0743) 83375.

Solihull (SARS)—19 July ("Raynet—current developments", by G8CQH), 7.30pm. Manor House, High Street, Solihull. Sec Nigel, G4NRR, tel 021-707 3684.

Stoke-on-Trent (North Staffs ARS)—Mondays, 7.30pm. Harold Clowes Community Centre, off Dawlish Road, Bentilee, Stoke-on-Trent. Sec Kevin Balch, G8FGR.

Stoke-on-Trent (SontARS)—Thursdays, 7.30pm. 2a Racecourse Road, Oakhill Road, Stoke-on-Trent. Sec G4IMV, tel Newcastle (0782) 613207.

Stourbridge (STARS)—4 July (Informal meeting), 18 July (Subject to be announced), 8pm. The Garibaldi, Cross Street, Stourbridge. Sec G8JTL, tel Lye (593) 4019.

Stratford-upon-Avon (S-upon-A&DARC)—11 and 25 July (To be announced). The Control Tower, Bearley Radio Station, Bearley, Nr Stratford. Sec G8HJS, tel Stratford (0789) 295257.

Sutton Coldfield (SCARS)—Second and fourth Monday in each month, (Lectures etc), 11 and 25 July (To be advised). Central Library, Sutton Coldfield. Sec G8TUR, tel 021-353 2061.

Tamworth (TARS)—Second Monday in each month, 13 July ("Equipment on offer", by Keith from "New Idea"). The Rugby Club, Cotton Green, Tamworth. Sec G4BKA, tel Tamworth (0827) 283952.

Telford (T&DARS)—2 and 3 July (VHF Field Day from the Wrekin, co-ordinator, G4IUT). Phoenix Centre, Webb Crescent, Dawley. Sec G8UGL, tel Telford (0952) 584173.

Walsall (WARC)—Wednesdays, 8pm. Regular Morse practice evenings. Forest Community Centre, Haulbush Road, Leamore, Bloxwich. Sec Bob, G4FAJ, tel Brownhills (05433) 2169.

Warwick (Mid-Warwickshire ARS)—First and third Tuesday in each month, 8pm. 61 Embscot Road, Warwick. Sec Mrs Finnis, G6LKP, tel Southam (092681) 4765.

Willenhall (W&DARS)—Alternate Wednesdays,

8pm. Saracens Head Public House, Bloxwich Road South, Willenhall. Sec David, G4FAQ, tel Wolverhampton (0902) 730300.

Wolverhampton (WARS)—Mondays, 8pm. Wolverhampton Chamber of Commerce & Industry, 93 Tattenhall Road, Wolverhampton WV3 9PE. Sec David, G6AKN, tel Wolverhampton (0902) 782883.
Worcester (W&DARC)—2 and 3 July (VHF Field Day), 4 July (Club meeting for rally preparations), 9 July (Final preparations for rally, 2pm), 10 July (Droitwich Radio Rally at Droitwich High School), 18 July (Informal meeting at Old Pheasant, New Street, Worcester). Sec G4NRD, tel Evesham (0386) 41508.

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

Area representatives in Region 4

B. Bennett	G3EAM	Lincoln
J. C. Burbanks	G3SJJ	Nottingham
A. W. Faint	G6GWH	Leicester
A. R. Kiddle	G4HVC	Newark
D. H. Lander	G4LQL	Mansfield
J. Shardlow (Mrs)	G4EYM	Derby
J. A. Sheardown	G8TIY	Scunthorpe
B. Thompson	G4KAL	Grimsby

Bolsover (BARS)—Wednesdays, 8pm. The Angel Hotel, Bolsover. Sec. David Brocklehurst, G8KIF, tel Chesterfield 811666.

Bourne (BARS)—First and third Tuesday in each month, 7.30pm. Village Hall, Edenham. Sec Ian Bothwell, G6SBE, tel Bourne 424426.

Buxton (BARS)—12 July ("Getting started on 10GHz", by G8PHO and G8AGN). Egerton Hotel, 36 St Johns Road, Buxton. Sec Derek Carson, G4IHO, tel Buxton (0298) 5006.

Derby (D&DARS)—Wednesdays, 6 July (Junk sale), 13 July ("Out of court", by Bob Eccles), 20 July (Radio control), 27 July (2m direction finding practice), 7.30pm, 119 Green Lane, Derby. Sec Jenny Shardlow, G4EYM, tel Derby 556875.

Derby (NHARG)—Fridays, 7.45pm. Nunsfield House, Boulton Lane, Alvaston, Derby. Sec Ian Cate, G4CTZ, tel Derby 799452.

Eastwood (Notts & Derby Border ARC)—Tuesdays, 7.30pm. Hand-on-Heart, Cotmanhay, Sec Peter Fretwell, G6DXL.

Grantham (GRC)—19 July (Chat night), 8pm. Shirley Croft Hotel, Harrowby Road, Grantham. Sec John Kirtan, G8WWJ, tel Grantham 5743.

Grimsby (GARS)—14 July (Visit), 21 July (DF hunt), 28 July (Amateur radio for beginners), 7.30pm. Cromwell Social Club, Cromwell Road, Grimsby. Sec Reg Scarlett, G4HZF.

Hearon (SE Derbyshire ARS)—Tuesdays, 7.30pm. South East Derbyshire College, Ilkeston Road, Hearon. Sec S. Cope, G6ETO, tel Langley Mill 3753.

Hinckley (HARES)—Wednesdays, 7.30pm. John Cleveland College, Butts Lane, Hinckley. Sec Tony Chamberlain, G6HQT, tel Leicester 870137.

Ibstock (IARS)—5 July (Computer talk), 12 July (Summer junk sale), 19 July (Talk, tba), 26 July (DF hunt and supper), 7.30pm. Hastings Arms, Ibstock. Sec Ted Bowen, G4JKQ, tel Ibstock 60396.

Leicester (Leicester Repeater Group)—Sec Geoff Dover, G4AFJ, tel Nottingham 875200.

Leicester (LRS)—Mondays, 7.30pm. Sundays 10.30am. Gilroes Cottage, off Groby Road. Leicester. Sec Frank Elliot, G4PDZ, tel Leicester 871086.

Loughborough (L Falcon ARC)—Fridays, 8pm. Brush Sports & Social Club, Fennel Street, Loughborough. Sec Peter Crooks, G4KGG, tel Loughborough 268561.

Louth (L&DARS)—First Wednesday in each month, 7.30pm. Church Rooms, Eastgate, Louth. Sec Chuck Turner, G8ZVF, tel Grimsby 822482.

Lincoln (LSWC)—7 July (Visit to Lincolnshire Standard Group Printing Works), 13 July ("Electricity distribution", talk by EMEB), 27 July ("Video" by G6AJL), 8pm. City Engineers Club, Waterside South, Lincoln. Sec Pam Rose, G4STO, tel Gainsborough 788356.

Mansfield (MARS)—First Friday and third Tuesday in each month. Victoria Social Club, Princes Street, Mansfield. Sec Graham Ridgeway, G8UYD, tel Mansfield 652093.

Melton Mowbray (MMARS)—Third Friday in each month, 7.30pm. St John Ambulance Hall, Asfordby Hill, Melton Mowbray. Sec Richard Winters, G3NVK, tel Melton Mowbray 63369.

Newark (N&DARS)—7 July (DF hunt, first transmission 7.30pm). Palace Theatre, Appleton Gate, Newark. Sec Roger Hiscock, G4MDV.

Nottingham (ARCON)—7 July (Forum and



Cliff, G4PZK, answering questions during a lecture at the Chiltern ARC

beginners' quiz), 14 July (Preparation for exhibition station at Henry Mellish School), 21 July (Foxhunt), 28 July (Talk, tba), 7.30pm. Sherwood Community Centre, Woodthorpe House, Mansfield Road, Nottingham. Sec Phil Barber, G4OSL.
Scunthorpe (SARC)—Tuesdays, 7.30pm. Grange Farm Hobbies Centre, Franklin Crescent, Scunthorpe. Sec Joe Sheardown, G8TIY, tel Scunthorpe 732438.

Skegness (S&DARS)—First and third Thursday in each month, 7.30pm. The White Swan, Burgh-le-Marsh, Skegness. Sec Clive Ironmonger, G6HYF.

Spalding (S&DARC)—Second Friday in each month, 8 July (144MHz df contest), 8pm. Maple Room, 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, tel Market Harborough 62827.

REGION 5—RR J. S. Allen, G3DOT, 77 Rosslyn Crescent, Luton LU3 2AT. Tel 0582 508515, or at work, 0582 21151, ext 700.

Area representatives in Region 5

L. Critchley	G3EEL	Peterborough
C. M. Goadby	G8HVV	Bottisham

Bedford (B&DARC)—Wednesdays. The club-house, Ravensden (three miles north-west of Bedford). Informal meetings at RAFA Club, Bedford (opposite railway station). The club may take part in VHF NFD. Sec Jane Ferguson, G6JJT.

Cambridge (C&DARC)—Fridays during term-time, 1, 15 July (Talks have been planned), 8, 22 July (Informal). Visual Aids Room, Ground Floor, Coleridge Community College, Radegund Road, off Coleridge Road, Cambridge. Sec Dave Leary, G8JKV, tel Swavesey 31120.

Cambridge (CUARS)—Mondays during term-time (Informal). St Johns Buttery Bar. Sec T. J. Gleeson, G8TUG.

Corby (C&DARG)—Fridays (Informal), 8pm. Hightrees Scout Centre, The Nook, Corby. Sec P. Richardson, G8MLA.

Dunstable Downs (DDRC)—1 July (VHF NFD discussion), 10 July (Visit to Nene Valley Railway), 18 July (DF hunt), 29 July (Woburn talk-in planning evening), 8pm. Chews House, Dunstable High Street. Chairman Clive, G4ENB; sec G8XTW.

Leighton Linslade (LLRC)—Mondays, 4, 18 July (Informal), 7–10pm. Vandyke Community College, Room A64, Vandyke Road, Leighton Buzzard. 31 July (Fun df hunt). Sec Pete Brazier, G6JFN, tel Heath & Reach 270.

Luton (Kent Process Controls ARC)—First Wednesday in each month. KPC Club House, Tenby Drive, Luton. Only open to employees of Brown Boveri or Brown Boveri Kent. Sec G3DOT.

March (M&DARC)—Thursdays, 2 Grays Lane, March. Sec V. Cracknell, G4KPZ.

Northampton (NRC)—Thursdays, 8pm. Kings-thorpe Community Centre. Sec G3VMU, tel Northampton 28516.

Peterborough (GPARG)—Fourth Thursday in each month, 21 July (Talk, to be arranged), 7.30pm. Southfields Junior School. Sec Frank Brisley, G4NRJ.

Peterborough (PR&ES)—Fortnightly. Peterborough College of Adult Education. Further details from sec D. Wilson, G4KSW.

Shefford (S&DRS)—Thursdays, 7 July (VHF NFD debriefing, followed by contest slide show by G4DRS and G4JQL), 14 July (Junk sale), 21 July (Planning for the Henlow Fete), 28 July (Planning for SSB NFD), 8pm. Church Hall, Shefford, Beds. Sec Alan, G4PSO.

St Neots (StN&DARS)—Alternate Mondays, 8pm. Horseshoe Inn, Offord Darcy, nr Huntingdon. The club will take part in VHF NFD. Chairman Ron Oakley, G8GRT; sec Steve Foote, G4FOH.

Wellingborough (Nene Valley RC)—6 July (Natter night), 13 July ("WAB Award Scheme and 160m operating", by G3ONT), 20 July (Natter night), 22 July (Visit to Northamptonshire Police HQ), 27 July ("Microcomputers—an insight", by G4NWH), 8pm. The Dolben Arms, Finedon. Sec Lionel Parker, G4PLJ, tel Wellingborough 79539.

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

Area representative in Region 6

C. Sharpe	G2HIF	Wantage
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Amersham (Forest Glade DX Group)—Details c/o 100 Chestnut Lane, Amersham, Bucks HP6 6EE.

Aylesbury Vale (AVRG)—Details c/o 26 Finmere Crescent, Aylesbury, Bucks HP21 7DG.

Aylesbury (AVRS)—9 August (Lecturer Stan Cook, G5XB, talks on "Intruder Watch"), 8pm. Stone Village Hall, Stone, nr Aylesbury. Details from sec Cathy Clark, tel 0844 51461.

Banbury Vale (BARS)—Details c/o 64 Mascord Road, Banbury, Oxon OX16 0NB.

Bracknell (BARC)—Details c/o 8 Toll Gardens, Bracknell, Berks.

Bracknell (Sperry Gyroscope ARS)—Details c/o Sports & Social Club, Downshire Way, Bracknell, Berks RG12 1QL.

Chesham (C&DRS)—Contact John Alldridge, G6LKS, 15 Whicote Gardens, Chesham, tel Chesham 786935.

Didcot (Rutherford Labs RC)—Details c/o J. D. Gilbert, Bldg R25, Chilcot, Didcot, Oxon OX11 0QX.

Farnham VHF Group—Details c/o 31 Pigott Road, Wokingham, Berks RG11 1PZ.

Harwell (HARS)—Contact area rep Cliff Sharpe, G2HIF, tel Wantage 3497.

High Wycombe (Chiltern ARS)—Second Wednesday (Informal), 7.30pm. Last Wednesday (Formal), 7.30 for 8pm. Science Block, Sir William Ramsay School, Rose Avenue, Hazlemere, High Wycombe. The club runs a double tutorial on morse code and theory: Mondays (cw), 8pm.

Tuesdays (theory), 8pm. RAE classes started in June. Details from G4PGZ or G3NCL. Details from sec G3NCL, tel High Wycombe 712020.

High Wycombe (Mid-Thames DFC)—Details c/o Lowfield House, Bolter End Lane, High Wycombe.

Langley (LCARS)—Details c/o Station Road, Langley, Berks SL6 7UF.

Maidenhead (Home Counties ATG)—Details c/o 33 Switchback Road North, Maidenhead, Berks SL6 7UF.

Milton Keynes (MK&DRS)—Sec Dave White, G3ZPA, tel Milton Keynes 501310.

Milton Keynes (Robson Nats Cote Apprentice Technical Club)—Details c/o Bletchley Park, Milton Keynes MK3 6EF.

Newbury (N&DARS)—12 July (DF hunt), August (No meeting). Please note new sec Mike Fereday, G3VOW, tel Newbury 43048.
Oxford (O&DARS)—Details c/o Rush Common House, Porchester Crescent, Abingdon, Oxon.
Oxford (OURS)—Details c/o 62 Banbury Road, Oxford OX2 6PN.
Reading (Ariel RG)—Details c/o 57 St John's Road, Caversham, Reading RG4 0AL.
Reading (R&DARS)—Details c/o Chris Young, G4CCC, tel Reading 471761.
Reading (Racal S&S Club)—Details c/o PO Box 112, Reading RG2 0QL.
Slough (Burnham Beeches RC)—First and second Monday in each month, 8pm. St John Ambulance HQ, Burlington Avenue, Slough. Sec Tony Alderman, G4LQD.
Slough (McMichael ARC)—Details c/o J. Parry, McMichael Ltd, Slough, Bucks SL2 5EL.
Slough (S Bucks Contest Group)—Details c/o 47 Severn Crescent, Langley, Slough SL3 3UU.
Vale of the White Horse (VWHARS)—5 July (AGM). Details from sec G3SEK, tel 0235 31559.

REGION 7—RR to be appointed

Addiscombe (AARC)—Tuesdays (Informal), 9pm. The Woolsack, 154 Gloucester Road, Selhurst, Croydon. Sec Peter Hart, G3SIX, tel 01-656 9054.
Ashford (Echelford ARC)—Second Monday and last Thursday in each month, 8pm. The Hall, St Martin's Court, Kingston Crescent, Ashford, Middx. Sec Anton Matthews, G3VFB, tel 01-892 2229.
Bexleyheath (North Kent RS)—First and third Tuesdays in each month, 8pm. Pop-in Parlour, Graham Road, Bexleyheath, Kent. Details from sec J. R. Frampton, G6CUE, tel 01-309 7214.
Biggin Hill (BHARS)—Last Tuesday in each month, 8pm. Biggin Hill Memorial Library. Sec Ian Mitchell, G4NSD, tel Biggin Hill 75785.
Coulsdon (CATS)—Second Monday in each month, 7.30pm. St Swithun's Church Hall, Grovelands Road, Purley, Surrey. Sec A. R. Bartle, tel 01-684 0610.
Cray Valley (CVRS)—First and third Thursday in each month, 8pm. Christchurch Centre, Eltham High Street, Eltham SE9. Sec Peter Clark, G4FUG.
Croydon (Surrey Radio Contact Club)—First and third Monday in each month, 8pm. TS Terra Nova, 34 The Waldrons, Croydon. Sec Ray Howells, G4FFY, tel 01-642 9871. The second meeting in each month is an informal discussion with an opportunity to practice cw.
Crystal Palace (CP&DRC)—16 July ("UHF operating"—talk and demonstration of a home-built 432MHz transverter and equipment for 1,296 and 2,320MHz, followed by discussion, by Alan Bellfield, G4GLN). All Saints Parish Church Rooms, Upper Norwood, London SE19 (opposite the IBA tv transmitting mast). Details from G. Stone, G3FZL, tel 01-699 6940.
Guildford (G&DRS)—Second and fourth Friday in each month, 8pm. Model Engineers HQ, Stoke Park, Guildford. Sec Helen Mullenger, G8SXB, tel Aldershot 20384.
Guildford (UHF Repeater Group)—First Thursday in each month, 8.45pm. Anchor & Horseshoe, Burpham, Guildford. Details from Roger Taylor,

G4HZA, 6 High Street, Chobham, Woking, Surrey, tel Chobham 7552.
Kingston (K&DARS)—Third Wednesday in each month, 8pm. Alfriston, 3 Berrylands Road, Surbiton. Sec Brian Smythe, tel Epsom 26005.
New Cross (Clifton ARS)—Fridays, 8pm. Above the New Cross Inn, Clifton Rise, London SE14. Details of programmes from R. Hinton, 42 Sutcliffe Road, Welling, Kent.
Redhill (Reigate ATS)—Third Tuesday in each month, 8pm. Constitutional & Conservative Club, Warwick Road, Redhill. Sec Chris Barnes, G8FEE, 25 Hartwood Avenue, Reigate RH2 8ET.
Sutton & Cheam (S & CRS)—Fridays, twice monthly, 8pm. Sutton College of Liberal Arts, Nicholas Way, Sutton, and at the Sea Cadets HQ, Church Path, Beddington. Details from George Brind, G4CMU, tel Banstead 54497.
Thames Ditton (Thames Valley ARS)—First Tuesday in each month, 8pm. Thames Ditton Library, Watts Road, Giggs Hill, Thames Ditton. Sec Julian Axe, G4EHN, tel 01-946 5669.
Wimbledon (W&DRS)—Second and last Friday in each month, 8pm. St John Ambulance Hall, 124 Kingston Road, Wimbledon SW19. Sec Geoff Mellett, G4MVS, tel 01-644 8249.

REGION 8—RR to be appointed

Area representatives in Region 8

J. Brooker MBE	G3JMB	Haywards Heath
G. D. Edy	G4AXD	Maidstone
J. C. Greenhow	G3PEY	Tunbridge Wells
B. A. Hancock	G4NPM	Sheerness
K. J. Homewood	G8NPC	Hastings
R. W. Jones	G3YMK	Westerham
A. D. Ralph	G8XLH	Chatham

Brighton (B&DRS)—Every second Wednesday in each month, 7.45pm. YMCA, Marmion Road, Hove. Details from sec Wendy Firmager, 26 Brownleaf Road, Brighton.
Burgess Hill (Mid-Sussex ARS)—7.30 for 7.45pm. Marle Place Adult Education Centre, Leylands Road, Burgess Hill. Details from Colin Campbell, G6NPY.
Canterbury (East Kent RS)—First and third Thursday in each month. The Cabin, Kings Road, Herne Bay. Details from Stuart, G6LZG, or call on GB3KS.
Canterbury (UoKARS)—Mondays, 7.30pm. Radio Shack, behind Maintenance Buildings, off Giles Lane. Talk-in on S15. Meetings consist of cw practice and then drink and chat. Details from G6FRX.
Chichester (CARC)—First Tuesday and third Thursday in each month, 7.30pm. Fernleigh Centre, North Street, Chichester. Details from S. Talbot, or club sec, G4ETU, tel West Ashling 463.
Crawley (CARC)—Fourth Wednesday in each month (Formal). Second Wednesday in each month (Informal, at a club member's QTH). Trinity United Reform Church, Ifield Drive. Sec David Hill, G4IQM, tel Crawley 882641.
Dartford (DDFC)—Steve, G4NKM, is the one to contact at Malt Shovel PH if you are interested in DFCing, as all are made welcome.
Dover (South East Kent YMCAARS)—Wednesdays, 7.30 for 8pm. YMCA, Leybourne Road, Dover. Mondays is RAE with G4EGQ. Thursdays is cw night by arrangement with G3VSU. Listen on S20 or GB3KS for info and talk-in by G8YMD or G3YMD.
Eastbourne (Southdown ARS)—First Monday in each month, 7.30 for 8pm. Chaseley Home for Disabled Ex-servicemen, Southcliff, Eastbourne. Details from Tom, G4MVN, or tel Peter, G8IQO, 763123.
Gravesend (GRS)—Mondays, 8pm. Windmill Tavern, Shubbery Road. Details from sec, G4NBQ.
Hastings (HERC)—Wednesdays, 8pm. First, second, fourth and fifth Wednesday is micro night, first Wednesday, committee meets, all at Ashdown Farm Community Centre. Third Wednesdays in each month (Main meeting at West Hill Community Centre). Details from Alan Beecher, G8VEM, tel Hastings 216516.
Horsham (HARC)—First Thursday in each month, 8pm. Guide HQ, Denne Road, Horsham. Details from Tony Wadsworth, G3NPF.
Kent Repeater Group—This group is responsible for GB3KS (Dover); GB3KN (Mid-Kent); both on 144MHz. GB3CK (Charing); GB3EK (Margate); GB3NK (Wrotham); and GB3SK (Folkestone); all on 432MHz. Information from chairman, G3MDO.
Maidstone (MYMCAARC)—Fridays, 8pm. "Y" Sports Centre, Loose Road. First and third Fridays are for beginners mainly, but all are welcome. Details from G4GKW or G4EMC.
Medway (MARTS)—Fridays, 7.30 for 8pm.

Details from Peter Poole, G4EVY, tel Medway 76463, 6.30-9.30pm only please.

Sussex Repeater Group—This group is responsible for GB3SR and GB3BP on 144MHz. GB3BR, GB3HO and GB3NX on 432MHz and GB3WX, GB3CP and GB3HM on 1.3GHz. Details from G4GNX.

Swale (SARC)—Mondays, 7.30pm. A cw course is planned for Thursdays and RAE lessons on Fridays. Nina's Restaurant, 43 High Street, Sittingbourne, at 7.30pm on club nights. Sec Brian Hancock, G4NPM.

Thanet (RCT)—8pm. Birchington Village Centre. Details from Ken, G4PTE, tel Thanet 32198.

Tunbridge Wells (West Kent ARC)—Alternate Fridays, 8pm. Adult Education Centre, Monson Road, Tunbridge Wells. Informal meetings at Drill Hall, Victoria Road, Tunbridge Wells, on following Tuesdays. Details from Brian Castle, G4DYF.

Worthing (W&DARC)—Tuesdays, 7.30 for 8pm. Pond Lane Amenity Centre, Worthing. Details from Joyce Lillywhite, tel Worthing 63062.

REGION 9—RR W. J. Colclough, G2XC, Highview, Indian Queens, St Columb, Cornwall TR9 6LL. Tel 0726 860 485.

Area representatives in Region 9

B. H. Body	G8JML	Truro
A. C. Courtney	G8XIP	Exeter
H. G. Hughes	G4CG	Barnstaple
L. G. Mays	G2CWR	Paignton
A. E. Warne	G3YJX	Wadebridge

Cambridge (Cornish RAC)—First Thursday in each month, 7 July (Repeater talk by G3NPB, held over from June meeting), 7.30pm. Computer section: 18 July ("CPM tutorial", by G3OCB). The SWEB Club Room is to be demolished. For details of the new venue contact pro S. Rodda, G4PEM, 1/2 Penrose Terrace, Penzance, tel 0736 3948 or 3524. Club net weekdays, 3-7.14MHz, 1000h, Sundays 3-6.92MHz, 1100h. Cornish award manager Ted Bowden, G2AYQ.

Caradon Hill Repeater Group—GB3CH, on RB2. Chairman Paul Widger, G8AGU; treasurer, Graham Scott, G8MXE; sec Chris Bartram, G4DGU, 23 Tuckers Park, Bradworthy, Holsworthy, Devon EX22 7TL, tel 0409 240543.

Exeter (EARS)—Second Monday in each month, 7.30pm. Community Centre, St David Hill, Exeter. First and third Monday (Informal). Scout Hall, Emmanuel Road, Exeter. Club call G6ARE. Chairman R. Williams, G3RSJ; sec F. Stower, G6FGS; treasurer, R. Donno, G3YBK; pro Andy Lake, G8YOA, tel Exeter 39597.

Exeter (EUARS)—Sundays during termtime, 2.30pm. Room 225, Applied Science Building, North Park Road, Exeter. Details from Miss Bellchamber, G8ZPJ, Devonshire House, Stockers Road, Exeter EX4 4PZ.

Exmoor (ERC)—Thursdays, 8pm. Loughrigg, East Street, South Molton, Devon. Sec Peter Dixon, G4JBR, tel 07695 2738. Club call G8SSS.

Exmouth (EARS)—Alternate Wednesdays, 7.30pm. 6th Exmouth Scout Hut, Marpool Hill, Exmouth, Devon. Chairman Alec Atkins, G3RRK, treasurer Steve Gurney, G8UXJ, sec Hugh Edwards, G4RUT, "Crimmond". The Common, Exmouth, Devon, tel Exmouth 73157. Club call, G4HOB.

Newquay (N&DARC)—Second Monday in each month, 7.30pm. Treviglas School, Newquay. Chairman Frank Kneebone, G6CEP; vice-chairman Joe Johnson, G3THT; treasurer Brian Pearce, G8GOR; sec Pat King, G4GFY, tel 0872 71133. Club repeater GB3NC, manager and sec Bill Colclough, G3XC; treasurer Ted Warne, G3YJX.

North Cornwall (NCRC)—First Wednesday in each month, 7.30pm. Warrington House, Camelford, N Cornwall. President, Mike Frances, G3LOV. This is a new club, all are welcome. As a priority more classes are being prepared to help all class "B" licence holders. Contact John Finch, G6JUN, tel Camelford 213380.

North Devon (NDARC)—Odd months, fourth Wednesday, 7.30pm. Community College, Abbotsham Road, Bideford, Devon. Even months, fourth Wednesday, 7.30pm. Community College, Chaddiford Lane, Pilton, Barnstaple, Devon. Chairman, Les Hawkyard, G5HD; treasurer, Geoff Beal, G4ELU; ass sec, Charles Searl, G4LST. Contact sec George Hughes, G4CG, tel 0271 3683.

Plymouth (PPARS)—Meetings during term 12h per day. Contact Jeff Key, G8VTW, ARS, Plymouth Polytechnic Students' Union, Drake Circus, Plymouth, Devon.

Plymouth (PRC)—Alternate Mondays, 7.30pm.



West Kent ARS president, Hugh Richards, BRS40902, presenting the Kevin Keen Memorial Cup for merit to 14-year-old Joel Anderson, G6UJY, as the society's most outstanding junior member. Brian Castle, G4DYF, (centre) received a QRP Award at the agm for his ssb contact with UK5UDX in Kiev (1,308 miles), using one tenth of a watt! Photo: A. Nevison, G4OSH

Tamar School, Paradise Road, Millbridge, Plymouth PL1 5QW. Contact Dave Whitbread, G6EQM, tel 0752 20224.

Saltash (S&DARC)—First and third Friday in each month, 7.30pm. Toc H, Burraton, Saltash. President, Harry Griffiths, G2DFH; chairman, J. Miller, G8NSP; treasurer, G. Huntley, G4LXB; magazine editor, G4SOG; sec R. Rayment, 142 Mile House Road, Stoke, Plymouth, Devon, tel Plymouth 50793. Contact S. Hills, 5 Wearde Road, Saltash, tel Saltash 4461.

St Austell (English China Clay RC)—Alternate Mondays, 7pm. Pentewan Labs, Pentewan Road, St Austell, Cornwall. Chairman, Maurice Richards, G3WKF; vice-chairman, Chrys Rodgers, G4MXB; sec Mike Porter, G4OKS; treasurer, Tony Turner, G6EKZ; area rep Chris Golley, G4JYF; pro Jack Redfearn, G8HSZ, tel 0726 3647.

St Ives County Primary School (G4DWB) Repeater (GB3SI)—Contact David Blackford, G3NPB, c/o St Ives County Secondary School, Higher Tregenna, St Ives, Cornwall.

Torbay (TARS)—Fridays, 7.30pm. Last Saturday in each month (Special meetings), 7.30pm. Bath Lane, rear of 94 Belgrave Road, Torquay. President, Les Mays, G2CWR; chairman, Derek Webber, G3LHJ; sec Mrs M. Rider, 7 Kingston Close, Kingskerswell, Devon, —TQ12 5EW, tel 08047 5130. Nets Monday, Wednesday, Friday, 3-756MHz, 1030h, Saturdays, 1000h. Club calls, G3NJA and G8NJA. Contact pro Les Mays, G2CRW, tel 0803 558714.

REGION 10—RR to be appointed.

Abergavenny and Nevill Hall (A&NHARC)—Thursdays, 7.30pm. Above Male Ward 2, Pen y Val Hospital, Abergavenny. Sec D. F. Jones, G3SSY, tel Blaenavon 791617. Club call, GW4GFL.

Aberystwyth (ARSGBG)—7.30pm. The Bay Hotel, The Seafront, Aberystwyth. Sec Simon Mee, GW4CTV, tel Aberystwyth 828365.

Barry (BCoFERS)—Club calls GW3VKL, GW4BRS, and GW6BRC. Thursdays, 7.45pm. Barry College of Further Education Annexe, Weycock Cross, Barry. Slow morse class followed by constructional projects in the shack with films or lectures in the hall. Sec Simon Lloyd-Hughes, GW8NVN.

Blackwood (BARS)—Club call GW6GW. Fridays, 7pm. Oakdale Comprehensive School, Oakdale, Blackwood, Gwent. Club net on 144-675MHz each Tuesday, 7pm. This club does not meet during school holidays. Sec Wynn Wright, GW8UAM.

Bridgend (B&DARC)—Second Wednesday in each month, 7.30pm. NCB Social Club, Tondur. Club net Sundays and Wednesdays at 7pm on S13. Special meeting in July to finalise details of "Castles Competition" to be run on 24 July. Details from P. F. Lynn, GW4RMI.



Alison, GM4TGY, (right), receiving her Duke of Edinburgh Brooch from the Guide County Commissioner, Mrs Malcolm. Alison studied "amateur radio" for the skills section of the award. Photo: Anthony Macmillan

Cardiff (CRSGBG)—11 July ("The universal antenna matching unit", by Dave Thomas, GW3RWX), 7.30pm. Pantmawr Hotel, Tyla Teg, Pantmawr Estate, Whitchurch, Cardiff. Sec Cyril Laws, tel Cowbridge 3212.

Loughor (LAR&EC)—Club call GW4HVJ. Tuesdays fortnightly, 7.30pm. Loughor Scouts Hall, Heol Cae Tynewydd, Gorseinon. Sec Tim Griffin-Thomas, GW8TYS, tel Gorseinon 893392.

Newport (NARS)—Club call GW4EZW. Mondays, 7pm. Brynglas House, Brynglas Road, Newport. CW classes each meeting. HF dx group, construction and microwave groups meet each month on Thursdays. Sec Robert Johns, GW4NXD, tel Pontypool 56348.

Pembroke (PRSGBG)—Club call GW2OP. Last Friday in each month, 7.30pm. The Defensible Barracks, Pembroke Dock. Sec Martin Shelley, GW3XJQ, tel Pendine 267.

Port Talbot (BSCARS)—Club call GW3EOP. Thursdays, 7.30pm. BSC Sports & Social Club, Margam. Sec Reg Bray, GW4ESV, tel Briton Ferry 821993.

Powys (PARC)—Club call GW4HVN. Thursdays, 7.30pm. The Cricket Pavilion, Montgomery. Sec Mike Smith, GW4DWX, tel Welshpool 2068.

Rhondda (RARS)—Thursdays fortnightly, 7.30pm. National Union of Mineworkers Club, Tonypandy. Sec John Howells, GW4BUZ.

Swansea (SARS)—Club call GW4CC. First and third Thursdays in each month. The club will be participating in the Year of the Castle contest on 24 July from 1000-1800h at Oystermouth Castle, Mumbles, Swansea. It is hoped to use the GB2OC callsign. Sec Roger Williams, GW4HSH, tel Swansea 404422.

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

Area representatives in Region 11

A. R. Evans GW4HDR Rhyll
E. C. Jones GW4JPP Tywyn
J. Lawson-Reay GW8WFS Llandudno

Anglesey (ARG)—12, 26 July, 7pm. Primary School, Benllech, Anglesey. 24 July (Special event station at Beaumaris Castle, 0700 to 1500gmt.) Sec Mr C. Williams, GW6DOK, tel Gaerwen 603.

Bangor (University College of North Wales ARS)—The Rockets Room, Room 261, School of Electronic Engineering Science, Dean Street, Bangor, Gwynedd. No details of programmes or secretary.

Colwyn Bay (Conwy Valley ARC) (GW6TM)—14 July (Talk by Mr S. Abbott, G3JU, "Meteorology and vhf propagation"). Green Lawns Hotel, Bay View Road, Colwyn Bay. 9 July (Special event station in the Conway Carnival, callsign GB2CCR), 24 July (Special event station at Conway Castle). Sec Mr J. N. Wright, GW4KGI, 46 The Dale, Woodlands, Abergale, Clwyd LL28 7DS, tel 0745 823674.

Dolgellau (Meirion ARS) (GW4LZP)—7 July. Nannau Country Club, Llanfachreth. Sec Mr Bob Halhead, GW3KOR. No further details.

Menai Bridge (Ysgol David Hughes Radio Club)—No further details.

Rhyll (R&DARC)—14 July (Activity night), 28 July (Fox hunt starting at 7.15pm bst from Scout HQ), 7.30pm. The 1st Rhyll Scouts HQ, Tynewydd Road, Rhyll. Sec Mr B. Jones, 6 Rhodfa Maes Hir, Rhyll, Clwyd, tel 0745 37284.

Sealand Deeside (RAF Sealand ARC)—E. E. Hewins OIC, Radio Wing, No30 MU RAF Sealand, Deeside, Clwyd. No further details or programmes.

Wrexham (WARS)—c/o 4 Ithens Way, Southey Road, Wrexham, Clwyd LL13 7EQ. No further details.

REGION 12—RR M. R. Hobson, GM8KPH, 4b Tummel Crescent, Pitlochry, Perthshire.

Area representatives in Region 12

G. G. Brooks GM4NHX Caithness
B. Q. Deans GM6PQE Angus
R. M. Grant GM4DQJ Scone
G. W. A. Pople GM4DKL Kildary

Aberdeen (AARS)—Fridays, 7.30pm. Details from Don, GM4GXD, tel Aberdeen 9643428.

Grampian Repeater Group—At the recent agm the following were appointed: president, GM8MHU; sec/treasurer, GM8HGD; project manager, GM6GJZ; committee—GM6AXU, GM3DNU, GM3DWW, GM8FFX. Members should note that the Peterhead uhf repeater GB3PD should now be

operational on RB10. Details from sec Alec Jones, GM8HGD, tel Peterhead (0779) 2413.

Dundee (Kingsway TCARG)—Now on holiday until 13 September. Details from Malcolm, GM3ZXE, tel 0382 85312.

Elgin (Moray Firth ARS)—Last known sec Rev Stanley Bennie, RS52053, All Saints Rectory, 14 Cluny Square, Buckie, Banffshire.

Speyside Repeater Group—Information from Ron, GM4ILS, tel 0343 45842.

Invergordon (Easter Ross RC) (GM4MFL)—Fridays, 7.30pm. Community Room, South Lodge School, Invergordon. Details from George, GM4DKL, tel 086-284 2556.

Orkney (Kirkwall)—Members meet infrequently to discuss amateur radio and allied subjects. Information from Bill, GM3IBU.

Perth (P&DARG)—Tuesdays, 8pm. Perth City Sports & Social Club, Leonard Street, Perth. 25 and 26 August (The club will be running demonstration stations at the Boys Brigade Centenary Camp, Scone Palace. Visitors welcome.) Details from Richard, GM6ESY, or Ron, GM4DQJ, tel 0738 52477.

Shetland (Lerwick RC)—Believed to meet on Wednesdays, 7pm. Lerwick Community Centre. Details from Arthur, GM4LBE, tel 0595 4270.

There are several other clubs known to exist in the region but RR12 has no information on file.

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

Area representatives in Region 13

D. G. L. Anderson GM4JJJ Dunfermline
J. McVicar GM8GEC Musselburgh

Berwick-upon-Tweed (B&DARS)—First and third Friday in each month, 7.30pm. Details from GM3YPI, tel Eyemouth 50492.

Dalgety Bay (Marconi Space & Defence Systems ARC)—Details from GM4HRL.

Dunfermline (DARS)—Second Thursday in each month, 7.30pm. Room 7, Old High School, Priory Lane, Dunfermline. Details from GM8IID, tel 728778.

Edinburgh (E&DARC) (GM4HAM)—Tuesdays, 7.30pm. City Observatory, Catton Hill, Edinburgh. Details from GM3RFQ.

Edinburgh (Ferranti Recreation Club ARS) (GM4FER)—Membership restricted to company personnel. Details from GM8JJK, tel 031-441 5684. Visits by other clubs by prior arrangement.

Edinburgh (GB3ED Repeater Group)—Details from GM3GBX, tel 031-447 2611.

Edinburgh (Heriot-Watt UARC) (GM3WEE)—Wednesdays, 2.30pm. Mountbatten Buildings, 31-35 Grassmarket, Edinburgh.

Edinburgh (Leith Nautical College AR&EC) (GM4AXG)—Thursdays, 6.30pm. Leith Nautical College, 24 Milton Road East, Edinburgh. Details from Michael Gathergood, GM4KFK, Halls of Residence, Leith Nautical College.

Edinburgh (Lothians RS) (GM3HAM)—Second and fourth Thursday in each month, 7.30pm. Drummond High School, Broughton Street, Edinburgh. Details from GM6JAG, tel 031-664 5403.

Glenrothes (G&DARC) (GM4GRC)—Wednesdays and third Sunday in each month, 7.30pm. Provosts Land Centre, Leslie, Fife. Details from GM8ZTV, tel Kirkcaldy 203582.

Kelso (KARS) (GM4KHS)—Mondays, 7.30pm. Abbey Row Community Centre, Kelso. Details from GM6FEA, tel 24654.

Lothians Raynet Group—Details from GM3OWU.

Scottish Borders Repeater Group—Details from GM4BDJ, Cairndhu, Walter Street, Langholm, Dumfries-shire, tel 0541 80018.

St Andrews (UoStAR&ES) (GM4BGA)—Details from GM4JWW, tel 74507.

REGION 14—RR V. J. Kusin, GM4HCO, 109 Weymouth Drive, Glasgow G12 0EL.

Area representative in Region 14

J. G. Gaughan GM4FEO Helensburgh

Ayr (AARG)—Second and fourth Friday in each month, 7.30pm. Community Leisure Centre, 24 Wellington Square, Ayr. Details from sec R. D. Harkness, GM3THI.

Central (CSFMG)—The Central Scotland FM Group maintains repeaters in Fife, Ayrshire and Central Scotland. Membership details from Colin Dalziel, GM8LBC.

Dumfries (D&G REC)—First and third Monday in each month, 7.30pm. Cargenhall Hotel, New

Abbey Road, Dumfries. Details from GM4NNC.
Glasgow (WoSARS)—Fridays, 7.30pm. 22 Robertson Street, Glasgow. Morse classes. Details from Ray James, GM4CXM.
Helensburgh (HARC)—First and third Wednesday in each month, 7.30pm. John Logie Baird School, Helensburgh. Operational night Thursdays. Details from sec Barrie Spink, GM6CBF.
Irvine (Cunninghaime & DARC)—Thursdays, 7.30pm. 1 Bonnyton Row, Girdle Toll, Irvine. RAE and CW classes. Details from Rodger Bryce, GM3JWB.
Motherwell (Mid-Lanark ARC)—Fridays, 7.30pm. Wrangholm Hall Community Centre, Jerviston Street, Motherwell.
Stranraer (Wigtownshire ARC)—Thursdays, 7.30pm. The Community Centre, Lewis Street, Stranraer. Details from J. N. MacDonald, GM4LQS.

REGION 15—RR J. T. Barnes, GI3USS, White-gables, 95 Crawfordburn Road, Bangor, Co Down BT19 1BJ. Tel 0247 3948.

Area representatives in Region 15
 R. J. G. Burnside G16DGP Belfast
 D. F. Campbell G14NKD Craigavon
 J. Chapman G14LVC Magherafelt
 C. J. T. Corderoy G14CZW Enniskillen
 A. T. Hamilton G14HVI Castlerock
 H. M. Irvine G13TLT Kircubbin
 W. P. McMichael G14LKA Greenisland
 S. G. Moore G18YTH Belfast
 J. A. Porter G13GGY Londonderry
 P. S. Valentine G13RKE Omagh

Antrim (ANDARC)—Third Thursday in each month, 7.30pm. Clotworthy House, Castle Grounds, Antrim. Sec GI4FUM NOT QTHR. Tel Antrim 64672.

Ballyclare (East Antrim ARC)—Second Tuesday in each month, 7.30pm. Fairview Primary School, Ballyclare. AR GI4LKA. Sec GI4JXM.

Ballymena (BRC)—Thursdays, morse class, 8-9pm; Club meeting, 9pm. Sundays (Club get-together) 3pm. 70 Nursery Road, Gracehill. Details from sec GI4HCN.

Banbridge (Mid-Ulster ARS)—Sundays, 3pm. GI4BAC QTH. Details from GI4NVD.

Bangor (B&DARS) (GI3XRQ)—First Friday in each month. Sands Hotel, Bangor. Sec GI4JTF.
Belfast (BRSGBG)—Third Wednesday in each month, 8pm. 90 Belmont Road, Belfast. AR GI6DGP.

Belfast (COBYMCAARC) (GI6YM)—Tuesdays, 7pm. Saturdays, 2.30pm. Club room, Fourth floor, YMCA, Wellington Place, Belfast. Sec GI6BJO.

Belfast (Queens UoBRC)—Tuesdays, in term-time, 7pm. 37 Fitzwilliam Street, next to Students Union, Club station GI3LLQ/GI6FQB on all bands, 3-5 to 432MHz. RAE and morse tuition available. Activities include electronics and computing. Details from GI6JHF, tel 0232 703027, or 0232 661111, ext 4017, daytime.

Colrairie (C&DARS) (GI4NRQ)—Fridays, 8pm. Flowerfield Arts Centre, Portstewart. Sec GI4LNU.
Colrairie (NWARC)—First Tuesday in each month, 8pm. Whitehall Chambers, New Row, Colrairie. Contact GI8NBW.

Craigavon (Mid-Ulster ARC)—First Sunday in each month, 3pm. QTH of GI4BAC. Sec GI4NKD.
Enniskillen (Lough Erne ARC)—Third Monday in each month, 8pm. Lakeland Forum. Sec GI4PCY (Ex-GI6E2T).

Larne (L&DARS)—Newly formed and will be applying for affiliation. Wednesdays, 6.30-9.15pm. Larne Tech College, Room 270. Morse classes available. RAE class in tech college. Programme being arranged. Details from sec GI4CPP.

Lisburn (Lagan Valley ARS) (GI4GTY)—Second Monday in each month, 7.30pm. Rathvarna Teachers' Centre, Pond Park Road, Lisburn. Sec GI8SXN.

Londonderry (NW of IARC) (GI4CFH)—First Monday in each month, 7.30pm. The New Boathouse, Victoria Road, Prehen, Londonderry. Sec GI4OUN.

Magherafelt (MARS) (GI4MFT)—First Tuesday in each month, 7.30pm. Other Tuesdays (CW and construction). 12 Garden Street, Magherafelt. Sec GI4OMO (ex-GI8JNP).

Omagh (West Ulster ARC)—Second Monday in each month, 8pm. McAleers, Campsie, Omagh. Sec GI4OHV (Ex-GI8XQM).

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

Area representatives in Region 16
 R. A. E. Hillson G4OWX Hadleigh
 F. R. Howe G3FIJ Colchester
 R. W. Howe G3PLB Basildon
 J. R. Tootill G4IFF Ipswich
 L. V. G. Turner G4CUT Chelmsford

Braintree (B&DARS)—First Monday in each month (Informal), 8pm. Third Monday in each month (Formal), 7.45pm. Braintree Community Centre, Victoria Street. Details from Mick Jones, G6DFZ, tel Braintree 44168.

Bury St Edmunds (BSEARS)—Third Tuesday in each month, 7.30pm. Guildhall, Guildhall Street. Details from John Munro, G3GBB, 29 Angel Hill, Bury St Edmunds.

Canvey Island (South Essex ARS)—Wednesdays, 7.30pm. The Paddocks Community Centre, Long Road, Canvey Island. Details from G6BYH, tel Canvey Island 683526.

Chelmsford (CARS)—First Tuesday in each month, 7.30pm. Marconi College, Arbour Lane. Details from Andrew Mead, G4KQE, tel Silver End 83094.

Colchester (CRA)—Thursdays fortnightly, 7.30pm. Colchester Institute, Sheepen Road. Details from Frank Howe, G3FIJ, tel Colchester 70189.

Felixstowe (FARC)—Tuesdays, 8pm. Felixstowe Golf Club. Details from John Hobin, G3XIX.

Great Yarmouth (GYRS)—Thursdays fortnightly, 7.30pm. STC Sports & Social Club, Beevor Road, South Denes. Details from A. D. Besford, G3NHU.

Harlow (H&DRS)—Tuesdays, 7.30pm. Mark Hall Barn, First Avenue. Details from Cilla Mann, G4KVR, c/o Mark Hall Barn, First Avenue, Harlow.

Haverhill (H&DRS)—Fridays, 7.30pm. Copse Hall Farm, Steeple Bumpstead Road. Details from Dave Hickford, G4MYK, tel Haverhill 61207.

Ipswich (IRC)—Second and last Wednesday in each month, 13 July (DF hunt), 27 July (The microdot computer), 8pm. Club Room, Rose & Crown, Norwich Road. Details from Jack Tootill, G4IFF, tel Ipswich 44047.

Loughton (L&DARS)—Fridays fortnightly, 8pm. Loughton Hall, Rectory Lane. Details from R. Mills, G6AMY.

Lowestoft (L&DARC)—Fridays, 7.30pm. Suffolk Teachers Centre, Lovewell Road. Details from Terry Weatherly, G3WDI, tel Lowestoft 63216.

Martlesham (MRS)—Wednesdays, 7.30pm. British Telecom Research Labs, Martlesham Heath. Please contact G3ZNU first.

Norwich (Norfolk ARC)—Wednesdays, 7.45pm. Crome Community Centre, Telegraph Hill East. Details from Paul Gunther, G8XBT, tel Norwich 610247.

Saffron Walden (SW&DRAS)—Third Wednesday in each month, 8pm. Details from Garry Morton, G6KDW, tel Saffron Walden 22715.

Southend (S&DARS)—Fridays, 1 July (Natter night), 8 July (2m repeater discussion), 15 July (Diamond jubilee station on the air), 8pm. Civic Suite, Council Offices, Hockley Road, Rayleigh. Details from G3YOA.

Stanford-le-Hope (SIH&DARC)—Mondays, 8pm. The Scout Hut, Hardie Road. Details from Alan Taylor, G4KJL, tel Stanford-le-Hope 5057.

Stowmarket (S&DARS)—First Monday in each month, 7.30pm. Red Cross Hut, Station Yard. Details from Jim Lowe, G8SCB, tel Needham Market 721296.

Thurrock (TARC)—First and third Tuesday in each month, 8pm. Grays Park Hall, Orsett Road, Grays. Details from G3KMD.

Vange (VARS)—Thursdays, 7 July (Junk sale), 14 July ("RSGB", by G3PLF), 21 July (Treasure hunting), 28 July ("Transmission and carburetors", by G6HRL), 7.30pm. Main Hall, Barstable Tenants Community Association, Long Riding. Details from Mrs D. Thompson, 10 Feering Row, Basildon SS14 1TE.

REGION 17—RR H. G. Cunningham, G8FG, 235 Station Road, West Moors, Wimborne, Dorset BH22 0HZ. Tel Ferndown (0202) 876018.

Area representatives in Region 17
 P. G. Brooker G3WXC Cowes
 M. A. Lawrence G4JXO Portsmouth
 J. E. Martin GU3YIZ Guernsey CI
 D. I. Mason G3ZPR Poole
 L. V. Mayhead G3AQC Southampton
 A. D. Morrissey G3JYL Jersey CI
 A. C. A. Newman G2FIX Salisbury
 P. J. Sterry G3CBU Basingstoke
 M. J. Stevens G3CPN Ferndown
 G. S. Symons G3DSS Sturminster Newton
 G. M. Taylor G8HVY Weymouth

Andover (ARAC)—First Tuesday and third Wednesday in each month, 5 July (Quiz night), 20 July (Natter night), 8pm. For venue contact sec, G4OZL.
Basingstoke (BARC)—Second Tuesday in each month, 7.30pm. British Legion Club, Basing. Sec G6KVN, tel Tadley (07356) 3004.

Basingstoke (UK FM Group, Southern)—First Wednesday in each month, 7.30pm. Chineham House, Basingstoke. Pro Chris Oliver, tel Alton (0420) 88563.

Bournemouth (BRS)—First and third Friday in each month, 7.30pm. Kinross Community Centre, Bournemouth. Sec G4EKE, tel Ferndown (0202) 877945.

Chippenham (C&DARC)—Tuesdays, 7.30pm. Chippenham Sea Scouts HQ. Sec G8UGY, tel Bromham (0308) 850289.

Eastleigh (Itchen Valley ARC)—Meets every two weeks at the St John Ambulance HQ, Blenheim Road, Eastleigh. Contact sec G4PPJ, tel Botley (04892) 3312, for times and dates.

Fareham (F&DARC)—Wednesdays, 13 July ("Switch mode psus" by G8VOI), 27 July ("HF antennas"), 7.30pm. Portchester Community Centre. Sec G4ITG, tel Fareham (0329) 234904.

Fareham (HMS Collingwood ARS)—Wednesdays, 7.30pm. HMS Collingwood. Details from G8OWJ, tel Fareham (0329) 234139.

Farnborough (F&DRS)—Second and fourth Wednesday in each month, 7.30pm. Railway Enthusiasts Club, Access Road, Farnborough, Sec G4BJQ, tel Farnborough (0252) 534036.

Gillingham (Blackmore Vale ARS)—Second Tuesday in each month, 7.30pm. Sherman Chemicals, Station Road, Gillingham. Sec G3WRV.

Gosport (Rowners & DARS)—First and third Monday in each month, 7.30pm. Hardway Community Centre, Gosport. Sec G6OTY, tel Locksheath (04895) 2541.

Guernsey (GARS)—Tuesdays and Fridays, 8pm. The Lodge, La Corbinerie, Oberlands, St Martin. Sec Mrs Wild, tel 0481 25858.

Hordean (H&DARC)—Second Thursday in each month, 14 July ("Mobile operating", by G4DIU), 7.30pm. Merchiston Hall, Hordean. Sec G4RLE, tel Hordean (0705) 593429.

Jersey (JAEC)—Second Wednesday in each month, 13 July (Foxhunt with GJ4ICD as the fox), 8pm. The Communications Centre, St Brelade. Sec GJ8KNV, tel 53333.

Jersey (JARS)—Sundays, 10.30am. Fridays, 8pm. Le Hocq Tower, St Clement, Jersey. Sec GJ6BUK.

Liphook (Three Counties ARC)—This newly formed club meets at the Railway Hotel, Liphook, 7.30pm. For dates contact sec, G6SOQ.

Portsmouth Hill Repeater Group—Sec G8GNB, tel Titchfield (03294) 41456.

Portsmouth (Marconi EARS)—Last Tuesday in each month, 8pm. Broad Oaks Canteen, Portsmouth Airport. Sec G3FWE.

Portsmouth (P&DRS)—Thursdays, 7.30pm. Portsmouth Community Centre, Malins Road, Buckland. Sec G3JZV.

Poole (PARS)—Meetings held at the Poole Technical College, 7.30pm. Contact sec, G3ZYD, tel Poole (0202) 671562, for dates.

Salisbury (SR&ES)—Tuesdays, 7.30pm. Grosvenor House, Churchfields Road, Salisbury. Sec G2FIX, tel Salisbury (0722) 743837.

Southampton (SARS)—Wednesdays, 7.30pm. Bitterne Park Secondary School, Dimond Road, Bitterne. Details from G4LDK, tel Bursledon (042121) 3451.

Southampton (SUARC)—Tuesday evenings, informal meetings lunchtimes. The Clubroom, Old Union Building. Sec G4LYL.

Southampton (Waterside Short Wave Club)—Fourth Tuesday in each month, 7.30pm. Blackfield Community Centre, Blackfield, near Southampton. Sec G6DLJ, tel Fawley (0703) 891875.

Swindon (S&DARC)—Thursdays, 7.30pm. Park School, Marlrow Avenue, Swindon. Sec Ian Browne, tel Swindon (0793) 485564.

Weymouth (SDRS)—First Tuesday in each month, 5 July (Chairman's discussion night, G3SDO), 7.30pm. Army Bridging Camp, Wyke Regis, Weymouth. Sec G3ZGP, tel Weymouth (0305) 812893.

Wimborne (FRARS)—Sundays, 3 July (Natter night), 10 July (New York slide show, by G6CML), 17 July ("Nicks rambles", by G8MCQ), 24 July ("Fighting the valve", by G3WNG), 31 July (Video evening), 7.30pm. Flight Refuelling Social Centre, Merley, Wimborne. Sec G8VFX, tel Wimborne (0202) 882271.

Winchester (WARC)—Third Saturday in each month, 8pm. The Scouts Log Cabin, Stockbridge Road. Sec G6FBR, tel Winchester (0962) 66764.

REGION 18—RR W. A. Ricalton, G4ADD, 4 South Road, Longhorsley, Morpeth, Northumberland NE65 8UW. Tel Longhorsley 259.

Consett (C&DARC)—Mondays, 7.30pm. RAFA Club, Sherburn Terrace, Consett. Sec G8WEJ.

Durham (DURES)—Physics Dept, Science Site, Durham University.

Easington (EAR&EC)—Tuesdays and Thursdays, 7.30pm. Easington Village Working Mens Club. RAE and morse tuition if required. Sec G4GX1.

Great Lumley (GLAR&EC)—Alternate Wednesdays, 7.30pm. Great Lumley Community Centre. Sec G8HPW.

Hartlepool (HRH)—Mondays, 7.30pm. Methodist Church Hall, Frange Road. Sec G3NWU.

Middlesbrough (Post Office ARC)—All amateurs welcome, but first contact sec G8CDP.

Middlesbrough (Teeside Repeater Group)—Last Tuesday in each month, 7.30pm. 196 Marton Road, Middlesbrough, Cleveland. All amateurs and swls invited but first contact sec G8MBK.

Morpeth (Northumbria ARC)—Thursdays, 7.30pm. Old Telephone Exchange, Ellington. Sec Peter Barker, G8BBZ, tel Morpeth 519929.

Newcastle upon Tyne (T&WRG)—Now no formal meetings. Sec G8XDF.

Prudhoe (TARC)—7pm. Active all bands. CW instruction each night. Falcon Hotel, Prudhoe, Co Durham. Sec G4IZW, tel 0632 678828, evenings.

Redcar (East Cleveland ARC)—Fridays, 7.30pm. RAE classes held. Advice to newcomers given. RAFA Club, Newcomen Terrace, Redcar. Pro G4KIR.

Sunderland (SRAS)—The Brewery Buildings, Westbourne Road. Sec Arthur Everard, G8PCD.

Tyneside (TARS)—Mondays, 7.30pm. Community Centre, Vine Street, Wallsend. Sec James Dingwall, G4ILW, tel 872661.

REGION 19—RR R. J. C. Broadbent, G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ. Tel 01-989 6741.

Area representatives in Region 19

W. G. Dyer	G3GEH	Acton
L. D. E. Light	G3KDL	Wembley
P. J. Marcham	G3YXZ	Watford
B. H. J. Pickford	G4DUS	Rickmansworth
J. H. Sleight	G3QJI	Ware
T. J. Tugwell	G8KMW	Stevenage

Barking (B&DARS)—Mondays, Tuesdays, Thursdays, 7pm. Westbury Recreational Centre, Ripple Road, Barking. Monday is RAE class night, Tuesday is morse code practice, Wednesday is constructional and operational night and Thursday a general get-together. Contact sec Alan Sammonds, tel 01-594 2471.

Cheshunt (C&DARC)—6 July (Junk sale), 13 July (Natter night), 20 July ("A rocket", from Dennis, G3TIK), 27 July (Natter night), 8.15pm. The Church Room, Church Lane, Wormley, nr Cheshunt, Herts. Details from Roger Frisby, G4OAA, tel 09924 64795. This club is actively engaged in fostering newcomers to obtaining their RAE. It also holds morse classes.

Chingford (Silverthorn ARC)—7.30pm. Friday Hill House, Simmonds Lane, Chingford E4. Sec G4AJA, tel 01-529 2282.

Chiswick (ABCARC)—19 July (Amateur test gear

demonstration). Committee Room, Chiswick Town Hall, High Road, London W4. Sec W. G. Dyer, G3GEH, tel 01-992 3778.

Ealing (E&DARS)—Tuesdays, 8pm. Hanwell Community Centre, Room 5, First Floor, Westcott Crescent, Hanwell W7. Information on the new club premises (temporary) from B. Greenaway, G3THQ, tel 01-450 8259.

Edgware (E&DRS)—The Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware. Sec Howard Drury, G4HMD, tel 01-952 6462.

Grafton (GARS)—8pm. Five Bells Pub, East End Road, East Finchley, London N5. Sec Jim Chambers, G4IBK, tel 01-346 5841.

Harrow (RSH)—8 July (Talk on hf antennas), 15 July (Informal and practical), 17 July (Summer madness and Bar-B-Q), 22 July (Talk, tba), 29 July (Equipment test evening), 7.30 for 8pm. Roxeth Room, 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 (H&DARC)—6 July (Quarterly business meeting), 13 July (G3AAJ on AMSAT/UOSAT), 20 July (Informal), 27 July (TBA), 8pm. Listen on GB2RS, Sundays. Fairkytes Art Centre, Billet Lane, Hornchurch, Essex. Details from A. Negus, G8DQJ, tel Upminster 24059.

Ilford (IGRSGB)—7 July (Why doesn't my project work?), 14 July (Auto insertion of pcbs), 21 July (Modern techniques of pcb layout), 28 July (Beginners' guide to construction—part two), 7.30pm. 50 Mortlake Road, Ilford, Essex. Sec G. Skeat, tel 01-590 3193. Chairman, J. Hooper, G3PCA, tel 01-478 3741. All are welcome to attend this venue but please telephone first if you are a new member.

Ilford (Gould Advance RC)—Wednesdays. Service Dept, 2-8 Roebuck Road, Ilford, Essex. Club callign, G4CAE. No other details. Sec R. Howard, G4JOK.

London (Central POHQARS)—This group have started a 3.5MHz net which is open to all BT employees and other Post Office and PTT employees in other countries. Listen out on Wednesdays, 2000h, local time in UK on 3.750MHz. Net control, G3BYW. Details from J. A. Clarke, G3TIS.

London (City University ARS)—Thursdays. The club has recently restarted its operations and meets at the City University somewhere not specified in the letter. Contact Robert Benyon, G4KSK, Flat 4, Bullen House, Collingwood Street, London E1, tel 01-253 4399.

London (Civil Service ARS)—First and third Mondays in each month, during the lunch hour. The Civil Service Rec Centre, Monck Street, Millbank SW1. Details from G. Costin, G4GFU, tel 01-632 6444, daytime.

Southgate (SARC)—14 July ("DBS satellites and cable", by staff of BBC Publicity Unit), 8pm. St Thomas's Church Hall, Prince George Avenue, London N14. Pro John Fitch, G8EWG.

Stevenage (S&DARS)—First and third Tuesdays in each month, 8pm. T S Andromeda, Fairlands Valley Park, Shephall View, Stevenage, Herts. Morse classes, 7.15pm. Pro Trevor Tugwell, G8KMW, sec G4BGP, tel Baldock 893736.

St Albans (Verulam ARC)—RAFA HQ, New Kent

Road, St Albans. Sec Ed Bailey, G4KLQ, tel Redborne 3291.

South West Herts UHF Group—Information from sec T. Groves, G4KUJ. Current situation on uhf repeaters is: GB3SWH is operational; GB3HR may be moving from the site; GB3BH is under construction.

Wanstead (ELGRSGB)—Third Sunday in each month, 3pm. Wanstead House, The Green, Wanstead, London E11. Details from G6DXV, tel 01-550 7013.

UK FM Group—For information on this group and future policy please contact Pat Spenceley, G8LZA, by letter, or J. Parkins, G8KVP.

Further to the ORM on 8 May: There are over 9,000 RSGB members in Region 19, 54 of them, including Council and RSGB Committee members, turned up at the Ashmole Centre on Sunday 8 May. Many grateful thanks to RSGB officials and members who did me the honour of attending this the first Official Regional Meeting in 16 years. I will not hold another and will stand down when my term of office as RR19 ends.

REGION 20—RR B. L. Goddard, G4FRG, 2 Greenfield Park, Portishead, Bristol BS20 8NQ. Tel 0272 848140.

Area representatives in Region 20

R. W. Marshall	G4ERP	Cheltenham
E. A. Perkins	G3MA	Gloucester
K. A. Saunders	G8SFM	Leightonston
J. Thorn	G3PQE	Weston-super-Mare

Bath (B&DARC)—Welcome to this newly affiliated club. Alternate Wednesdays, 7.30pm. Englishcombe Inn, Englishcombe Lane, Bath. Details from Colin Rose, G8YCV, Westfield Orchard, 10 Englishcombe Lane, Bath, tel Bath 311687.

Bath (Downside School ARS)—Details of the school's radio activity can be obtained from the Physics Department, Downside School, Stratton-on-the-Fosse, Bath, Avon.

Bristol (BARC)—Tuesdays, 7.30pm. YMCA, Park Road, Kingswood. Computer night every fourth Tuesday. Details from Trevor Cockram, G8GFZ, or Alan Williams, G3ZKI, tel 0272 553020.

Bristol (BRSDBG)—7.30pm. Queens Building, University Walk, Bristol University (enter University Walk from the Hawthorns Hotel and look for the Continental-type road barrier). Details from Chris Short, G8GLQ, tel 0272 62253.

Bristol (First Crockern Scouts Short Wave Group)—Details of the group (licensed amateurs and short wave listeners are welcome to the shack by arrangement), from Pete Knowles, 30 Church Path Road, Pill, Bristol BS20 0EE, tel Bristol 8814248.

Bristol (HTVRC)—Details can be obtained from Robin Thompson, G3TKF, tel Keynsham 3965.

Bristol (North Bristol ARC)—Fridays, 7.30pm. C/o Self Help Enterprise, Braemar Crescent, Northville, Bristol. Details from Ted Bidmead, G4EUV, tel 0272 691685.

Bristol (UoBARS)—Details of the society's activities etc can be obtained from Mark Posen, G6DYY, c/o Students Union, Bristol University, Queens Road, Clifton, Bristol BS8 1LN.

Bristol (432MHz Repeater Group)—For enquiries regarding the 432MHz repeater GB3BS, and GB3AA, the 1.3GHz repeater situated at Alveston, near Bristol, contact the sec Steve Bailey, G4MCQ, or Terry Rowe, G8NNU, tel 0272 559398.

Cheltenham (BYLARA)—YLS and xyls. Details can be obtained regarding membership c/o Little Croft, Shurdington Road, Cheltenham. (Ladies—how about some copy for this column? RR20).

Cheltenham (CARA)—First and third Friday in each month, 7.30pm. The Stanton Room, The Branch Library, Charlton Kings. Details from Gill Harmsworth, G6COH, tel Cheltenham 25162.

Cheltenham (Government Communications ARC)—Details from sec, c/o Government Communications Headquarters, Benhall, Cheltenham.

Cheltenham (Smiths Industries RS)—Second Thursday in each month, 7.30pm. The Club House, Newlands, Bishops Cleeve. HF, vhf and fstv operating under the callign G4MEN. Details from sec, c/o Sports & Social Club Office, Smiths Industries Aviation Division, Evesham Road, Bishops Cleeve, Cheltenham GL52 4SF.

Gloucester (GARS)—Wednesdays, 7.30pm. Please note new address: St Barnabas Church Hall. Details from Tony Martin, G4HBV.

Mendip Repeater Group—GB3WR, 144MHz repeater, GB3UB and GB3VS, 432MHz repeaters, and GB3UT, 1.3GHz tv repeater. Details of the repeaters, subs, and applications for membership can be obtained from Steve Gardner, G8GMZ, tel Midsomer Norton 413902.



Mike, G6ADX (treasurer), operating the Stevenage & DARS station G8SAD during a recent 144MHz contest. Photo: Les Mather, G8OKI

Portishead (Gordano ARG)—Fourth Wednesday in each month, 7.30pm. Ship Hotel, Down Road, Portishead. Details from Bob Coles, G8ROC, tel 0272 877789.

Shirehampton (SARC)—Fridays, 7pm. Twyford House, High Street, Shirehampton. Details from Ron Ford, G4GTD.

Taunton (T&RDC)—Fridays, 7.30pm. The County Hall, Taunton (opposite the Crescent car park). Details from sec Graham Swetman, G8TJF.

Thornbury (T&DARC)—7.30pm. The White Horse, Groves End, on the A38. Details from Alan Jones, G8AZT, tel Thornbury 416381.

Wells (EMI Sports & Social Club RC)—Cedar House, Chamberlain Street, Wells, Somerset BA5 2PJ. (Regret no further details—RR20). Details from sec, at the above address.

Weston-super-Mare (RAFARS)—This is the headquarters station of the RAFARS, and

details of membership etc can be obtained from the Admin Secretary, RAFARS, RAF Locking, Weston-super-Mare, Bristol BS24 7AA.

Weston-super-Mare (WsMRS)—Second Monday in each month, 7.30pm. The Rugby Club (off Grove Road), Weston-super-Mare. Details from G3BLO or G3PQE, tel 0934 22712.

Yeovil (Y&DARC)—Thursdays, 7.30pm. Milford Recreation Centre, Milford Park, Yeovil. Adrian Denning, G4JBH, tel 0935 23873.

Members' Ads

CONDITIONS OF ACCEPTANCE

These subsidized flat-rate advertisements are accepted as a service to members of the RSGB only. They must be submitted on the Members' Ad form printed on the back of a recent address label carrier used to mail *Rad Com* to the advertiser: this will automatically provide proof of membership and should not be more than two months old. No acknowledgement of receipt will be sent, and advertisements not clearly worded or punctuated, or which do not comply with the conditions of acceptance, will be returned. No correspondence concerning this service will be entered into.

Trade or business advertisements, even from members, will not be accepted for "Members' Ads" but should be submitted as classified or

display advertisements in the usual way. Traders who are members must enclose a signed declaration that the items for sale or wanted are part of, or intended for, their own personal amateur station.

The RSGB reserves the right to refuse advertisements, and accepts no responsibility for errors or omissions, or for the quality of goods offered for sale. Advertisements for citizens band equipment will not be accepted.

Warning. Members are advised that they should, as far as possible, ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The "purchase" of goods legally owned by a

finance company could result in the "purchaser" losing both the goods and the cash paid.

The current rate is £1 for 40 words or less: advertisements containing more than 40 words will cost an additional £1 for every additional 40 or less words. Each advertisement must be accompanied by the correct remittance, either as a cheque or postal order made payable to Radio Society of Great Britain.

Closing dates in 1983 for issues in brackets, are **12 July** (September); **24 August** (October); **22 September** (November); **20 October** (December); **17 November** (January); **15 December** (February).

Post to: MEMBERS' ADS, RSGB, 88 BROOMFIELD ROAD, CHELMSFORD, ESSEX CM1 1SS
Do not post to RSGB HQ or Advertising officer.

FOR SALE

Icom ICR70 rx with fm board, three weeks old, manual, orig packing, super performance, new cost £529, genuine reason for sale at £470. Yaesu FR77700 atu, brand new, cost £42.55, bargain at £30. Tel Bulls Green (Herts) 219.

Scanners: SX200N, £220; Bearcat 220FB, £170. Both with orig packing and full workshop manuals. G8PRR. Tel 01-340 4139.

FDK M700E fm 2m tx/rx, vgc, £130 ono. Eddystone 680X gen cov rx, £50. Creed 7B, £10. Data Dynamics 390 teletype (ASCI 11), £50. Trend telegraph measuring set No 1, £50. Trend telegraph generator, £50. G8POP, QTHR. Tel 0793 41412.

Crank-up telescopic tiltover, 30ft, galvanized steel mast, base plate mount, head for AR40 rotator, never erected, garage stored, cost £260 new, sell £130. 2m linear amp, 10 in, 100 out, QQV06-40 rf, switched 240 ac supply, £60. 5-el 2m antenna, as new, £6. Buyers collect. G3KPB, QTHR. Tel Canterbury (0227) 66652.

Heathkit HW100 tx/rx, 80-10m, ac psu, £100 ono. G3NAW. Tel 01-550 0753.

Arcos K2RIW 432MHz KW amp kit, silvered anode circuits, all brand new components incl Eimac 8930S, bases, cost £500, accept £350. Drake TC2 144MHz transverter, £150. IC260E, £230. Sony ICF2001, £80. Kungsimport 2-way 144MHz power divider, G3NSM. Tel 0865 56321.

AR40 rotor, as new, £55. Mosley TA31JR rotary dipole, barely used, £20. G3SWX, QTHR. Tel Leicester 302430.

ZX81 and psu in Fuller keyboard, 16k rampack, ZX printer, Decca bw tv, recommended Ferguson cassette recorder, orig ZX81 case, psu, vu-cal, vu-fil, club record, and collector's program cassettes, three game cassettes incl "Flight", all as new, £120. G6TXX. Tel West Hanney 498 (Oxon).

Two Pye Pocketfone 70 tx/rxs, comp with base chargers, unmodified, working on approx 436MHz, £45 each. Heathkit OS2 scope with X1-X10 probe kit, £35. Grundig tv camera with F25 1:0, 95 Angenieux lens, 24V dc supply input, £35. G3JDK, QTHR. Tel Rotherham 541606.

IC25E, mic, mobile fittings, £225. Trio R1000, £195. Sinclair ZX81, 16k ram, psu, Fuller keyboard and case, flight simulation and chess cassettes, various manuals, £55. Heath rf sig gen, £30. Heath gdo, £20. G4BLB, QTHR. Tel Deal 3538.

Low SRX30 gen cov rx, manual, purchased from

Low, exc cond, collect or carriage by arrangement, £95. BRS25941, James Ebdon, 8 Cleavelands Avenue, Pittville, Cheltenham. Tel 0242 515112.

Microrot, printer interface, cable, as new, used 10h only, sacrifice at £350. G4GGV, QTHR. Tel 0628-20651.

Comp hf station: KW2000B, psu, 4B remote vfo, SB220 linear amp, desk mic, built-in processor, sensible offers. G3YNC, QTHR. Tel Romford 49175.

Yaesu 480R 2m multimode tx/rx, boxed, six months old, used only as base station, £295 ono. 2m 8-el 13V 5A psu, Himound key, Yaesu headphones, swr bridge, £60. Package deal, £350. G4DTI. Tel Wokingham 792102, evenings, weekends.

Mobile rig: Heath HW17-2, good cond, comp with Heath fm adaptor, solid-state Heath power supply, fm rec module, dash bracket, xtals, all handbooks, offers. GW8FI, 20 Erw Goch, Waun Fawr, Aberystwyth.

Multi 700EX, reliable 25W fm, 25/12-5kHz channels, £135. G4DBE, QTHR. Tel 051-648 6525.

Marconi CR100, six bands, wkg order, ac mains, handbook, ideal keen swl, offers. GW8FI, 20 Erw Goch, Waun Fawr, Tel Aberystwyth 3591.

2m antennas, Ringo Ranger co-lin, halo, dipole, 5/8 mobile, no reasonable offers refused. 7A 13-8V psu, £15. Waltham stereo tape deck, used little, £15. G6BGW, QTHR. Tel 061-665 1722.

MMC 435/600 atv converter, perfect wkg order, £15. G2HCG, QTHR. Tel New Milton (0425) 617090.

TS830M, unused, new, £620. TR9000, £250 ono. PS20 power supply, as new, £35 ono. G6IKL, QTHR. Tel 021-449 3282.

Waylaxer FT767DX, FP767, FC707, FV767DM, YM35, as new, £700. G2AXO, QTHR.

Hallcrafters Hurricane tx/rx, psu, remote vfo, 1kW p.e.p. output, Rolls Royce rig, £495. P40 TH3JNR, rotator, £395. 1kW marine tx in rack, £25. Other junk. Buyer inspects and collects. G3UVZ, QTHR. Tel 01-778 4085, evenings only.

20A 13V psu, £75. Oric and BBC programs, rty, £7.50. Morse tutor, £4.50. Distance, £3.50. Texas TI99/4A Morse tutor, £4.50. Datong FL1 audio filter, £35. Base mic, £10. G8KMW, QTHR. Tel 0438 54689, evenings.

FRG7700 rx, FR77700 tuner, hardly used, £250 for quick sale. G6ITX NOT QTHR. Tel Cambridge 891997.

IC22A, fitted R0-8, S16, S20-23, preamp, comp with handbook, £75. GEC Envoy, 70cm fm tx/rx,

fitted RB10, RB14, works okay but needs case, comp with circuits, £35. Tel 0376 510664.

Eddystone 880/2, £200. AR88D, £35. Redifon 230AC GR470, 50ch marine vhf tx/rx, £85. SR9 marine, £35. **Wanted:** scrap R1155 for spares. T1154 front plate or complete tx. Cables, connectors etc, ARP3 valves for WS52. PSU for BC342. Tel Alnwick 602487.

Yaesu FT208, NC9C charger, only four months old, no mods, immac cond, boxed, £150. G8YJC. Tel Orpington 73014.

LDF550 22ft, £40. CU2Y jin, 22ft (similar spec LDF450), £21.50. LDF250, 45ft, £21.50. All comp with connectors, used but checked ok. Mid-band GEC625 radio telephones, £15. **Wanted:** STC xtal filters type 923B. Non-wkg antenna rotators. G8APV. Tel 01-732 8319.

Kenwood TS830, three months old, mint, £575. VFO 230, digital, new, £195. Desk mic, Kenwood MC50, mint, £22. G3UGL, QTHR. Tel 0234 750050. **CRF320** Sony world zone rx, 32 band, perfect wkg order, new £895, offers around £385. Tel 0726 850129 (Cornwall).

FT902DM nine-band tx/rx, six months old, comp. SEM Transmatch, Eezytune, the lot, £700. Buyer collects. Tel 061-761 2952.

Yaesu FT208R, three nicads, spkr mic, 2x 1/4, carrycase, charger, mint, £150. Trio R1000, KX2 atu, Microwave Modules 70cm-28MHz converter, mint, £200. Microwave Modules rty to tv converter, mint, £95. Pye PF70UB, single charger, leather carrycase, spkr mic, last new 3ch vhf model, mint, £89. Serious illness forces sale. G6MIW. Tel Bolton 653230, after 3pm.

Standard C78 70cm portable, cw case, nicads, charger, £145. Vic-20, cassette unit, joystick, three games cartridges, various programs, £160. SB2M ssb portable, xtals 144-1 to 144-4, nicads, K40 speech processor, £55. All vgc, orig packing. G8IQV, QTHR. Tel Maidenhead 23738.

Trio 2500 handheld, charger, immac cond, boxed, £140. G8YJC. Tel Orpington 73014.

FRG7, £100 or exchange for good moped with MoT. Tel Gloucester area (0452) 60268.

101ZD Mk2 incl fan, mic, cw filter, vgc, only used swl, usb/lss, £425 ovno. FC902 atu, immac 1yr old, orig carton, £100, no offers. RAE correspondence course, £20. **Wanted:** Info/progs, ham use, log-book? W.H.Y? Dragon 32. G6NVC. Tel Keith, Rainham (Essex) 54909.

KDK 2025 Mk2, 144MHz, 25W, fm tx/rx, 12-5kHz synthesizer steps, band scan, 10 write-in non-volatile memory channels, memory scanning, hold facility, auto toneburst, ±600kHz shift,

£149. G3XVN NOT QTHR. Tel 0782 621920, evenings.

Racal R17CX, MA197B preselection unit, RA98 sideband adaptor, relevant manuals, good cond, £250. G4SVU. Tel 0623 29289, after 6pm.

FT221R, exc cond, no mods, £275. Eddystone EC10 rx, comp with ac/dc packs, £60. MMT 432/28 transverter, perfect cond, £100. G4CVK, QTHR. Tel Stourbridge 5917.

Kenwood TS520SE, as new, £370. R600, four months old, £185. Yaesu FT7700W atu, £25. Ranger DE4806 29MHz fm mobile, £35. Datong FL2 multfilter, £65. All as new, used little. G4OLC, QTHR. Tel 0670 813352 (Northumberland).

Search 112m scanning rx, xtals S13, 14, 19, 20, R1, R5, vfo, hardly used, £45. SMC receiving disc, unused, £12. Shure 444 mic, £5. Bellsonic 3A psu, £5. Pentax 110, three lenses, flash, £85. G8IQV. Tel Maidenhead 23738.

FT101Z, nine bands, mic, fan, manual, immac cond, £400. Icom IC255E 25W fm mobile tx/rx, good cond, £150. G3STB, QTHR. Tel Preston 35049.

T158 programmable calculator, good cond, all handbooks, psu, stationery etc, £30. G8SJR, QTHR. Tel Orpington 29025.

IC402, cw accessories, £175. RM3 Icom remote/display, £65. Daiwa CN620 pwr/swr, £35. MM 70cm/2m converter (new), £15. 2m-70cm tripler, £10. Shure 444G, unwanted gift, £25. Mutek 2m preamp, £15. Mobile compressor mic, £5. AOI base mic, £7.50. Latest Philips car radio, £7. 150MHz frequency counter, £20. Crosshatch generator, £7. 9-el Tonna (elements still boxed), £12. *Wanted*: good portable communications rx at reasonable price. G8MAG NOT QTHR. Tel Milton Keynes 676221.

Attention collectors: rx broadcast BV613 cat No ZA24798 tx/rx, TR11HA, offers. G3GWD, QTHR. Tel 01-650 3163.

9MHz cw block filter XF90C, £10. PW Nimbus board, rx wkg components for tx, pair R0 xtals, £10. G4IOK, QTHR. Tel Witney 4867.

Retiring? Amateur's ideal QTH at delightful Carlyn Bay, Cornwall. Two bed, det fh bungalow, double glazed, gas ch, garage, workshop, shack, tower, hf beam, rotator, large easily maintained gardens, offers under £42,000. G2KF, QTHR. Tel 072-681 2337.

FRV7700B 144MHz converter for FRG7700M, new, boxed, £30. Buyer collects. Tel 0474 813524 (Kent), after 6.30pm.

ITT2020 48k with ds, dd, used little, Palsoft colour, 3-el mini-beam 10m, Tonna 2m/70cm Oscar beam, ham frequency counter, five digit, 10kHz-50MHz. Sell or w.h.y? Tel Rayleigh (0268) 774089, after 2pm.

High power five-band hf tx/rx FT500 Sommerkamp, good wkg cond, £160. FT75 10W, five band, mobile and base power units, £85. G3LBX, QTHR. Tel 0900 823269.

Multimode 2m tx/rx, Icom IC260E, as new, incl mobile mount, scanning mic, etc, £240. Comp 2m antenna system comprising AR40 rotator, two Jaybeam 6-el quads, phasing harness, poles, etc, all brand new, boxed, £120. Will separate. G4GNU, QTHR. Tel 0268 774947.

Creed 7B with TTL compatible interface, £20. FR50 rx with 160m, £65. Trio TR7200G, 1/10W, £80. G4BVC, QTHR. Tel 0533 708585.

Yaesu FT220 (forerunner FT221) 2m tx/rx, fm/ssb/cw, repeater shift, cw manual/circuit diagram, working but needs tweaking, £99 ono. G8BPK, QTHR. Tel Rayleigh (0268) 777934.

SB102, SB600, HB23, lot, £225. SB303, £150. SB610, £50. SB650, £30. BC221F reg psu, £25. IC240, superscan, ac/psu, £180. G-whip, 80/40 coils, mount, match tran, £25. All superb. *Wanted*: SB401 with all xtals, FT290R, unmod only. G3KGW, QTHR. Tel Codsall 2214.

RTTY test units, in mint cond, comprising TSG10, TDMS70, offered comp with handbooks, £75. Morris. Tel Bolton 52384.

FT480R, boxed, as new, used little, rx only by son swl, unemployment forces sale, £310 ono. Jaybeam LR1 colinear, £15. 5Y2M beam, £9. RLD3 vhf rotator, £24. SMC 13-8V 8A, continuous psu, £24. G3BRT, QTHR. Tel Bristol 657997, after 1pm.

FRDX400 rx, 160-10m, 2 and 6m converters, a.m., fm, ssb, cw filters, matching spkr, £140 ono. Tel Kilmarnock (0563) 24009.

Yaesu FT480R 2m tx/rx, six months old, used only as base station, boxed, £285. 2m 8-el 13V 5A psu, HK708 key, Yaesu headphones, swr bridge, £60. All for £330 or will split. G4DTI. Tel Wokingham 79102, evenings, 6pm, weekends.

FT708R, six months old, incl charger which

operates from 12V, £185. Peter Crosland, Red Lion Cottage, Holt Heath, Worcester. Tel 0905 620041, home, 021-454 8585, work.

Yaesu FT202R handheld, nicads, charger, rubber duck, manuals, £55. IC202S, boxed, immac, £110. Sentinel 30W linear amplifier, to go with IC202S, £35. G4KCD, QTHR. Tel Marlow 71803.

MMC 144/28, Tonna 2m 9-el Yagi, boom collapses to three sections. Jaybeam 70cm 12XY with harness. Offers to G4QXM. Tel 0642 819922.

Swan SS200 solidstate tx/rx, 80-10m, ssb/cw, 200W input, matching psu, spkr, manual, £200. G4BVI, QTHR. Tel Ipswich (0473) 53270.

Icom 720A, comp with power supply, external spkr, ICAT100 auto atu, as new, orig packing, offers around £1,100. G4SVJ NOT QTHR. Tel 01-641 1127, anytime.

FT707, YM35 mic, Sota psu, G-whip, base, coils for 160m, 80m, 40m, mobile bracket, £425. 1980(V) Yamaha XS250 motor cycle, good cond, £350 or swap for hf tx/rx. G4OOT. Tel 0704 24454.

FT480R, exc cond, 5/8 whip, mag mount, swr meter, mobile brackets, leads etc, £250 ono. G4OZR. Tel 021-552 2362, anytime.

Radio and TV Servicing, 14 volumes, 1966-80, mint cond, offers. G2FNS, QTHR.

Yaesu FT301, 200W p.e.p., a.m., cw, ssb, 160-10m, 13-8V, cw mobile bracket, cw filter, £350 ono. Datong FL1 filter, £25. NAG linear, 144MHz, 250W+, £250. G4RZG (G8XBB). Tel 0462 813235, day, 0767 314189, evenings.

TS930S, comp with automatic antenna tuning unit, used a few hours only, still under warranty, save over £200, £1,150. FT901DM, all optional extras fitted, mint cond, absolutely as supplied, ideal bargain for new G4, £475. G3KDH, QTHR. Tel Tring 3505.

Yaesu FT101ZD fm Mk3, fitted fan, hand mic, MD1B base mic, SP901 spkr, FC707 atu, YE77 lightweight headphones, all two months old, boxed, mint cond, best offer secures, or will split if enough enquiries. Tel Harlow 441994, anytime.

Chinon CE4S electronic camera, comp with flash gun, power wind, gadget bag, new cond, £150. Securicor carr included. G6CHB. Tel John, 0632 462606.

G2AKQ closed, Collins R391 rx, 500-32,000kHz, 32 bands, 1MHz wide, digital readout, bandwidths 100 to 16,000Hz, panel 10-5in, cabinet 23in deep, valves, 180V stabilised vfo, bfo, xtals, ovens, spare i.f. vfo. G2AKQ, QTHR. Tel Ringwood 5643.

2m fm Sommerkamp TS280, 80ch, synth, exc mobile rig, 10/1W, mint cond, auto rep shift, mobile bracket mic, manual, box, £105. Dymar 880 3ch portable for 2m conversion, three nicads, 5/8 magmount, 2m. G6DMQ. Tel Wolverhampton (0902) 332295.

Yaesu FT2270 hf mobile, exc cond, hardly used, bargain, £390 ono. Tel Devises (Wilts) (0380) 6330.

Yaesu FT290R 2m multimode portable, comp with base power supply, 7/8 whip, base, new Nov '82, mint cond, £230. Carr included. G6CHB. Tel John, 0632 462606.

Handheld IC2E, standard accessories, ICHM9 spkr/mic, ICBP4 battery case, £120. G8ANU, QTHR. Tel Stafford (0785) 52693.

VIC20, cassette, printer, paper, 16k, eight games, cartridges, Joystick, at new prices, £740, want only £425 or swap for Yaesu FRG7700 and atu or similar. Dave Cooksey (RS50876), 52 Sturgeon Avenue, Clifton, Nottingham. Tel 215357.

Yaesu FT227RA, 143-970-148-10, 1 and 10W, power supply, and base whip antenna, coaxial cable, plugs, comp station for £210. Tel Orpington 20723, anytime.

Two-element quad for 10 and 15, boomless type, 25dB front to back, all set up ready to erect, £25. SSB filter MF45510AZ, usb, lsb, xtals, £10. GW4BCD, QTHR. Tel 065671 8963, after 6pm.

Icom R70 hf rx, still boxed, unopened, absolutely mint, cancelled commercial project, £425, save £74. Tel Godalming (04868) 7088.

Icom 701, PS20 psu, spkr, 160-10MHz, 100W p.e.p., ssb/rtty cw, twin vfo, pb tuning, speech processor, mic, af, rf gain, vox, nb inbuilt swr meter, last model, mint, only used for receive, £475 ono. Tel Crawley 510491.

Heathkit Mohican gen cov rx, 0-6-30MHz, mains psu, nicads, manual, in good order, £40. Buyer inspects and collects. G4EAO, QTHR. Tel 0925 65813, evenings.

Teleprinter handbook, unwanted gift, £10. Datong Morse tutor, £35. Microwave Modules MMC144/28, £15. Pye Westminster dash mount, all accessories, £40. Racal RA137A-1 If adapter, £25. Tel Redhill (0737) 72202.

Yaesu FT101ZD Mk1, fan, YD148 mic, FC901 atu,

£475. FT208R, spare nicad, NC8 base charger, YM24A mic, NC9C charger, PA3 (dc) adaptor, carrying case, comp, £210. Yaesu FP80A base station power supply for FT480R etc, £40. Tel Farnborough (Hants) 547900.

KW Atlanta, remote vfo, just serviced by KW, £200. G3WUM. Tel Brighton 688105, day, 605704, evening.

Cambridge fm dash mount on 2m, toneburst, fb tx audio, S18, 19, 20, 21, R6, £45 ono. G8SDN, QTHR. Tel 0525 714128.

MMT 70/144 4m transverter, £80. MML 70/50S 4m 50W linear, £55. MM 50MHz counter, 500MHz prescaler, £60. Datong Morse tutor, £30. Jaybeam 4-el 4m beam, £10. Jaybeam 144MHz 4W harness, £10. D. Boniface, G4DSC. Tel 0765 2230.

Apple 2 micro disc drive, £165. Microsoft, 16k ram card, £40. 2716 eeprom programming card, £58. All mint, or part exchange Microwave Modules 2m/70cm linears, transverters, (70cm, 23cm). Trio/Yaesu station monitorscope. W.H.Y? G6THT, QTHR. Tel Crawley (0293) 515201.

IC215 fm tx/rx, nicad charger, £110 ono. IC730 hf tx/rx, PL20 240V power supply incl spkr, first class order, £525 ono. TS130V, £375, or part exchange TS130S and power pack. *Wanted*: FC902 or equivalent. G4JFE, QTHR. Tel 0635 41613.

Creed 7B teleprinter, power supply, stroboscope, manual, all in wkg order, £12.50 ono. G6DJJ. Tel Mark, 01-440 7135.

TS830S tx/rx, AT230 atu, SP230 spkr, all in mint cond, no mods, £750. MC50 mic, £20. MMT 144/28 transverter, cables to suit TS830S, £85. LF30A low pass filter, £15. G2DYM dipole, matching unit, £50. G4JXU. Tel Reading 698276, evenings.

Heathkit DX40U tx, Heathkit vfo, model VF1U, £50 the pair (handbooks included). AR88LF, vgc, spares, handbook, offers. Would consider exchange with adjustment either way for 2m or 70cm rig. G6MAX NOT QTHR. Tel Bradford (0274) 663928, anytime.

Eddystone 940, spare valves, 2m converter, £200 ono. Yaesu FT101B, £400 ono. BR531756. Tel Mike, Staines 52079.

Daiwa auto atu CNA1001, as new, boxed, £95. Keith Smith, G4PEU. Tel 0889 270324 (Staffs).

Electroniques hamband coils, valves, transistorized models, £15 each. Cossor double beam oscilloscope model 1049 Mk3A, manual, perfect, £30. Amplion AR19 wooden petal horn loudspkr, c 1923, vgc, £75. K. W. Clark, G3WIF, QTHR. Tel Bristol (0272) 293738.

FT101Z, mint, boxed, £380. Trap dipole, 80-10MHz, Unidillo traps, hf 1:1 balun, £20. Cambridge noise bridge, £15. Homebrew atus, eht transformers etc, command tx, 1-6-3MHz, stabilized power supply, excellent as vfo or driver. G3DHH, QTHR. Tel Chisleborough 365.

Yaesu FT480R, exc cond, mods, will exchange for good hf tx/rx, solidstate preferred. G6TNG NOT QTHR. Tel Frensham (025125) 4105, anytime.

Wireless World from 1956 to present date, for sale as complete years only at £1 per year, or £20 the lot. Buyer must arrange carriage. G4ERA, QTHR.

FT101ZD, fm board, cw filter, mic, spare valves, boxed as new, faultless, used little, £545. FC902 atu, as new, £100. All untampered with. G4PCK. Tel Barrie James, Torquay 38134.

FT101E tx/rx, manual, service manual, two sets spare valves, ac and dc leads, mic, SP101B spkr, Oskerblock SWR200 power meter, £340. Yaesu monitorscope YO100, manual, leads, £70. Hygain 18AVT-WB vertical ant, manual, £40. Heathkit rf sig gen IG102, manual, £22. Heathkit Cantenna HN31, manual, £15. Raymart super band checker, 10-160, £6. Tradipr trans TE15 gdo, manual, £13. Codar T28 rx, hb a.m. tx, 160/80, Codar 12M5 mobile dc psu, mic, £22. G-whip, 160/80, base mount, £7. HB cw key click filter, audio osc, Morse key, £5. Valves, some boxed, unused, resistors, wide range caps, trans, spkrs etc, £12. Weller pistol grip soldering iron, £6. Nine vols *Rad Com*, '74-82, £4. FB cond, first £525 secures package. Buyer inspects, collects, cash deal. G3TIH, QTHR. Tel 032 72 71681, Daventry area.

IC255A 144MHz fm tx/rx, 25W op, microcomputer-based digital pll synthesizer, memory channels, two vfos, scanning, mic-preamp, £175. FT221R 2m base station, all modes, £260. Avometer model 40 Mk2, £50. SWR meter model FS2, £5. G3JGC, QTHR. Tel Poole 681215.

Racal RA17, ssb adaptor, both vgc, in case, handbooks, £200. *Wanted*: Drake linear L7 or L4. Tel 0432 267876.

FT101E, virtually unused, in mint cond, leads,

manual, orig carton, £360. K. W. Clark, G3WIF, QTHR. Tel Bristol (0272) 293738.

Two telescoping steel lattice mast sections, 13 and 16ft, buyer inspects and collects, £60. G3MEA, QTHR. Tel Durham 734560.

AF speech processor, £12. Rogers Cadet Mk3 stereo amp, spare valves, £15. Rascal 25A regulator type PU1163, £8. All vgc. Small Meccano set, £5. G4BNB, QTHR. Tel 01-504 3260.

Yaesu FT101E, all leads, spare unused driver and pa valves, looks new, protective cover not removed front, prefer buyer to test and collect, £350. Reason for sale firm presenting me a new rig on retirement. G5WG, QTHR. Tel 01-504 5499.

Video: Philips N1700, £98. Sailor Danish marine transistor df rx, 150kHz-4MHz, £55. IC215 2m portable, 15ch, £89. IC206E 2m multimode, £245. Barlow Wadley portable communications rx's, all mode to 30MHz, £98 each. All good cond, ono. G3LZN, QTHR nr Warwick. Tel 05643 2014.

Transverter FTV107-R2, Yaesu, brand new, unused, adaptable for FT102, cables supplied, £160. Hill, G4PYQ. Tel 061-366 0927, evenings or weekend, or 061-480 4550, office.

Last chance before scrapping! Philips valved cctv system, camera, two 14in monitors, power/control unit, cables, manual. Exchange for 2m/70cm portable/handheld, modern hf rx, etc, or sell. Offers. W.H.Y? GW6AYM, QTHR. Tel Swansea (0792) 204146.

10m fm, as new, ex cb conversion, inc USA repeater shift, 400kHz coverage (much more possible). G4NXX. Tel Abingdon 25898, after 6pm. TS820, £375. FL2100Z, £335. VFO520, £55. MM28/144 converter, lo, SP820, £30. LAC895 atu, £40. G4DYR, QTHR. Tel 0902 34068.

Yaesu YO101 monitorscope, mint, £99. LAR Omni-match, brand new, £12. LAR noise bridge, brand new, £24. Hygain TH5DX beam, six months old, £195. MC50 mic, £10. Collect or carriage extra. G4CHP, QTHR. Tel Swainsthorpe 470365.

Icom AT500 auto tuner, unused, £150. Drake MN4 tuner, £60. Heathkit 610 monitorscope, £55. Altai gdo, unused, £20. Shure 444, £15. KW dummy load, £10. KW lpf, £10. All fb. Manuals, cash, carriage. G3YYI, QTHR. Tel Tyneside (0632) 383050.

Brand new, unused Drake TR7A, one week old when advertised, change of plan forces sale, £895. NRD NDH515 24ch memory unit, as new, £125. G3HWX, QTHR. Tel Halsall (Lancs) (0704) 840328.

Trio TR2400, ST1, BC5, LH1, perfect cond, £170. Microwave Modules comp, 2m, 4-6MHz i.f., £12. Sinclair ZX81, 16k ram-pack, printer, £75. R107, free to first caller. Tel Wilmet, 061-456 3190.

Creed 7ERP teleprinter, £20. Creed 6S6 tape reader, £10 ono. Both in good wkg order. Trio 2200GX tx/rx, handheld, 10 xtals fitted, £60. G3TAZ, QTHR. Tel 0582 26995.

FT101Z, six bands, mic, fan, dc converter, immac, £400. Leader atu, 80-10m, built-in 250W power meter, swr bridge, £75. G-whip hf mobile antenna, comp, £15. Lowe 2m colinear, £15. G4HIY, QTHR. Tel Crowmarsh (049169) 788.

Yaesu FT720RVH 2m fm 25W tx/rx, £160. Dragon 32 computer, £150. Acorn Atom, £100. G6JUT, Tel Bedford (0234) 751397.

KW77 hf amateur band rx, 1.8-28MHz, £80. SR9 2m rx, vfo, but fitted with five xtals, £30. Can deliver W Midlands area. G4TIL NOT QTHR. Tel Southam (092681) 4765.

FT101, perfect, homebrew linear, £380 or sell separate. G4MIP, QTHR. Tel Ivybridge 4383.

Yaesu FV102DM digital memory vfo for FT102, scanning, used little, £190. G4RHL, Tel Durham 41840, daytime, Houghton le Spring 846435, evenings and weekends.

Jaybeam antennas, still boxed: PBM 14/2m, PBM 18/70, 10Y/2m, 12XY/70, C8/70, SPM, X6/2M-X12/70, half current price. Heavy duty steel tower sections, lattice, square, climbable, 11ft long, £10 each. 6-25kVA diesel gen, £400. G6DMS, QTHR. Tel Great Easton (Essex) 250.

Trio TS510 hf tx/rx, 250Hz cw filter, PS510 power supply, spkr, exc five-band rig, in good cond, £200 ono. G3YIQ, Tel Bob, Crewe (0270) 841168.

Drake R7 rx, vgc, cw four 2-2, 1-8, 0-5, 0-3kHz filters, nb aux prog, £750. Lowe HF5 five-band vertical antenna, cw 5R five-band radial rods, coil, all fittings, as new, £35. Tel 05432 24563.

TR2200G, fitted S10, 13, 18-23, R0, R1, R3, R5+, spare xtals for R6-7, S8, c/w nicads, charger, carrying case, boxed, manual, £100 ovno. G6NXX, QTHR. Tel Roger, Fareham 238305, evenings weekends.

Yaesu, late FT101B, FL2100B, FL101B, all mint, accessories, spare valves, vfl split, Eddystone 730/4, mint, handbook, valves. GM30XC, QTHR.

Tel 0224 832544, day, 646984, evenings. **TR2300**, fully synthesized 2m fm portable, as new, orig packing, case, mic, nicads, charger, £110.

Wanted: IC202S or similar. GW6MNC NOT QTHR. Tel Cardiff 842774.

Detached bungalow, 500ft asl, ideal amateur radio, Brighton three miles, university two, two beds, lounge, kitchen, bathroom-toilet, detached garage, large rear garden, unobstructed downland views, requires internal decoration, early occupation, £32,000 freehold. Tel 0749 3612, evenings, 5-8pm.

Sinclair ZX81 16k, factory built, used very little, incl psu, manual, two games tapes, £55. G4KFN, QTHR.

22 reels 0-25in tape on 5in reels, 0-5h play approx each side, all boxed, most used once, £10 the lot, or 50p each. Two part rolls of lead tape, several various size spare reels. P. W. Hall, 10 Dulverton Square, Leeds LS11 0LL. Tel Leeds 771090.

Linear amp, 10W input, 80W output, £75. MMA144V preamp, £20. SMC hf trap dipole, 10-80m, comp, unused, £25. Two power supplies, 5A, £10 each. Yaesu headphones, unused, £5. All must go. GM4FTB. Tel 0224 741676, after 26 July.

SN-A21CALC BBC (B) computer program cassette, gives beam heading, distance from your QTH, 350 item file, add, delete, sort by prefix or place name, record QSL, running clock, incl data file of 250 locations, £3.50. Briggs, 57 Charlton Drive, Sheffield S30 4PA.

N1550 video, needs heads, £20. LVC150 unused tape, £10. FT2FB 2m, 11ch, faulty, £40. Stereo amp, £10. Dual beam scope, £20. Rover 2000 car wings, £25 each. Car radio, £5. Tel 01-790 3123, evenings.

KW2000A, ac psu, manual, remote VFO4B, KW Q-multiplier, good cond, some valves, £180. Heathkit SW717G, manual, £30. MFJ cw and ssb audio filters, £5 each. DA1 auto keyer, £10. G3KMA, QTHR. Tel Chobham (09905) 8224, evenings or weekends.

Trio TS520, as new, 240/12V input, fan, £300. G3RWM, QTHR. Tel 021-308 5171.

Marconi test oscillators TM3123A, TM3083A, 50kHz, 100MHz. R216 cw ac psu, some spare valves, Heathkit rf scope, new, spare 3RP1, GD1W gdo, all coils, external rough but wkg. Offers or information requests in writing. G3ADZ, QTHR Rugby.

Trio 7500 2m fm, late model, vgc, never used mobile, comp with all mobile mount, etc, manual, mic, Belcom power supply, £135. Buyer collects. GW3TFQ, QTHR. Tel Port Talbot 887860.

Morse Tutor, Datong model D70, as new, £35. Tel Malcolm, Nottingham 472879.

Iambic keyer, £12. KW lopass filter, £7.50. Creed teleprinter 7E, tu, £25. Pye Vanguard, £8. Sig gen, Taylor 65B, £12. Various transformers, 1,500V, 0-5A, £18. 16V, 20A, £12. Multimeters, 27 ranges, £8. Tel Loughborough 263131, ext 485, ask for Gino.

Alumast Western 2 by 10ft hinged base and rotator plates, £115. AR40 rotator, cable, £50. G4MH mini beam, coaxial, £50. Jaybeam 2m/70cm 10-el satellite antenna, never used, £20. G3POX, QTHR. Tel 0480 53775.

Microwave Modules 144/100S linear amp, 100W, unwanted gift, £110 plus postage. Lowe SRX30 rx, £100, plus postage, or exchange for IC2E, Trio 2300 or similar handheld. G6TWN, QTHR. Tel 0704 20003.

Trio TR2300, as new, orig packing, hardly used, comp with nicads, charger, carrying case, etc, £110 ono. Tel Chris, Bedford (0234) 851129, after 6pm.

FT480R tx/rx, 2m, vgc, used once, £300. Yaesu power supply, 12V/4A, £25. Mag mount whip, £12. G6JVI, Tel Romford 24704.

Yaesu FT-ONE, as new, comp with filters, £995, no offers. G4IQL, QTHR. Tel 01-653 3456.

Pye Cambridge FM10B, wkg on 70-45MHz fm, 15W output, rx sensitivity better than half microvolt, comp with control box, long connecting cable, mic, spkr, £35. G3KLF, Tel Fareham 236906, weekends or evenings only please.

Oric, BBC programs, morse code tutor, £4.50. Locator gives distance, bearing, points, handles lat/long, QRA, QTHL codes, £4.50. BBC rty, requires tu, £5. Texas TI99 distance, £4. G8KMV, QTHR. Tel 0438 54689.

Trio R1000 gen cov rx, exc performance, comp with manual, £190. Tel Winslow (Bucks) (029671) 2725.

Property of the late G4DJL: Kenpro KR500 elevation rotator, comp with cable, £90. Heavy duty psu, 5/20V dc at 60A, £30. 140ft copper wire, 14swg, new, £10. FM sig gen type 202E, £40. Electroniques QP166 converter, £20. Taylor meter

type 105A, £20. Quad spider with glass fibre poles, £20. Kango diesel generator, 110V ac at 22-5A, £150. HF3 vertical antenna, £40. 6ft by 19in rack pa system, free to collector. Yaesu FTV250 transverter, £85. Offers for the above to G3UXH. Tel Medway 250562.

DX40U, VF1U, £40. Heavy duty psu, 600-0-600, 500mA, 300V, 50V, 24V, £40. Mamiya C220 outfit, telefoto, wideangle lenses, accessories, £200 or consider part exchange hf rig, eg FT75 with cash adjustment. W.H.Y? G3TRR, QTHR. Tel 051-327 7309.

Versatower P60, £32,000 with three bedroom detached bungalow, oil ch, secondary dg through-out, cavity wall insulation, parquet flooring or fitted carpets, fitted kitchen, corner plot, small country estate eight miles south Norwich. G4CHP, QTHR. Tel Swainsthorpe 470365.

Advance constant voltage transformer, input 190/260V, output 240V rms, 250W load, perfect cond, current price new £159, will accept £60 ono. **Wanted**: external vfo for FDK Multi Quartz 16. G8NNJ, QTHR. Tel Romford 41717.

Yaesu FT480 2m multimode tx/rx, good cond, £280. PSU for above, £10. Teletype KSR33, RS232 interface, ASCII code, £55. Nascom 1, in case, psu, £85. G6EBA NOT QTHR. Tel Padgate (Warrington area) 812290.

Garex SX200N, used little, as new, £210. SSM Europa vhf transverter, best offer, £35. Tel 051-430 0220, 9am to 5pm.

FLDX400 tx, comp with all 13 valves, suspect insulation breakdown in the mains transformer, suitable for spares, instruction manual, offers. 34 Queensway, Euxton, Chorley PR7 6PD, Lancs. Tel 02572 78630.

Video Genie EG3003, 48k ram, Aculab floppy tape drive, assembler, Forth system, adventure and games programs, £150. G3VTO, QTHR. Tel 0225 29658, evenings.

Swan 350 tx, sep power pack, exc cond, recently overhauled, £275 ono, or part exchange linear in good cond, cash adjustment. Swan can be vouched for by G4DAZ as to cond. G3BWN, QTHR.

FLDX400/FRDX500 tx/rx, 10-80m, mic, manual, some spare valves, £240, collected. SWR/pwr meter, £8. G4KTX. Tel 0245 33222 (Essex).

Jupiter Ace programs for cw practice, cw message generator, rty receive etc, all with full instructions and hardware diagrams where required. Send sae for lists. All at £3. G4IPZ, QTHR. **Yaesu FP901DE**, Curtis 8044 keyer, £500. FL2100B, Yaesu linear amp, hardly used, £300. Yaesu desk mic YD844A, dual imp, boxed as new, £20. Prefer buyer inspects/collects. G3EPE, QTHR. Tel 0253 890467, after 2pm.

Triangular fixed radio tower, 52ft high, three sections, with 4ft walk around at top, new cond, drawings available, £300 ono. Could arrange transport. Viewing Leicestershire. G2DGA, ex-G8WDH. Tel Hungerton 310, evenings.

FRG7700, memories, matching atu, bought November 1980, sale necessary due to decease of swl, £300. Buyer collects or pays carriage. G2DRW, QTHR. Tel Coventry (0203) 597135.

FT77S 10W hf tx/rx, brand new, fm board fitted, 20m and 40m Yaesu mobile whips, base etc, £425. PF2 70cm on RB6, RB4, SU8, new cond, £65. G4GZS, QTHR. Tel Rugby 815506.

Icom 251E base station rig, all mode, exc cond, £400 ono. Microwave Modules 432/28 transverter, £100 ono. BATG rty terminal unit, bargain, £20. Reason for sale, getting married. G4OCO. Tel 0295-721 123.

Kenwood rx R820, perfect wkg cond, £400. Tel Derby (0332) 43935.

2m to medium wave converter, in/out switch, suit car, instructions, £15. Hamgear combined atu preamp, xtal calibrator for rx, instructions, £25. Homebrew audio notch and noise limiter, *Practical Wireless* design, instructions, £5. G4ALV, QTHR. Tel 01-460 3852.

Digital frequency meter, Ambit DFM6, large easy to read green fluorescent display, a.m./fm 100Hz res to 3999-9MHz sw 1kHz, vhf 10kHz, fitting instructions, brand new, unused, £25 ono. Tel 061-231 3025.

Yaesu FRG7000 gen cov rx, £180. Buyer collects Worcester area. G4RRG. Tel 0905 352110.

FT230R, absolutely brand new, used only to test pa, £215. Tono MR150W 2m pa, over 200W out, without overdriving, immac, £130. 18-el Parabeam, 70cm unused, varnished, ready to go up, £20. Going hf. Tel 021-471 3518, evenings.

Microwave Modules MM4000 rty tx/rx, RCA keyboard, £230. Micronta oscilloscope, £90. Valve voltmeter, Philips MC6070, £20. G3RDV, QTHR. Tel Stan, Accrington 395376.

Pair Toshiba 6JS6C tubes for FT101, NEC 12BY7A

driver, £10. Shure 444 desk mic, £12. G4HZV, QTHR. Tel 0483 811597.

Trio R600 rx, mint, £210. Barlow Wadley XCR30 rx, £90. Creed tape reader, £15. CDE AR22 rotator, £15. G3UGX, QTHR. Tel 01-435 4105.

Marconi Atalanta rx, 15kHz-28MHz, marine duplex filter, psu, handbooks, £100. Prefer buyer collect. Ultra Lion uhf mobile, unmod, incl circuits, £25. Atari games console, four games, £85. Additional games, £12. G3ZON, QTHR. Tel 01-546 3447.

HQ1 mini quad, two-el, 10-15-20m beam, worked the world, six months old, perfect cond, ideal where space is limited, £80 ono. G4OFR. Tel Plymouth 880784.

Collins tx/rx, vgc, FC702 atu. *Wanted:* Drake atu MN2000. Any Collins radio, must be good cond. Collins linear amp. Tel Derby 557705.

Versatower P60, only one year old, comp with winches etc, as new, £390. G3PJK, QTHR. Tel 061-643 2631.

CQ110E digital hf tx/rx, 150W output, ssb/a.m./cw/rtty, 160-10m (eight bands), under five years old, full history, used little, professionally realigned March '83 with new output valves, spare new output valves, mic, £350. G3VCA, QTHR. Tel Bob, Ruislip 35463.

FT250/FT200, hb power supply in matching cabinet, fully xtalld for ten, spare pa driver, and bal mod valves, bargain, £150. Ideal first time rig. Delivery possible 30 mile radius of London Heathrow airport. G3NTM, QTHR. Tel Staines 56567.

Eddystone 770R 19-165MHz, £90. Plessey telegraph sig gen TSG40, 5 and 8 level, "quick brown fox ... etc" on rom, all solidstate, £120 ono. AT&E TDM56, needs slight attention, manual available for copying, £8. *Wanted:* manual TSG20 for copying or circuit diagram. G5XB, QTHR. Tel 0734 722195.

FT7 80-10m tx/rx, cw/ssb exc cond, £250. Pye Ranger 2m tx/rx, tx modded, rx unmodded, £5. 522 2m a.m./cw tx, needs psu, £5. Buyers inspect/collect or carriage extra. G4EHT, QTHR. (Lichfield, Staffs).

Sommerkamp FT7B, £350. FT902DM, £750. FT290R, £225. FRG770M, £335. Trio TR900, £250. All in exc cond. GW4CBB. Tel Neyland 600907, after 6pm.

Trio TR9000 2m all mode, £275. PS20 power supply, £30. Daiwa DR7500R rotator, round controller, £65. Jaybeam 8XY Yagi, mast, wall brackets, £30. UR67 cable, £5. All equipment used little. G6FCB. Tel 021-477 4697.

A3 Cushcraft 10/15/20 hf beam, exc cond, dismantled ready for collection, £130. G3VQL, QTHR. Tel Shrewsbury 55179.

Have back numbers *RSGB Bulletins* May '46-Dec '75 inclusive (except Jan '66, May '61, May '53, Jan-Apr '47, Sept '46) Indexes Vols 22-52. *Shortwave Mags* Oct '46, Jun '49, Sept 51-Aug '81 (except about 24, mainly 1958-62). Indexes Vols 9, 11-15, 18, 20-25, 27-37. Polite suggestions or offers before destruction, to G2DFG, QTHR. Tel 0303-54466.

FT480R, mint cond, £310. TR2500, mint cond, nicad, leather case, £195. Rotator channel master 9508, £50. Support bearing, £10. Two seven-el Yagis with antenna combiner, £45. TRS80 16k L2, £135. Software, books, £50. G8TQO. Tel Hastings 437513, evenings.

23cm dish antenna, 2m diameter, Mutek dipole feed, fd 0.25, wire mesh over plywood arms, steel hub plate with fixings for 2in mast, proven contest winner, dismantled ready for collection, only £35. G3SPJ, QTHR. Tel Coln, 01-311 8405.

Standard C5800, 25W multimode for 2m, mint cond, under warranty, £299. G6MHA, QTHR. Tel 01-200 1839.

Exchange Belcom Liner 2 tx/rx, wkg on 2m and 10m, comp with mobile mount, mic etc, for hf linear amp, transistor or valve, or sell, £69. G4ANW, QTHR. Tel 0983 866687.

Trio R1000 gen cov tx, 200kHz, 30MHz a.m., ssb, cw, vgc, £210. Buyer collects. Would consider exchange for Dragon 32 or Vic 20. G3IFM NOT QTHR. Tel 01-560 0205.

FT101E, in perfect cond, £350. Buyer to collect. G. Kirk, G4KQG. Tel Nottingham 257396.

Icom IC720A, cw filter, power supply, new, £850. Tono 9000E comm computer, new, £575. GW4ACO, QTHR. Tel 0492 515240.

Sinclair Spectrum tapes containing four morse code tutor programs, QRA locator with European map, £3.50. Jones, G4SWH, 8 Cowper Road, Worthing, Sussex, BN11 4PD.

TS130S, Trio, hf bands tx/rx, mic, mobile bracket, home made 20A psu, good cond, £400. FT1200B, Yaesu, linear amp, good cond, £200. Venus slow

scan camera, good cond, offers. Norman Turner, G4DDZ, QTHR. Tel Chorley (02572) 78347.

Trio TS830S, mint cond, spare pa valves, boxed, £580. MM 2/28 transverter, suit above, £50. G4MH minibeam, three months old, £60. G4KSI, QTHR. Tel 0703 692820.

Racal RA117L, recently aligned, case, £175, 2in square panel meters, 100 Ω , 1mA scale, 0-10, 1-5, 0-25, £2 each. 250W dummy load resistors, metalized glass, 150 Ω , 68 Ω , £3 each. Transformer 1.350V, 110mA, £5. G8ZGK, QTHR. Tel Watford 40848.

Computer: CBM3032 desktop personal computer, built-in vdu, rock steady commercial standard green display, 32k ram, 3600 baud high speed tape system, programmer's toolkit, resident assembler and disassembler, dust cover, cassette decks, soundbox facility, counter, many programs incl advanced morse tutor etc., £500 ono. RSGB VHF/UHF Manual, 3rd edition, £4.50. Creed 3X teleprinter, valve tu, psu, £15. Buyer collects. G3XGK, QTHR. Tel 0502 64160.

18AVT/WB us? Correct 12swg soft aluminium wire for rewinding coils, 20p/m plus postage. Icom IC2E, professionally modified to 140-150MHz receive, 144-148MHz transmit, spare BP4, new nicads, charging adapter, excellent cond, manual, £110. G6ZH, QTHR. Tel Wallingford (0491) 561259.

Trio 700S, good cond, matching spkr, boxed, manual, £390. G4GIQ, QTHR. Tel Northwich 45584.

Eddystone rx type 556, a.m. only range, 58kHz/30-5MHz in five bands, ac 240V, dated from about 1944, in vgc, £45. Tel Ludlow 4836, evening.

Standard C7900, 10W fm slimline mobile for 70cm, mint cond, under warranty, £199. G6MHA, QTHR. Tel 01-200 1839.

Complete swl station: FRG7700, memory, matching atu, in orig cartons, mint, HF5 five band trap vertical, never assembled, £285 or exchange hf tx/rx. Tel Caton 770881.

88mH toroids, American open pattern, suit BARTG tx, ST6, DT600 etc, £2.25 each (incl). Chris Pedder, G3VBL, Thorncliffe, 5 Royalty Lane, New Longton, Preston, Lancs PR4 4JD. Tel 0772 612289.

HW101, HP23 psu, cw filter, irt, mic, handbooks, spare valves, 160m modification by authors of SWM article, £180 ono. Property late G3OKS. Delivered 50 miles. G3OTK, QTHR. Tel Wells (0749) 73025, ext 35.

FT107M, fitted power unit, memory, filters, YM38 scanning mic, FV107 vfo, FV107R transverter, fitted 2m unit, 70cm unit, FC902 atu, YP150 dummy load, wattmeter, SP107 spkr, incl all manuals, mint cond, unused since purchased, Jaybeam DC1/UB 2m, 70cm, aerial, Benham-Holman trap wire dipole, four masts, genuine reason forces sale, offers. Tel 0404 850501 (Devon).

Morse key: Navy 7681 Jaybeam, eight-el Yagi, 2m beam, two brand new, BAY96 Bantam fm high band portable, requires servicing, components, xtals, tuning condensers, dials, tu components, Pye mic, etc, wants, offers, exchanges. G3EQK. Tel Newcastle (0632) 852343.

Pet 2001 computer, 8k integral tape display, incl toolkit, rtty/morse, many programs, £165. Possibly exchange for MM144/100LS. Keyboard decoded, smart alloy case, 76 quality keys, ideal for ZX81 or other micro/rtty use, £8. G4PEY. Tel Horsham 69835.

Eddystone EC10 Mk1, good cond, £55 plus carriage. New Zealand wireless tx/rx ZC1 Mk2, faulty, offers. Dave Christie, RS84225, 8 Ballytober Road, Bushmills, Co Antrim, N Ireland. Tel Bushmills 31086.

Icom IC240 2m mobile, as new, hardly used, orig packing, mic, manual, mobile mount, etc, £120. Antenna specialists, 5/8 whip, coil, magnetic mount, coaxial, £8. Both items, £125. G4ALD, QTHR. Tel Gravesend 69357.

144MHz linear power amp by Microwave Modules, 100W output, £100. Trio 2300, nicads, mobile mount, £100. Eddystone rx model EC10, 500kHz-30MHz, £50. Nombrex sig gen, 160kHz-300MHz, solidstate, £10. Tel Rhyl 2859.

Robot 800, rtty, ASCII, cw/ssv super terminal, split screen, 511 chars, buffer, as new cond, will deliver, £550. G3SVH, QTHR. Tel 0922 414524.

Trio 2300 2m tx/rx, exc cond, incl case, nicads, ideal for portable and mobile, bargain, £100. G6ASA. Tel Oxford 863333.

Yaesu FT101ZDFM, fitted fan, dc/dc converter, Yaesu FC707 antenna tuning unit, Yaesu SP801 spkr, all boxed as new, £670. RS50217. Tel Trevor, Brixham 6795, evenings.

Exchange mint TRS80 16k L2 with cpu, monitor, psu, editor/assembler, books/software (software

includes morse trainer) for FT101 series hf rig (or similar). Tel 061-338 7016.

PET "basic Basic"—a computerized programmed course to teach you basic programming, two program cassettes, with instructions, £12.50 pair, including p&p. PET test programs, one cassette, £6 incl p&p. *Wanted:* Yaesu YO901P, FV901DM. Fax equipment. G3AZI, QTHR. Tel 0772 37815.

Datong ASP, £49. Two-el 10-15-20m cubical quad, 9ft glass fibre spreaders, (one repaired) or makes two VK2ABQ, only £49. UK101 8k case, £99. FT207R, £99. G4JYH, QTHR. Tel 01-886 0126, day.

Silent key: G3GMI, FT101Z, 2-5 years, £300. FTDX401, FV401, £175. KW1000 linear, £175. All exc cond. Numerous selection valves, components, meters etc, enough to fill rally stand, must be seen for offers, G4KTY, QTHR. Tel Burnham (06286) 65536.

Jaybeam trap vertical antenna, 10-15-20m, measured ground planes, £30 only. G3SOF, QTHR. Tel St Albans 59693, evenings.

Pye uhf base station L470, xtalld on SU8, rx takes Westminster xtals, exc cond, comp with conical mic, service manual, built-in reflectometer, sturdy 10W out, £120 ono, plus carriage. Prefer buyer collects. G6IJA, QTHR. Tel Shephed 503985.

FT102 hf tx/rx, incl fm, mic, mint cond, used only twice, £750 ono, plus carriage. Going hf mobile. G6DHF, QTHR. Tel 0726 2072.

FDK Multi 700EX 2m fm, immac cond, perfect from new, comp mobile bracket, mic, etc, used very little, £140. G3INN, QTHR. Tel 084421 2641.

FT212RD, Mutek front end board, extra fixed chan xtals, vgc. G3MPN, QTHR. Tel Wymondham 603382.

WANTED

Record or tape: Lale Andersen or Dietrich, *Lily Marlene* also *Ferry Boat Serenade*. G6FBR, QTHR. Tel Winchester 66764.

Mk128 set in wooden case, also Mk119, Mk122 and Mk217 sets, incomplete or damaged items welcome, has anyone any connecting cables for Canadian No29 set? Also require comp STC STR18 hf tx/rx. Taylor, G3UCT NOT QTHR. Tel York (0904) 29777.

3032K Commodore PET or 4032K with any peripherals. FT75B with any vfo, FP75, etc. Going rates paid by new station. Sig gen, 100kHz-150MHz. Logic checkers 14/16 way d.i.l. TTL/DTL cmos or TTL/cmos logic pulser. Colour camera, video, similar Panasonic 3030E with power unit if available. ZX80A. G4IZW. Tel Ken, Newcastle-upon-Tyne (0632) 678828, anytime.

Attempting my own "real" radio collection. Good price paid for mint 19 sets, 38 sets, 1154, 1155, BC348, anything of this era accepted. W.H.Y? G3ZYC, QTHR.

Manual with information on alignment of vfo for Yaesu FT75. G4SVE, 1 Hastings Avenue, Kingston Park, Newcastle-upon-Tyne NE3 2YF.

Racal MA79 tx drive unit or other Racal gear considered. G3YFG, QTHR. Tel 025482 3769.

G2DAF rx parts, 898 dial, v/caps for preselector, vfo, 455kHz i.f.s, part or full chassis. G4GIM, QTHR. Tel 0905 354727.

For the Wireless Museum: old radio books, magazines, catalogues, service sheets, QSL cards, call books, Gamages catalogue, morse keys, valves, components, knobs! Collection arranged. Details please to hon curator, G3KPO, 52 Westhill Road, Ryde, IoW. Tel Ryde (0983) 62513.

Sony ICF2001 service manual. Will copy and return or pay direct. Modifications and technical tips thereon will be appreciated. Info on active antenna arrays and combiners needed. PO Box 31026, Braamfontein, South Africa 2017.

Jackson type C808 split stator, 10pF each section, quantity three. G3LTN, QTHR. Tel Banbury 710623.

Johnson or Miller wide spaced 500pF transmitting variable capacitor. G3AMF, QTHR. Tel 01-989 9224.

MMT1296/144 transverter at around £110. WG16 to coaxial transitions. *For sale:* VLF stations frequency list, worldwide up to 160kHz, 80 sheets, £5. ISXWW, Crispino Messina, Via di Porto 10, 50058 Signa FI, Italy.

Can you help me? Circuit or photocopy and thermal delay for Minimitter 150W tx. Manuals to buy, borrow or copy for Class D wavemeter and R1155 rx, especially info on di/circuitry. Details to G3KXF, QTHR. A. Hrs. Tel Worthing 764599.

Microwave Modules MMV 129C varactor tripler, Bird thru-line directional wattmeter model 43, elements. G8KPS, QTHR. Tel 01-366 2963.

Urgent: Circuit and/or component values of Eagle Products model K110 rf power and swr meter, 52

and 75Ω. Thurlow, G3WW, QTHR. Tel 0354-740 255.

Southend sea cadet corps are in urgent need of your unused radio equipment: txs, rxs, atus, psus, antennas for the purpose of training young cadets in radio comms. Donations gratefully accepted. Tel Southend (0702) 48334, Tuesday and Thursday evenings.

Manual for Trio 2400. External mic and carrying case. Mr P. Darke, 18 Colchester Close, Prittlewell, Southend, Essex. Tel Southend 353247 after 2100h any evening.

Mechanical hand or desk calculators, eg Brunsviga, Britannic or similar vintage. Instruction manuals. G8AGN NOT QTHR. 345 Redmires Road, Sheffield S10 4LD.

Trio TX310. Please send details to G6VEK, 15 Lynchets Road, Amesbury, Wiltshire. Tel TONY, Crawley 25472.

Collins F455Z-4 usb mechanical filter or filter centred on 455kHz for sideband switching, eg Kokusai MF-455-10CK. NB cw filter. Polar C28-142 two gang 75 or 100pF variables. G3KWJ, QTHR. Tel Nick, 027-587 2306.

Kenwood DG5 digital readout for TS/520SE. Unmodified BC348. For sale: Solartron oscillator CO/546 range 25Hz to 500kHz, £25. KW E-zee Match, as new, £30. Pair unmodified Pye Pocket-fone tx/rxs, nicads, base chargers, £45 each. G3JDK, QTHR.

Electroniques gen cov transistorized coilpack. Rad Coms Dec '68, Sept '76, Sept '77. Bases for pair of 4-250A valves. Two Bright emitter valves with pip tops to complete restoration project. K. W. Clark, G3WIF, QTHR. Tel Bristol (0272) 293738. **Tektronix 545B** oscilloscope tube, manual, would consider unworking scope. Manuals for type B and CA plug-in units. Information for GEC Courier and Advance counter TC7. G4FIT, QTHR. Tel Burgh Heath 54696.

Stolle rotator type 2010, automatic, with or without control box, two required. PM2000 peak reading wattmeter, 4/6-el 2m quad. KW107, KW109 atu or similar type. 15/20m five core cable, good cond essential. G4CMT, QTHR. Tel 0482 812115. Bulk accumulations of QSL cards needed for cash, and also early letters, documents relating to

amateur radio. Mags of the 'twenties welcome, (*Wireless World*, *Bulletin* etc). G3BDQ, White Friars, Friars Hill, Guestling, Hastings, East Sussex TN35 4EP.

SSB filter, 455, 470kHz range, bandwidth 2-4kHz, similar to MFL455, but usb, preferably with carrier xtal. Details to G3YWW, QTHR. Tel 0305-81 3880, evenings.

QSL cards and morse keys from pre-war period. Actual money disbursed for same! Please give brief description, and state price required if you wish. G4LQF, QTHR. Tel 021-426 3663.

KW2000, single pa valve, psu, in clean wkg order. G4LSB, QTHR. Tel Dean 43329.

KW107 or KW109, must be in good cond, good price paid. Will collect within 100 miles of Cheshire area if necessary. For quick deal tel 061-928 3939. B. Abbott, RS52130.

FL2100 linear, in good cond. Compact monitor-scope. G2DLO. Tel Leicester 738137.

Hygain DB10/15 beam or Mosley Egan. G4BMX, QTHR. Tel 04536 5042.

TR931 Racial man-pack set urgently sought. Johnson 1kW Matchbox. G3KVT, QTHR. Tel 0603 860452.

Strong hf rotator, good cond. IC245E, good price paid! G4MAP, QTHR. Tel 0562-744 062.

KW108 monitor-scope. Vox unit for KW204. G4SOX. Tel 0926 498388.

YO901P Yaesu monitor-scope, good price offered. Can you help me find one. G4NOW. Please tel 01-850 4848, evenings, weekends.

Drake TR7; L7; MN2000 or MN2700; any other good quality equipment considered. Datong FL3. Will pay cash and collect. Jim Taylor, G4ERU, QTHR. Tel Bournemouth 510400.

Now on the air with T1154: need matching unmod R1155 to complete. A1134, loop ant, accessories. Sync unit for Gee indicator 62A or similar scrap indicator. Second world war WS29. For sale: Cossor 3733 1930s rx, £12. G3XSJ. Tel Bristol 685280.

Can any old-timer supply me with following—Post Office morse key type 610, large knob. 500pF wide-spaced capacitor and a 250pF + 250pF wide-spaced split-stator capacitor. GW4JKR. Tel (0248) 715582.

10X xtal holder, must exist somewhere! Please help. G4BKM, QTHR. Tel Denham (0895) 834358. **Lowe FX1** wavemeter, VOX3 unit for TS700G, 2m 13-el portable tonna, all in good cond please. G8CXQ, QTHR. Tel 0926 313669.

Macrotechnics M80 rttv/cw interface manual. All costs, postage and tel calls refunded. C. R. Bayliss, G3WKZ, Woldings, Wellgreen Lane, Kingston, Nr Lewes, E Sussex BN7 3NP. Tel Lewes 3377.

Can anyone assist with an integrated circuit number SN76001ND for the vertical output amplifier stage of a Heathkit model GR9900 television receiver? G3RDU, QTHR.

Atlas 210X mobile mount; noise blanker; ant match trans; digital display readout, or any other Atlas bits. Jim Taylor, G4ERU, QTHR. Tel Bournemouth 510400.

Break-in November '78 and May '79—buy, loan or photocopy of articles over super regen. Paul Henriouille, ON4QH, 20 Rue Du Village, B5952 Orp-Jauche, Belgium.

Drake R4C rx or comp 4C line, T4XC R4C, combination wanted. Must be late model and good cond. Hygain TH3 Mk3 beam. Willing to collect. G3TKN, QTHR. Tel Waterlooville 65101.

Manual for ex-RAF T4188 tx. Circuit diagrams for linear amps using 4X150A valve, both hf and vhf. Andrew Wright, G4OJY, 14 Thorne Grove, Rothwell, Leeds LS26 0HP. Tel Leeds 827203.

Any useful information about mods and improvements to Atlas 180 tx/rx. All expenses refunded, can photocopy. G8IMM, QTHR.

GDO, linear amp, hf 100W or 200W. Dummy load 50Ω, reasonable prices. G3NZY NOT QTHR. Tel 0904 410385.

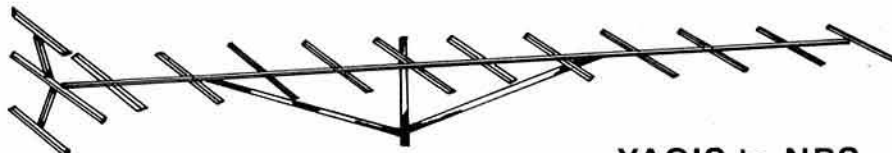
G2DAF rx, prefer Mk3 but would accept Mk1. G3EXV, QTHR. Tel Preston (0772) 616929.

Refurbishing old HRO: any knobs, panel labels, coils or w.h.y. welcome. Reasonable prices paid. For sale: Jaybeam phasing harness type PM H/2G/50, Bauer key paddle, both brand new, £8 each. Higgins, G3YMT, QTHR. Tel Belfast 794688.

18AVT/WB trap vertical. Exchange Nikon Photomic F2 with 28mm f2.8 lens, case, mint, for good hf tx/rx. Large quantity QST, 73, CQ, Ham Radio mags for disposal. Tel Bournemouth 510400.

MET

ANTENNAS



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432/17T	17 Ele long	2.9 m	15 dBd	£37.33
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144/7T	7 Ele	1.6 m	10 dBd	£19.99
144/8T	8 Ele long	2.45 m	11 dBd	£31.26
144/14T	14 Ele	4.5 m	13 dBd	£44.49
144/19T	19 Ele	6.57 m	14.2 dBd	£53.22
144/6X	6 Ele crossed	2.5 m	10.2 dBd	£37.86
144/12X	12 Ele crossed	4.57 m	12.2 dBd	£54.95
4 M				
70/3	3 Ele	1.7 m	7.1 dBd	£28.69
70/5	5 Ele	3.45 m	9.2 dBd	£43.56

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FT101Z	160-10m 9 Band Transceiver (FM)	590.00	(—)
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YH77	Lightweight Headphones 8 ohm	9.95	(0.75)
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2M BNC or PL259 (state which required)	4.50	(0.50)
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70cm BNC or Thread	4.50	(0.50)
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HK704	Deluxe Up/Down Key	16.95	(1.00)
MK704	Squeeze Paddle	10.95	(0.75)
—	Practice Oscillator	8.75	(0.75)
DK210	Daiva electronic keyer — needs paddle (MK704)	47.00	(1.50)
EK150	Electronic Keyer	87.50	(1.50)



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SP230	External Speaker Unit	41.00	(1.50)
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PS430	Matching Power Supply	112.00	(3.00)
SP430	Matching Speaker	29.44	(1.50)
MB430	Mobile Mounting Bracket	11.27	(1.50)
FM430	FM Board for TS430	34.50	(1.00)
TS130S	8 Band 200W Pep Transceiver	559.00	(—)
TS130V	8 Band 20W Pep Transceiver	458.00	(—)
VFO120	External VFO	98.00	(1.50)
TL120	200W Pep Linear for TS120V	167.00	(1.50)
MB100	Mobile Mount for TS130/120	18.60	(1.50)
SP120	Base Station External Speaker	26.40	(1.50)
AT130	100W Antenna Tuner	93.00	(1.50)
PS20	AC Power Supply - TS130V	57.96	(2.50)
MC50	Dual Impedance Desk Microphone	30.80	(1.50)
MC35S	Fist Microphone 50K ohm IMP	14.70	(0.75)
MC30S	Fist Microphone 50K ohm IMP	14.70	(0.75)
LF30A	HF Low Pass Filter 1kW	21.00	(1.00)
TR9130	2M Multimode	433.00	(—)
TR9500	70cm Multimode	450.00	(—)
BO9A	Bass Plinth for TR9130	39.30	(0.50)
TR7800	2M FM Mobile 25W	257.00	(—)
TR7730	2M FM Compact Mobile 25W	199.00	(—)
TR2300	FM Portable	152.00	(—)
VB2300	10W Amplifier for TR2300	65.70	(1.50)
MB2	Mobile Mount for TR2300	21.00	(1.50)
TR3500	70cm Handheld	250.00	(—)
TR2500	2M Synthesised Handheld	232.00	(—)
ST2	Base Stand	51.90	(1.50)
SC4	Soft Case	13.80	(0.50)
SMC25	Speaker Mic	16.10	(1.00)
PB25	Spare Battery Pack	25.00	(1.00)
MS1	Mobile Stand	31.90	(1.00)
TR8400	70cm FM Mobile Transceiver inc. PS10	299.00	(—)
PS10	Base Station Power Supply for TR8400	64.00	(2.00)
R600	General Coverage Rec	257.00	(—)
R2000	Synthesised 200KHz-30MHz Rec	398.00	(—)
HC10	Digital Station World Time Clock	67.60	(1.50)
HS5	Deluxe Headphones	23.00	(1.00)
HS4	Economy Headphones	11.27	(1.00)
SP40	Mobile External Speaker	14.26	(1.00)

FDK

Multi 700AX	2M FM Mobile 25W	215.00	(—)
Multi 750X	2M Multimode	315.00	(—)
Expander	70cm transverter for 750X	199.00	(—)

ICOM

IC740	H.F. 9 Band Transceiver	769.00	(—)
IC720A	H.F. Tx + Gen. Cob. Rx	949.00	(—)
IC-PS20	P.S.U. for above with Speaker	155.00	(—)
IC-PS15	P.S.U.	119.00	(—)
IC2KL	H.F. Linear 500 Watts O/P	915.00	(—)
IC2KLPS	P.S.U. for above	256.00	(—)
ICAT500	1.8-30MHz Auto A.T.U.	349.00	(—)
ICAT100	3.5-30MHz Auto A.T.U.	249.00	(—)
IC251E	2M Multimode Base Station	559.00	(—)
IC290E	2M Multimode Mobile	379.00	(—)
IC25E	2M FM Mobile 25W	269.00	(—)
IC2E	2M Handheld	179.00	(—)
IC4E	70cm Handheld	199.00	(—)
ICBC30	Base Charger	45.00	(1.50)
ICMH9	Speaker - Microphone	12.00	(1.00)
ICML1	10 Watt 2M Booster IC2E	59.00	(1.00)
ICSM5	Desk Mic (8 pin for Icom only)	29.00	(1.00)
ICR70	General Cov. Receiver	499.00	(—)

ANTENNAS BITS

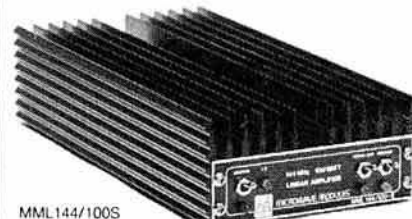
H1-Q Balun 1:1 5kW (PL259 Fitting)	9.95	(0.75)
W2AU Unadilla 4:1 Balun	15.95	(1.20)
7.1/14/21MHz Unadilla Traps - Pr.	15.95	(1.20)
7.1MHz Rail Traps - Epoxy - Pr.	7.95	(1.50)
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Polyprop Strain Insulators	0.40	(0.10)
Small Egg Insulators	0.40	(0.10)
Large Egg Insulators	0.50	(0.10)
75 ohm Twin Feeder - Light Duty - Per Metre	0.16	(0.04)
300 ohm Twin Feeder - Per Metre	0.14	(0.04)
URM67 Low Loss 50 ohm Coax-Per Metre	0.60	(0.20)
UR76 50 ohm Coax-Per Metre	0.25	(0.05)
UR70 70 ohm Coax - Per Metre	0.30	(0.05)
4mm Polyester Guy Rope (strength 400kg) per metre	0.18	(0.04)
Self Amalgamating Tape 10cm x 25mm	3.50	(0.75)

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FL1	Frequency Agile Converter	79.35	(—)
FL2	Multi-mode Audio Filter	89.70	(—)
FL3	Audio Filter & Notch	129.37	(—)
ASP	Auto RF Speech Clipper (Tno or Yaesu 4 pin Plug)	82.80	(—)
D75	Manually controlled RF Speech Clipper	56.35	(—)
RFC/M	RF Speech Clipper Module	29.90	(—)
D70	Morse Tutor	56.35	(—)
AD270	Indoor Active Antenna	47.15	(—)
AD370	Outdoor Active Antenna	64.40	(—)
MK	Keyboard Morse Sender	137.42	(—)
Codecall	Selective Calling Device (Link prog)	32.20	(—)
Codecall	Selective Calling Device (Switch prog)	33.92	(—)
RFA	Wideband Preamp	33.92	(—)
DC 144/28	2 Metre to 28MHz converter	39.67	(—)
MPU	Mains Power Unit	6.90	(—)

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MMT432/28S	70cm Transverter for HF Rig	159.95	(—)
MMT432/144R	70cm Transverter for 2M Rig	184.00	(—)
MMT70/28	4M Transverter for HF Rig	119.95	(—)
MMT1296/144	4M Transverter for 2m Rig	184.00	(—)
MMT70/144	4M Transverter for 2M Rig	119.95	(—)
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MML144/50S	2M 50W Linear Amp	85.00	(—)
MML144/100S	2M 100W Linear Amp	139.00	(—)
MML144/100LS	2M 100W Linear Amp	159.00	(—)
MML432/30L	70cm 30W Linear Amp	99.00	(—)
MML432/50L	70cm 50W Linear Amp	109.95	(—)
MML432/100	70cm 100W Linear Amp	228.64	(—)
MM2001	RTTY to TV Converter	189.00	(—)
MM4000	RTTY Transceiver	269.00	(—)
MMC50/28	6M Converter to HF Rig	29.90	(—)
MMC	4M Converter to HF Rig	29.90	(—)
MMC144/28	2M Converter to HF Rig	29.90	(—)
MMC432/28S	70cm Converter to HF Rig	37.90	(—)
MMC432/144S	70cm Converter to 2M Rig	37.90	(—)
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MMD600P	600MHz Prescaler	29.90	(—)
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MMA144V	2M RF Switched Preamp	34.90	(—)
MMF144	2M Band Pass Filter	11.90	(—)
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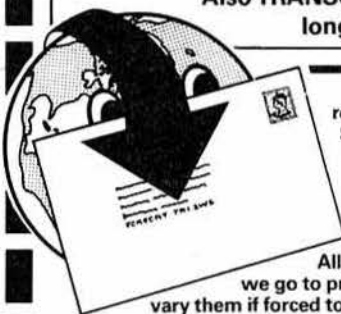
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SP45M	130MHz-470MHz POWER/SWR Meter	51.00
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CT300	300/1kW dummy load 250MHz (SO239)	49.50
CT03N	3W dummy load 1.3GHz ('N' socket)	30.00
CH20A	2 way coax switch 1kW 900MHz (SO239)	17.95
CH20N	2 way coax switch 1kW 1.3GHz ('N' socket)	21.95
TP05X	50-500MHz power meter with load	13.95
TP25A	50-500MHz 25W power meter with load	17.50
TP20Q	30-1500MHz power meter with load	139.00
CA35A	Static discharge protector. DC 500MHz 300w	10.75
CA23N	Static discharge protector. DC 1500MHz 300w 'N'	12.60

MICROWAVE MODULES

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MMT 432/28S	70cm Transverter for HF Rig	159.95
MMT 432/144R	70cm Transverter for 2m Rig	184.00
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MML 432/50	70cm 50W linear Amp	189.95
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MM 400KB	RTTY transceiver with keyboard	299.00
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MMC 435/600	70cm ATV converter	27.90
MMK 1296/144	23cm converter to 2m Rig	69.95
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MMA 144V	2m RF switched pre amp	34.90
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GLNA 432u-2	432MHz gasfet unswitched preamp 0.65dB nf/ 13dB gain	56.90
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GLNA 129ub	1.3GHz two-stage ultra-low noise gasfet unswitched preamp 20dB gain	82.25
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BBA 860u	250-860MHz broadband low-noise preamp	20.50
XPFF 700ub	Band IV-V bandpass tv filter	2.95
PSPU 012	12v (nominal) mains psu for BBBA 500u and BBBA 860u	6.95
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RPCB 251ub	IC211/251E replacement front-end board	69.90

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such as the 144LIN25B and MPA2.
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FM Receiver	70FM05R5	68.25	48.25
Synthesiser (2 pcb's)	70SY25B	84.95	60.25
Synthesiser Transmit Amp	A-X3U-06F	27.60	17.40
Synthesiser Modulator	MOD 1	8.10	4.75
Bandpass Filter	BPF 433	6.10	3.25
PIN RF Switch	PSI 433	9.10	7.75
Converter (2M or 10M i.f.)	70RX2/2	27.10	20.10
FM Package 2 (Synthesised)	70PAC2	163.00	128.00
TV Products			
Receive Converter (Ch 36)	TVUP2	26.95	19.60
Pattern Generator	TVPG1	39.95	32.53
TV Modulator	TVM1	8.10	5.30
3W Transmitter (boxed)	ATV-1	87.00	—
3W Transceiver (boxed)	ATV-2	119.00	—
Power Amplifiers (FM/CW Use)			
50mW to 500mW	70FM1	14.65	8.85
500mW to 3W	70FM3	19.65	13.25
500mW to 10W	70FM10	30.70	22.10
3W to 10W	70FM3/10	19.75	14.20
10W to 45W	70FM45	58.75	45.20
Combined Power Amp/Pre-Amp	70PA/FM10	48.70	34.65
Linears			
500mW to 3W	70LIN3/LT	25.75	18.60
3W to 10W (Compat. ATV1/2)	70LIN3/10E	39.10	28.95
Pre-Amplifiers			
Bipolar Miniature (13dB gain)	70PA2	7.90	5.95
MOSFET Miniature (14dB gain)	70PA3	8.25	6.80
RF Switched (30W Max)	70PA2/S	21.10	14.75
2M EQUIPMENT			
Transceiver Kits and Accessories			
FM Transmitter (1.5W)	144FM2T	36.40	22.25
FM Receiver	144FM2R	64.35	45.76
Synthesiser (2 pcb's)	144SY25B	78.25	59.95
Synth Multi/Amp (1.5W o/p)	SY2T	26.85	19.40
Bandpass Filter	BPF 144	6.10	3.25
PIN RF Switch	PSI 144	9.10	7.75
Synthesised FM Package (1.5W)	144PAC	138.00	105.00
Power Amplifiers/Linears			
1.5W to 10W FM (No Changeover)	144FM10A	18.95	13.95
1.5W to 10W FM (Auto-Changeover)	144FM10B	33.35	25.95
1.5W to 10W SSB/FM (Auto c/o)	144LIN10B	35.60	26.95
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FM Receiver	4FM2R	61.65	43.15
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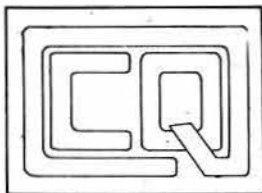
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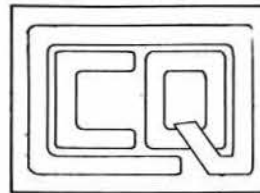




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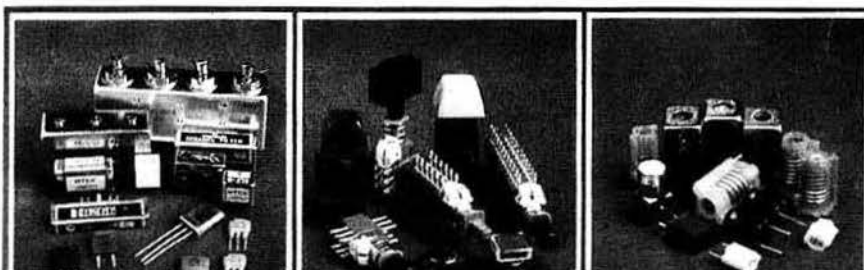
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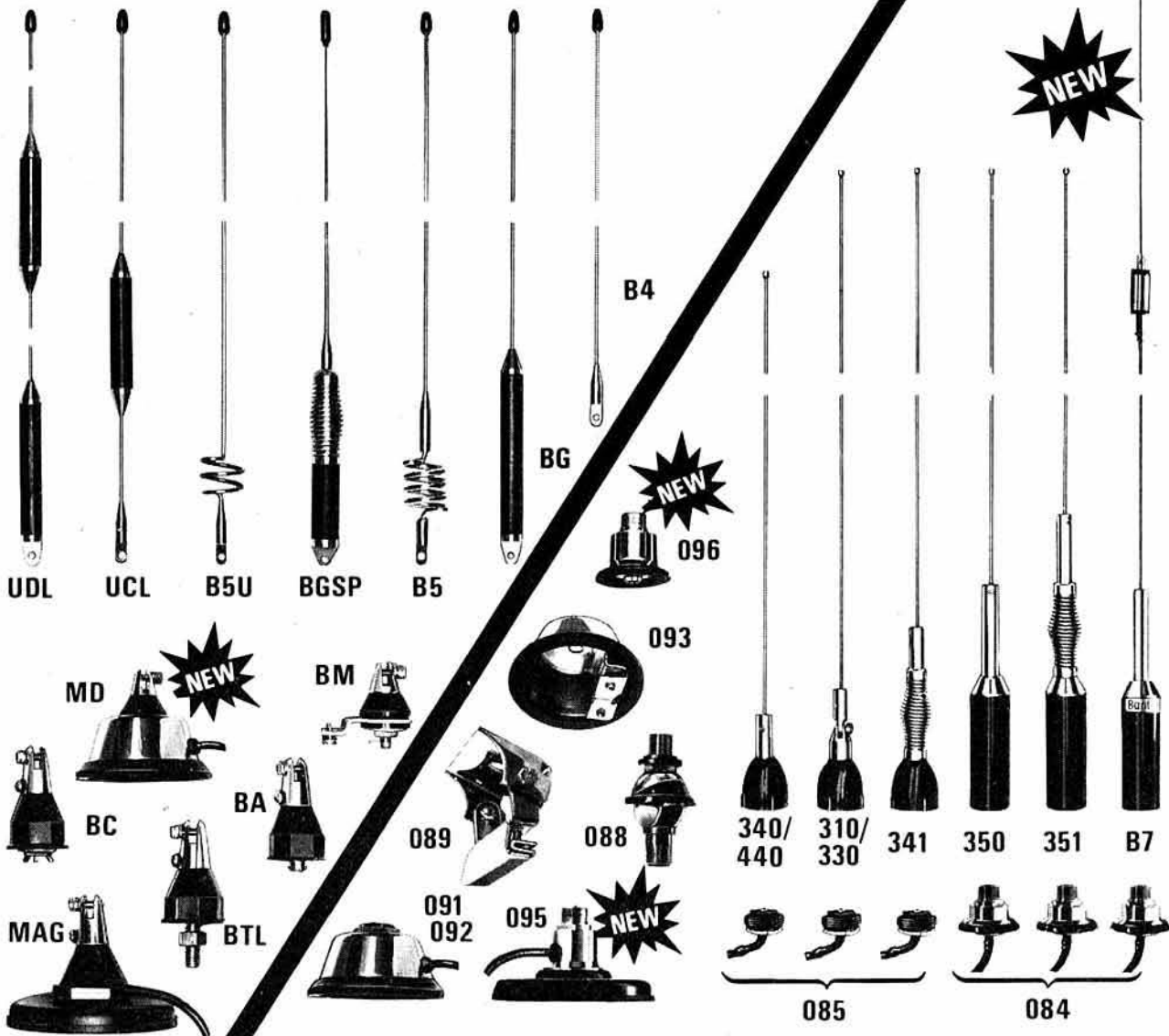
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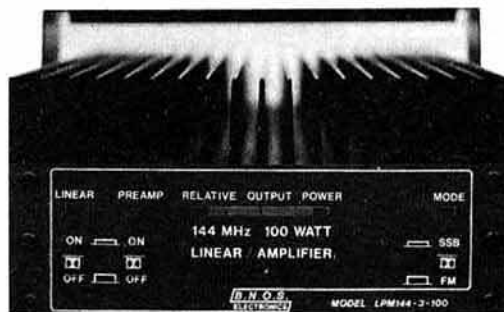
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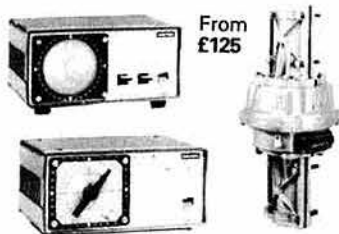
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TS830S	£697.82	R600	£257.60	TS130V	£456.32	TR2300	£152.00	TR8400	£199.00
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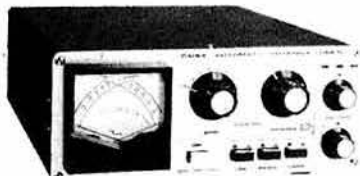
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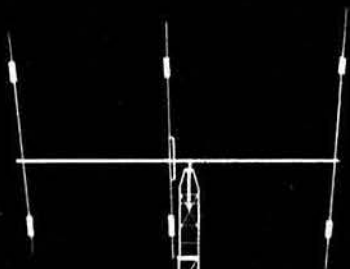
or call at one of our dealers listed below:

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A Low frequency fundamentals in HC13/U or HC6/U

Total tolerance $\pm 100\text{ppm } 0^\circ \text{ to } +70^\circ\text{C}$

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80 to 99.99kHz HC13/U	£13.08
100 to 159.99kHz HC13/U	£11.32
160 to 399.99kHz HC6/U	£7.83
400 to 499.99kHz HC6/U	£7.00
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B High frequency fundamentals/overtones

Adj. tol. $\pm 20\text{ppm}$, Temp. tol. $\pm 30\text{ppm } -10^\circ\text{C to } +60^\circ\text{C}$

800 to 999.99kHz (fund) HC6/U	£11.01
1 to 1.499MHz (fund) HC6/U	£11.25
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2.6 to 20.9MHz (fund) HC6/U	£4.87
3-4 to 3.99MHz (fund) HC18 & 25/U	£6.75
4 to 5.99MHz (fund) HC18 & 25/U	£5.36
6 to 21MHz (fund) All Holders	£4.87
21 to 25MHz (fund) "	£7.31
25 to 30MHz (fund) "	£9.00
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Delivery—Mid range 1MHz to 105MHz normally 4/6 weeks.

Other frequencies 6/8 weeks.

Holdings—Low Frequencies 6 to 150kHz HC13/U, 150kHz to 3.4MHz HC6/U, 3.4MHz to 105MHz HC6/U, HC18/U or HC25/U, over 105MHz—HC18/U and HC25/U.

HC33/U (Wire ended HC6/U) is available on request as per HC6/U.

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

COMMERCIAL AND PROFESSIONAL CRYSTALS NEW FASTER SERVICE

We are now supplying crystals to most commercial and MIL specifications in the range 1MHz to 60MHz ordered in small quantities in 21 weeks AT NO EXTRA CHARGE. We also have even faster EXPRESS SERVICES available for that VERY URGENT order.

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TERMS: CASH WITH ORDER—MAIL ORDER ONLY. PRICES INCLUDE P&P (BRITISH ISLES) EXCEPT WHERE STATED OVERSEAS CHARGED AT COST.

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USE (TX or RX
and HOLDER)
m s250

OUTPUT
FREQUENCY

CRYSTAL FREQUENCY	4MHz-TX-HC6/U	6MHz-TX-HC25/U	8MHz-TX-HC6/U	10MHz-RX-HC6/U	11MHz-RX-HC6/U	12MHz-TX-HC25/U	14MHz-RX-HC25/U	18MHz-TX-HC25/U	44MHz-RX-HC6/U	52MHz-RX-HC25/U
144.4 (433-2)	b	c	b	e	e	c	c	e	e	e
144.800	e	e	e	e	e	c	c	e	e	e
144.825	e	e	e	e	e	c	c	e	e	e
144.850	e	e	e	e	e	c	c	e	e	e
145.000/R0T	a	c	a	c	c	b	e	b	e	a
145.025/R1T	a	c	a	e	e	b	e	b	e	a
145.050/R2T	a	c	a	e	e	b	e	b	e	a
145.075/R3T	a	c	a	e	e	b	e	b	e	a
145.100/R4T	a	c	a	e	e	b	e	b	e	a
145.125/R5T	a	c	a	e	e	b	e	b	e	a
145.150/R6T	a	c	a	e	e	b	e	b	e	a
145.175/R7T	a	c	a	e	e	b	e	b	e	a
145.200/R8R	a	c	a	e	e	b	b	b	a	e
145.300/S12	e	e	e	e	e	e	e	e	e	e
145.350/S14	e	e	e	e	e	e	e	e	e	e
145.400/S16	e	e	e	e	e	e	e	e	e	e
145.425/S17	e	e	e	e	e	e	e	e	e	e
145.450/S18	a	e	a	e	e	b	b	b	a	e
145.475/S19	a	e	a	e	e	b	b	b	a	e
145.500/S20	a	c	a	c	c	b	b	b	a	e
145.525/S21	a	c	a	c	c	b	b	b	a	e
145.550/S22	a	c	a	c	c	b	b	b	a	e
145.575/S23	a	c	a	c	c	b	b	b	a	e
145.600/R0R	a	c	a	c	c	b	b	b	a	e
145.625/R1R	e	e	e	c	c	e	e	e	a	c
145.650/R2R	e	e	e	c	c	e	e	e	a	c
145.675/R3R	e	e	e	c	c	e	e	e	a	c
145.700/R4R	e	e	e	c	c	e	e	e	a	c
145.725/R5R	e	e	e	c	c	e	e	e	a	c
145.750/R6R	e	e	e	c	c	e	e	e	a	c
145.775/R7R	e	e	e	c	c	e	e	e	a	c
145.800/R8R	a	c	a	c	c	b	b	b	a	e
145.950/S38	a	e	e	c	e	e	e	e	a	e

PRICES: (a) £2.15, (b) £2.55, (c) £2.80 and (e) £4.87

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

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Many types of made to order crystals are available on our "EXPRESS SERVICE"—with delivery of three days on our class "A" service. Telephone for details.

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Due to the much higher multiplication involved compared with 2 metres all our 70cm crystals are to a much higher tolerance than our standard amateur spec. crystals.

We are stocking the following channels:—RB0, RB2, RB4, RB6, SU8, RB10, RB11, RB13, RB14, RB15, SU18 and SU20 TX and RX for use with: PYE UHF Westminster (W15U), UHF Cambridge (U10B), Pocketphone (PF1) and UHF PF70 Range and Storno CQL/COM 662 all at £2.55.

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

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HC6/U and HC13/U 25p each, HC25/U 20p each plus 20p P&P (P&P free if ordered with crystals).

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All at £3.00, 38–6666MHz (144/28), 42MHz (70/28), 58MHz (144/28), 70MHz (144/4), 71MHz (144/2), 96MHz (1,296/432/144), 101MHz (432/28), 101–50MHz (434/28), 105–6666MHz (1,296/28) and 116MHz (144/28).

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200kHz and 455MHz in HC6/U £3.50
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Please let us know your requirements eg 4MHz HC18/U, 1 off £2.00, 100 off £1.10, 1000 off 99p, 2500 off 50p.

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10m whip only 1-3m long with magmount	£18.00 P&P £3.00
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The Araki Range are handmade of top quality anti-corrosion treated aluminium or stainless steel.

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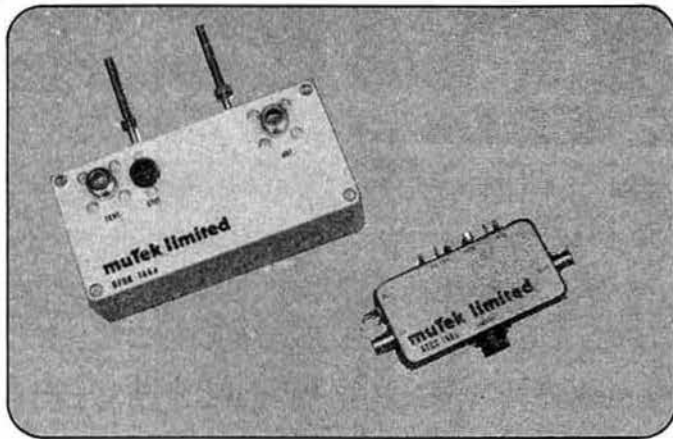
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The vast majority of manufacturers of preamplifiers for the amateur radio market are quite content to use 'traditional' amateur designs without too much thought. Whilst it's true that almost anyone can make a low-noise amplifier of sorts it's a rather different matter to make high quality amplifiers at prices attractive to radio amateurs. There are also other important factors which many of our competitors either don't understand or try to ignore. To do the job properly requires considerable investment both in test equipment and engineering skills. It's a sobering thought that even a humble SLNA 144ub sees around £20k in test equipment before it leaves our factory!

We've always approached the design of our products rather differently from many of our competitors. Rather than simply copy what has gone before it's been our practice to approach the design problem in a rather more systematic manner. Our two new 144MHz preamplifiers perhaps demonstrate this.

It is probably not going too far over the top to say that the GFBA 144e is the best 144MHz band preamplifier manufactured anywhere. It uses an MGF1200 gasfet in a unique negative-feedback circuit (this is probably the only sensible way to use gasfets at vhf) which simultaneously achieves a very low noise figure (better than 0.9dB) and very good strong-signal performance (input third-order intercept point typically +14dBm).

As is usual with our amplifiers we've incorporated extensive bandpass filtering not only does this help to remove problems with image breakthrough from the 118-136MHz aircraft band but it will also provide protection from out-of-band intermodulation problems.

The antenna changeover switching has been designed to handle powers way in excess of the UK legal limit. In order that relay life isn't shortened drastically by switching hundreds of watts on load the GFBA 144 is only supplied with its companion ATCS 144 controller. This will interface with any 144MHz transceiver.

The SLNA 145sb is a different amplifier for a different application. We've taken a conventional low-noise mosfet (BF981) and designed around it a preamplifier tailored specifically to the FT290. Our traditional regard for good filter design hasn't been forgotten and we've also fitted a low-loss relay to bypass Yaesu's lossy diode antenna changeover circuit.

THE RANGE

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SLNA 70ub	Unboxed version of SLNA 70u	13.70
SLNA 144s	144MHz low noise switched preamplifier using BF981 (0.9dB noise figure)	37.10
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SLNA 144ub	Unboxed version of SLNA 144u	13.70
SLNA 145sb	Transceiver optimised preamplifier with antenna c/o switching using BF981. Intended for the FT290R, but has many other applications!	27.40
GFBA 144e	Ultra-high performance environmentally housed switched gasfet preamplifier using advanced negative feedback circuitry for superb dynamic performance. Supplied with ATCS 144s controller	129.90
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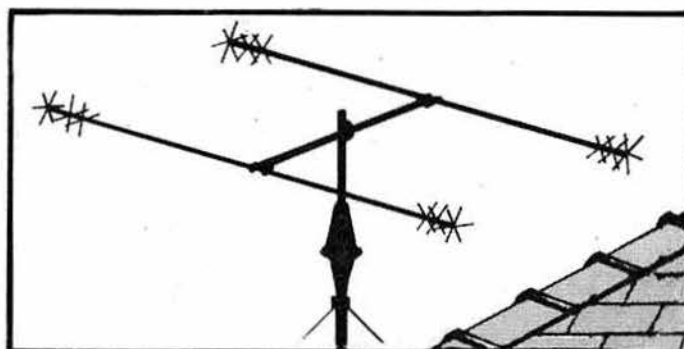
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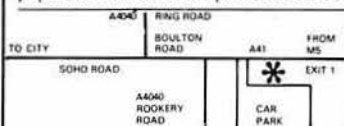
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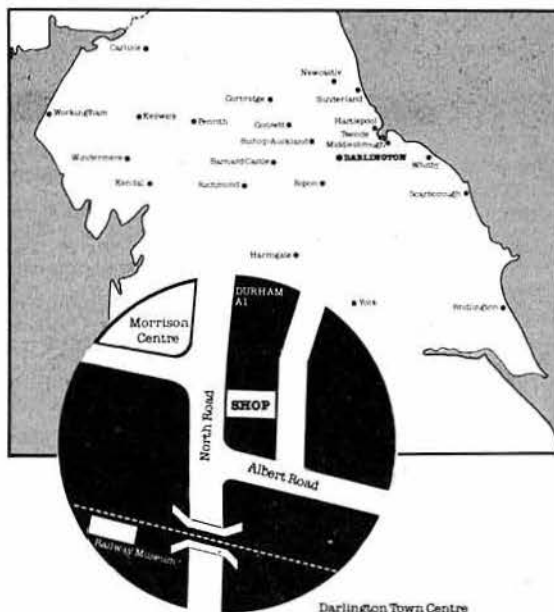
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However, as all these facilities are to be found across the road from our new amateur radio shop in the North East of England, then you will appreciate that we take great care in positioning the Lowe Electronic shops to help both you and other members of your family. The shop is in Darlington, 56 North Road, that is on the A167 road to Durham, only a few minutes from the town centre. Darlington is a delightful market town with extremely good links to the A1 north or south and to the west and east. Indeed, Darlington is easy to get to from towns such as Scarborough, Bridlington, York, Harrogate, Penrith and Carlisle. To the fortunate Radio Amateurs of the North East, then you have Lowe Electronics in your own backyard.

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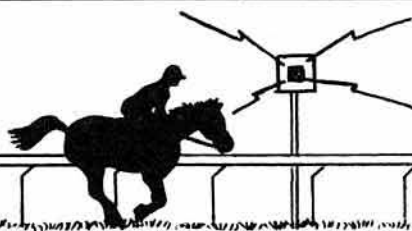
This will consist of rewriting or adapting existing written material, where appropriate with the co-operation of the original authors, and assisting with the origination of new material.

In particular, he will be involved in the production of specific equipment designed expressly for beginners to amateur radio.

The person required must have high technical ability, but of great importance will be his capacity to understand the technical problems of licensed amateurs and short wave listeners at all levels of experience. He must, therefore, be able to recognise technical aspects of importance to amateur radio, have the initiative to tap the resources available and to produce a technical output of high quality. A proven technical writing ability would obviously be an advantage.

This is a new appointment within the Society's headquarters at Potters Bar, and reflects the growing staff effort devoted directly to services for members. The successful applicant will receive considerable support from existing staff and experienced members of the Society.

Please write with full cv to: David Evans, G3OUF, General Manager/Secretary, RSGB, Alma House, Cranborne Road, Potters Bar, Herts EN6 3JW.



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FT 790R	70cm all-mode portable	349.00
DCT 101Z	DC Adaptor	42.50
FV 101Z	Remote vfo	112.00
FV 101DM		235.00
FT 902DM	9-Band AM/FM Transceiver	885.00
FC 902	9-Band atv, 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	445.00
FRG 7	0-5-30MHz receiver	189.00
FRG 7700	SSB/AM/FM recvr.	335.00
MEM 7700	Memory unit for above	89.00
FRV 7700A	118-150MHz Converter	69.75
FRV 7700B	50-60MHz & 118-150MHz	75.50
FRV 7700C	140-170MHz	65.95
FRV 7700D	70-80MHz & 118-150MHz	72.45
FRV 7700E	140-160MHz & 118-130MHz	71.30
FRV 7700F	150-160MHz, 118-130MHz & 170-180MHz	71.30
FRT 7700	Receiver aerial tuner	37.85
FT 480R	2m all-mode transceiver	369.00
FP 80A	230V AC power supply	63.00
FT 780R	70cm all-mode UK rpt. shift.	399.00
FT 290R	2m all-mode portable	285.00
NC 11C	AC charger	8.00
MMB-11	Mobile mounting bracket	22.25
FT 208R	2m synthesised portable FM	199.00
NC 9C	AC charger	8.00
FT 708R	70cm hand-held	229.00
FT 230R	2m FM mobile	255.00

All Yaesu accessories available - mostly ex stock.

TRIO-KENWOOD

TR 7930	2m XCVR	NEW P.O.A.
R 2000	Receiver	395.00
TR 3500	70cm Handy	250.00
TS 930	Gen. coverage transceiver	1219.00
TS 530S	160-10m trans 200w pep digital	P.O.A.
TR 2500	2m FM synthesised handheld	232.00
DM 801	Dip meter	71.30
R 600	Gen. coverage receiver	257.00

All Trio-Kenwood accessories available.

SOMMERKAMP

TS 280FM	2m Mobile 50W FM	199.00
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ROTATORS

KR 250	Kenpro Lightweight 1-1 1/2" mast	55.00
KR 400RC	Kenpro-inc. lower clamps	115.00
KR 600RC	Kenpro-inc. lower clamps	163.00

ICOM

IC 740	Multimode H. F. transceiver	769.00
IC 720A	HF transceiver and gen. cov. rec.	949.00
ICR 70	Multimode receiver	NEW 499.00
PS 15	Power supply for 720A	119.00
IC 251E	2m multimode base station	559.00
IC 290H	2m multimode mobile	NEW 399.00
IC 2E	2m FM synthesised handheld	179.00
IC 4E	70cm handheld	199.00
ICL1/2/3	Soft cases	3.50
IC HM9	Speaker/microphone	15.00
IC CP1	Car charging lead	4.49
IC BP2	6V Nicad pack for IC 2E	33.00
IC BP3	9V Nicad pack for IC 2E	23.00
IC BP4	Empty case for 6 X AA Nicads	6.95
IC 8PS	11-5V Nicad pack for IC 2E	44.00
IC DC1	12V adaptor pack for IC 2E	11.99

TRIO

CI 303G	Communication scope	196.65
PF 810	Power/SWR meter	97.75

Catalogue of Trio instruments send SAE.

TONNA

20117	2m 17 element	39.90
20505	50MHz 5 ele.	34.90
20104	2m 4 ele.	14.25
20109	2m 9 ele.	15.44
20209	2m 9 el. port	17.46
20118	2m 2 x 9 el. cross	28.51
20113	2m 13 el. port	27.20
20419	70cm 19 el.	19.90
20438	70cm 2 x 9 el. cross	30.05
20421	70cm 21 el.	26.00
20422	21 el. ATV	30.05
20199	2m + 70 Oscar	30.05

Full range of Tonna accessories stocked.

G-WHIP MOBILE ANTENNA RANGE

Tribander helical for 10/15/20 metres	25.80
Base mount single hole fixing + 3m cable	6.30
LF 40m coil for above aerial	6.55
LF 80m coil for above aerial	6.55
LF 160m coil for above aerial	6.55
LF telescopic resonator whip	4.25

We also stock flexiwhip & multimobile G-whips.

WELZ

SP 10X	Mini meter 1-8-160MHz 200W	24.00
SP 15M	1-8-150MHz 2-5W-20W-200W	35.00
SP 45M	2m/70cm 100W	49.00
SP 200	1-8-160MHz 20W-200W-1kW	73.00
SP 300	1-8-500MHz 20W-200W-1kW	99.75
SP 350	1-8-500MHz 200W	55.00
SP 400	130-500MHz 5W-20W-150W	72.25
SP 250	1-6-60MHz 2kW	49.30
SP 380	1-8-500MHz 20W-200W	61.30
AC 38M	8 band ATU	64.90
CH 20A	<450MHz coax switch	17.50
CT 150	150/400W D/load	35.00
CT 300	300/1kW-250MHz D/load	53.80

TONO

THETA 9000E RTTY/CWASC11	650.00
THETA 550 The latest—a winner!	299.00

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

ADONIS MICROPHONES

MM 202S	Safety mic. Lapel type	20.95
MM 202HD	Safety mic. head band	29.00
MM 202HM	Headphone & mic.	39.00

ALINCO

AL 230	2m 30W Linear 1-3W in FT 290R etc	39.00
AL 710	70cm 10W Linear	65.00
AL 730	70cm 30W Linear	79.00

SAGANT

MT 240X	HF 80-10m Wire array	49.50
MTE 40X	80m + 40m array	45.00
BL 40X	1:1 Balun SO 239	12.65

FRITZELL

FD 4	Windom Array HF bands	31.50
FB 16	1:6 Balun for DIY	17.45

Send for details NEW RANGE.

HALBAR

STR 5	2m 5 el. Yagi	9.99
FOLDI	2m 5 el. Foldup	13.00
TWIN	2m Vert.	14.95
TWIN 70	70cm Vertical	7.99
DIP 2	2m Dipole	3.95
HALO	2m Halo	5.50
LPA	Log-periodic 70cm	15.00
QUAD 6	2m 6 el. Quad	25.00
QUAD 4	2m 4 el. Quad	17.50

DAIWA

DR 7500R	up to 3 el. HF beam round controller	125.00
DR 7600X	Heavy duty w. preset cont. as above round cont.	P.O.A.
DR 7600R	as above round cont.	P.O.A.
KSO 65	Stay bearing	18.50
CS 201	2-way switch 0-500MHz	14.00
CS 201N	above w. N sockets	21.00
CS 401	4-way w. SO 239	43.00
RM 940	Infra Red mic.	P.O.A.
CN 520	1-8-60MHz SWR/PWR	40.60
CN 540	50-150MHz SWR/PWR	35.00
RX 110G	2m GaS Fet Preamp	NEW 39.00
RX 430G	70cm GaS Fet Preamp	NEW 63.00
RF 670	RF Speech Proc.	NEW 44.00
FD 30LS	Low pass Filter	13.50
FD 30M	LP Filter HD	21.50

MISCELLANEOUS

CANTENNA Dummy Load	14.95
ARROW 15Amp PSU with meter	86.00
COAX SEAL for sealing antennas etc against weather	20p foot
SWEDISH KEY Brass on Teak beautiful straight key	P.O.A.
VIBROPLEX various types in stock 64MHz minibeams	80.00
Microwave Modules stocked.	
KENPRO KP 100 Keyer	79.00
ARROW 6 Amp supply	48.30

TET

HB 33SP	3 el. Tri-Bander HF Beam	189.00
MV 3BH	Tri-Band vertical	40.25
MV 5BH	5 Band Vertical	71.25
SQ YO 8	8 el. Quagi 2m	48.96

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FT-980

The FT980's innovative design boasts the highest level of microprocessor (80-85) control ever offered as a standard feature in an all mode, all solid state, amateur H.F. transceiver.

Every frequency related function is digitally synthesised permitting local or external control via a personal computer of: Mode, all VFO and memory functions, IF shift and width, clarifier, band limits, FSK shift—and more!

Two independent VFO's—multiple tuning methods including; flywheel knob, two speed scanning in 10Hz (also 5/500 KHz) steps and keyboard entry.

12 totally independent mode/frequency memories (whose contents can be checked even while transmitting) are provided.

Primary digital readout offers resolution to 100 or 10Hz is mode sensitive, displays offsets and even VHF frequencies when used with the matching transverter. A remarkable secondary display indicates frequency change by scrolling sideways, with a scrolling cursor providing resolution to 1 KHz.

Two receiver front ends are provided, one for general coverage—150KHz to 30 MHz, the other for amateur bands only. Seven high IDSS JFETs produce extraordinarily wide dynamic range and the employment of ten V.C.O's secures a high carrier to noise ratio—even in the adjacent channel.

The triple conversion design of the FT980 receiver (Ω 47 MHz, Ω 9 MHz, 455 KHz) incorporates four cascaded stages for all modes and can operate as standard on SSB, CW, AM, FSK and FM transceiving.

The transmitter covers all H.F. amateur bands in 500 KHz segments. Convenience features include: simultaneous measurement of forward and reverse S.W.R., or compression (RF processor) or Ic or Vc or output power or ALC (includes "easy adjust" peak hold facility), AMGC (reduces ambient noise on voice transmissions), and a transmission

quality monitor (all mode IF demodulator).

With a P.A. rated for 560W dissipation 100W PEP is produced from a 24V line with 3 order intermodulation at typically -40dB. Full thermal (with blower and VSWR) protection (though power delivery is still 75% of full into a 3:1 VSWR!) are of course standard.

For CW, full break-in and calibrating (spotting—zero beating with other station) and choice of sidetones are fitted, and an inbuilt Curtis Keyer is optional.

Other FT980 features include AGC speed, tone, FM, squelch and centre zero meter, additional 'write' button for protected memories, display dim, dial lock, QSK linear provisions—the list is almost endless—Ask your authorised Yaesu dealer for a full colour leaflet or better still call in to him and try one out today!

GENERAL

Frequency coverage
Rx: 50 KHz—30 MHz (continuous)
Tx: 10-160M (9 bands)

Frequency accuracy
Better than ± 3 p.p.m (0-40°C)

Tuning steps
10Hz, 5 KHz & 500 KHz (band)
Direct/Computer keyboard entry

Modes of operation
J3E (LSB/USB), A1A (CW), A3E (AM), J1B (AFSK), G3E (FM); Rx & Tx

Power requirements
100/120-200/234 V 50/60 Hz
72VA Rx, 530VA Tx (100W out)

Dimensions (Ex/Inc projections)
370/380W x 157/165H x 350/465D mm
17Kg, Nett

Options
XF-455.8MCN 300Hz CW Filter
XF8.9HC 600Hz CW Filter
XF8.9GA 5 KHz AM Filter
MH-1-B8 Hand Scan Microphone
MD-1-B8 Desk Scan Microphone
D3000026 Curtis Keyer Unit
FIF-80 Computer Interface

RECEIVER

Sensitivity (2-30MHz)
J3E/A1A/J1B : 0.25 μ V (2.4 KHz)
(10dB S + N/N) : 0.16 μ V (600 Hz)
A3E : 0.10 μ V (300 Hz)
(10dB S + N/N) : 1.40 μ V (6 KHz)
G3E (12dB SINAD) : 1.25 μ V (5 KHz)
Sensitivity (150 KHz-2 MHz) : 1.00 μ V (3 KHz)
J3E/A1A/J1B : 0.60 μ V (12 KHz)
(10dB S + N/N)
A3E : 4.0 μ V (2.4 KHz)
(10dB S + N/N) : 2.6 μ V (600 Hz)
G3E : 1.6 μ V (300 Hz)
A3E : 22 μ V (6 KHz)
(10dB S + N/N) : 20 μ V (5 KHz)
G3E : 16 μ V (3KHz)

Dynamic range
95dB in 300 Hz (max sensitivity)

Audio peak filter
350 Hz-1400 Hz

IF notch filter
500 Hz-2700 Hz (demodulated)

Audio
4-16 Ohms, 3W in 4 ohms (10% THD)

Image/I.F. rejection
Better than 70dB

TRANSMITTER

Power output
J3E/A1A : 100W(PEP)
A3E : 25W
G3E/J1B : 50W

Intermodulation (3rd Order)
Better than -40dB (14 MHz 100W)

Carrier suppression
Better than -50dB (peak output)

Sideband suppression
Better than -50dB (1 KHz tone)

Spurious radiation
Better than -50dB (peak output)

Audio response
Better than 250 Hz-2750 Hz @ -6dB

FM deviation
 ± 5 KHz (maximum)

AFSK shift
170, 425, 850 Hz

Microphone impedance
600 Ohms nominal

Output impedance
50 Ohms nominal, unbalance

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