

Radio Communication

January 1989



POLAR EXPEDITION 1989

**Scottish radio
amateurs
run base camp
operations**



KENWOOD



TS-790E – Just when you thought it was impossible

Impossible to design and produce a multi band VHF/UHF transceiver which would render all others obsolete? But this is what Kenwood have done with the TS-790E, in the same way that the TS-940S set new standards which have not yet been beaten, or the TR-751E 2 metre multimode, which is still without any serious competition. Kenwood have the magic touch which gives the customer what the customer wants, in a package which is easy to use, performs like a dream, and is simply a delight to own.

The TS-790E gives you all-mode operation on 2 metres, 70 centimetres, and with an optional internally fitted section adds 23 centimetres as well. Power output is 45 watts on 2, 40 watts on 70, and 10 watts on 23; and there is little doubt that the receiver performance will better any previous transceiver.

It is fashionable in some quarters to sneer at the microprocessor, but Kenwood write the software in their processors with the aim of giving the user complete control over a wide range of facilities and not confusing the issue. In this respect, the TS-790E adds a new dimension to VHF operating, with its dual (triple) band monitoring, cross band operation, full duplex facilities, and a wide range of features to make life easy for the operator.

I must mention the TS-790G which has already been advertised elsewhere. The "G" suffix denotes that the transceiver is produced for the Japanese home market. That's acceptable if you can read the Japanese handbook, but the 10 watt power outputs on 2 and 70 may not be to your liking, nor indeed the fact that there is no connection at all between the purveyor of the product and the Kenwood UK sales and service network. I know and understand the desire of certain importers to be the "First on the market" with a new product, but so often it's a bit like being the first man to offer the square wheel – not quite right for the intended purpose, but somebody will always buy it.

As always; Caveat Emptor.

John Wilson
G3PCY/5N2AAC

LOWE ELECTRONICS LTD.

Chesterfield Road, Matlock, Derbyshire DE4 5LE Telephone 0629 580800 (4 lines)

Sole Appointed UK Distributor for KENWOOD Amateur Radio

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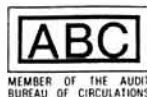
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FRONT COVER
THE POLAR SUN
ANOTHER EXPEDITION
TO THE POLE
GETS UNDER WAY



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Radio Communication

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Technical articles on subjects of amateur interest are always welcome and should be sent to: The Editor, *Radio Communication*, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.

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.

A contribution will only be considered for publication on the understanding that the person submitting it is the original author and owner of the whole copyright, and that on acceptance for publication such copyright will become the property of the RSGB in consideration of the above-mentioned payment by the RSGB to the contributor.

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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five weeks before publication date

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GREAT BRITAIN 1988

8 of the best from Kenwood!



TS940S

Top of the range, the TS940S has everything the discerning HF operator requires. Amateur bands from 160 to 10 metres, together with a general coverage receiver tuning from 150KHz to 30MHz. Operating modes USB, LSB, LW, AM, FM, FSK. Forty memory channels, each affectively a separate VFO. Easy keyboard frequency entry. Leadership in the field. The TS940S is the transmitter everyone wants to own one day.

TS940S...£1995.



TS140S

Kenwood common sense. The TS-140S shows the way to go in balancing performance, operating features, and ease of use; all at an attractive price. All modes are provided, USB, LSB, AM, FM, and full BK CW for the hot operators. The TS-140S offers everything you ever needed, but it doesn't break the bank balance. Every TS-140S we obtain is instantly sold, and when you have tried one out, you know why.

TS140S...£862.00.



R5000

Virtually the receive section of a TS940S. The R5000 is probably the best HF receiver available right now. Notice the family resemblance to the TS440S which gives it a clean, easy to operate look, and of course Kenwood have applied all their ergonomic skills to make you "at home" the moment you begin to use the R5000. All mode of course, and has an optional internal VHF converter which extends you to 108-174MHz.

R5000...£875.



TL922

You Brute. If it wasn't for all the safety interlocks I would operate my TL922 with all the covers off, just to admire the sheer engineering beauty of the innards. The TL922 is THE linear amplifier, and once you own it you will never part. The effortless ease with which the TL922 produces RF power has to be experienced to be believed, and it is probably the world's most sought after station accessory.

TL922...£1495.



TM221E

The 45 watt wonder for 2 metres. Common sense facilities, ease of use, and a massive of 45 watt output make the TM221E probably the most wanted FM mobile around. All this and an amazing receiver. All you need in a compact package, including all channel spacings (5, 10, 12.5, 15, 20, and 25 kHz). P.S. It also has a 70 cm. brother, the TM421E, and a remote controller available for operating them both together.

TM221E...£317.30. TM421E...£352.84.



TS711E

Called by many "The perfect 2 metre Base station", The TS711E is a close to perfection as state of the art can make it. All mode operation, full band coverage, continuous tuning or step tuning for FM channels. Two separate VFOs, 40 memories storing frequency, mode, repeater shifts, even whether or not you need a tone burst. Optional voice synthesiser, the list of features is almost endless. (And it too has a 70cm brother, the TS811E).

TS711E...£898 TS811E...£998



TR751E

Versatile 2 metre multi mode mobile or fixed station, the TR751E again shows that Kenwood magic touch in making a complex transceiver so easy to use. Virtually a miniature version of the TS711E, the TR751E set new standards of performance at its introduction, and has continued to win friends ever since, continuing as it did the line started by the TR9000 and TR9130. (And, you've guessed, it has a 70cm counterpart, the TR851E).

TR751E...£599 TR851E...£699



TS-790E

A brand new successor to the TS-780, the TS-790E gives the VHF/UHF enthusiast everything needed for the home station. With all mode operation on 2 metres, 70 centimetres, and (optionally) 23 centimetres (24 if you prefer), the TS-790E covers every band, every mode. Powerful (45W on 2, 40W on 70) and with that attention to operating ease which characterises Kenwood design, the TS-790E has no equal. See it soon.

TS-790E...£1495 PS-31...£186

LOWE ELECTRONICS LTD.

Chesterfield Road, Matlock, Derbyshire DE4 5LE Telephone 0629 580800 (4 lines) Fax 580020 Telex 377482
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All branches are closed all day Monday.

25 years in amateur radio

Did he say 25 years in Amateur Radio?

That's absolutely right; the company was registered in 1964 and the first advertisements for J. B. Lowe were soon in the magazines. As you can see from the early effort below, the business was built on selling small components — oh, all right if you insist — junk; but only the best quality junk.

J. B. LOWE

115 Cavendish Road, Matlock
Derbyshire

CAPACITORS. 1000mF, 12v, miniature, 1/3. Paper, ceramic, etc., from 3d. each. Variables, 170pF, single section, 2/-, Trimmers, 2-12 pF., 1/-. AR88 I.F. TRANSFORMERS. LF 2nd and 3rd I.F., "xial load" 2/6. LF CHOKES. Rx or bench p.s.u. 2" x 1 1/2" x 2 1/2" high, now surplus 3/6. 16H good for at least 200ma. 4 1/2" x 3 1/2" x 4 1/2" high. These are very nice indeed for 10/-. BALI DRIVES. Electroniques 6 : 1 at 6/6, two speed 6 : 1 and 36 : 1 at 15/-. SEMI-CONDUCTORS. Texas 2G381 at 3/-; Mullard OC170 at 6/-. BY100 at 6/-. TERMINAL BOARDS all shapes and sizes brand new. 10 assorted for 4/-. COILS, 29 turns 2" long by 1 1/2" diameter. New surplus 2/6. VIBRATORS 12v., 4 pin new surplus 6d. RELAYS 12v. DPDT plus DPST make 4/6. ROTARY SWITCHES CERAMIC. 2 wafer one 2p2w the other 2p3w. Brand new surplus 3/6. **THE ABOVE IS MERELY A SELECTION OF THE INCREDIBLE AMOUNT OF JUNK I HAVE STASHED AWAY.** This is probably due to a nervous twitch I have as a result of combating the QRM—this in turn makes me the purchaser of all kinds of things at Government Auctions in spite of screaming protest. A s.a.e. will get you a stock list.

HOWITZERS 6" rock bottom price for gross lots.

NATIONAL. NCX3 NCX5 Mk 2, NC190 and NC303 in stock. Brand New and list price. For the bargain hunter I have an NCX3 and a NC303 demonstrators at way below list.

LAFAYETTE. HA350 75 gns; HA230 33 gns; KT340 (HA230 kit) 25 gns. Mechanical filters as used in the HA350 2.1 kc/s £9 19s. 6d. complete with matching I.F. transformers.

CODAR. AT5 with matching a.c. and d.c. p.s.u. PR30X all new and list price. PR30X used only an hour or two £6.

SUNDRIES. KW2000 new list price. Electroniques QP166 ham band front end, new, list price. Star SR550 double conversion hambander as new £50. BC348 in excellent shape £15. Crystal Calibrator 1 mc/s for National 190 or 190X £2 10s. Heathkit V7A valve voltmeter kit brand new £12. OS1 'scope built but hardly used £15. 52 set p.s.u. brand new in crates £2 10s., carriage paid. Matching cable for 52 set brand new 7/6 post free.

In addition to the new equipment which I keep in stock, I have a constant stream of trade-ins so that in general I have as fine a collection of venerable old clunkers as you are likely to meet. If you are in the market for a Rx or Tx why not just drop me a line—a s.a.e. will get you the latest stock amongst which you may well find what you are looking for at the right price.

TRADES: I honestly do my best to give you the best allowance in the business —if you don't believe me, a s.a.e. may convince you. To those of you prepared to contribute to the Credit Company Director's next Rolls-Royce, I can arrange H.P.

POSTAGE: I just give up—send plenty and I will refund the balance.

73 de BILL

Bill Lowe laid down some basic rules of business behaviour which we still follow today, and the most important of these was the idea of service to the customer. The concept of "Flog it and forget it" was not allowed in Lowe Electronics, and those who know us will agree that as far as we are concerned, service is not just an idle promise, it's a fact. Unlike many companies, we employ more people to look after our customers than people to sell the goods, and although this may be unfashionable in today's "Forty quid off, John" environment, it does keep the customers coming back to us — and they are always welcomed.

The history of the last 25 years is clearly too long to cover in detail, but we must have done something right, because we are still here when many of those who started down the road at the same time are gone and forgotten. Not only are we here, we have been chosen as the UK distributors by several major manufacturing companies, including Kenwood, Daiwa, JRC, Signal, AOR, Kantronics, Bencher, and many others. Their continuing confidence in us is matched by the confidence of our customers, past, present and, we hope, future.

Obviously we are pleased to be 25 years old in 1989, and to celebrate the event we shall be holding a monthly prize draw for all our customers. Each month throughout 1989, all the names of those customers who have made a purchase of more than £5 will be put into the hat at the end of the month and one name drawn out. The winner will then receive a fairly substantial piece of amateur equipment completely free, and so as not to limit his or her choice, we will publish a list of items from which to choose. It's one way we can say "thank you for your support over the years".

The January list will contain the following:-

Kenwood TM-221E, TH-25E, TH-405E, Lowe HF-125, Signal R-535; which should give a reasonable spread of interests.

For purchases made in any of our branches, the branch manager will give you a card to complete, and all the cards will be returned to Matlock at the end of each month for the draw to take place. The winner for each month will be informed right away, and his or her name given in a later magazine — just to prove that the draw HAS taken place.

Having mentioned some of the companies we represent, it is perhaps opportune to give you an idea of what they produce.

Kenwood amateur radio is too well known to need listing here, and I would refer you to our advertising for the last 13 years or so. Daiwa are noted for their leadership in RF power measurement and high quality power supplies; JRC are renowned for their communications equipment, and the recently introduced JST-135 HF transmitter, following on from the world wide success of the NRD-525 receiver speaks for itself. Signal are specialists in design and manufacture of air band receivers, and AOR are quite simply the world leaders in wide range monitor and scanning receivers. Their soon to arrive AR-3000, which covers 100kHz to over 2000 MHz, will set the market on end, and will render everything else completely obsolete.

Aerials and accessories have not been forgotten in our range, and we have stocked and sold the J-Beam and Hokushin ranges since the beginning — and very happily, because their aerials are well made; perform properly; and give satisfaction to the user.

From the U.S.A. we are pleased to represent Kantronics, world leaders in packet radio terminals and systems, and of course Bencher keys, which have to be seen and handled to really appreciate how near perfection a key can be. The Rolls Royce (or should I say Cadillac) of the keyer market.

Too much to cover in a small space, so why not send off for a complete product listing, enclosing £1 to cover postage. You will find lots of useful reading, and details on everything we stock and sell. If you have a particular interest in one receiver or transceiver, just mention this and we will include extended information.

Good luck in the prize draw.

John Wilson
G3PCY/5N2AAC

SOLE UK DISTRIBUTOR FOR KENWOOD

Name
Address

Post Code

FREE INFO.
Don't forget £1
to cover postage.
R.C.

ICOM

VHF/UHF FM Handhelds

If you want a handheld with exceptional features, quality built to last, and a wide variety of interchangeable accessories, take a look at the ICOM range of FM transceivers.

All ICOM Amateur handhelds are supplied with a flexible antenna, rechargeable nicad battery pack and an AC wall charger.

IC-2E 2 Metre Thumbwheel Handheld

This popular transceiver from ICOM is still available after eight years of production. If you're looking for a straightforward but effective handheld the IC-2E takes some beating. Frequency selection is by means of thumbwheel switches (with 5KHz up switch), with simplex and repeater operation possible. Power output is 1.5 watts or LOW 150 milliwatts (2.5 watts possible with BP5A battery pack).

MICRO 2E/4E

These micro sized 2 metre and 70 centimetre handhelds give the performance and reliability you expect from ICOM. Measuring only 148 x 50 x 30 the micro fits in your pocket as easily as a cassette tape. The micro features up/down tuning switches for quick frequency changing, 10 programmable memories, LCD readout and 1.5 watts output (2.5 watts possible with BP24 battery pack).

IC-02E/04E Keypad Handheld

These direct frequency entry handhelds utilise a 16 button keypad allowing easy access to frequencies, memories and scan functions. Ten memories store frequency and offset, a front panel LCD readout indicates frequency, signal strength and transmitter output. Power output is 2.5 watts or LOW 0.5 watt. (5 watt is possible with the BP7 battery pack or external 13.8v D.C.)

IC-2GE/4GE

The 'G' series of handhelds fulfills the most important criteria for a handheld transceiver, it is small, rugged and easy to operate. The 20 memory channels can store simplex and repeater frequencies and with the several scan functions there is no need to manually search for activity. The 3 watt output and power saver circuit ensures low battery drain. (7 watts is possible with the BP7 battery pack or external 13.8v D.C.)

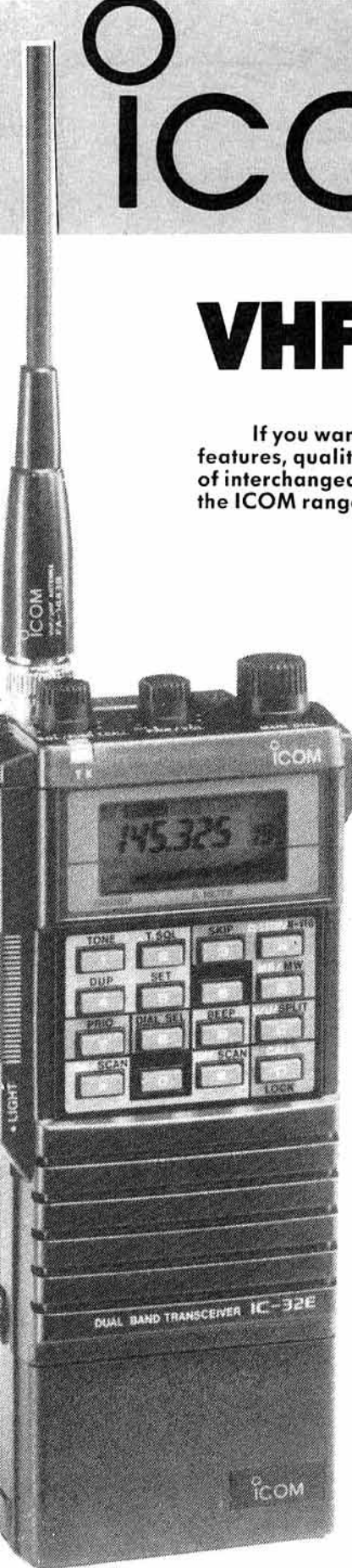
IC-12E 23 Centimetres

Similar in style to the 02E/04E this 1296MHz handheld utilizes ICOM's experience in GHz technology, gained by the excellent IC-1271E base station. With the growing number of repeaters on 23cm the IC-12E makes it an ideal band for rag chew contacts. Power output is 1 watt from the standard BP3 battery.

IC-32E Dual Bander

This exciting new handheld offers 2 metres and 70 centimetres in one compact unit. Tough and splash resistant it offers many features including crossband duplex operation, 20 dual band memories and power saver circuit. The IC-32E utilises most existing ICOM accessories, ideal if you are upgrading from an existing ICOM handheld.

Also available for ICOM handhelds are a large range of optional extras including rechargeable nicad battery packs, dry cell battery cases, desk chargers, headset and boom microphones, leatherette cases and mobile mounting brackets. New products just released:- HM46 miniature speaker/microphone and HS51 lightweight headset/microphone complete with PTT and Vox unit.



Icom (UK) Ltd.

Dept RC, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.

Into '89 with Icom

IC-751A HF All-Band Transceiver



- **Amateur Bands 160m - 10m.**
- **General Coverage Receiver.**
- **105db Dynamic Range.**
- **100W Output (40w A.M.)**
- **32 Memories.**
- **Electronic Keyer.**
- **CW Semi/Full Break-in.**
- **HM36 Microphone.**

The ICOM IC-751A was created for the ham operator who demands high performance whether entering contests, chasing DX or just simply enjoying the shortwave bands. It is an all mode solid state transceiver with a host of features designed for the crowded HF bands of today.

Additional features include passband tuning, 9MHz notch filter, adjustable AGC, noise blanker, RIT and XIT. A receiver pre-amp and attenuator provides additional control when required. The FL32 9MHz/500Hz CW filter is fitted as standard with CW sidetone on Rx and TX modes. On SSB the new FL80 2.4Khz high shape factor filter is fitted.

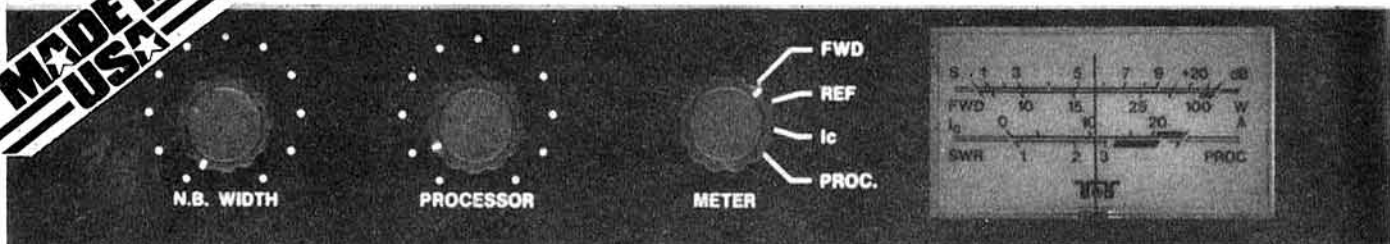
The transmitter is rated for full 100% duty cycle with a high performance compressor for better audio clarity. With 32 memory channels and twin VFO's, scanning of frequency and memories is possible from the transceiver or the HM36 microphone supplied.

The IC-751A is supplied for 12v operation but can be used with either internal or external A.C. power supply. It is fully compatible with ICOM auto units such as the IC-2KL linear amplifier and the AT500/100 antenna tuners.

Options available:- PS35 internal AC power supply, PS15 external AC power supply, EX310 voice synthesizer, SM8 and SM10 desk microphones and SP3 external loudspeaker.

Helpline: Telephone us free-of-charge on 0800 521145, Mon-Fri 09.00-13.00 and 14.00-17.30. This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.
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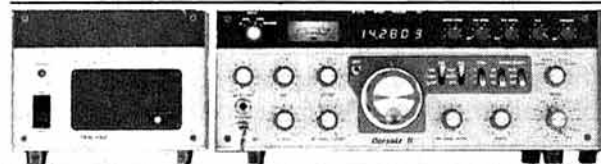


TEN-TEC FOR THE

The new Paragon — 100w all band, all-mode H.F. transceiver.

Here's the very latest hi-tech North American state-of-the-art transceiver to reach the U.K.'s HAM Shops. The new Paragon — or should we say Paragon of virtue! Ten-Tec's unique combination of 'in-house' processes ensures their ability to produce equipment of highest quality, reliability and value for money.

• General coverage receiver • R.F. output adjustable (10-100w) • SSB, FSK optional FM • Noise blanker/speech processor • Dual VFO's, RX offset and TX offset • QSK changeover < 30 m/s • Five IF filters • Pass-band tuning • Greatly reduced phase noise • Glass epoxy circuit boards removeable with no de-soldering • 62 programmable memories • 7 digit alpha-numeric display — for entering net-name, call sign or I.D.



CORSAIR II — 100w HF TRANSCEIVER:

• All 9 Bands — 1.8-30 MHz SSB/CW • Permeability Tuned oscillator for improved RX performance (unique to Corsair) • Low noise floor even with strong adjacent signals • 50+ db notch • Passband tuning with 16 pole XTAL ladder filtering • QSK changeover < 30 m/s • Integral speech processor • Iambic keyer adjusts 8-50 wpm for the HAM radio purist.



CENTURY 22 — 20W CW HF TRANSCEIVER (NOW MADE IN THE U.K.):

Put the fun back into HAM Radio — Portable/Mobile
• Weighs only 6lbs!! • Receives USB & LSB • 80m through 10m • Full break in CW — variable bandpass audio filter • Size: 10" x 10 1/2" x 4"!! • 12v DC for 50w 'no-tune' output
• Receiver Selectivity — 8 pole variable band-pass audio filter centred at 750Hz, 200Hz bandwidth, variable skirt attenuation.

HRS Electronics plc., are pleased to announce that they are now Sole U.K. Agents for the entire range of Ten-Tec products — a few of which are shown here. Ten-Tec offer you the viable alternative when it comes to 'top-end' Amateur Radio — built by renowned, tried and tested U.S. engineering that put men on the moon!

TEN-TEC

Ring 021-789 7171 for

HRS Electronics Plc., Garretts Green Lane, Garretts Green,



THE PRO-AM!

Now you really have a choice!

Using advanced U.S. Electronic engineering ability (which we are so pleased to see is back again!) the Paragon has a number of star features, we'd like to bring to your attention:

- Improved receiver performance • Freq stability 1 PPM per °C (worst case) at 28 MHz • Microprocessor PLL synthesized • Aluminium construction throughout!

Before you choose your next HF rig — checkout the PARAGON at your local dealer!

TITAN 1500w HF LINEAR:

The tremendous TITAN — maximum power when it's 'ticking-over'.

- Incorporates 2 x 3CX 800 A7's • 65w-80w in for 1500w output • Peak reading wattmeter — 10 element LED • -35 db distortion @ 1Kw
- Integral SWR and overdrive warning LED • Virtually noiseless tape wound Hypersil transformer — a real 'pussy-cat' to tune and load



ARGOSY II — COMPACT HF 50w SSB TRANSCEIVER (NOW MADE IN THE U.K.):

- PTO freq control (see Corsair) • No tune solid state final • Rugged and reliable for portable/mobile use • 80m through 10m in 500KHz segments
- 12-14v dc supply • 50w or 5w output • Variable notch > 50 db rejection
- LSB/USB/CW • Weighs just 8lbs!! • Size: 4" x 9 1/2" x 12"



HRS
from
your nearest dealer.

Contact your local dealer for more details on the Ten-Tec range — now you have the choice — be sure you make the right one!

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TEN-TEC

ALINCO SAVES YOU MONEY & SERVES YOU WELL

- ★ 144-146MHz (Rx. option 140-170MHz)
- ★ 25 watts output. ("HE" model 45 watts)
- ★ 21 memories & 2 "call" channels.
- ★ Programmable Scanning & Priority channel
- ★ 12.5kHz & 25kHz steps.
- ★ Includes microphone & mobile mount.
- ★ Bright LCD display
- ★ Reverse repeater etc.

Designed for optimum performance combined with small size, the ALINCO ALR-22E reaches new heights in both technical performance and value for money. We've managed to keep the price down to a level that cannot be matched by any other manufacturer although we believe that a small increase will shortly be made to the price. What better time therefore, than now to purchase one of these super rigs. You won't see prices like this again! Technically it's superb and inside it looks very much like some of its more expensive competitors! Measuring only 5.5" x 6.5" it will fit into most places and if you ask, we will extend the frequency range to cover 140-170MHz on receive. We could bore you with the specification but frankly it's just the same as all the others (apart from the price of course). We could tell you about all the various features it has, but again its not much different from the competition. Lets be honest, apart from being some £100 cheaper than some of its competitors and having an extended receiver coverage, it really is like most other rigs. So if money is no object and you only want 144-146MHz coverage, you probably won't be interested in the ALR-22E. If on the other hand these things are important to you, why not send for the full colour brochure today.

2m FM Mobile ALR-22E



Order now to
beat the price rise

£249


- ★ 2M FM 144-146MHz
- ★ RX 140-170MHz!
- ★ 3 Watts output
- ★ Battery Saver
- ★ 10 memories
- ★ LCD Readout
- ★ S-meter
- ★ Tone Burst
- ★ Priority
- ★ 12.5KHz steps
- ★ 12v DC operation!

Another winner from ALINCO. A true handy transceiver with no extras to buy! Unlike its competitors, you get the nicad pack (500mAh) AC charger, and provisions for direct 12v DC charge. Measuring 168 x 61 x 30mm it's a beauty! Optional accessories include speaker-mic, mobile bracket and high power packs. Get the facts today!

DJ-100E 2M FM

NEW

IN STOCK



£219

ALD-24E 2m/70cm Dual Band FM

See colour photo on front cover



£449

- ★ 2m/70cm. Full duplex operation.
- ★ 25 watts FM on both bands.
- ★ Single antenna socket output.
- ★ 21 memories & 2 "call channels".
- ★ Programmable scanning and priority.
- ★ 12.5KHz & 25KHz steps.
- ★ Includes all hardware & microphone.
- ★ Bright LCD readout.
- ★ Reverse repeater operation.
- ★ 12 months warranty parts & labour.

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We are about to introduce a range of compact single band hf rigs (80/40/20m) for the QRP enthusiast. Each one provides SSB/CW output of 2 watts. Features include VXO tuning, RTT, optional noise blanker and break-in module, built-in Morse key, internal dry cells or external supply, analogue power/S-meter, good dynamic range, excellent IF rejection and ultra stable. Send SAE for further details, prices and availability.

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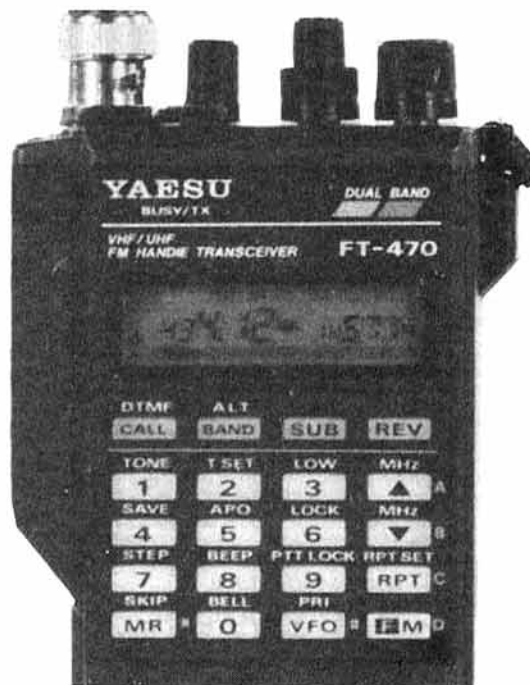
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Zone E E J Case, GW4HWR
Zone F J T Barnes, G3USS
Zone G F Hall, GM8BZX

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Awards managers: HF: S Emlyn-Jones, GW4BKG; VHF: Ian L Cornes, G4OUT
Chief morse test examiner: A N Ianson, G3GDO
HF manager: E J Allaway, G3FKM
Microwave manager: C W Suckling, G3WDG
Observation Service organiser: R J Osborne, G4FJN
Trophies manager: Mrs H Claytons-Smith, G4JKS
VHF manager: K A M Fisher, G3WSN

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

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Affiliated club or society/registered group (UK): £20.50 (including Radio Communication): £12.30 (excluding Radio Communication) (Subscriptions include VAT where applicable)
Membership application forms available from RSGB HQ



INTERNATIONAL LICENSING

Reciprocal licensing has been around for several decades, but up to now operation in another country has been hampered by a necessity to offer prior notice plus lots of form-filling. Not any more – at least as far as nine member states of the CEPT are concerned. Form filling and prior notice go with effect from 1 January 1989.

You will now be able to use most of your amateur equipment when you travel in Austria, Germany (Federal Republic of), Liechtenstein, Luxembourg, Monaco, Netherlands, Norway, Switzerland and Turkey. More countries will be added to this list as soon as the appropriate decisions have been taken by other administrations. The DTI plans to print a list of countries in which you can operate under the CEPT agreement on your annual licence validation document.

If you plan to operate in any of the CEPT

countries with which the UK has an agreement, you will need to be clear about the callsign to use, bands available, etc. Ideally you should request this information from the appropriate licensing authority, or national society, for each country in which you intend to operate. Membership Services at HQ can provide these names and addresses on request. The DTI also has an information sheet (No 9) available, and this can be obtained either from the DTI direct (Telephone 01-215 2316) or from the membership services department at RSGB HQ.

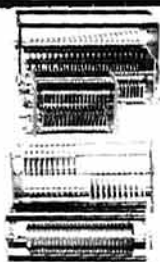
It seems that the CEPT licensing arrangements are being viewed as a model by countries all over the world. Already a Euro-licence, for member states of the European Community, is actively being discussed and other nations are talking about it.

One day there will be an international amateur radio service licence which will doubtless function along similar lines as today's international driving licence. The RSGB has always supported such concepts through behind-the-scenes work at Conferences and through internal working groups, both as a means of reducing the administrative load on Government and as a benefit to UK amateurs. The RSGB will continue to work towards such objectives.

PROJECT YEAR

The results of the Project YEAR Consultative questionnaire sent to all members of the RSGB last September are published in this month's edition of *Radio Communication*. The results demonstrate the enthusiasm within the membership for ensuring a bright future for amateur radio, which clearly is to be welcomed. Informal discussions between the Society and people that the Society has talked to in Government, education, employment, guides/scouts and industry, have revealed good reactions to the Society's positive initiative. The Society hopes that every member will read the results and go on to help move Project YEAR closer towards reality. *David Evans, G3OUF.*

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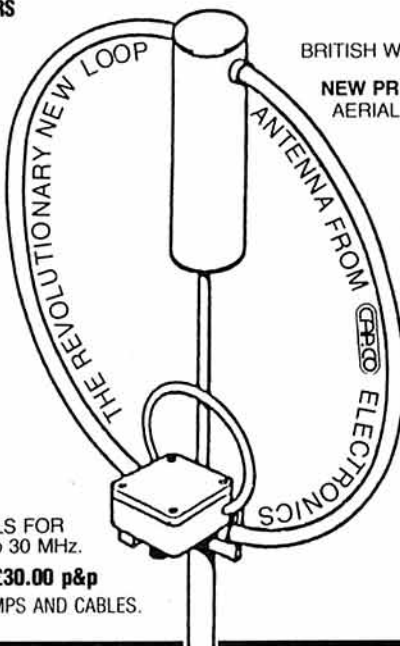
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Kenwood	R5000	875.00	(—)
Yaesu	FRG 8800	649.00	(—)
Yaesu	FRV 8800 VHF Converter	100.00	(2.50)
HF TRANSCEIVERS		£	(c&p)
Kenwood	TS 940S	1995.00	(—)
Kenwood	TS 440S	1138.81	(—)
Kenwood	TS 140S	862.00	(—)
Kenwood	TS 680S	985.00	(—)
Yaesu	FT 980	1795.00	(—)
Yaesu	FT-747GX	659.00	(—)
Yaesu	FT 757GX II	969.00	(—)
Yaesu	FT 767GX	1599.00	(—)
Icom	IC 735	979.00	(—)
Icom	IC 751A	1500.00	(—)
VHF SCANNING RECEIVERS		£	(c&p)
Icom	IC R7000	989.00	(—)
Yaesu	FRG 9600M 60-950MHz	509.00	(—)
Kenwood	R21 Wide Band Receiver	465.00	(—)
AOR	AR 2002	487.00	(—)
Signal	R535 "Airband"	249.00	(—)
VHF HANDHELD RECEIVERS		£	(c&p)
Signal	R537S "Airband"	69.51	(2.50)
Sony	Air 7	249.00	(2.50)
Sony	PRO-80 Receiver AMF/FM/SSB	349.00	(—)
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ANTENNA TUNER UNITS		£	(c&p)
Yaesu	FRT 7700 Short wave listening	59.00	(2.50)
Yaesu	FC 757AT	349.00	(—)
Kenwood	AT 230	208.67	(—)
Kenwood	AT 250 auto	366.00	(—)
2M TRANSCEIVERS		£	(c&p)
Kenwood	TH 205E Handheld	215.26	(—)
Kenwood	TH 215E Handheld	252.13	(—)
Kenwood	TR 751E 25w multimode	599.00	(—)
Kenwood	TS 711E base station	898.00	(—)
Kenwood	TM 221ES 45w FM Mobile	317.30	(—)
Kenwood	TH-25E Handheld	258.00	(—)
Kenwood	TW4100E 2M/70cm FM Mobile	499.00	(—)
Yaesu	FT 211RH 45w FM Mobile	309.00	(—)
Yaesu	FT 290R11 multimode	429.00	(—)
Yaesu	FT23R Handheld + FN B10	243.50	(—)
Yaesu	FT736R Multimode VHF/UHF base	1359.00	(—)
Icom	IC32E Dual Band Handheld	399.00	(—)
Icom	IC 2GE Handheld	265.00	(—)
Icom	IC 02E Handheld	279.00	(—)
Icom	IC 228E 25w FM Mobile	365.00	(—)
Icom	IC 275E Base Station inc PSU	1069.00	(—)
Icom	IC 3210E 2M/70cm FM mobile	499.00	(—)
Icom	Micro 2 Handheld	249.00	(—)
70cm TRANSCEIVERS		£	(c&p)
Kenwood	TH 41E Handheld	218.00	(—)
Kenwood	TS 811E base station	998.00	(—)
Kenwood	TH 405E Handheld	273.18	(—)
Kenwood	TH 415E Handheld	298.85	(—)
Yaesu	70cm module for FT 726R	349.00	(—)
Yaesu	FT 73R Handheld + FNB10	263.50	(—)
Icom	Micro 4 Handheld	299.00	(—)
Icom	IC 04E Handheld	318.00	(—)
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Icom	IC 48E FM Mobile 25w	455.00	(—)
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MD1B8	Base Microphone	79.00	(2.50)
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GC5	ICOM World Clock	43.00	(2.50)
KPC2	Kantronics Packet Communicator	159.00	(2.50)
AEA	PK-232 6 mode Terminal Unit	269.95	(2.50)
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UR 76 50 ohm coax dia. 5mm per metre		0.35	(0.10)
UR 70 70 ohm coax dia. 2.3mm per metre		0.40	(0.10)
UR 95 50 ohm coax dia. 2.3mm per metre		0.40	(0.10)
4mm Polyester Guy Rope (400kg) per metre		0.25	(0.10)
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NEWS

BULLETIN

Soviets take RAE in space

The handsome chap shown in our pic is Space Pilot Vladimir Titov, and some lucky people may have had a QSO with him on 144 MHz - his callsign is U1MIR, or maybe U2MIR. No, there hasn't been a major tropo opening to the USSR and neither has there been an out-of-season Es event - Titov is one of the crew members of the Soviet MIR spacecraft, which as we went to press had completed about SIXTEEN THOUSAND orbits of the Earth.

Space addicts know all about MIR, but essentially it's a Soviet spacecraft which has been orbiting now for just over a year - it hasn't had the same crew all that time, of course. What makes MIR suddenly an interesting topic from the amateur radio point of view is that two crew members studied for, sat and successfully passed the Soviet equivalent of the RAE a month or two ago whilst in orbit! This might just be an amateur radio first..... According to reports from AMSAT-UK, they were given lessons on technical subjects by ordinary boring ground-based radio amateurs in Russia whilst overhead and then sat for the exam - quite amazing, and definitely worthy of a special pass slip.

Using the callsigns U1MIR and U2MIR, (what, not "spacecraft mobile?") the astronauts have been quite active early in the evening, usually on 145.550 MHz but also on .575 and .525. By press time we'd heard that four British stations had "worked" the spacecraft, although we gather that "worked" isn't quite the right word - the astronaut operating has just repeated the callsign of the ground station and then asked for another. It seems that their lessons didn't include anything on operating procedure (sounds like the RAE) and that no-one's told them yet that a QSO consists of a shade more than that - never mind, no doubt they'll soon get it sorted. Apparently they'd made about 35 contacts with Soviet amateurs by the first week in December.

If you want to have a crack at working MIR - and in principle it should be quite easy - here are a few ideas on how to go about it:

1. The frequency said to be used by MIR is 145.550 MHz but they may come on anywhere between 145.400 and 145.600. AMSAT tells us they used a 147 MHz channel over the USA - apparently their second QSO was with W4BIW in Atlanta on 12 November 1988. You might need to look quite hard to find them, but remember the terms of your licence.
2. Keep your call EXTREMELY short. We suggest a callsign twice, then a 10-second pause and then maybe another quick call if you got nowhere.
3. If you're not heavily into spacecraft dynamics and all that and your computer isn't telling you where the thing is to the nearest half an inch, remember that MIR travels from west to east at a rate of knots. In the south of the UK its inclination is 51.7 degrees. This means that you won't have more than ten minutes at the very outside to make contact - and if you're a 144 MHz DX-chaser with some whopping long Yagi you're not going to do well for more than a very few minutes.
4. It seems that if you speak Russian you have a better chance of something resembling a



meaningful QSO. If you can, try and explain what you would like - namely a report, the operator's name and a QSL when they return to Earth. Some form of fraternal greeting would seem to be a good idea too - they've obviously gone to some trouble to give terrestrial amateurs pleasure and it'd be nice to say thank you. Try something like "blagadarju zavyizaf" ("thanks for the call"), or better still get hold of a copy of the "Radio Amateur's Conversation Guide" by OH2BAD and OH1BR - available from HQ, nudge nudge.

5. Remember that they've only had their licences for a matter of a few weeks, that they're in orbit as opposed to sitting in a nice warm shack and that English isn't their native language. So don't expect brilliant DXpedition-type operating or anything like a sustained QSO.
6. Remember to use FM only.
7. Finally, their sleep periods seem to commence at midnight

(cont. over)

(cont. from previous page)

Moscow time, i.e. 9pm our time, so they won't be active after that - also, it's understood that most activity is likely to take place at weekends.

Have fun, and if you manage a QSO with MIR, don't keep it to yourself - tell us about it. If you want to know more about the spacecraft, AMSAT-UK does a small handbook on it. Ron Broadbent, G3AAJ (who supplied the info about MIR to us, mni tnx dr OM Ron) says that a small donation to AMSAT funds will "....get you a copy fast". We guess a largish stamped addressed envelope would help too.

Incidentally, MIR is visible to the naked eye if you live in the south of the UK. Look for a bright object about 45 degrees above the horizon orbiting west to east during twilight or just after. There is also a ground-space link on 143.625 MHz, so if you have a suitable Rx try listening to that. Finally, some QSL info (don't say the Bulletin doesn't keep you informed...) If you work them, send a QSL card to:-

B Stepanov, UW3AX
PO Box 679
Moscow 107207
USSR

F2 ON 50 MHz:

There was a spectacular 50 MHz opening on 30 November 1988 to South America, North America and the Caribbean. Dave Butler, stalwart editor of the RSGB's VHF Newsletter, says that at 1258 GMT the usual white noise coming out of the Rx was replaced by the majority of the European 50 MHz beacons, all on a beam heading of 240 degrees. Dave said that in addition "...the French Guyana beacon, FY7THF, was literally end-stopping at S9++". He added that "Whilst this opening lacked large quantities of DX stations, it certainly made up for it by the rarity of some of the countries available". Star turns were HC2FG in Ecuador, VP5D on Turks & Caicos and P43AS on Aruba. More on this terrific opening in Ken Willis' column.

muTek LATEST:

Good to see the much-respected name of muTek back in the marketplace - now in the capable hands of Mike Dorsett, G6GEJ. We had a long chat with Mike just before going to press, and he asked us to apologise to readers who've had a problem getting in touch by telephone - the phone number in his ad lost a digit somewhere along the line (urgh) and the correct one is 0602 729467..

It's volts that jolts - a Winter's Tale

Two years ago last month, the Editor of this part of RadCom moved from London to a rather spiffing VHF QTH in the middle of nowhere on the Welsh border. As we approach winter and the extremities start to freeze, it reminds me of a problem which cropped up not long afterwards and which seems to be moderately common - especially this time of year.

Not long after getting the wireless station up and running, some rather odd things started happening to the power supply and control unit of a 144 MHz amplifier. First of all, it was noted that a stabilised supply for the heaters of the 4CX350s in the amplifier, which had hitherto been 100% reliable, would occasionally fail to start. Secondly (and much nastier) there was an occasional loud "thud" from within the power supply, which would trip the EHV and which - according to the alarm system - was associated with an undervoltage condition in the screen supply. The output power of the 144 MHz multimode was also noticed to be rather variable, for no very good reason. After a good deal of head-scratching and muttering, the reason for all these nasties was discovered to be the mains supply....

In London the mains had been relatively stable around 235V, and all the home-built amateur radio equipment had incorporated transformers and whatnot to produce voltages based on that particular value of incoming supply plus or minus the statutory 6%. In practice, the variation wasn't usually more than about five volts either way. However, at the new residence it wasn't as simple as that. The incoming mains was found to be around 250 volts most of the time as opposed to 235, but when a large domestic appliance such as an

oven was switched on the mains sagged to about 220V. At 0500 one Sunday morning it was measured as 259V! This was the final straw. An Iwatsu data recorder was hired and connected to measure and produce a graph of the incoming mains voltage on a continuous basis for a seven-day period. The lowest recorded voltage during the period was 216 and the highest 264, both of which are as a matter of fact outside the statutory limits of 6%.

No doubt it's because the mains comes to the editorial residence over a very long run of overhead cable, but its regulation is decidedly poor - hence the problems. A resistor value had to be changed in the heater supply so that it could start at a slightly lower raw input voltage than that for which it had been designed, to cater for when the mains was low. The "thumps" were found to be coming from the reservoir capacitor in the screen supply which, when the mains was high and the unit off-load, ended up with slightly more than its working voltage across it at the peak of the ripple! Why it didn't fail catastrophically, with the usual loud explosion, is unclear - guardian angel, perhaps....

The moral of the story is, if you move house, don't forget to check whether the mains voltage at your new residence is at least similar to that at the old. If it's much higher, it would be prudent to think about the working voltage of any electrolytic capacitors used in reservoir or smoothing applications, not to mention the reverse voltage rating of any rectifiers, etc. This is particularly true if you move to the country. Oh, and don't expect your local Electricity Board to take much interest in your little problem either.....

Apparently the number of products available has significantly increased since the last ad appeared and it now includes transverters for HF (the TVHF230c) and the 144 MHz transverter (the TVVF144a). Mike also has the little preamps for the FT290 back in stock.

430 MHz operators should read the next bit carefully....

There's also a brand-new product coming very soon, which is intended to replace all the original 430 MHz amplifiers and it sounds really good. It's a masthead preamp which uses a new device - apparently the

prototypes have achieved a noise figure of about 1 dB for 12 dB gain and the third-order input intercept is +6 dBm. The machine, whose type number is SLNA433sp, lives in a die-cast box sealed to IP65 and comes complete with a stainless steel plate for masthead mounting. We gather that masthead amplifiers for 144 and 1296 MHz are in the pipeline - sounds exciting for VHF/UHF addicts.

MuTek Limited
PO Box 24
Long Eaton
Nottingham NG10 4NQ.

Just under 250 people attended the first RSGB Annual Meeting to be held outside London. The venue was the University of Manchester Institute of Science and Technology, which was recommended by the local clubs.

MANCHESTER GIVES WARM WELCOME TO RSGB

It was announced at last year's meeting that the Society hoped to be able to hold the 1988 meeting outside London, and affiliated clubs, groups and societies were invited to make suggestions or recommendations for suitable venues (ie. those which could accommodate up to around 500 people and had good audio visual facilities as well as being able to provide refreshments during the break in the meeting). A number of suggestions and recommendations were made to Council and UMIST was chosen as the venue for this year's meeting.

The first part of the afternoon was the 'formal' meeting. This received and considered the Minutes of the 61st AGM, the accounts for the year ending 30 June 1988 and the reports of the Council and Auditors. It also re-appointed the Auditors and authorized Council to fix their remuneration. The names of the members elected to serve on the Society's Council for 1989 were announced (see inset for full results) and, with the formal business over, the meeting broke for tea.

PRESENTATION OF AWARDS:

The second part of the meeting began with the presentation of Awards by the Society's President Sir Richard Davies, KCV0, G2XM. The awards fell into two categories, Council Awards and Committee Awards, and were presented as follows;

Council Awards

The Calcutta Key - awarded for outstanding service to international friendship - was presented to Tony England, WOORE, for his considerable work in connection with SAREX and promoting amateur radio to young people. Unfortunately, Tony was unable to make the trip from the US and Brian Davies, GW3KYA, of the Blackwood ARS, accepted the award on his behalf.

The Founders Trophy - awarded for services to the Society - was presented to Neville Ianson, G3GDO in recognition of his work as Chief Morse Examiner.



Committee Awards

The G5RV Trophy - awarded by the EMC Committee - was presented to Bob Peace, G8SOZ, for his outstanding and supportive work in the field of electro-magnetic compatibility.

The Ostermeyer Trophy - awarded by the Technical & Publications Committee for the best article on home-constructed equipment published in Radio Communication during the year ending 30 June 1988 - was presented to R.C. Whelan, G3PJT, for his article entitled "An electrically-steerable vertical parasitic array for 10 MHz" which appeared in the January 1988 issue.

The Norman Keith Adams Prize - awarded by the T & P Committee for the most original article published in Radio Communication during the year ending 30 June 1988 - was presented to M. Gibbings, G3FDW, for his article entitled "Moxon slopes at VHF and other thoughts" which appeared in the May 1988 issue.

The Courtney-Price Trophy - awarded by the T & P Committee for the most outstanding technical contribution to amateur radio published during the year ending 30 June 1988 -

was presented to D.J. Reynolds, G3ZPF, for his article entitled "Wind loading" which appeared in the April and May 1988 issues of Radio Communication.

The Wortley Talbot Trophy - awarded by the T & P Committee for experimental work in amateur radio - was presented to James Miller, G3RUH, for his work on high-performance modems in the field of amateur satellites, data and packet radio.

The Raynet Trophy - awarded by the Raynet Committee - was presented to John F Stewart, GOCPR, in recognition of the work done during the hurricane which hit the south-east of England, south Wales and other areas during October 1987.

The John Rouse Memorial Award - awarded by the Microwave Committee - was presented to Les Sharrock, G3BNL, for his design of a phase-lock-loop narrowband transceiver for 24 GHz.

And finally, one additional award was made this year to the White Rose Amateur Radio Club from Leeds, who were considered to have organised the most meritable event for the RSGB's Families and Activities Day on Sunday 24 July 1988. The prize was a case of champagne, and Dorothy, G4OAT came up to collect it on behalf of the White Rose ARS. A selection of the photographs taken at the event were published in last month's RadCom.

With the awards presentation completed, the meeting was treated to a 15-minute video presentation of the official opening of the 75th Anniversary National Convention by His Royal Highness Prince Philip. The video covered His Royal Highness' address and presentation of the DTI-sponsored Young Amateur of the Year Award to Andrew Keeble, G1XYE, and included a resume of the thinking behind the award by Mr Mike Coolican of the DTI.

The video was another first for the Society and was the direct result of volunteer effort by members of the British Amateur Television Club.



THE PRESIDENT'S ADDRESS:

Following the video, the President - Sir Richard Davies, KCVO, G2XM - rose to give the traditional President's Address. Sir Richard looked back 75 years to the early days of the Society. It had been formed by a group of enthusiastic radio experimenters who not only wished to meet together to exchange ideas but also saw the need to join together in a common front in negotiating with the licensing authority to the benefit of all amateur radio enthusiasts. Sir Richard said that this work had continued ever since, and one of the main purposes of the RSGB has been to represent the interests of British radio amateurs whenever they have been threatened both at home or overseas. In this sphere of activity the Society deserved the support of all radio amateurs. He expressed a hope that members would take every opportunity of pointing out this obligation to those who, for one reason or another, had chosen not to join.

Sir Richard went on to point out that there were increasing pressures on frequency allocations and said that the Society would do everything in its power to protect amateur frequency allocations. However, he warned that if the present reduction in the rate of new amateurs coming into the hobby continued, the Society's case for retention would be considerably weakened. For this reason, Sir Richard hoped that plans to encourage more recruits, particularly among the young, would be supported by the membership.

Sir Richard said that, since the official launch of Project Y.E.A.R. the Society had consulted the membership with regard to its plans and had begun to seek sponsorship for the various activities necessary to develop the project. Sir Richard said that he was delighted to be able to inform

the meeting that one sponsor had already agreed to contribute £150,000 worth of professional effort towards the preparation of educational and promotional material. He added that the DTI had agreed to help the Society in arranging a conference with industry next year, at which the Society would be able to outline to companies how Project Y.E.A.R. could establish a pool of trained and motivated entrants into industry.

The President also spoke about the proposals for a new beginners' licence and stated that the consultative questionnaire which was published in September's Radio Communication had produced a substantially positive response. (A full report appears elsewhere in this issue).

Sir Richard went on to talk about the new amateur licence (which came into effect on 1 January 1989) and said that both the Society and the DTI had put in a great deal of work. Although not everything the Society had hoped for had been achieved, it marked a number of very beneficial changes in the amateur licence conditions. Not least of these was the adoption

of the CEPT provisions, which would make operating in other European countries considerably easier. The Society would continue to work towards getting the most favorable conditions for the UK amateur service by means of continuing discussions with the DTI.

Finally, the President mentioned the work of the recently-formed Membership Liaison Committee and the RLO scheme, which appeared to have got off to a good start despite the inevitable teething troubles. He added that operations at Headquarters continued to become more streamlined with the use of more computer-based systems, particularly in the area of book production. He reminded members of the debt of gratitude which they owed to the many dedicated volunteers and often overburdened staff who gave their time, effort and loyalty in providing such a wide range of services.

In closing, Sir Richard said that this was his penultimate public appearance as President of the RSGB. Later that evening he would be handing over the chain of office and all that it entailed to

(cont. bottom p.29 col.1)

THE RESULTS OF THE 1988 COUNCIL ELECTION

The numbers of votes cast and the results of the recent RSGB Council Election are as follows:-

Ordinary Members:

G L Benbow, G3HB	3,539 votes - Elected
M H Claytonsmith, G4JKS	3,586 votes - Elected
P L Crosland, G6JNS	2,443 votes
I J Kyle, G18AYZ	2,332 votes
A A McKenzie, G3OSS	3,887 votes - Elected
N F O'Brien, G3LP	2,856 votes - Elected
F S G Rose, G2DRT	2,815 votes - Elected

Zone C:

J Greenwell, G3AEZ	808 votes - Elected
T I Lundegard, G3GJW	522 votes

Zone D:

P Chadwick, G3RZP	UNOPPOSED
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Zone E:

E J Case, GW4HWR	UNOPPOSED
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Zone G:

A Q Beale, GM1FML	174 votes
F D Hall, GM8BZX	256 votes - Elected

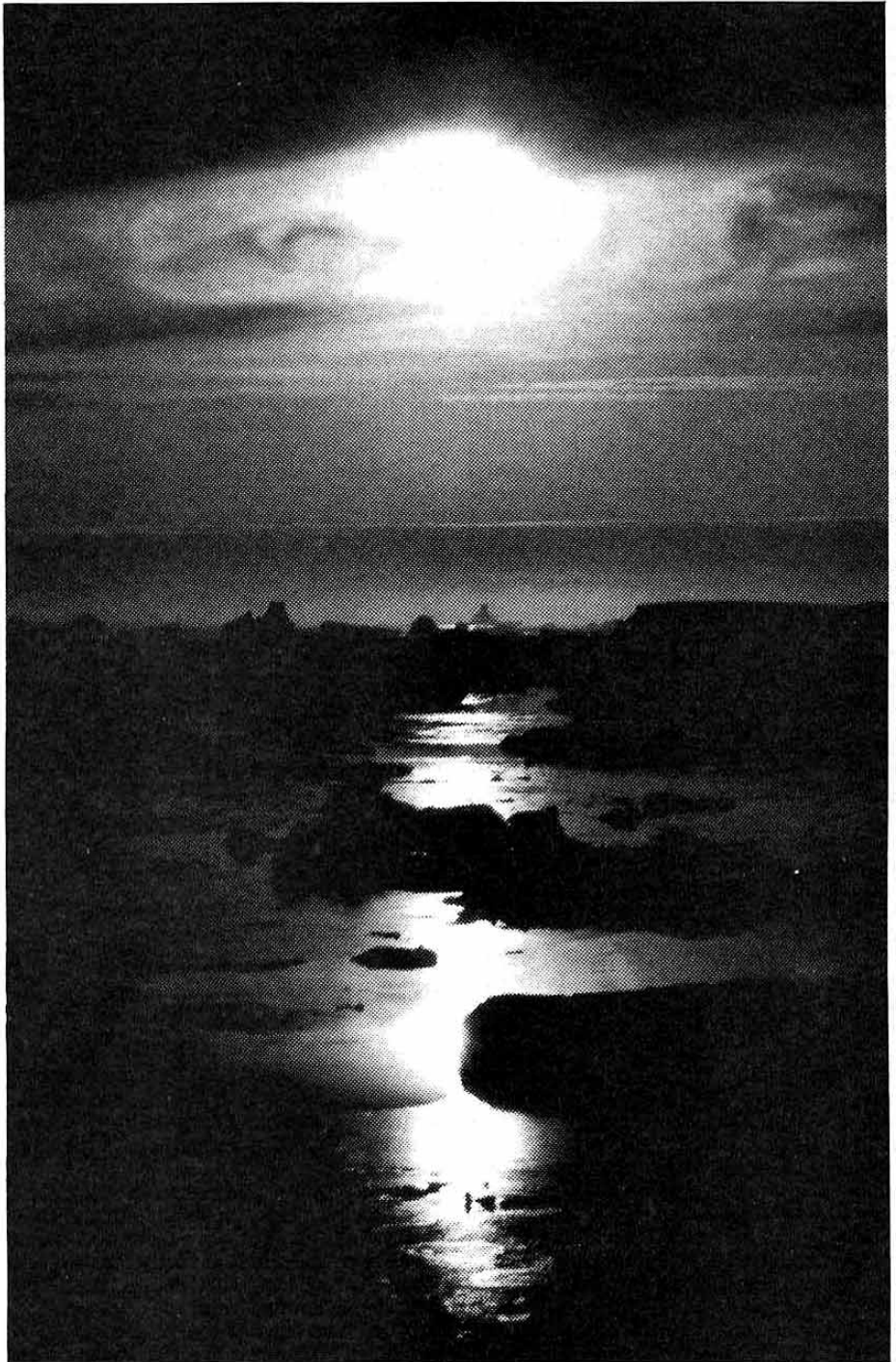
Invalid votes:

Spoiled	14 votes
Late	38 votes
Unidentified	174 votes
Incomplete identification	12 votes
Non Corporate members	9 votes
Non Paid-up members	44 votes

Well-known VHF operators and intrepid travellers Lawrence and Morag Howell, GM4DMA and GM1ILL, are off on their travels again - and if you want to cross off an exotic locator square on your map (actually it isn't even on ours....), read on.

ALL POINTS NORTH

by
Lawrence Howell
GM4DMA



An expedition under the leadership of Sir Ranulph Fiennes is blasting off from Ward Hunt Island towards the North Pole in February 1989; to make life more interesting this one is what's known as "unsupported", which means that the sledge carrying all their supplies is pulled by the expedition members. That's right - no Sno-Cats, no diesels, no huskies and nothing out of an Alastair Maclean novel (like a handy nuclear submarine appearing just when you've abandoned all hope) to help them. Lawrence is its base commander, and under some slight pressure from the Editor (i.e. threats with a blunt instrument) he was persuaded to tell us all about what Morag and he are up to. Here's the story - wrap up well before you read it....

"The intention of the expedition is for (probably) two persons pulling sledges weighing about 400 lb to travel from Ward Hunt Island in the North West Territories of Canada to the geographic North Pole without resupply, air support or other mechanical means. That's a distance of about 450 miles, in average temperatures of about -45 degrees Celsius. Contrary to what you might think, the ground is NOT flat - it's a rough ice surface with "pressure ridges" which can form almost in front of your eyes. We were thwarted last year by absolutely appalling weather, so we're having another try. "Morag and I don't get to go to the Pole - our job is to look after "base camp", which is actually a canvas hut 15' X 10'. As well as maintaining a round-the-clock radio watch for the expedition members, we have a number of scientific tasks assigned to us. We gather meteorological data for input into the world's met system and, since we're sitting on top of the Ward Hunt Ice Shelf, we carry out some ice core drilling. We also investigate the local flora and fauna. Our power comes from two 24V 50W wind turbines feeding 24V 500 amp-hour secondary cells and there's also a 2.5 kW petrol generator.

"The field party equipment consists of the highly reliable M.E.L (Crawley) PRC319 military man-pack transceivers giving up to 50W pep and powered by lithium batteries. Since the field party is pulling everything behind them, the PRC319 - being only a few kilos in weight - will not add much to their burden.

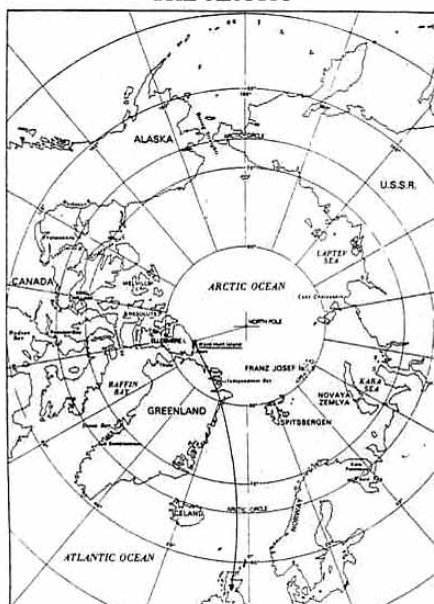
"On the antenna side, the party will use resonant dipoles laid out on the snow/ice surface only a metre or so above the Arctic Ocean. This leads to a near vertical incidence of radio waves, ideal for the 'local' (ie zero to 700km) range required for communication with base camp. As you can imagine, the base communications antenna for this link is also low, receiving as much signal as possible from the near vertical reflection off the ionosphere.

"As before, we're taking amateur equipment for HF, 50 and 144 MHz. On HF the equipment is a Yaesu FT757GX/FT707/FC102 line-up, with an FT690 plus linear for 50 MHz (giving up to 120W) and an FT480R plus Microwave Modules 200W amplifier for 144 MHz. Antennas are Jaybeam - a TB3 for HF, a 4-ele for 50 MHz and two five-over-fives for 144 MHz. In addition, an 8-30 MHz rhombic is beamed on the UK.

"As in 1988, we'll be conducting various propagation experiments at these very high geographic and magnetic latitudes at 50 and 144

MHz. We operated for three weeks in March/April 1988 during times when Europe was experiencing "auroral" conditions and our 144 MHz signal was received by DL3YBP - probably via MS-assisted auroral E. This was during the period between the afternoon and late-night phases which produce the "reflective" type of auroral signal; the "between-phases" period is known as the "Harang discontinuity" and looks as though it is the favoured time for auroral E propagation to Europe. It seems very unlikely that this method would support communications on frequencies as high as 144 MHz, but it should be highly possible on 50 MHz - however, this doesn't mean that some as yet undefined 144 MHz mode doesn't exist, or possibly a combination mode of some sort, which is enough to bridge the three or four thousand kilometres

THE ARCTIC



involved. After all, throughout the history of radio the most absurd-sounding links have been tried and have succeeded! Anything could happen.

"Satellite communications will be used via the highly successful RS10/11 144 up/29 down links. Excellent communication with the UK was achieved by this route on the last expedition, and our location gave us the advantage of being able to hear almost every pass. In fact, communications were so good that Ward Hunt's antenna wasn't shifted in direction during the majority of passes. Moving the antenna was fraught with problems, such as freezing your hands - ever tried using a normal rotator at -65 degrees Celsius?

"With power coming from secondary cells and difficulties with carburettors freezing, we did have some "power budget" problems.

In 1989 we are doubling our amp/hr capability and using pre-heating for the carburettors, which should give us more capacity for some of our higher-current-drain devices. We are also somewhat dependent on wind velocities because our wind turbines (incidentally British-built) are required to recharge the secondary cells.

"Our propagation analyst and seer is the IARU Auroral Co-ordinator, Charlie Newton, G2FKZ. In 1988 Charlie kept both ourselves and our UK control station abreast of possible auroras, sudden ionospheric disturbances, polar cap absorption, solar noise and a few other things - all of which combined to make radio communication interesting. In 1989 Charlie will again be forecasting for us, in the hope that we can catch an elusive 50/144 MHz opening as well as making sure that HF links back to the UK work well. We are limited to about 25W PEP output on the HF bands, so we use high-gain rhombics with about 300' on each leg. Height-wise, these slope from 60' at the feedpoint to 30', with an apex angle of around 45 degrees. The rhombic is (literally) a pain to erect - Morag froze her foot whilst sorting lanyards and Lawrence froze his butt whilst hanging off the tower in his harness at 60'.

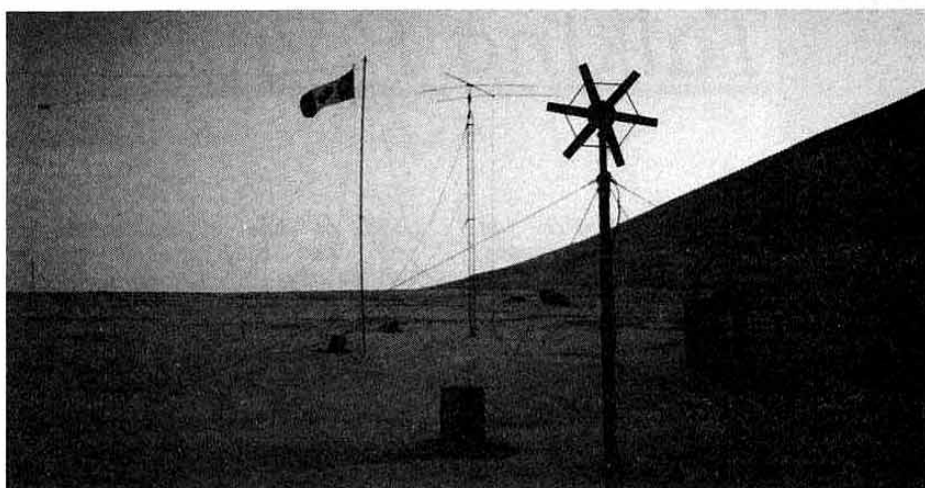
"In tests, HF links to the UK could be established with powers down to 50 mW, and we had nightly "pole-to-pole" contacts with the British Antarctic Survey base in Halley Bay. Communication was still possible even in the most disturbed periods, probably helped by quiet conditions at both ends of the path and being roughly on the same longitude. We actually had five different HF antennas to choose from, and it was sometimes the case that our multi-band dipoles outperformed the rhombic when signals were coming from more than about 35 degrees above the horizon. On the antipodean link it didn't seem to matter which antenna we used; the signal was nearly always the same strength. This either doesn't say much for our aerial design or it says something quite profound about the propagation path!

"The radio equipment in our canvas hut might be thought to be something special. You might be interested to know that our amateur equipment (for instance my much-battered thrown-from-aircraft-and-habitually-operated-between -70 and +50 degrees C FT707) is standard. The only problems we encountered were frost and ice build-up on the front panel and controls which were rather stiffer than usual. Before we depart from the UK, all radio systems are

checked out, degreased and made to suffer various mechanical traumas similar to those which they'll experience for real before being shipped to Canada. We obviously can't afford any radio failures, especially since we're about 2,500 miles from the nearest component stockist!

"Once our forward base camp at Ward Hunt is set up and everything proved to be working properly, our 'ice team' will start their long and gruelling haul to the Pole. Their progress will be slow; they're pulling a sledge weighing about 400 lb which contains all their life-supporting food and fuel for about twelve hours a day. They are a difficult burden to move over the broken ice rubble and fragmented ice floes which make the ever-moving polar ice such a formidable obstacle. In temperate climates this would be an arduous feat for man or beast; with the temperature falling below -60 degrees and no resupply drops or changes of clothing, morale has to be kept as high as possible. The nightly radio schedule with base camp is therefore of paramount importance. To save precious battery power, base camp does all the talking unless there's very urgent traffic - the field party just confirms receipt with a brisk 'roger'. There has to be absolute trust between the field party and base camp; their confidence is only as good as their knowledge that Morag or myself are monitoring our safety channels every minute of every day. An emergency can happen at any time of day or arctic night.

"I am very lucky to have Morag, my wife, as our accomplished commercial operator. You can



imagine that being enclosed in a small, cold hut with just one person for a long period of time could cause personal conflict - so the choice of expedition members with the right temperament is vital. The 'self' has to be a low priority, and personal pride has to be totally removed.

"We expect to arrive at Ward Hunt on 3 March 1989. Look for us on 50.110 and 144.123 MHz, with special watches on the hour, and any time on the HF bands. The crossband frequency will be 28.885 MHz and there will be the usual call-ins to the 'VHF net' frequency on 14.345 MHz. Callsigns to listen

for are either GM1LL/VE8 or GM4DMA/VE8 and QSL via the bureau. Locator is FR23WB".

Well, gents - if you want to make propagation history, keep a listening watch! More info as we get it, but don't forget to think of Morag and Lawrence sitting in their little canvas hut at sixty below as you sit in your centrally-heated shack looking at the powdery snow on the lawn....

NEXT MONTH - We hope to bring you Charlie Newton's fascinating article on relevant propagation modes....

SPONSORS

Expeditions such as this one, which often have associated amateur radio interests, would not be possible without the support of sponsorship by commercial companies and other organisations.

Amateur Radio:

South Midlands Communications Ltd - FT757G x 2; FT690R + linear; and servicing of trusty FT707.

Jaybeam - TB3 HF antenna; 2 off 5-over-5 144 MHz yagis; 4-ele 50 MHz yagi.

Microwave Modules - 144 MHz 200W amplifier + frequency counter.

Raychem Ltd - Special low-temperature coax which has an unpleasant taste (keeps the wolves at bay!) plus aerial wire.

Commercial Radio:

M.E.L. (Crawley) - PRC319 Man-pack HF transceivers.

ICOM (UK) Aviation - ICA2 Aviation radios.

Peninsula Electronics - ICOM (UK) Aviation ICA20 Aviation radio.

Other help and assistance from - Charlie Newton, G2FKZ Propagation/auroral coordinator.
- BTI, Portishead Radio Communications.
- 81 SU, RAF Bampton Castle Communications.



Talking Point

The new licence

Well, as of 1 January 1989 you should be operating your super wireless station in accordance with the terms and conditions of the new amateur radio licence - which we've been covering in these pages for some months now.

We published chapter and verse on the new licence in the August 1988 edition of *Radio Communication* - between pages 581 and 599, to be precise - so if there's anything you're not sure about or want to check up on, that's the place to look. It might be a good move to remove those pages from the August RadCom (or take a quick trip to the local copy shop and copy them) so that you've got them handy in the shack for easy reference.

Let's just recap on the major changes to the licence;

- * There's now an annually renewed single-sheet licence validation document, with a separate booklet setting out the terms and conditions of the licence.
- * There's now only ONE type of licence document. This covers ALL types of licence - individual, club, maritime mobile, etc.
- * The CEPT licence agreement has been adopted - hooray. See this month's Editorial for the latest info.
- * Holders of an RAE pass slip and also visiting CEPT amateurs can now operate the station under supervision.
- * Maritime mobile is now included in the standard licence.
- * The restrictions relating to emergency operation have been relaxed.
- * The /A suffix has been abolished - like Monty Python's parrot, it is no more. Use /P from now on.
- * The identification requirements have been relaxed.
- * The speed limits for CW identification have been abolished.
- * Logging requirements have changed quite a bit - see page

593 of the August RadCom for all the info on what you need to do now.

- * Restrictions on recording and retransmission of messages have been relaxed.
- * Believe it or not, packet digipeating is now legal....
- * Various types of unattended operation are now allowed.
- * The requirement to give the DTI a list of operators of your club station has been abolished.
- * Restrictions on use on behalf of "social organizations" have been relaxed. This is to allow use of the station in connection with non-profit-making amateur radio organizations such as clubs, rallies, etc.
- * Crossband contacts with overseas stations transmitting on frequencies which they can legally use but you can't are now allowed - i.e. USA stations on 220 MHz or 7.2 MHz, etc.
- * You can now use data and RTTY on Top Band
- * And finally - RIS closedown procedures have been clarified. See Note (m) of the new licence, or page 597 of the August RadCom.

In the November edition of RadCom - on page 849 - we gave the texts of a couple of DTI press releases on third-party operation and digital communications. Whilst you're dismantling last year's RadComs or taking them to the copy shop, you might like to have a look at these pages as well.

Some time ago we collated a number of points from your letters and sent them to the DTI for clarification. Nothing's happened yet by way of a reply but it shouldn't be long now, so watch this space for the 'Word' from Waterloo Bridge House.

In the meantime, here are a couple of points from the postbag - this time with a bit of a Raynet bias. As usual, we've stuck them in a question-and-answer format:

Q. The licence includes the County and Regional Emergency Planning Officers in the list of User services. How do local authorities, district and parish councils fit into this?

A. Involvement of District Councils is normally arranged through the County Emergency Planning Officer, who is responsible for the planning and exercising of emergency communications arrangements throughout his County. This arrangement is believed to be working satisfactorily.

Q. Is permission needed to do exercises with user services?

A. Section 1(2) of the Terms and Limitations booklet makes it clear that exercises may now be undertaken for user services. Members are advised to contact their local Raynet group who are in regular contact with the user services, and who undertake such exercises on a regular basis.

Still on the subject of licensing and the DTI and all that, we're aware that there has been a decidedly worrying growth in the amount of legislation affecting amateur radio in the course of the past year or so. It is especially unfortunate that much of this has been introduced for reasons which are not primarily to do with amateur radio, and their effect on our hobby is largely incidental. These topics are currently dominating our discussions with the DTI.

We are still working to obtain some further relaxations on the import and manufacture of equipment for 28MHz. Important though this topic is, another issue - the EEC EMC directive - may have a far greater impact on the hobby through the restrictions and requirements it imposes on dealings in ALL electronic equipment. Although this is not due to come into force until 1992, detailed discussions are going on regarding its implementation. This is a major issue, and it is absolutely vital that a strong, unified response be given by all European national societies. If you were wondering whether the Society does anything for you than provide a QSL Bureau and a RadCom each month, wonder no more....

We had a spiffing article in RadCom back in May 1988 about RF connectors and how to persuade them on to the ends of coaxial cable. Since then we've had a number of people ask us about how to go about waterproofing the ones you use at the antenna end, together with how to keep water out of things like the rotator connections - and over the years we've also heard some horror stories about what can go wrong. With that in mind we thought a piece on this topic might not come amiss, although you're probably reading this in December when the last thing on your mind is messing about with antennas!

The trouble with water from an engineering point of view is that it reacts chemically with practically everything. This means that we have to go to some trouble to keep it out of areas where such a reaction will cause a problem - like coaxial cable, for example, where water getting in will tend to oxidise the outer braid and considerably reduce its conductivity, thus increasing its loss. This means that every time you put a connector on coax intended for use outdoors, you need to give some thought to how to stop water getting in. Water getting into baluns and things will also cause problems - not only because it'll cause corrosion but because its presence can cause some marked changes in electrical properties.

Let's take the case of keeping water out of coax first, since it seems to be the one which you're most likely to come across. Suppose you've just put up a new antenna, to which the feeder connection is made via one of the common in-line coax connectors like an N or UHF type. Now the N-type is said to be capable of keeping water out of coax if it's properly installed, although I for one wouldn't take a chance on that being true. However, the PL259 and its friends is about as waterproof as a fishing net. If you put a PL259 on the end of a run of UR67 and there's a light shower thirty miles away, the coax will turn green in ten seconds flat. So either way I'd recommend some serious waterproofing of any connector that's used for antenna purposes. The best and simplest way seems to be by using a wonderful substance known as "self-amalgamating tape". This is made by companies such as Scotch and Rotunda and you can get it from almost any of the usual suppliers

such as Maplin, Electromail, STC, Farnell and the like. Self-amalgamating tape comes in the form of a roll of what looks like thick insulating tape but with a thin paper backing on one side of it. It's used in a similar way to insulating tape insofar as you peel off the backing strip and then proceed to wrap the tape around whatever it is you want to waterproof, overlapping each winding by about 50% of its width to ensure a good seal and keeping a bit of "stretch" on the tape as you wind so that it goes on under tension. It's best to start from the thinner end of the job, so to speak - meaning that if you want to waterproof, say, an in-line connector joining two pieces of coax, start the tape on one or other piece of the cable, take it over the connector and on to the other piece. Having said that, if the job allows it's also a good move to make the joint what a professional would call "half-lapped" - meaning that when you reach the thickest part of the job (such as the connector), cut the tape and then start again from the other piece of cable, overwinding the second tape run on to the first so that the connector is completely covered. This will ensure that there are no "voids" in the join in which water could condense. The aim of the game is to get the self-amalgamating in intimate contact with whatever it is you're trying to waterproof.

What happens then is a little miracle of industrial chemistry. In a short time the separate layers of tape which you've wound on start to fuse together, so that ultimately the connector or whatever is completely covered with what amounts to a custom-made fully waterproof "boot". Provided that the physical construction of whatever it is you're waterproofing allows you to wind self-amalgamating tape on to it, it's far and away the best stuff to use for the job. There is one slight snag, though. Self-amalgamating tape is actually a plastic substance called polyisobutylene, which is one of a class of thermoplastics that doesn't like the ultra-violet content of sunlight much - so it tends to go a bit brittle and crack after a year or two. No problem at all - all you need to do is to wrap it with a layer of ordinary PVC insulating tape. If you feel like

doing a really gold-plated mil-spec job, you can give the final result a couple of coats of clear polyurethane varnish.

If you do these things, you can rest assured that water doesn't have even a faint chance of getting into the cable and messing things up. At my last QTH-but-one there were about fifteen connectors treated in the manner described above, and all of them were as good as new after just over eight years of service when the time came to take all the antennas down prior to moving house. Actually, it's when you come to dismantle connections made in this way that the only real problem crops up. Self-amalgamating tape that's done its stuff and self-amalgamated is amazingly tough, and nothing short of a Stanley knife with a new blade will make any impression on it. So when you decide to move house and take down the antennas, allow a little time for dismantling....

One other point, incidentally, is that if you buy a brand-new drum of coaxial cable it's very tempting to assume that the outer plastic sheath will be completely watertight. Not necessarily! In the last few years I've come across a number of instances in which drums of brand-new coax from reputable manufacturers had the odd little nick or hole in the outer sheath - presumably as a result of a problem somewhere in manufacture, or maybe when the cable is wound on to the drum. It's always worth closely inspecting a new run of coax (or multi-core rotator or preamp control cable, come to that) before you do something irrevocable like bury it in conduit or run it over the roof. If you do find the odd flaw in the outer, the self-amalgamating-&-insulating-tape routine will soon deal with it.

All in all, it's a very good move to keep a couple of rolls of self-amalgamating tape and ditto of the ordinary insulating tape in the shack. What happens, though, if we want to waterproof something like the connector block on the bottom of a rotator - or the driven element and balun connections on, say, a Cushcraft 144 MHz antenna, which are all done with nuts and bolts? You probably can't get self-amalgamating tape to do the business here because it's physically impracticable to get it in or around the job. What you need here is a "sealant" - and nowadays

that usually implies something which comes out of a tube and which either a) sets by chemical reaction of some sort into a waterproof non-conductive semi-solid which is rather "rubbery" in nature or b) something like silicone grease which doesn't set - it just seals and protects. Of this latter type, the most common is Dow Corning MS4, which comes in what looks like a giant-sized toothpaste tube. MS4 is just the job for all sorts of filling and coating applications with a view to excluding moisture. Like most silicones it has high dielectric strength - 21.7 kV/mm, to be precise - so it's quite happy in high-voltage applications. Actually, it's also incredibly handy for lubricating things like grommets or cables which need to be squeezed through confined spaces.

There are two main types of chemical sealant, and one of them needs to be avoided like the plague for our purposes. This is the variety which liberates acetic acid as it cures - you can tell these by the fact that when you take the top off the tube and have a whiff of the contents, there's a strong smell of vinegar (with the brand that RS Components sell, in fact, it's not so much a strong smell as an amazingly powerful and pungent one, which will blow your head off if you sniff too hard). This stuff has approximately the same sort of relationship with copper as Billy Bunter had with cream buns, so sticking it anywhere near anything like coaxial cable or electrical connectors is asking for big trouble. Your scribe found this out the hard way some years ago, when it seemed a good idea to give the eight-way screw terminal block and connections on the bottom of a CDE CD44 rotator a coating of it before putting it up on the mast. About a year later the rotator failed (in the usual way, this happened five minutes into a good 144 MHz aurora - at least, I heard afterwards that it had been good...) and inspection revealed that all the wire ends and screw terminals on the block were corroded beyond belief. The whole connector block had to be replaced, and if it hadn't been for the help of a good mate down the road (tnx G3ZKE) it would have been weeks and weeks before I got back on the air with a rotatable antenna.

What this means is that anything marketed as "silicone rubber" or "RTV" or anything similar needs to be approached with caution. If the package says anything along the lines of "liberates a small amount of acetic acid on curing", put it back on the shelf smartish. If it doesn't say anything about acetic acid but it smells sharp and vinegary, ditto. If it doesn't

smell of anything much, it's probably not going to cause a problem. The sealant which IS perfectly safe on our kind of relatively delicate connectors and so on is the acrylic variety, of which the curing mechanism is non-corrosive - this either doesn't smell at all, at least to me, or there's a slight odour of something like almonds or shoe polish. One example of an acrylic is Dow Corning Type 738, of which its makers say "....may be used in corrosion-sensitive electrical and electronic equipment". To use it, you just squeeze the stuff on to whatever it is you want to protect and wait about three days for it to go off - it'll stick to almost anything and doesn't slump, so it'll keep whatever shape you want it to without sagging. The long setting time is a bit unfortunate, but actually it doesn't really matter as long as you don't touch it - it's very sticky and you'll a) get it on your trousers and b) pull it off whatever you're trying to persuade it to stick to, and the upshot will be an almighty mess. As it happens, 738 has about the same dielectric strength as self-amalgamating tape so it's quite happy with kV knocking around it. Try a tube next time you want to keep water out of something like a terminal block - here again, all the usual suppliers seem to sell it, although we ought to mention that it isn't particularly cheap at about #4 a tube. Mind you, a tube contains 90 ml and lasts for ever if you keep the top on. Getting it off when the time comes is no problem - get a knife-blade under one edge and you should be able to peel it off whatever it covered quite easily.

The most difficult type of connection to waterproof well seems to be the one where a coaxial feed line is terminated on a socket mounted on a flat surface such as the box containing a masthead preamp. The problem with these always seems to be that you can't get self-amalgamating tape right up to where the socket is mounted on the box; even if you take care to try and get it as close as possible, there's always some shrinkage. Also, with masthead preamps the makers always seem to put the input, output and power sockets quite close to one another - which makes it almost impossible to get the tape on in the first place, especially if you're using a large-diameter low-loss feeder such as Helix. The otherwise superb muTek devices were a case in point. In this situation, the best answer seems to be a combination of the techniques we've mentioned above. Do your best with the

self-amalgamating tape; then before you overwrap it with insulating tape, run some 738 sealant around the edge where the tape almost touches the box. Give it a few days to go off and then do your stuff with the insulating tape. Yes, I KNOW it's far easier to write about it than to do it and I KNOW it's messy and fiddly and a pain in the neck; it's still better than writing off Helix connectors at about £30 a throw as a result of water ingress. Just recently I saw an assortment of LDF-5 connectors which had been removed from some cable that hadn't been terminated properly; the sight was enough to make strong men and hardened DX-chasers weep.

The other tricky one is how to waterproof the termination on the balun supplied with some of the Hy-Gain family of HF antennas: in these a PL259 is screwed into an SO239 recessed into the short end of the balun body by about the depth of the socket. It's amazingly difficult to tighten up the '259 in the first place with this arrangement (is it me or is the knurling on the collar of every PL259 in the universe at the wrong end?) but getting self-amalgamating tape in there is nigh-on impossible. The best solution, bearing in mind the known propensity of PL259-terminated cables to absorb water like a new loofah, seems to be a combination of self-amalgamating and insulating tape on as much of the connector as you can manage followed by about half-a-tube's worth of 738 squirted well down into the recess in the body of the balun. Doing this practically "pots" the entire connection in sealant, which might seem rather messy but it's certainly effective.

That covers most of the usual problems of connectors and termination - are there any others we could think about? Well yes there are, especially with the new antenna that you're about to put up. An awful lot of commercial antenna manufacturers don't yet seem to have tumbled to the fact that a) rain falls at some time or other practically everywhere on the planet and b) there exists a interesting phenomenon known as electrolytic corrosion. The first point just means that you might have to do some of the manufacturer's thinking for him before you put the antenna up - can water get in the balun and can you stop it doing so, for example, or is it really satisfactory to have the inner of the feeder and two halves of a driven element appearing on three SO239 sockets mounted on a bracket on the boom

and not protected from the weather in any way whatsoever? The second point is that the use of dissimilar metals in an antenna system is likely to cause a lot of trouble. The reason is that every metal has something called an "electro-potential" and it's different for every one of them. In actual fact, you can divide all metals into two groups, known technically as "anodic" and "cathodic". Into the "anodic group" come the following:

Magnesium
Aluminium
Duralumin and most aluminium alloys
Zinc
Cadmium
Iron
Chromium iron alloys
(i.e. some stainless steels)
Chromium nickel iron alloys
(other stainless steels)
Tin-lead alloys
(i.e. solder)
Tin

The following are in the "cathodic" group:

Lead
Nickel
Brasses
Bronzes
Nickel-copper alloys
(i.e. "nichrome")
Copper
Silver alloys
(i.e. silver solder)
Silver
Gold
Platinum

Condensing about four hundred pages of physical chemistry into a sentence, if you put two dissimilar metals in contact, the difference in electro-potential will cause some corrosion at the point where they touch. This will be even worse when the joint gets wet. Now then - if you put two anodic, or two cathodic, metals together there won't be very much effect at all. However, putting a cathodic metal in contact with an anodic one will cause a lot of dismay after some

time has passed. Cathodic metals corrode anodic ones; for example, if you use brass screws to assemble an antenna made of aluminium alloy you'll find the aluminium starts to flake and crumble and ultimately turns to a fine white powder whilst the brass sits there looking smug. As a matter of interest, the table above is given in order of electro-potential. Lead doesn't corrode tin very much but if you assembled a magnesium antenna with platinum screws (anyone ever seen platinum screws?) you'd soon be in big trouble.

Believe it or not, some antenna manufacturers seem blithely unaware of this effect. One British-made discone is assembled with two long brass screws through its aluminium upper head, and a recent antenna article in a British amateur radio magazine suggested assembling the (aluminium) antenna with brass bolts on the grounds that they were "...slightly more flexible" than steel ones! Do watch out for this little nasty and make sure it doesn't bite you unless you don't particularly mind replacing your antennas every year or so. If for some inconceivable reason you have to use anodic and cathodic materials in close proximity on an antenna, make jolly sure that water doesn't have a chance to get in. I'd suggest copious quantities of 738 sealer as the best way to deal with the problem, although I'd suggest that a better solution would be replacement of the offending hardware by something with the same electro-potential as whatever it is you're putting together. As an aside, this point needs watching if you're building something like a linear amplifier which contains both brass and aluminium parts - you need to be careful what hardware you use to assemble everything.

As a final thought in this area, remember that what goes up must come down and that eventually you'll want to take down your Megabeam to replace it with a Gigabeam (or presumably a Picobeam if the enforcement notice has arrived, the Council's planning department is waiting at the end of

Acacia Avenue with a mobile crane and you're bowing to the inevitable). Dismantling antennas and mountings is infinitely easier if you gave some thought to this before you put them up - like coating the brackets and bolts which hold the antenna to the mast with grease before assembling them, and spraying the insides of boom sections with WD40 or similar so that they come apart easily when the time comes. A bit of MS4 (or whatever silicon grease you have to hand) on the element retaining clips used on Tonna antennas helps enormously when the time comes to get them off the boom. And so on and so forth - a little bit of forethought and preparation in this area can pay dividends later on, and it can even save you having to scrap things which can't be dismantled because they've seized solid and can't therefore be removed from the mast, etc.

So there you are - we hope that's given you some ideas about how to keep water from going where it shouldn't and doing unpleasant things to your antennas. In the next "In Practice" we'll take a look at how to keep overvoltages from going where they shouldn't, with a quick whiz round the world of filters and VDRs and all that. Don't forget, though, that if there's anything you'd like us to cover in this feature, let us know and we'll see what can be done.

In next month's 'In Practice' we take a look at some members of the resistor family - with a few hints and tips to help you on your way. Remember that if there's anything you'd like to see us cover in this section, for instance anything to do with electronic theory or practice and also those little hints and tips that everyone but you seems to know all about, just drop us a line and we'll be pleased to oblige.

SORRY

No 'Helplines' this month but we'll be back again in February.

(cont. from p.22 col.3)

Dr Julian Gannaway, G3YGF, the Society's new President for 1989. He said that he was proud and deeply honoured to have been President and he expressed his sincere thanks to all those whose advice and kindness had helped him through the year. Members were urged to continue their support and encouragement of the Society which, he said, was "good for at least another 75 years".

OPEN FORUM:

The Open Forum raised many points, and the need to encourage more young people into the hobby seemed to be uppermost in members' minds. As usual, members were able to fill in a form before this part of the meeting, and questions were drawn at random for discussion as well as being accepted from the floor.

At 6.00pm, the moment which many of those present had been waiting for

duly arrived - the draw for the 75th Anniversary Lottery. The large lecture theatre was the quietest it had been all day when the President rose to pull out the winning ticket from an enormous drum. However, you'll have to wait until next month to find out who the lucky winners were.....

As usual, the AGM will be fully written up in a subsequent issue of Radio Communication.

Around the Groups

 The deadline for the MARCH issue is Wednesday 23 JANUARY latest, but if you can send items in earlier it would be much appreciated.

BRITISH VINTAGE WIRELESS SOCIETY:

The British Vintage Wireless Society exists to "...promote the study of wireless history and the preservation of early wireless equipment". Currently, it has just over 650 members, many of whom live overseas, and membership of the BVWS offers collectors help in renovating and preserving examples of vintage wireless equipment, often by locating those difficult to find spares. Members also receive a quarterly publication called "Bulletin" and copies of other interesting historical publications from time to time. BVWS's Bulletin Editor is:-

Mr Robert Hawes
 63 Manor Road
 Tottenham
 London N17 0JH

Membership of the British Vintage Wireless Society costs £12.00/year for UK members, £14.00/year for Europe, and £18.00/year for the rest of the world. The Membership Secretary is:-

Mr Gerald Wells
 23 Rosendale Road
 West Dulwich
 London SE21 8DS

The current Chairman of BVWS is Mr Patrick Leggatt, BSc, FIEE, who recently retired as Chief Engineer External Relations at the BBC. Many thanks to Patrick for the information.

SOLENT FORTIFICATIONS:

For almost three years a group of volunteer amateurs in the Solent area have given up much of their spare time, equipment and enthusiasm to promote local forts and castles by means of special event amateur radio stations. Up to 30 of these have been activated and the group offers a very attractive award connected with working a number of the stations. Details of the award were given in a previous issue of Radio Communication.



David Evans, G3OUF, RSGB Chief Executive (left) and Tom Atkins, VE3CDM, President of the Canadian Radio Relay League on the steps of RSGB HQ in Potters Bar during his visit in October.



The photograph (above) was taken at Portchester Castle and the callsign used was GB0CDP. More activity is expected throughout this year and the team looks forward to contacting as many stations as possible. Left to right are - Dave, GOIWN; Ted, GOASZ; Art, GOJRN; Vic, G6MWY; Julie, SWL; Alex, GODHZ (Station Manager); Frank, G1UBI; Taffy, SWL; Terry, GOJEJ and Gordon, G3VPO.
 (Photo: TNX GOJEJ)

RAYNET REPS FOR ZONES 1 & 6 WANTED:

There are now two vacancies for representatives, in Raynet Zones 1 and 6. Zone 1 comprises Northumberland, Tyne & Wear, Co. Durham and Cleveland. Zone 6 comprises East & West Sussex, Kent, Surrey, Hampshire, Berkshire, Oxfordshire, Buckinghamshire and the Isle of Wight.

Raynet members resident in either of these zones may forward nominations for their zonal representative to "The Secretary (Raynet)" at RSGB Headquarters. Nominations should be supported by five Raynet members who are currently registered within the appropriate zone, and must be received no later than 5.15pm on Friday 27 January 1989. The nomination should also be accompanied by a declaration from the nominee that he or she is, (a) normally resident within the zone, (b) is currently a registered Raynet member, (c) is a member of the RSGB, and (d) is willing to serve if elected. The period of appointment is normally for three years.

If more than one valid nomination is received by the due

date an election will be held during the month of March.

Intending nominees are strongly advised to read the guidance notes on the role and duties of a Zonal Representative before submitting their application. These notes have been prepared by the Raynet Committee and are available from the Chairman, G3STG (QTHR) or from the Membership Services Dept at RSGB Headquarters.

STOURBRIDGE & DARS GOLDEN JUBILEE:

The Stourbridge & District Amateur Radio Society celebrated its 50th anniversary with a dinner on 17 September which attracted present and former members.

The Society was founded in 1938 by Alec Higgins, G8GF, and the late Don Rock, G8PR, with valuable assistance from John Timbrell, G6OI - sadly also a silent key but whose callsign is now held by the Stourbridge & DARS.

During its 50 years' existence the Society has been particularly successful in contests, with two successive wins in the HF NFD in the early 1960s and several wins in Affiliated Societies' contests.

The Stourbridge & DARS meets on the 1st and 3rd Mondays of each



Ellen White, W1YL - career employee at ARRL for 26 years - visited RSGB Headquarters in Potters Bar on Tuesday 4 October 1988. Ellen is the former Deputy Communications Manager of ARRL and has been DX Editor of QST for 8 years. She now lives and works in sunny Florida with her husband Bob, W1CW.

month at the Robin Woods Centre, Stourbridge. Further details can be obtained from the Hon. Sec. Charles Brunn, G1WAI.

MORSE COURSE IN HUNTINGDON:

Subject to sufficient numbers of people enrolling, it is hoped to run a Morse course at:-

The Huntingdonshire College
California Road
Huntingdon
Cambridgeshire
PE18 7BL

If all goes well, the course will commence on Tuesday 10 January 1989 and will cost £22.00. The classes will take place on Tuesdays between 7pm and 9pm. Further details can be obtained from the tutor Barry Street, G3MSU, on Huntingdon 52346 ext.159.

RSGB STRAIGHT KEY DAY - REPORT:

The RSGB Straight Key Day took place during the second weekend of October. Unfortunately, the overall 80m band conditions were not good causing problems in communication up and down the country. Although there was a fair amount of activity it was not as much as last time, with most contacts taking place in the morning daylight hours.

Along with the regulars - G8DV, G8QM and G3YF - the RSGB Headquarters' 75th anniversary station, GB75RS, took an active (over)



For over eighteen months, amateurs in Kirkcaldy and surrounding districts have been in regular contact with their counterparts in Kirkcaldy's twin-town of Ingolstadt, Germany. Most of the Scottish amateurs are members of the Glenrothes & District Amateur Radio Club and skeds are held every Sunday morning at 10 hours GMT on or around 14.330 MHz or 21.330 MHz as conditions allow. The photograph shows Jim Dunn, G4ZNG being presented with a scroll by Mr Robert King, Convener of Kirkcaldy District Council. The scroll, which was commissioned by Micheal Reinecke, DL1MCP, took artist Jakob Rusch six hours to complete. It was sent to Jim by members of the Ingolstadt Radio Club in recognition of his efforts in furthering the twin-town link.

part. It was also a pleasure to hear many newly-licensed G0 stations with good firm 'fists'.

One of the most interesting aspects of the Straight Key Day is the use of old or ex-Services keys. G3YYF used an ex-Army Key 8 amp Mk2; G8DV used an ex-RAF type key, typical of those used at many RAF ground stations during the 1940s; G3JJZ used a GPO twin-lever key, a particularly good example purchased for 12/6d from a local junk shop in 1960 (see photograph); G4XPE used a 'bathtub' key as used by Bomber Command and the Fleet Air Arm in Swordfish torpedo bombers; G2ACZ used a Marconi Marine key; and, perhaps the most unusual was G3VTT's set-up with a variety of keys wired in parallel including a Czechoslovakian Army key, a NATO Navy key, a home-made key and a Junkers key which was obtained at a Dutch junk sale.

QRP is also widely used during Straight Key Day and GOBUZ was heard operating with low power from West Sussex and battled on in spite of another strong station who came up and called on the frequency.

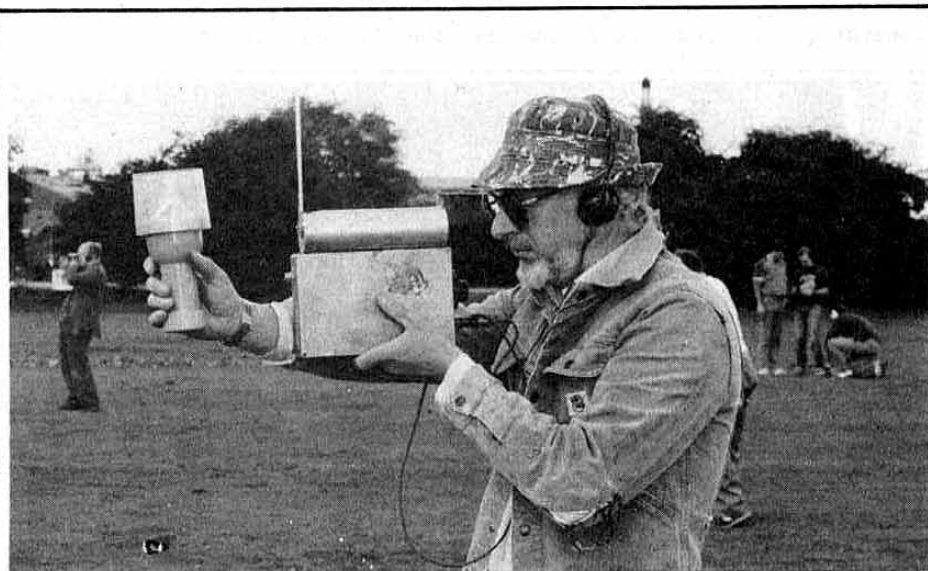
Only one contender was nominated for the SKD 'Best Fist' prize, but, since he is a member of the HF Committee, the prize will be held over until next year.

The RSGB HF Committee would like to hear members' reactions to G3YYF's suggestion that the Straight Key Day be moved to the 40m band which would improve inter-G working. However, there is a danger of increased European QRM. What do you think? If you would prefer to change to the 40m band, please write to the RSGB HF Committee c/o G3VTT (QTHR).

Finally, the HF Committee would like to thank all those who took part in the event and looks forward to hearing you all again next time...

RSGB NEWS EDITOR:

On 1 December 1989, David Gough, G6EFQ, was appointed RSGB News Editor. David will be responsible for compiling Society and general amateur radio news for publication in Radio Communication and the GB2RS News Service. Items of news should now be addressed to him at RSGB HQ and should be typed double-spaced on one side of the paper only. News items may be posted direct to Headquarters or sent via FAX to the RadCom office on 0707-46094. Later it will be possible to send items or copy via a permanently on-line modem which will handle several communications standards. In the meantime, please send any items of news as soon as possible. We may not be able to use everything sent in but please don't let that deter you from writing.



Direction finding is one of the most popular activities in club calendars. The photo above shows Chris Plummer, winner of the DF Qualifying Event held at Grimsby on Sunday 4 September, taking his first set of bearings. The event was hosted by the Grimsby Amateur Radio Society. (Photo: TNX G8YGN)

Following several months of successful experimental CW transmissions, the GB2RS schedule for the 40m band (7047.5 kHz) will be modified as from 5 February. The new schedule is given below;

Time (local)	TX from	Mode	Notes
0930	G13GGY	AM	Voice transmission
1000 - 1005	G3LEQ	CW	Identification
1005 - 1013	G3LEQ	CW	News at 22 wpm
1013 - 1021	G3LEQ	CW	News at 28 wpm
1021 - 1029	G3LEQ	CW	News at 30 wpm
1030	G3LEQ	CW	Repeat news at 18 wpm
1100	G3LEQ	LSB	Voice transmission

CLUB NEWS

DEADLINE - Items for inclusion in the MARCH issue must be sent to HQ marked "Club News - Bulletin" to be received by Wednesday 23 JANUARY latest.

If news is received by the published deadline, it will appear in the listing. It is your responsibility to ensure that items are sent to HQ in good time, either direct or via your RLO. News items should be sent in writing, preferably typed or written legibly, and be signed by the club secretary or the person responsible for publicity.

AVON:

- * Bath & DARC - 4, talk; 18, computer night.
- * Bristol ARC - *NEW SECRETARY* Barry Robbins, GOCFH tel: Bristol 600603. 5, talk "Domestic Appliances"; 12, special event station; 189, video "Amateur Satellites".
- * Bristol RSCB Group - 30, talk "The new amateur radio licence" by G4VHQ.
- * North Bristol ARC - 13, CW activity night; 17, AGM.
- * Shirehampton ARC - 13, Equipment test night; 20, video evening; 27, CADF talk by GOCJG.
- * South Bristol ARC - 4, 1989 planning evening; 11, VHF activity evening; 18, HF activity evening; 25, club video evening.
- * Weston-super-Mare ARS - 2, AGM; 16, constructors evening.

BEDFORDSHIRE:

- * Bedford & DARC - *CHANGE* Meets 1st and 3rd Tuesday of the month. 10, talk "Erections" by G0EYV; 24, talk "Packet Radio" by G0DWT.
- * Dunstable Downs RC - 6, talk "Basic Testing" by G3WLM; 14, club dinner and dance; 20, talk "Fault Finding" by G4ENB.
- * Shefford & DARC - 12, RSCB film show; 19, visit to Stevenage Postal Sorting Office, 18.30 hrs; 26, AGM.

BERKSHIRE:

- * Burnham Beeches RC - 3, mid-day social; 16, talk "Bleepers" by G4CCS.
- * Reading & DARC - 3, talk "Packet Radio" by G3WCV.

BUCKINGHAMSHIRE:

- * High Wycombe ARC - *NEW* meets every second Thursday of the month at Unit 2, Fryers Works, Abercrombie Avenue, High Wycombe. Details G2DRT.

CENTRAL:

- * Falkirk & DRS - *REFORMED* Details Bill Ferguson, G6VGV tel: 0324-2244.
- * Stirling & DARS - *NEW SECRETARY* Brian Mulleady, G6IPVG tel: 0324-36235.

CLWYD:

- * Conway Valley ARC - *TEMPORARY SECRETARY* G4NNL, tel: 0492-530725. 5, talk "Raynet" by local CEPO.
- * Delyn RC - 3, Tell a tall tale night; 17, visit by Microwave Modules; 31, talk and exhibition of photography by Glyn Jones of G & G Photographers.

DERBYSHIRE:

- * Buxton RAs - *NEW VENUE* Leewood Hotel, Buxton. Details G4IHO tel: 0298-5006.
- * Derby & DARS - 4, Junk sale; 11, "The Year in Retrospect"; 18, Video show; 25, talk "First Aid in the shack" by G8SSL.

DEVON:

- * Exeter ARS - 9, talk "Fault Finding" by Ian, G0CLS.
- * Plymouth RC - 9, talk "Fishery Protection" by Colin George; 16, video of 1988 Rally; 23, talk "British Telecom" by G3WVC.
- * Taunton & DARC - *NEW SECRETARY* Peter Robinson, G0EYR tel: 0823-275973. 6, talk "HF Contesting" by Peter, G0EYR; 20, talk and film "Robotics" by Dug, G5JJ.

DORSET:

- * Flight Refuelling ARS - *NEW SECRETARY* Graham, G3VMO tel: 0202-886151. 8, talk "Mains Anywhere" by G6AKG; 22, talk "Fletcher's Memoirs - WW2 Radar Systems".
- * South Dorset RS - 3, chairman's talk by G4UBY.

ESSEX:

- * Chelmsford ARS - 3, film show.
- * Loughton & DARS - 13, Any RAE questions; 27, talk, "Cellular Radio Update" by G4FKI.

GREATER LONDON:

- * Acton, Brentford & Chiswick ARC - 17, AGM.
- * Crystal Palace & DRC - 21, talk "VHF communications developments over the last 5 years" by G8CJO.
- * Edgware & DARS - 12, AGM.
- * Southgate ARC - 12, talk "Award Hunting" by G4OUL; 26, "Homebrew Amnesty" help for problem projects.
- * Wimbledon & DARS - *RECENT NEW SECRETARY* Nick Lawlor G6AJY, tel: 01-330 2703. 13, "meet the committee" evening; 27, talk "Homebrew UHF & VHF Yagi Antennas" by G8IYS.

GREATER MANCHESTER:

- * South Manchester RC - 13, talk "The 7th Mystery" by G8TYV; 20, talk "The Present and Future of Satellite and High Definition Television" by G3ZDH; 27, talk "Work and Play" by G3TZV.
- * Stockport RS - 11, talk "Sumsort exercise for lugholes" by G3RMV; 25, discussion night.

GWENT:

- * Chepstow & DARS - *NEW SECRETARY* Dan Taylor G4OEGH, tel: 0291-424725.

GWYNEDD:

- * Dragon ARC - *NEW SECRETARY* Tony Rees, G4WFMQ tel: 0248-600963. 2, Chairman's evening "A miscellaneous mixture"; 16, talk & demo "A Model Steam Traction Engine, famous for its charity work and as seen on TV", by Eric Lynn, G4W3REV.

HAMPSHIRE:

- * Andover RAC - *NEW SECRETARY* G8ALR tel: 0264-23741.
- * Basingstoke ARC - *NEW SECRETARY* David Deane, G3Z0I tel: 0734-332777. 2, talk "Basingstoke UHF Repeater Proposal" by Noel, G8GTZ.
- * Farnborough & DARS - *NEW PRO* G0HNA tel: 0252-519773. 11, film show; 25, talk "Is Construction Dead?" by G8ATK.
- * Horndean & DARS - *NEW SECRETARY* Mr F Charrett, G3C00, 8 Mavis Crescent, Havant, Hants, PO9 2AE. 5, talk "Weather Satellite Systems" by G4EMR.
- * Itchen Valley ARC - 13, talk "The RSCB" by G3KNU; 27, talk "Lapidity" by John Harper.
- * Romsey & DARS - *NEW SECRETARY* G6WGN tel: 0705-261977.
- * Southampton ARS - *NEW SECRETARY* Malcolm Troy, G1UWL tel: 0703-701770.
- * Waterside SWRC - 24, junk sale.

HEREFORD & WORCESTER:

- * Bromsgrove ARS - 10, QRP Club G4LOF; 24, night on the air 160m.
- * Vale of Evesham ARC - 19, AGM.
- * Wythall RC - 10, construction night; 17, talk "Test Equipment and its use"; 24, night on the air; 31, video evening.

HERTFORDSHIRE:

- * Welwyn-Hatfield ARC - 16, Bits & Pieces.

ISLE OF WIGHT:

- * Binstead ARS - *NEW ADDRESS FOR SECRETARY* Mr D.F. Barnes, Flat 17, Rose Court, Melville Street, Ryde PO33 3AT.

JERSEY:

- * Jersey ARS - *NEW SECRETARY* David Reid, G3OBZF.

KENT:

- * Edenbridge ARS - 4, net night; 11, talk "The Amateur Licence" by Mike Dennison of RSCB; 25, shack visit, G7AVG.
- * Maidstone (YMCA) ARS - 13, G3ACH with hands-on KW's transceiver; 27, rally planning meeting.
- * SE Kent (YMCA) ARC - 11, talk "The Work of the Dover Transport Museum Society"; 25, talk & demo "Resuscitation" by Brian G4SAU.

LANCASHIRE:

- * Central Lancs ARC - 2, 3.5MHz AFS planning night; 16, talk by G4ZYN.
- * Thornton Cleveleys ARS - 16, talk "Video recording" by G1TXV; 30 talk "A home-brew telescopic mast" by G4TMA.
- * Wyre ARS - 2, social night (with butties & beer); 16, station on the air.

LEICESTERSHIRE:

- * Leicester RS - 2, final AFS Contest arrangements; 9, HF/VHF activity night; 16, RSCB video; 23, AGM; 30, HF/VHF night on the air.
- * Melton Mowbray ARS - 20, quiz evening.

MERSEYSIDE:

- * Liverpool & DARS - *NEW SECRETARY* Lynn Bromsgrove, G1EXJ tel: 051-486 5745.

NORFOLK:

- * Norfolk ARC - 4, talk & demo "Magnetic loop antennas" by G3PDH; 11 debate "CQ for a copy"; 25, demo home-brew spectrum analyser by G4UUB - bring your HF rig along for checking.
- * Yarmouth RC - 12, contest plans for 1989.

NORTH YORKSHIRE:

- * Hornsea RC - 4, talk "Military Equipment" by G4ICY; 11, talk "UHF Techniques" by G3ZTR; 18, talk "Gems" by G4OOP; 25, annual dinner.

NOTTINGHAMSHIRE:

- * Mansfield ARS - *NEW VENUE* Westfield Folk House, Westfield Lane, Mansfield, second and forth Fridays at 7.30pm. 13, antenna construction; 27, junk sale.
- * Worksop ARS - 17, darts & dominoes; 31, magazine sale.

OXFORDSHIRE:

- * Oxford Raynet - 25, AGM at West Oxfordshire DC Offices, Woodgreen, Witney starting at 7.30pm. Talk-in on 144.825 MHz FM.

SHROPSHIRE:

- * Telford & DARS - 11, talk "Alaskan sled race - part 2"; 18, HF PD planning; 25, talk "Aeronautical Navigation" by G6HOK.

SOMERSET:

- * Mid-Somerset ARC - 13, recruitment evening & radio station demo; 27, skittles v Tiverton Club.
- * Yeovil ARC - 5, talk "Receivers" by G8AWB; 12, talk "Transposing formulae" by G3MYM; 19, talk "Kilve Review" by G3MYM.

SOUTH GLAMORGAN:

- * British Telecom ARS - 11, talk "New Licence Conditions" by Graham Barry.
- * Cardiff RSCB Group - 9, talk "Straight Receiver Comparisons" by Bill Andrews and Arthur Probert.

SOUTH YORKSHIRE:

- * Rotherham & DARS - *NEW VENUE* The Comedian public house, St. Anns Road, Rotherham. Meets on the first Wednesday of each month.

STRATHCLYDE:

- * West of Scotland ARS - 13, talk by G3AXX; 20, talk "Sail to Iceland & Greenland" by Mr G Kerr.

SUFFOLK:

- * Felixstowe & DARS - 9, social; 23, talk "Chinese Cuisine" by G4YQC.
- * Ipswich RC - 11, talk & demo "Radio Controlled Models" by G4FAW; 25, illustrated talk "Aircraft Photography" by a member of the US Air Force.

SURREY:

- * Reigate ARS - 17, talk "RTTY" by Alan, G8G0J.
- * Chm BARTG plus presentation of construction contest prizes and certificates.
- * Sutton & Cheam RS - 20, talk "Antennas for the Landed Gentry" by G4XMK.

WARWICKSHIRE:

- * Mid-Warwickshire ARS - 10, HF night on the air.
- * Stratford-upon-Avon & DARC - 9, talk "4 & 6 metre Transverters" by Terry, G3MXH; 23, talk "Raynet" by Dr Best, G8CCH.

WEST MIDLANDS:

- * Coventry ARS - 6, night on the air & Morse tuition; 13, computer night; 20, night on the air & Morse tuition; 27 annual dinner.

WEST SUSSEX:

- * Horsham ARC - 5, talk "Top Band DFing" by G3NPF.

WEST YORKSHIRE:

- * Keighley ARS - 31, AGM.
- * Spen Valley ARS - 5, RSCB video; 19, talk "Packet Radio" by G4KGS & G8LJO.
- * Todmorden & DARS - 2, construction competition.
- * White Rose ARS - 4, talk "CW Contest operating" and AFS briefing by G3FCW and G3PSM; 18, talk "Morse Keys - A Collectors View" by G4MH; 25, committee forum.

WILTSHIRE:

- * Trowbridge & DARC - 4, AGM.

MOBILE RALLIES

This is a list of all rallies, exhibitions and conventions notified to HQ (as at press date).

Events Diary

Items are given in detail for the next three months inclusive and in brief thereafter. Please send detailed information, including contact callsign and telephone numbers direct to HQ and marked 'Bulletin'.

22 JANUARY

* Oldham Mobile Rally - Queen Elizabeth Hall, Civic Centre, Oldham. Usual trade stands, large bring & buy, refreshments and bars. Easy access for disabled visitors. Free parking. Details Kathy G4ZEP tel: 061-624 7354.

29 JANUARY

* NARSA Rally - Norbreck Castle Exhibition Centre, Blackpool. Details Peter G6CCF, tel: 051-630 5790.

25 FEBRUARY

* Rainham Radio Rally - Parkwood Community Centre, Deanwood Drive, Rainham, Gillingham, Kent. Opens 10am, usual attractions, bring & buy stall, refreshments and bar. Talk-in on 2m and 70cm by G4RRR. Details Bob, G1LKE tel: 0634-362154.

26 FEBRUARY

* 2nd Taw & Torridge Rally - BAAC Halls, The Pill, Bideford, Devon. Opens at 10.30am, trade stands, bring & buy, refreshments, bar, ample car-parking, talk-in on S22. Details GOAYM tel: 02372-76402.

4 MARCH

* The Blue Star Radio Rally - High Gosforth Park (Newcastle Racecourse). Usual attractions, talk-in available. Details Terry, G6VEG tel: 091-264 8196.

5 MARCH

* Barry Rally - Barry Leisure Centre, off Holton Road, Barry. Details Mike G8WCMU tel: 0446-711426.

* Bury Hamfest - The Castle Leisure Centre, Bolton Street, Bury. Doors open 11am, large bring & buy, refreshments available, talk-in on S22. Venue just 3 mins from M66. Details G4KLT tel: 061-762 9308.

12 MARCH

* Trafford Rally - *NEW VENUE* The G-MEX Centre, Manchester. Opens 11am (10.30 for disabled), RSCB stand, usual traders, bring & buy, refreshments, bar and cash draw. Details Graham G11JK tel: 061-748 9804.

* Pontefract & DARS 9th Annual Components Fair - Details Colin G0AAO tel: 0977-43101.

19 MARCH

* South Essex ARS Mobile Rally - The Paddocks Community Centre, Long Road, Canvey Is. Opens 10am, talk-in on S22 by G84RSE. Details Ken G0BBN tel: 0268-755350.

* Mid-Devon Rally - Pannier Market, Tiverton. Opens 10am, trade stands, bring & buy, refreshments, talk-in on S22. Details G4TSM, Mid-Devon Rally, PO Box 3, Tiverton, Devon.

* Cambridgeshire Repeater Group Junk Sale & Rally Extravaganza - Phillips Catering Centre, St. Andrews Road, Cambridge. Traders, bring & buy, all-day auction. Details G0HEY tel: 0799-23689.

26 MARCH

* Cunningham District RC Rally - Magnum Leisure Centre, Irvine. *NEW* Opens 10.30am, trade stands, leisure centre facilities for the family. Details Peter G4QFCI tel: 0294-72253.

IN BRIEF - More details later.

2 APRIL

* White Rose Rally - Leeds University. Details A.S. Kessler, G4DXA, PO Box 73, Leeds, LS1 5AR.

* North Cornwall Radio Rally - Sports Hall, Launceston College. Details Mary tel: 0566-5632.

16 APRIL

* RSCB VHF CONVENTION - Sandown Park Racecourse, Esher, Surrey. Details RSCB HQ.

23 APRIL

* Swansea ARS Rally - Leisure Centre, A4067 Swansea to Mumbles road. Details Roger G4HSH tel: 0792-404422.

30 APRIL

* BATC Rally - The Crest Hotel, junction 2 of the M6 motorway. Details Trevor, G8CJS tel: 0532-670115.

* 6th Anglo-Scottish Rally - *CHANGE OF DATE* Tait Hall, Kelso. Details Bruce G4U1B.

1 MAY

* Mid-Cheshire ARS Rally - Civic Hall, Winsford. Details David, G4XUV tel: 0606-77787.

7 MAY

* Southend & District Mobile Rally - Roachway Youth Centre, Rochford, Essex. Details Ted G4TUO tel: 0702-202129.

* Yeovil GRP Convention - Preston Centre, Monks Dale, Yeovil. Details Dave, G1MMH (QTHR).

14 MAY

* Drayton Manor Mobile Radio Rally - Drayton Manor Park, Tamworth, Staffs. Details Norman G8BHE, tel: 021-422 9787.

21 MAY

* 32nd Northern Mobile Rally - Great Yorkshire Showground, Harrogate, North Yorkshire. Details Harry G3CQO.

* British Telecom ARS Rally - BT HQ, Coryton, Cardiff. Details Martyn Jenkins, tel: 0222-379634 (office).

28 MAY

* 13th East Suffolk Wireless Revival - Civil Service Sportsground, Bucklesham, nr. Ipswich. Details Jack, G4IFF tel: 0473-464047.

* Maidstone (YMCA) Radio Rally - Sports Centre, Melrose Close, Maidstone. Details G6FZD tel: 0622-50709.

* Plymouth RC Mobile Rally - Plymstock School, Church Road, Plymstock, Plymouth. Details Joe, G1RXR tel: 0752-509855.

29 MAY

* Doncaster Radio Rally - Bircotes Sports Centre, near Bawtry, Doncaster. Details Audrey Wilson tel: 0302-721259 or 0302-857526. Write: 23 Florence Avenue, Balby, Doncaster.

11 JUNE

* Elvaston Castle Mobile Rally - Elvaston Country Park near Derby. Details John G4PZY tel: 0332-767994. Trade Peter G3WU tel: 0332-700265 evenings.

* 29th RNARS Mobile Rally - HMS Mercury, Petersfield, Hants. Details Cliff, G4UJR tel: 0703-557469.

18 JUNE

* Denby Dale ARS Rally - venue to be advised. Details Gerald Edinburgh tel: 0484-602905.

25 JUNE

* 32nd Longleat Mobile Rally - Longleat Park, nr. Warminster, Wilts. Details Shaun, G8VPC tel: 0225-873098.

2 JULY

* Pontefract Racecourse Rally & Fair - Details Colin G0AAO tel: 0977-43101.

8/9 JULY

* 2nd RSCB DATA SYMPOSIUM - Harrow School, north west London. Further details later from RSCB.

9 JULY

* Worcester & DARC Droitwich Strawberry Rally - High School, Droitwich. Details Derek Batchelor tel: 0905-641733.

16 JULY

* Sussex Amateur Radio & Computer Fair - Brighton Racecourse, Sussex. Details Bob, G110S tel: 0243-43841.

29/30 JULY

* 4th AMSAT-UK Colloquium - University of Surrey, Guildford. Details G3AAJ tel: 01-989 6741.

6 AUGUST

* RSCB NATIONAL MOBILE RALLY - Woburn Abbey, Bedfordshire. Details Norman Miller, G3MNV tel: 0277-225563 daytime.

20 AUGUST

* Red Rose Summer Rally - Bolton Sports & Exhibition Centre. Details Dave, G1100 tel: 0204-24104 evenings.

27 AUGUST

* Torbay Mobile Rally - STC Social Club, Brixham Road, Paignton, Devon. Details G3KZJ (QTHR).

* Galashiels & DARS Open Day - Fucus Centre, Galashiels. Details John, G4QAMB.

* BARTG Rally - Sandown Park Racecourse, Esher, Surrey. Details Peter, G8VXY tel: 021-453 2676.

3 SEPTEMBER

* 22nd Preston ARS Rally - University of Lancaster. Details Godfrey, G3DQO tel: 0772-53810.

* Telford Amateur Radio Rally - Telford Exhibition Centre. Details Martyn, G3UKV tel: 0952-255416.

10 SEPTEMBER

* Vange ARS Rally - Nicholas School, Basildon. Details G4NVT tel: 0268-43025 or Mrs Thompson tel: 0268-552606.

24 SEPTEMBER

* Harlow Mobile Rally - Harlow Sports Centre. Details G4MIS tel: 0279-722622 evenings or G4KVR tel: 0279-22365 daytime.

8 OCTOBER

* Armagh Rally - Drumsill House Hotel. Details G1BRHX.

19 NOVEMBER

* West Manchester RC Winter Rally - Bolton Sports & Exhibition Centre. Details Dave, G1100 tel: 0204-24104 evenings.

* Birmingham Mini-Mobile Rally - (Venue to be advised) Details Norman, G8BHE tel: 021-422 9787.

OTHER EVENTS

8/9 JULY 1989

* 2nd RSCB DATA SYMPOSIUM - Harrow School, north west London. Further details later from RSCB.

29/30 JULY

* 4th AMSAT-UK Colloquium - University of Surrey, Guildford. Details G3AAJ tel: 01-989 6741.

GB CALLS

The list below shows ALL the special event stations licensed for operation during this month and early next month, (as at press date)

It is taken direct from the GB Calls file on the HQ computer. These callsigns are valid for use from the date given but the period of operation may vary from 1 to 28 days.

* DON'T FORGET *
* ENTRIES FOR THE RSCB 75 AWARD *
* CLOSE ON 1 APRIL 1989 *

1 JANUARY 1989:

GBOCDN - Grid: SZ 295 849
GB2CDV - Grid: SZ 569 786
GB5RFC - Royal Flying Corps, Leicester.

2 JANUARY:

GB0WFX - Kingsthorpe Comm Centre, Northampton.
4 JANUARY:
GBOCDN - Grid: SZ 339 879
GB4CHS - Castle House School, Newport, Shropshire.

5 JANUARY:

GB2CDU - Grid: SZ 627 588
GB2WLC - West Cumberland Hospital.

6 JANUARY:

GB4CL - Chorley Lions, nr Preston, Lancs.
7 JANUARY:
GB2NRS - Norbreck Castle Hotel, Blackpool.

15 JANUARY:

GB2PPC - Prior Park College, Bath, Avon.
GB4HMS - HMS Warrior, Hants.

16 JANUARY:

GBOCDN - Grid: SU 628 069
GB1CDS - Grid: SU 628 069
GB1CDV - Grid: SU 617 001

18 JANUARY:

GB5IS - Scout & Guide HQ, Ivybridge, Devon.
21 JANUARY:
GB2NIS - Antrim High School, N.Ireland.

25 JANUARY:

GB2PK - Porthcurno, Penzance.
28 JANUARY:
GB6RB - Land of Burns Centre, Scotland.

29 JANUARY:

GB2CDV - Grid: SZ 569 786
1 FEBRUARY:
GB0LFC - Scout & Guide Hut, Low Fell, Gateshead.

4 FEBRUARY:

GBOCDX - Grid: SZ 339 879
GB0RMR - Rotherham.

WORLD NEWS BRIEF

- West Germany -

The AGCW-DL Straight Key Party, which is open to all licensed amateurs, takes place on 4 February 1989 between 16 and 19 hours UTC. Activity will be between 3510 and 3560 kHz and participants should key "CQ HTP".

- United States -

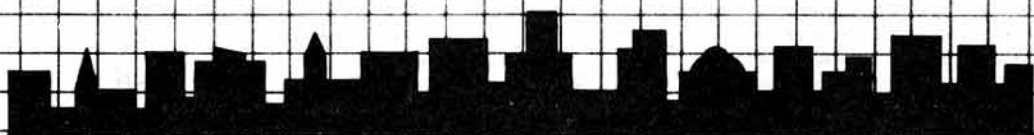
The ARRL Awards Committee has unanimously accepted a DX Advisory Committee majority-decision recommendation to add 'Malyj Vysotskiy Island' (located in the bay of Vyborg, western USSR) to the DXCC Countries List by virtue of a commitment made by ARRL in 1970. In addition, the Awards Committee unanimously endorsed the DXAC finding that the 4J1FS operation, in July 1988, met the published accreditation criteria.

L.A. Moxon, G6XN



hf antennas

for all locations



HF ANTENNAS FOR ALL LOCATIONS by Les Moxon, G6XN, is renowned worldwide as probably the most in depth look at practical amateur radio hf antennas available. Sometimes controversial, but always helpful and encouraging to the experimenter, the author guides the reader through the theory of hf antennas with the minimum of headaches. The book is not just theory however. Many practical designs are given, a large proportion of which are completely unique to this book. Whether you throw a piece of wire out of an upstairs window, or have four elements on 7MHz you cannot fail to be fascinated by this book.

HF Antennas for All Locations costs £6.15 to RSGB members by post.

TECHNICAL TOPICS

PAT HAWKER · G3VA

COMPLEX ICs SIMPLIFY RECEIVERS

In so often advocating a 'kiss' (keep it simple, stupid) approach to amateur radio generally and home-constructed equipment in particular, I am acutely aware of the paradox presented by the increasing availability of medium, large and very-large-scale integrated circuits (MSI, LSI and VLSI). These often provide extremely complex circuitry yet represent to the constructor relatively simple devices with a minimum of external passive components. The 'one-chip' receiver is already with us, although it may still present some problems of lay-out etc, and is more applicable to broadcast than amateur reception. But there can be no doubt that LSI opens the way for the home-constructor to build 'complex systems' without breaching 'kiss' advice.

An informative article 'Simple receivers from complex ICs' by Bill Parrott, W6VEH (*Ham Radio*, annual receivers issue, November 1988, pp10-12, 14, 17, 18, 20, 22-23) describes the use of the recently introduced Signetics/Philips NE602N, in conjunction with the high-gain audio amplifier Plessey SL6310-DP etc, to form simple direct-conversion and super-DC-gainer receivers; in his case to form part of a portable noise-bridge detector. The NE602N comprises a double-balanced mixer, associated bipolar oscillator and integral buffering: Fig 1. The mixer portion resembles the MC1496G except that the eight external resistors usually required with the MC1496 have been moved on to the chip. The oscillator is internally biased and it should be noted that the external circuits need either to be isolated from earth and the 6V power line or blocking capacitors used. The mixer outputs however can be connected to the positive source voltage through the output circuit. W6VEH claims that "the chip is very easy to hook up and the oscillator seems to work with almost any breadboard lash-up". Like a multi-electrode frequency changer valve it can be used as a product detector, or frequency converter for HF or VHF, up to about 200MHz. The NE602N is optimised for 6V operation and in order to use a 9V battery without the power waste involved in zener diodes, W6VEM used a National LM2931 adjustable voltage regulator intended for vehicle applications which has a quiescent current of only 400µA and an input/output differential of only 0.6V. It is self-protecting against short-circuits, overloads, reversed input voltages and 60V transients. It sounds a very useful device for such purposes.

Figs 2 and 3 from the *HR* article show the basic front-end of a 28MHz DC receiver and the use of the NE602N as a crystal-controlled converter with extremely simple external circuitry and providing a simple means of adding extra bands to an existing direct-conversion receiver. In some cases it may prove possible to use the widely-available, low-cost 'clock-oscillator' crystals intended for digital systems.

The November 1988 issue of *Ham Radio* also contains a very long article by James M Larson, KF7M which is the reverse of 'kiss'. It describes the complete rebuilding of a Collins 75A-4 receiver in solid-state. More than 5,000 of these excellent

amateur-bands receivers were manufactured from 1955 to 1958 and they quickly gained the reputation of being one of the best communications

receivers ever built for the amateur-radio market. I must admit that if I had a 75A-4 in good condition, the last thing I would want to do would be to change

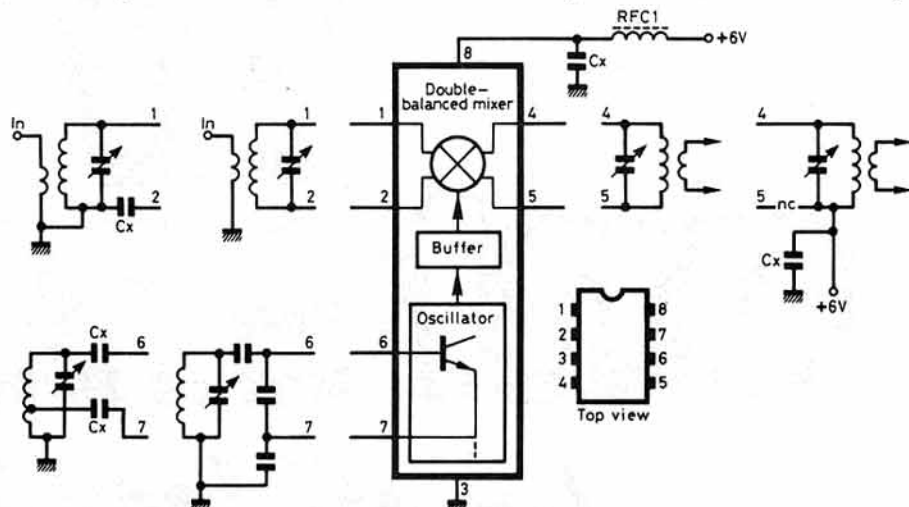


FIG 1. SOME POSSIBLE CONFIGURATIONS OF THE SILICONIX (PHILIPS) NE602N WHICH HAS BEEN CONFIRMED AS AVAILABLE IN THE UK. W6VEH POINTS OUT THAT BALANCED CIRCUITS ARE TO BE PREFERRED BUT MAY BE MORE DIFFICULT TO IMPLEMENT. CX BLOCKING/BYPASS CAPACITORS 0.001 TO 0.1µF DEPENDING ON FREQUENCY. RFC1 FERRITE BEADS OR RFC RECOMMENDED AT HIGHER FREQUENCIES. UNMARKED COMPONENTS ARE TUNED CIRCUIT ELEMENTS. TYPICAL NE602N OPERATING PARAMETERS: SUPPLY VOLTAGE 6V DC, 2.5mA, MAXIMUM FREQUENCY 200MHz, NOISE FIGURE 5dB, MIXER GAIN 20dB, THIRD-ORDER INTERCEPT -15dBm, INPUT AND OUTPUT IMPEDANCES BOTH 2x1.5KOHMS.

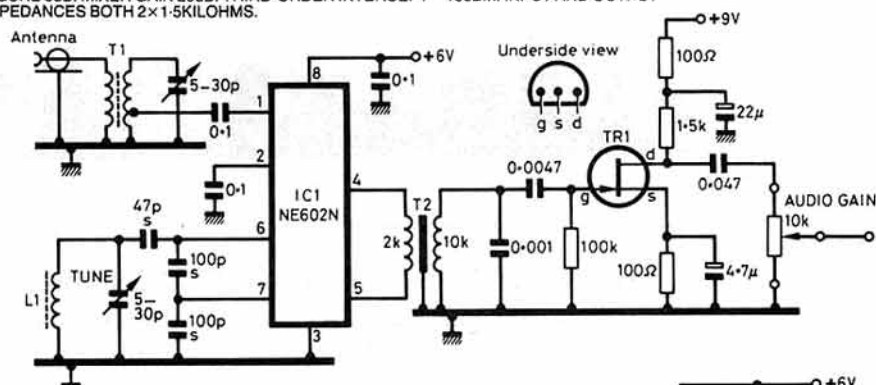


FIG 2. FRONT-END AND FIRST AF STAGE OF THE 28MHz VERSION OF W6VEH'S '3x8' DIRECT-CONVERSION RECEIVER. CAPACITORS MARKED 'S' ARE STABLE TYPES (IE POLYSTYRENE, SILVER MICA OR NPO CERAMIC). FOR 28MHz, L1 19 TURNS ON AMIDON T-50-12 CORE. TR1 MPF102, MPF106 OR SIMILAR FET. T2 MINIATURE 2K:10K AUDIO TRANSFORMER. THE FOLLOWING LOW-NOISE AF AMPLIFIER (NOT SHOWN ON THIS DIAGRAM) IS A SIGNETICS NE5230N DEVICE.

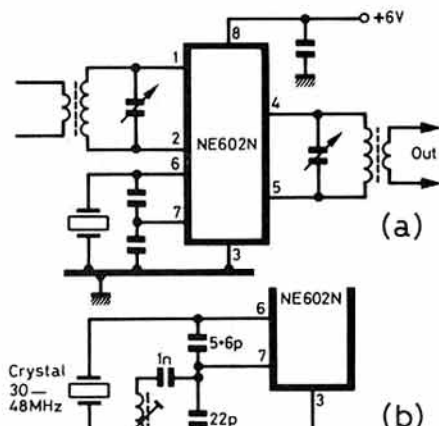


FIG 3. USE OF NE602N AS A CRYSTAL-CONTROLLED CONVERTER. THE 5dB NOISE FIGURE IS LOW ENOUGH FOR OPTIMUM SENSITIVITY UP TO ABOUT 50MHz WITHOUT AN RF AMPLIFIER.

it to solid-state, but there is no accounting for taste. KF7M set out "to get the tubes out yet retain or improve the original operating features and performance. I wanted a receiver that looked and felt like a 75A-4". His major project certainly resulted in considerably improved stability (to $\pm 10\text{Hz/hour}$) but his improved IMD performance depends on the use of an AGC-controlled input attenuator without any pre-mixer amplification, although retaining the pre-mixer tuned circuits as a double-tuned filter, rather than attempting to maintain the basic dynamic range of the original model which used the special 6DC6 valve with its good signal-handling performance. Nevertheless anyone contemplating rebuilding an old valve receiver as a long-term project would find KF7M's article instructive.

SIMPLE OVERCURRENT PROTECTION

M R Perry, G8AKX believes that many of us have overlooked an effective 'kiss' system of providing current overload protection that he has found invaluable over many years in electrical, radio and television engineering; it saved him many RF power transistors in his early days of building transistor transmitters and recently in tracing an intermittent and unpredictable fault in a high-voltage switch-mode power supply that resulted in

several blown transistors. It has also proved useful in a digital multimeter when a change to nicad batteries underlined the fact that during switching operations there was a temporary short-circuit of the battery, no problem with batteries having appreciable internal resistance but resulting in burning of the PCB track.

So what is this simple solution? A solution that also provides a visual indication of an overcurrent situation. It is, as you may have guessed, the common tungsten lamp which has a much lower resistance when the filament is cold, than when hot and which is designed to dissipate considerable power. The lamp is connected in series with the load requiring protection. As a very rough guide the cold resistance of most tungsten lamps is about one-tenth of the resistance as calculated from its rating as a lamp, but G8AKX warns that there are exceptions and considerable variation between different samples of nominally similarly-rated lamps.

He points out that the two basic requirements in using this method is that the lamp voltage should be roughly equal to the supply rail voltage and the normal lamp current should be above the normal load current by a factor of about five. For example, in the test-meter application with a 6V battery and presenting an 80mA load, an 0.3A pilot (dial) bulb

was used which gave less than 0.5V drop under normal operation. A 300V PSU was protected during testing and fault tracing using three 240V, 100W lamps in parallel. Apart from the possible problem of thermal inertia, applicable to the fastest acting devices where there is no overvoltage protection, the only snags could be for equipment where even a small voltage drop cannot be tolerated or for equipment taking many amperes; for example it could not be used to provide overcurrent protection for the 30A PSU described on page 38.

G8AKX gives some examples of the cold resistance of lamps, though these should be regarded only as a very rough guide:

Lamp Rating	Cold Resistance (ohms)	Rating	Cold Resistance (ohms)
6V 100mA	6	12V 21W	0.6
6V 0.5A	2	24V 50mA	50
12V 50mA	25	130V 15mA	800
12V 2.2W	7	240V 100W	40
12V 6W	1		

This is a simple yet effective technique provided that, in the case of RF power transistors etc, it is remembered that it does not provide protection against overvoltages. Semiconductors can be destroyed by a very short-duration transient over-voltage.

EMC - SLOW PROGRESS OF EUROPEAN DIRECTIVE

There is still only slow progress being made in connection with the European Commission's EMC Directive and the UK legislation that will be needed to make a number of BSI/CISPR standards legally enforceable. According to the DTI, on present timescales, the Directive should come into force on 1 January, 1992. However, it will allow a transitional period in the event of non-completion of standards at the date of its implementation, but with a deadline currently limited to 31 December 1992. Thereafter the Directive would apply to all apparatus and, if standards were still not drawn up, manufacturers would be asked to certify compliance with its general requirements by means of the proposed technical file route. But it would seem possible that even these deadlines may slip again.

BSI/CISPR standards that are still not legally enforceable include the spurious radiation limits of industrial, scientific and medical equipment (BS4809/CISPR11); radiation from information technology equipment including computers (BS6527/CISPR22); and the immunity of television and radio receivers to local RF fields (BS905, Part 2/CISPR20). All of these are of considerable importance to radio amateurs but it looks as though enforcement is still several years away.

Last year I visited the DTI's Kenley Radio Technology Laboratories on the former RAF aerodrome near Whyteleafe, Surrey, the main UK laboratory for approvals testing. It was frustrating to watch a demonstration of the measurement of the radiation, under the conditions specified in BS6527, from an Amstrad personal computer that showed it was radiating 40dB(μV) at 128MHz, 10dB more than the still unenforceable BS6527 limit of 30dB - and thus a potential hazard to aeronautical radio. Similarly Kenley showed their large TEM cell for testing the immunity of television receivers, etc, in a measurable, evenly-spread level of RF energy at frequencies up to 150MHz, but unfortunately there is still no way in which the DTI can insist on set makers complying with BS905 Part 2.

Even when these eventually become legally enforceable in the UK amateurs should not expect too much benefit from immunity regulations which are difficult to 'police' and enforce. The DTI last year made it known that although it expects to be given power under the European Directive to forbid the marketing of apparatus or insist on their withdrawal from the market if it does not meet the appropriate standards, it expects to act only on receipt of specific complaints rather than insisting on a pre-marketing 'approval test' for the bulk of consumer electronics.

Even where, as in the Federal Republic of Germany, there has been for a number of years an established system whereby anyone buying a radio or television set receives a letter from the German Post Office, EMC problems may still arise. This letter, according to Hans Ruckert, VK2AOU (*Amateur Radio*, July 1988) is as follows:

"Dear radio listener/television viewer: (1) This equipment has been permitted to be purchased and used for the reception of radio and television signals. (2) The equipment must be used only to receive broadcast sound and television signals within West Germany. It is illegal to listen to police, maritime and mobile land radio stations. (3) Marking with the FTZ Test Number offers you the guarantee that this equipment does not interfere with other telecommunication services including radio services. Marking with the letter 'S' or 'SK' beside the FTZ Test Number indicates that this equipment is largely immune against disturbance by other radio services (eg amateur radio and CB radio). Please contact the local Radio Disturbance Measuring Office if, in special circumstances, disturbance occurs.

"Notes: *Disturbance* is caused by lack of immunity of a piece of equipment from licensed transmissions affecting it. *Interference* is caused by illegal transmissions."

To a British amateur such a letter reads almost like manna from Heaven! But tests carried out in 1986 by the German consumer-goods testing

organisation on 12 prominent makes of television receivers showed that in seven cases the sets did not meet the standard implied by their certification.

Apparently, the FTZ tests only one prototype receiver and this is not necessarily representative of mass-production. As VK2AOU puts it: "Regulations which are not effectively policed are worse than no laws at all. They are misused by those who attempt to be 'smarter' than the authorities, to the detriment of the public."

Personally, I feel that it would be naïve to expect too much from future UK or EC regulations on television set and video cassette recorder immunity. I suspect that there will be occasional problems of TVI, VCRI and spurious radiation from digital equipment and switched mode power supplies for years to come; welcome though the 'immunity' regulations will be.

J M Osborne, G3HMO suggests that: "In investigating possible TVI with neighbours it is often difficult to obtain confirmation of whether this really happens, when it happens, and what are the actual effects on the screen or sound. Without assistance one cannot go around and see while the transmitter is being operated normally. It is not even always convincing if the XYL says she did or did not notice anything untoward. I recently acquired (for another purpose) a 5.5-in. mini monochrome television set, about the size of an Avo multimeter. It now sits on my ATU. If I have 100W SSB radiating without any observable TVI on any channel, I can feel reasonably certain that any interference problem is not at my end. It can also be a useful point to make when discussing TVI with a neighbour as he will understand such an explanation or demonstration and not feel you are attempting to blind him with science. Of course, it is not an infallible test but it does boost confidence."

Incidentally, I wonder whether we should follow the German lead and distinguish between the words 'disturbance' and 'interference'. Perhaps we should cease talking about TVI and use TVD instead.

Pat Hawker's observations on this complex subject are strictly personal and do not reflect the views of the RSGB.

20A POWER SUPPLY UNIT

Although there are now evident advantages in running medium and high-power amplifiers from 50V or 28V power supplies, the majority of current equipment continues to be based on the use of 12-14V supplies and, if operated directly from AC mains supplies, calls for power supply units capable of delivering very high currents without saturating on peaks. Since an SSB rig represents a variable load with intermittent peaks, there is much to be said in favour of using, in the shack, as well as during mobile operation, a trickle-charged vehicle-battery, preferably a modern sealed type. This type of arrangement has been discussed many times in *TT* and remains a cost-effective approach provided that due care is taken to maintain the battery in good condition. Vehicle batteries, designed to deliver the heavy load of a starting motor, are capable of delivering very high peak currents, always provided that the battery leads offer very low ohmic resistance. However, the lifetime of a neglected, poorly-maintained battery can be short.

Despite the attraction of heavy-duty lead-acid batteries, there are many situations where users prefer to obtain power directly from the mains supplies. This can call for units able to deliver up to about 20A continuously. Several 13V, 20A units have been described over the years in *TT*, the most recently being G3LBA/PA3ACQ's unit with a hex fet (IRF150) pass device, 723-based voltage regulator and over-voltage protection in the form of a thyristor crowbar (*TT*, October 1985, p785). This remains a most useful design although not all suppliers appear to stock the IRF150 device which comprises six power fets in a single package. See also the *Practical Wireless* 30A 'Marchwood' PSU in *TT*, May 1984 pp402-3.

Over the past 20 years, the Moorabbin and District Radio Club of Victoria, Australia has published a number of designs in *Amateur Radio* (VK)

for high-current power supply units in support of their kit projects. From time to time, the Moorabbin PSU has been redesigned, in part to take advantage of new components but also because of the perennial problem of some devices (eg 78HG primary regulator) vanishing from the marketplace.

The Moorabbin Mark IV PSU is described in *Amateur Radio* (VK) August 1988, pp4-6 rated at a continuous output of up to 20A and featuring overvoltage and overcurrent protection and a 275V metal-oxide-varistor (MOV) to clip transient high-voltage spikes from the mains supplies (General Electric V275LA20A). Another useful, though uncommon, feature on low-voltage supplies is the 200-ohm, 10W resistor (two 100-ohm, five-watt resistors in series) across the very high-capacitance 33,600µF reservoir capacitor (six 5,600µF, 40V high ripple-current capacitors in parallel) to ensure that the large and potentially dangerous amount of energy stored in these capacitors is quickly bled off when the PSU is switched off.

A 723 (14-pin DIL) device is used as the primary voltage regulator, fitted with 1nF ceramic bypass capacitors to prevent malfunctions in strong RF fields. The 723 drives the base of a single 2N3055 DC amplifier which in turn drives the eight, parallel 2N3055 pass transistors. The use of eight of these devices, each of which has a maximum current rating of 10A, needs some explanation. This is given as follows: "It is true that a 2N3055 can pass 10A but, at this current level, the DC gain has dropped to an alarmingly low level and little or no regulating capability remains. Assuming that the 2N3055 is at the lowest end of its DC gain specification then each pass transistor should carry no more than 2.5A if the capabilities of the driver transistor and the 723 primary regulator are not to be overtaxed."

The rectifier and the pass transistors must be

mounted on adequate heat-sinks. A 75mm length of 'Minifin' should be suitable for the 35A bridge rectifier; four 150-mm lengths for the eight 2N3055 pass transistors, two mounted on each length. If a PCB is used, all high-wattage (5W) resistors should be mounted on standoff spacers to reduce the amount of heat applied to the circuit board. Eight 0.22ohm 5W current-sharing resistors are connected in the emitter connections to the pass transistors. The combined output current passes through three paralleled 0.1ohm 5W resistors to form a voltage drop for overload protection. When the total output reaches 20A the voltage drop across the 0.033ohm resistance will equal or exceed 0.67V and is applied across pins two and three of the 723. This has the effect of progressively reducing the voltage output of the 723 and consequently the voltage and current supplied to the external load.

The overvoltage protection is described as follows: "For outputs up to 15V the zener diode does not conduct. Above 15V it conducts and a voltage appears across the 470ohm resistor between the zener diode and earth. This voltage is filtered and applied to the BD136/BD140 combination causing them to draw current through the relay coil. This breaks the DC supply to the regulating section and energises the overvoltage indicator LED. The supply will remain in the cut-off condition until AC is removed from the transformer primary and the capacitors discharged through the 200-ohm bleed resistors. Optional voltage and current monitoring can be obtained by means of a 30A FSD meter in series with the output from the circuit board and the output terminal on the enclosure; similarly a 20V FSD meter can be connected across the output terminals for voltage monitoring.

It should be noted that the supply as shown in Fig 4 is 'floating' with the mains earth connected only to the electrostatic shield of the transformer. *Amateur Radio* recommends that this mains/shield/case

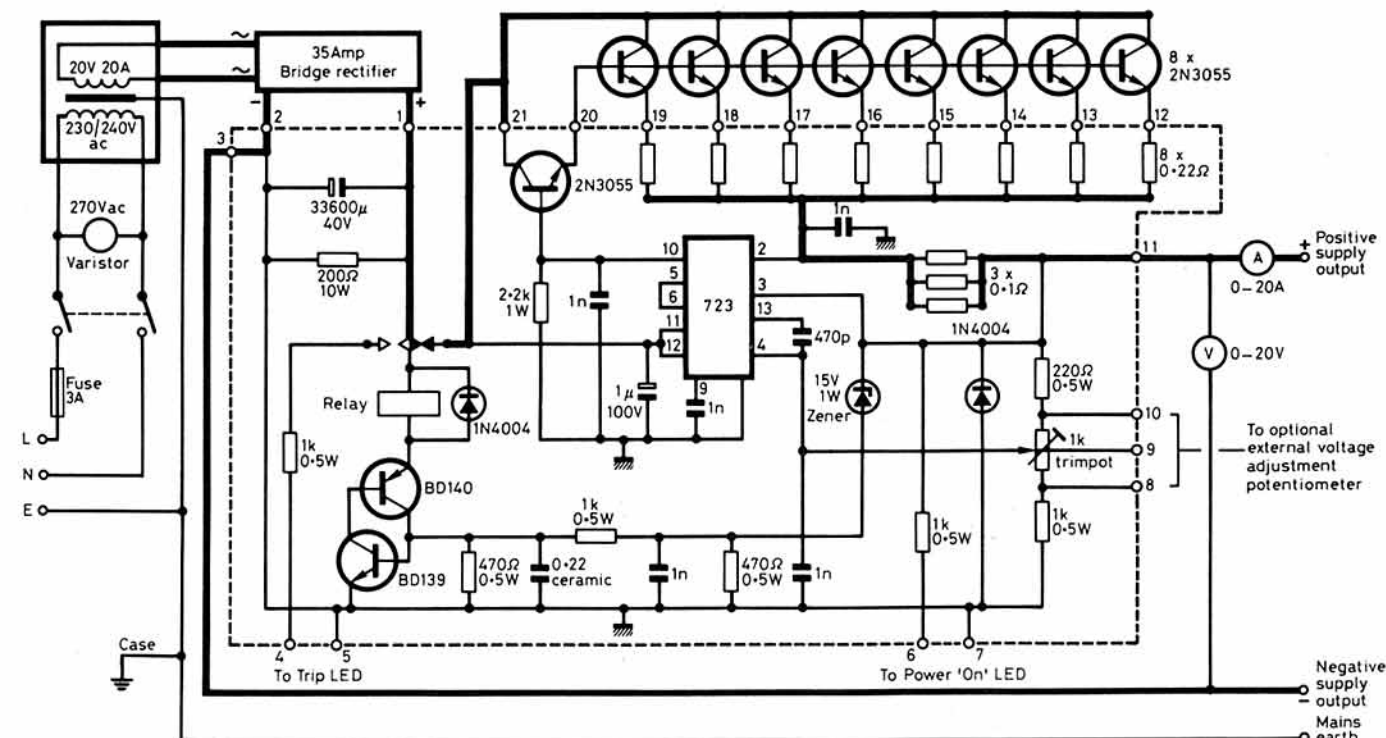


FIG 4. THE MOORABBIN MARK IV 20A POWER SUPPLY UNIT WITH OVERVOLTAGE AND OVERCURRENT PROTECTION. COMPONENTS WITHIN DOTTED LINES CAN BE MOUNTED ON A 150mm-SQUARE CIRCUIT BOARD (LAYOUT SHOWN IN *AMATEUR RADIO*, AUGUST 1988) BUT THIS IS NOT ESSENTIAL.

earth lead be brought to a separate front panel terminal for connection to the negative supply output terminal if required. Normally the voltage setting trimpot is mounted on the control board and is set to give one specified voltage output. Optionally this potentiometer can be omitted from the board and replaced with a 1K linear potentiometer mounted on the front panel. This will enable the output voltage to be varied as required between a low of eight volts and the upper limit of 15V determined by the overvoltage circuitry.

The transformer secondary must be rated to supply at least 20A continuously. The 'heavy' leads in Fig 4 should be capable of carrying 30A or so.

DIRECT-READING CAPACITANCE METERS

Twelve years ago, *TT* (January 1977, p35, Figs 2 and 3) included information on two direct-reading capacitance meters based on the 555 timer IC that had originally appeared in the magazine *Television*. One had five switched ranges covering capacitor values from a few picofarads to about 10 μ F: Fig 5.

The other unit was intended for measuring electrolytic capacitors in the range 10 μ F to about 4000 μ F.

The basic principle of the unit shown in Fig 5 is to charge the unknown capacitor to a fixed voltage (4-5V) and then to discharge it into the meter circuit; the average current is directly proportional to the capacitance; the whole process being continuously repeated by the astable operation of the 555. The meter needle remains steady, although some vibration can be observed on the higher capacitance ranges. The unit which draws about 3mA battery current, delivers unidirectional voltage to the capacitor under test; this means that it can be used to measure polarised capacitors, such as electrolytics, and it will also cope with reverse-biased semiconductor junction capacitances which can be a useful guide to the f_T of an unknown transistor.

In 1977 it was noted that: "To avoid overloading the meter movement, large value capacitors should not be connected with the range switched to a low capacitance range: it is therefore useful to arrange the switch so that one starts at the highest value

range, rotating the switch clockwise until reasonable deflection is obtained, and the value read off. The five S1 switch positions give FSD ranges of 1 μ F, 0.1 μ F, 10nF, 1nF and 100pF. S3 provides a 'times ten' extension, for example providing measurement up to 10 μ F on the 1 μ F range. S2 is a 'divide by two' facility, providing FSD ranges of 0.5 μ F, 0.05 μ F etc. The 50pF 'divide by two' range is unlikely to be accurate, but it does allow estimation of values down to 1 or 2pF."

Recently, Ray Pascoe, G3IOI built this capacitance meter but noted that the 100pF range was reading approximately 10% low compared with the other ranges. A second 555 IC was substituted but showed the same effect. G3IOI's remedy was to connect a switched 100k Ω preset resistor in parallel with the existing 47k Ω range-setting potentiometer on all ranges except the 100pF range: Fig 5 (b). He writes:

"Ideally, the 100k Ω preset would be switched into circuit with another bank on the range switch but mine did not have any spare contacts so I use a small toggle switch with legends 1 and 2-5 corre-

EUROPEAN VALVE NOMENCLATURE

It is difficult for some of us always to appreciate that many present-day radio amateurs and enthusiasts have never used valves, either in receivers or transmitters and have little idea of how they progressively evolved over more than 60 years into effective, flexible and rugged devices. It is often forgotten that the Post Office Research Station, while at Dollis Hill, developed a range of valves for use in submarine cable repeaters with a guaranteed operational lifetime of 20 years. Dr Tommy Flowers who led the wartime Post Office team that developed the pioneering 'Colossus' computers for Bletchley Park — generally recognised now as the world's first programmable, operational, digital-electronics computers although possibly challenged for this title by the work of Dr John Atanasoff and Clifford Berry whose 'ABC' machine developed between 1939 to 1942 was held in 1973 to upset the Sperry Rand Corporation's patents for the ENIAC machine which, until the disclosure of the 1943-44 work on Colossus by the PO team under the guidance of Bletchley Park cryptanalysts Max Newman, Alan Turing and Gordon Welchman, had been widely accepted as the first working digital electronic computer.

Last year, Dr Flowers described how it proved possible to develop equipment using as many as 2400 valves yet capable of providing reliable 24-hour operation. That thermionic valves and copper-oxide rectifiers could be used as switches at much higher speeds than electromagnetic relays was recognised in the 1930s, but put to little practical use because of cost and fear of valve failures. On Colossus, to achieve long and reliable valve life, heaters were never turned off, not even during maintenance. The use of relatively large pre-war valves such as the EF36, 6V6, 807 etc meant that they were not mounted very close together resulting in fewer 'hot spots' than in later valve equipment based on 'miniature' (B9A etc) valves. In practice, after the usual few initial failures, the valves in Colossus proved as reliable as the passive components.

Today, of course, vastly more computer power than that of Colossus is available on one or two chips and nobody would dream of using valves for such applications. However, it must be remembered that this is not the case where we need to handle or generate high RF power.

Even those who have long used valves, however, tend to be more familiar with American type numbers than with the considerably more informative European valve nomenclature. Did you know, for example, that the type number EF80 tells you immediately that the valve is an RF pentode, has a 6-3V heater and a B9A base? Two standard codes were originated in Continental Europe but were progressively introduced into the UK via the Philips/Mullard group of companies and were ultimately used by most UK valve manufacturers. The first applied to power valves for transmitters and industrial equipment; the second to valves used in receivers and general-purpose equipment.

Transmitting valves: The first letter of the type number denotes the general class of the valve: M audio (low-frequency) power amplifier or amplitude modulator triode; P RF power pentode; Q RF power tetrode (QQ double RF tetrode); R rectifier; T RF power triode. The second letter (or with QQ types the third letter) indicates the type of cathode/filament: G oxide-coated filament in mercury-vapour rectifier; V indirectly-heated oxide-coated cathode; X directly-heated pure tungsten filament; Y directly-heated thoriated tungsten filament; Z directly-heated oxide-coated filament (except in mercury-vapour rectifiers). A third letter S indicates a silica envelope. The first number (one or two digits) indicates the anode voltage (CCS rating) in kilovolts (eg 05 indicates 0.5kV, ie the valve is conservatively rated for an anode voltage of 500V; similarly 5 means 5kV etc). The second number (following a dash) shows for valves up to 5kW anode dissipation, the maximum permissible (continuous) anode dissipation in watts.

To show how this system works, the following are some types that have been used in amateur transmitters: QV04-7 indicates an RF power tetrode with an indirectly-heated oxide-coated cathode with its anode conservatively rated to work from a 400V HT line and to dissipate up to seven watts continuously. QQV06-40 tells you that this is a double-tetrode RF power valve with indirectly-heated oxide-coated cathode, the anodes rated for 600V and 40 watts dissipation. QV08-100 RF power tetrode with oxide-coated cathode rated for 800V (in amateur practice up to about 1250V) able to dissipate up to 100 watts continuously. QY3-125 is a directly-heated RF power tetrode with thoriated

tungsten filament suitable for use with up to 3kV on the anode and able to dissipate 125 watts continuously (ie near European equivalent to the well-known 813). One cannot, however, tell from the type number the type of valve socket required.

The European receiving valve code does provide this information. Unfortunately it was, for many years, not used by a number of British valve manufacturers who insisted on using their own type numbers and their own bases even when the valves were direct equivalents of types also available in the European code.

In this code, the first letter denotes the heater/filament rating in volts or amperes as follows: A 4V; B 180mA (DC); C 200mA (AC/DC); D 1.4V (DC filament); E 6.3V; F 13V; K 2V (DC filament); P 0.3A AC/DC; U 100mA (0.1A) AC/DC; V 50mA (0.05A) AC/DC.

The second, and where applicable, third and fourth letters in multi-electrode valves indicate the general type of valve: A diode; B double-diode; C triode; D output triode; E tetrode; F RF pentode; H hexode or heptode; K octode; L output pentode (including line-output pentode etc); M magic eye (tuning indicator); X full-wave rectifier, gas-filled; Y half-wave rectifier (vacuum); Z full-wave rectifier (vacuum).

The number following the letters shows the individual type but also the type of its base (socket): side-contact numbers 1 to 10; 'footless' 11 to 20; local 21 to 30; international octal 31 to 39 and 300 series; B8A 40 to 49 and 140 to 149; B9A 80 to 89, 180 series, 800 series; B7G 90 to 99; B10B 200 series; B9D 500 series.

Some examples will show how this code works: EF85 RF pentode with 6-3V heater, B9A base (in practice a useful variable- μ RF pentode for HF receiver front-ends); EABC80, 6-3V heater, diode plus double-diode, triode with B9A base (ie triode-diode-triode widely used as FM discriminator/AM detector/AF amplifier in old AM/FM broadcast receivers); EL84 output pentode with 6-3V heater and B9A base; PL500 0.3A heater, (line) output pentode with B9D base.

The code does not eliminate the need to know the electrodes to which the pins are connected and often the more detailed valve characteristics etc, but are, nevertheless, useful as a preliminary source of information.

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HOW TO GO MOBILE ON "TWO" WITHOUT REDESIGNING YOUR CAR

J A BLADON, G3FDU

A SIMPLE WINDOW-MOUNT ANTENNA FOR 144MHz MOBILE OPERATION

I wonder how many amateurs have faced the problem of fixing a mobile antenna to a car without drilling any holes or marking the paintwork? Obviously the serious mobileer with a 40watt dual bander or the like will spend time and money making a proper job of his antenna to get the best out of his expensive investment. But the driver with a low power rig like the FT290, or a handheld, who wishes to enliven the occasional longer journey with some mobile operation, is in a dilemma about what to do for an antenna.

If you fit into this category, then read on. The little gadget I have devised can be made in an afternoon and might be the answer to your antenna problem. It doesn't need much mechanical skill to make, it lives happily in the boot for months and can be mounted and dismounted literally in seconds when you want to go mobile. The car is quite unmarked in any way.

After that buildup you might be forgiven for

asking "What's the catch?" One reservation must be the strength of the mount, which depends on your own installation. The author's Fiesta provided a reasonable mount for a quarter wave whip. Anything longer (like a 5/8 wavelength) seemed altogether too precarious for safety.

Perhaps more insidious is a possible radiation hazard from operating close to the antenna. This cannot be worse than using the same rig with a rubber duck – the experts say that it would be advisable to keep the output power down below 1 watt. It might be more serious if you had a carload of kids, but in any case under such conditions you should keep your hands on the wheel and your eyes on the road. If, like the author, you operate mobile only a few times in the year, always solo and never with more than three watts nominal power, you might decide that the RADHAZ situation is no worse than other more obvious dangers of the highway. But if you are sensitive about such matters you may feel that this antenna is not for you after all.

TECHNICAL POINTERS

It's hardly correct to describe the following as theory; probably a better definition is principle because it is based on good fundamental practice.

Location: Obviously the higher the antenna can be mounted the better. This implies putting it on the roof of the car. As holes, gutter clamps and mag-mounts are taboo because they damage the paintwork, the first possibility was the sunroof. This was abandoned because there didn't seem to be any way to clamp the antenna other than by trapping it in the rubber moulding – which was likely to leak when closed and fail to clamp when open. Doors and boot lid suffered from similar defects. After sleeping on the problem, the idea of nipping a

clamp mount in a window moulding seemed possible. A five minute experiment with a piece of thin aluminium demonstrated that the concept was feasible.

The final result was the design shown in the figures. It is a clip mount which fits tightly on a window glass and is nipped in the plastic surround when the window is wound up. Further experiment confirmed that this would be strong enough to take a 1/4 wave vertical. While it would not be in the ideal position on the car roof, the majority of the antenna would be above roof level.

Next it became necessary to consider how the antenna should be connected to the rig. There was no metallic connection between the outer conductor of a coaxial cable and the car – the window moulding is quite a good insulator. It was decided to fool the coaxial feeder into thinking that it was properly terminated on the outer sheath by employing a 1/4 wave choke stub. This eventually became a coaxial sleeve surrounding the feeder proper which provided, in effect, a conventional sleeve dipole with the top half radiating outside the car and the bottom half coincident with the feeder within the vehicle.

Feeder matching was the next consideration. Provided that the antenna was cut to resonate at 145MHz, the impedance at the feed point would be more or less resistive in nature – but what resistance? Being unable to make accurate measurements, I decided that while the antenna feed resistance would probably be lower than the customarily assumed 50ohms, the use of 50ohm coaxial cable would probably be satisfactory. The length would be short and any losses would therefore be low. As an added precaution the feeder was made a whole number of half wavelengths long, taking account of the shortening effect of the velocity factor of the cable. This would present the antenna feed resistance to the PA and minimise the detuning effect. Having chosen a convenient line of argument, it was rather a relief to find that the results obtained seemed to fit the 'theory' nicely.

CONSTRUCTION

The Window Clip: Details of the window mount clip are shown in Figs 1 and 2. The dimensions are not critical electrically and may be varied to suit different cars. The shape is first marked out on the aluminium sheet and the holes drilled to take the SO259 sockets. The slot for the jumper is also cut out at this stage.

In bending the sheet to form the window clip, dimension 'X' is most important as it must give a good tight fit around the top of the window. One way to achieve this is to use a piece of thicker

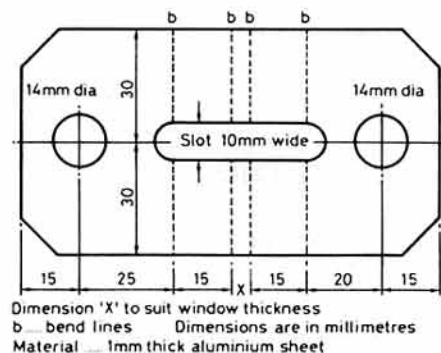


FIG 1. THE WINDOW CLIP BEFORE BENDING

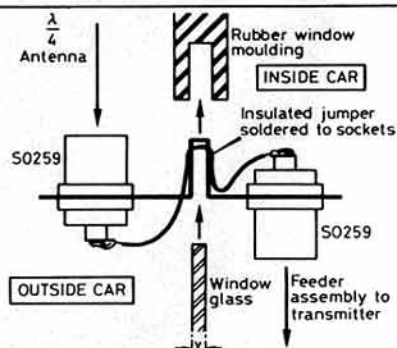


FIG 2. CLIP BENT TO SHAPE AND FITTED TO TOP OF WINDOW. CLOSE WINDOW FIRMLY AND DO NOT USE WITH LONGER ANTENNAS.

aluminium, the same thickness as the window glass, as a bending template in a bench vice.

The clip can now be tested on the car window. If all is well and it is nice and tight, mount the two sockets. The jumper can be made from a piece of braid removed from coax outer conductor, cut to length, insulated with sleeving and soldered to the centre connectors of the two sockets. Check again that the clip fits well at the top of the window, that the jumper is not strained in any way and that the antenna element will not foul the roof gutter when finally fitted.

The Feeder System: This is a bit fiddly but with care the final result can be made to look quite professional. A dummy run might be advisable if you're not sure how well the parts are going to fit together.

The feeder cable is not particularly critical – I used some old Band 3 TV cable which had been lying around the shack for years. More regular alternatives could be either RG58U, Uniradio 43 or Uniradio 76 – all small diameter 50ohm cables. The choke section is made from screening braid stripped from the outer conductor of a larger cable – something like RG59U or Uniradio 70 would do. Again, this is not particularly critical: the important thing is to be able to thread this over the outside insulating sheath of the feeder proper and then pull it down snugly to give the effect of one homogeneous cable. The PL259 plug at the antenna end should be a tight fit over the whole assembly of cable and choke section. As a starting point, try a standard PL259 UHF plug with a 'large' reducer suitable for Uniradio 70 cable. The PL259 (or BNC plug if needed to suit your rig) at the other end could be fitted with a 'small' reducer suitable for the main feeder cable.

Before making the feeder assembly, check the exact length needed. The author used a full wavelength equivalent to 1360mm. This might be short in a larger car, in which case the length should be increased to 2050mm or even 2730mm. Measurements should be as accurate as possible but are not too critical – the author used a standard 6ft rule for this purpose. Having decided the total length of feeder needed, cut off at least one metre more to give yourself room to work and even to recover from a false start.

Start at the antenna end of the feeder and prepare the cable end in the usual manner for fitting the PL259 UHF plug. Leave the other end of the coaxial cable free so that the various components of the assembly can be threaded on the outside in the correct sequence.

Thread a 550mm length of screening braid over the outer sheath of the feeder cable and make a tidy soldered connection to the outer conductor of the feeder cable at the point where it has been bared ready to be terminated at the plug. Run the solder around the whole cable to form a neat joint between the loose braid and the feeder outer conductor, taking care that the centre insulation is not permanently deformed and that there are no whiskers which might short circuit the outer to the inner when the plug is assembled.

Fit the PL259 UHF plug body to the end of the feeder assembly and solder off the centre conductor. Don't worry about connecting the outers to the plug body – our choke arrangement has made this unnecessary. It's a good idea at this point to use an ohmmeter to check that there are no short circuits between centre and outer conductors.

Now 'stretch down' the bare braid on the outside of the assembly, starting at the plug and pulling it

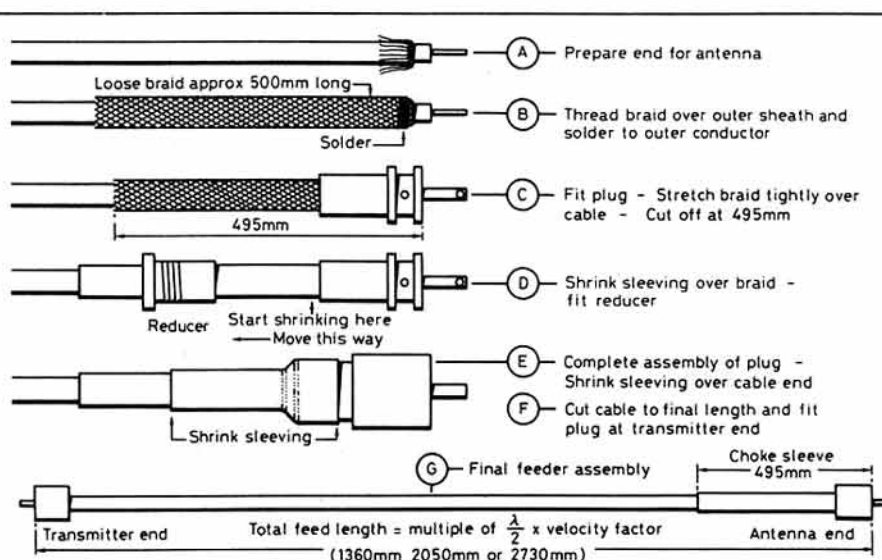


FIG 3. INSTRUCTIONS FOR CUTTING CABLES AND FITTING CONNECTORS

as tightly as possible while working towards the free end of the feeder cable. Do this two or three times to get a good snug fit, then trim off the braid as accurately as you can at a length of 495mm from the far end of the PL259 plug body to form the quarter wave choke sleeve. Now pass a 500mm length of heat shrink sleeving over the outside and thread it as close to the plug body as it will go. Apply a candle flame and start shrinking the sleeving where it enters the plug body. Work gradually towards the free end, rotating the cable between the fingers, and shrink the sleeving progressively over the cable assembly until the whole is a single solid coherent mass. Fit the reducer and screw it tightly into the plug body to clamp the whole cable assembly into the plug. Finally, slip about 75mm of large diameter heat-shrink sleeving over the plug body and shrink it down to give a tight end to the plug and cable assembly.

Check again for shorts with the ohmmeter and, if there are none, the worst is over.

Cut off the free end of the feeder cable to provide the total length previously decided and prepare the end for making off into the remaining plug. Don't forget to thread another 75mm length of large diameter heat shrink sleeving and the small reducer over the cable. Fit the plug in the usual manner, tighten the reducer to clamp the cable and shrink the sleeving over the outside to finish off. Check again with your ohmmeter for no shorts and for conduction between the centre pins of the two plugs.

The result is a flexible cable with the choke end hanging inside the car from the socket on the window clip connecting the antenna outside to your rig inside. The rig itself can be placed in any suitable position – the author's car has a convenient location above the instrument panel where a FT290 can be safely wedged in.

The antenna element: The author's original antenna was made from a length of 12SWG hard drawn copper wire. One end was soldered into a PL259 plug, the other was cut off to give a total length of 490mm. Some epoxy glue was pushed into the plug body to give adhesion and support. This worked well, but in a weak moment the author bought a commercial 1/4 wave whip which performs the same, but looks a lot better.

TESTING AND OPERATION

For the first test assemble the antenna on the car where it is intended to be used. Fit the antenna element, check that the window is wound up tightly and connect the feeder taking care to see that the choke end is attached to the antenna clip. For the first tune-up it is advisable to use an SWR indicator at the TX end of the feeder and to operate on low power until sure that nothing nasty is going to happen or that the PA is going to be damaged.

Key the press-to-talk briefly for just long enough to get a SWR reading. If this is below about 1.8:1, all is well and you may move on to the next stage. If the SWR is out of limits, switch off immediately, disconnect the feeder assembly and check with your ohmmeter for conductivity in the centre conductor and infinite resistance between inner and outer conductors at the TX (non-choke) end. If anything is wrong, check the whole system (including the measurements), reassemble it and try again carefully. Don't keep trying if you get the wrong answers as you risk permanent damage to your rig.

With satisfactory operation on low power, increase the output to no more than one watt (remember the RADHAZ thing!) keeping an eye on the SWR and the output power indicator on the rig. If these continue to look normal the system is OK and ready for use without the SWR indicator in the feeder.

The author's original version was made with enthusiasm rather than absolute accuracy and gave a SWR of 1.5:1 on first test. It has been used for over two years, living most of the time in the boot, but performing well with a FT290 working barefoot at a nominal three watts. It seems to work as well as more regular antennas, possibly because of the care taken to ensure a reasonable termination of the coax outer conductor. Have you ever wondered how your magmount or gutter mount was grounded at the far end?

Provided that the window is properly closed, the mounting is very stiff and sturdy at all legal speeds (and for safety, of course, beyond). But be warned – a 1/4 wave antenna is the limit. Don't be tempted to use anything longer because the clip won't be strong enough.

A NEW KIND OF FM RECEIVER

A 144MHz
FM receiver which
provides good
performance from
simplicity and low cost

In 1986 the Trowbridge and District Amateur Radio Club organised a home construction competition. The challenge? To build a simple 144MHz FM receiver. As home brewing is one of the favourite aspects of Amateur radio at G0BBL, I opted for a double conversion super heterodyne with a tunable IF of around 1.7MHz and a second IF of 455kHz. This design made full use of the features of the TDA1083 one-chip AM/FM radio IC and gave a reasonable reception of local stations. Although awarded the club's Constructor Cup that year, the receiver was not suitable for duplication because it demanded critical alignment in order to extract optimum performance.

This year a new and different approach was taken. I investigated an idea born during a discussion with G6POW, when we pondered over whether the Mullard TDA7000 Integrated Circuit could be adapted for use in a 144MHz FM receiver. It proved possible, and led to the design of the receiver which forms the subject of this article. This receiver, like the direct conversion receiver now popular with home constructors and QRP operators on the HF bands, provides a surprisingly good performance considering its simplicity and low cost. It does, however, suffer from the same drawbacks inherent in DC receivers, ie, low adjacent channel rejection and overloading by strong local signals. The poor adjacent channel rejection stems from a low intermediate frequency of only 10kHz, which means that the local oscillator either runs 10kHz above or below the signal frequency. For example, when the receiver is tuned to 145,500kHz (S20), the local oscillator is set to 145,510kHz. A transmission on S21, 145,525kHz will easily cause interference as the 15kHz difference is well within the passband of the IF amplifier. The solution I offer is simply to switch the local oscillator to a frequency of 10kHz below the signal frequency, ie, 145,490kHz. This will increase the rejection of the transmission on S21 sufficiently, except when dealing with very strong local signals. This process is similar to how a CW operator tunes his DC receiver on a crowded HF band for the sideband which yields least interference from adjacent channels.

The second drawback, overloading, is almost certainly caused within the mixer of the TDA7000. This IC draws only 7mA at 4volts, which although ideal for portable operation does seriously limit the signal-handling capabilities of the mixer. The complete receiver draws about 20mA and can be economically powered by four 1.5V dry batteries.

J. VERDUYN G0BBC

Born 1947 in Holland. Fascinated by radio since childhood days. Passed the RAE at the age of 17 whilst studying to become a radio officer. First licensed as PA0VDR and after settling in England allocated G5BBL and later G0BBL.

Main interests are homebrewing and experimenting, QRP operation on 80m and 2m as well as club-night natter.

Also enjoys good food, table tennis and music.

At present still sailing the Seven Seas on large oil tankers but owing to the rapid decline of the West European fleet, is now looking for a new shore career in the UK as a (service) engineer in the telecommunications or electronics industry, for which additional qualifications have been obtained.

IN BRIEF

Like the now popular direct conversion receiver, this VHF FM Receiver employs a circuit with low intermediate frequency (10kHz) yet offers a useful performance. A relatively simple design results from the use of an IC that incorporates most stages needed in a small personal VHF radio. This article describes how this IC, although specifically designed for the reception of wideband FM broadcast transmissions, can be employed for the reception of narrow-band FM 144MHz amateur stations.

The receiver, for which a ready-made PCB is available, is easily adapted for use on the 29, 50 and 70MHz amateur bands by changing only a few coils and crystals. As is the case with typical HF direct conversion techniques, the receiver contains most of the circuitry for a simple NBFM QRP transceiver. Only two more stages would need to be added, and a suitable block diagram is discussed in the text.

This design is not presented as a 'foolproof' project, but full constructional information is provided as a guidance for amateurs with construction experience beyond the kit-building stage. It could also serve as club project when less confident constructors can rely on assistance of any more experienced members. The layout of a single sided printed circuit board and the employment of ready-wound coils should result in a predictable performance. Arrangements have been made with G8SEQ for the supply of PCBs and kits of parts. Suitable crystals are either in the 8 or 12MHz range and should be cut for the transmit frequency of the channel to be covered. 144MHz simplex frequencies are readily available at reasonable cost. (Please check your junkbox first...) Frequencies to cover the repeater output channels are more difficult to obtain and may have to be made to order. Clubs should be able to obtain significant discounts by pooling orders.

EXPERIMENTS WITH THE TDA7000

This IC contains most of the circuitry for a personal radio covering the 88-108MHz VHF broadcast band (Walkman type). Only the final audio stage and optional RF stage need to be added. A close look at the manufacturer's data sheet, which can be found in the 1987 Maplin catalogue, reveals that this IC consists of a single conversion superhet with a low IF of 70kHz. Active filters are employed to obtain sufficient selectivity and yet do away with the need for any IF coils. Two phase detectors, a mute switch and a built-in local oscillator with AFC capability are also incorporated on this chip.

As a first step the recommended circuitry in the data sheet for a 88-108MHz broadcast receiver was built. Next, the capacitors in the active filter stage were replaced by values calculated for a bandwidth of 16kHz, the FM detectors tuned to a centre frequency of 10kHz and the RF coils changed to cover 145MHz. Although the maximum frequency of the TDA7000 is specified as only 110MHz, the local oscillator functioned quite happily at least 180MHz.

Without an RF stage, very promising reception was obtained from local 144MHz stations. Of course, the stability of the free-running local oscillator on 145MHz is such that the AFC (or Frequency Locked Loop - FLL - as the data sheet names it) is unable to compensate for all the drift that occurs. A



solution was found by disabling the LO and injecting a stable LO signal, generated by a crystal oscillator and multiplier stage. This resulted in stable reception of the local repeater, and this prompted a number of other experiments in order to get the best possible performance from this IC on narrow-band FM. Attempts were made to reduce the IF bandwidth to under 8kHz, but this did not work well. Stations which transmitted more than 1.5kHz off-channel could not be resolved at all, or only with great difficulty.

CIRCUIT DESCRIPTION

After playing with the breadboard version of the TDA7000 NBFM a 'proper' receiver was built.

The block diagram and full circuit diagram are provided in Figs 1 and 2. An RF stage with either a 40673 or 3SK85 was added so that sensitivity would be up with the Jones's! This stage does not run at maximum gain in order to minimise overloading of the TDA7000 by strong signals and also to conserve battery power. TR2 and TR3 form the two stages of the crystal controlled LO chain. The crystal oscillator is designed for fundamental mode xtals of either 8MHz or 12MHz with little difference

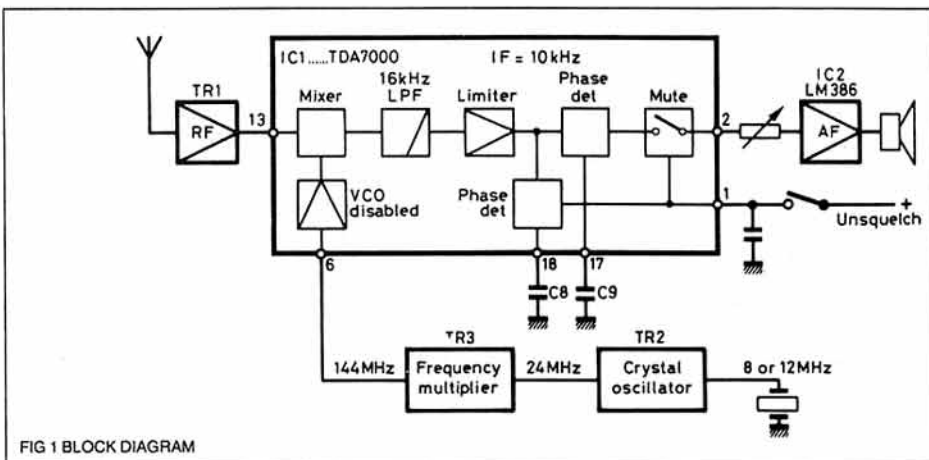
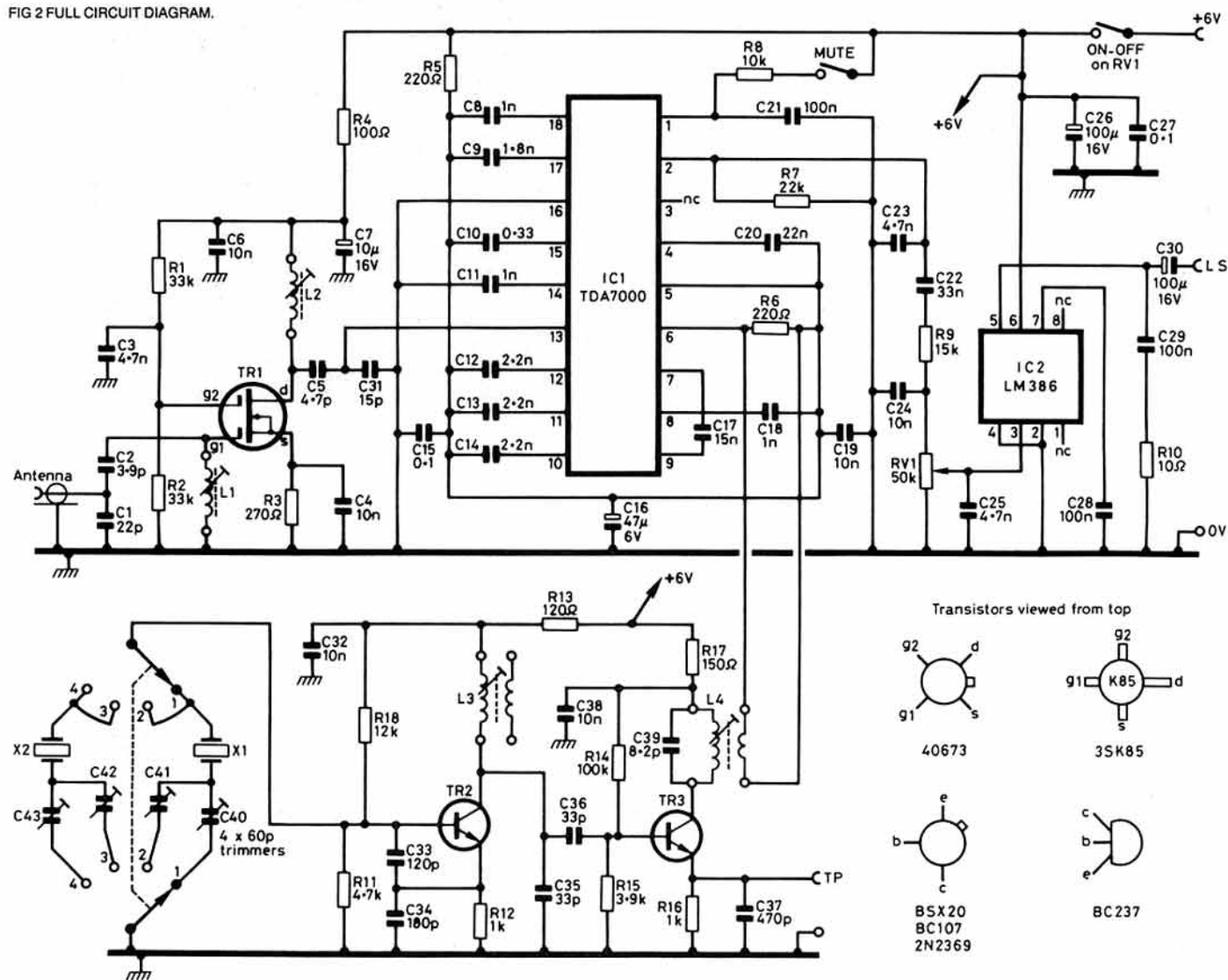


FIG 1 BLOCK DIAGRAM

in performance. In the second version of this receiver, an 8MHz S20 crystal was actually used for Ch. 1 and a 12MHz S23 crystal fitted in Ch. 2 without any noticeable change in sensitivity when switching between these channels. Coil L3 in the

collector of TR2 is tuned to 24MHz while L4 is tuned for resonance on 145MHz. Two trimmers are available on the PCB for each crystal. In areas of high activity these trimmers are adjusted so the LO is set above and below the wanted channel in order

FIG 2 FULL CIRCUIT DIAGRAM.



be able to switch sidebands in case of interference on a nearby frequency. In less crowded areas, however, two adjacent channels may economically be covered with only one crystal by aligning the trimmers appropriately. An 8MHz HC6U Crystal, cut for S22, could actually be pulled from S20 to R0 with the 60pF trimmer shown. The purpose of resistor R6 is to dampen L4 sufficiently so that the internal LO is disabled and only functions as a buffer amplifier.

C8 and C9 set the centre frequency of the two phase detectors. A value of 1.8nF results in a centre frequency of about 10kHz, which arguably results in the best compromise between adjacent

channel rejection and detector distortion. Increasing C9 to 2.2nF lowers the centre frequency of the phase detector to 7.5kHz with an improvement in selectivity, but the audio of some transmissions is prone to distortion as the phase detector cannot cope with the relatively large deviation. The second phase detector is tuned to a higher centre frequency and serves as a squelch detector. A properly tuned signal will cause this detector to deliver a DC output which operates the Mute switch. Squelch operation is not abrupt and very weak signals may not fully close the mute switch. The receiver is therefore fitted with a Squelch defeat switch. This switch may be substituted with a 1Mohm potentiometer if a continuous squelch control is preferred.

The audio stage consists of a LM386 in the minimum ($\times 20$) gain configuration. This illustrates best the high level of recovered audio by the TDA7000 on NBFM signals in the circuit shown.

CONSTRUCTION

Two versions of the receiver in Fig 2 were built; one on double sided and the second on a single sided

PCB. Both worked without many problems, although the receiver built on single sided board was more prone to instability. This was cured by fitting screening cans over the S18 coils. As most constructors prefer working with single sided PCBs this lay-out is reproduced in Fig 3. A simple method of producing a suitable board is as follows.

- (1) Take a photo copy of Fig 3.
- (2) Cut a piece of single sided board to size and fix the photo copy of the layout against the copper side with glue or cello tape.
- (3) Mark the locations of the holes through the paper on the board with an awl or other sharp tool. Clean the board thoroughly.
- (4) Connect the holes according to Fig 3 with a Dalo pen or other permanent marker pen.
- (5) Etch the board after the paint has dried.
- (6) Drill and clean the board.

In case any modifications are contemplated, I recommend you to copy the circuit as published first and to implement any changes only after the receiver is working. For instance, C10 looks like an ordinary decoupling capacitor, but its value is quite critical with respect to the recovered audio; substi-

COMPONENTS

RESISTORS

R1, R2	33k
R3	270
R4	100
R5, R6	220
R7	22k
R8	10k
R9	15k
R10	10
R11	4k7
R12, R15	1k
R13	120
R14	100k
R15	3k9
R17	150
R18	12k
RV1	potmeter 50k with switch

SEMICONDUCTORS

TR1	3SK85 or 40673
TR2	BC237 or BC107
TR3	BSX20 or 2N2369
IC1	TDA7000 (Maplin)
IC2	LM386 (Maplin)

CAPACITORS

C1	22p ceramic
C2	3p9 cer.
C3, C23, C25	4N7 cer
C4, C6, C19,	
C24, C32, C38	10N cer.
C5	4p7 cer.
C7	10µ 16V elec.
C8, C18	1n Mylar
C9	1n8 Mylar
C10	0.33µ Mylar
C11	1n cer.
C12, C13, C14	1n2 Mylar
C15, C27	0.1µ monolytic
C16	47µ 6V tantaal
C17	15n Mylar
C20	22n cer.
C21, C28, C29	100n Mylar
C22	33n Mylar
C26, C30	100µ 16V elec.
C31	15p cer.
C33	120p cer.
C34	180p cer.
C35, C36	33p cer.
C37	470p cer.
C39	8p2 cer.
C40, C41, C42, C43	60p trimmer Mullard

INDUCTORS

L1, L2	Toko S18 0.18µH 4.5 turns
L3	Toko kank3335R
L4	Toko S18 0.114µH 3.5 turns with 1 turn link added

GENERAL

Crystals HC6 or HC25. Freq see text
3 screening cans for S18 coils
Trimming tool for S18 coil
Rotary switch 4 way 2 pole
PCB, Veroboard pins, hardware, case
BNC socket, BNC plug (antenna)
Subminiature on/off switch
Speaker 8ohms. 3.5mm phone socket
2 knobs, 6V battery box
A PCB and kit of parts are available from John Beech, G8SEQ, 124 Belgrave Road, Wyken, Coventry CV2 5BH. The ready-made PCB costs £10 and a kit of parts including PCB, electronics components, switches and volume control costs £30. This does not include crystals or box. Prices include UK postage and packing.

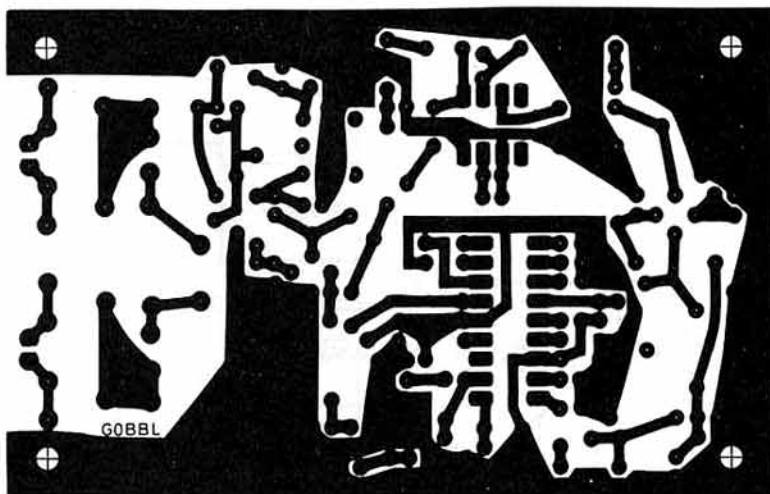


FIG 3 SINGLE SIDED PCB LAYOUT.

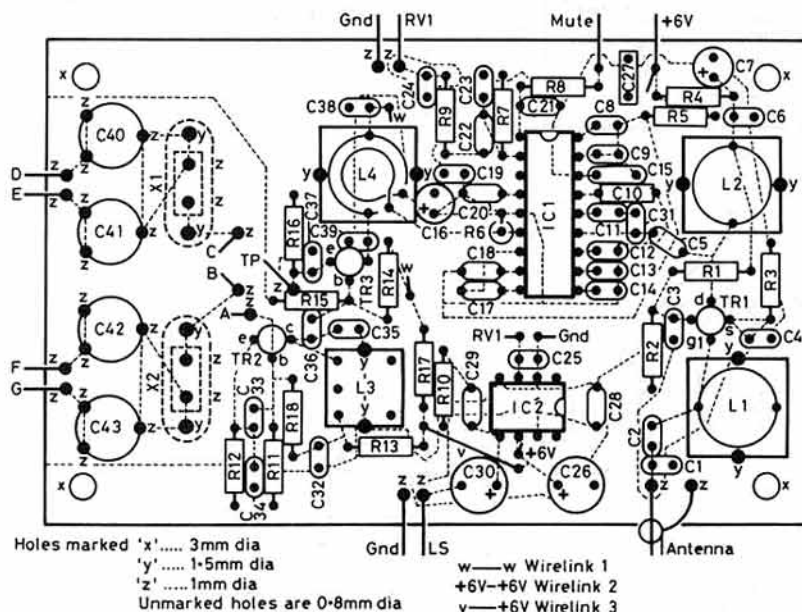


FIG 4 COMPONENT LAYOUT.

tution by a value of $1\mu\text{F}$ will result in low AF output. It is also advisable to follow the grounding arrangement of the capacitors around IC1. The negative rail is used as a common ground for the RF and audio stages while the positive rail serves as common for the IF and detector stages. If all the capacitors are connected to the same rail, C16 needs to be increased drastically to prevent instability. The same can be said of TR3. Another BC237 in this position is not suitable as insufficient LO injection will be obtained and sensitivity could suffer.

Most components can easily be obtained. The ready-wound coils and the TDA7000 are stocked by Maplin, while a range of crystals covering the 144MHz simplex frequencies may be obtained from QuartzLab Marketing, one of the regular advertisers in *Radcom*. The required crystals should be suitable for transmitting on the channel to be received. The exact crystal frequency is found by dividing the correct channel frequency by 18 or 12 depending on whether 8 or 12MHz crystals respectively are to be used. Crystals on these frequencies are quite easily tuned by the required amount for the necessary 10kHz offset after multiplication and if desired will cover adjacent channels as well. The PCB will accommodate HC8U as well as HC25U style crystals. Please note that stock repeater transmitting crystals are cut for a frequency which is 600kHz lower than the output frequency of the repeater. When used in this receiver such a crystal would result in the reception of the repeater input and not the repeater output frequency.

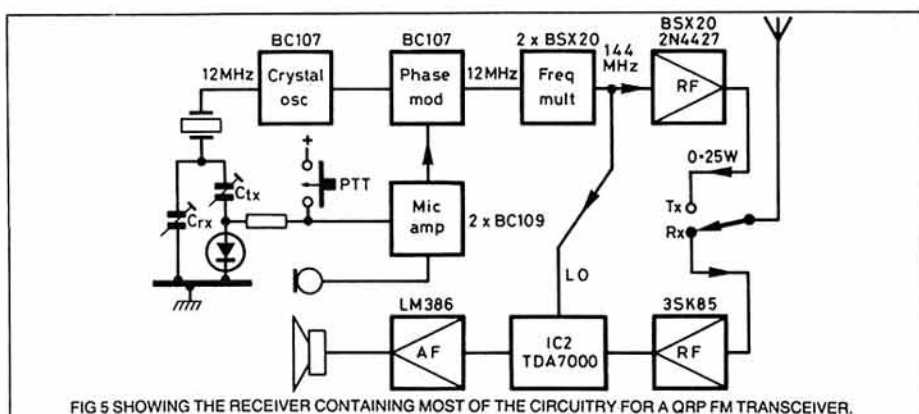
All coils are ready-wound with the exception of L4. A secondary consisting of 1 turn of 26swg enamelled copper wire should be fitted around this coil and its ends soldered to the PCB. Also note that three wire links are required: Link 1 connects the holes marked W in Fig 4 while the other two links interconnect the junction of R17/R13 and the two +6V connection pins on the PCB.

Although the prototype was cased in a small (6"x4"x2") plastic case, some basic screening was incorporated by mounting the PCB at a distance of 3mm parallel to a piece blank printed circuit board. If such a small housing is used, care should be taken regarding the position of the miniature loudspeaker. At G0BBL, more than once the magnetic field of these small speakers detuned an otherwise properly aligned project as soon as the lid holding the speaker was screwed onto the case!

ALIGNMENT

The first check after the receiver has been constructed is to measure the current consumption. With a power supply of 6volts this should be around 20-22mA. If this value is not obtained further checks should be made using the voltage details in Table 2 as a guidance. The voltage over source resistor R3 should be between 0.7V and 1.0V and will vary according to whether a 3SK85 or a 40673 is fitted. If desired, R3 may be changed to bring this voltage within this range.

By now noise should be heard from the speaker when the Mute switch is disabled (contacts in closed position). Prior alignment adjusts all the coils so their cores are level with the top of the formers. Crystal trimmers are set to a midway position. Now a voltmeter is connected between testpoint TP (the emitter of TR3) and ground. Using a properly fitting plastic trimming tool slowly adjust L3 until maximum reading is obtained on the meter. This reading may vary between 0.5V and 2.5V,



depending on the crystal activity and whether an 8 or 12MHz crystal is fitted. If no reading can be obtained, the circuitry around TR2 should be checked. A general coverage receiver can be employed to ascertain whether this stage is oscillating or not.

With a satisfactory testpoint reading obtained, L4 is carefully adjusted until a minute dip is witnessed in this reading. This dip will coincide with a marked change in the noise pattern from the speaker.

Next an antenna should be connected to the receiver and an attempt made to align the RF stage using a suitable 144MHz input signal. This can be either a signal generator or a black box operated with a dummyload connected. Alternatively a local amateur may be asked to transmit on a certain channel; in busy locations this channel can be monitored on a second receiver for signs of activity. With a suitable signal available the crystal trimmers are adjusted until the best audio clarity is obtained. It is also possible to align trimmers to the required frequency by connecting a frequency counter to pin 5 and 6 of L3 (24MHz) or direct on the secondary of L4. As a final step coils L1 and L2 are peaked for maximum signal. This has to be done by ear as there is no easy way of connecting a voltmeter to measure the relative strength of the incoming signal on the TDA7000.

Perfectionists may try to optimise the level of LO injection into IC1 by altering, in turn, the position of the link over L4 and by retuning the core. This could provide a marginal improvement in the conversion gain of the mixer stage.

VOLTAGE DETAILS

Appropriate voltages

TR1 source 0.85V (adjusted by R3)
gate 2.7V
drain 5.6V
TR2 emitter 1.0V
base 1.6V
collector 5.8V
TR3 emitter min. 0.5V (varies depending on alignment L3 and crystal) collector 5@8V
IC1 TDA7000 Current consumption: 8mA

Pin 1 4.0V unswitched (3.2V muted)
Pin 2 1.3V
Pin 3 2.7V
Pin 4 3.6V
Pin 5 4.3V
Pin 6 4.3V
Pin 7 3.7V
Pin 8 3.7V
Pin 9 3.0V

Pin 10 3.0V
Pin 11 3.6V
Pin 12 3.6V
Pin 13 1.3V
Pin 14 1.3V
Pin 15 3.6V
Pin 16 0V
Pin 17 3.3V
Pin 18 3.3V

IC2 LM386 Current consumption: 5mA
Pin 2 0V
Pin 5 2.9V
Pin 6 6.0V
Pin 7 2.9V

Instability at high audio output levels may be the result of IC2 generating bursts of RF energy which is radiated by the wires connecting the speaker. This was only noticed when the receiver was used with a small 'rubber duck' antenna and was cured by replacing this wiring by a screened cable. Apparently small AF power ICs often exhibit this symptom.

CONCLUSION

As Fig 5 shows, the receiver contains most of the circuitry for a QRP FM transceiver. A simple 2 or 3 stage transmitter strip with a power output of 0.2 to 0.4watts would match the performance of the receiver and can be directly connected to the 145MHz LO output.

In the block diagram, a one-transistor phase modulator is shown after the crystal oscillator, driven by a simple microphone amplifier. This arrangement will deliver a constant level of frequency deviation, regardless of the characteristics of the crystals used. The crystal frequency is shifted to the exact transmit frequency by adjustment of trimmer Ctx on transmit. No doubt it would also be possible to dispense with the phase modulator completely by applying the audio modulation to a varicap diode in the crystal oscillator.

Seasoned QRP enthusiasts will have their own ideas and may come across useful improvements in the published circuitry.

The most likely area where refinement could pay off is in adjacent channel rejection by improving the filter slope of the active filters in the IF amplifier. One or two coils added here might make a big difference. This has not been tried as the aim was to make the receiver as simple as possible.

In the Trowbridge area, performance has been more than adequate. The receiver has been used to monitor S20 and 'WR', the Mendip Hill repeater on R0, for many hours with only a vertical in the loft as antenna.

Compared with a conventional double conversion 144MHz rig, sensitivity is almost as good and only strong local stations transmitting on the next channel (25kHz difference) and located within a few miles are known to cause interference or blocking. When the difference in frequency becomes 50kHz (2 channels) slight interference may be experienced from transmitters located within a one-mile radius.

With the present popularity of building simple receivers and QRP transceivers for the HF bands, for which there is no shortage of suitable designs, it is hoped that this article will spur amateurs into building similar type FM mode equipment for the VHF bands.

KEEPING AN EYE ON YOUR SIDEBAND PEP

An accurate method of indicating peak envelope power on ssb from your transmitter, designed and described by
JOHN FIELDEN, GW4NAH

Single sideband is probably the most widely used mode on the amateur bands today, yet few people can measure their peak output power. The quantity needs to be maximised for best reception at the other end but, at the same time limited to the 'linear' capability of the RF power amplifier. Exceeding this may result in distortion, splatter, and licence violation.

A modern SSB receiver's S-meter can 'hold' signal peak for comfortable observation, even if it is only of short duration. Unfortunately transmitters have no equivalent, and the only easy recourse for observing peak output on the RF-power/SWR meters that most of us use is to whistle. This is the only noise humans can produce which approaches the sine wave with which our meters are calibrated. This gives acceptable readings on constant power modes (FM, CW, FSK) but is useless and even misleading on SSB, because our whistle is just not that pure.

The error is down to the inability of a moving coil meter, and indeed our eyes, to follow the rapid transients of the voice. The transient voltages are, however, accurately produced by the SWR bridge, so the only modification required is to lengthen the response of the moving coil meter. The add-on module described here performs this function simply and accurately.

CIRCUIT DESCRIPTION

In Fig 1, the resistance of VR1+VR2 replaces the meter of an existing VSWR instrument; the voltage developed across these presets is fed via R1/C1 to the non-inverting input of operational amplifier (op-amp) A1. Its output, appearing at pin 1, charges C3 via D2 and R6, with a rise time constant of 0.1 sec, whereas C3 can discharge only through R7 with a decay time constant of 10secs. The voltage across C3 is buffered by voltage follower A2 to pin 7 and via D3 to the moving coil meter of the existing VSWR instrument, and also via R5 as 100 per cent feedback to the inverting input of A1. The total circuit has unity gain, causing the output voltage to rise quickly and exactly to the peak of an input voltage, but then holds the output for a few seconds after the input drops. C2 creates a slight phase advance in the feedback loop to prevent overshoot on rapid transients. The small voltage across D1 of approximately 0.6V is used to balance out voltage and current offsets in the op-amps via VR3, R3 and R4. The LM358 dual op-amp was chosen because it can operate down to zero output on a single DC supply of 4 - 25V. D4 protects against supply reversal and C4 provides a low supply impedance. D5 and C5 protect the meter from overload and RF respectively.

COMPONENTS

R1, 2, 5, 6 - 100k Ω , 5%, 1/4W; R3, 4 - 1M Ω , 5%, 1/4W; R7 10M Ω , 5%, 1/4W; RV1 - 200k Ω ; RV2 - 2k Ω ; RV3 - 50k Ω .

C1, 2 - 100nF, 63V ceramic; C3 - 1 μ F, 63V polyester; C4 - 47 μ F, 16V DC, elect.; C5 - 100nF, 63V, ceramic.

D1-D4 - 1N914/1N4148; D5 - 1N4002; IC1 - LM358.

*THE PEP MODULE IS AVAILABLE FROM TECHNICAL SOFTWARE, FRON, UPPER LLANWROG, CAERNARFON, AT £12, INCL. VAT, P & P.

CONSTRUCTION

The module can be constructed from readily available components on a small PCB (the commercial version* measures 55x30mm), which can be mounted inside an existing RF-power/VSWR instrument. It may be fixed there with BluTack or a bolt, spacer and nut arrangement, but do so only after calibration. Placement is not critical, except where the SWR instrument is combined with an antenna tuner; in that case the module should be placed away from and shielded from the strong RF fields which exist around tuner coils, capacitors and their leads.

INTERCONNECTIONS

Undo both leads from the moving coil meter (only from the forward power meter if there are two). Check that the negative lead is grounded; in most instruments it is, but you can find the odd one where the positive lead is earthed, and this has consequences when supplying power to the module. Now ascertain that the meter resistance falls within the range of RV1 + RV2, which is 0-2200ohms. All commercial VSWR meters encountered so far do, but some homebrew models using meters with 100 μ A or less full scale deflection do not. In that case, make RV2 10kohms.

Next, connect the former meter leads to the input terminals of the module and the module's output to the meter, carefully preserve polarities. A DPDT switch or PTT-operated relay can be inserted to switch the PEP module in and out for SSB and other modes respectively. Another method of reducing the peak holding feature of the module is to reduce R7, say by switching a 220k ohms resistor across it.

Power, anywhere from 4 to 25V DC at little more than 1mA, must now be connected. If the negative meter lead was found to be earthed, a suitable voltage source, say 9 or 13.8V that is 'on' when transmitting, can be found on the back of most transceivers. Use a single wire to connect that voltage, preferably through a 2700ohm current limiting resistor, to the +ve terminal on the module. The coax shield will take care of the -ve return.

In the rare case where the positive meter terminal is found to be earthed, a floating power supply must be used. In either case, three Duracell pen light cells would typically last nine months if left on continuously, or for years if switched on only when used. In all of the following adjustments, remember that the meter will travel up-scale

rapidly, but settle back slowly. Do wait for the meter to settle before reading.

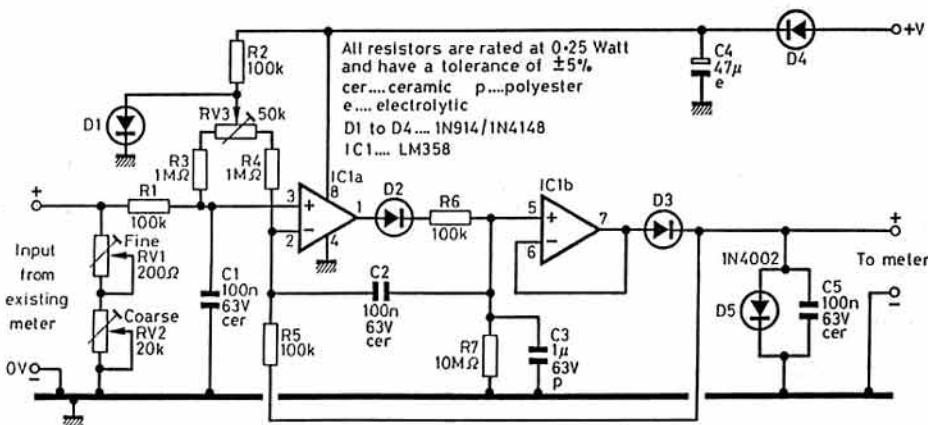
First, the op-amp offsets must be balanced out. For the commercial module this was done at the factory and RV3 was sealed. If you have built your own, or must replace the LM358 for any reason, a procedure is suggested below. A small positive meter reading with zero input is not an indication of an offset error and upscale readings will be correct.

Next, a calibration level must be established. With the PEP module out of the circuit, your transmitter in a constant carrier mode (CW, FM) and your SWR meter between the transmitter and a dummy load, pass some RF power through the meter. Increase the output to where a stable forward power reading, preferably over half-scale, is obtained. Make careful note of the power reading and do not change the transmitter power setting until calibration is complete. Now reconnect the PEP module, set RV1 and RV2 to zero (fully CCW), apply DC power to it, and switch the transmitter back on at the power setting previously established as calibration level. Advance the 'fine' preset RV1. If, with RV1, you can exceed the calibration reading previously noted, adjust to this reading. If the meter does not rise far enough upscale, set RV1 to about mid-travel and slowly advance the 'coarse' preset to the calibration reading. RV1 will now allow more precise adjustment.

This calibration makes sure that RV1+RV2 presents the same load to the SWR instrument as the moving coil instrument previously did, so the input voltage to the module is unchanged. The module has exactly unity gain, so this voltage is repeated at the output, ie across the meter. Consequently the original meter calibration, non-linearities and all, remains unchanged. On fast peaks, however, such as are encountered when speaking on SSB, the module will hold a peak long enough for the meter to rise to it and for you to check it.

RESULTS

The results will probably surprise you. Without the module, normal speech will show peak meter readings of, say 30 per cent of what an oscilloscope would indicate. With the module, it's 100 per cent. A whistle, without the module, will show 80 or 90 per cent, not 100 per cent, and another interesting example is produced by tapping the mic with a pencil. The unmodified meter will show no reading, but with the module, full power will be indicated.



Participate in the planning of PROJECT YEAR. Please complete and mail to arrive at HQ as soon as possible. Unless you tick ONE answer that best suits your viewpoint.

'Excellent idea . . . long overdue . . . should have done it 20 years ago . . . Congratulations' expresses the overall reaction to the Consultative Questionnaire published in the September 1988 issue of Radio Communication. Hundreds and hundreds of questionnaires have arrived from all over the country, many of which have been accompanied by letters containing a whole variety of positive ideas, suggestions and individual responses to our appeal for assistance with training. Every single sheet and every letter has been read! David Evans has read them, committee members involved in the planning of the Project YEAR are studying them and, as a member of the Project YEAR Advisory Group, I have been asked to report to you on the results of the survey without delay.

AN ANALYSIS OF YOUR RESPONSE

In statistical terms, a random response of 2.3% from the total membership of the Society is considered to be an excellent sample of opinion and at a level that has already raised an approving eyebrow or two amongst the professionals currently advising the Society.

By adding the extensive reports now arriving from the RLOs following their consultations at the 'grassroots' of our affiliated societies and feedback from Council members and senior staff who have visited Clubs all over the country, you will appreciate that there has been quite a remarkable reaction.

In any free society, such an emotive topic will obviously elicit all shades of opinion, from the positive to the negative. While the vast majority of questionnaires totally supported the Project YEAR theme, naturally there is a minority who are totally opposed to the idea and a handful who went to great lengths to pour on scorn.

However, by far the greatest number of questionnaires were completed with great care and carried a number of technical and practical suggestions that relate to aspects that, frankly, had not even entered our heads at this stage of the operation.

PROJECT YEAR

Youth into Electronics via Amateur Radio

AN ANALYSIS OF YOUR RESPONSE TO OUR SURVEY

BY VICTOR E BRAND, MCAM, MIPA, MIPR, G3JNB

YOUR OPINION

By far and away the greatest number of questionnaires reveal that, as far as Project YEAR is concerned, you like it! In fact, the Society is actually congratulated for doing something practical for a change instead of being criticised for dissipating its resources in administrative activity.

Simplifying the results of the survey, it appears that the majority of members believe that there should be a new 'Novice Licence' based on a practical training system that should not be too difficult and open to all age groups from 8 – 80. Initially, such a licence might be valid for a three-year period with limited frequency allocations, crystal controlled transmitters and a maximum power input of 4watts. CW continues to be seen as a necessary requirement, although there is a substantial body of support for simple phone transmission to be permitted as CW was seen as a deterrent by some. On the other hand, it is well-known that many young people particularly enjoy the fun and experience of learning Morse Code.

The level of response for lending a helping hand with teaching theory or providing practical support is outstanding and shows that the spirit of amateur radio is alive and well.

Never before have we been able to gather such an invaluable degree of guidance from the members. Extracts pulled out of the file at random are reproduced to give you some of the flavour of opinion from your colleagues.

A STATISTICAL ANALYSIS

Due to the postal strike and the consequent delayed distribution of Radio Communication, questionnaires are still arriving at Potters Bar but, as at 25 November when these notes were prepared to catch the January edition, the analysis of your opinions are shown.

AREAS FOR CONCERN

From your letters there have emerged a number of aspects requiring careful consideration. First and foremost, there is the obvious problem of qualified 'B' licensee holders finding that their own novice students pass an examination and are admitted immediately to HF operation. Nice one! Council has debated this situation and believes that a Class 'B' licensee should be given the novice HF facilities upon passing the proposed 5wpm Morse Test.

Similarly, the view was expressed that should we be looking at a natural progress of licensing, as in America. However this one is solved there could well be a need to rewrite licence conditions generally; or so some of you thought.

For many firm supporters the lower age limit of 8 is considered to be a little too low and recommendations that the 12 year age group should be considered as suitable candidates. On the other hand, there are members who have children of their own accustomed to the world of amateur radio who would be anxious to take out a novice licence at an early age.

Surprisingly, our determination as a movement to ensure the continuation of CW as a pre-requisite of licensing has thrown up a host of comments that would seem to reverse the concept by entitling a new licensee to start with simple telephony and progress upwards to Morse within the timescale of the licence. It has been pointed out that CW remains a stumbling block in terms of time to accomplish skill but offers the incentive of long distance working on low power. The possibility of, say, VHF operation leading to an HF CW endorsement award to licensees who make the required progress, is a potent argument. Again, the concept of local and authorised Class 'A' members being examiners for a 5wpm test has some appeal.

The required methods of training novices of all ages are invariably seen to be of a practical nature and the many teachers among you have

► recommended that the techniques for the preparation of manuals should follow the latest trends. "Keep It Simple" is the advice from everyone except those who would have the present RAE retained as the only means of taking up amateur radio transmission.

The undoubted sensibility of those earlier days involving an SWL apprenticeship has been put forward by many. The collection of QSLs and the reception of broadcasting stations could perhaps play a part in the acquisition of the licence.

Not surprisingly, the return to practical training and hands-on experience, that it is hoped will be the centre piece of Project YEAR, has led many to express the view that the British novice licence could lead to a steadily improving standard of operation by all stations in the years to come. These opinions are in direct contradiction to the small minority who anticipate that their favourite bands may be despoiled.

In general, Project YEAR has been heralded as the best and most positive action to be initiated by the RSGB for many years. It is seen as the first real action plan to halt the decline of our hobby, to meet the nation's projection of a desperate shortage of young people with some basic understanding of electronic and, a major opportunity to re-educate the general public on amateur radio as a worthwhile hobby and service thereby, hopefully, providing the means of laying to rest, once and for all, the Hancock image.

The prospect of a more gentle start in the hobby for those of mature years and the disabled has emerged as a major bonus to the whole scheme. This opportunity is of particular value to those bereft of any form of technical background and who desperately wish to join our ranks but have the need to get started in a simple manner and at a low cost.

Finally, the KISS principle and the obvious appeal of Project YEAR to those dependant on pocket money or pensions is believed to be a new dawn for home construction. Simple kits, easy to understand articles in our national publications – including our own DIY Radio, to be launched next year we expect, are universally recognised as the solution to our oft-repeated cry for a 'Back to basics' crusade.

Take heart all those who, for years, have expounded such a policy. Project YEAR will be the very foundation of those revolutionary principles that you have so long recommended.

WHAT HAPPENS NOW?

The questionnaires have been audited. Your personal comments and letters have all been read! The huge amount of information is being digested at Headquarters and at the Committee levels. The results of the survey is providing guidance to all those who are involved in drafting the proposals that are to be put before the DTI next year. Those volunteers who have offered assistance at a practical level are being logged for future reference. You will understand that we cannot, as yet, harness your enthusiasm but we are grateful for your support and many of you will be hearing from us at the final phase of the programme.

To the Doubting Thomases, we say "Stay with us". The Society is, as always, determined that your best interests and those of amateur radio shall be safe-guarded while every effort is made to re-invigorate this wonderful hobby of amateur radio and its continued enjoyment by the present and future generations of British men and women.

1) WHAT SHOULD THE LICENCE BE CALLED?

A. Student Licence	23.8%
B. Novice Licence	32.4%
C. Beginner's Licence	7.2%
D. Provisional Licence	15.1%
E. Incentive Licence	1.6%
F. Basic Amateur Radio Licence	15.8%
G. Other (Includes 1-6% (10) for 'Class C')	4.0%

2) STUDENT COURSE DRAFT SYLLABUS

A. I like it	74.3%
I do not like it	8.9%
B. It is too difficult	9.4%
It is too easy	7.5%

3) AGE LIMIT

A. I suggest lower age limit should be 8 years	50.5%
B. I recommend no lower age limit	32.5%
C. Lower age limit of 10 years	4.3%
Lower age limit of 12 years	7.5%
Lower age limit of 14 years	5.1%

4) POWER

A. Power input of 4 watts	74.8%
B. Power input of 2 watts	20.3%
C. Power input of 10 watts	4.2%
Power input of 25 watts	0.8%

5) MORSE SPEED

A. 5 wpm	60.8%
B. 7 wpm	31.8%
C. 10 wpm	0.2%
12 wpm	1.4%
No morse test necessary	5.7%

6) FREQUENCY ALLOCATIONS

A. As suggested	49.6%
B. As suggested to few	4.6%
C. As suggested to many	39.0%
D. Further suggestions:	
18MHz	0.3%
24MHz	0.3%
27MHz	0.7%
49MHz	0.2%
70MHz	1.4%
144MHz	3.9%
All bands under supervision	0.2%

7) FREQUENCY CONTROL

A. Transmitter to be crystal controlled	53.2%
B. VFO only	11.8%
C. No regulation is necessary	34.9%

8) DURATION OF LICENCE

A. 1 year	29.8%
B. 3 years	34.6%
C. No limit	10.7%
D. No limit but renewable	22.8%
E. My ideas are:	
5 years	1.1%
10 years	0.5%
Expire at 18th birthday if no RAE pass	0.6%

9) THE LICENCE

A. I like the concept	80.2%
B. I do not like it	19.8%

10) I WISH TO PLAY MY PART IN PROJECT YEAR . . .

I can help with:	
Teaching the theory	13.8%
Helping with practical work	18.2%
Shack experience	18.9%
Design of simple projects	16.8%
Writing training manuals	6.9%
Visiting/demonstrating to youth groups	13.9%
Assisting at shows	11.6%

YOU SAY . . .

"Exceedingly excellent idea. I wish this had been available when I first became interested in radio." – G0JMI

"Long overdue! It is possible that the course represents a higher practical standard than the RAE!" – G1DRG

"Excellent. Deserves full support. Have established contact with Southport Scouts, several of whom are already enthusiastic. This is the kind of help I received from local amateurs some 57 years ago!" – G6SX

"Excellent but KISS!! Or you will frighten them off!" – G3LCS

"Congratulations to RSGB! An excellent concept to help secure the future of the hobby!" – G4VW

"Excellent – should have been actioned years ago. Other countries encourage their youth and have schemes already in place. Good luck!" – ZL2TX (G3TJD)

"A very good initiative. It should re-vitalize the self-training spirit and help improve the 'CB' mentality in Amateur Radio." – G4ZUP

"There is quite a lot of top band AM in the Kent & Essex area. How about using the scheme to revive this elsewhere. This is where many amateurs cut their teeth." – G4DES

"If you want to get people interested give them a fair chance to make QSO's. Suggest 25W o/p for CW. 4watts is difficult with good antennas." – G4BWP

"1. Encourage school clubs with emphasis on operating involvement. 2. Try to arrange parts of the licence syllabus to be common with school curriculum/GCSE work." – G3VMZ

"Make the new DIY Magazine available through Smith's, Menzies etc., and other mags by RSGB also." – G4MH

"An excellent idea. I would hope that young pupils at my school would be able to attain this licence during dinner hour!" – GW4VPX

"Forget it. There is these days a great lack of self discipline and I do not wish to hear on the amateur band what one hears on CB." – G4ZCV

"Basically a very good idea – having been involved with talking/demonstrating to youth groups for some years, the most definite message is that even a basic Morse test would deter youth. Better to keep them off HF than to introduce Morse at this stage." – G8ZYX

"To encourage DIY construction and communication by CW – still the most reliable and successful HF mode." – G3TRR

"A first class idea. The hobby will stagnate unless such a project is undertaken now." – G0EYR

"It will not work. Too much trouble, especially Morse for too little excitement is offered. I suggest 25W phone on 10m, soon. I know we did not like 11m, but look at the results circa 1979! Age limit should be 14 years – lower will detract from perceived status." – GM0JRZ

"Excellent idea. In my own professional career with British Aerospace Amateur Radio has played a very large part." – G4IZS

"I must inform you that I am totally opposed to any form of dilution or change to the existing licensing structure." – G3KWT

"For the young Morse is dead. The advances in datacomms need exploiting." – G8GKO

"Excellent idea. Heartily endorse need for simple, cheap CW kits (or AM on top band DSB on 80m). Best of luck with the project – should have been done years ago!" – G3NRD

"To bring the young and old into the spirit of radio enjoyment, both building and create a lasting hobby." – G0GWM

"Very commendable. Appears plenty of enthusiasm to keep momentum going. Please remember the retired." – G0KCA

"Congratulations on progress so far. It will be good to hear youngsters talking about their homebrew. Like old times." – G4DYF

"At last we are making an attempt to train properly – this should lead to greater enjoyment for all in the hobby of Amateur Radio." – GM3WTA

"I wish we could have had such a thing when I was a SWL of 9 to 10 years old. I like it." – G4PRJ & G8XCY

"Not to persist in the Morse qualification, as I feel this should be dropped for all licensees – we are nearing the year 2000, and not the years of 1920/1930." – G1ABW

"Worst idea RSGB has had in 50 years." – GW3YDX

"First class. Yes, go ahead simple theoretic instruction on amateur bands. Say, 1/2 hour at fixed times from RSGB HQ station (like W1AW bulletins – but in SSB!) – G4SFU

"Favourable. However I think the age limit for an A/B licence should be removed. I had to wait two years to sit the RAE because I was 12, thus robbing me of two years at Sun Spot maximum." – GM4SVM

"Should have been done 10 years ago. This would have avoided the 'CB' fiasco." – G4POK

"We feel sure that if the Amateur Radio Movement in this country is to have a bright future, that future must surely rest with the young, and what better starting point than a 'Novice Licence'." – Rolls Royce Amateur Radio Club

"Very good start, especially the draft syllabus. Licence should be made available ASAP. Congratulations to all concerned." – G3IGV

"I fail to see the need for this Students' Licence. Andrew Keeble has shown that a young person can obtain a B licence, and learning CW is easier at a young age." – G4LPV

"I will be seeking the support of the RNARS for Project YEAR." – G3HZL

"An excellent project. Make available low cost quick result kits that students can afford. Teach correct operating 'on air' manners." – G4DOW

"A worthwhile project to ensure a continuing supply of Radio Amateurs in future years." – G0EQF

JOHN ALLAWAY G3FKM

Some comments made by G3IGW when he was installed as president of the FOC I find interesting. He said: "I do fear for the new 10MHz band. This is a prime section of the spectrum and being, by IARU recommendation, a CW only band should surely be the normal hunting ground for FOC and other CW clubs. Unhappily, despite the fact that most countries have authorised the use of the band, activity remains at a low and I believe a declining level. The intention is that eventually this becomes an exclusive amateur-only band, but far from any expectation that the commercial stations would now be moving away, it seems that in fact they are moving in. This may well be a case of use it or lose it. My own view is that the complete lack of any form of competition is the reason why so many take a look in and then pass on. Surely there would be no harm in ARRL extending DXCC to this band, or for IARU to run some controlled contest activity, and of course for FOC to encourage activity in any responsible way..." Mike has good points but I'm a bit unsure of the possible effects that the recent 3D2XX or 3W8CW expeditions might have had on some of those who are currently the primary users. In fact most likely only the DXCC award would produce problems of this kind - a tribute to the amazing worldwide popularity of this HF DX'ers yardstick.

G4FUJ is receiving QSLs for contacts which he is supposed to have made between 1983 and 1987, mostly using a /MM suffix. Although a Merchant Navy officer he has not been on the HF bands since 1981.

NEWS FROM THE USSR

Following on some changes in administrative subdivisions of the Soviet Union the Radiosport Federation of the USSR has modified the "R-100-O" award list. Deleted oblasts are: Turganskaya (UL7Y), now part of Kustanajskaya (UL7L); Mangyshlakskaia (UL7A), now part of Gur'evskaya (UL7O); Narynskaya (UM8P), now part of Issyk-Kul'skaya (UM8Q); Tallaskaya (UM8T), now part of regions directly subordinated to republic - UM8M; Kurgan-Tyubinskaya (UJ8X); and Kulyabskaya (UJ8K). A new oblast - Khatlonskaya - is based on the former Kurgan-Tyubinskaya and Kulyabskaya oblasts. Callsigns assigned to this oblast are RJ1K-RJ0K and UJ1K-UJ0K (the same as for the former Kulyabskaya oblast). It is now Oblast 192.

The RSF has added Malyj Vysotskij Is to the list of "R-150-S" countries. The first amateur radio operation from this island took place between 8 and 11 July 1988. The callsign 4J1FS was used by the first ever combined "east-west" DXpedition. The international team consisted of OH2BH, OH2RF, OH5NZ, UR2AR, UZ3AU, and UW3AX.

OVERSEAS NEWS

Dr Omar Shabsigh, YK1AO, who is President of TIR - the Syrian national society - has written to say that the information which appeared in the April 1988 column concerning the transceiver donated by the N.California DX Foundation is not quite correct. In fact it was given to Omar himself and not anyone named Abdul. Omar's eldest son, Ghiath, YK1AR, is at the moment finishing his doctorate in economics course in the USA. His daughter, Dana, is YK1DS, and she is a third year student in the

Faculty of Architecture in Damascus, and his other sons Ahmad, YK1AS, and Aiman, are still at secondary school. All are on the air except Ghiath and all are CW enthusiasts. YK1AO's station should be improved soon by the addition of a 500W linear, a good tri-band antenna, and suitable antennas for 1-8, 3-5, 7MHz and the WARC bands, together with facilities for Packet and AMTOR.

Nigel Cleaver, ZC4NC, has written to me to ask me to let readers know that as QSL manager for the Eastern Sovereign Base Area of Cyprus he is receiving many QSLs for ZC4s who are no longer on the island and for whom he has no forwarding addresses. These include ZC4s MR, RP, RB, IO, BU, MT, LP, YC, NB, GO, SR, BI, and RH. If any reader has held one of the callsigns listed and wishes to collect his cards Nigel would be pleased to hear via the ZC4 Bureau, JSB, BFPO 53, London (a small donation towards postage costs would be appreciated please). QSLs will be kept for four months after the appearance of this information and if not claimed by then will be disposed of.

Also from the same area comes the news that Bob Francis, G0EYP, is in Cyprus and will be on the air as ZC4RF for the next three years. He hopes to use all bands although 1-8MHz is a problem due to the limited size of his garden. He hopes to be using CW, AMTOR, and RTTY. QSLs go to the address given in the previous paragraph.

There has been a change in the prefix structure for amateur stations in the Sultanate of Oman which came into effect on 23 December last. In future, Omani citizens will use the A41AA-A41ZZ series. A42AA-A42ZZ is being reserved, A43AA-A43ZZ will be used by special event stations, and A45AA-A45ZZ by expatriates and visitors. In future club stations will use callsigns in the A47AA-A47ZZ series.

Joe Phillips, G3KSK, has arrived on Ascension Is and is operating as ZD8JP until the end of April this year. He is on all HF bands with CW and SSB.

EXPEDITIONS

I have heard from Laurence Howell, GD4DMA (formerly VP8SB, etc) that there is to be an unsupported attempt to travel from a Canadian mainland base camp located on Ward Hut Is, NWT (83.00°N, 74.06°W) to the geographic North Pole. The expeditioners will leave the UK on 20 February and arrive home on 16 May. They will reach the base camp on 3 March (where the temperature is expected to be an average of -45°C with variations between -60°C and -10°C). It is hoped that the base-camp station will be active on all bands from 1-8MHz to 30MHz including the WARC bands as well as on 50-110MHz for auroral Es and F2 to Europe and America, and on 144-123MHz. Both SSB and CW will be used and there will be up to 24h of operation daily. Antennas will include multi-band dipoles, verticals, a tri-band beam, a rhombic on HF, a four-element Jaybeam yagi on 50MHz and 2x2 over 5 Jaybeam yagi for 144MHz. Laurence believes that with the present state of the ionosphere many types of propagation could occur from this high Arctic location. The expedition wishes to thank SMC, Microwave Modules, Jaybeam Engineering Ltd, and Raychem Ltd for lending or donating the amateur equipment. The expedition's patron is HRH Prince Charles, and

expedition leader is Sir Ranulph Fiennes, Bt, DSC. Anyone wishing for further information should contact Laurence (during working hours) on 0224 576155, ext.274.

Although the outcome of the application for DXCC status for Malyj Vysotskij Is is not known at the time this is being written it is reported that there will be another operation from there in May. A request has been made for a special callsign.

DX NEWS

JX1UG is LA1UG and will remain on Jan Mayen Is until mid-April.

The operation by a group sponsored by the N.California DX Foundation from Rotuma Is as 3D2XX was in full swing at the time this was being written. I have received copies of the documentation which has been sent to ARRL with a view to getting the island recognised as a new country for DXCC purposes. The reason being put forward is that the applicants believe that Rotuma qualifies under Point 2a of the DXCC criteria (separation by water) as it is more than 225 miles from Kia, the nearest point in the main Fiji Is group.

According to QRZ DX RA0AD/JT5 should now be on the air from Mongolia and is likely to be there for two years. It is expected that he will operate quite a lot on the LF bands. If you are looking for a top-band contact with Hong Kong, VS6DO has said that he will be on again this winter on 1-823 or 1-833MHz at the time of sunrise in VS6.

PA3AXU has returned to the Netherlands from Egypt where he was with the UN Peace Force in Sinai. He made over 22,000 QSOs with 115 countries. PA3BRF/SU is now active but DXNS reports that he is relatively inexperienced in DX pileups - 21-115 and 28-565MHz are suggested as likely places to find him between 0900 and 1030, and on 14,107kHz around 1600. It is understood that 5R8AL should be back in Madagascar and on all bands.

CONTESTS

French Contest 1989

0600 28 January - 1800 29 January (CW) 0600 25 February - 1800 26 February (SSB)
Single and multi-operator and listener sections. The contest covers the 3-5 to 28MHz bands and entrants are expected to follow the IARU band-plans and stay within the contest-preferred segments on 3-5 and 14MHz. Exchange RS/T and QSO serial number (from 001). French stations will also give their department number. QSOs should be with stations in France, the French Army in Germany, and French departments and territories overseas. Each QSO with a station in the same continent counts one point, with other continents three. The multiplier is one point for each department (note that Corsica has two - 2A and 2B), DA1 and DA2, plus the overseas departments and territories on each band. In addition F6REF/00 counts as a special point. Logs must be sent to Réseau des Emetteurs Français REF Contest, c/o M. Pacchiana Christian, F6ENV, 7 Chemin des Ecoles, Quartier St-Jean, 13110 Port-de-Bouc, France. CW logs must reach this address by 15 March and phone by 15 April.

UBA Contest 1989

1300 28 January - 1300 29 January (CW)
1300 25 February - 1300 26 February (SSB)
Once again this is under the patronage of Mr Ripa di Meana, Member of the Commission responsible for Communication, Information, and Culture, and

the European Community Trophy will be presented to the highest scoring EEC member station from both the CW and SSB Class B (single-operator multi-band) sections. Other classes include Class A (single-operator single-band); Class C (multi-operator single-transmitter); Class D (QRP - up to 10W input, otherwise as Class B); and Class E (listeners - also as Class B). 3.5 to 28MHz observing the IARU Region 1 band plans and using the "contest preferred segments" where appropriate - ie (CW) 3-500-3-560, 7-000-7-035, 14-000-14-060, 21-000-21-080, and 28-000-28-100MHz, and (SSB) 3-600-3-650, 3-700-3-800, 7-040-7-100, 14-125-14-300, 21-200-21-400, and 28-500-28-800MHz. Exchange RS/T and serial QSO number (from 001). Belgian stations will give a two letter code to indicate their province. QSOs with ON, DA1, and DA2 count 10 points, with other stations in EEC countries three points, and with anyone else one. The multipliers are the Belgian provinces plus each of the Belgian prefixes ON4-ON9, plus DA1 and DA2, and each of the following: CT, CU, DL, EA, EA6, EI, F, G, GD, GI, GJ, GM, GU, GW, I, IS, LX, OZ, OY, PA, SV, SV5, SV9, SY, TK, and ZB2. Final score is total QSO points times total number of multiplier points. Logs must show date, time, station worked, exchanges, multipliers and points claimed. Use separate sheets for each band. Enclose summary sheet with signed declaration

etc. Listeners log station heard, report sent, call-sign of station being worked, and a report on the station heard's signal. Logs must be postmarked no later than 30 days after the contest and sent to UBA Contest Committee, Jan Galicia, ON6JG, Oude Gendarmeriestraat 62, B-3100 Heist op Den Berg, Belgium.

UBA SWL Competition 1989

0000 1 January to 2400 31 December

The object is to log during the year as many DXCC countries as possible on the six bands 1-8, 3-5, 7, 14, 21, and 28MHz. Each counts as one point per band as well as one multiplier and the final score is the total of countries heard on all bands added together multiplied by the number of countries heard. There are five categories - (1) Single-operator, phone; (2) Single-operator, CW; (3) Single-operator RTTY, AMTOR, ASCII, and Packet; (4) Single-operator SSTV and FAX; and (5) all mode club or multi-operator entrants. To enter, it is necessary to send in two interim reports during the year - one to reach the contest manager by 1 April and the other by 1 September. More information is available from Marc Domen, Postbus 38, B-2200 Borgerhout 1, Belgium. I have photocopies of the rules - SASE please. In the 1987 competition Tina Parry, a G listener, scored 88,245 points in category 1 and came 17th in the list of entrants.

RS28198 scored 70,560, G1RPA 69,639, G20041 38,068, G6XOU 34,524, and RS88825 10,184. In category 2 RS52868 scored 44,604 points and came ninth and RS84869 scored 19,536.

CQ WW 160M DX Contest

2200 27 January - 2200 29 January (CW)

2200 24 February - 2200 26 February (SSB)

Single and multi-operator. Exchange RS/T and serial QSO number (beginning from 001). USA and Canadian stations will indicate their state or province. QSOs with own country count two points, with other stations in the same continent five points and with those in other continents 10. Each state, province, and DXCC country counts as a multiplier but please note that the countries of USA and Canada do not. Three points will be deducted for each unmarked duplicate, false, or unverifiable contact removed from a log. Sample log sheets and entry forms are available on request from CQ 160M Contest, 76 North Broadway, Hicksville, NY, 11801, USA, in exchange for an addressed envelope and some IRCs. Other log forms may be used provided that they have 40 QSOs per page with columns for date, time, exchanges sent and received, (if multiplier applicable), and points claimed. The usual signed declaration must accompany entries which must be posted before 28 February for the CW section and by 31 March for

HF F-LAYER PROPAGATION PREDICTIONS FOR JANUARY 1988

The time is presented vertically at two-hour intervals 00(00)gmt for each band, ie 00=0000, 02=0200, 04=0400 etc.

The probability of signals being heard is given on a 0 (indicated by a dot) to a 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 plus (+) sign in the 28 and 3-5MHz columns respectively.

Time / GMT	28MHz	24MHz	21MHz	18MHz	14MHz	10MHz	7MHz	3.5MHz
000001111122	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122
024680246802	024680246802	024680246802	024680246802	024680246802	024680246802	024680246802	024680246802	024680246802
** EUROPE								
MOSCOW	...48972...	...69994...	...89997...	...99899...	...2877885...	431765557843	886532235788	++42...25++
MALTA	...58763...	...79886...	...99998...	...98899...	...1.287779941	662764457996	998632125899	++3...25++
GIBRALTAR	...6543...	...18775...	...499883...	...798996...	...8877894...	342.75556895	888653224799	++2...4++
ICELAND	...1562...	...3785...	...69981...	...89993...	...288898...	121.76667851	787264345787	++3...24++
** ASIA								
OSAKA	...2...	...41...	...73...	...85...	...1751...1...	1.153223513	...2...13663	...35...
HONGKONG	...762...	...884...	...8871...	...16873...	...455521...	2...1223563	1...3674	...353
BANGKOK	...8971...	...79983...	...168886...	...137788...	...154683...	3...2135745	2...3677	...355
SINGAPORE	...78881...	...179893...	...158886...	...137788...	...546674...	2...2135855	1...2676	...353
NEW DELHI	...8873...	...17885...	...25877...	...336772...	...1.3466...	52...135456	72...2678	4...355
TEHERAN	...8982...	...288994...	...566887...	...6547881...	1.521457511	7422...135876	872...2677	54...344
COLOMBO	...8983...	...17895...	...235888...	...1.37882...	...457611...	51...135876	51...2678	2...345
BAHRAIN	...188872...	...278894...	...555781...	...533683...	3...3.357832	8521...25887	872...2677	54...344
CYPRUS	...9985...	...19997...	...3888993...	...68788941...	32.765578963	885532246898	8862...14788	+3...4+5
ADEN	...188885...	...2778971...	...4436894...	1.51147973	52.2...157974	973...25888	872...2676	54...344
** OCEANIA								
SUVA/S	...153...	...3761...	...6884...	...7787...	...365673...	...532354...	...131...22...	...
SUVA/L	...322...12...	...54411241	1...87643552	...87665741	...27534772...	...352.244...	...12...21...	...
WELLINGTON/S	...453...	...6761...	...28883...	...58786...	...765671...	...532353...	...2...121...	...
WELLINGTON/L	...	...	...321...111	...64211321	...7533452...	...1521243...	...2...11...	...
SYDNEY/S	...6456...	...86782...	...188885...	...187787...	...655672...	...3223561...	...351...	2...
SYDNEY/L	...	...21...1	...1531.131	...47531351	...5544751...	...3212463...	...1...14...	...
PERTH	...66442...	...178665...	...258788...	...1377781...	...5457611...	...2135863...	...2662...	33...
HONOLULU	...	...	...2...	...5...	...11.1.1.161...	...141412143...	...3531...21...	...4...
** AFRICA								
SEYCHELLES	...133663...	...2447761...	...32368841...	1.2.147873...	52...157974	961...25888	83...2677	5...344
MAURITIUS	...477761...	...1467882...	...23368952...	1.111379851	63...157986	85...25899	72...2688	4...355
NAIROBI	...767872...	...16678841...	...343489741	21.411268973	75.2...37997	983...15898	872...2677	54...354
HARARE	...3456631...	...4557863...	1.233369862	42.311148985	8712...16999	983...4899	862...1688	54...355
CAPETOWN	...3367752...	...44678741...	21.43348984	54.121126997	9812...3799	984...1589	862...278	54...4+
LAGOS	...898862...	...87679852	31.85358985	54.62127998	98343...4899	9851...1699	7883...378	455...55
ASCENSION Is	...5854662...	...77557751	21.85358884	54.83113797	988416...599	98553...279	7885...58	45+2...2+
DAKAR	...487862...	...68778841...	1...87546874	32.85224897	874.72...1699	98944...379	77862...158	44+4...2+
LAS PALMAS	...299884...	...5999971...	...8988994...	98778972	443.86556897	988464223699	889741...1479	+5+5...4+
** S. AMERICA								
St. HETLAND	...1344542...	...35556541	1...67655553	32.87533355	564.6521.125	455242...2	12321...2	...
FALKLAND Is	...1456751...	...36666631	...67543453	22.87421245	664.751...25	688352...3	36652...3	...332
R DE JANEIRO	...543451...	...754463...	...37432463	21.5621.275	765.73...58	989351...26	87862...3	55+4...
BUENOS AIRES	...243551...	...2454553...	...57532342	11...7731.144	554.75...16	789252...3	57862...1	25+4...
LIIMA	...98861...	...97662...	...1853331	...22211122	323.546...4	6782531...2	47863...	554...
BOGOTA	...98761...	...98662...	...85333...	...1731132	223.34...15	7782431...3	67763...	3544...
** N. AMERICA								
BARBADOS	...198761...	...397672...	...6843551	...7721263	323.54...47	8782331...16	87663...3	5444...
JAMAICA	...7+86...	...88761...	...87443...	...752132	213.1242...15	7782431...4	67763...1	3544...
BERMUDA	...8+86...	...88871...	...287664...	...4753562	213.5421256	8782331...26	87763...4	5544...
NEW YORK	...4985...	...69871...	...78773...	...1775651	223.3552355	77823322...26	77763...3	4444...
MEXICO	...885...	...9851...	...8641...	...174111	123.11351...2	47824222...	27863...	453...
MONTREAL	...4985...	...69971...	...78883...	...1776751	223.4554465	778233221136	77763...14	4444...
DENVER	...73...	...285...	...5861...	...6752...	122...55222	478241122...2	368631...	454...
LOS ANGELES	...53...	...74...	...861...	...1851...	122...1.36211	368232.23...	158631...1	254...
VANCOUVER	...1...	...13...	...46...	...771...	122...1.7631	467143125322	257631...2	244...
FAIRBANKS	...	...	...1...	...14...	131.13235721	466143235643	245531...2422	24...

The provisional mean sunspot number for October 1988, issued by the Sunspot Index Data Centre, Brussels, was 124.8. The maximum daily sunspot number was 156 on 12 October and the minimum was 138, on 23 October. The predicted smoothed sunspot numbers, February, March and April are respectively: (classical method) 138, 144, 150 and 157; (SIDC adjusted values) 138, 145, 152 and 159.

the SSB. I believe that entries should be sent to Donald McLenon, N4IN, 3075 Florida Av, Melbourne, Fla, 32904, USA, but unfortunately the 1989 rules are not available to me at the time that this is being written.

Hungarian DX Contest

2200 21 January - 2200 22 January

Single-operator single and multi-band and multi-operator multi-band sections. 3-5 to 28MHz CW only. Exchanges consist of RST and progressive serial number (from 001). Hungarian stations will also give a two letter code to indicate their county (there are 20 of these). QSOs with Hungary count six points, with other continents three points and with own continent no points are scored. The multiplier is the total of counties worked on each band added together. Separate logs must be submitted for each band and the usual signed declaration and summary sheet enclosed. Post entries within six weeks of the contest to HRAS Contest Bureau, H-1581 Budapest, Box 66, Hungary.

K4IIF RETIRES FROM CQ MAGAZINE

After 21 years, first as DX editor and later as Chairman of the CQ DX Award's Advisory Committee, John Attaway, K4IIF, has retired from the staff of CQ Magazine. His tenure at CQ was noted for the great expansion of the DX awards and an enormous surge in the worldwide popularity of the CQDX and WPX programmes.

During this 21 year period, the number of applicants for CQ awards increased by 20-fold, though perhaps the greatest achievement of the K4IIF years was the introduction of the DX Hall of Fame.

I would like to record my own thanks to John for the long co-operation which has taken place between us through the years. (It has always seemed to be a remarkable coincidence that the two of us should have such very similar names.) Thank you John - and I look forward to another personal QSO soon...

AWARDS

My comments about awards on the WARC bands were answered by Bob Nash, G4GEE, overseas publicity officer of the **Worked All Britain** awards. He points out that these are available for WARC band QSOs and that contacts with UK stations from the first date on which each band was released are valid.

Icelandic Radio Amateurs Award

Available to licensed amateurs and listeners. Only contacts/confirmed reports with Icelandic citizens operating from Icelandic territory count. UK applicants need 96 points to claim the award. QSOs with TF novices on 3-5MHz count 32 points, on 7MHz 24 points and on 21MHz 16. Points gained per QSO, band by band (1-8, 3-5, 7, 10, 14, 18, 21, 24, 28, and 50MHz) are as follows: (CW) 10, 8, 6, 5, 3, 4, 5, 6, 7 and 8; (RTTY) 8, 6, 5, 4, 2, 3, 4, 5 and 6; (SSTV) 8, 6, 5, 0, 2, 3, 4, 5, 6 and 7; and (SSB) 6, 4, 3, 0, 1, 2, 3, 4, 5 and 6. Each station may be worked once per mode per band. Send QSLs or certified copies together with 14 IRCs (or equivalent) to: IRA Awards Manager, Postbox 1058, 101 Reykjavik, Iceland.

BAND REPORTS

More stupidity on my part. Unfortunately part of 88KG's October report became garbled - in the second paragraph, line 5, 'in late July' should have read 'in late 1989'. In addition to this in the last sentence the numbers '100-120' should have

TABLE SERIAL NO 26

ALL TIME BAND TABLE - CURRENT COUNTRIES No 9.

Call	1-8MHz	3-5MHz	7MHz	14MHz	21MHz	28MHz	Total
G3KMA	124	236	298	318	315	300	1590
G3GIQ	71	208	263	316	315	297	1470
G3MCS	64	211	259	314	314	294	1456
G3XTT	160	204	248	295	285	257	1449
G4GIR	97	210	246	294	283	262	1392
G4BWP	101	216	247	294	269	256	1383
G4DYO	66	184	233	309	302	283	1377
VK9NS	105	199	251	304	271	222	1352
G3UML	33	219	238	317	289	251	1347
G3ALI	2	223	238	305	278	240	1286
G3XQU	56	179	200	300	277	251	1263
G4LJF	31	201	231	287	252	207	1209
G3TXF	65	163	191	280	255	213	1167
G3NOF	5	97	97	315	316	271	1101
G3IGW	105	148	234	226	190	172	1075
G3YMC	79	109	180	246	248	195	1057
G4OBK	124	140	168	243	198	167	1040
GW4OFQ	52	222	196	215	189	135	1009
GM4OR	75	137	186	220	200	180	998cw
GM3PPE	66	155	160	195	177	141	894
G4JBR	62	142	124	142	156	172	798
GM4ELV	36	93	142	189	126	129	715
Average	72	177	210	269	250	223	1201

Next deadline, scores to reach G3GIQ no later than 8 January.

appeared instead of '100-200'. Smithy's report this month makes mention of this and goes as follows:

"Much has happened in 1988. At this time a year ago we had got as far as noting that Cycle 22 was off to a good start and might, with luck, reach a peak in the vicinity of 120-140, putting it into the above-average category. One year later there can be no reasonable doubt that this marking was grossly unfair and needs to be changed to 'exceptional', perhaps to possibly 'record-breaking'!

The prediction in *HF News* for October that monthly sunspot numbers would be at least in the 100-120 region in the last quarter of 1988 (which was mis-printed as 100-200!) was probably on the pessimistic side. The number for September was 120.8 (solar flux 153 SFU) while that for October was 124.4 (solar flux 170 SFU). Incidentally, the daily 28-00MHz solar flux topped the 200 mark on 3 October for the first time in the new cycle - but only for the one day. The average of the 27 days to 18 October was 172 SFU, also a Cycle 22 high. SIDC Brussels predict monthly sunspot numbers in the 130-150 region in the first quarter of 1989.

During October there were no really bad days on the higher HF bands despite a few disturbed periods. For the most part things ranged from good to excellent, particularly in the last ten days, and there can seldom have been a CQ WW DX Phone contest so well blessed with high MUFs and stable conditions. It may be worth mentioning that the very strong signals on 28MHz from Scandinavia and the Mediterranean area during the month were not due to sporadic E but simply indicated that the F2 skip had shortened to less than 2000km during the hours around noon because the long-skip MUFs were up in the 40-50MHz region.

On the basis of the September data NOAA Boulder has raised the prediction of the peak smoothed monthly sunspot number to 185 in late 1989 or early 1990 (the prediction in *HF News* for October of a peak in late July 1989 was a misprint of seemingly quite remarkable exactitude!). At the time of writing there is little to choose between the position of Cycle 22 and that of Cycle 19 at the same age, so the race is still on."

A very large number of excellent reports were received this month and it is interesting to see that not all the excitement has been on 28MHz. In fact a

1988 28MHz COUNTRIES TABLE

G3VOF	214	G4OBK	134
G4XAH	190(ssb)	G4DXW	114
G4MUW	171(ssb)	G3PXT/M	88
G4ZYQ	162	GM4CHX	60
G4SJK	151	GW4TEJ	57
G4NXG/M	150	G4JBR	50
G0DNV	150	G4OUT(cw)	34
G0ELY	148	G0FYD	38
G4XTT	142		

10MHz COUNTRIES TABLE

	All-time	1988
G4XRV	39	39
G3PJT	106	36
G3SED	71	32
G3JJG	102	18
G4VDX	71	-
G4YWG	64	-
G4OBK	57	-

QTH CORNER

K7OWJ/BV2	Heathkit Corporation, Benton Harbor, MI, 49022, USA.
C53FV	via G3YMM, 9 Cloister Rd, N. Acton, London, W3 0DE.
H44DX	now Wes Elton GW3RIH, 15 Main Av, Peterston-super-Ely, Cardiff, CF5 6LY.
LX8A	via DL7MAR, Grazerstr. 15, D-8070. Ingolstadt, FR Germany.
VP8BTY	G3KEC, Stone Rock Cottage, Portuan Rd, Looe, Cornwall, PL13 2DN.
ZD8JP	via G3ATK, Orchard House, Camel St, Marston Magna, Yeovil, Somerset, BA22 8DB.
ZX0F	PY5EG, Box 37, 80000 Curitiba, PR, Brazil.
3D2XX	WB6GFJ, PO Box 1, Los Altos, Calif, 94023, USA.
3W8CW	E. Brunnthaler, PO Box 131, Vienna 1140, Austria.
3W8DX	E. Brunnthaler, PO Box 271, Vienna 1140, Austria.
4U43UN	NA2K, 72 Kuhlthau Av, Milltown, NJ, 08850, USA.
5UV386	DJ6SI, Baldu Drobnica, Zedernweg 6, D-5010 Bergheim, FR Germany.

lot of DX has been worked on 7MHz as well. Thank you to all who wrote and particularly to G2HKU, G8KG, GJ3EML, G3's GVV, HCT, KSH, YRM, G4EHQ, GW4KGR, G4s MUW, NXG/M, OBK, SFU, SJG, XAH, GD4XTT and G0CKP, GD0ELY and G0HGA. As always stations using A1A are listed in italics.

1-8MHz 2000 LZ0C, OK, UA1AGO, UQ2GRP. **2300** UP8A.

3-5MHz 0600 ZL1CCR. **2100** 5B4OA.

7MHz 0000 ZS6QU, 9M2AX. **0600** HC3AEI5, KH6IJ, KL7PJ, NS0Q (N.Dak), TU4PO, VE7ZG, VP2VI, W7SE (Wyo), 3D2VV. **0700** J3/K8CV, PJ4I, W7EJ, W7IGE, 3D2XX (LP). **0800** F2JDIJ6L, KH6CD. **1600** 3D2XX (SP). **1700** JF1HOH, RA0ACN, YB0DPO. **1800** VU27EC/ZMZ. **1900** JA4CFS, RV0YF (Z.19). **2100** JA5QCR, VU2YCN, 3W8CW. **2200** ED9EA, UA0WB, VK6HD, VS6UO, 9Q5DX. **2300** P37T, TU4CO.

10MHz 0600 K6CBL, VK3NC, W7AYY. **1200** VK6WT. **1500** TA2AO. **2000** CE0ZIG. **2100** JA1IFF, VK5PE.

14MHz 0000 CE0ZIJ. **0600** FK0AW, WY5L/KH3. **0700** AH2BT, F05IW, 3D2ER. **0800** VP8BBR, 5W1HK. **0900** KC6NX. **1500** A92BE. **1600** VI8WIA, 3B8FU. **1700** KC6NX, VS6UW, 3W8DX, 7P8EH. **1900** KL7H. **2000** P40V, T53RC. **2100** JA, JY6RS, KL7Y, 3DA0AH. **2200** KC200NY (Mont), KL7RA, P43SF, SU1ER. **2300** HK0EHM, T5GG, 7X2ARA.

18MHz 0800 VK2, VK3.

21MHz 0700 BY1QH, JT1BQ, KD7P/KH2, VS6DO, ZL. **0800** AX0NE, BV6IA, BY4SZ. **0900** BY5RT, DU1DZA, HK2KAK. **1000** FK8FI, HL1XA, 3X1SG. **1100** JT1BG, KH0JA1QGG. **1200** P40MA, SU7/TU4BR, 6W1NQ. **1500** A4XKP. **1600** VI88XPO, ZY0TX. **1700** D68/KY0T, VP8s BRT, RAF. **1800** KH6CD, V47Z, VP8BQE (Ant), 3B9FR. **1900** C53GH, D68JL, FH4EE, 1A0KM. **2000** FH5EG, FR4FA/J, VK, ZF2ML8, ZK2RY, 8Q7s MS, MT. **2200** CE0GHO. **2300** VK, YB3KW. **24MHz 1000** ZL2ANT. **1100** OY1R, **1200** J37AJ. **1300** PY6WTY, W1-5, 8-0. **1400** W5APX. **1500** W7. **1600** N1CIX, DK6AS/SV5, TA2AO, W4DR, W7HCQ.

28MHz 0700 A25/ZS6P, CE (LP), KD7P/KH2, YJ8FB, ZL2UW. **0800** BV2FA, K7OWJ/BV2, ET3RA, FT5ZB, HL88XP, KH0JH0USD, VS6DO. **0900** BY5RT, FK8GA, HS0A, JT1BS, J52US, P29VU, TZ6FIC, YJ8FB, ZL3SQ. **1000** BY8AC, HZ1HZ, S01A, SU1ER, VK9YG, VP2ET, VU2RX, ZL1AMO, 7X2ARA. **1100** D68JL, FY5ET, HL2IDM, KH0AC, SP5DRS/JW, V21AS, VK6HD. **1200** FP5HL, P29RB, VE8RCS, VS6CR, 9K2KM, 9Q5DX. **1300** HD9OT, ZX0F, 3W8DX. **1400** AP2UR, D44BC, HD8DZ, OX2XE, DF9FA/4S7. **1500** FJ5AB, H5AK, P43HM, 9V1JY. **1600** A92BE, FT2XE, HH7PV, J52US, ZF2MZ/ZF8. **1700** J73LC, K6GSS/KH6, KL7XD, S01A, W6-W7, ZD9BV, 4U43UN, 5N28/G3GJQ. **1800** V44KI, VQ9QM, W7ITN (Idaho). **1900** KH6s BI, IJ, VE2ACP (Zone 2), ZY0TE. **2000** V21YL. **2100** FM/HB9CQX, ZL2GH.

Thanks go to the following publications for information extracted: *CQ Magazine* (W1WY), *DXNL* (DL3RK), *Long Island DX Bulletin* (W2IYX), *DX News Sheet* (G4DYO), the *Ex-G Radio Club Bulletin* (G13OEN/W6), *DX Report* (VK9NS), the *Lynx DX Group Bulletin* (EA2JGO), and *DXpress* (PA3CXC).

For **March** issue please send in items to reach me by **12 January**. Final scores in the 1988 28MHz table to me by 12 January please.

KEN WILLIS G8VR

Here we are at the start of another year. A year which promises to provide a great deal of interest to the VHF operator, since by autumn the current solar cycle should be well and truly approaching its peak. This should offer the chance of some good auroral activity, quite apart from the possibility of long range F2 propagation on 50MHz.

Those, like me, who play the 'numbers game' by collecting solar figures from various sources, will have noted that the daily figures for solar flux took a downward turn both in mid-October and mid-November. Having reached 202 by 3 October, the more optimistic among us had hoped for some very high numbers by November, only to find that we were back in the 150's again. Many 50MHz operators have been afraid to leave the shack in case the much-awaited F2 propagation appeared, but to date nothing spectacular has occurred. Note how blasé we have become about working ZS and 5N2! Numerous solar flares have been reported, no fewer than eighteen plus a proton event in the first two weeks of November alone, with nine on a single day on the 14th of the month.

The illustration shows the very home-brew sunspot viewing equipment at G8VR. The telescope tube is made from tin cans soldered end to end. The 4.5in. objective lens was liberated from the sighting of a WW2 German tank and the lens-hood is a paint can with its end removed. This set-up projects an image of the sun's disc approximately six inches in diameter. This type of observation, though very interesting, provides little by way of scientific data, though when the spots get large and close to the sun's equator it is reasonable to hope for things to happen. For the amateur, the daily flux figures are probably the best guide to the progress of this solar cycle, as are the geomagnetic indices which have varied over a very wide range (A index between 2 and 28) in recent weeks.

I have said it before, and have no hesitation in saying it again. Never look directly at the sun through any forms of lens system unless very opaque filters are installed, and please remember never leave an unattended telescope pointing at or near the sun where children might be tempted to take a look.

CONTEST NEWS

The 1989 Scandinavian VHF-UHF-SHF Activity Contest is open to all stations outside Denmark, Finland, Norway and Sweden. There are three sections, namely:

1 144MHz, on the first Tuesday of every month from 1800 to 2200 GMT.

2 432MHz, on the first Thursday of every month from 1800 to 2200 GMT, and
3 Microwave, on the first Monday of every month from 1800 to 2200 GMT.

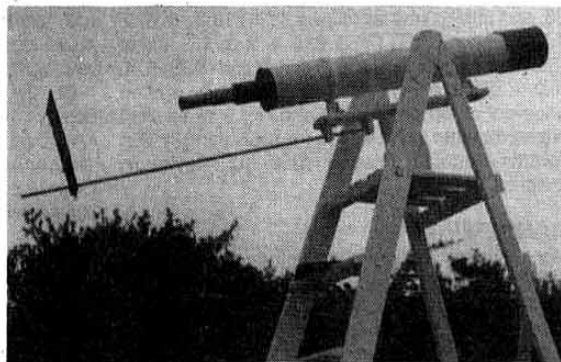
In the year's operation, only the best nine months' results are counted. For full details of scoring etc, please send me a sae plus a 10p stamp. Since the rules require logs to be mailed before the 15th of each month, it is unfortunate that this information arrived too late for publication in December so the contest will probably be under way before this copy of *Radio Communication* reaches you.

The 50MHz Trophy contest held on Sunday 23 October was well supported and showed how popular this band has become in the past year. Portable stations were much in evidence and in the early stages contacts in excess of one per minute were being made by the leading operators. By the close, numbers being exchanged indicated that 300-400 stations must have been QRV, so this was a great opportunity to work new counties and squares. The highlight was undoubtedly the appearance in mid afternoon of G3GJQ/5N28 from Lagos, Nigeria, (see 50MHz report) who must have worked 50 or more UK stations. ZS3 and ZS6 also added to the fun. Geoff, GJ4ICD, worked nine countries and 37 counties in 143 countacts, even though he went QRT early due to poor band conditions at his location. Dick, G1CWP, portable on the South Downs said "the pile-ups were awesome", and he worked 10 countries and 52 counties in all. With some stations giving numbers indicating more than 300 contacts, and a multiplier system in force, the results may be very close and interesting to analyse. G1CWP said "HF operators please note, we had to log callsign, report, serial number, county and locator both ways to complete a contest QSO".

AWARDS

Ian Cornes, G4OUT, has now taken over from Jack Hum G5UM as RSGB VHF/UHF awards manager. Ian is also replacing me as manager for the ARRL VHF/UHF Century Club awards (VUCC). This should work out well since previously QSL cards had to be inspected by both Jack and myself, whereas now one office will deal with both sets of claims. VUCC awards relate to contacts made on or after 1 January 1983 and apply to vhf, uhf and microwave bands. Ian Cornes' QTH is: 6 Haywood Heights, Little Haywood, Staffs, ST18 0UR. ARRL plans to appoint VUCC managers in the various European countries, but overseas readers please

TELESCOPE WITH PROJECTION SYSTEM FOR VIEWING SUNSPOTS AT G8VR.



note that G4OUT will continue to handle all European claims until further notice. Meanwhile if anyone has sent cards and a claim to me, the application will be or has been processed either by myself or Ian.

BEACON NOTES

John Wilson, G3UUT (Cambs), wrote to say that he had supplied the transmitter for the Cornish 50MHz beacon to the local repeater group who are the beacon-keepers. Delivery of a ruggedised dipole from Jaybeam was awaited, but by now the beacon should be QRV on 50-0425MHz. The group has sought permission to change the well-known GB3CTC callsign (Cornwall Technical College) to GB3MCB (Mid-Cornwall beacons) to recognize the change in QTH, the new site near St. Austell providing an excellent take-off. The transmitter will run 40 watts, the dipole firing SW/NE. John also commented that we have all probably forgotten about GB3REB on 70-040MHz. This one used to sign GB3WHA and even earlier, GB3SX. After nearly three years, approval has been obtained for the beacon to be activated from a military barracks near Chatham and it will be maintained by the Royal Engineers Radio Society. This one also should be on the air by now running 10 watts to a two element Yagi pointing towards the NW.

SWL reports were received at headquarters for reception of beacon GB3NHQ on 50-050MHz in Czechoslovakia (OK1AHZ) and Austria (Edmund Pigal). Edmund uses a long wire antenna on 50MHz and a micro computer program to print out the beacon format. He said that he often hears G and PA stations on this band around 50-110MHz.

Brian, G3COJ reported that the Emley Moor beacons on 432 and 1296MHz came back on the air in October. Brian has also compiled a UK beacon list covering all bands from 28 to 432MHz which he intends to revise to include antenna data as well as other salient information. He commented that GB3NGI should eventually operate on 50-625MHz, although when he wrote, the DTI had not authorized a move from 50-0575. As mentioned previously, ZS3AT copied this beacon on 10 October between 1818 and 1820 GMT, a day when there was an aurora in the UK, following a minor solar storm reported some 24 hours earlier.

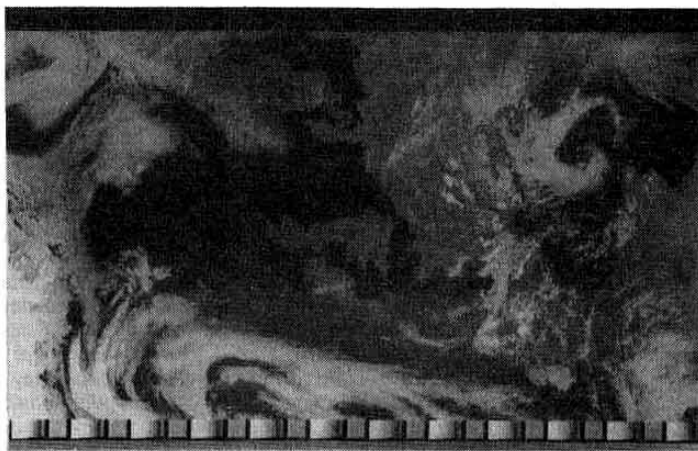
Brian also produced an updated list of 50MHz beacons in and near Europe, noting that proposals are 'in the works' for beacons on this band in Finland, Norway and Andorra, with another in Geneva authorized but not yet QRV. The Icelandic beacon TF3SIX (50-0575) came back on the air on 29 October following repairs (reception reports to G4CVI or TF3JB). Note that this is co-channel with GB3NGI at present, and on much the same beam-heading for most UK amateurs, hence the need to move one of them.

G2AHU reported to the VHF Committee that the transmitter for GB3BUX, the 50MHz beacon designed to transmit timing signals for path measurements, is well advanced. Control circuitry will follow later.

REPEATER NEWS

Robbie Adamson, GM6KWU, has taken over from GM6LJE as secretary of the Anglo Scottish Repeater Group. The group runs two 144MHz repeaters, GB3AS and GB3EV, and a 2-3GHz link between these is in the planning stage. On 70cm, GB3CA, operated by the group, was due to come on when Robbie wrote in. Anglo-Scottish would welcome new members, and the modest annual

IMAGE COVERING
MEDITERRANEAN TO
GREENLAND
TRANSMITTED BY
NOAA-9 WEATHER
SATELLITE AND
RECEIVED ON 137MHz
BY DREW, GM3CEA,
STANRAER.



subscription brings four copies per year of the excellent Central Scotland FM News which has so often been featured here. Contact GM6KWU QTHR for further information.

Cambridgeshire Group's newsletter No. 17 showed a very handsome profit from a well-planned junk sale, and hon. treasurer Tony, G4NBS, expressed his thanks to all those who contributed to its success. Eleven new members were enrolled on the spot at the sale, but more members would be welcomed. On the technical front, the group renewed the tx antenna on GB3PI with a noted improvement in its coverage. At the proposed new Madingley site for GB3PI, a new antenna had already been installed ready for the change when it was learned that MoD had refused permission for PY to operate from this location without channel change, RB8 being a possible compromise; a decision is awaited. With PY's logic dating back to its original installation in 1974, thoughts are turning to its replacement. This active group also reported work of various types on GB3PX, PV, PS and PT, and on 23cm link equipment. The newsletter also contained information on modifying the Pye Westminster for 144MHz packet operation.

GB2RS newscasts mentioned that packet digipeater GB7CK at Charing, Kent started up on 145-650 on 16 October (reports to G3TIS), while on Emley Moor, GB3ET, a 1-3GHz tv repeater also came on the air in October (reports to G8CJS or G3PTU).

Other newsletters received were from Kent, Midland, Leicester and Speyside, all issued in September/October 1988. There is so much of interest in the newsletters which go to individual group members that much more space would be required to do justice to them all. Possibly the solution would be a regular repeater column in *RadCom* when space allows, even if only on a quarterly basis. This is purely an idea of my own, not one which I have discussed with the Editor nor with repeater groups. Repeater operation, though part of vhf/uhf amateur radio, does involve techniques and problems not encountered in other forms of operation. Furthermore, there are many operators who use only repeaters and consequently have simple equipment not suited to weak-signal operation, and I feel that this has a role to play and should not be discouraged. Perhaps repeater users would let me have their own views on the subject, especially the sort of information needed which could be extracted from newsletters and would make interesting reading in *RadCom*.

50MHz

I mentioned last month that some readers deplore the fact that 50MHz news sometimes seems to dominate the column. Alan, G4SSO, commented that VHF/UHF News & Views, "is becoming more and more a 50MHz column". There is no doubt that the band is very popular, as the 50MHz trophy contest indicated, but if or when we get some real F2 propagation, there could be a mad scramble to be QRV on the band, because those who know, say "We ain't seen nothing yet". The fact is that I receive four or five letters related to 50MHz operation for each one dealing with other vhf topics or bands. I have to try to report as fully as I can within the limitations of the available space. This month, reports arrived not just from the UK but also from France, Germany, Cyprus, Malta, South Africa, Gibraltar and the USA, some of which would fill a complete page in *RadCom*, so all I can do is to be brief.

The nearer the equator, the better the 50MHz propagation, at least under present conditions. Paul, 9H1BT, said that there are six stations active on the band in Malta. They have been enjoying numerous openings in South Africa, mostly two per day, in the early afternoon and evening, with the ZS3E beacon audible up to midnight. Countries worked are ZS3, ZS4, ZS5, ZS6, A22, TR8, 5N and 5H1. The path to ZD8 is often open until midnight, signals being very fluttery. Paul hears South American beacons from about 2230, with PY stations appearing an hour or so later, probably when they finish work. 9H1 stations have worked into LU, CX8, PY and VP8. Lack of activity has probably restricted working into the Indian Ocean area, but FT5ZB (now QRT), FT3ZC and FR5EL have been worked. At the time of writing 9H1 had enjoyed three massive openings to Japan during which Paul was working J's at a rate of one a minute at strengths 55 to 59.

In France, FC1AKE (Nantes) reported working GJ4ICD on 23 October which he thinks is a first GJ/F 50MHz QSO. Some French stations were authorised to use the band in October, and by 16 October 417 had applied for permits with 80 issued. Well-known VHF operator F9LT was refused a permit because his QTH was in an area deemed liable to cause TVI.

Chris, GM3WOJ, will remember 18 October because on that day he worked G4IJE via meteor scatter, some ZS6's via tep, EI6AS via aurora, and G4IJE again on backscatter, with ne'er a tropo contact! On 9 October George GD3AHV worked ZS3AT at 1715 gmt, which he thinks is a first

GD/ZS3 contact for the band. Any other claimants? G4LSA was surprised to receive a card from JA5GJN for an alleged QSO on 22 October with 51 report. He knows nothing about this, so if anyone was pirating G4LSA's call, will he please come forward to claim his prize because he has made a little bit of VHF history.

From Cyprus, Ted, 5B4OG, received 50MHz equipment on 5 October and immediately started to hear the ZS's. He said that a solar flux number in excess of 175 appeared to be a critical factor for propagation along this path. Ted says that 5B4AZ works mainly crossband 28/50 but there will be another QRV on the band from Cyprus soon. They are limited to 50-500MHz. PY5ZBU attained his 50MHz DXCC, and then went on to work No. 101 in the form of EA8/G3JVL, Mike being in the Canaries with a ten-watt rig during November. Brian, G3COJ, says that SZ2DH, operated by SV1DH is the only licensed amateur in Greece, others are not legit. He has reservations about EA1MO.

The big surprise in the UK was the sudden appearance of 5N28/G3GJQ from Lagos on 22 October, and again next day during the contest. Roy put up a three element antenna, plugged it into a IC575 giving 7-8 watts when "everything exploded". Not literally, just wall-to-wall G's calling. The first to make it seems to have been Bill, G6NB, for a first-ever 5N2/G contact on the band. The "5N28" prefix was to commemorate 28 years of independence, so maybe next year it will be 5N29! GJ4ICD had made 70 or more ZS contacts up to the end of October a first in the shape of 5N28/G3GPQ. Dick, G1CWP sent a card from Gibraltar followed by a detailed log. Operating there as ZB0/G1CWP he had much fun working into South Africa using 10 watts to a single wire Delta loop, and even had a near miss with ZD8MB, just failing to exchange the relevant information for a full contact. Dick says that Jimmy, ZB2BL is moving the ZB2 beacon to his home QTH and hoping to get it on soon. It caused some QRM to essential services in its old location. Thanks to G4JCC, G3SED, G4UPS, and G3NOH for reports.

METEOR SCATTER

Two late reports suggest that the Perseids shower in August was more intense than I believed. What, perhaps, was more interesting, was the number and variety of signals reported worked or heard on the CW and SSB random channels.

Tony, GW4VEQ worked three new countries in TK5EP (Corsica), OY9JD (Faeroes) and OH2TI, the last two being random contacts. He also made four more random contacts and three from skeds, the other countries worked being I, F, YU and DL. He was no doubt helped by having 4 x 8-element Jaybeams with masthead preamplifier and full legal power from a 4CX250 linear. Tony asks whether any other GW has worked TK and/or OY, or were his contacts "firsts"?

Alan, G4SSO (Middx) said it was the best Perseids shower since he began meteor scatter, and he started to make good contacts in the lead up to the peak (7 to 10 August) with UR1RWK, SP2NJ and HG4XG, all on SSB. During the main shower he made 10 random SSB contacts with OY, OK, YU, UR, EA3 and myself, then he completed in a sked with YT3ET. Alan heard "many more OK, YU and I stations, but had already worked them", so the level of activity was clearly quite high.

Mike, G3SED, reported reception of 50MHz beacons 9HISIX, OX3VHF and CTOWW in the UK on 13 August, but whether this was as a result of

FROM HERE AND THERE

CX4HS, who lives in a remote part of Uruguay, manages to put out a very potent 50MHz signal despite having no mains supply laid on to his QTH. He uses batteries which provide 32 volts at 440 amps, kept charged by a wind-driven generator. For contests he sometimes uses a petrol generator, but is mainly dependent on his batteries and says that the battery room in his house is like the interior of a submarine!

On the subject of battery powered rigs, remember that massive two-day 144MHz opening to the Canaries on 9/10 September? Tony, GW4VEQ (Anglesey), was at his parents' house when a friend telephoned to say that EA8's were end-stop on 144MHz. After a mad dash homewards, Tony arrived only to find the area Electricity Board busily moving a pole carrying power to his house, having first of all cut off the supply. Wiping away the tears and with only a slight backward glance at his 32 element array, stark and lifeless against the sky, Tony retired to his car, connected up a halo to a 10-watt rig, and drove up the road to see if he could hear anything. He certainly could, and between 1822 and 2235 he worked from the car, six EA8's, five EA's on FM via the Santiago repeater, and seven EA's direct, plus a few French stations. After awakening next morning, wondering if he had dreamed it all up, he went back to the same spot and from the car worked another three EA8's. In a long FM contact with 'EA8BML, 59 plus both ways, they changed to each other's repeater (GB3AR here and Fuerteventura Island for Manuel) where they had an extended chat during which each tried to teach the other a little of his own language (Welsh in Tony's case!). In Tony's words, "they parted hoping they would both live to see another opening as mega-huge as this one on the best vhf band, 144MHz". I hope soon to produce an analysis of this event by someone well qualified to comment. It could well have been the biggest ever recorded in terms of duration as well as overall distances worked.

Another GW, Rhys, GW4RWR, was languishing on the beach near Royan during most of the EA8 activity. However he consoled himself by erecting 4 x 16 element Jaybeam antennas, after which he managed to work some USA stations on 144MHz eme. It can be done. Some of us a few years ago worked K1WHS on 144MHz using legal power and single 16 element Tonnas. The bigger USA stations have the antenna systems to make such contacts possible, but it won't do you much good to call CQ 'off the moon' unless you have done some homework. Rhys thinks that he may have made the first ever 144MHz eme contacts from North Wales. He varied the elevation of his stacked array manually which worked even when the moon was hidden by cloud since he was using a Moontrack program.

Tom, GM3NHQ, whose call is sometimes confused with the beacon at HQ, was at his home QTH in Invergordon while his VHF equipment was at the /A location during the aurora of 10 October. His VHF experience paid off, however, when he noted

that signals on 21MHz were going auroral. This is only the second time he had experienced this on the band in 30 years of operation. The last time was in May 1969 when he worked G3JYP and heard G6YL on the band, both being well-known VHF call signs to those old enough to remember! In this event, Tom worked LA2EG and heard LA1VF, YU7OP and LZ1V, all tone-A on 21MHz CW. The most interesting was the USSR station EK8HWT whose signal alternated between T9 and tone-AS for a long period. Throughout the event, VU2BK was non-auroral.

Old friend and well-known VHF/UHF operator Rolf Niefind, DK2ZF, called to say that he was closely following the achievements of UK 50MHz operators. Rolf has had a great interest in the potentialities of this band for more than 10 years. He said that while there are but three Channel 2 tv stations currently operational in Germany, it is unlikely that any 50MHz privileges will be granted to German amateurs since the demands on frequencies in this part of the spectrum are too great. Rolf said that people outside Germany do not perhaps appreciate the extent to which his country is host to very large numbers of Allied Forces of several nationalities. The requirements for communication channels are consequently very great. This emphasises the debt we owe to all those who negotiated our own allocation on 50MHz, which in turn opened the way for so many other countries' amateurs.

Bill Leyland, VE7HBL (British Columbia), spent a couple of weeks with his wife walking around the Lake District and West Yorkshire in October. Despite rain and high winds Bill was delighted to work several UK stations both direct and via repeaters on 144MHz using call sign G/VE7HBL and a 3-watt Kenwood TR2600. He found 144MHz activity to be greater here than in his own part of the world, but was confused by our electric sockets. When charging up his nicads overnight, he became quite expert at inserting two bare wires into 13 amp sockets! Bill wants me to say "many thanks gents" to all who he worked or tried to work. He had no trouble working into South West Scotland and the Isle of Man, but failed miserably to make it to Chandlers Ford when five miles away in Southampton, en route for his trip home. That's vhf Bill.

The third issue of QSB, the newsletter dedicated to 70MHz was published in October and now boasts over 80 subscribers. It contains a wealth of information relating to this band, and is well presented, especially as it is a private operation run by its editor G4WND. One interesting feature of this band is that it attracts those who like to do something different. Home brew equipment, modified pmr rigs, amplitude modulation, all have their adherents, and there are clearly far more stations to work that one might suppose from a casual check on the band. Call Roger Banks, G4WND (0827 894464) or write QTHR for further information.

sporadic E or long meteor bursts we do not know. characteristics. One problem he suffers is that his antenna is sited over the exhaust outlet from a fume cupboard in the Chemistry department which

Rhys, GW4RWR, being back at university in Cardiff has little time for radio, but to keep his hand in he has embarked on a project to monitor meteor

reflections from beacons, broadcast stations etc, proposing to analyse their attack and decay characteristics various nasty gases guaranteed to wreak havoc with the aluminium!

Please send in reports on the Quadrantids shower this month quickly so to meet my 14 January deadline. Happy New Year everyone. ■

RON BROADBENT G3AAJ

Events last month kept the keen satellite users occupied for hours, and this included the listeners for the MIR Traffic on 143.625MHz. A round up of this news begins with MIR. Apart from the activity between the MIR ground control and the spacecraft itself on the above frequency, there has also been activity on 144MHz FM. Yes, you chaps that only have FM on 144MHz can now speak to a flying object in Space again. The last time was with the USA Shuttle a couple of years ago. The Russian Crew members were given their Operator's Licence in early November after passing out from the Russian Amateur Examination while in orbit. It must be a first for amateur radio that crew members of a space craft undertook lessons on a technical subject from ground-based radio amateurs while overflying Russia, then sat for the exam and passed. Congratulations are in order.

As we go to press, amateur radio signals are being sent by two crew members of MIR - callsigns are U1MIR and U2MIR. The first QSO was made on 12 November 1988. I have had a tape recording sent to me by UA3CR while he was in the USA. On the tape U2MIR is having the second QSO of the flight with W4BIW in Atlanta on 13 November 1988. Leonid, UA3CR was with W4BIW at that time. The QSO only lasts a few minutes but is loud and clear. During the next day many UK listeners reported to me that they had also heard transmissions on S22 (145-550). Callsigns reported were OE3EU and IW3KL. I also understand that OK3AU, UP5ICR and OH5UK were heard to QSO on 18 November. It is also reported by G3IOR that G3PZX, Norwich, was tuning around the band and came across U2MIR calling while over the UK, and was so surprised he didn't respond! It would also appear that a QSO consists of an acknowledgment of your call only at this 'date'.

A few tips may help. U1MIR and U2MIR will have been operating on 145-400MHz from 26 November. Before that they were QRV on 145-00MHz. They keep Moscow time for operations, ie they go to bed at about 9pm UK time. They are both very new at the game of amateur radio, so please give them a chance to enjoy themselves; this way they can continue to use amateur radio as a fun occupation between their daily workloads. If it becomes boring or arduous, because of bad manners from ground operators, I suspect we will end up with nil operations except over Russia. U2MIR does not speak fluent English, but seems to get his message across OK. I suggest you use the "Alfa, Baker, Charlie, Delta" phonetics. QSLs should be sent to UW3AX: B Stepanov, PO Box 679, Moscow 107207, USSR.

MIR itself is visible to the naked eye if you live in the south of the UK. Look for a bright object at about 45 degrees orbiting west to east during twilight or just after. Remember that command stations change the orbit from time to time. Listen on the AMSAT-UK Nets at 7pm Mondays and Wednesdays on 3-780MHz for exact times of passes for the ensuing couple of days. Use a wideband, or rather a wider bandwidth antenna and point it at the middle of the pass track. High power is not needed. Listen first, then go back on 145-550MHz simplex. At the time of writing no exact frequencies have been published. I suspect that these will come after the crew have become more settled with their new toy. No offence meant,

but it is certain they are rather raw with AR right now.

For those readers who wish to know more about this spacecraft, and what it does, AMSAT-UK publish a small handbook on the subject. A small donation to AMSAT-UK funds will get you a copy fast. This book also gives details of a small homebrew converter which will enable anyone with a 144MHz receiver to listen to the 143-5 to 143-7MHz talk-back frequency between MIR and their Command Stations.

OSCAR 13 AND MODE JL

Oscar 13 has been very active during the past month. Many amateurs new to satellite work have had their first QSO through this bird - possibly because it gets more like a repeater in the sky every day. This certainly applies on 432/144MHz where folk do not have to work for a QSO. I suppose that's what it's all about - it would not do for every one to be struggling to get a QSO.

The argument about use of Mode JL (Two up, Seventy down) still suffers the odd remarks made mostly by the ill-informed or the "I'm right brigade", like "Why do AMSAT restrict my fun?". First, most of the arguments being slung at me as AMSAT UK Secretary are from non-members of AMSAT. They therefore have not put one penny towards any satellite that they are bitching about. Your national society subscription does not include any money towards satellites or their design. Second, it seems funny to me that most of the ill-informed think AMSAT-DL have thought up a devilish plan to exclude certain amateurs in the UK, who cannot get onto 144MHz, from using Oscar 13. Note that we have no allocation there - other countries in IARU do have that allocation thanks to their licensing authorities. Third - most of the arguments fail to recognise, or even wish to recognise, that having asked the majority of other users to keep off the top end of 145MHz, how can we now expect to encroach onto the 144.450MHz portion where WAB Nets, QRP nets, and moonbounce talkback links are common? I may be wrong, but I thought a little give-and-take between radio amateurs was the order of the day.

During the past two weeks we took a short-break touring holiday into the Borders of Scotland up as far as Edinburgh, via Manchester, Liverpool, Leeds, York, Newcastle, Berwick and Selkirk. Because I normally place my money where my mouth is, I decided to investigate, first hand, the situation North of Watford in respect of the Mode JL situation. I took with me the FT 726, and made over 200 checks on and around the above frequency for any activity. Checks were made at random during all times of the day and evening periods. As some of the Manchester boys will confirm, in that area it is a wilderness for activity around 144-450MHz. Even from the top of Audley Edge on the Sunday I was hard pushed to make my first QSO during the trip. As we were also mostly on tops of hills during our 1000-mile round trip I hoped to hear more activity. To be honest, I cannot see any problems if people read and stick to all of their licence conditions. But having said that, I will not be using Mode JL, preferring to stick to the gentleman's agreement of many years past. I hope some of my fellow satellite members will also remember their long loud cries of pain when they found an FM'er in their satellite

frequency during the past 10 years. I cannot ask the nut cases - they are always with us.

During the AMSAT-NA Symposium in Atlanta, USA, in early November, Leonid Labutin gave a resume of his recent Ski-trek. He also said that there is an American-Soviet SKITREK Expedition being planned for the Antarctic next year.

On Sunday, the day after the Symposium, Leo Labutin, UA3CR, became UA3CR/W4 as a result of passing the Amateur Extra Exam administered to him by two Volunteer Examiners at Georgia Tech. Leo mentioned that his biggest problem was understanding all of the FCC regulations, but after studying the night before, he had no problem passing all of the exam elements from Novice to Extra class and definitely no problem with the Morse Code and theory.

THE SATELLITES

Oscar 10. At this date (28 November) Oscar 10, yes 10, is doing a great job for the few radio amateurs who now take the trouble to listen for this old gal. We first heard from Ian, ZL1AOX, that he had been able to get some command back from the satellite during early November. A list of MA positions was given which will be out of date by the time you read this. However, in January 1989 I suggest that the MA's which you should not use are between 40 to 100. This is a guesstimate so listen to AMSAT nets.

Fuji Oscar 12 started to transpond again on 15 November, and I understand some digital Packet has been heard on this satellite, especially to the East of Europe. The Packet Interface PCBs are still available for your home micro. A SASE will get immediate attention.

Oscar 13 again. I have received a list of operators heard on the recently-opened transponder Mode S. There were 18 calls in total. Reports would be welcome. Two of the calls are G2BFO and GW3XYW. Incidentally, David, G2BFO has written to tell me that he uses a form of AGC-derived voltage from the beacon frequency on Oscar 13, Mode L, which allows him to electronically control his linear so that he cannot go above the power limits set by himself (ie, never above the beacon received signals). He has said he will release the details in due course.

I do not propose to give a set of Kepler elements for Oscar 13 this month, as last month's are good for at least another four months. Anyone wishing to get a set of Kepler Elements can telephone me during reasonable hours for an immediate response.

OSCAR-13 SCHEDULE PLANNINGS

From 1 January 1989 it is planned to reorient the spacecraft back to 180° longitude and 0° latitude, since the sunangle is even better than during the past months. This gives optimum squint angle (direction of the satellite antennas from your view) around apogee, which results in a new schedule mainly modified for the Mode-L operation.

The following transponder schedule will be in use from 6 January until 15 March 15:

Mode-B	from	MA	3	until	MA	100
Mode-JL	from	MA	100	until	MA	150
Mode-B	from	MA	150	until	MA	240
OFF	from	MA	240	until	MA	3

Oscar 13 must again be re-orientated in early March using the magnetometer owing to increased sun angles, but the exact Mode-S schedule will be

MIKE DIXON G3PFR

WHITHER ON 10GHZ?

(PART 4 - THE MIDI-TECH APPROACH)

Have you followed through some or most of the improvements to your Gunn-based system? It is now mid-winter and you should have started to prepare for the forthcoming 'season', by using the Winter Activity Days (first Sunday of each month, October to March inclusive) to check the results of your efforts! If you have, then you've probably gone as far as you can without resorting to such 'exotic' things as 10GHz preamplifiers and image rejection, transmit mixers and filters, ultra-stable oscillators and high performance IF strips, including the all-important post-mixer preamplifier which should be there already!

So what next? No, you don't have to abandon the gear and start all over again to go to an even narrower band. It is possible to adopt the tactics that I earlier called "midi-tech". For, whilst using many of the wideband modules you already have, it represents a half-way-house between the techniques you've so far used and the hi-tech (and hi-cost) techniques of the German 'silver boxes'.

To recap slightly, the most significant system improvements come from accurate frequency setting, narrowing the RX bandwidth and reducing the TX bandwidth to match. These require high-performance oscillators - both RX and TX - meaning accuracy, stability, noise and sensibly constant output power.

It is an unfortunate fact that a tunable oscillator, especially one which needs to tune 100MHz or more at 10GHz, is neither impressively stable nor is its output constant across this range. Many oscillators vary by 10 to 20dB, even over a few tens of MHz - hardly likely to get the best out of your otherwise carefully optimised system! This is yet another reason to go to separate RX and TX oscillators. The TX oscillator can be fixed-tuned and you can expect it to stay within a MHz or less of nominal under most conditions if it is well designed and constructed. Now you can start thinking about restricting RX oscillator tuning to, say, 5MHz or less, with the benefits already mentioned. Existing WB operation would also benefit from better frequency setting and a restricted bandwidth to have to search whilst tuning.

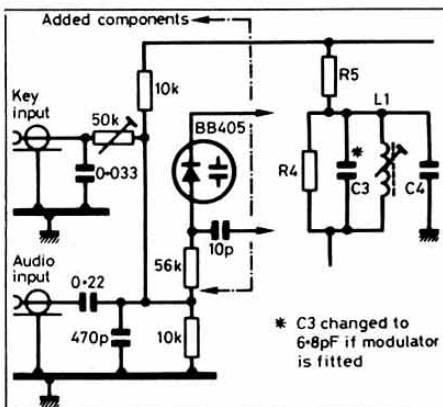
The number of choices to attain these objectives can be very confusing to the relative novice. First I would suggest that you discard some of the established techniques which have become engrained in the tradition of simple wideband 10GHz operation; be adventurous and try some real experiments! For example, discard the idea of the single conversion, low-order IF, tunable first oscillator approach for your RX. Next abandon the notion that SSB is the *only* effective mode. It needs all kinds of complications such as linear mixing and/or

amplification and high-Q filtering. In terms of overall complexity and efficiency, it falls far behind (FSK) CW or even AFSK CW and NBFM, all of which can be generated with a minimum of complication.

By now, you must have guessed that the next suggestion is to use your 144MHz multimode or FM transceiver as the back-end of your 10GHz RX. Many 144MHz rigs tune more than 2MHz in RX mode. Ergo, use this 'box' as your tunable 'back-end' with a fixed-tuned 10GHz 'front-end', with the benefit of being able to receive any mode. What can be done to improve the 10GHz oscillators to a point where the benefits of this 'superior posterior' can be used to the full?

If you look at page 9.50 of the 4th edition of the VHF/UHF Manual, you will see mentioned the injection locking of free-running oscillators: a very viable midi-tech way of generating quite high levels of TX output. The system will typically show a 'gain' of 20dB ie. your 300mW Gunn will lock quite happily to a 3mW crystal controlled source and will take on its characteristics. Now 3mW of crystal controlled, filtered 10GHz is not hard to generate. Put together the 384MHz source (pages 9.4 to 9.7, VHF/UHF Manual), using a 96-0000MHz crystal for output at 10,368MHz, amplify your 384MHz to about 0.5 to 1W and feed this into the simple multiplier on page 9.51. The multiplier output *must* be well filtered using one of the filters described on pages 9.38 and 9.39. My experience with this set-up is that 5 to 7mW is easily attained, more than enough to lock your 300mW Gunn. FM the crystal source and - bingo - 300mW of locked FM output!

An alternative, for those who do not have or cannot find a circulator, is to build the G4DDK001 source and 002 amplifier and feed this into a DK2VF multiplier. This combination will allow the use of a simpler post-type filter (page 9.38) and still



generate to the order of 100mW of filtered narrowband output. The methods of producing FSK, AFSK and NBFM, for either source are similar and can be achieved with the circuit of Fig 1. Either of these midi-tech (some would say old-tech!) approaches will generate considerable stable 10GHz power without a GaAsfet in sight!

What of the RX oscillator? Again, several approaches are possible but here the requirement is for one or two mW of stable, non-tunable output to drive the mixer. You could use a continuously running fixed-tuned Gunn and learn to cope with the slow drift which will take place after the initial rapid switch-on drift. What might defeat this approach is the residual FM jitter on the Gunn output: some Gunns are worse than others. Alternatively a dielectric resonator stabilised oscillator (DRO) can be substituted for the Gunn with several advantages. They are more stable and dissipate less power for a given output and can use the same power supply as a Gunn, simply modified for a slightly lower voltage range than that needed by the Gunn which it will replace. The stability of these devices is such that it should prove quite easy to hold an NBFM signal in a 25kHz channel without any difficulty. Thermal drift should be nowhere near the problem that it can be with a Gunn. Suitable high stability oscillators are the NEC MC5808 (stable to within ± 1 MHz from -40 to +50 deg C), or the Mitsubishi FO-1010XS (± 0.5 MHz, -20 to +60) whilst a suitable, somewhat less thermally stable mixer/oscillator (yes, almost an 'in-line' assembly) is the Mitsubishi FO-UP-11KF. Such modules are price-competitive with conventional Gunn devices.

If you require a good narrowband RX front-end without resorting to several delicate and expensive GaAsfets and expensively etched PCB, the 'old-tech' JVL image recovery mixer still takes some beating! It may be disappointing as a TX mixer, but it's good on RX. It is now made easier by driving the LO multiplier at 1136MHz (for 10,224MHz injection) using the 'DDK boards'. This will enable a wider filter to be used after the multiplier and this could be the same as the JVL signal input filter with consequential easier alignment.

So there you are, you've arrived at quite respectable narrowband performance in fairly easy stages using 'classical' techniques and materials simply by disregarding tradition and not ditching all your early equipment! Not as elegant as a 'silver boh', nor nearly as costly or demanding in skills and alignment, but just as effective! The only *real* improvements resulting from hi-tech are compactness and amplifiers. I hope I've said enough to show that the midi-tech approach, which can be made on the kitchen table, can still yield very acceptable results. If you are still not convinced that such alternatives do work, then look back to the November column for ZS6BMS' initial results. I've since heard recordings of both the CW and NBFM QSOs and they are most convincing. Otherwise, to misquote 'purchase and be damned'!

published on the CW/RTTY/PSK beacon. The transponder schedule may also change for engineering or conditions change. Watch the beacon for up-to-date transponder schedule information. Peter Guelzow, DB2OS.

UA3CR ACTIVE ON UoSAT-OSCAR 11

From Monday, 7 November 1988, UA3CR will have been active via the Digital Communications Experiment (DCE) on board UoSAT-2 (OSCAR 11). His

first message was successfully loaded in the spacecraft DCE memory at 08-18GMT after some practice trials the previous week.

The experiments were performed at the QTH of RA3APR, Evgeni Labutin, operator at the RS3A satellite command station in Moscow, in the presence of Leonid, UA3CR; George, RA3AU; Wladimir, RW3DR and Michael, PA3BHF (of UoSAT, University of Surrey). Equipment used were ICOM transceivers for the 144MHz and 70cm

bands, a home-brew power amplifier, high gain X-Yagis with AZ/EL control, DCE modem and an IBM compatible computer with 20mb hard disk running the DCE software under MSDOS. The DCE modem for Moscow was donated by AMSAT-UK and built at the University of Surrey.

UA3CR has a NET/ROM (actually 'The Net') running at 14-099MHz (UA3CR-2 or MSK2), with a VHF gateway UA3CR (MSK1). From there you may be able to connect UA3CR or RA3APR.

The plague of packet splash onto 144-750MHz has diminished to almost nothing, which is a thankful improvement. Well done all those people who have fixed their stations. Continuing vigilance and caution is required, however, as the odd burst is still heard, especially in a lift.

G4CRJ and myself won the September 10GHz TV contest with just one contact from Old Reading to the Hoggs Back. Naturally, this path was tried out on a previous occasion and either Murphy was asleep or conditions were good because a P4 was obtained. But during the contest it was all down to Percy Verence (some other fellow) to get as much as a P2. We re-assessed the equipment which we used, and this clearly indicated that better results could have been achieved. The receiving antenna was only a 1ft diameter dish and the transmitting one 2ft, precariously perched (with a CRJ-special rusty G clamp) on top of a camera tripod with a fair wind blowing. There is, of course, the argument that had the equipment been mounted properly it would never have worked at all!

The receiving site was even more scientific. The dish mounting was a perch on top of my car with maps wedged under one edge to set the correct elevation, relative to the camber of the road and the slope of the roof. Transmitter power was a meagre 10milliwatts which, just goes to show over a line of sight path how well it can work. The typical trans-

mitter set-up is a Solfan head unit containing a Gunn diode, modulated with a short circuit proof current source, driven by a CCIR pre-emphasis circuit and a 6MHz sound injection oscillator. Details of the circuit are shown.

The Black Hole. In order to explain what it is, let's look at its effects. A normal signal from a beacon is being received. The signal level at the receiver is 15dB above noise. Over a five minute period the signal drops to the fringe of audibility. This condition can last for up to an hour. When does this happen? Usually 12 to 24 hours after thundery weather, in perfectly clear cloudless conditions. It could be something to do with the state of ionisation that has been left behind from the storm. Any ideas, anyone?

Trevor Brown, G8CJS, has sent me some interesting information about the Emley Moor TV amateur repeater. The concrete tower is 900ft and the steel mast on top is 184ft, the whole structure weighs 11200tonnes. One aerial points at 45° and another is to be added at 135°, but the 3dB points are at plus and minus 50° giving a good chance to the south under lift conditions. The 80ft of feeder with a 10dB loss, however, is certainly a good candidate for replacement. Anyone got two lengths of LDF550 and connectors to donate?

A number of people have asked me which boards mentioned in a previous article we hold at



Home Counties TV Group. 'In stock' are the G8CMQ transmitter, FM receiver board and 80 channel frequency synthesiser.

I have revised a number of things in the transmitter to make it a more reliably repeatable design. Of all the repairs and tune-ups that I have done, the major contributory factor to poor performance has been capacitor legs that are too long. The capacitor values are now all appropriate to chip c's as supplied by Bonex. One particularly disturbing point is that Mullard ceramic capacitors now have a 'pin head' on the leg to prevent the ceramic dipping entering the solder and causing a dry joint on

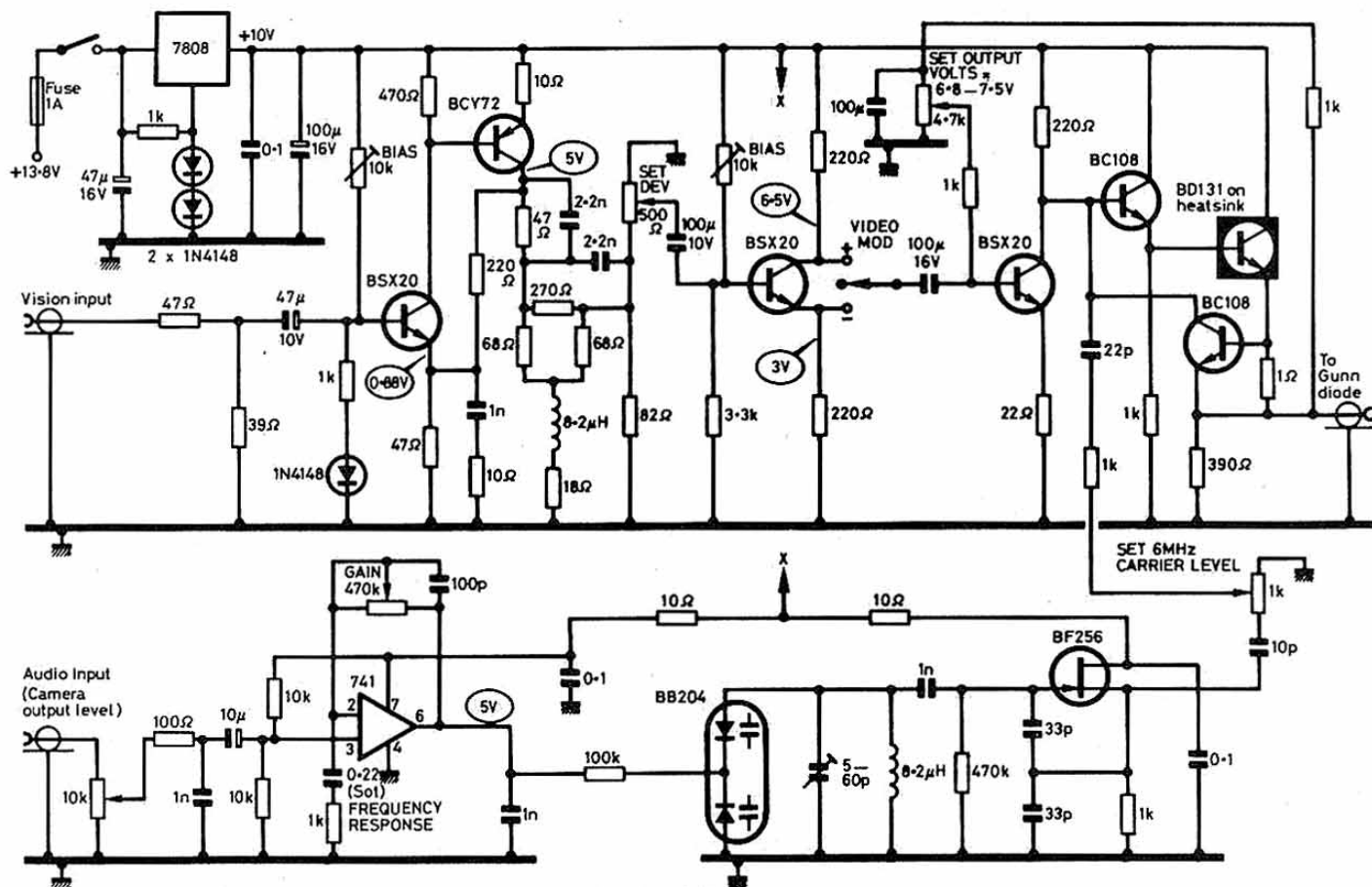


FIG 1. CIRCUIT USED BY G4CRJ AND G8LES FOR THE 10mW TRANSMITTER. SEE TEXT ABOVE.

printed circuit boards. This type of capacitor has so much lead inductance that it's *useless* for RF construction unless you chip away the protective coating, cut off the pin head, and solder onto the newly exposed lead. The transmitter gives around two watts flat across the band when built according to the new instructions.

The receiver has undergone changes to improve quieting of the picture, colour performance, sound quieting and bandwidth. The receiver has tunable sound, full UHF band input IF, one watt audio output, AFC, signal metering, tuning metering, limiting and AGC. The synthesiser is £6.50, the receiver is £10.50 and the transmitter is £8.50. All come with modified instructions and a recommendation to buy your own components from Bonex at Langley, near Slough.

I have hand-carved some of my 'own design' PA boards for the Mitsubishi M57762. They seem rather better on this board than the reviews would indicate for the earlier design in CQ TV. When driven by the above transmitter on 13volts, 25watts was obtained on 1250 and 19watts on 1310; this is a pretty good power bandwidth curve. If there is enough interest in this board I will make some available.

SUNDAY NEWS

The RSGB has taken up our proposal that the DTI allow us to bring the Sunday news broadcast into the 20th Century by televising the half an hour reading via the High Wycombe TV repeater. I hear that other groups want to do the same in their areas. I can only foresee benefit from this, so please let's be allowed to get on with it! There are a number of production problems to be overcome, and we will probably have to start in the same way as commercial TV by simply videoing the news reader. It's obvious that the use of a teleprompter with RSGB approved text on disk, read into a large character creation program, will improve the news reader's 'talk to camera'. As we gain experience, we can bring in a genlocked computer and camera, to add photographic material from groups and graphics to the transmission. We think this is a great idea, and hopefully we will be able to get moving soon.

Repeater linking is also a subject undergoing considerable discussion. It appears to be a popular activity in New Zealand, Australia and USA. How about this for a proposal. The access control sequence could be on the audio channel and in the form of a quick burst of tones or packet data. Stations not strong enough to get their audio above squelch would not get into a link, as they may well not be able to hear each other on two metres and be reliant on that link.

If a sequence such as G6HVQ HV UD were to be transmitted, his signal would route via High Wycombe to Dunstable, and appear on HV as normal. The command sequence would open the link to UD. UD would then repeat the link for, say, 30 seconds. G6HVQ would drop transmission after 30 seconds. UD and HV would both go into 'K' mode. UD would open the link in return for 30 seconds. If the repeater was busy with local traffic it would place that on the link, and if not its 'K' card would be displayed, thus giving the local station an indication of acceptance or denial. Remote accessing would not be allowed at more than five minute intervals, on the five minutes, with a plus and minus 30-second window. All sections of the link would have to have gear relay operated.

Links are effectively as much a major project as a

repeater in themselves, and therefore I suspect that if this comes off we will have to rely on appropriately sited stations to form a manned chain, between repeaters. Point to point links must be getting a P4 at minimum and ideally reprocess the signal at some point in the chain. I suspect that it will be too expensive to set up special link sites and deal with all the red tape that goes with them, so a manned chain looks like the best idea to me. Anyone got any ideas?

LMW Electronics have written to me (0533 630038) enclosing their catalogues and information. They keep a number of devices and kits for 23cm, including the M57762 PA modules. It is well worth spending the extra money on this module rather than the BLV93 six watt PA because several that I have had to fix all seem to be 144MHz noise generators. The main culprit is the base choke, which needs to be replaced with a resistor about 4-7ohms. The transistor itself is not really suited to 23cm and has a peculiar characteristic in that the maximum input drive and collector current tuning position does not correspond to the best output. After modification and inclusion of some extra decoupling capacitors it does, however, produce a useful increase, but I would go for the modules in respect of effort versus results.

The aerial tests that I mentioned previously have been carried out by G3NAQ at Harwell. Results will be available as soon as the reference aerial has been calibrated, against which the results were compared. Many thanks to all those who helped over several weekends.

70CM

G8MNY has completed his K2RIW linear for contest working. It turned out to be a major project, taking just over a year to complete. Its development threw up quite a few interesting points, which I shall skim through now. For instance, a single valve takes 15watts drive for peak sync ATV, and so it is entirely logical that the K2RIW two-valve amplifier takes 30watts to drive it. A major consideration has to be a transistor PA to drive the valves, preferably using a 50watt transistor to keep it away from sync compression and within the linear operating condition. Such a device could be an SD1434, available from Transworld Scientific at High Wycombe. Another difficulty encountered was ensuring that the valves were driven truly in parallel. To this end an extra-large triangular shaped piece of brass was fitted, replacing the original T-bar shape. This minimised the inductance between the valve bases forcing the valves to operate as one. The output coupling flapper capacitor was increased in size. In its original condition, if the loading was lightly coupled it could lead to half-inch sparks or valve flash over. The output power from this design appears to be around 650watts of carrier (in peak terms is 919watts) which is enough to cook eggs on the next door neighbour's TV front end transistor! The amplifier has one drawback in that it is only really suitable as a contest unit because its colour performance is poor owing to its narrow bandwidth. It may be possible to shorten the anode line and increase the tuning capacitor, to lower the Q and increase the bandwidth, but at the cost of efficiency and output power.

COME ON - SEND IN SOME DETAILS OF LOCAL ACTIVITY: WHO YOU'VE WORKED, WHAT'S BEEN HAPPENING AND WHAT WILL BE HAPPENING. OTHERWISE I WILL HAVE TO PRISE INFORMATION OUT FORCIBLY!

SWL

BOB TREACHER BRS32525

HEARD ALL BRITAIN AWARD SCHEME

Dennis GW6JNE has recently taken over the SWL side of this very popular award scheme. It is a few years since I was a member of the WAB Committee, but since then, the scheme has really taken off.

For those new SWLs who are unaware of the scheme, it was devised by the late G3ABG to promote interest in Britain and sponsor a series of awards based on the British Isles. Since its inception, the award scheme has grown beyond all proportions. The grid reference system of Great Britain and Northern Ireland is used as the basis of the main award - to collect 600 squares, 35 counties and one station in each of G, GD, GI, GM and GW. More difficult awards are also available, culminating in the Sapphire award which requires 2,500 areas, 77 counties, one station from all G prefixes and eight islands. Nets are in evidence at most times on 3-760kHz, and also on 1-930kHz and 7-060kHz.

Award record books are priced £6 and are available from G4KSQ, QTHR. If any SWL has any ideas to improve the award scheme for the SWL, GW6JNE would be pleased to hear from you. His address is 7 Penrhos Crescent, Rummey, Cardiff CF3 8PB. I shall be pleased to provide a quarterly update in the column on awards issued to SWL's, new SWL members and any other information about SWL's associated with the award scheme.

HF CONTESTS FOR 1989

As promised last month, I can provide a few details about the major contests open to SWL's this year. Every year it is hoped that more listeners will take the plunge and enter a contest. However, the response is disappointing. Hopefully this year will see a change. Contests are really good fun and go a long way to improving your skill and technique, but, like our transmitting colleagues, you either like them or loathe them.

Here are the major events of the year, together with their sponsors.

Contest	Date	Sponsor
UBA 1989	1 January - 31 December	UBA
LF Challenge	1 January - 31 January	BRS32525
White Rose LF 7MHz CW	14/15 January	WRARS
Commonwealth UBA SSB	25/26 February	RSGB
RRU	11/12 March	UBA
UBA CW	25/26 March	RSGB
RSGB SWL	21 May	UBA
21/28MHz SSB	27/28 May	RSGB
21MHz CW	8/9 July	RSGB
HF Challenge SSB	8 October	BRS32525
HF Challenge CW	15 October	BRS32525
	28/29 October	
	25/26 November	

Those keen on HF Contests will note that the Society's 7MHz SSB is missing from this year's calendar. This is down to poor support for the last few years, by both amateurs and SWLs. A new event may be forthcoming to take its place. The Region Round-Up (RRU) contest is also under review and may be replaced with a similar event.

Cray Valley RS may sponsor their SWL Contest again in September, but it did not appear in 1988. Finally, a reminder that the White Rose RS are looking for a sponsor for their LF SWL Contest. If none come forward, the event will be lost - it is up to you!

CQWW SSB

With conditions so good for the CQWW SSB contest at the end of October, and a good number of listeners sending me details, I will give a brief synopsis of the event.

The matrix shown here was devised using the information sent by Arthur Miller BRS88969, Robert Small BRS8841, David Whitaker BRS25429 and myself. It gives a good indication of how good the bands were. It shows that a total of at least 170 countries were active during the weekend, and that at least 151 were active on 28MHz alone. All four of us spent a great deal of time on that band and were rewarded with some really good DX – for example ON5SY/BV, FR5ZB, AH0B, KD7P/NH2, YJ0RY, ZX0F and VK9YG.

After 28MHz, the best band appeared to be 7MHz, where 92 countries were heard, including ZX0F, J52UG and 5Z4SS. A glance at the 21 and 14MHz columns of the matrix will show that these bands were in good shape too. The 3.5 and 1.8MHz were poor, although JX1UG was a welcome addition on the latter. A table of individual scores by the four of us is as follows:

Station	28	21	14	7	3.5	1.8	Total
BRS8841	101	67	66	47	41	35	357
BRS25429	128	—	—	75	—	44	247
BRS32525	118	72	82	55	49	37	413
BRS88969	111	93	86	71	45	35	441
Total	151	108	105	92	58	50	564

Obviously this only represents what a very small percentage of British listeners heard during the contest. Others might have heard more – exactly what will be revealed when the HF Challenge results are available.

There were the usual number of 'odd' prefixes which were issued specially for the contest, let me know of any real difficulties. However, one which had already caused problems was the country status of the 'PJ' stations. One easy way to tell is from the contest exchange given. Those who gave 'Zone 8' were on islands counting for St Maarten, Saba and St Eustatius (PJ7), while those who gave 'Zone 9' count for the Netherlands Antilles (PJ2).

Several groups offered certificates for working stations on five bands, I will see if SWL reports for five bands also qualify – I see no reason why not!

G4LJF FOOTNOTE

Now, a footnote to the piece on G4LJF QSLing arrangements which appeared last month.

Following Ian's recent expedition to Antigua (as G4LJF/V2), he has stated that all SWL reports must detail a contact made with a country outside your own. Also, all SWLs who need a card from V2 should ensure that their cards are with G0BTY by 1 March, SWL cards received after that date will not be answered; you have been warned.

MORE COUNTRIES?

Avid country-chasing SWLs might be interested to note that there could be a few 'new' countries on the way. It appears that some enterprising DXers have spotted what appears to be a loophole in the new DXCC rules which were adopted last January. The recent 3D2XX trip seems to be a good example of this. The new rule talks in terms of country status being allowed if the country is separated by a minimum of 225 miles of open water from a continent, another island or group of islands that make up any part of the 'parent' DXCC country. Rotuma Island is 280 miles from its 'parent' country of Fiji so would appear to be a 'new one'.

ANTENNA SLOT – THE VERTICAL

The basic vertical antenna is a quarter-wave long (see Fig 1), with the ground itself acting as a mirror quarter-wave segment which has some influence on the antenna's performance. The mirror segment of the antenna can be the ground itself or a network of wires or conducting tubing that acts as a synthetic ground; this is called a ground plane and tends to improve results. A ground plane should also be used when mounting the antenna high above the ground.

Maximum sensitivity is concentrated at low vertical angles below 45 degrees and in terms of long-haul DX, the low wave angle is advantageous and can be obtained even though the antenna is usefully mounted near the ground.

A simple arrangement for a vertical antenna is shown in Figs 2 and 3. By driving a pipe (6ft or longer) into the ground a reasonably low-resistance link to ground can be obtained. A ground radial system comprised of four or more quarter-wave conductors buried about 2in beneath the lawn will help improve sensitivity at low vertical angles. These two methods can be combined with good effect. In connecting the coaxial cable, the inner conductor connects to the very bottom of the vertical, while the braid connects to the pipe/radial system. Next month we will look at the delta loop.

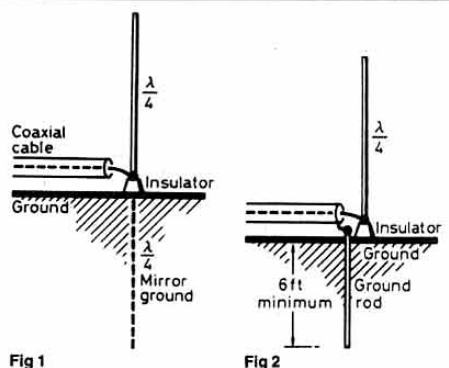


Fig 1

Fig 2

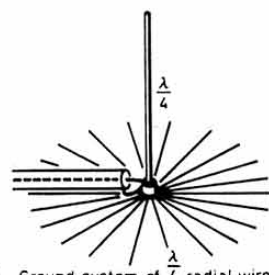


Fig 3 Ground system of 4 radial wires

HF NEWS

Joan Slater BRS90400 reported only one new country during the big contest over the last weekend of October, but recorded plenty of unusual prefixes.

Brad Bradbury BRS1066 wrote for the first time for a few months to update happenings from Cheltenham. He participated in the Society's 21MHz CW contest and claimed a score twice as high as in 1987! Brad also reported a number of Russian confirmations and his 158th Oblast confirmation from U18CAJ for a 7MHz report, the card coming back from UB5-065-494 complete with Russian Calendar! For others who collect Oblasts, it might be worth noting that Oblasts 176, 177, 179, 182, 183 and 184 have been deleted, with 192 (UJ-K) being added. This gives a total of 179 to collect.

The 3W8CW/DX expedition was reported by many SWL's on all bands from 3.5 to 28MHz. A fine expedition indeed, and one which gave even the most experienced listener several new band countries.

Martin Parry BRS52543 has acquired the new Lowe HF125, which he finds performs well on all bands. However, Martin has also been putting a new zepp antenna through its paces with good results.

Richard Cains BRS91517 sent for a QSL Managers list advertised last month and that he used a Sony ICF600D receiver, but was considering buying another receiver though he was undecided on which model. He is fairly new to the hobby but has already picked up many useful tips from members of several clubs in South East London.

Once again I seem to have left Robert Small's report until last! He reported a very good month, logging the 3W8 on five bands. Robert had hoped to collect a few new countries on 1.8MHz in the contest, but was disappointed in only catching ZB2X. Not surprisingly, Robert has spent much of his listening time on 28MHz, deserting his favoured 14MHz. He managed the 3W and 3D2VV for new ones on SSB, while CW accounted for 10 new

countries including D68JL, 5UW386 and P29PL. At last he had received cards for the VU4GDG expedition, plus one from VP8BRR on South Georgia.

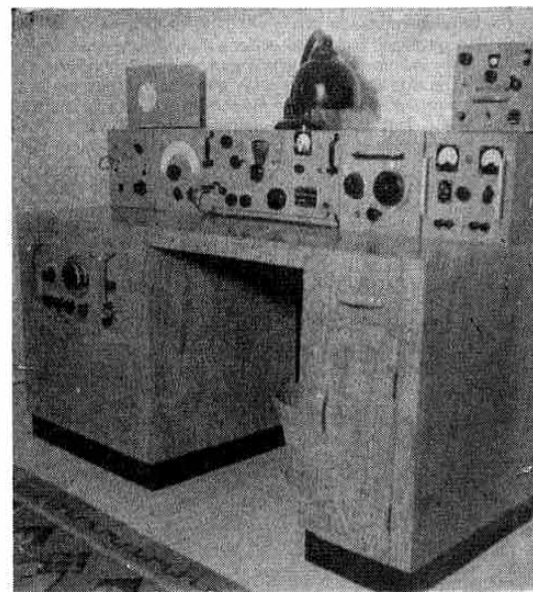
FINALE

Apart from reminding listeners about the North Pole expedition mentioned last month, that is about all for this issue. Next month I may even have a competition for you! Help me fill the extra space by sending any news, views, photographs for the March issue to arrive no later than 7 January.

1988 HF COUNTRIES TABLE

Station	DXCC	28	21	14	7	3.5	1.8	Tot
BRS25429	251	192	199	205	167	138	70	971
BRS8841	258	183	213	228	143	137	57	961
BRS52543	220	156	160	174	133	134	53	810
BRS32525	194	168	107	120	122	130	57	704
BRS88969	154	111	93	86	71	45	53	551
BRS1066	158	80	112	121	92	49	45	499
BRS90400	184	51	105	165	66	80	20	487
BRS91397	140	54	101	93	52	45	15	360
ORS45992	172	95	100	115	21	20	0	351
BRS90808	143	21	59	109	43	52	12	296
F11ATZ	124	76	87	55	25	15	0	258

A good battle is developing for top spot for 1988 – who will finish number 1.



C O N T E S T N E W S

GENERAL RULES FOR RSGB VHF/UHF/SHF CONTESTS 1989

The rules governing all RSGB VHF/UHF/SHF Contests held in 1989 will include the following general rules, supplemented by individual rules for each contest. *Please read the rules carefully before the event.*

Rule 16 has been changed to limit the power capabilities of amplifiers used for contest work. Manufacturer's valve and transistor ratings will be used in determining compliance with this rule.

Cover sheets (Form 427-86), summary sheets (Form 4422), and small quantities of log sheets (Form LSVHF) are available from RSGB HQ on receipt of a large s.a.e. Larger quantities of log sheets may be obtained from RSGB Publications (Sales).

Queries on VHF contests may be made to John Quarby, (G3XDY), 12 Chestnut Close, Rushmere St Andrew, Ipswich, Suffolk IP5 7ED; Telephone Ipswich (0473) 717830 (between 6pm and 9pm).

The individual contest rules contain most of the detailed information on the sections, scoring systems and methods of tabulation. Unless otherwise stated in the individual contest rules, all of the general rules apply in every contest.

Please note that all points claimed for a contact will be lost by both stations if either station logs callsigns incorrectly, including any suffix. The receiving station will also lose all claimed points for a contact where other information is logged incorrectly. Ten times the claimed score will be lost for unmarked duplicate contacts.

The committee intends to make station inspections in events other than VHF NFD during 1989.

Rules that have changed are marked by an asterisk.

1 Entries*

All entries must be sent to the contest adjudicator at the address shown in the individual contest rules. Entries sent to other addresses will be treated as check logs. All entries become the property of the RSGB and cannot be returned. Recorded delivery and registered post should not be used, as receipt of your entry may be delayed.

2 Last posting date

All entries must be postmarked not later than 16 days after the end of the contest or last cumulative activity period.

3 Cover sheets*

All entries must be accompanied by a correctly completed current RSGB VHF/UHF contest cover sheet (Form 427-86) for each band used, including full details of antennas and final amplifier devices. In multiband events entrants must also complete a multiband summary sheet (Form 4422). In contests using a county/country multiplier scheme a multiplier check list must also be included.

4 Operators

All operators must be RSGB members.

5 Single-Operator fixed stations

Single operator fixed stations are those operated by the licensee in person from his/her normal place of residence, with no assistance with operating or log keeping during the contest.

6 Fixed stations*

To be eligible to enter a fixed station section the station must be located at the main station address shown on the licence validation document.

7 Locations*

In multiband events all stations forming one entry must operate from one site, defined as a circle of 1km radius.

All equipment for /P stations must be installed on site during the 24 hours before the contest or during the contest itself. There must be no operation from the site on the bands involved in the contest in the week prior to the contest.

Entrants may not change the location of their stations during the contest.

8 Valid contacts*

No points will be lost if a non-competing station contacted by an entrant is unable to supply an IARU Locator, or serial number, but the receiving operator must obtain and record enough information to be able to calculate the claimed distance score. Contacts with stations whose callsigns appear on the cover sheet will not count for points.

Only one scoring contact may be made with a given station on each band in use during the contest, ie any callsign regardless of suffix or prefix may only be worked

for points once. Any non-scoring contacts must be clearly marked in the log. Unmarked duplicate contacts will be penalised at the rate of 10 times the claimed score for that contact.

In cumulative contests one contact may be made with a given station (as defined above) during each activity period. The adjudicator will normalise the scores in each session (see rule 10), and each entrant's best three scores will be combined to determine the overall placing. Entrants should submit logs for every session for which they are active.

9 Radial ring scoring*

Contacts made between stations separated by the distances shown in the table will score as indicated.

km	Points
0-50	1
51-100	3
101-150	5
km	Points
151-200	7
201-250	9
251-300	11

and pro rata. For computer scoring purposes a conversion factor of 111.2km/degree must be used. In 50MHz contests all contacts over 650km score 25 points.

10 Final Tabulation of multiband and cumulative contests

The final tabulation showing the overall results will be formed by taking the sum of the normalised scores on each band or from the three best sessions in cumulative contests. The normalised score will be calculated by dividing each station's points score by that of the band/session leader and multiplying by 1,000.

ie

Normalised score for each band/session =

$$\frac{\text{Score achieved}}{\text{Band/session leaders score}} \times 1,000$$

11 Awards

There will be an award to the highest scoring station in each section. An award will also be made to the runner-up in each section in which there are ten or more entries. Certificates of merit may be awarded at the adjudicator's discretion.

12 Crossband contacts

Crossband contacts do not count for points.

13 Log Keeping*

The logs for contest entries must be made out on current RSGB vhf/uhf log sheets or, if computer listings are to be submitted, these must be cut to A4 size, RSGB log format, line spaced to contain 25 contacts per sheet, and be correctly collated (not Z-fold). Each sheet must be headed with the entrants call sign, IARU locator, contest title, and sheet number. The total points claimed on each sheet must be included at the foot of the sheet. Logs must be tabulated as follows:

- Date/time (GMT)
- Callsign of station worked
- My report on his/her signal and serial number
- His/Her report on my signal and serial number
- IARU Locator received
- QTH or county received (when required) or comments
- Points claimed

The contest exchange must consist of both callsigns, RS or RST report followed by serial number, and IARU locator. Where QTH information must be exchanged it must be given as a point identifiable on an Ordnance Survey route planning map or equivalent (scale 1:625,000) or as a distance and direction not greater than 25km from such a point. Any complaints received or made about signals must be recorded in the comments column.

14 County/country multipliers*

a) In contests using a county/country multiplier scheme the contest exchange will include the full county name on phone or the code letters shown in this operating guide on CW. The county must be shown on each log sheet.

b) Each new county or country worked is a multiplier and must be clearly identified in the log. Note that this includes your own county and country, and that a contact with a station in another G Prefix area can count for both a county and country multiplier. Where more than one station is worked in a particular Scottish region, additional multipliers can be claimed for each contact, up to a maximum of three multipliers per region.

c) The score obtained under rule 9 is multiplied by the total number of multipliers worked to provide the claimed score.

d) A separate multiplier check list must be included showing as a minimum the counties and countries worked in alphabetical order together with the callsign and serial number of the first claimed contact for each multiplier. If other contacts are to be considered as alternative multipliers should the first contact be invalid for any reason, then please include callsigns and serial numbers for subsequent contacts with each county or country.

15 Serial Numbers

Serial numbers start from 001 on each band and advance by one for each contact. In cumulative contests serial numbers increment from 001 for each activity period.

16* A station must operate from within the terms of his/her normal licence. (This excludes high power permits.) The final amplifier device(s) used must not be capable of a rated power output in excess of twice the power specified for the event or the licence limit, whichever is lower. Special event callsigns may not be used.

17 The same antenna system must be used on transmit and receive.

18 Stations using telephony in the recognised CW sub-bands are liable to disqualification. Entrants must observe the provisions of the IARU/RSGB band plans. Bands other than those included in the contest cannot be used simultaneously by a separate station for setting up contacts or talkback.

19 Stations which persistently radiate poor-quality signals, or otherwise contravene the code of practice for VHF/UHF contest operation (see below), are liable to disqualification or loss of points. Gross errors in logging will result in disqualification.

20 Contacts made via a repeater, man-made satellite, or moonbounce will not count for points.

21 Proof of contact may be required.

22 Entrants must permit inspection of their station by members of the VHF Contests Committee, or its representatives, and give site access information if requested to do so. The inspector must be permitted to remain for as long as desired, and to return to the site at any time during the contest. Contestants must demonstrate to the inspector's satisfaction that they are obeying the rules of the contest.

23 The ruling of the Council of the RSGB shall be final in all cases of dispute.

GENERAL RULES FOR RSGB LISTENERS VHF/UHF CONTESTS 1989

1 The 1989 general rules for vhf/uhf contests will apply except where modified by these rules.

2 Listeners contests are open to all non-licensed members of the RSGB. Only the entrant may operate the receiving station.

3 Logs must show in columns: (a) date/time (GMT), (b) Callsign of station heard, (c) My report on his/her signals, (d) report and serial number sent by station heard, (e) callsign of station being worked, (f) IARU locator given by station heard, (g) QTH given by station heard (if appropriate), (h) points claimed.

On 144MHz the callsign in column (e) may only occur once in every ten contacts logged. CQ and test calls do not count for points and should not be logged. If both sides of a QSO can be heard, both can be claimed for points.

The Hansen Trophy will be awarded to the entrant with the highest aggregate score in all the swl contests between 4 March and 3 September 1989. The aggregate score will be calculated in accordance with general rule 10.

CODE LETTERS FOR USE IN RSGB CONTESTS

County/Region	RSGB Zone	Letters	County/Region	RSGB Zone	Letters
Alderney	D	ALD	Isles of Scilly	D	IOS
Antrim	F	ATM	Isle of Wight	D	IOW
Armagh	F	ARM	Jersey	D	JER
Avon	D	AVN	Kent	C	KNT
Bedfordshire	B	BFD	Lancashire	A	LNH
Berkshire	D	BRK	Leicestershire	B	LEC
Borders	G	BDS	Lincolnshire	B	LCN
Buckinghamshire	D	BKS	Greater London	C	LDN
Cambridgeshire	B	CBE	London	F	LDR
Central	G	CTR	Lothian	G	LTH
Cheshire	A	CHS	Greater Manchester	A	MCH
Cleveland	A	CVE	Merseyside	A	MSY
Clwyd	E	CWD	Norfolk	C	NOR
Cornwall	D	CNL	Northamptonshire	B	NHM
Cumbria	A	CBA	Northumberland	A	NLD
Derbyshire	B	DYS	Nottinghamshire	B	NOT
Devon	D	DVN	Orkney	G	OKE
Dorset	D	DOR	Oxfordshire	D	OFE
Down	F	DWN	Powys	E	PWS
Dumfries & Galloway	G	DGL	Shropshire	B	SPE
Durham	A	DHM	Sark	D	SRK
Dyfed	E	DFD	Shetland	G	SLD
Essex	C	ESX	Somerset	D	SOM
Fermanagh	F	FMH	Staffordshire	B	SFD
Fife	G	FFE	Strathclyde	G	SCD
Mid Glamorgan	E	GNM	Suffolk	C	SFK
South Glamorgan	E	GNS	Surrey	C	SRY
West Glamorgan	E	GNW	East Sussex	C	SXE
Gloucester	D	GLR	West Sussex	C	SWX
Grampian	G	GRN	Tayside	G	TYS
Guernsey	D	GUR	Tyne & Wear	A	TWR
Gwent	E	GWT	Tyrone	F	TYR
Gwynedd	E	GDD	Warwickshire	B	WKS
Hampshire	D	HPH	Western Isles	G	WIL
Hereford & Worcester	B	HWR	West Midlands	B	WMD
Hertfordshire	C	HFD	Wiltshire	D	WLT
Highlands	G	HLD	North Yorkshire	A	YSN
North Humberside	A	HBS	South Yorkshire	A	YSS
South Humberside	B	HBS	West Yorkshire	A	YSW
Isle of Man	A	IOM			

CODE OF PRACTICE OF VHF/UHF CONTEST OPERATION

1 Obtain permission from the landowner or agent before using the site, and check that this permission includes right of access. Portable stations should observe the Country Code.

2 Take all possible steps to ensure that a site is not going to be used by some other group or club. Check with the club and last year's results table to see if any Group used the site last year. If it is going to be used by another group, come to an amicable agreement before the event. Groups are advised to select possible alternative sites.

3 All transmitters generate unwanted signals; it is the level of these signals that matters. In operation from a good site, levels of spurious radiation which may be acceptable from a home station may well be found to be excessive by nearby stations (25 miles away or more).

4 Similarly, all receivers are prone to have spurious responses or to generate spurious signals in the presence of one or more strong signals, even if the incoming signals are of good quality. Such spurious responses may mislead an operator into believing that the incoming signal is at fault, when in fact the fault lies in his own receiver.

5 If at all possible, critically test both receiver and transmitter for these undesirable characteristics, preferably by air test with a near neighbour before the contest. In the case of transmitters, aim to keep all in-amateur band spurious radiation, including noise modulation, to a level of

-90dB relative to the wanted signal. Similarly, every effort should be made to ensure that the receiver has an adequate dynamic range.

6 Above all, be gentlemanly at all times. Be helpful and inform stations apparently radiating unwanted signals at troublesome levels - having first checked your own receiver! Try the effect of turning the antenna or inserting attenuators in the feedline; if the level of the spurious signal changes relative to the wanted signal then non-linear effects are occurring in the receiver. Some recent synthesised equipment has excessive local oscillator phase noise, which will manifest itself as an apparent splatter on strong signals, even if there is no overloading of the receiver front end. Preamplifiers should always be switched out to avoid overload problems when checking transmissions. If you receive a complaint, perform tests to check for receiver overload, and try reducing drive levels and switching out linear amplifiers to determine a cure. Monitor your own signal 'off air' if possible. Remember that many 'linears' may not be linear at high power levels under field conditions with poorly regulated power supplies. The effects of overdriving will be more severe if speech processing is used, so pay particular attention to drive level adjustment.

If asked to close down by a Government Official or the site owner, do so at once without objectionable behaviour.

1 Date: 5 February 1989

2 Time: 0900 - 1500gmt

3 Teams. A society entering one team will have its placing determined by the aggregate scores of the three highest scoring stations in its team. A society may enter more than one team, in which case the aggregate scores of the three highest scoring stations will be placed in team 'A', the next three highest scoring stations in team 'B', etc.

4 Eligible entrants. Operators entering on behalf of an affiliated society must be a member of that society, but need not be a member of the RSGB. Other individual entrants must be RSGB members. All stations representing a society must be operated within 50km of the normal society meeting place. No station may represent more than one society. In the case of a society with national coverage, eg RNARS, each team may define a different society meeting place, but this should be a place of recognised significance, eg a naval base. For all purposes other than the indication of affiliation, each such entry shall be regarded as entirely separate. No operator shall use more than one callsign during the contest period.

5 Sections.

Each station will enter one of the following sections: Single Operator Fixed Stations, All modes (Section S) Single Operator Fixed Stations, FM only (Section F) Multi Operator Fixed Stations, All Modes (Section M) Listener section (Section L)

6 Entries. Each individual entry shall conform to the general rules. Each log must be accompanied by a 427-86 cover sheet, and must show the RSGB Zone that the station operated from. RSGB zones are defined in the Code Letters for use in RSGB Contests table published in the January 1989 issue of Radio Communication. All entries from one society are to be sent in one package to the adjudicator. Packages underpaid and bearing postage due stamps will be returned to the sender. Each package must include a declaration signed by an officer of the society that each entrant is a member of that society, and the normal meeting place address must be given. A note stating the number of teams representing the society, and their scores, should also be included.

7 Awards. Certificates will be awarded to the following:

The leading single operator fixed station (all mode) in each RSGB zone.

The leading single operator fixed station (FM only) in each RSGB zone.

The leading multi-operator fixed station (all mode) in each RSGB zone.

The leading affiliated society team in each RSGB zone.

The leading listener entry.

8 General Rules. The following general rules, published in *Rad Com* January 1989, will apply: 1, 2, 3, 5, 6, 8, 9, 12, 13, 15-23.

9 Adjudicator. All entries and check logs to: VHF Contests Committee, c/o J H Quarmby G3XDY, 12 Chestnut Close, Rushmore St Andrew, Ipswich IP5 7ED.

NB Although the contest includes an inter club element, entries from individual single or multi-operator fixed stations are encouraged.

144/432MHZ & SWL CONTEST RULES

1400 - 1400gmt, 4 - 5 March 1989

The general rules published in *Rad Com* January 1989 will apply. There will be three sections, section S for single operator stations, section M for multi-operator stations, and section L for listener entries. Single band entries for 144MHz only will not be accepted. Single operator entrants must use the same callsign on both bands. In addition to logs on LSVHF stationery, computer generated logs on IBM 360k format 5 1/4" Floppy Disks will be welcome. Please contact the adjudicator for further details.

All entries and check logs to: VHF Contests Committee, c/o D A Yorke, G4JLG, 40 Edge Fold Road, Worsley, Manchester, M28 4QF.

70MHZ CUMULATIVE CONTEST RULES

1100 - 1200gmt 29 January; 12, 26 February; 12 March; 0900 - 1100gmt 26 March 1989.

The general rules published in the 'Operating Guide', *RadCom* January 1989 will apply. There will be two sections, Section F for Single Operator Fixed stations, and section O for all others. QTH information must be exchanged.

All entries and check logs to: VHF Contests Committee, c/o D J Robinson G4FRE, 15 Ferry Lane, Cavendish Park, Felixstowe, Suffolk IP11 8UR.

432MHZ FIXED STATION, AFFILIATED SOCIETIES AND SWL CONTEST RULES

The rules for the inter club competition are the same as last year. The contest will continue to be open to individual entries, both single and multi-operator, as before. Individual station scores and overall team results will be separately tabulated, and certificates will be awarded to the leading stations and team in each RSGB Zone. A new FM only section has been added for this year. A team can comprise entrants to any of the sections.

50MHZ FIXED STATION CONTEST RULES

0900 - 1500gmt, 9 April 1989

The general rules published in *Rad Com* January 1989 will apply. There will be two sections, section F for single operator fixed stations, and section O for all other fixed stations. County and country multipliers will be used (general rule 14).

All entries and checklogs to: VHF Contests Committee, c/o A J Collett, G4NBS, 10 Quince Road, The Limes, Hardwick, Cambridge, CB3 7XJ.

THE COMMONWEALTH CONTEST 1989 RULES

(Participation in this contest will count towards the HF Contest Championship for UK entrants)

TRANSMITTING SECTION

1 Date and Time: 1200gmt Saturday 11 March to 1200gmt Sunday 12 March.

2 Sections: Single-operator entries only from members of the RSGB resident in the UK and radio amateurs licenced to operate within the British Commonwealth or British Mandated Territories. Entries from GB prefixes, marine or aeronautical mobile will not be accepted. Entries may be single-band or multi-band. Single-band entries should show contacts on one band only. (Details of contacts made on the other bands should be in the form of a check-log and will not count for points or bonus.) Multi-band entries will not be eligible for single-band awards.

3 Bands and mode: A1A only in the 3-5, 7, 14, 21 and 28MHz bands. In accordance with IARU policy to minimise interference to non-competing stations, entrants should

operate in the bottom 30kHz of each band (except when contacting novice stations that operate above 21030 and 28030kHz. Cross-band contacts will not count for points or bonus.

4 Operation: Entrants must operate from the same location during the duration of the contest and strictly within the terms of their amateur licence. As this is a single-operator contest, entrants may not receive any assistance whatsoever during the contest. This includes the use of spotting nets or any other form of bonus assistance.

5 Exchange: Contacts may be made with any station using a British Commonwealth prefix, except those with the entrant's own call area. UK entrants may not work other UK stations for points or bonus. A contact exchange consists of RST and a serial number commencing with 001 and increasing by one of each successive contact through the contest. Serial numbers when sent by non-competing stations must be recorded.

6 Scoring: Each completed contact will score five points. In addition a bonus of 20 points may be claimed for the first three contacts with a Commonwealth call area on each

band. Commonwealth call areas for use in this contest are shown in the accompanying list. All UK call areas (G, GB, GD, GI, GJ, GM, GU and GW) count as one call area, except for the special Contest Committee station GB5CC, which will count as a separate call area for all entrants (including the UK). It is possible that other HQ stations from Commonwealth societies may be active and these will also count as a separate call area.

7 Documentation: Separate log sheets using the IARU preferred format (RSGB HFC1) showing gmt, callsign of station worked, RST/Serial number sent, RST/Serial number received, points and bonus claimed. Separate band totals should be added together and the totals shown on the cover sheet. A sheet showing duplicate contacts will be appreciated. Entrants should note that logs are carefully checked and unmarked duplicate contacts for which points are claimed are penalised at 10 times the number of points/bonus claimed. Logs containing more than five unmarked duplicates may be disqualified. The entry should include a signed declaration stating that the station has been operated in accordance with the terms of the entrant's

COMMONWEALTH CALL AREAS

The following call areas are recognised for the purpose of scoring in the Commonwealth Contest, 1988.

A2	Botswana	VP9	Bermuda
A3	Kingdom of Tonga	VQ9	Chagos
C2	Nauru	VR6	Pitcairn
C5	Gambia	VS5	Brunei
C6	Bahamas	VS6	Hong Kong
G/GB/GD/GI/GJ/GM/GU/GW UK			
H4	Solomon Is	VY1	Yukon
J3	Grenada	VU	India
J6	St Lucia	VU7	Lacadeive Is
J7	Dominica	VU7	Andaman & Nicobar Is
J8	St Vincent	YJ	Vanuatu
P2	Papua New Guinea	Z2	Zimbabwe
S7	Seychelles	ZB2	Gibraltar
T2	Tuvalu	ZC4	Cyprus (UK Bases)
T30	W Kiribati	ZD7	St Helena
T31	C Kiribati	ZD8	Ascension Is
T32	E Kiribati	ZD9	Tristan da Cunha, Gough Is
V2	Antigua, Barbuda	ZF	Cayman Is
V3	Belize	ZK1	Cook Is
VE1	Maritime Provinces	ZK1	Manihiki
VE1	Sable Is	ZK2	Niue Is
VE1	St Paul Is	ZK3	Tokelau
VE2	Province of Quebec	ZL0	New Zealand
VE3	Province of Ontario	ZL1	New Zealand
VE4	Province of Manitoba	ZL2	New Zealand
VE5	Province of Saskatchewan	ZL3	New Zealand
VE6	Province of Alberta	ZL4	New Zealand
VE7	Province of Br Columbia	ZL7	Chatham Is
VE8	North West Territories	ZL8	Kermadec Is
VK1	Aust Capital Territory	ZL9	Auckland & Campbell Is
VK2	New South Wales	3B6/3B7	Agalega & St Brandon
VK3	Victoria	3B8	Mauritius
VK4	Queensland	3B9	Rodriguez Is
VK5	South Australia	3D2	Fiji
VK6	Western Australia	3D6	Swaziland
VK7	Tasmania	4S	Sri Lanka
VK8	Northern Territories	5B4	Cyprus
VK9L	Lord Howe Is	5H	Tanzania
VK9M	Melish Reef	5N	Nigeria
VK9N	Norfolk Is	5W	Western Samoa
VK9X	Christmas Is	5X	Uganda
VK9Y	Cocos (Keeling) Is	5Z	Kenya
VK9Z	Willis Is	6Y	Jamaica
VK0	Heard Is	7P	Lesotho
VK0	Macquarie Is	7Q	Malawi
VK0/VP8/		8P	Barbados
ZL5	Antartica	8Q	Maldives
VO1	Newfoundland	8R	Guyana
VO2	Labrador	9G	Ghana
VP2E	Anguilla	9H	Malta
VP2K	St Kitts, Nevis	9J	Zambia
VP2M	Montserrat	9L	Sierra Leone
VP2V	British Virgin Is	9M2	W Malaysia
VP5	Turks & Caicos	9M6/9M8	E Malaysia
VP8	Falkland Is	9V	Singapore
VP8	S Georgia	9Y	Trinidad & Tobago
VP8	S Orkneys		
VP8	S Orkneys		
VP8	S Sandwich Is	GB5CC	RSGB HQ STATION
VP8	S Shetland Is		OTHER HQ STATIONS

144MHZ TROPHY AND SWL CONTEST RESULTS

Despite the postal strike the number of entries was little changed from last year. GU4APA/P, the Hillbillies group, repeated their win of 1987 from the same site, with a convincing margin over the Parallel Lines group operating from the Cherbourg peninsular, and their name will appear on the Mitchell Milling Trophy again. In the Single Operator section G4PIQ wins the Thorogood Trophy, with G6HKM in runner-up spot. Certificates will also go to the leading stations in each RSGB Zone, and to BRS32525, the leading SWL.

Tropo conditions were reasonable, but there was some surprising Sporadic E propagation which enabled GU3CKR/P to work 10 Italian stations in rapid succession on the Sunday morning. No other stations seemed to experience this opening. Despite this boost to their score, GU3CKR/P failed to work many of the German stations contacted by GU4APA/P, and this accounted for much of the difference in their scores.

The exodus from the mainland encouraged the Parallel Lines group to go to France, and they thought it was "almost worth the three hours trying to get through the French customs". Several stations suffered from generator failure, plus the usual list of equipment malfunctions as can be seen from a sample of the comments received: "Suffered two faulty linears and a faulty generator" G4UHF/P; "lost two linears in the first hour and had to borrow another" G3ISO/P; "WX= Very Windy (1 broken mast, 2 broken antennas, and very little blood), RX= Reasonable enough - although as I write EA & F stations are booming in, support very low - many stations not out and seemingly not on" G14KIS/P.

G14KIS also suggested that the scoring system should benefit the more remote stations more. The effects of rescoring some logs using the suggested square law system is being studied to see if this would have the desired effect.

A number of entrants commented that activity seemed to be lower than expected, particularly in the midlands and North of England. This year there was a complete absence of portable stations in Wales, and only a very low level of support from GM.

Thorough checking showed up a lot of inaccuracies, with over 10% of claimed scores lost in some cases. Contacts with French stations seemed to give the greatest problems, particularly with variants of callsigns.

A computerised checking system is now available, and this will allow log data supplied on IBM format floppy disks to be handled efficiently. Full details can be obtained from G4JLG, QTHR. The assistance of G4IRB and G4NTY during checking helped greatly.

Zonal Winners:

Zone	Multi-Op.	Single op.
A	GD4IOM	G8ZRE
B	G4SIV	G6IAT
C	G6CMS/P	G4PIQ
D	GU4APA/P	G0HXO/P
E	-	GW4VEQ
F	G14KIS/P	-
G	GM0GDL/P	-

licence and that the rules and spirit of the contest have been observed.

8 Entries: To the HF Contests Committee RSGB, PO Box 73, Lichfield, Staffs, WS13 6UJ, England. Adjudication of this contest will commence on Monday April 10, 1989. Overseas entrants are advised to forward their logs by airmail. Entries received after the adjudication date will be treated as check-logs. Entries become the property of the RSGB and in the event of any dispute the ruling of the Council of the RSGB shall be final.

9 Awards:

(a) Multi-band section: To the overall winner the Senior Rose Bowl; to the runner-up the Junior Rose Bowl and to the leading UK entrant the Col. Thomas Rose Bowl. (b) Single-band section: Certificates of merit to the leading overseas and UK entrants on each band. (c) Certificates of merit to the leading multi-band station in each of the call areas.

RECEIVING SECTION

Rules as for the transmitting section except as detailed below:

(a) Only the entrant may operate the station for the duration of the contest. Holders of transmitting licences covering the frequencies below 30MHz are not eligible to take part.

(b) To count for points, a station outside the entrants own call area must be heard in a contest contact. CQ or test calls will not count for points. A station may be logged only once on each band for the purpose of scoring. When both stations in contact are heard, they should be logged separately and points claimed for both entries provided that the stations are outside the entrant's own call area.

Each completed log entry will score five points. In addition, a bonus of 20 points may be claimed for the first three stations heard in each British Commonwealth call area on each band. All British Isles prefixes will count as one call area.

A separate log is required for each band. Logs should show the date/time gmt, callsign of station heard, RST/serial number sent by the station heard, callsign of the station being worked and points claimed.

(c) The Receiving Rose Bowl to the winner. Certificates of merit to the leading entrant in each continent.

Multi-Operator Section

Pos	Call	Pts	QSO	Loc	Amp	Ant no.	type	km	Best DX call
1	GU4APA/P	15113	1035	89VR	2x8874	8	17Y	840	DF0OG
2	F/G4LPP	12704	884	99IO	2x'250B	8	17Y	860	DL1ZC/P
3	GU3CKR/P	9213	646	89QK	2x 8874	8	17Y	1905	IT9IPQ/P
4	G6CMS/P	8590	648	01PU	4CX1000	4	14Y	818	FF2LY/P
5	G4RKV/P	7747	585	01OI	2x'250B	2	17Y	836	OK1KDO/P
6	G3EFX/P	6748	641	90XV	2x'250B	3	17Y	790	DK3GR
7	G4SIV	6423	480	92TR	3CX800	4	16Y	842	DL1GBX/P
8	G6URU/P	4901	455	00BT	4CX1000	2	17Y	932	F6EVA/P
9	G8LNC/P	4803	393	80AQ	8877	4	19Y	905	DF8WS/P
10	G2XV/P	4621	434	02EB	NAG	2	17Y	759	DF0AAJ/P
11	GD4IOM	4614	379	74QD	8877	4	17Y	778	PA3CEG
12	G4CDC/P	4210	350	94WC	2x'250B	4	11Y	835	F2EI/P
13	G8SMR/P	4040	386	93EH	1x'250B	2	17Y	949	DL0UL/P
14	G6SFR/P	3851	426	80WO	2x'250B	2	19Y	768	DJ6GK
15	G4WET/P	3827	509	92CA	200W	2	14Y	666	DG6PP/P
16	G3XBY/A	3753	209	69UV	3CX800	2	17Y	851	EA2LU/P
17	G4RBV/P	3010	354	81UC	150W	1	12Y	806	DG3FK/P
18	G0KEG/P	2952	432	91PS	2x'250B	1	18Y	776	DL0LB/P
19	G4VAT/P	2943	368	91TW	180W	4	9Y	800	DF0AJ/P
20	G3WRS/P	2926	296	94MJ	150W	2	16Y	824	FF6KIM/P
21	G4CRA/P	2802	296	01JW	160W	2	21Y	763	F5DN
22	G8ZKE/P	2572	410	82QL	160W	1	17Y	700	DL0KK/P
23	G4UHF/P	2496	369	91LT	80W	2	17Y	841	F5DE/P
24	G4EKT/P	2411	235	94SB	180W	1	17Y	840	F2EI/P
25	G3ISO/P	2385	318	900W	100W	2	16Y	859	EA2LU/P
26	G1SGB/P	2350	309	93FK	200W	2	18Y	652	DC8VJ
27	G14KIS/P	2300	167	74BU	60W	1	13Y	777	ON4ASL/A
28	G6BSE/P	1863	217	02HE	'640	1	16Y	559	DJ1KN
29	G1UXA/P	1641	200	01FJ	100W	1	12 ZL	687	DL0LB/P
30	GJ8RVT/P	1639	151	89XF	80W	1	16Y	757	DF0OL/P
31	G8YMD/A	1203	130	01PD	100W	1	19Y	632	G14KIS/P
32	G6WWR/P	1118	203	91LD	50W	1	18Y	596	PI4GN
33	GMOGD/LP	1063	101	76XA	100W	1	19Y	770	ON4ASL/A

Single Operator Section

Pos	Call	Pts	QSO	Loc	Amp	Ant no.	type	km	Best DX call
1	G4PIQ	3622	346	01MU	2x'250B	1	14Y	747	F5DN/P
2	G6HKM	2911	322	01FT	160W	1	15Y	748	DL0UL/P
3	GW4VEQ	2795	313	73SG	25W	1	8Q	735	PA0OOS
4	G6IAT	2146	256	91TV	1x'350	2	17Y	592	DF8VK
5	G8PHN/P	1283	154	01GP	10W	1	10Y	723	DL0UL/P
6	G4NBS	966	90	02AF	1x'350	1	9Y	595	DK0BN/P
7	G1HLT	839	99	93KD	130W	1	9Y	586	DF0RE
8	G0HXO/P	804	80	70NJ	25W	1	14P	651	PE0MAR/P
9	G1CRH/P	778	78	92WK	25W	1	14Y	691	F/DK0GR/P
10	G4DFI	752	80	01BL	1x'350	1	9Y	680	HB9CUA/P
11	G1NRM	657	143	91UO	70W	1	10XY	517	G14KIS/P
12	G1WIS/P	647	101	90KP	100W	1	9Y	566	G14KIS/P
13	G8ZRE	614	74	83NE	100W	1	8Y	572	F6CTT
14	G6MXL	499	60	80XR	180W	1	9Y	761	HB9CUA/P
15	G6UJJ	395	33	94FV	100W	1	9Y	589	F/G4LIP/P
16	G6HXU	381	52	83RF	25W	1	6Q	447	F6IFR/P
17	G6CSY	330	50	01BJ	20W	1	9Y	555	G14KIS/P

Listener Section

Pos	Number	Pts	QSO	Loc	Ant no.	type	km	Best DX call
1	BRS32525	981	141	01AL	1	9Y	708	HB9S/P
2	BRS25429	755	73	93FX	1	8Y	620	F6HPP/P
3	BRS31976	578	86	01HO	1	9Y	546	DK0WD/P

Check Logs: G0CLP/P, GM1JPJ/P, G2FWX, GM40JR/P, G7AOU.
Disqualified: G1CSR, G3UES/P (Rule 3), G6YLW (Rule 13)

CONTESTS CALENDAR RSGB HF CONTESTS

7 Jan	3-5MHz Cumulative
8 Jan	3-5MHz CW Affiliated Soc. Team (Oct 88)
8 Jan	7MHz Cumulative
9 Jan	1-8MHz Cumulative
14 Jan	7MHz Cumulative
15 Jan	3-5MHz Cumulative
17 Jan	1-8MHz Cumulative
21 Jan	3-5MHz Cumulative
22 Jan	7MHz Cumulative
25 Jan	1-8MHz Cumulative
28 Jan	7MHz Cumulative
29 Jan	3-5MHz Cumulative
2 Feb	1-8MHz Cumulative
4 Feb	3-5MHz Cumulative
5 Feb	7MHz Cumulative
10 Feb	1-8MHz Cumulative
11 Feb	1-8MHz CW
25, 26 Feb	7MHz CW (Oct88)
11, 12 Mar	Commonwealth Contest (Jan89)
2 Apr	Ropoco 1
10 Apr	28MHz Cumulative
16 Apr	Low Power Fixed
18 Apr	28MHz Cumulative
26 Apr	28MHz Cumulative
4 May	28MHz Cumulative
12 May	28MHz Cumulative
21 May	Region Roundup
3, 4 Jun	NFD/Region 1 CW Field Day
24, 25 Jun	Summer 1-8MHz
8, 9 July	SWL
16 July	Low Power Field Day
6 Aug	Ropoco 2
20 Aug	Hopscotch
2, 3 Sep	SSB Field Day
8 Oct	21/28MHz Phone
9 Oct	28MHz Cumulative

Region Roundup and Hopscotch are under review and may be replaced with similar type events. Please watch RadCom for further information

RSGB VHF CONTESTS

29 Jan	70MHz Cumulative (Jan89)
5 Feb	432MHz Fixed & AFS & SWL (Jan 89)
12 Feb	70MHz Cumulative (Jan 89)
26 Feb	70MHz Cumulative (Jan 89)
4, 5 Mar	144/432MHz & SWL (Jan 89)
12 Mar	70MHz Cumulative (Jan 89)
26 Mar	70MHz Cumulative (Jan 89)
9 Apr	50MHz Fixed (Jan 89)
9 Apr	10GHz Cumulative
23 Apr	70MHz Fixed Station Contest
6, 7 May	432MHz-24GHz Trophy Contests & SWL
14 May	10GHz Cumulative
27, 28 May	144MHz & SWL
18 Jun	50MHz Trophy & SWL
25 Jun	10GHz Cumulative
1, 2 Jul	VHF National Field Day
16 Jul	10GHz Cumulative
5 Aug	144MHz Low Power & SWL
6 Aug	432MHz Low Power & SWL
13 Aug	10GHz Cumulative
2, 3 Sep	144MHz Trophy/IARU VHF & SWL
10 Sep	10GHz Cumulative
17 Sep	70MHz Trophy & SWL

OTHER CONTESTS

1 Jan	Happy New Year CW Contest (Dec 88)
14, 15 Jan	White Rose LF Bands CW/SSB (Dec 88 SWL)
14 Jan	Mid-Winter Contest CW (Dec 88)
15 Jan	Mid-Winter Contest SSB (Dec 88)
21, 22 Jan	Hungarian DX Contest (Jan 89 HFN)
28, 29 Jan	UBA Contest CW (Jan 89 HFN)
28, 29 Jan	French HF CW Contest (Jan 89 HFN)
25, 26 Jan	UBA Contest SSB (Jan89 HFN)
25, 26 Feb	French HF SSB Contest (Jan 89 HFN)

First Tuesday each month 144MHz Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)
First Thursday each month 432MHz Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)
First Monday each month Microwave Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)
Dates of publication of rules in RadCom are shown in parentheses

P. J. ECKERSLEY G4FTJ

AMATEUR RADIO OPERATING MANUAL

THIRD EDITION

THE AMATEUR RADIO OPERATING MANUAL contains information on setting up a station, operating procedures, DX working, Contests, Mobile and repeater operation, satellites, RTTY, slow scan tv, and special event stations. There are also eight useful appendices showing continental and regional maps, callsign and countries lists, time zones, frequency allocations, standard frequency stations, and foreign language contacts. This book should be in the shack of every active amateur.

Amateur Radio Operating Manual costs £5.81 to RSGB members by post.

RSGB SOCIETY OF GREAT BRITAIN

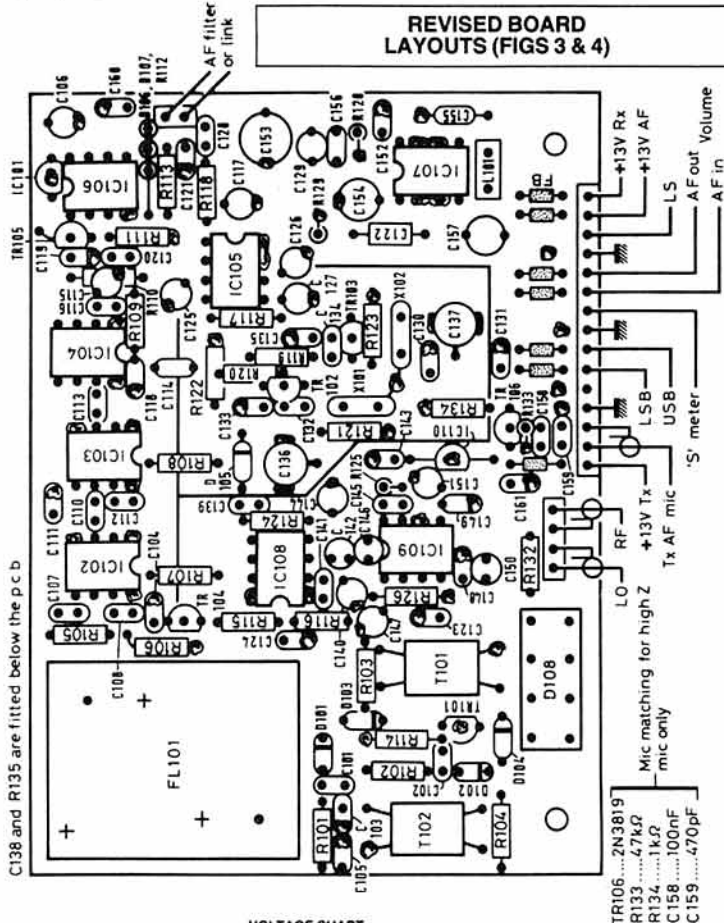
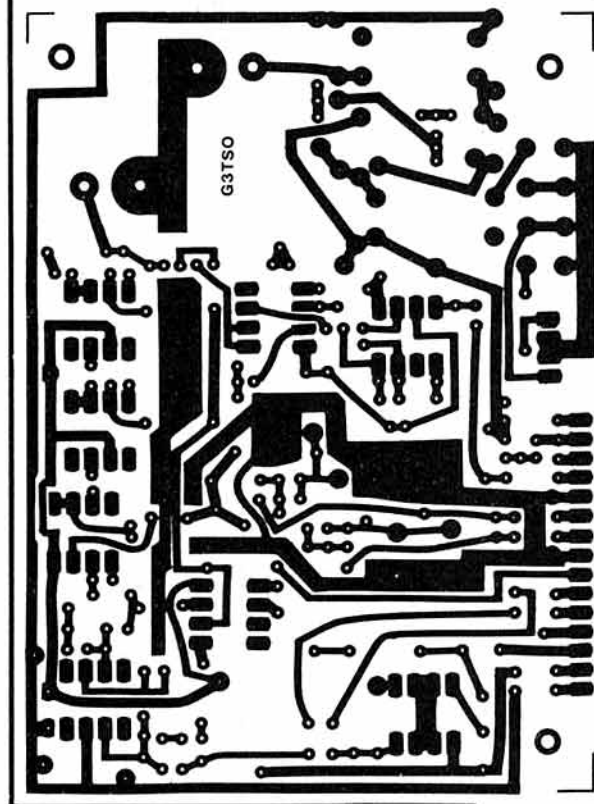
G3TSO MODULAR TRANSCEIVER

MORE NOTES AND CORRECTIONS FOR THE DESIGN PUBLISHED IN THE OCTOBER AND NOVEMBER ISSUES

All coils used in the prototype transceiver in modules 3 and 4 were rewound from surplus items and contained only one winding. All unused pins are shown earthed. It is important to note that the suggested Toko coils have additional taps and secondary windings and it is essential that these are not connected to ground. All relevant pins may be isolated from ground by tightly countersinking the PCB track around the pin hole and then leaving the pin open circuit. One end of a secondary winding may be grounded.

Fig 5: R331 is 8-2R not 8-2k.
Module 3: component list, IC301 is SO42P not SO32P.
Fig 10: Output from IC401 is 1V RMS not Pk to Pk.
Fig 17: L513 is RFC501.
Main chassis parts list, FBX has 7 turns not 3.
See also P.1013, December.

REVISED BOARD LAYOUTS (FIGS 3 & 4)



COUNCIL BRIEF 9 July 1988

The Treasurer presented his report to Council on the 1988/9 budget.

A timetable for the Patron's visit to the forthcoming NEC exhibition was outlined by the Secretary, who also reported on the arrangements for the 75th Anniversary.

Council noted that a successful meeting between RSGB Liaison Officers and members of the Training & Education Working Group and Membership Liaison Committee had recently taken place. The main topics of discussion had been Project YEAR and proposed Student Licence.

Council ratified the appointment of Mr Ian Cornes, G4OUT, as Honorary VHF Awards Manager, following the retirement of Mr Jack Hum, G5UM.

Council then reviewed in depth the annual reports of Committee Chairmen. These described the work of each committee for the year ended 30 June 1988, stated progress on the committee's objectives and included details of any future projects.

Council deliberated the proposal from the EMC Committee regarding the establishment of an EMC County Advisors' Scheme. This would be referred back to EMC with a request for details on how it was intended to ensure that the scheme would be self-financing.

The President called for nominations for the 1989 President. Dr Julian Gannaway, G3YGF, was nominated and the current President declared that Dr Gannaway be appointed President during 1989. Council briefly discussed the possibility of holding the presidential installation ceremony on the same day as the AGM.

Council gave consideration to the presentation of its awards for 1988.

MODULE 1

IC	1	2	3	4	5	6	7	8	Notes
102, 3	Gnd	6V	2V	Gnd	-8V	-8V	0	Gnd	Pin 7 rises to 5V with AGC
104	Gnd	2.7V	0	Gnd	5.2V	5.2V	2.8V	Gnd	
105	1.2V	0	1V	0.4V	1V	nc	Gnd	Gnd	Pin 2 rises to 2V with ant noise, 2 - 5V with AGC
106	nc	4.8V	4.8V	Gnd	nc	4.8V	13V	nc	
107	1.4V	Gnd	Gnd	6.6V	13V	Gnd	Gnd	0	
108	Gnd	2.7V	0	6V	6V	6V	2.6V	Gnd	Tx - No AF input
109	-1V	3V	6V	1.6V	0	Gnd	1.4V	1.4V	

Rx measurements - no Ae input; Tx measurements drive max, no AF input.

TR	e	b	c
105	4.8V	5V	13V
104	6V	6V	0

TR	s	g	d
102, 3	7V	0	13V
101	0	0	13V

MODULES 2 and 3

TR	e	b	c
302	3.8V	4.4V	9.6V
303	3V	3.8V	9.6V
304	1.5V	2.2V	12V

TR	s	g	d
201	0.14V	-2V	9.1V
202	1.2V	0	9.1V
301	0	0	8V

* RF input to TR302 200mV pp (80mm)
▲ RF coil TR304 3V pp

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC301	gnd	13V	13V	gnd	13V	gnd	3V	3V	gnd	-7V	1.4V	-7V	1.4V	gnd

MODULE 4 & 4A

	1	2	3	4	5	6	7	8	Pin 7 varies with ALC and Drive
IC401	Gnd	5.6V	1.8V	Gnd	1V	1V	0	Gnd	
IC402	Gnd	Gnd	1.8V	6.4V	nc	1.8V	nc	4.2V	

MODULE 6

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC601	0.5V	-1V	-5V	-6V	1V	-6V	0	0	0	-0.5V	-0.5V	-1V	0	10V

MEASUREMENTS TAKEN ON TX, NO AF INPUT, NO ALC ACTION

Members' Ads

The Conditions of Acceptance are published below the Member's Ad form circulated with every issue of *Radio Communication*. Please note that FOR SALE and WANTED ads must not be mixed in the same advertisement.

The current rate is £2.30 for 40 words or less: advertisements containing more than 40 words will cost an additional £2.30 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.

FOR SALE.

● KATSUMI electronic keyer EK150: £70. KW EZE match: £25. 11 valves for Eddystone 940 RX: £9. 19 valves for AR88: £5. New boom for G4MH minibeam: £3. 14AVQ Cushcraft vertical: £35. 0745 15938 eve.

● FT107M tcvr, FP107E ext. PSU, FL107 ATU, 500Hz CW filter etc. Complete: £495. FL2100B linear: £395. (Little use). KLM 4ele. HF beam KT34A plus 6ele. XA extension kit (both unused): £325. IC25A 2m mobile: £120. Ham IV rotor (unused) and control cable: £145. All with manuals and in orig. packing. John, G4HVG QTHR. (St. Albans) 0727 42119 eve.

● BBC-B SER7 in vigen case. Separate keyboard. Fitted shadow and sideways ram, DDFS and ADFS, copro adaptor with 512K board. Twin 80/40 drives hi-res monitor. Midi interface with software. G3LIV Amtr controller: £550. May split. G3KNJ. 0923 244069 after 6pm.

● TRIO 430S FM, SSB, CW filters, PS430, SP430, HS6 phones, MC42S mic, mobile bracket, etc: £850. LF30A lowpass filter: £20. Welz AC38M ATU: £65. MA5A HF mobile antenna system: £60. MMT 144/28 tcvr with attenuator: £100. G4SVI QTHR. 0603 409632.

● YAESU FRG7 gen. cov. rcvr with manual. Good cond. Ideal first time SWL receiver: £110. YAESU FR7700 ATU: £30. If purchased together: £130. Stan G4OPG. (Taunton) 0823 251764.

● TRIO TS120S HF 100W tcvr with mic, CW filter, manual. Recent complete overhaul so GWO: £350. Les G0LLW. 01-462 6740 eve-w/e. 01-858 8675 x 141 day.

● FC707 ATU boxed: £100. Kenwood PSU PS430 with matching speaker SP430: £150. Sommerkamp FRDX500 comm. RX: £75. Mike G1UAX. (Hatfield) 07072 65025.

● KENWOOD TS940S, auto ATU, MC85, SDP940, AM filter, Lowe MD, workshop manual, mint cond. very little use: £1800. KW monitor scope, manual, mint: £110. Shure 444: £30. YAESU SP900: £25. G4ERU QTHR. 0202 510400.

● TM221E: £260. AR2001: £260. WIN-108 airband: £140. Sony 7600DS: £125. All mint, boxed, manuals. G3LLX QTHR. (Mellis) 037983 596.

● EDDYSTONE 840A rcvr. Exc. cond: £80. AVO (c.1943) valve tester: £50 on. RCA TE149 wavemeter: £35 on. Tandberg series 3000X reel-to-reel tape recorder: £40 on. Amstrad 7000 video cassette recorder: £60. Bob, G8SAS QTHR. 0732 351361 eve.

● 60FT tower on trailer, free standing with outriggers. Ready for work. Offers, HF5 vertical with radial kit: £80. G0KGF/G6YAD QTHR. 0223 880835 eve-w/e.

● MICROVITEC 14in. colour monitor with RGB input and connecting lead: £70. G3XFB QTHR. 0902 850033.

● YAESU FT480R 2m all-mode tcvr c/w owners manual. Exc. order, never used. Mobile: £225. Ken, G3RDG QTHR. 01-455 8831.

● CLEAROUT. Scope plug-ins TEK HP: £20. X-band WG16 circulators: £15. S-band pre-amp: £20. 2.5KV-0.25KV 100mA transformer: £15. Transistors, diodes, ICs etc. 30A Variac: £25. G3XMB QTHR. 0245 320747.

● TEN-TEC Century 22 HF TX/RX, CW only, 20W output with current protection circuit breaker, hand-book, first class cond: £250. No offers. WPO 2m FM TX/RX 1W, neat size, as new: £55. G3KZU QTHR. (Oxford) 0865 63000.

● TRIO TR7930 FM only 2m, mint cond. with mobile bracket: £175. 8A PSU also available. G3MTX QTHR. (Brighton) 0273 305187.

● HANSEN FS-710H PEP SWR meter, ranges 20W, 200W, 2000W. Case slightly marked. Perfect working order: £40 on. Also Cambridge antenna noise bridge, exc. working order and appearance: £25 on. Mark QTHR. (Belfast) 0232 795783.

● HEATHKIT HW101 TX/RX with Xtai filter, SB600 speaker, HP23B PSU. All factory made. VGC. Plus desk mic, and complete set of manuals. Buyer collects or Securicor: £225 on. Mike G2FZ. (Cheshire) 08298 410 eve-w/e.

● REALISTIC PRO32 scanner VHF/UHF: £140. Kantronics KAM communicator: £220. Daiwa MR750 multi-torque rotator: £220. All items carr. paid. G10GRU QTHR. 0662 42020.

● RA17L c/w RA137A LF adaptor, manual. Good cond: £125. (Potton) 0767 260637.

● FT102 mint, CW filter FM boxed, manuals: £550 on. MM 10/100 2m linear, good cond: £110 on. G0JDX. 0623 513758 after 6.30pm.

● FT290R, nicads, charger, c/case, boxed. Little used. Perfect cond: £260 on. 051-426 3251.

● VERSATOWER P60, c/w post. Taken down and ready to transport: £375. TH6DX, 6ele tri-band beam, fantastic DX capabilities: £175. HAM-M rotator, heavy duty: £100. Together with cables etc. or will split. Tam, G4CYZ not QTHR. 0273 890830.

● YAESU FC700 ATU: £95. Tolo low pass filter: £10. Half size G5RV: £3. G0JXL. (Exeter) 0392 59754.

● FT102, mic, manual: £475. FT901DM, mic, manual: £425. Collins 7553, 3253, 516F2, 312B4, SM1, manuals 110V: £500. R392URR, mobile version of R390A with CV591A, SSB converter, manuals: £150. Buyer collects. Reading area. 0734 693284 eve.

● YAESU FT703R 70cm hand-held with soft case and strap: £100. Sommerkamp FRDX500 HF hand-band rcvr with 2m, 6m and FM options all fitted: £85. Bob, G6KBN not QTHR. (Wolverhampton) 0902 344220.

● TRIO TS130V CW filter exc. cond: £350. Trio TS250S, matching AT200 separate VFO: £325. AT200 new cond. never used: £135. G4YNU QTHR. 0977 704227.

● JENNINGS vacuum capacitors 7.5kV 250pF(4), 2300pF(4): £15ea. Split stator 1000pF+1000pF very large wide space. Four rolls 18in fax electro-sensitive paper: £3ea. Prefer collect above capacitors, fragile, 18ele 70cm parabean: £15. 3ele 6m Homebrew beam: £5. QTHR. (Banbury) 0295 710623.

● FT690R tcvr 6 mths old, 3 mths use c/w nicads and charger: £325 on. p+p extra. Also free-standing 10T tower: £20. Buyer collects. GW8YJN QTHR. 0437 781265.

● FT101B. Good cond. Just back from overhaul by Lowe's. Test report available. With mic, manual and all leads: £250 on. G3RPD. 0285 763291 eve.

● TRIO 9500 70cm multimode: £340. Trio 9130 2m multimode: £350. Both never used. Mobile Trio TM201A 2m FM with remote unit: £180. Trio PS20: £75. Daiwa infra-red remote kit: £20. AOR240A 144-148 FM hand-held with speaker, mic, case charger, elical: £100. 5A PSU with crowbar: £18. G6MAW QTHR. 0602 723457.

Master 128 plus rom extender cartridge. Manuals rom/disk software: £190. Colour monitor Microvitec 1451. Resolution exceeds Master requirement: £110. Twin 800K drives 40-80 track fitted Acorn plinth, computer slides under monitor above: £90. 9 mths old. John. 0525 376269.

● SOTA 432/28 tvtr, 10W, 4MHz coverage, VGC, reasonable offers? John G4HGT. 0532 665581 eve.

● UNIQUE opportunity. YAESU FT200 HF valve tcvr with PSU/LS. Found barely used, recent domestic sale. Orig. wrapping. Absolutely mint. Reallocated, refurbished, 3 sets brand new. PA/drivers. Offers above £200. Robert G4XDD. 01-221 4399.

● TRIO 510, remote VFO-5D with tvtr output: £150 on. Eddystone 770R MkII: £80 on. Alnico ELH-230E 2m linear, suitable FT290: £40 on. Heathkit sig. gens. RF-IU: £10. IC-102: £25. G4MH minibeam: £60. Buyer collects. Ian Stuckey, G6TEQ QTHR. Newton Abbot (0826) 85754.

● YAESU MD-1 base mic, unused: £48. Pitney Bowes 5200 desk-top photocopier 8cpm with A4 and foolscap cassettes: £225. FT780R 70cm multimode, mint: £275. G6WWW QTHR. 01-302 6985.

● ICS AMT-2 unit with cables and PSU. Also CBM 64 cartridge software: £150 on. Alistair Thores

GMAJKT. 0383 872846.

● FRG7 mechanical filter fitted. Also timestep digital unit: £140. Datong PC1 cvtr: £75. Carr. extra or collect. G3GNR QTHR. 040923 301.

● TRIO 940S and ATU. Little used: £1750. SP940: £30. Shure 444D: £20. Icom 7000 scanner: £600. YAESU 726R 2x70 plus sat board: £700. Tokyo HL160V linear: £120. Samson electronic keyer: £50. Datong ASP processor: £50. G4THH QTHR. 01-834 7296.

● YAESU FT230R 2m FM mobile up/down scanning mic with mobile mount: £185. Farnell PSU twin meters 0-350V 100mA: £45. Advance dual-beam scope: £40. Teleguipment dual-beam scope: £50. All gear works OK. Martin. 099289 2810.

● ALTRON telescopic mast. First reasonable offer. Buyer collects. G4UTJ QTHR. 01-500 9256.

● LF type AR88 comm rcvr: £65. Ten-Tec Century 21 CW tcvr: £120. Labgear top band TX: £20. Ferrograph valve stereo T/R: £35. 3.5MHz valve VFO + Xtai calibrator: £25. 1920's Telsen Broadcast RX: £15. G0HTR QTHR. (Tamworth) 0827 898024.

● TRIO TS830S and instruction and workshop manuals. Spare new 6146Bs, 12B77AS. Offers. G6AS QTHR. 021-328 6070 day. 021-706 3709 eve.

● MICROWAVE modules MMT 144/28 2m linear tcvr: £95 on. G0KIW ex G1OYR QTHR. 0452 504728.

● GOING ORT. FT902DM with additional filters, DC/DC lead, FC902 ATU, DL1000, 1kW dummy load, LF30A Kenwood lowpass filter. Hi-mount paddle. Hand mic: £755. AMTI. RTTY/AMTOR/CW. c/w RCV fitted. Eprum + interface for Commodore 64: £165. Commodore 64, colour VDU, power pack, 4 colour printer, plotter: £255. Scope Teleguipment D43R dual trace, 15MHz: £50. All manuals for above equipment. Buy the complete station and the scope free! Buyer(s) collect. G4LXN QTHR. (Avon) 0454 318528.

● FRDX500 all-mode HF ham band rcvr (+2m): £110. Scope Solatron CD1212 24MHz dual trace, 40MHz single trace. Free-standing on four-wheel trolley: £85. Both items in exc. cond. and c/w manuals. Ken G4WAS. (Walsall area) 0902 475057 anytime.

● ORO 2m valve, RCA DOD006 1500W dissipation, good for 1kW. Plus some data available: £30. inc p+p. G8NEY QTHR. 0225 810138.

● FT707 100W CW AM SSB. Warc-bands. Immaculate cond. No mods, sorry no mic: £350 on or would consider P/x for handheld scanner. Can deliver 50 mile radius. G8OGV not QTHR. 0733 66471 after 6pm.

● SP230 mint cond, boxed: £40. Mic MC50, plug for 830, boxed: £27. Datong RFA: £20. Prices inc. postage. G3RHM QTHR. 01-423 2329.

● STANDARD C500 nicads B/box as new: £340. K-band LNB megasat: £30. Katronic KAM all-mode TNC: £165. 15 ITT Starfonos UHF batteries and chargers, working: £30 the lot. GBLXI not QTHR. 01-981 3518.

● KENWOOD TS140S tcvr plus matching PS50 PSU. New and unused: £750. G4NQK. 0908 566689.

● £5 still offered for each of the following ceramic valve holders: Lissen 5 and 7 pin. Hammarlund UX and octal. OT please note! And many thanks to members who have already helped. Bernard Litherland, G4MT QTHR. 0225 891254.

● AMSTRAD CPC6128 disk drive computer with GT65 green screen monitor plus scarab ham software. Virtually unused in exc. packing: £200 on. Would consider exch. for FT290R or similar multimode. Clive G4FVP. (Sheffield) 0742 362960 eve.

● YAESU FT901. All HF modes, SSB/AM/FM/FSK. exc. cond. Spare PA and driver valves: £550. Vic G4BYG. (E. Yorks) 0482 55063.

● 18AVT/VB 5-band vertical antenna: £40. YAESU YC355D digital frequency counter, 5Hz-200MHz: £55. Microdot RTTY/CW comm. terminal, built-in VDU: £180. G3JXG QTHR. 0482 842386.

● FULL sized 3ele 20m beam. ARRL design. Made Uppington, Bristol. Good cond. works well. Buyer collects. G3OOO QTHR. 0789 205973 after 6pm.

● REVCO R2000 scanner with Whittlers mod and discone: £180. Alex GW0FYO. 0792 299342.

● VERSATOWER, 30ft autowinch, head unit, top bearing, little used: £220. Converted multimode CB partly crystallised for 10m: £55. G4EHT QTHR. (Lichfield) 0543 251133.

● Howes 80m RX, wired pc board, tuning caps. Mint: £20. All info. Geoff Barnes G3AOS. (Macclesfield) 02605 2287.

● HEATHKIT SB104A solid state 10-80m 100W TX/RX. c/w Heathkit PSU and manuals: £165 on. G4XDL QTHR. (Cheltenham) 0242 510138.

● ICOM 490E 70cm multimode. As new: £350. (Gainsborough) 0427 616977.

● FT290R with Mutek board, nicads, charger, case. Good cond: £245. GW4URC not QTHR. 0675 64455.

● TEN-TEC Argosy 2 500Hz filter fitted, c/w PSU and mic, 18 mths old. Genuine reason for sale: £550. Dave, G3ASX QTHR. 01-444 5923.

● COLLECTORS items WW2 radio equip. RF unit 24 10D1015: £10. Wireless set No.38: £10. Wireless RX chassis No.18 Mk3: £5. Vibrator 4-pin non-sync ZA4520: £5. Taylor sig. gen. Model 66A £15. G3OEG. (Staines) 0784 54757.

● HEATHERLITE 2m Explorer amp 4CX250B valve: £425. FC707 ATU: £100. 2m tcvr F2V-107R: £150. Kenwood PS430 PSU, SP430 speaker: £150. Sommerkamp FRDX500 comm. rcvr: £75. 2m 19ele mast antenna: £35. Mike G1UAX. (Hatfield) 07072 65025.

● APPLE Macintosh Plus computer. 1MB ram. Internal 800KB drive. 6 mths old. Hardly used. c/w orig. packing, manuals, V5-0 system disk, multifinder and hypercard: £1300. Jonathan, G0DVJ QTHR. 0473 642598 day. 0255 502605 eve.

● TRIO TS120V tcvr, good cond. 220W PEP linear 80-10m exc preamp. Superb mobile station: £240 on. Will split. G3XGE QTHR.

● HOMEBREW steel tower, tilt-over Channelmaster rotator, top-bearing winch: £140. 8ele 2m Jaybeam: £12. 934MHz Delta 1 colinear 30ft co-ax: £230. 3ele 6m beam: £16. 5-band vertical antenna HF5 radial kit: £50. G0HIA not QTHR. 021-745 3429.

● YAESU YD844A desk mic imp 600ohms/50kohms. Boxed as new: £18. G3EPE QTHR. 0253 890467 after 2pm.

● COMPLETE HF station for sale. YAESU FT707 without filters, FV707DM, FP707 and Daiwa auto ATU 500W PEP, mobile bracket. Shure 44A desk mic: £750. Also Spectrum 48k+ with PSU. Joystick, interface: £50. No splits. Mike G0GZM. 01-660 8692 after 5pm.

● IC735 HF tcvr (Icom) inc. gen. coverage rcvr, 2VFOs, 10 memories. Mint cond. Orig. packing: £750 on. G4CCN not QTHR. 03943 6529.

● COLLINS VFO 312B-5 inc. wattmeter, speaker and phone patch: £250 on. Brian, G4GNZ QTHR. 0266 880740.

● FT77 never used mobile, fitted narrow filter, marker board and FM unit, c/w mic and boxed in orig. package. VGC: £450 on. Reason for sale? Bought TS140S. Steve G4YGA. (Norwich) 0603 406234.

● HUSKY PSU TXFRS. Input 0/230/440 out 350-0-350/1500mA 315V/600mA, 5V/9A. Wt 17kilo: £12. Input 0/220/440 out 350-0-350/1500mA 1500mA, 5V/9A. Wt 20kilo: £12. G4M4RU QTHR. 0555 70409.

● YAESU FT757GX inc YAESU U/D hand mic in exc. cond. Orig. box and packing, plus manual: £600. Frank, G0HAO QTHR. (Cotes) 0983 293402.

● COMPLETE clearance! All parts for several really serious linear amps - part built PSU on trolley. Prefer sell as one lot. Absolutely mint Dentron MLA 2500B HF linear - brand new Eimac valves. Sensible offers. Mike. 03306 613 after 7pm.

● CATRONICS RTTY terminal unit: £35 on. G4ERS. (Romford) 0708 45733.

● FT290 multimode, Mutek front-end. Nicads, charger, rubber duck, soft case, manual quarter wave magmount: £270 on. MM 144/100S linear 10W in 100W out. CW pad for 25W driver: £100 on. Post paid. Martin Wills G3ZZS. (Plymouth) 0752 707550.

● Wood and Douglas ATV transmitter: £25. ATV rcvr: £25. Jaybeam 4800 70cm beam with 20ft mast and union rotator plus brackets with nylon guy ropes and tensioners: £55 or £90 the lot. BBC computer s/scope interface: £15. BBC computer function generator: £25 Five-eighths gutter mount aerial plus co-ax: £20. AVO sig. gen. 2-250MHz: £25. Valve milli-voltmeter: £15. Various PMR manuals, Westminster, Olympics. Offers. RF pwr meter: £8. Ian, G6PSO not QTHR. (Coventry) 0203 664502 after 7pm.

● C58 2m multimode: £195. FT790R 70cm multimode, nicads, mount: £225. MML432-30L 70cm linear: £75. All with orig. packing. Heath H-14 dot-matrix printer, RS232 interface, manual: £75. Hosking. (Macclesfield) 0625 31880 eve.

● MAGNETIC loop antenna CAP CO AMA5 3.5MHz to 11MHz with control box. As new, buyer collects: £200 ono. 4ft diameter radar dish ex Marconi, slight damage - repairable. Buyer collects: £30. Chris, G0FYU QTHR. (Worthing) 0903 40072.

● STOLLE rotar control: £5. Codor AT5 80-160 transmitter, complete: £25. Burns wave meter TC101: £10. BC2217 freq. meter mains: £10. Kenwood VFO 120: £40. Valves 640, CV4010, 6BW6, 6J6, QOV310: £1 each. G4JFE. (Newbury) 0635 41613.

● ATU 5PC3000 range 1.5-29.5MHz. Power capability 1.5kW continuous. 3kW PEP dual meters. SWR and forward power. Mint, boxed with instructions. Lifetime investment. Match anything in range 20-100ohms: £250. G2FZU QTHR. (Southwell, Notts) 0636 813847.

● DIAWA PS300. Regulated 9-15V. PSU 30A max, 22A continuous. Rarely offered. Not to be confused with later version. Mint, boxed with instructions. Wt. 9.7kg: £150. G2FZU QTHR. (Southwell, Notts) 0636 813847.

● SOMMERKAMP FR-100B rcvr, manual, spare valves. VGC: £85. Well-constructed Homebrew 180W valve linear 80-10m + mains PSU: £50. Beautifully built QRP VFO TX's: Howes 80m: £35. PW Terme 20/40m: £45. Full info. Buyer collects. G4DFP QTHR. 061-736 3187.

● EDDYSTONE 940 gen. cov. RX: £100. Eddystone 770U MkII 150MHz-500MHz: £70. Ex RN B40D RX. Very heavy RX: £50. Trio J60 gen. cov. + 2m RX: £50. KW2000A tcvr + PSU, speaker: £130. G7BZE. (Barnsley) 0226 285643.

● FT790R, nicads, case: £225. FT101Z fan, FM, CW filter: £350. Homebrew quad Zele by 9H1GL as RadCom April 1984: £25. G4XOU QTHR. (Nottingham) 0602 270402.

● KW 202 good working order: £100. FRG7700 with tuning unit. Offers? GM3VAR. A. Campbell, 2 Dunlin Cres, Craigends, Houston, PA6 7JX.

● TRIO/KENWOOD TR9130 2m multimode tcvr: £350. Also Welz SP45M SWR/PWR meter 140-470MHz: £45. Both orig. cond. with boxes. Free aerial rotator to buyer who collects. Swap all for Amstrad PS1512 computer with colour monitor. Dennis G1NEO. (Nottingham) 0602 622651.

● FT707, FP707, FC700 ATU, YM34 desk mic. Mobile mount, Yaesu i/loss filter. All manuals. All mint cond: £600 ono + postage. G0ELB QTHR. (Notts) 0623 654234.

● FL2000B linear. Spare 572B: £300. Jaybeam triband 3ele yagi. G3PJU QTHR. 0223 263137.

● AEA PK32 data controller with fax 3 wks old with BBC-B2 program. Genuine reason for sale: £260. Also FT221, good cond.: £200. Alan, G4HMF QTHR. (Ipswich) 0473 51319.

● FT780R c/w mobile bracket, box, manual: £300 ono. Eagle A66 stereo amp, matching AM/FM tuner, pair Denton speakers: £50 ono. KW dummy load: £20. Sonab cassette deck modified for MS: £20. G4JBH QTHR. 0935 824225.

● FT730 70cm mobile FM tcvr (Yaesu) c/w mic etc. 10W, good cond. one careful owner: £195. G4NLF QTHR. (Stoke-on-Trent) 0782 680763 after 6pm.

● KENWOOD TR751E 2m all-mode tcvr. As new: £450. (Devon) 0392 877819.

● ICOM 1200E 23cm mobile/base, as new, latest model: £440. Trio SW200 SWR/PWR meter (2m) plus extra (70cm) head unit: £105. Jaybeam PBM18/70 70cm antenna, new: £22. Also Cuedee 17432AN 70cm, yagi: £37. Paul, G4XHF. 0293 515201.

● TANDY printer V11 made by Seikosha. Standard Centronics connector. 30cps. Tractor feed. 9.5in max width. Cost £200, accept: £40. TX-3 RTTY/CW TX/RX software on disk for BBC-B: £10. Tili interface for BBC-B: £20. G4AEL QTHR. 0272 699967 Sun-Tues.

● YAESU FT77 80T. 10MHz 100W. VGC: £400. Realistic DX302RX digital read-out. VGC: £120. Tono 550 CW/RTTY reader. VGC: £120. Buyer pay postage or collect. Bob, G0GVZ QTHR. (Cambridge) 0223 243581 after 6pm.

● M/Tm vtr MMT432/144 10W output, recently serviced by Microwave: £90. FT690RII and Spectrum 25W linear. Mint cond. Hardly used: £310

ono. Also damaged 6m 5ele Tonna: £10. Buyer to arrange collection. G1BJZ. (Northants) 0536 524833.

● TRIO TR2400 handheld 144-148MHz. VGC: £90. Belcom linear 2. No mods, seldom used. Exc. order: £60. GMBBQU QTHR. 031-441 2348.

● YAESU FT102 NAR CW: £500 ono. Yaesu FT101B plus spare new PA valves: £300 ono. Yaesu FRG7: £125 ono. HQ1 minbeam: £500 ono. All in good working order. G4VOW QTHR. (Nottingham) 0602 812588.

● TRIO TR2300 with spare nicads, charger, case etc: £90. AR88LF. Good cond. Has won awards with phones and speaker. G1SET QTHR.

● MORSE key type D AM: £15. RadCom 1975 to 1984: £15. Buyer collects. G3PKD. 0572 812472.

● YAESU FT101 HF tcvr c/w G3LLL speech clipper. Good cond. Boxed with manual: £275. G4GTR QTHR. (NW Derbyshire). 062987 475.

● PK232 with software for use with Commodore 64. 12 mths use: £250. G4OEX. 0925 65569.

● SHACK clearance, going HF. Standard C58 all-mode tcvr, c/case, m/mount. 10W linear, new nicads, book, box: £250. BNOS LPW-144-10-100W linear preamp, SSB/FM, book, box: £110. Yaesu FT480 VHF m/mode tcvr, m/mount, book, box: £290. MMT432/144 tcvr, book: £95. No time wasters. Sensible ono. GM1ARG. (Langholm) 0541 80327.

● TANDON DS.40T disk drives (four) ex-equip fully tested. (Shugart i/face) uncased: £35. P+P at cost. G4GBW QTHR.

● ICOM ICR70 HF rcvr with FM board: £400. MM 2m-10m tcvr: £70. AMT one multimode data controller: £80. (Inc. BBC software). Yaesu low-pass filter: £18. All VGC. Offers considered. Prefer buyer collects. Mike G4ORP. 0273 411019.

● HP430C microwave pwr meter with head: £50. Advance OS250 DB scope: £100. WandG wavemeter 470/2500MHz: £30. Dymar modulation meter 1785 AM/FM 30/240MHz: £60. Pye Westminster FM/HB: £30. STC Novatel viewdata TV: £25. BBC dual disk drive: £100. G8AYN. (Lutterworth) 04555 57790.

● R107 comm. rcvr, working cond: £35. Cash only. Buyer collects. R. Mills, G8CQC, 48 Lady Bank, Birch Hill, Bracknell, Berks. (Bracknell) 0344 412239 after 6pm.

● TRIO TR2300, nicads, case, charger: £125. MML144/30LS linear, 1-3W in, 30W out: £60. G60BB QTHR. 0602 872505.

● FT707, FC707, FP707, m/mount, manual, cables: £580. Hustler mobile antenna, 5 coils, bumper mount: £50. G3VLO not QTHR. (Yeovil) 0935 22973.

● EDDYSTONE EC10 comm. rcvr, mains and battery packs, instruction manual: £50. Bang and Olufsen record turntable, Beogram 3000: £20. G4CBE QTHR. 0727 55542.

● RADCOM 1974/86 inc: £1 per year or £10 the lot. Buyer collects. G3YNR QTHR. 0246 274603.

● DATONG direction finder: £110. Can be seen working. G4PWB QTHR. (Essex) 0268 737398.

● ICOM IC04E 70cm handheld. VGC. Orig. box, handbook and charger. Exc. way of getting going on 70cm: £195. G1PCW QTHR. 0272 393427.

● HW8 + PSU: £55. BK100 mech bug: £10. G4KJL QTHR. 0276 22558.

● KENWOOD 2m FM synth 25W mobile: £130. Sanyo PR8800 comm. rcvr 250kHz, 30MHz 240/12V/batt DF FM b/cast SSB, narrow wide, analogue, 19x96in: £75. Pye car radio 6/12V pos/neg FM/M/L 1961: £15. Several domestic valve radios: £10 each. (Nottingham) 0602 606589.

● COUTANT PSUs 3 off 11-15V, 1 off 15-0-15: £6 each. 12V 20VA trans RS type: £3 each. Prism 2000 modem: £25. Misc. comps. all types. Sinclair QL+Q connect interface, games etc: £100 ono. HP-41CX calculator: £150 ono. GM1PSU. 0506 883091.

● SCANNER portable Tandy PRO32. Air ham bands etc. Boxed, exc. cond: £145. DNT 10m FM only boxed: £40. Tristar 777 multimode 10m: £65. G4YTF QTHR. (Leicester) 0533 416796.

● TRIO 520 tcvr, good cond. CW filter: £280. Matching homebrew 2m tcvr, 3W output: £50. G4UWK QTHR. 062982 3072 eve.

● ABSOLUTELY mint, box in fine cond: £450 free gift of FT101Z MK2 warc, fan, CW filter, manual. All immaculate. G3XNG QTHR. 0670 514574.

● FT290R with nicads and charger. Immaculate cond. and hardly used: £225. G6JPM not QTHR. 0525 851038.

● FT207, list mic, spare battery, offers. VT102 prof. serial terminal, all usual facilities, offers. G8NTH. (Guildford) 0483 34954.

● FT290R Mk1 with Mutek front end. Nicads, charger and soft case: £250. G0FZG QTHR. 0959 74275 after 6pm.

● KENWOOD 520SE tcvr: £300. TR7010 (SSB only) 2m tcvr: £150. FDK multi (FM only) 2m tcvr: £150 FDK handheld, charger: £80. PSU 13.8V 7.5A: £125. Small desk: £15. Keyer: £15. Some other

items. Property of Silent Kent. Peter G3UXH. (Medway) 0634 250562.

● RADCOM and bulletins. Large collection from 1936 to 1987, but not totally complete. For disposal for modest offer. Buyer collects. Write G2BN1 QTHR.

● COLLINS S line (Rockwell 1976) comprising KWM2 A, 516F2 AC/PSU/LS, 312B5 remote VFO/LS/wattmeter, SM2 desk mic, Xtals for additional bands, operating and service manuals: £750. Spares inc. components, valves, relays, VFO module and updated PM2 AC PSU also available. G3ONU QTHR. (Watford) 0923 676344.

● HF station: £195. 80m-10m SSB/AM/CW. TX Sommerkamp FL200B. RX Sommerkamp FR100B. TX facility. All connected, manuals, mic. Lovely cond. Will not split. Buyer inspects/collects. G4WNU QTHR. (Epsom) 0372 278597 eve.

● IC490E 432MHz 10W multimode. VGC. Orig. box, manual, accessories etc: £350 ono. Sad parting but unavoidable. Delivery negotiable or collect. Mike. (Leicester) 0533 630038 day, 0533 872895 eve.

● CLOSING down. Yaesu HF line-up. FT301D, FP310D, FV301, FC301, YO301: £500. FT221. Mutek i/e, MML 50W linear: £360. Tristar 747, converted 6m, 15W linear: £80. Altron AQ6/20 3ele minbeam: £75. Cash, no offers, buyers collect. Julian G4ILO. (Colchester) 0206 210878.

● FT902DM. Good cond: £625. KW2000 no additions: £380. FC902 tuner: £90. SP901 speaker: £20. Altai KDM6 GDM: £25. HK708 hi-mount key: £15. Trio TH21E 2m extras: £150. GW4VUC QTHR. (Cwmbran) 06333 4577.

● TRIO TR7800 2m tcvr in good cond.: £160. (Somerset) 0278 652139.

● TRIO TS890S and MC500 mic, in exc. cond. Orig. packing: £700 ono. GWGAG QTHR. 0222 868742.

● COMPLETE HF station. Drake R4B/T4XB (freshly serviced) c/w PSU, matching speaker, manuals, mic, phones c/w boom mic, and inc. warc bands, extra CW filter, ext. speech processor and stereocond: £4000 ono. Will not split. Richard, G3RWL QTHR. 01-366 4297.

● ANDREWS 7/8in foam co-ax - 30m: £40, 26m: £35, 15m: £20. 7/8in air spaced co-ax with 7/8in EIA connectors, 25m: £80. G4DZU not QTHR. 0532 525552.

● MICROWAVE modules 144/50S linear: £70. Microwave modules from 28-144MHz SSB tcvr: £70. M. Belcher G1SSL. 0235 819038 after 6pm.

● ALPHACOM 32 printer for ZX Spectrum c/w pwr supply connectors and rolls: £20. Sinclair ZX micro drive (unused) c/w cartridge: £35. Masterplug 4-1: £7. Des, G4NEK QTHR. (Bedford) 0234 852865.

● YAESU FT101ZD MkIII, warc, CW filter, FM. mint cond. Orig. packing, new 6146B's fitted. Full service, manual: £500. FV101DM remote digital VFO: £200. Drake R4B T4XB AC/MS4. Recent complete service, new valves. G4LW QTHR. (Trowbridge) 0225 753166 anytime.

● HF station. 160m-10m. Comprises KW Vespa TX, Lafayette HA350 RX. Both with manuals, mic with lab speech processor. Reluctant sale due to arrival of tcvr. Only: £140. Will haggle. G3VUV QTHR. (Kent) 0634 376498.

● YAESU FT757 GXMkII, 12 mths old, still warranty plus P757 GXPSSU: £700. MD mic: £50. G0LIF ex G1GWP QTHR. 075782 415.

● SWAN 500 HF tcvr, 3.5-28MHz 500W PEP solid state VFO. Matching speaker, PSU, mic, Vox unit. Circuit diagrams, manual, some spare valves. Good cond. No mods: £250 ono. G0JQR. (Northumbria) 0670 819297 after 5pm please.

● 70cm Handie FT73R + FNB10 and charger adaptor: £215. 0482 632417 anytime.

● SOMMERKAMP FL200B, FR100B, FL1000 linear. Matching speaker. All in orig. cond. Full TX or separate operation, desk mic, headset with boom, RF pre-selector. All in perfect order: £450. G0GVM QTHR. 0243 863121 x221 day, 0705 550421 eve.

● TRIO TS530SP with 35S mic. Little used since new. Immaculate: £530. SP230 speaker: £40. AT230: £150. All with manuals and packing cases. TS700S 2m base station multimode 10W with manual: £270. GM3YKE QTHR. (Ayrshire) 029483 2263.

● FDK multi 750 multimode. 10W and 20W output. c/w mobile mount, instruction book: £230. 7.5rpm brake motors. Ex equip. Someone must have a use for these: £4 each. G1LUN QTHR. (Leeds) 0532 766949.

● 4m and 2m SSM tcvrs. RX front ends updated. 80/90W PEP output. With matching PSU and connecting leads: £55 complete, KW Elec. LPF: £10. Prefer buyer collect tcvrs. G3GHB QTHR. 0386 792582.

● YAESU FT690R MkII. Mint cond. Orig. packing: £285. G4DIC QTHR. (Hincley) 0455 636315.

● YAESU FT7B 50W tcvr: £350 ovno. GW4NQJ QTHR. 0686 25182.

● HB33M tri-band beam. Made by TET. 10-15-20.

Longest ele 17ft, beam 10ft. Good performance. In use 2 yrs: £150. Tony, G0CJU QTHR. 0342 312374 w/e.

● GENERATOR 1500W 240V petrol. Portable, very well made. Little use: £150. Howard G0H2H. 0394 460474.

● AERIALS: MET 144-6X as new: £35. Jaybeam CR/23 as new: £25. Tonna 2019 2m 9ele: £12. Sandipie 23/24cm 20T helical: £15. Jaybeam C5/2m Mkl 2cm colinear: £40. G3MEH QTHR. (Tring) 044282 6651.

● TRIO TS830S narrow CW filter, mic, matched set, spare valves, instruction book and box. Little used of late. Bargain for: £650. Cash no offers. G3CPT QTHR. (North Bucks) 0908 76984.

● FT101ZD MkIII + FM + warc bands. Fan, mic, manual, boxed, superb cond: £500. Cushcraft AV3 3-band vertical antenna. VGC: £25. SEM Tranz/match ATU. VGC: £60. (Shorne) 047482 3797.

● TEN-TEC Century 22 c/w keyer, circuit breaker. As new: £240. G3OVT QTHR. 0438 350136.

● FRG9600 VHF/UHF scanning rcvr 60-905MHz: £300 ono. or swap for BBC computer with disk drive and printer or good 35mm camera SLR. WHY? GW4VWY not QTHR. 0443 772387 anytime.

● LINEAR amp. builders. Components for high power valve liners, transformers, LF Chokes, high-V, caps, valves, sockets, switches, tank coils, wide-spaced tuning caps. HF chokes, relays, meters, chassis, cabinets, high-V. Dynamotors. SAE list. G3WIF, 16 Goldney Rd, Clifton, Bristol. 0272 293738.

● £61,500 house West Hill, Hastings. 300ft ASL. Super take-off all directions. Magnificent views Hastings Old Town, fishing village and English Channel. Three bedrooms, garden front and rear. Gas central heating. Wright G3CYT. 0424 436868.

● RACAL equipment for enthusiasts: MA794 driver, MA121 sideband adaptor, dual diversity unit, tactical cypher units, panoramic amplifier, manuals or WHY? 0705 380411 day 0243 572162 eve.

● YAESU FT757 line-up. FT757GX with 500kHz-30MHz RX, 9-band TX, SSB/CW/AM/FM. Ray Com modified VFO. FP757HD heavy duty PSU. FC75-7AT automatic ATU. All in mint cond. Boxed with manuals: £999. David, G4JLU QTHR. 01-954 9180.

WANTED..

● SET of counterpoise radials for Hokuishin HF5 5-band trap vertical. Also memory unit for Yaesu FRG 7700 GC RX. Stan G40PG. (Taunton) 0823 251764.

● VACUUM variables 1000pF and/or 2000pF. All letters answered. GM3WJO. QTHR.

● DRAKE C line accessories RAC filters WHY? Particularly need CW filter. W4 wattmeter. Also MN4 ATU. 4-1000 or 3-1000 valve/s with or without base. Gavin Williams G3YCP QTHR. (Hove) 0273 728322.

● WIND up tilt-over tower. Les G0ILW. 01-462 6740 eve-w/e, 01-858 8675 x141 day.

● EARLY wireless Xtal sets, horn speakers, valves, old books, catalogues, bound volumes Wireless World wanted. Also interested in American Com. RX's. Jim Taylor G4ERU. 5 Lutter Road, Winton, Bournemouth. 0202 510400.

● SMALL HF tcvr, good comm. RX. G4ERU QTHR. 0202 510400.

● WARTIME avionics museum requires T1115, T1083, TR9-D, TR3577, TR1133, TR1143. Also require manuals AP2018A (Barracuda), AP1522E (Whitley), AP1136 Vol 3 to buy/copy. Various 1940/50's airborne item's available for exch. C. Baker RS85130, 71 Sunnyhill Ave, Derby, DE3 7JL.

● 1296 tcvr. G0KFC/G6YAD QTHR. 0223 880835 eve-w/e.

● HANDHELD tcvr for 2m or 70cm. Also HF mobile whip. G3XFB QTHR. 0902 850033.

● R/C electric cars, bits or whole swaps WHY? G3XMB QTHR. 0245 320747.

● RACAL equipment must be mint cond: driver unit MA794, sideband unit MA121, pan adaptor RA66, encryption unit MA4204 or WHY? 0243 572162 eve.

● VIBROPLEX key. 6A7, PENDD61, 78 valves. Services textbook of Radio vols 2,4,6. 1960's RadCom. CCT for Philco 444 mantle radio. RSGB handbook 1968. Drake R4C filters, 6kHz AM and 250Hz CW. Nick Brooks G4BHM. (Kettering) 0536 712273.

● TEN-TEC Argosy or Corsair. G14PCY QTHR. 0365 24993.

● 7360 valves, borrow/buy manual Pye Olympic, 6B6 valves, 6A56 valves. TCS TX, Hallicrafters Sky Rider or Champion. John G8MLH QTHR. 08382 304.

● OPERATING manual (photocopy will do) for Dawe DC valve voltmeter type 611A. G8YVU QTHR. 0282 62493.

● ICOM 720A, 735, Trio 930S, any HF rig with gen.

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cov. RX, also TS830S and good ATU. 0843 294446.
● BRT400 rcvr. AM filter for R820 rcvr. SM220 monitor scope. Deluxe tuning knob for 820 rcvr. J. Wright, 54 Queen Mary's Ave, Basingstoke, Hants. 0256 468649.
● TRIO VFO 700S, Trio SP70 speaker, also Welz SP15M PWR/SWR meter. G7BHC not QTHR. (Suffolk) 098681 582.
● KDK VHF FM 2025 tcvr instruction book or copy. Post and costs refunded. R.E. Gill, 24 Larkfield Cres, Rawdon, Leeds, LS19 6EH. G7BHG.
● YAESU FRT7700 ATU, setting up and working instructions, buy or borrow. Reg Smith, 6 Breach Lane, Shaftesbury, Dorset, SP7 8LE.
● GERMAN valves RES164D, RE904. Early horn loudspeaker, DC-DC converter for type 123 EX-WD tcvr. (Haywards Heath) 0444 458390.
● YAESU FT301. Do not mind a faulty unit or one in poor cond. Price must be reasonable. G8FXG. 040924 548. Daytime.
● 70cm and 6m modules for FT726R. Must be mint. G6WWW QTHR. 01-302 6985.
● Heathkit HP23B PSU etc. Martin. 099289 2810.
● DFC 230. G3RHM QTHR. 01-423 2329.
● TYPE D morse key with case. All expenses paid. G0CTU QTHR. 051 327 2553.
● FT7B buy/exchange C500. G8LXI not QTHR.

01-981 3518.
● BOOKS - History of the Marconi Company - Wireless at Sea-The First 50 Years, others on history marine radio, coast stations etc, buy or borrow. Also any Marconi Marine W/T gear esp. TX's, autokey. Bruce, GW4XXF QTHR. 0654 710741/711541.
● DENC0 blue aerial coils. Transistor usage ranges 3T, 4T, 5T. Denco red oscillator coils. Transistor usage ranges 3T, 4T, 5T. G4VPF QTHR. 0283 44212.
● TX. The TX side of the JR310 RX by Trio. Or KW204 TX, or TX WHY? to cover 3.5-3.8 SSB. Peter. 0287 34397 office hours.
● BOUND volumes 'Wireless World' 1961 onwards. 'Inexpensive Television' (Data Publications, 1950). 'Unit Constructed TV Receivers', 'Television Test Equipment' (both E.N. Bradley). Any older books on scopes or TV construction. G3YJM QTHR. 0254 60455 day. 0254 55939 eve.
● KW2000 tcvr. G4EHT QTHR. (Lichfield) 0543 251133.
● TRIO station monitor SM220. Jaybeam vertical VR3. Geoff Barnes G3AOS. (Macclesfield) 02605 2287.
● INFORMATION on Elliot Brothers ammeter (dBmeter NO10AL) chart recorder in massive

wooden case. A pen required or sketch to make one. Documents listed on instrument are makers booklet No 4 and transmission telephones F1082. G4BTU QTHR. (Fareham) 0329 235164.
● WS17, WS18, WS19, WS22, WS38, WS46, WS58 or anything similar or parts accessories. Anything considered for restoration and museum purposes. Always willing to help with info and swaps. Jim G4XWD. (Kidderminster) 0562 823674 eve.
● FT200 or similar tcvr (80m-10m) plus PSU. Must be good cond. with mic. Will pay carr. 0424 425909 9.00-11.00am.
● WORKSHOP manual for FT901DM or copy. All expenses refunded. Also PSU 8-20A, no home-brews. G0CUT. (Aylesbury) 0296 86916 after 7pm.
● COLLINS 516FZ AC PSU R/E would carriage USA 8877 base and chimney. 0743 884858.
● YAESU FC902 ATU, SP902 speaker. Good price paid for items in good cond. G3EPE QTHR. 0253 890467 after 2pm.
● YAESU FTV700 2m tcvr. Yaesu FP757HD PSU. Must be in VGC and good working order. G7CMO. (Stourport) 02993 78672.
● INFO on best mods for 51J-4 RX. Brian, G14GNZ QTHR. 0266 880740.
● CAREER change sought by inventive and practical teacher. 50. Odd hours and travel inc. short or part-time welcome. Desk work, long hours and high pay NOT sought. W. Jarvis, Salewheel, Ribchester, Preston, PR3 3XU. 0772 215.
● GEM Quad HF antenna. Complete antenna or spreader arms. G4HXQ QTHR. 089285 2817 eve-w/e.
● DATONG FL3 filter trap vertical for 10-15-20. G4ERS. (Romford) 0708 45733.
● CIRCUIT diagram for AVO valve characteristic meter MkII. All expenses paid. G1FPV QTHR. 0788 51282.
● HEATHKIT monitor scope model H0-13 (A model from the 1960's). Philips 12in B/W video monitor Type LDH 2153. Morris. (Bolton) 0204 40629.
● COLLINS 7553B, 32S3 or KWM2(A). Also vacuum variable about 300pF 7+kV. Turns counters, Groth, Millen or B and W. Hy-gain DB10-15 or similar small 10-15m dual band yagi. Chris Pedder, G3VBL QTHR. 0772 612289.
● INFORMATION regarding Xtals for Blick International radio rover 6 channel VHF tcvr. Any info welcome. G1ULI. 0462 678994.
● EITHER to purchase or swap 6m module for FTV901R, FM unit for FT101Z, digital unit for FT101Z. G1SET QTHR.
● CIRCUIT diagram and handbook for Unohm PAL colour bar generator EP874. Borrow or copy. Costs refunded. G3RXG QTHR. 093484 3562.
● WANTED for Akai V110S camera one vidicon. Any batteries for same VTR? and old Philips type tapes! G4GBW QTHR.
● YAESU FC902 ATU. G3HFG QTHR. 06267 5608 after 6pm.
● COMMODORE Pet 4000 series computer, service manual or circuit to buy or borrow. Maurice, G4RHC QTHR. 091-526 4555.
● KW Vespa transmitter, preferably working. G3MDQ. 021-354 9972.
● IN-LINE pwr meter, Daiwa, Hansen, Welz or WHY? Also required, PSU for (Canadian) VRL RX and an AR88 'S' meter or 5mA meter with zero deflection to the right. GM0EKM QTHR. 09505 405.
● MUTEK board for Icom IC271, your price paid. G8NTH. (Guildford) 0483 34954.
● PYE pocketphone 5002 HB/FM. Also spare boards, batteries etc. Also radac set 68-27R by Technical Ind. Assoc. Rockville, Maryland, USA or circuit instructions etc. John Cook. (Weybridge) 0932 563404 work, 0932 852128 eve.
● RADIO-TELEPHONE BT system 4 equip, eg Pye M4000 etc. GW4GCB. (Colwyn Bay) 0492 531760.
● WANTED for 1154/1155 installation, Jones plugs, connecting leads, valves VT104, VT105, tech. info, manuals etc. Ext. RF ammeter, antenna leads, bath-tub morse key etc. WHY? Will pay good price for items. G0JNT. (Grimsby) 0472 752794.
● BELCOM LS-202E, Trio DFC 230 VFO. Trio 120 linear. Peter, G0ESB QTHR. 0543 264586 after 6pm.
● DRAKE MN2700 ATU in mint cond. G4DIC QTHR. (Hinckley) 0455 636315.
● ANYONE got a spare operating manual and a circuit diagram for a Windsor Universal meter, model 88A. My junk sale purchase did not include one! Even a good photocopy will do. G0HVH QTHR.
● REMOTE VFO for FT101Z model FV101. Also need digital unit for FT101Z. GW3XJQ QTHR. 09945 201.
● ICOM 761 or 781. Must be mint. Also matching speaker and desk mic. Howard G0HZH. 0394 460474.
● HAVE FT75 to support. Need one scrap unit, AC and DC pwr supplies for spares. Also need working matching VFO or circuit details for photocopy. G4LBH QTHR. (Luton) 0582 415846.
● DIGITAL whizz-kid repair FDK800D. Agent unwilling, faulty up/dn counter/display. Service manual. Copy supplied. GW3IFV QTHR.

IN MEMORIUM

*We record with regret
the passing of
the following
radio amateurs*

Mr J R Abbot, GW0BQL, 31/8/88
Mr R T Allen, G4DHG
Mr F N Barry, K6RTU, March 1988
Mr J W Barton, G3FQJ
Mr D G R Bawden, G3YI, 31/8/88
Mr R L Bellows, G3OGS, 12/11/88
Mr S Bergman, G4KXJ, October 1988
Mr B Bird, G3PUD, September 1988
Mr P H Bottom, G8DHD, 29/9/88
Mr W E Brown, G3AFN, 21/12/87
Mr C W Calvert, RS23545, 26/9/88
Mr A Campbell, RS90735, 11/10/88
Mr J A Carr, GM3AXR, 23/9/88
Mr A D Cockburn, GM4ZMV, 18/1/88
Mr F H Cookman, G1HVX, 18/10/88
Mr B C Clay, G8GGJ, 4/9/88
Mr A E Cooper, G3EEM, February 1988
Mr A Courtney, G8XIP, 19/6/88
Mrs Day, G1AOB, 12/8/88
Mr G E Davies, GOCNM, 16/12/87
Mr E M Davies, RS53634
Dr I Doherty, GM4SQH, 3/9/88
Mr J. Dow, GM4NDK, 13/7/88
Mr H N DuFresne, G3HXJ, 3/11/88 aged 84
Mr R S Evans, G3BDE, 29/11/88
Mr T H Eyre, G3CC, 24/10/88
Mr J R Farnie, G4FKL, 7/10/88
Mr H G Fisher, G3KNF, 8/11/87
Mr E. W. Ford, G4UYQ, June, 1987
Mr A W S Fowler, G3FAN, 22/9/88, aged 73
Mr L F Garland, G3OFG, 14/9/88
Mr T E Harding, GW3GRR, 6/10/88
Mr M Y Hawkins, G3FIG
Mr K G Hughes, G3BXM, 23/11/87
Mr A R Hurst, G8THI, 19/10/88
Mr D E Jones, RS86579
Mr E L Kelland, G3AMJ, 11/10/88
Dr G Lange-Hesse
Mr J H McArdle, RS34585, July 1988
Mr D A McNeilly, RS87718, September 1988
Mr C Moncur, GM4BAG, 14/9/88
Mr A E O'Nions, RS48568, 1/9/88
Mr R Osborn, G4ZPD, August, 1988
Mr R W Parr, G0CDI, 1/10/88
Mr C B Perham, G4BTV, 21/8/88
Mr A Reeves, G8WN, 1/9/88, aged 86
Mr G M Reston, GM8CH, 24/10/88
Mr D M Richardson, G6UQT, 18/7/88
Mr A Riley, G4EXB, 19/8/88
Mr A W Rix, G3RYF, 29/7/88
Mr D Roper, ZL1RE, 20/1/88
Mr F Scaife, G4CNP, 1/9/88
Mr R Schaak, K7MF
Mr R F Sims, RS90180
Mr N Smith, GW3UCS, 22/7/88
Mr D Sowman, GW6ZZB, 1/11/88
Mr P Sterry, G2CBU, 8/11/88
Mr S O Sullivan, RS85432, 16/6/88
Mr W Tennant, G31BW, 21/8/88
Mr D Thompson, G3VQC
Mr A D Tuck, G1PYX, 10/9/88
Mr R Walmsley, G31BB, 21/6/88
Mr K Wetherell, G4IVA, April 1988
Mr S M Whitley, G3XBS, 8/10/88
Mr E A W Williams, RS85119, 11/9/88
Mr E Willis, G4XOQ, 25/10/88
Mr J Womack, G0HEK, 30/8/88
Mr F Yates, G3PUL

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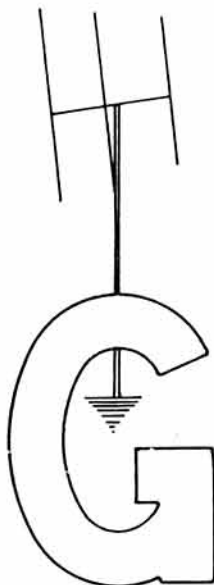
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New kits and winter projects!

Building your own equipment is one of the most satisfying aspects of amateur radio. Now that the darker evenings are with us, this is the time of the year to have a look through our new catalogue for an interesting project. The latest edition has quite a few new kits to choose from. In addition to our well known CW QRP equipment, this year we have given in to popular demand, and introduced a simple transmitter, complete with modulator! Homebrew Top Band AM – that's REAL Radio!

AT160 80 AND 160 METER AM/DSB/CW TRANSMITTER

This new transmitter offers both 'phone and CW on 80 and 160 Meter bands. Ideal for the club Top Band net, and general local nattering, as well as a nice sounding CW note for those longer distance contacts. There are front panel controls provided for both carrier level and RF output power (up to 10W PEP output). Broad-band circuitry eliminates the need for any tuned circuit alignment, whilst relay switched elliptical output filters are used on each band to ensure a clean signal. A PTT operated antenna relay is provided. A matching microphone amplifier, type MA4 has been introduced to suit this TX. We have been asked time and time again "when are you going to introduce a simple 'phone rig?", well here it is. It is not just a 'phone rig though, the CW is also rather good. We hope you like it.

AT160 Kit: £34.90

Assembled PCB: £53.90

AA2 ACTIVE ANTENNA AMPLIFIER

The new HOWES AA2 kit enables you to build yourself a really compact HF reception antenna that can be accommodated in even the smallest QTH. Even if you have room for large antennas, you will still find this kit useful for building a rotary antenna for the lower frequency bands. Have you got a rotatable Top Band antenna? The advantage in being able to "null" QRM with a miniature rotary dipole should not be discounted. The AA2 has facilities for both short single wire and dipole inputs. The antenna length can be varied to suit your requirements, but about 6 to 8 feet is a good maximum length. The PCB is designed to fit inside standard 1.5" waste water pipe, so making for easy weather proof construction if required. Direct or Coaxial powering can be used, so the unit can be located next to the receiver, or remotely on a mast, chimney etc. It is also ideal for building a telescopic antenna facility into a homebrew portable. Features include a two stage amplifier with FET input, 50 Ohm coax output and two gain settings, it covers long wave to 30MHz applications.

AA2 Kit: £7.50

Assembled PCB: £11.50

MA4 MICROPHONE AMPLIFIER

The MA4 has been introduced to suit the modulation input of the new AT160 transmitter. It is designed to use a normal low or medium impedance hand mic, our CM2 desk/mobile mic kit or even an AP3 speech processor. The four stage circuit includes two stages of active low-pass filtering to help keep your transmitted signal bandwidth within tight limits. A gain control and RF filtering on the input are provided.

MA4 Kit: £5.60

Assembled PCB: £9.90

MBRX MARINE BAND COMMUNICATIONS RECEIVER

The new HOWES MBRX kit is designed to enable you to build a receiver covering the whole Marine band from 1.6 to 3.95MHz, including both the 160 and 80 Meter amateur bands. Modes covered are SSB and CW, although you can also use it for RTTY, FAX etc if you have a suitable terminal.

Features include:- ★ Switched input attenuator ★ RF stage ★ Balanced, Direct Conversion mixer ★ 2 stage active SSB filter ★ Stable FET oscillator ★ Fine tune control ★ Fast and Slow AGC ★ 1W audio output ★ Optional filters, signal meter etc are available. Requires two 365pF (or 500pF) tuning capacitors. A kit to build a real communications receiver with good facilities and performance at a sensible price.

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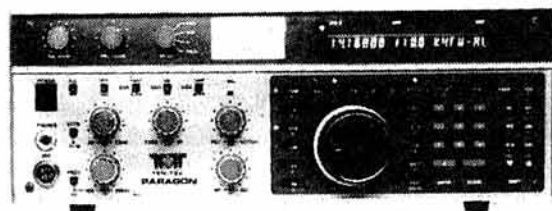
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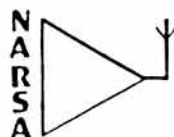
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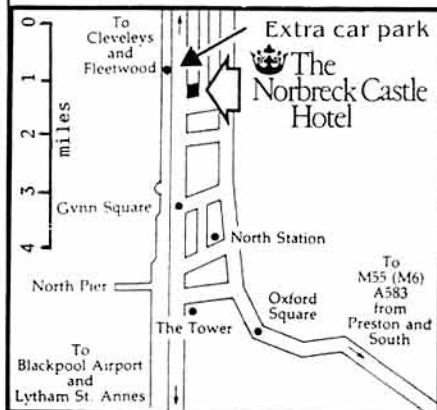
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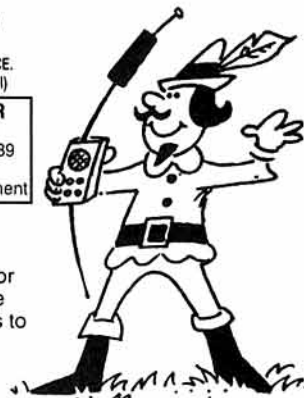
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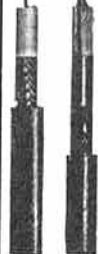
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the last ...

DON'T FORGET 70MHZ!

While, as usual, G3OSS has written a well presented and technically first class article ("Should we pack more channels in?"), I was somewhat surprised that no mention was made of 70MHz. As most members are well aware, the band is much under utilised and certainly local communication over a reasonable range using simple vertical aerials, low power and inexpensive equipment is well within the scope of most radio amateurs. Many low band FM ex-PMR equipments can be obtained at rallies and through at least two advertisers in RadCom. In the late 60's and early 70's there was a thriving 70MHz group in London using ex-BCC69 which had an output of approx 3watts on AM.

So why not "have a go" in true amateur spirit? I should add that generally in this part of Essex 144MHz is certainly not over-occupied, but if anyone likes to contact me I will be happy to become involved with a 70MHz net.

J D Harris G3LWM

WHERE DO WE FIND THE YOUNG ENTHUSIASTS?

To help promote "Project YEAR" I wrote to the 'heads' of six of the twelve senior schools here in Peterborough, inviting any interested pupils to an 'open night of Amateur Radio' to be held at our Club HQ in October.

So that we could forward plan for the 'mass invasion' of youngsters, I requested an informative reply by the end of September. Only two of the six Headteachers had the decency to acknowledge my letter, and both with no positive information.

Not to be discouraged, and, assuming that all the 6000 or so pupils got the message, we went ahead and put on a display of radio equipment, including a 144MHz working station, HF receiving Station, CW Station with operators, handouts from the RSGB and radio books, magazines, etc. - and we waited!! Not ONE

student turned up.

Had this been even a partial success, we had intended to repeat the event in February 89 for the benefit of the other six schools. Where did we go wrong? Or are they just not interested? S Meadows G1UGA (Sec., Greater Peterborough Amateur Radio Club)

FALSE DIPLOMACY

I have great sympathy with G4MVR but frankly do not see how such problems as his or mine (which is a terrace house in a conservation area) may be mended once they are established. For the consideration of others who may have to move to a similar location in future I advocate some caution against regarding 'diplomacy' as the answer; pursuit of that strategy here to the extent required to maintain reasonable relations has amounted to no more than appeasement, and has resulted in virtually no serious operation except on evenings, weekends and school/public holidays (often announced by S8 computer noise on 10m with the distinctive periodicity of computer programs). Were I not retired there would be little indeed. Even that does not guarantee freedom from problems - "Are you SURE you were not on your radio last night, my picture was not right?" - once the mere presence of an amateur station is known.

Should a move to a similar QTH have to be made in future, I shall try another tack. I shall make apparent other pastimes, to account for my time, but not amateur radio: I shall not exhibit anything recognisable as an aerial (a magnetic loop in the loft beats some outdoor wire aerials, with less TVI, by the way). I shall, of course, make the station as clean as possible and extend the amount of operation gradually so that any effects do not proclaim themselves suddenly.

Generally I shall be discreet; for instance radio periodicals will not come by mail - I shall want a plain brown cover for RadCom! Such measures may well work for a long time, as they seem to for some pirates, and if found out I can always resume 'diplomacy'

and be no worse off than now.

One thing more. If what we are doing is regarded as a minority hobby, we cannot expect to get away with as much nuisance as, say, keen gardeners' noises and smells. But if it really is to be classified as a 'service', as in some RSGB, IARU and official pronouncements, we should have had far more official backing in exercising our right to do what we have been licensed to do; frankly I think the Society could have done far more kicking and squealing on that point, which must affect most members to some extent, even at the expense of some other issues. Instead of which the new licence speaks of the suppression of "unwanted emissions or field strengths to the degree satisfactory to the Secretary of State," and requires power to be logged. I find it possible to imagine a very nasty interpretation of that being applied in the event of virtually any complaint being made; viz. that the power of any signal, however clean, must be reduced until it has no noticeable effect of any device, however close and however wide open, not actually tuned to receive it. If it is not, as is probable, too late, I would ask that the RSGB concern itself with this point rather than 10metre-only gear.

A L Dick (Sandy) GM0IRZ

Mr Dick has taken the reference to "unwanted emissions of field strengths" out of context. The sub-clause - 4 (3) - refers solely to Undue and Harmful interference to any wireless telegraphy. The terms are defined in sub-clauses 12 (1) (h) and (n), and are quite specific. It has always been a requirement to operate so as not to cause such interference; the new wording simply clarifies this. We know the answer because we raised this very point with the DTI during discussion. We also argued strongly against the requirement to log power. However, the RIS were adamant that it should be kept in as they saw it as an essential tool in dealing with interference cases. They also required that many amateurs already logged power. - Ed.

UNWARRANTED RUDENESS

May I, through the courtesy of your column 'The Last Word' thank for his vigilance and public-spiritedness the kind 'gentleman' (believed to be a G operator, although he gave no call sign), who broke into my QSO on 28.092MHz with Janos, HG8FH today, accused Janos of being a CB operator and told him in no uncertain manner to "get off the frequency".

I am glad to know that he shares my own attitude to unlicensed operators, but I can't help thinking that he would have been well advised to have listened a great deal more carefully before butting in on - and completely ruining - what had up to that point been a very enjoyable QSO between two properly licensed amateurs.

OK, so we were using SSB in a part of the band where that mode is not usually to be heard, but there was a good reason for this. Having had a QSO on RTTY we had arranged an experiment on SSB for talkback. The experiment had been concluded (unsuccessfully!) and we were just wrapping the contact up when chummy chipped in with his two penn'orth. Poor Janos, whose command of spoken English is in any case very limited, was very confused and audibly upset by the whole sordid affair. I can only hope that he doesn't think all G's are as arrogant and unpleasant. Alright, perhaps we should have QSY'd

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up a bit but there seemed little point in doing so on a band that was virtually deserted. Even so, our 'friend' is guilty, first of failing to establish the facts before levelling his accusations, and second of intolerable rudeness - and I sincerely hope that he will think before indulging in this kind of thing again.

John Sutton, G3YKP

PS I agree with G4PEF and G2DYM about the so-called cartoons you have started to print. They are puerile and pathetic and not the least bit funny. Get rid of 'em.

THE GREAT CARTOON CONTROVERSY

Sir, I agree with your comments re cartoons in last month's issue of RadCom.

We need to forget about the stiff upper lip attitude, and get with it! Like other magazines!

If this is the attitude of most members that your cartoons are of immense distaste, then thank goodness I am a SWL and not an amateur, as I would dread to upset them if I voiced my opinions on the matter of amateur radio.

Perhaps if you bring out cartoons on the SWL's it may bring those who complain to seeing a broader view of life that there IS spirit in amateur radio. So let's see more of them. Keep up the cartoons, Ed.

MB Marsden, RS85477

THE RELEVANCE OF THE GB CALLSIGN

Looking back at copies of Radio Communication, I saw in the May 1988 issue a reference to GB2DWR. Being a Welshman I immediately associated the callsign with either a water board event or some aquatic function (the word 'DWR' in Welsh means 'water'). To my amusement I saw that the real meaning of the callsign was Distillers' Whisky Route. Was there something in this, I wonder?!

Looking across the page I saw a reference to GB2TOT, which seemed to be more appropriate, but I saw that this was to give aid to the charity for the treatment of toddlers at Birmingham Children's Hospital. I hope that both special event stations were successes. Unfortunately I was unable to contact either station personally because of involvement in local special events, but had great pleasure reading about them.

D E Roberts GW0ABLPs

I wonder if they would allow GB2 LLANFAIRPWLLGWYNGYLLGOGERYCH-WYRNDROBWLANTYSILOGOGO-GOCH? (Dewi is the Chairman of the Dragon ARC who are based at LLAN...) - Ed



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