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<td>M02</td>
<td>Mast</td>
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Mini-Hybrid Quad (HQ-1) ... (p.p. £1.50) £4.50
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**TRIO COMMUNICATIONS EQUIPMENT.** Whilst chaos reigns in certain sectors of the Japanese import market in respect of prices, Trio stays cool (and so do their P.A. tubes). We saw the trouble coming many months ago—that's why we backed Trio. For an unbiased report read Radio Communications review of the TS515 in September 1973.

| TS515 Transceiver and p.a. | £211.00 |
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144 MHz MOSFET CONVERTER
- I.F.s available ex-stock: 14-16, 18-20, 24-26, 27-7-29-7, 28-30 MHz.
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- 5 watts input, six channel crystal controlled.
- Supplied with crystal for 145 MHz
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432 MHz MOSFET CONVERTER
- I.F.s available ex-stock: 14-16, 18-20, 24-26, 28-30, 144-146 MHz
- Price: inc. VAT £19.91

1296 MHz CONVERTER
- Gain 25 dB, N.F. 8-5 dB
- I.F.s available ex-stock: 28-30, 144-146 MHz
- Price: inc. VAT £26.40

432 MHz VARACTOR TRIPLER
- Maximum input power at 144 MHz: 20 watts. Typical output power (at maximum input): 14 watts
- Price: inc. VAT £27.50

1296 MHz VARACTOR TRIPLER
- Maximum input power at 432 MHz: 24 watts. Typical output power (at maximum output): 14 watts
- Price: inc. VAT £27.50

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For the Benefit of Overseas Readers, We List Our Agents in the Following Countries:

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Holland: S. Hoogstraal Elektronika, Almelo, Oranjestraat 40, Holland.
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DUAL GATE MOSFET CONVERTERS FOR 2 METRE OR 4 METRES

Look at these features:—

* Protection against reserve supply connection and excess voltage.
* Protection against MOSFET failure
* High performance
* High overtone crystals with no frequency multiplication on all the common I.F. 2 and 4 metre converters
* By far the most popular converters around.

2 METRE I.F.s AVAILABLE—Ex-Stock

2-4 MHz and 4-6 MHz for use with most general coverage receivers. Double conversion design using 2 mixers and no crystal oscillator multiplication. These techniques minimise breakthrough from out of band signals. Size: 2½ x 4½ x 1½.

28-30 MHz and 27-7-29-7 MHz and KW2000 type. For use with amateur band receivers or transceivers. These converters use 116 MHz range crystals with no frequency multiplication. This overcomes the problem of unwanted signals from the fundamental and harmonics of the 38 MHz crystals generally used in other converters.

Other I.F.s in stock 9-11 MHz, 14-16 MHz and 24-26 MHz, 4 metre I.F. 28-30 MHz. All these converters are £15 12.

SENTINEL X DUAL GATE MOSFET 2 METRE CONVERTER—Ex-Stock

This is a de luxe version containing an internal mains power supplier or battery operation. It has a front panel RF gain control, Size: 5 x 12 x 4 front panel, 4 deep. Stock I.F.s: 2-4 MHz, 4-6 MHz, 27-7-29-7 MHz, 28-30 MHz. Price : £21-45.

THE SENTINEL M.F. DUAL GATE MOSFET 2 METRE TO MEDIUM WAVE CONVERTER—Ex-Stock

Receives 2 metres on a conventional M.W.B.C. receiver, very good used with a car radio. I.F. output 0.5 to 1.5 MHz for 144-5 and 144-5 and 146-6 MHz in two switched bands. Double conversion design with two switched crystal oscillators. Isolated supply lines. Size: 5 x 12½ front panel, 4 deep. Price : £20-62.

SM70 70CM CONVERTER—Ex-Stock

This one uses an I.F. output of 144-146 MHz. This has enabled us to produce a very high performance converter with a noise figure of 3.5 dB for only £15-12.

2 METRE PRE-AMPLIFIERS (2 MODELS TO CHOOSE FROM)—Ex-Stock

The Sentinel low noise FET pre-amplifier.

* Built in a box which matches our converters.
* Isolated supply lines make it compatible with any existing supply polarity.
* Low noise figure 2 dB. Gain 18 dB.

The PA3 DUAL GATE MOSFET PRE-AMPLIFIER

* Small (about 1 cubic inch) printed circuit pre-amplifier developed to fit inside transceivers where it can be wired into the receiver serial lead after the c/o relay.
* Low noise figure 2 dB. Gain 18 dB. Price : £5-50.

SSM EUROPA 10 TO 2 METRE TRANSVERTER

The 2 metre band plan change involves the move of the SSB segment to the bottom half of the band. No problem to Europa users. Tune your dial down the band return your Europa front panel controls and you are there.

The Europa gives you:—

* Direct plug into accessory socket in Yaesu-Sommerkamp equipment (plugs and multicore lead supplied).
* High transmit power—up to 200W input—50% efficiency.
* Excellent receive converter performance. 2 dB noise figure.
* Extremely stable operation.
* Clean output.
* Attractive appearance—size 9½ x 4½ front panel, 4½ deep.
* Low price : £28-09 complete. £6.35 less valves—valves required are 2 off QQV03/10—1 off QQV06/40A. Additional 12V 2 amps transformer for use with 6.3v. A.C. heater Yaesu equipment (FT40I, etc.), £2-20 or in a case to match the Europa, £5-50.

Please note that Amateur Electronics in Birmingham and their Scottish agent are now stocking our equipment.

To obtain any of our products. We can dispatch by return of post. We give same day C.O.D. service. You can call in here any time to look at the gear. Or visit any of our retail distributors. Queries ? Write or ring if you have any questions. Paul G3MXG.
TELECOMMUNICATION INTERNATIONAL AGENCY LTD.

LINER 2. Add an amplifier module comprising of 40 watts PEFP linear power amplifier and modest preamp for the RX extremely simple to use with any -1 but could be easily adapted for use with any TX/RX receiver to more power and better sensitivity. Spec.-RX preamp gain 20 db NF < 2.5 dB. Power Amplifier, 10 watts PEFP output. Power requirements @ 15 Vdc, 0.5 A.

For further details and S.A.E. Price £200. Free carriage.

MURPHY MOSFET CONVERTERS. Overall gain of 10 db, NF <2.5 dB unit requires 12v. 20-30 MHz T output (others can be supplied on request). Price £100. Free carriage.

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GEC COURIERS AM high band 12j kits in leather cases, complete with batteries and charger. 2 only at £500. Free carriage.

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Cambridge AM100D Circuits of Tx, Rx, Inverter, etc., 55p post paid.

Vanguard AM25B Circuits of Tx, Rx, Inverter, Control gear, etc., 65p post paid.

Pye Bantams, FM, 49 MHz, in leather cases, with battery box, untested at £22.00 - 50p carriage.

Pye Bantams, AM, 86 MHz, in leather cases, with rechargeable battery, tested at £66.00 - 50p carriage.

2M Receiver XTN09A, suitable for Cambridge, Vanguard, Westminster, etc. 51.7 MHz for 144.51.768 MHz for 144-5. £1.00 each.

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Please enclose SAE for all enquiries.

TERMS OF BUSINESS: cash with order.

Callers welcome by appointment.

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SOLID-STATE RTTY CONVERTER-KEYER SRD-1

- COPIES 850/400/110 Hz SHIFTS
- BUILT-IN SINGLE AND DOUBLE CURSOR RTTY
- F.S. KEYER FOR TX (AND OPTIONAL AFSK)

Complete and ready-to-go for send-receive RTTY with TX, RX and teleprinter.

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- 3-pole Butterworth input band-pass filter.
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- Mark Hold and Normal/Reverse shift switch.
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- Narrow-shift CW identification.
- F.S. Keyer output for TX.
- Socket and circuitry already fitted for optional plug-in AFSK keyer module. 850/110 Hz.

- Part exchanges are a pleasure.
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ALL PRICES INCLUDE VAT (except Toroids + add VAT please).

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Note: All "E" Models (2" mast fitting)

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2M Converter Kit (less crystals) ... £4.13 12p
Crystal for above 70 or 75 MHz ... £3.00 4p

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A SUPERB RANGE OF ELECTRONIC KITS
FM and AM Tuners, Preamplifiers, Amplifiers, Multichannel Receivers, VU and Stereo Balance Meters, Power Supplies, Multivibrator, Transistor Tester, Light Cell Units, Triac Light and Power Control Units, Psychedelic Light Unit, Cabinets, etc.

S.A.E. FOR DETAILS OF KITS AND PRICES

YOUR CARD NO. Enquiries S.A.E. please.

TOWERS
Rotators
Coax
Ropes & Lines

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2M Converter 3.5-4 or 28-30 MHz ... £15.12 22p
70 Cm. Converter 144/146 MHz ... £15.12 22p
PAA Preamp for 2M Equipment ... £5.50 6p
2M Preamp in case ... £7.15 12p

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OSKER SWR-200 SWR/Power Meter 52/75 ... £20.35 30p
KW101 ATU/SWR ... £15.60 30p
KW101 SWR 52 or 75 ... £9.10 30p
KW103 SWR/Power 75 or 75 ... £11.70 40p
TMK TP10 2kV ... £6.06 30p
TPS 20kV ... £10.63 30p
500 30kV ... £15.04 30p
700 30kV ... £10.74 30p
SANWAPSB 2kV ... £7.33 30p
JPXD 2kV ... £4.50 30p
USDX 2kV ... £12.00 30p
A307/300 20kV ... £16.53 30p
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TECH 11-2 20kV ... £6.69 30p

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Low Loss Coax Coax ... £32.94 35p
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ML4 400 lb. line ... £6.06 25p
AT Insulators (Centre 2) ... £16.33 30p
14 swg 14/0 Copper Wire ... £7.33 30p

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All prices include VAT

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<td>IC 21 XT</td>
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(GB3SWM)

**Vol. XXXI**  
**JANUARY, 1974**  
**No. 363**

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Advertising: Maria Greenwood

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Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of quarto or foolscap sheets. Photographs should be lightly identified in pencil on the back with details on a separate sheet. All drawings and diagrams should also be shown separately, and tables of values prepared in accordance with our normal setting convention—see any issue. Payment is made for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

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Dislocation

While we ought to express regret that this issue is so late, it is not really incumbent on us to have to make any apology for circumstances quite beyond our control.

Till the rail go-slow started (holding up the mails) and the Prime Minister made his announcements on Thursday, December 13, we had taken all necessary steps, in co-operation with our printers—the normal Christmas mail hold-ups being allowed for—to ensure appearance of this issue on December 28, the due date.

However, since mid-December it has been impossible to keep to any sort of schedule. What with extended mail delays (it taking anything up to five days even for first-class postings to get anywhere), the Govt.-imposed short-time working and the constant threat of power cuts, any sort of production schedule became impossible to sustain.

Of course, it is not only we who are affected. Any periodical publisher is in the same sort of difficulty. The whole Nation is going through a time of trial, affecting in one way or another the lives of us all.

* * * *

When you will see this we cannot tell—but we do wish you a Happy New Year!
COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

As suggested by last month’s tailpiece, in giving the deadline for this CDXN, the approach this month will have to be somewhat discursive, as it is hardly likely that many folk will have been able to get their letters to us in time for them to be taken into this offering.

But not to worry, there are more things to DX than lists of exotic calls worked, and maybe this month’s notes will still be of interest.

The year just completed, taken in retrospect, has been one of ups and downs, perhaps the most notable feature being the virtual death of Top Band as a GDX and EDX carrier, saving among a small group of the faithful —and yet with the continued appearance of DX (almost all in a North-South direction) when all predictions suggested that the band should have reverted to its normal slumbrous state. Perhaps a less obvious, but none the less potent for that, factor was the solar disturbance earlier in the year which did not die away completely till Summer was all but done, giving conditions generally a marked up-till Summer was all but done, giving which did not die away completely potent a less obvious, but none the less its normal slumbrous state. Perhaps that the band should have reverted to (almost all in a North-South direc-

the continued appearance of DX group of the faithful—and yet with the Top Band as a GDX and EDX feature being the virtual death of retrospect, has been one of ups and downs, things to DX than to be taken into this offering. But not to worry, there are more to be acquired about what is happening, even though periods low on the purely transmitting side, that activity has been at an all-time course will come the rise to a new slope to a minimum—but then of long slide down the sunspot cycle the most important is the continued importance of establishing a good ground system with the loaded vertical aerials which are increasingly popular on most bands. A thought here is that, as far as the receiving set-up goes, is to embody a self-test facility (such as is used on the receivers of secondary radar ground equipments) to give a positive guard against the slow deterioration with age that can occur, particularly in a valve receiver, but less obviously can also appear in solid-state or integrated circuitry. One way of doing it is to terminate the receiver in a dummy-load and check the noise output at the audio end under specified conditions, thus measuring the overall gain of the receiver. Another approach is to inject a given signal and to look at the output. Either way requires care, but an experimental set-up on the bench seems capable of indicating the behaviour of the receiver at the flip of a switch—very handy when you are going through one of those periods when no DX appears to be about and the band seems so dead you suspect the receiver.

However, we have not yet got to where we can have a running check on the receiver, to bring up an alarm if at any time it goes even slightly off colour, as is possible with sophisticated commercial installations.

Looking Forward

What can we see ahead? Perhaps the most important is the continued slide down the sunspot cycle slope to a minimum—but then of course will come the rise to a new peak which thousands of amateurs will never have experienced before. Even those who have seen it all before, several times, will know how each minimum has been progressively countered by the improvements in gear, both transmitting and receiving, by the more consistent use of full power in whatever mode, by the advent of SSB, and by the gradual adoption in this country of beams and vertical antennae. And, of course, the progressive movement of the televaters from Band I, Ch. 1 up to the 625-line standard has meant less and less problem with TVI for those of us who live in built-up areas. Coupled with that there has been the realisation of the fact that the broad of the TV coax was most often the route of the interfering signal—which has meant the introduction of efficient braid-breakers to kill a TVI problem hardly noted in the text-books on the subject. Anyway, it should mean that in the coming year yet more stations will be representing U.K. on the HF bands during TV hours.

Top Band

Here our main source of news this time is G3ORP (Maidstone) who not only works the stuff but is full of good schemes for improving signal-to-noise ratios in either direction. First, to the roll-call: On SSB there was KV4FZ, and on CW he booked in VE1MX, K1NOL, VO1KE, W1HTG, EP2BQ, W1BB, KV4FZ, W2DEO, DL2GG/VY5, K4CIA, W1PL, WA8IU, Y8AH, W2PV, W1GBP, K1CPF and PY1RO, not to mention much juicy stuff heard. Peter says the band is “crawling with DX on about four nights each week,” with all U.S. call areas audible save the elusive W6/W7 chaps. Operating points: Peter asks that the W’s should say where they are listening when they go over—this could save a lot of unnecessary QRM on other people in the 1825-1830 kHz answering segment of the band. G3ORP uses a separate receiver, with its own ATU, and a built-in Q-Multiplier in the ATU, so that he can get a really narrow bandwidth at signal frequency—this is of enormous help when a powerful signal opens up nearby. Incidentally, there are still people who hear DX on 1803 kHz, and then go and call it on its own frequency—surely everyone must know how it is done by now.
G3APA (Coventry) harks back to the paragraph in the November issue, p.536, about operating from Sark, and says that over the past years he has himself worked from Sark as GC3APA, sometimes for quite extended periods, without any problems. We quite accept that all of his Sark activity was authentic and trouble-free—but, somewhere along the line someone has been naughty. To drop a line to the authorities in Guernsey as they ask would seem to be both a courtesy and a guarantee of permission being granted—and, incidentally, the paragraph item on p.536, November, was inserted at the request of the Ministry.

G3ZYE (Tavistock) had a bit of a surprise recently. Robin has an FT-101, feeding a wire about 200 feet long but no more than ten feet high. On November 17 he was calling “CQ Fylde,” in the hopes of working some of his buddies at Thornton Cleveleys but had no joy, so wrote “Condx NBG” into his log. Imagine his amazement at receiving an airmail letter from VK3CZ giving him a report of 339 in Australia, who at the same time heard OK1KRS and DK6QJ/P. VK3CZ, to aid anyone interested in a VK contact, quotes the sunrise times at his end, and says he is on most mornings for a try his “transmit” frequency being around 1802.5 kHz. Sunrise on January 1 is 01:13, January 14, 01:14; February 1, 01:32; February 15, 01:47; March 1, 00:44; March 15, 00:19; April 1, 03:02 and April 15, 04:09 GMT. So, there you have it. No doubt VK3CZ would accept a solid and reliable sked arrangement, so why not have a try at working VK—it seems far more people get over one way than ever realise it! VK3CZ is QTHR, and you should use airmail.

Eighty Metres

Not given much notice by any of our reporters, G2HKU (Sheppey) turned his beady eye to the Side-band end of the band several times, and worked SB4FF on each occasion. Although he has not written in for a while, G3DNF assured us he is far from being out of action. Gordon is preparing a QRP rig with which to try Eighty during the QRP Contest over January 12/13, thus hoping to rake in some QSO points during the hours of dark. One hopes there will be other U.K. entries for this contest, if only to give G3DNF a run for his money! Unlike many of us, Gordon is not bothered by being QRT while constructing a new piece of gear, as he thoroughly enjoys this facet of the game.

The Royal Navy Amateur Radio Society High Speed Morse (QRQ Runs), which so many people use to bring up their CW speed, will be changing time. Instead of the advertised start at 1900 clock, they are putting the starting time back to 20.0 p.m. so as to enable the chaps who do the sending to arrive at the station and get sorted out without having to rush about. The only information of which we are deprived, having gone through much paper to check, is the frequency on which these transmissions can be heard!

G2NJ (Peterborough) mentions one late-night CW contact on Eighty with LA0AR near Oslo, who is British but has never held a U.K. call. He used to live at Chalfont St. Giles and is a radio technician. On the QRP front, G2NJ mentions a contact with G3IFF, Havant, who had three watts input into transistors and a bent dipole as the means to put a solid signal into Peterborough.

Forty

As always, the DX is there if you know how to winkle it out. G3RFG (Henlow) recalls the days back in 1925-1928 when the QRM from...
perhaps fifty ships all using spark in the same spectrum had to be contended with in order to pick out the wanted one and copy him "sometimes, (he says), in order to aid the concentration, he would close his eyes and let the lower jaw sag". Stan says the training was good—he can still read an S2 signal with S9 QRM practically on top of it (so can any competent CW operator on today’s HF bands) only given that both signals are clean, the slightest chirp or wobble of either making the situation impossible. Stan’s vertical Ae. enabled him to raise, on CW, K2SWP, JA4BJO, VK3MR, W2CBS, WB5DIZ, KV4AM, UK6AAN, VP2ST, YV1AD, ZF1FOC, and ZL2MM, plus a “heard” list twice as long and covering all continents, save Africa—and this on 40 metres!

Your conductor managed to spend the odd hour listening through the rumpus, and in the 2130-2200 period of November—beginning of December time seems to have stalled, with FL8OM and 4W1AF, the instigators, strung up for the reason that the political situation there is distinctly unpleasant; if things cool off a bit, there is said to be some chance they may be able to pull it off in January.

A4XFD is still there from Masirah Is. and has been heard on 21184 kHz and 14210 kHz, working Europeans, his 21 MHz time being around 1015z and on Twenty about 1620z.

It is quite surprising how the influence of JY1 has taken Jordan out of the lists of rare DX—we notice AP2ZR is reported on 21270-21280 kHz, working to a list taken by JY3ZH. Another AP signal of some interest to members of the Scout movement is AP2BS, who operates from Scout Hq. in Lahore, QSL address P.O. Box 65, Lahore, Pakistan.

**Twenty Metres**

The all-action, all-QRM band, this one. G3UZ (Goring-by-Sea) found conditions varying from good to indifferent, but nonetheless George’s CW penetrated to VK6FT, 4K1A, AX2BML, VU2ANI, VU2AL, CX2XA, PY7IE, PY7AHO, LUSCV, SV1AA, CH1BH, UA06WQ, UA0BL, W6EBG, W6AEM, W6EPQ, W7NHG, KP4CKY, PJ8WW, PJ2DW, VS9MJ, HS1AJB, UH8BDO, UL7WR, UL7PAS, UD6DJT, OD5BZ, LB1D, and HW8TT/FC, plus a string of UA9’s. The contact with W6EBG was of interest and lasted for over an hour; this arose because W6EBG knew Tommy, G6OB, well and also the area around Worthing, Goring and Arundel.

VK3AMM is a call perhaps better known as G6XJ, Arthur Edwards late of the Eddystone concern, manufacturers of amateur-band receivers. Arthur has now left New Zealand and at the time of writing is holed up with VK3ML. Then he goes on to VK2EK, Ted Kenny, who was G6XJ’s first VK contact back in 1929, and also his first-ever QSO on Twenty—it has taken them 44 years to meet! Another projected trip is to Alice Springs, to see VK8AD, manager of the Alice Airport.

Talking of the Antipodes, a specialist in working them is G2HKU, with his regular morning skeds; in the current month they have produced ZL1AJB, ZL1NX, ZL1VN, ZL3RS, and ZL3SE.

Just one contact is mentioned by W4WFL/1, a new country for him in the shape of 8QAC in the Maldives.

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**The JOTA station operated by G13ZIA from Enniskillen, Northern Ireland, worked 300 stations.**
The stand of Radio Shack, Ltd., the well-known dealers in the Amateur Radio market, at the Leicester Exhibition. On right, Terry Edwards, G3STS, with G3VKC assisting. One of their choice exhibits was a new Drake Rx priced at £1,133—oh, well!

Morgan is putting a good deal of effort into the CW end of the band, but sad to say, he is finding the pay dirt is only SSB in terms of new countries and other such desirables

QSL Information

W4WFL has some to offer: QSL’s for CR6K, XX6IK, CR6YY, CR6AA, XX6AA, CQ6AA, CR6VV, CR6MT, TY5ABK and EI7CI all to W8CNL. For CR3AB, send your card to Ritzen, CT2AK, USNAF, Box 15, A.P.O. New York, N.Y.09406. CT1VE, EAMAX, EA7DI and EA7JL cards should go to K1WPS; VPI5YL cards to W4SYL/5, Roger Burt, 6353 Kingston Court, New Orleans. CT2BO, VR1L, and YJ8BL cards are handled by W6NJU, who has recently moved to 7632 Woodland Lane, Fair Oaks, California, 95628.

Talking of QSL’s, one wonders how many of the folk who complain about the service from the bureaux ever stop to think that the reason for the slowness, particularly with a relatively inactive amateur, is the time taken for the stations concerned to get around to writing the cards out and posting them to his bureau. You can hardly blame the bureau if you sat on the card for six months!

It is estimated that it can now take one year for a DX card exchange to be effected via Bureau. And it is not unknown for cards to turn up two years after the QSO—laughable, isn’t it! If you are hot about QSL cards the solution, as we have been saying for years, is to QSL direct.

For those who like it, Fifteen is undoubtedly the best band of all, certainly if you want to work the DX in an atmosphere of relative calm—G3RFG used 15m. at odd times, and surfaced with CX2XA, HC1XG, K2QBH, PY7VOU, VE3AL1, VP2VBU, W1WU, W23TZT, W4MFOJ, W5EFO, W8GZX, W9FD, W9OYP, all mentioned in his first letter; his second indicated some slight lift in conditions and covered CX1JM, HS1AT, K1VME, K23OL, LU5EX, UA9YAG, VO1JE, WA9LHH, W2NFUN, W4NBLK, and W5MYA all worked; and there was a gotaway list to accompany, which in itself indicated the band was open to most of the world at the times most people can be on.

Here and There

An interesting thought was raised by a colleague, who is of the opinion that a well-equipped DX station should have both a beam and a vertical or ground-plane aerial if it is to take full advantage of the openings the bands offer. Basically, the argument goes something like this: Particularly in this country, the height above reference ground of the average twenty-metre beam is pretty low, usually between thirty and forty-five feet; this being the case, the beam has quite major lobes at high angles to the horizontal, and the low-angle lobe is itself not as low as one could wish. On the other hand, the vertical or ground-plane, at the same height of feed-point and adequately provided with radials, will at some times be intercepting more RF from a DX station than the beam would do, particularly at times when the band is just opening or closing. So, taking the argument to its logical limit, when a signal is propagated by “waveguide” action between the ionosphere layers, when it does escape and return to ground the angle of incidence will be so high that a dipole at a few feet above ground may well give more signal pick-up than either a vertical or a beam aerial. Interesting thought, and one which could well be experimented with by some keen DX-minded operator. Your conductor has done a few brief comparisons, which, it has to be said, do tend to bear out the theory.

Some new block callsign allocations are notified by the ITU, namely P2A-P2Z, for the Territory of Papua and New Guinea, and S6A-S6Z,
similarly allocated to Singapore who knows but prefixes for these regions may well pop up on our bands.

If you came across KH4NCA recently, around mid-December, it was a station on the appropriately-named Kill Devil Hill, from which the Wright Brothers made their initial tests and finally powered flight back in 1903.

An interesting prefix which has been heard on Forty is 4CSAA, found in the bottom 10 kHz segment on CW. The prefix is for Mexico.

If you are looking for a 9U5 QSO it is now too late. It is understood that operations were to have been suspended as from December 31, 1973; but as early as December 6, it was believed that 9U5CR was the last remaining station active.

4L8A was an interesting prefix from the UH8 area, active at the time of writing, but it is not known just now long he will be there to delight the prefix hunters.

Looking a little forward, maybe as far ahead as February, we hear a rumour that some operation from Spratly Is. could be coming up, although nothing seems to be definite as yet. Certainly an expedition there could expect to do good business on all bands.

Ten Metres

Not a lot of activity in the way of reports, although no doubt there are some in the pipeline, to be taken up next time. G3KFE has to say, regretfully, that at the times he can operate, there is generally a deathly hush over the band, or at best a tropo opening to somewhere fairly local.

G3RFG seems to have completely deserted 10 metres, and this month has not even mentioned the beacons; on the other hand G2HKU is quite out of his usual run of things when he reports CW contacts on the band with CR6OZ and ZD3X. The ten-metre band should never be neglected.

Some Other Points

January is traditionally the time for Good Resolutions, and no doubt those of us who hold a licence and look for DX may well make a few. One, perhaps, could be not to get bad-tempered in a pile-up, no matter what the provocation, remembering that the guy who loses his temper usually loses the battle. Another one, on Eighty, would be for the non-DX types to resolve not to interfere deliberately with the DX activity at the HF end of the band, while the DX chaps could at the same time make a resolution to avoid at all costs generating QRM to those rag-chewing within a few kHz of the DX frequency, by over-modulating or any other facet of the excitement of the chase. Phone-only types—for some reason, the YL's are usually more versatile—could well practise their CW, while CW-only men could try Phone once in a while. And both could try SS/TV, or RTTY, or some other angle, even—perish the thought!—VHF. The chaps who buy every item in the station from the tip of the aerial back to the microphone could well resolve to try to build something, whether by copying a published design, designing it yourself, or building from a kit. And all of us could well make a resolution never knowingly to break our licence conditions, and to jump hard on pirates and other malefactors who, by their activities, may well reduce the freedom from significant supervision we enjoy today.

Back to our muttons. If you are interested in working Crete, as distinct from any old Greek station, try looking for SV0WEE, or SV0WM3. The latter may be found during the early evening on Twenty, while the former seems to prefer to operate in his lunch hour,
Station of SM7FJE, Bo Nisson, Trelleborg, Sweden, who is one of the younger SM's.

say, 1130-1230 in the U.K.

We have already mentioned the San Andres Is. operation. Just as this was going down, news came in that they will be active on Top Band, probably signing HK40BKX, sending both SSB and CW on 1805 kHz, and listening around 1824 kHz for CW replies or 1820 kHz for SSB. This could be quite a QSO from the U.K. Other frequencies noted are: Anywhere in the band for SSB on Eighty; 7025 kHz CW, SSB anywhere they can get in; 14025 kHz CW, or 14270 kHz SSB; Sideband on Fifteen will be on 21310 kHz, and for Ten it will be on 28.6 MHz.

Also from the same late source we get the mouth-watering information that XV5AC has been doing good business on Top Band, at least into the West Coast—but no reports have reached your conductor of anyone in Europe recording him.

Sign-off

That's it for another month. Grateful thanks to all who rushed to put pen-to-paper last time and so enabled this piece to appear as usual; to Geoff Watts and his DX News Sheet for its useful advance information; and to the kind soul, whoever it may be, who arranged that weekly copies of the West Coast DX Bulletin should appear on this desk at just the right time. To everyone, a Prosperous New Year, with all the DX you want, when you want it. Finally, a deadline for next time, at January 10, latest, addressed as always to "CDXN," SHORT WAVE MAGAZINE, BUCKINGHAM. MK18-1RQ. 73 de G3KFE.

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CLUB MEMBERSHIP LISTS

We are always interested in seeing these and usually they come out with the newsletter of the Club concerned, as part of the annual summary. For instance, in the case of the Echelford Amateur Radio Society, of Ashford, Middlesex, we find they have over one hundred registered members, of whom about 60 are fully licensed, with twenty or so G8/3's and the remainder in the SWL category. This suggests a pretty fair balance of Amateur Radio interest.

THEFT OF GEAR

We are asked to notify the theft of an HW-100 from Bristol Amateur Radio Club, University Settlement, Bright Street, Barton Hill. The HW-100 itself has circular scratch marks on the dial and an SO239 socket on the rear chassis drop to replace the B-L type normally fitted, and the PSU to go with it is home-built. Any information to R. J. Harris, G8BR, 35 Fremantle Road, Eastville, Bristol. (Tel. 70271, Ext. 26.)

TEN-METRE BEACONS

The following beacons are now in regular operation in the 10-metre band: DL0IGI (28-195, alternate 28-2); GB3SX (28-185); VE3TEN (28-175); VP9BA (28-165); ZC4CY (28-180) and 3BBMS (28-190). All frequencies in MHz. These signals are, of course, very important as certain pointers to band conditions on ten metres. Reception reports would be appreciated and when they are heard, the band should be monitored and CQ calls originated. (Data from Region I News, August).
THE SHORT WAVE MAGAZINE
January, 1974

BROAD-BAND ANTENNAE FOR EIGHTY METRES
SOLVING A COMMON PROBLEM
R. L. GLAISHER (G6LX)

The bandwidth of most low-impedance fed aerials is insufficient for complete coverage of the 80-metre band. If only CW (or SSB) is worked and the aerial is cut for the right end of the band, there is no problem, but if both modes are used, then difficulties can arise due to excessive voltage standing waves on the feedline. This can result in poor transmitter loading, spurious emissions such as key clicks and splatter, TVI, flashover of the PA components, or even overheating and destruction of the feedline.

Most modern transmitters and transceivers are designed to feed non-reactive loads of either 50 or 70 ohms. In order to keep size to a minimum, components are rated so that the PA will only cover a limited matching range and there are no safety factors which will take care of VSWR's worse than 2 or 2.5:1. An 80-metre dipole resonated in the centre of the band, mounted about 40ft. above electrical ground, will certainly produce SWR's that are greater than 2.5:1 at the band edges. Inverted-Vee's usually have less bandwidth than dipoles, and multi-band trapped aerials even less still. Shortened and loaded aerials are worse than their full sized counterparts, and bandwidths of 25 to 50 kHz for a 2.5:1 SWR are commonplace for these types.

Snags Encountered

In order to overcome the loading and flash-over problems, many amateurs use some form of external tuning unit to match the low-impedance feeder at

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Fig. 1. Multi-resonant dipole for full coverage of 80 metres.

Fig. 2. Multi-resonant inverted-Vee for Eighty.

Fig. 3. Broad-band wire vertical Ae. for 80m.

Fig. 4. Multi-resonant version of the 30ft. inverted-L.
different in-band frequencies to the transmitter. While the use of a tuning unit helps to overcome the problems of showing the transmitter a constant non-inductive load, it does not reduce the SWR on the feedline. This can only be done by making the aerial resonate over a wider range of frequencies, or by using some form of multi-frequency matching section at the aerial feed-point. Aerials such as the multi-wire folded dipole and double coaxial bazooka provide sufficient bandwidth for complete coverage, but these tend to become rather complex and are not always as easy to make and erect as a straight wire dipole or inverted-Vee.

Solving The Problem

A simpler arrangement is to use a pair of parallel dipoles fed with a common low-impedance line. The parallel dipole arrangement is in common use for two or three band coverage, but it is not generally appreciated that the same technique can be used to provide multi-frequency resonance within a particular amateur band. If 70- or 300-ohm twin ribbon feeder is used for the parallel elements, it is possible to construct a simple wide-band aerial that is no more difficult to erect than its single wire counterpart.

In practice, one set of elements is cut for resonance at 3575 kHz and the other at 3725 kHz. As both types of ribbon are inherently strong, it is only necessary to support the aerial by insulators attached to the longer of the parallel wires. The shorter element(s) are cut back flush with the insulating material and sealed by the application of gentle heat from a match or a soldering iron. Care is needed in the sealing process, as too much heat will melt the insulation and could cause shorts to the other element.

As shown in Figs. 1 to 5, the parallel-element arrangement can be used to increase the bandwidth of various types of wire aerial. All these have been tried and in no case did the SWR rise above 1:6:1 on any frequency within the 80-metre band.

The British Amateur Television Club had an impressive live show at the Leicester Amateur Radio Exhibition. Their well-equipped vehicle was parked inside the hall, and here we see G6STO/T and G6K0J/T (right), chairman of B.A.T.C.—and see p.671.
LINEAR RF AMPLIFIER FOR THE HF BANDS

PASSIVE GRID, USING 813's FOR FULL P.E.P.

R. I. THOMAS (GW4BCD)

It became apparent to the writer that the 50 watts p.e.p. from a single 6146 was not really conducive to having good DX QSO's. Europeans could be worked, but DX contacts were very difficult and a solid DX QSO was the exception rather than the rule. The antenna is, of course, the prime factor, but it no improvements can be made in this direction due to lack of space or QRK (both, in the writer's case), an increase in power should help to find the answer.

Commercial QRO linears are expensive so it was decided to construct a simple linear using 813's, two of which are easily capable of 400 watts p.e.p. output, even with voltages as low as 1.8 kV on the plates. The passive grid mode was chosen to ensure a reasonable match to the exciter without having to provide input tuning, as is necessary with grounded grid stages—the inherent stability of such an amplifier and ease of tuning also played a part in the choice. The screen and bias voltages were already available, so a cheap and effective RF amplifier was put together in a fortnight or so of two-hour evening sessions.

Tank Coil Circuitry

The circuit is shown in Fig. 1. The one departure from a conventional design in the prototype is the pi-tank coil, L1, which is a roller coaster type, ex No. 53 Set, which has been available on the surplus market for some time. This is a beautifully made component, consisting of 48 turns of silver plated 16g. wire on a 2½in. diameter ceramic former—a silver plated wheel traverses the former, so that any number of turns can be brought into circuit. (See SHORT WAVE MAGAZINE, March, 1972, p.27, for a full description). The actual RF handling capability of this coil is not known but in the prototype 400 watts of output power has presented no problems.

This tank coil arrangement works well over 3.5 to 21 MHz, but on ten metres efficiency falls off markedly and if much operation is envisaged on this band a purpose-wound coil should be used. It was found that on 21 and 28 MHz the minimum capacity of the anode tuning capacitor was too high to achieve efficiency in RF transference. For a time the amplifier was not used on these bands for this reason, but a solution was found in the Radio Handbook—the problem was overcome simply by switching out the anode tuning capacitor and resonating the tank circuit with the coil using the inherent output capacity of the 813's to form the C-proportion of the requisite LC ratio. A conventional switched coil can, of course, be used, the Edystone 2½in. ceramic former being ideal, though a heavy duty ceramic switch is very necessary in this part of the circuit.

Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>0.1 μF, disc cer., 5 kV</td>
</tr>
<tr>
<td>C2</td>
<td>0.001 μF, disc cer., 6 kV</td>
</tr>
<tr>
<td>C3, C4</td>
<td>0.001 μF, mica, 1 kV</td>
</tr>
<tr>
<td>C5, C6</td>
<td>0.001 μF, mica, 250v</td>
</tr>
<tr>
<td>C7, C8</td>
<td>0.001 μF, mica, 250v</td>
</tr>
<tr>
<td>C9</td>
<td>0.01 μF, disc cer., 1 kV</td>
</tr>
<tr>
<td>C10</td>
<td>0.01 μF, mica, 250v</td>
</tr>
<tr>
<td>VC1</td>
<td>150 μF var., wide spaced</td>
</tr>
<tr>
<td>VC2</td>
<td>1500 μF, BC type</td>
</tr>
<tr>
<td>R1</td>
<td>50-400 ohms, see text</td>
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<tr>
<td>RFC1</td>
<td>1000 ohm, on 1 in. ceramic former (see text)</td>
</tr>
<tr>
<td>RFC2, RFC3</td>
<td>1.5 mH, 250 mA RF choke</td>
</tr>
<tr>
<td>APC1</td>
<td>6.16g. on 47 ohm resistor body</td>
</tr>
<tr>
<td>APC2</td>
<td>0.01 μF, mica, 250v</td>
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<tr>
<td>M1</td>
<td>0-500 mA</td>
</tr>
<tr>
<td>M2</td>
<td>0-100 mA</td>
</tr>
<tr>
<td>V1, V2</td>
<td>813</td>
</tr>
</tbody>
</table>

Fig. 1. Circuit of the Passive Grid Linear RF Amplifier using parallel 813's for full power.
Other Circuit Considerations

The grid resistor R1 shown can be reduced if plentiful drive is available, 50 to 75 ohms being the ideal, but with the writer's KW-2000 as driver some 400 ohms at R1 gave full 400 watts p.e.p. output. If the drive is available low this resistor can be increased to get the requisite grid voltage swing, up to the point where the amplifier becomes unstable. This varies from valve to valve but an often quoted value is 1000 ohms. This resistor R1 must be non-inductive and adequately rated for power dissipation. Ten 3700-ohm one-watt carbon resistors in parallel in the prototype cope easily with 50 watts drive from the exciter, showing no signs of over-heating even with prolonged transmission. The anode RF choke, a vital component in this circuit, is 300 turns of 32g. wire wound on an inch diameter ceramic former 6in. long. These turns are wound in unequal sections as follows: 165, 65, 35, 20 and 15 turns with one-eighth inch spacing between sections. This is as recommended by the books but does not seem critical as a straight 400 turns on a 6in. paxolin former was also tried in the prototype and no difference whatsoever was noticed.

The anode tuning capacitor VC1 must be wide spaced, with about 1/10th inch spacing between its stator and rotor plates. VC2 can be a standard broadcast Rx type which will not flash over with RF if a good match exists between aerial load and amplifier. A tolerable SWR is imperative at this power level—a bad match will cause all sorts of problems. Apart from flashover, RF burns may be a problem from the chassis can. TI (or worse TVI), breakdown of C2, and so forth. The prototype behaves perfectly into an SWR of 2:1 but beyond this difficulties do begin to arise.

The receive-transmit relay also switches the screen voltage supply, thus obviating the risk of applying HT to the screens before plate voltage which could destroy even the 813's, the most robust of QRO valves. This arrangement also allows the 813 standby current to be zero, thus preserving the IVS rating of the mains transformer in use. The screen voltage in the prototype is not stabilised—no ill effects have become apparent because of this. A heavy-duty change-over relay is required, as now normally available.

The bias input choke RFC2 is a standard 15 mH pie-wound component, as is RFC3 across the output, the latter being required should the blocking capacitor C2 fail. Originally, in the prototype, the output choke was across the antenna socket but when the amplifier was switched to “receive” and this choke switched out, the PA loading capacitor flashed over with DC. This apparently impossible phenomenon was due to the fact that the PA tune and load capacitors VC1 and VC2 have a proportion of HT across them, despite a perfectly good blocking capacitor at C2. Therefore, the output choke RFC3 should be across the tank circuit under both “receive” and “transmit” conditions.

Layout and Construction

In the writer’s experience layout is not particularly critical, provided the standard precautions are taken. Probably the prime consideration in this respect is that the input must not “see” the output. This implies getting all input circuitry below chassis and all output above it. All leads carrying RF should be short and stout. Single-point earthing was not employed in the prototype either for decoupling or the pi-network capacitors, instead emphasis was placed on keeping component lead length as short as possible—this seems to have been successful as the amplifier is completely stable over its range. Neutralisation is not necessary—though it might be in some cases.

The amplifier should be built into an RF-tight cabinet and, needless to say, sturdily. Blowing the 813’s is not necessary but free circulation of air is required. (A surplus hair-dryer motor is employed in the prototype).

Power supply circuitry, at Fig. 2, is self-explanatory. The required smoothing is accomplished by a series-parallel arrangement of capacitors with equalizing resistors. The cans of C1 to C4 inclusive are at varying potentials above earth so should be encased in tubing for operator safety. The series arrangement of diodes gives a total p.i.v. of 6 kV, which is an adequate margin. However, the equalizing resistors should not be omitted under any circumstances. Using the mains transformer rated as specified HT off-load is 1775 volts, dropping to 1500 volts at full rated output. The bias supply is arrived at by the voltage divider network shown—adjustment of RV1 allows the standing current to be varied. Maximum plate dissipation of the 813 is 125 watts for one valve. The HT voltage is, of course, lethal and the voltmeter should always be scrutinised for a zero reading before delving into the power supply. The voltmeter is shunted by five 2-watt resistors to avoid arc-over across the resistor bodies, which could (and did) occur if only one or two of the higher value are used. The capacitor bank retains a hefty charge for some time after switch off and the power supply as a whole is approached herculean neither. At this QTH it is built into a sturdy earthed steel case and placed in such a manner that it cannot be touched from the operating position.

Setting Up

Tuning the passive grid linear is simplicity itself, especially if a switched-coil type pi-tank is incorporated. A small amount of drive is applied until the plate current just moves off the resting current position and the anode tuning capacitor meshed to find resonance as shown by
Fig. 2. Power Supply Unit for the 813 Linear Amplifier.

Suitable roller coaster tank coil—see text.
Table of Values

Fig. 2. Power Supply Unit for the Linear

C1-C5 incl. = 80 + 80 µF, 450v.
C6 = 32 µF, 450v, wkg.
C7 = 8 µF, 250v, wkg.
R1-R12 incl. = 270K, 2w.
R13-R17 incl. = 470K, 2w.
R18, R19 = 470K, 5w.
R20, R21 = 20K, 2w.
VR1 = 20K, 5w, wire-wound.
D1-D17 incl. = 1N4007, 1000 p.d.v., 1 amp.

<table>
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</tr>
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<tbody>
<tr>
<td>C1-C5</td>
<td>80 + 80 µF, 450v. incl.</td>
</tr>
<tr>
<td>C6</td>
<td>32 µF, 450v, wkg.</td>
</tr>
<tr>
<td>C7</td>
<td>8 µF, 250v, wkg.</td>
</tr>
<tr>
<td>R1-R12</td>
<td>270K, 2w. incl.</td>
</tr>
<tr>
<td>R13-R17</td>
<td>470K, 2w. incl.</td>
</tr>
<tr>
<td>R18, R19</td>
<td>470K, 5w.</td>
</tr>
<tr>
<td>R20, R21</td>
<td>20K, 2w.</td>
</tr>
<tr>
<td>R20, R21</td>
<td>20K, 2w.</td>
</tr>
<tr>
<td>VR1</td>
<td>20K, 5w, wire-wound</td>
</tr>
<tr>
<td>D1-D17</td>
<td>1N4007, 1000 p.d.v., 1 amp. incl.</td>
</tr>
</tbody>
</table>

Notes: 1. T4 have standard mains primaries. S1, S2, S3, heavy-duty DPST rated 250v. 6 amp. M1, 8-10 mA shunted by 5 w. 500K resistors, to read 0-5.5 kV
Fuses F1-F5, anti-surge.

Reference to the “forward” position on an SWR bridge. Drive is then increased and the amplifier loaded to its peak current by both “tune” and “load” capacitors. Drive should then be backed off so that the maximum plate current on speech peaks is about half the peak loaded current. Tuning should always be directed towards producing maximum RF rather than for dip, as with most unneutralized linears. With the roller coil shown in Fig. 1 tuning is initially more difficult, but once the optimum L.C ratio has been found and logged it becomes very straightforward. As a rough guide to any prospective user of this method maximum RF is produced (with the 53 Set roller coil) in the prototype with the following number of turns in circuit for 3.5 to 20 MHz respectively: 19, 9, 4, 2, 1.

At this QTH, the amplifier is used into a matched end-fed wire or 30ft. vertical and has given the expected 2 or 3 S-points increase in reports. More important, “talk power” has increased, turning an R3 report to R5, which makes operating a lot more rewarding, to put it mildly.

TUNING A G-WHIP BY REMOTE CONTROL

USING AN INDUCTANCE SLEEVE

S. R. TUCKLEY (G3GOP)

Users of the popular centre-loaded whips will know that they are very frequency conscious. Tuning the transmitter 10 kHz either side of the resonant at which the whip is set results in a considerable increase in the SWR and should one wish to call a station, say on 80m, 100 kHz off the whip frequency setting, unless a separate Z-match is in use, it will be necessary to adjust a section of the aerial before transmitting on the new frequency, or accept a deplorable SWR and risk damage to the final amplifiers.

The writer uses a very simple method of tuning the G-Whip antenna quickly and accurately. It depends on the well-known trick of sliding a hollow metal cylinder over an inductance to alter its resonant frequency. The Mk. I version of this device employed a 1in. diameter tube, 2in. long, made of copper foil soldered down the seam and then mounted on a 5in. length of 4in. wooden dowel, weatherproofed, and held close to the lower section of the G-Whip, but loosely coupled by a 3in. wide polythene ring, cut from 1in. tube, and placed at a suitable position about 2ft. up, so that the dowel could slide easily. It will stay put due to the helix and can be slid to a tight fit when storing the G-Whip away. The lower end of the dowel is tapered and pressed into the expanded end of a 2in. length of old 4.5in. coax — this again accepts the stranded steel wire, inner of a suitable length of bicycle brake cable, the sleeve of which is anchored on the stout bracket to which the G-Whip is mounted. The cable extends to the operating position, a small knob pulls the cable inner out about 1in., thus in turn bringing the copper tuner down the loading coil from the top also about 1in. This was sufficient to tune the G-Whip from 3.6 to 3.8 MHz, resulting in a 1:1 SWR on any required frequency between these limits.

This design was tested static and considered satisfactory. The Mk. II version shown here was developed.
after discussing the project with G6XP who offered the useful idea of using cord drive. The drawing, which should be self-explanatory, shows (1) telescopic section of G-Whip fully extended on 80m.; (2) section of polythene tube \( \frac{1}{4} \)in. diam. \( \frac{3}{8} \)in. deep, pierced vertically each side to take the two similar light rustproof springs (3); (4) Copper or aluminium (cut pharmaceutical container) cylinder, lined with plastic tape to give a close fit over the already well-insulated loading coil of the G-Whip. (5) Nylon fishing line with a loop attached each side of the cylinder to give an even pull against the springs downwards, thus increasing the resonant frequency of the G-Whip antenna; and (6) loading coil.

The Nylon line could be taken either by any suitable means direct into the vehicle, using a small lever, giving say a 2 : 1 ratio, or it could be attached to a bicycle brake cable as in the Mk. I idea.

It is thought the Mk. II version might be used for Mobile working. On 40m. a shorter tuning cylinder of \( \frac{1}{8} \)in. is suitable, and for the G-Whip only about \( \frac{1}{8} \)in. diam. to tune over the 100 kHz allocated. Obviously, a SWR bridge is essential for correct operation. One can operate the tuner control and watch the SWR drop down to 1 : 1 from near the red, without any need for an additional Z-match unit.

GRAPPLING WITH DECIBELS

One has only to switch on a receiver and listen to a few QSO's to be certain that the abbreviation dB (decibel) is very frequently used. But does every amateur really understand the meaning and use of this expression? It is doubtful.

So, what is a dB? Firstly, a decibel is a part of the unit "Bel". In general, a Bel is the ratio of 10 : 1 between two different power levels. Better to understand the Bel, three different cases will be considered. If the power level in Case B is ten times greater than in Case A, one can say that the power level is 1 Bel up. If the power level in Case C is ten times greater than in Case B, it must be 2 Bels up on Case A—or 100 times greater.

A power ratio of 100 : 1 = 2 Bels; 1000 : 1 = 3 Bels; 10000 : 1 = 4 Bels; and so on. The exact relationship is given by the equation:

\[
\text{Loss in Bels} = \log \frac{P_1}{P_2}
\]

To take an example: A transmitter with an output power of 600 watts is connected to a dummy load/wattmeter by a coaxial cable. At the dummy load a power of 450 watts is measured. What is the loss in the cable?

\[
\text{Loss in dB} = 10 \log \frac{600}{450} = 10 \log 1.33 = 0.126
\]

The loss is, therefore, 0.126 Bels.

As the unit Bel is rather large, the smaller unit Decibel (written dB) is used. Now, 10 decibels — 1 Bel, so a value of

100 : 1 (2 Bels) is also 20 dB
1000 : 1 (3 Bels) is also 30 dB

The equation now becomes:

\[
\text{Loss in dB} = 10 \log \frac{P_1}{P_2}
\]

It should be clear that decibels measure only a ratio between two values and do not represent any definite power level. In the previous example, a figure of 0.126 Bels was derived from the equation but.

\[
\text{Loss in dB} = 10 \log \frac{600}{450} = 10 \log 1.33 = 1.26 \text{ dB.}
\]

Voltage and current ratios can also be expressed in dB. Since power is proportional to the square of the voltage or current, the equation becomes

\[
\text{Loss in dB} = 20 \log \frac{V_1}{V_2}
\]

Here are some practical examples.

(1) A VHF antenna has a gain of 12 dB. What is the voltage multiplication factor?

\[
12 \text{ dB} = 20 \log \frac{V_1}{V_2}
\]

\[
\frac{V_1}{V_2} = 10^{1.2} = 4
\]

The voltage multiplication factor is therefore four times, i.e. the voltage at the input to a Rx is four times greater than would have been the case with a half-wave dipole. An S-meter reading of S5-7 would be increased to S9.

(2) A transmitter has an output of 100 watts. The field strength at the receiver needs to be increased by 10 dB. On the one hand, a beam with a gain of 10 dB could be used, and on the other, the output power of the transmitter could be increased. What power increase would be required to give the extra 10 dB?

From the equation:

\[
\text{Power in dB} = 10 \log \frac{P_1}{P_2}
\]

we get

\[
10 \text{ dB} = 10 \log \frac{P_1}{P_2}
\]

\[
\frac{P_1}{P_2} = 10^{1.0} = 10
\]

Therefore, \( P_1 = 100 \times 10 = 1 \text{ kW} \).

(3) A signal report is given as S9 + 60 dB. What is the receiver input signal voltage?

For an average short wave receiver, a typical reading
of S9 would be equivalent to an input of between 50 and 100 microvolts. A reading of S9 + 60 dB would therefore be approximately equal to an input of 75 \mu V + 60 dB.

\[
\begin{align*}
\text{V1} & \quad \text{V1} & \quad 60 \\
60 \text{ dB} & = 20 \log \frac{\text{V1}}{\text{V2}} \quad \log \frac{1,000}{\text{V1}} & = 3 \\
\text{V2} & \quad \text{V2} & \quad 20 \\
\log 1,000 & = 3 \\
\text{V1} & = 1,000 \\
\text{V2} & \\
75 \mu V \times 1,000 & = 75 \text{ mV}
\end{align*}
\]

The receiver input voltage is, therefore, 75 millivolts.

The Table opposite gives a few useful dB values.

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<th>V1</th>
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<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>1</td>
<td>1.26</td>
<td>1.12</td>
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<tr>
<td>2</td>
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<td>1.6</td>
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<td>5</td>
<td>3.2</td>
<td>1.8</td>
</tr>
<tr>
<td>6</td>
<td>4.0</td>
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<td>7</td>
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<td>2.8</td>
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<tr>
<td>10</td>
<td>10.0</td>
<td>3.2</td>
</tr>
<tr>
<td>20</td>
<td>100.0</td>
<td>10.0</td>
</tr>
<tr>
<td>30</td>
<td>1000.0</td>
<td>32.0</td>
</tr>
</tbody>
</table>

A.H.D.

The stand of Amateur Electronics (G3FIK), Birmingham, at the Amateur Radio Exhibition in October had as supporters, from the left, G8GUS, G8HHE and G3RGD, with Ken Perfect himself, G3FIK, right.

Interior view of the B.A.T.C. van, with its impressive console layout, fitted up by members, who also renovated the vehicle, which has all amateur TV facilities. It can be taken anywhere for any A-TV activity.

To keep in touch with the world of Amateur Radio, read "Short Wave Magazine" regularly — Independent, Unsubsidised and now in its 31st volume.
CALIBRATING A FREQUENCY METER -
NOTES AND NEWS FROM READERS—
THE HPX LADDERS

HERE we are once again, with the Christmas celebrations safely out of the way; your conductor hopes all his readers have thoroughly enjoyed their break, and also found time for a spot of listening on the bands or maybe a bit of construction - or even just playing with the new toy in the shack!

Technical Points

The first one comes from W. J. Wellington (Whitley Bay) who writes again after a long silence while he recovered from the R.A.E., in which he was rewarded by the receipt of a pass slip. He has a BC-221T which is in full working order but less the charts, so he wants to know how to calibrate it. A tall order on amateur resources, but this might be a way to try it: First, you need to borrow another BC-221 with its charts, or use an oscillator and a good counter, accurate to one part in one million at least. First, copy out the printed part of all the 72 pages of calibration and instruction; that will leave the figures under the heading “Dial” on each page to be filled in. First, you must check and adjust the calibrator crystal within the BC-221. To do this you need either to couple the wavemeter into a counter as loosely as possible and tweak the 12 pF capacitor across the crystal until the 221 is bang on frequency, or (and this is the most likely way) you can find MSF or WWV on 10 MHz on the station receiver, couple a bit of wire to the Ae. terminal of the BC-221, and tune for zero-beat, which will be when the beat note has been got rid of and the meter is just slowly rising and falling at a rate slower than one beat a second; you may have to play with the relative coupling of the BC-221 to the receiver to get a clear indication. Now switch the wavemeter to “Check” from “Crystal” and set the “Corrector” to the middle of the scale. Tune for the various check points on the calibration charts, and mark in the dial reading, not forgetting the vernier reading. Now comes the tricky bit: You have to couple the two BC-221’s together, as loosely as may be to get a decent signal in the phones of the one being calibrated but not too much, or spurious responses will appear. You can then set frequencies as indicated on the other BC-221 and zero-beat them on your unit as carefully as you can, entering all the figures in the appropriate spaces on the calibration charts. Finally, you can take the two wavemeters to a transmitter friend (or use a signal generator to produce a signal) measure its frequency with each BC-221 in turn and check that they give the same answer. If they do, you’re home and dry—all you then need to do is to check and reset the crystal periodically against WWV or MSF, and run through the check points in the book to see that all can be met within the range of the Corrector control.

Actually, to purchase a BC-221, or any other sort of heterodyne frequency meter capable of accurate calibration, without its charts or curve book is, these days, rather like buying a car without its petrol coupons—it will go, but runs out of accuracy just when you need it most. Every BC-221 and LM-14 (which are virtually the same thing) was issued originally with its own calibration book, numbered for that particular instrument.

We made a bit of a boob somewhere last time when we talked about the use of an attenuator with the FR-50B, as proposed by A. West (Hereford). What we should have said, when referring to the RF gain control, should have been the Monitor control, which is not much used by SWL’s, although of course the RF gain is continually used—so it is all—same as was said, except for “RF Gain” read “Monitor.”

How does one judge the selectivity of a receiver, in SSB terms? This is the question posed by L. Craven (Alvechurch). The bandwidth to the 6 dB points should be about 2:1 to 3 kHz, and the bandwidth to the 60 dB points as little greater as may be. Another way of expressing it is to give the “shape factor,” which should be as low a ratio as possible when comparing 6 dB and 60 dB points. What it boils down to is that if the receiver is designed for SSB and has either a multiple-crystal filter, a mechanical filter or even, as in the case of the Drake-2B and the KW-77, an LC filter at low frequency, the shape factor of the IF response is the important thing. For CW, you want a much narrower “nose” bandwidth to the 6 dB points, say, 200 cycles or so and again the best possible shape factor to the 60 dB “skirt” bandwidth. The RF stages and mixer contribute effectively nothing to the total bandwidth where adjacent-channel rejection is concerned, although the image ratio in dB should be as great as possible and this latter is a function of front-end design.

Signals around 4-9 MHz are queried by J. Hamill (Trinity College, Dublin) using such callsigns as VQ5X19, and talking about “cadets.” Almost certainly these would be Cadet Force transmissions, on Service frequencies.

The frequency of the crystals contained in his Trio JR-500SE is puzzling B. Rhead (Stoke-on-Trent). He hasn’t a manual for his receiver, but has found by experiment that pulling the 5-1 MHz crystal affects the 14 MHz band section. This is quite possible, and would depend on the frequency range chosen for the tunable oscillator and the second, fixed, IF at which the selectivity is generated. This should all be made plain in the “book of words” for the receiver.
George Briddon, of Westbury Cottage, Wellington Street, Matlock, Derbyshire is 73 years of age—and has been an SWL for 50 of them. He has had some memorable experiences in that time, building his own receivers from the crystal set days. The Rx now is an AR88D.

New Entries

Mrs. J. B. Jane (East Looe) has taken over the Codar CR-70A left vacant when the OM treated himself to a 9R-59DS—but she admits to having a little look round on the Trio when he is out, or even to hearing a few new ones when he is at the controls. Not so few at that, for Jacqueline comes in with an entry of 448 prefixes heard as a starter. Sad to say, it is probably a "dud" or even a mishearing due to gabbling a callsign.

Another one with queries is G. George (Woodmancote, Glos.) who has "ZQ1AA" and "Z1D," both reckoned to sound "fairly respectable." Respectable-sounding or no, it is to be feared they are not all they seem to be! Gareth is using an HRO which came from G2FWA, and he admits to lots of help from G4BRX and G3IXT.

M. Eccles (Lancaster) comes in to the list with an entry of 305 prefixes heard with a 9R-59DS and an untuned long-wire of some 200 feet doubled back on itself in a roughly North-South direction.

Up in Seahouses, Northumberland, lives R. Kell, who has a CR-100 which has been endowed with 6SG7 RF stage valves, an EL33 output stage, a Codar Q-Multiplier and preselector, and other modifications. Currently work is in hand on a Slow-Scan TV Monitor, also a home-construction exercise—Rick has good workshop facilities and seems to be coping quite nicely without any outside help. Good!

Other Letters

J. W. Sutton (Fareham) wonders what receiver your old scribe uses. The main Rx is a KW-2000B with an added Q-Multiplier, with an Eddystone 888 and Codar CR-70A as the back-up; in addition there is the facility for reception on Two in the shack. Aerials are an end-fed for Top Band and Eighty, a vertical for the 7-28 MHz region, or a triband beam; odd contraptions often also appear in the loft space in the course of researches into that most fascinating topic of aerials, to be compared against the normal antennae which are used as standards of comparison. On the test gear side, there are RF and AF generators, a brace of oscilloscopes with single and times ten probes, two-tone generator, BC-221, and various other bits and pieces mainly of use in obtaining some degree of precision in frequency and aerial measurements. Otherwise, J.C. prefers to live in peaceful anonymity, although he will admit, if pressed, that the Editor has some slight idea of his identity!

Although this period has given K. Kyezor (Perivale) more time for serious listening, it has been a time when, in his view, the bands have varied from passable to damnable. Agreed! Nonetheless, OM Kyezor has hiked his total up from 1163 to 1211, which is no mean jump.

R. Carter (Blackburn) has taken the advice of G3KFE in CDXN, and spent some time on Forty, the noise on which band Ben likens to that in a Lancashire weaving shed of years ago, so intense that speech was impossible and one had to learn to lip-read! True enough at first hearing, but a careful use of the controls on the receiver, and if possible an attenuator in the aerial feedline, will make a considerable improvement. A query signal heard was a "BQ9KT" who has the nerve to tell a U4 station he was a new prefix for Tibet!

Much contest activity is noted by J. H. Sparkes (Trowbridge) who duly profited thereby, as his score

ANNUAL HPX LADDER

This will close on December 31, 1973, and the last showing will be the list published in March 1974 “SWL” for which the deadline is January 17. Following issues will contain a new Annual Table, starting January 1, 1974. Rules will be as before.
heavy outside commitments, like work for example—McVey (Weston-super-Mare) thanks in
fixes recorded, we note such as ZY, from Brazil, XX6
ence; a look at J.C.’s copy of the U.S. Call Book indicates
shows. SWL Sparkes notices the absence of WB3 from
entries into the CW list as well as his SSB entry; of course,
recovered the speed in CW which he attained while he
was going to the Grafton Club R.A.E. and Morse classes,
and says he has been told of an American amateur who
thinks it is probably apocryphal. However, the Verulam
flag-pole lying horizontally, a vertical section made from
we fear, far-fetched, description of the two-metre aerial
(a motor-car, a
Nothing like inspired improvisation!
A photograph, unfortunately not contrasty enough
Rules for HPX—see Panel,
p.163, May issue.

### HPX LADDER

#### PHONE ONLY

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<thead>
<tr>
<th>SWL</th>
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<td>T. Roe (Hillord) 1355</td>
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<td>K. Yeates (Perivale) 1210</td>
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<td>J. Fitzgerald (Gr. Missenden) 1164</td>
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<td>L. A. Poole (London N.21) 1083</td>
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<td>R. Carter (Blackburn) 1059</td>
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#### CW ONLY

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<td>S. J. Proud (Letterston) 201</td>
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</tr>
</tbody>
</table>

### Starting score 900 for Phone, 200 for CW. Listings include only recent claims. Rules for HPX—see Panel, p.163, May issue.
faith in Santa Claus when it comes to new equipment. P. Davies (Stoke-on-Trent) reckons on the old gentleman coming across with a two-metre converter and pre-amp, plus a beam and an omni-directional array for the band.

An audio-frequency noise processor has been built by S. Eldridge (Crawley), and aerials have been changed; the new one is outside and fed through an ATU which has helped also with the problem of TV timebase interference. Stephen had several prefix queries, all of which are quite OK.

A commemorative callsign which has been puzzling a few people was II4FGM, which was in connection with the Marconi celebrations and was from Bologna, using the phonetics “Foundation Guglielmo Marconi” when calling and signing. E. W. Robinson (Bury St. Edmunds) came across this chappie among others during his rather abbreviated time on the bands during this period.

N. Henbrey (Northiam) seems to have spent quite a bit of time on Forty, from which he emerged with honours, and many DX’ers heard, although not much in the way of prefixes which had not been heard on other bands. However, the thing is that if one can wrinkle the stuff out on 7 MHz, you can surely do it on any other band! Norman sent in some photographs of his aerial arrays, which no doubt have some considerable bearing on the DX heard, both on the HF bands and on VHF; what a pity they don’t have enough contrast to reproduce.

A. May (Bromsgrove) is chasing the various States of America as an exercise, but cannot tell which station is which without a U.S. Call Book, which he does not have. So, take a trip to the Birmingham Reference Library, and consult their copy, which, it must be said, took them an hour to find, thanks to Andrew forgetting the Call Book is a magazine and filed as such. It offers the chance for your old J.C. to point out to any readers who may feel that help is necessary, or plenty of funds, to the business of becoming an SWL, or, indeed, a licensed operator; that it is not so, provided one is prepared to help oneself, and use the avenues which are open. For instance, both the British and American Handbook are available in the local library or can be got on request; Morse can be learnt quite as easily by listening as by reading: and R.A.E. can be passed by absorbing all the material in, for example, Rayer’s Amateur Radio as thoroughly as possible, the while carefully considering one’s technique in the examination. J.C. knows of lots of amateurs who got their ticket completely unaided, and at a late age at that.

M. Cuckoo (Herne Bay) spent ten hours in the CQ WW Contest, listening to the battle, and found the bands quite lively all around the globe, with alarming QRM on Twenty; but, sad to say, he only turned up 16 new prefixes and one new country for his pains—such is the luck of the game.

Two reasons have held back his HPX score, says E. Parker (Hove)—the first is that Ernie has been busy with the HAB business, the other being the one that affects so many of us if we are honest with ourselves—the spirit is willing, but the body persists in dropping off to sleep!

**ANNUAL HPX LADDER**

*(Started January 1, 1973)*

<table>
<thead>
<tr>
<th>SWL</th>
<th>PREFIXES</th>
<th>SWL</th>
<th>PREFIXES</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHONE ONLY</td>
<td>PHONE ONLY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L. Craven (Alvechurch)</td>
<td>489</td>
<td>P. Eaton (Folkstone)</td>
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<td>G. Ridgway (Darlington)</td>
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<td>474</td>
<td>S. Starred (Birmingham)</td>
<td>324</td>
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<td>Mrs. J. B. Jane (East Looe)</td>
<td>448</td>
<td>M. Rodgers (Harwood)</td>
<td>117</td>
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<tr>
<td>D. Churchill (Bexleyheath)</td>
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<td>W. J. Smith (Beaconstreet)</td>
<td>444</td>
<td>M. Hartley (Preston)</td>
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<tr>
<td>D. Johnson (Clitheroe)</td>
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<td>S. Hall (Quebec)</td>
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<tr>
<td>B. Khoud (Stoke-on-Trent)</td>
<td>421</td>
<td>A. May (Bromsgrove)</td>
<td>296</td>
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<tr>
<td>M. Wickstead (Taplow)</td>
<td>376</td>
<td>R. Shelley (Bisley)</td>
<td>282</td>
</tr>
<tr>
<td>P. Davies (Stoke-on-Trent)</td>
<td>369</td>
<td>C. B. Russell (Runcorn)</td>
<td>281</td>
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<tr>
<td>C. M. Little (Addiscombe)</td>
<td>366</td>
<td>W. McFaul (Londonderry)</td>
<td>253</td>
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<tr>
<td>M. Smith (Mataura)</td>
<td>354</td>
<td>R. Bell (Seahouses)</td>
<td>248</td>
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<tr>
<td>W. H. Smyth (Hartlepool)</td>
<td>349</td>
<td>G. George (Woodmanhouse)</td>
<td>228</td>
</tr>
</tbody>
</table>

Starting score 200, in accordance with the HPX Rules. All prefixes to be heard between January 1, 1973 and December 31, 1973. A new list starts January 1, 1974.

M. Wickstead (Taplow) has been to Vegoland to stay with some old friends since last we heard of him. As so many before him, Maurice is full of praise for the welcome he received in Canada and reckons it is a FB place to go for a holiday; among others, he mentions meeting VE6AMR who works in Calgary. Back on HPX, Maurice has tried tackling a preselector on ahead of his 9R-59 receiver in order to reduce the images on the HF bands, but he finds it still not enough—probably the gain is being run up a bit too fast to get the best out of the selectivity in the preselector and the front-end of the receiver.

M. Smith (Mataura, New Zealand) sent in his HPX log-book, in which he makes a fair copy of his loggings after going through the rough ones against the checklist. It certainly is a fine piece of work, but rather heavy to shuttle back and forth with postage rates, even U.K. ones, let alone airmail. However, in years to come, Mike will be able to look back at his logbook and bring back memories.

**Conclusion**

At this point we have reached the bottom of the pile, saving for those who sent in just a Table entry with little or no comment. We acknowledge such from: P. C. Jane (East Looe); C. L. Lee (Ulford); T. Rootsey (Ulford); B. Thomas (Ponafetract); L. Thomas (Ferryfryston); H. Alford (Burnham-on-Sea); K. King (Beeston); G. Raven (London S.E.13); M. Rodgers (Harwood); A. Glass (Plymouth); H. A. Lendesborough (Swanland, Yorks.); W. McFaul (Londonderry); G. G. & S. J. Proud (Letterston); T. Gravel (Burry Port); D. Johnson (Clitheroe); R. Shilock (Kingswinford); and L. A. S. Poole (Winchmore Hill).

**Final—Final**

It just remains for J.C. to wish everyone a Happy New Year; and to give a deadline of January 17—early because of the short month of February. The address, as always, is SWL, SHORT WAVE MAGAZINE, BUCKINGHAM, MK18-1RQ.
**New Band Plans**

We dealt last month with the general background of the new band plans to come into force on February 1, 1974, with emphasis on the Two Metre plan. This month we shall deal with the plans for the other bands. Before doing so, however, here are some details of the frequencies allocated to special activities in the two-metre band.

**144-00**

144-10 MHz - EME
144-10 MHz - Random Meteor scatter
144-20 MHz - SSB calling channel
143-60 MHz - RTTY (DX) channel
145-30 MHz - RTTY (Local) channel
145-50 MHz - Mobile calling channel
145-55 MHz - International mobile working channel and FM Simplex

It should be noted that the appellation “All Modes,” shown at the lower frequency end of two metres in the diagram on page 615 of the December issue as embracing the SSB allocation, has now been modified to apply only to those frequencies above the SSB allocation. This is a welcome change since it will help to avoid the mode overlap which would have been possible under the original arrangement, and on which comment was made last month. In the interest of harmonious relationships between those who operate with a carrier and those who do not, it would still be fruitful if those who use SSB worked below 144.35 MHz and AM/FM users operated above that frequency.

**70 Cms. and 23 Cms.**

The diagrams herewith are pretty well self-explanatory, and in most respects follow the general pattern of the two-metre plan with DX modes at the lower end of the bands. The following spot frequencies may be noted:

**432-00**

432-10 MHz - EME
432-10 MHz - Random Meteor scatter
432-20 MHz - SSB calling channel
432-60 MHz - RTTY (DX) channel
432-30 MHz - RTTY (Local) channel

**1296-00**

1296-10 MHz - EME
1296-20 MHz - SSB calling channel
1296-60 MHz - RTTY (DX) channel
1297-30 MHz - RTTY (Local) channel

It will be seen also that provision has been made for repeaters on 70 cm. These will have a spacing of 1-80 MHz between input and output channels, i.e., three times that on two metres, when, and if, they are approved by MPT.

**Four Metres**

No plan exists for this band since it is not allocated for use on the Continent. Readers view the suitability of 70-20 MHz for the SSB calling channel, which at least has the merit of the “20” as for the other bands, would be welcome. The alternative would appear to be 70-15 MHz as many operators now use. It has the advantage that it is nearer the other DX band (CW) and that users of equipment with 200 kHz band segments might find it a bit of a chore switching segments (or transverter xtal). The important aspect is to agree on one discrete frequency as a calling channel.

It is a little early to determine the majority view on this subject, but of those operators questioned so far most people see no objection to 70-20 MHz. There is, of course, the licence restriction on transmissions between 70-10 MHz and 70-30 MHz north-west of a line joining the Firth of Lorne to Moray Firth, but activity in that area is minimal. There is also the fact that 70-20 MHz (and 70-15 MHz come to that) fall within the EI frequency allocation which was extended this year to 70-125—70-45 MHz, and a final choice should take account of these factors.

**Three-Band Annual VHF Tables**

In view of the short notice this month of the reader deadline for sending in claims for these Tables, there have been few changes and it seemed appropriate, therefore, to give the breakdown by bands this time.

Encouraged though we be by the support you have given to this feature, and the total number of claims has been increasing yearly, we feel that the time has now arrived when a couple of changes would enable us more clearly to reflect present-day conditions on the VHF bands. First, there is the significant increase in activity on 23 cm. and, with the object of reporting and encouraging this, it is proposed that in 1974 a Table should be published alongside the Three-Band Tables to show results achieved on this frequency. There are a number of ways in which this information can be displayed, indeed there are a number of alternatives in the selection of specific information for inclusion in the display but, initially, it is proposed that the Table should show “All Time” 23 cm. contacts by county and country and be brought up to date by monthly, claimed additions. When activity warrants it, or if there is a demand for it, the Table may be amended to show annual scores only, on the lines of those submitted for the other VHF bands. At any time after January 1, 1974 therefore, we shall be pleased to receive your claims for contacts on this band, to date.

Secondly, encouragement is not so vital, nor performance so remarkable, on the other bands. We are all well aware of the high level of 2m. activity, for example, so it seems reasonable, and will keep the Tables to manageable proportions, if a lower limit be set for claims. In the early part of the year, when scores are fairly uniformly low, there should be no need to apply any restriction, but the situation will be reviewed after a few months and it may be that we shall then rule that, to figure in the Tables, a minimum score of say, 25 or 30 will be required. We shall, of course, give you plenty notice of any change.

A reminder that the Tables closed for the year on December 31, 1973 and re-opened on January 1, 1974. In order that the final 1973 results may be published in the February issue, as usual, final claims should be sent in to Buckingham by January 10,
latest, allowing for possible mail delays.

**VHFCC Awards**

It is regretted that space considerations did not permit the inclusion of certain Awards last month.

Six Awards to report this month—all for two-metre contacts. Certificate No. 197 goes to Geoff Wynes, G3TLV (Middlewich, Cheshire). He first came on the band in September, 1972 with an IC-21 which gave him about 10 watts output, but this has now been pushed up to 100 watts with a solid-state PA. In addition to this FM rig, Geoff has a “Liner 2,” believed to be the first sold in this country. The 14-ele. Parabeam is at 72ft. and the QTH 125ft. a.s.l. with a clear take-off for about 10 miles all round. The 40% QSL return rate on this band compares unfavourably with the 70% achieved on the HF bands.

G8GLV is A. A. Brown (Great Missenden, Bucks.) who collects Certificate No. 198. He came on in August, 1972 and is another who finds QSL’s hard to come by—41% in his case. He reckons that, on the basis of contacts made, cards sent and received, one should allow about one year for a Bureau-to-Bureau exchange of cards. If this is his experience, he would seem to be one of the less fortunate ones, in that most people would reckon in terms of three months or so, although it must be admitted that the last batch of QSLs received by G3DAH included two dated 1967! G8GLV runs a mobile type Tx with 23 watts into a QQV03-20A and for reception has a Mosfet converter into an AR88D tuning 2-4 MHz. The home-built antenna is a 6/6 slot at 27ft. a.g.l. rotated by Bowden cables from the bedroom/shack. The antenna at 35ft. is an 8-ele. beam.

We welcome another GW to the fold, this time GW8FHW, Leslie Henson, who has been putting out a big signal from Cardiff on SSB recently. He must spend as much time on the air as does GW3ZTH! Since coming on 2m. in October, 1971 he has worked some 700 stations and had over 7,000 QSL’s, most of these with 2 watts output from a Ranger, although he now has a “Liner 2” to supplement it. The antenna is a 14-ele. Parabeam at 45ft. and the QTH rises to 208ft. above the Bristol Channel which gives him a very nice take-off for both local and DX working. The
### THREE BAND ANNUAL VHF TABLE

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<thead>
<tr>
<th>Station</th>
<th>FOUR METRES Countries</th>
<th>TWO METRES Countries</th>
<th>70 CENTIMETRES Countries</th>
<th>TOTAL Points</th>
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<td>76 15</td>
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<td>197</td>
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</table>

This Table closed on December 31, 1973. Final placings for the year will appear in the February issue. The Table re-opened w.e.f. January 1, 1974, and new scores should be sent in as they accrue.
the high level of activity there. However, both these comments are equally applicable to holders of older call signs and one wonders if the lack of a greater number of claims from these operators is due to the fact that they have done it all before. Could be, but we should still welcome more claims from the holders of older call signs.

The object of the creation of the VHF Century Club was to recognise ability and to encourage activity on the various VHF bands and, for those reasons alone, it would be gratifying to see an increase in the claims for other than 2m., although, obviously, possession of the Award for any band lifts one out of the run-of-the-mill category.

**Contests**

**Results:** Pye Telecomms Contest Group was an easy over-all winner with a lead of nearly 3,000 points in the VHF/NFD event in September. They also headed the 432 MHz and 1296 MHz sections, came 3rd on 70 MHz and 5th on 144 MHz. Over-all runners-up were the March and District Society and the Midlands A.R.S. Leading scorers on the other bands were the Cornish R.A.C. VHF Group on 4m. and the Surrey R.C. Club on 2m.

**Reports:** Conditions were reported as generally poor for the 70 cm. Cumulative contests of November 6, 14 and 30, but were good for that on November 22, the North/South path being particularly favourable, with GW8AWS/P in Flint a colossal signal the whole time. Propagation was average for the 4m. Cumulative on November 11, but several operators reported high noise levels which made the DX difficult copy. Conditions were much better for the November 25 event in this series but, once again, local noise levels were reported high in many places, and those operators with CW, and the increasing number who use SSB on the band, gained substantial advantages.

**Forthcoming Events:** 4m. Cumulative on January 6, 1974. A 432 MHz SSB event has been organised for January 20 and a 4m. Fixed Station contest for the weekend of January 26/27.

**Notes from GM**

His friends will be pleased to learn that Bill Miller, GM5VG of Glasgow, is now out of hospital and back on the 2m. air. Our congratulations and best wishes go to "The Scottish Radio," Syd Rowden, GM6SR, who is keeping the flag flying (with a Vanguard) on his 85th birthday!

New calls on 2m. this month are GM3DJT, Balerno, and GM3HUN, Edinburgh. Heriot Watt are also up on Two with their GM3WEE call. Although not a newcomer to the band, GM4BHA is operating portable on 2m. and, as he travels a great deal, is popping up in all sorts of places, which may help the county chasers.

GM8BFJ has now got his transverter fully operational with a QQV06-40A PA. GM8FFX of Aberdeen reports and Aurora on 2m. on November 24, although the effect was weak and limited in extent.

**General News**

**Conditions:** G4BMM (Luton) worked HB9AEN/P on November 18. So did many other G stations, but the interesting thing about this contact was that the HB9 was on the mobile calling channel on SSB and was not replying to calls on FM or AM, but working a string of French stations. A call on CW produced an immediate reply with a 5 & 9 report. It's always worth trying this technique. Propagation was good on all VHF bands around this date, with a peak over November 21/22. The HB9 beacon was audible on 2m. right up into the Midlands at good strength and several contacts were being made with French stations well south of Paris. Conditions had reverted to normal again by November 24, although G8CBZ (Brixham, Devon) was still a good signal on the morning of the 25th. GW8FEB (Anglesey) has been getting some nice results with Oscar VI. He has worked 10 countries with 30 watts to a 9-ele. Yagi on 2m. and crossed dipoles in the roof-space for the reception on 10 metres. He says that high power is not necessary to work through the satellite.

On 432 MHz many operators contacted ON5FF and HW6BQH/P (G3KMS had two F QSO's) and the North/South path in this country as far down as GC was wide open. Once again, GW8AWS/P was the star performer from the North in the South.

**Four Metres:** There are some massive four metre antenna arrays around these days. G3JYP (Appley, Westmorland) uses a 12-ele. collinear stack at 60ft., and has worked G3RWM, G3FDW and G3FNQ (and by now probably others) on two-way SSB. G3ZRH (Brentwood, Essex) uses a pair of cross-polarised, 8-ele. beams which should also be useful for his MS skeds with SM6FO, GM3WOJ and GM3UAG. Tests with GW3MHWA (Cardigan) have proved its superiority over the 8-ele. horizontal for tropo transmissions.

According to G3JHM, the Sussex
### FOUR METRE ANNUAL TABLE

**January 1 to December 31, 1973**

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### 70 CENTIMETRE ANNUAL TABLE

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**The beacon on 4m. should be in service again early in the new year with an improved keyer, designed by G8AZU, and a solid-state Tx. G3DAH now has SSB available on 4m. if anyone is looking for Kent on that band in that mode.**

Above the Blue Horizon: Things are happening up aloft, as it is being reported that the Kohoutek Comet has possibly broken up and, even if it hasn't, is not likely to provide quite the brilliant display predicted. We may never know whether communication via the comet was possible! The Russian News Agency TASS has put out a report of the reception of signals from outer space which they claim could not have originated from an artificial satellite and indicate the existence of "a technically, highly developed, extra-terrestrial civilisation." The signals lasted several minutes and were repeated several times during the day. . .

**DX-Petitions**

Havering Radio Club is proposing to activate Rutland on March 30/31, before the county disappears under the Local Government reform plans due for introduction on April 1. Details as follows: Call, GB3RUT; Time, 48 hrs. continuous; Bands, 4m. 2m., 70 cm. and 23 cm.; QRG, 70-25 MHz, 145-1, 1454 MHz; 132-173 MHz and 1296-52 MHz. Modes: 4m., A1, A3; 2m., A1, A3, A3j and F3; 70 cm. as for 2m.; 24 cm. A1 and F3. For skeds, send s.a.e. to G4ALN, QTHR.

**Reader Deadline**

Deadline for the next issue is January 10. The address for news, views, claims and comment is "VHF Bands," Short Wave Magazine, Buckingham, MK18 1RQ. Another year has come and gone and your scribe would like to thank all those who have given him their support during 1973, to hope that you all have had a pleasant Christmas and to wish you good fortune and good DX during the coming year. VY 73 de G3DAH.

**Editorial Note:** It is much regretted that, due to dislocation caused by the holiday Period over Christmas and the New Year, and unforeseen mail delays, this issue is about a week late. The February Short Wave Magazine will, therefore, appear on Friday, February 1st, and that for March on March 1st—by which time we should be straight again.
In terms of the entries listed, the 1973 MCC was distinctly less successful than the last few in the series—and we have been running this Annual Club Contest for the best part of 30 years.

The falling-off this time has been variously ascribed to (a) The alleged complexity of the Rules, (b) Dropping of the Club code-identification system we have been using for some years, (c) Scoring rules said to be designed to give an advantage to GM/GW stations and others outside the G area, (d) Lack in many Clubs of competent CW operators because of the current black-box phone addiction, and (e) The coincidence of the Contest with Bonfire Night.

All these criticisms have a certain superficial validity. Taking them seriatim (1) Of course, the Rules were a bit more complicated this time—they had to be if county scoring was to be taken into account, the last time it would be possible by the present geography. (2) The Club ident. code was dropped because for the last few years MCC had degenerated into rubber-stamp exchanges (“RST 579 C31 AR”), the information as to who was working who being derived, not over the air, but from the book. MCC is a CW operating contest and this time it was for those doing the operating to find out if the other end of the QSO was a Club, and to identify as a Club—this is what operating means. We did not mind how it was done, so long as it was done, thus bringing out the operator aspect. Furthermore, the publication of identification codes took up an enormous amount of space, since all Clubs had to be allotted a code, just in case they entered. (And please don’t anybody suggest that this could be overcome by asking Clubs who wished to enter to apply for a code—we tried that once, some years back, and the result was a shambles, because so many Clubs left their applications till the last moment, making it impossible for us to publish a full, up-to-date list).

(3) As to the scoring system: Many hours were spent drafting Rules (5) and (6), not only to make them comprehensible to anyone taking the trouble to study them but to ensure also that as far as possible all U.K. Club stations on Top Band would have an even chance. Nevertheless, we have been assailed by complaints that “No G station could have a chance of winning” that “the loading was in favour of the GDX Clubs”—and so forth. Now look at the actual results. Could there be a fairer or more reasonable result in terms of geographical spread?

(4) As to the lack of competent CW operators in today’s active Clubs—well, as far as the invigilators could hear, MCC again showed a good standard of operating ability and the Clubs who had taken the trouble to understand the Rules seemed to be having no difficulty. (5) The coincidence with Bonfire Night “and the children having to come first”: This also was understood and foreseen—but anyone looking at last November’s contest calendar would see that, for Top Band, the week-end November 3-4 was the only reasonable one for the 1973 MCC. It would have suited us much better to put it the week-end later, but what a fine old shamozle that would have been, with another Top Band contest running at the same time! The fact of the matter is that, nowadays, there is so much scheduled contest activity going on that there are very few clear week-ends. For MCC, we only ask for one, and for nearly 30 years this has always been chosen in November, over a particular period when GDX conditions should be right for Top Band. Indeed, it was SHORT WAVE MAGAZINE that initiated, as far back as 1946, the whole idea of a 160-metre contest for Clubs.

The Log Evaluation

In general, the Logs were well presented—neat and tidy and headed up as required by Rule 7, which was essential in order to check quickly and accurately. But in spite of the fact that the point was re-emphasised in “Clubs” in the November issue, there were exceptions.

One entry came in on sheets headed “RSGB VHF/UHF Contest Log,” with no Club name anywhere, though this was specifically laid down in Rule 7. This log was thrown out, the claimed score (unchecked) being 13,838 points. Two other logs were also eliminated for presentation not in accordance with Rule 7, and another casualty was the Club station one of whose operators could not differentiate between “H” and “S” in his callsign. This caused incredible confusion all through the logs and many Club operators commented on it. In the circumstances, we felt justified in dropping that entry altogether.

There were no eliminations under Rules (8) and (9) though there were one or two border-line cases, when key-clicks appeared on certain signals for short periods. One Club was very nearly disqualified for vulgarity, by reason of the ident group they chose (it had better not happen next year! —Editor). However, they were let off because the letters used were in fact the initials of the Club’s name.
Before the actual checking, the logs were placed in claimed-score order. Though nearly all logs required adjustment, either by reason of arithmetical errors (it made us goggle a bit when the Manchester Technical Institute Transmitting Society, G3CXX, put in a claimed score of 312,000 points!), over-claimed multipliers or duplicated entries, in fact after the checking and correction the final placings, as shown in the Table herewith, were not substantially different from the claimed-score order. This suggests that the scoring system was well understood and also that any necessary adjustments and corrections have been fairly applied.

On the other hand, it must also be said that many Clubs did register a protest against the alleged difficulties of the scoring system, with a plea for a return to the ident. scheme for individual Clubs. This takes us back to what has already been said.

Operating Generally

As usual in MCC, the operating varied from very good to pretty mediocre. But this is not to criticise the latter efforts, there to do their best and learning all the time. The worst fault was over-fast keying with the preliminaries, e.g. “CQ de G4XYZ, MCC,” and then the obvious inability to read, through the QRM, somebody coming back at the same sort of speed. Why it should be thought necessary to scrabble along at break-neck speed on a bug not adjusted to the operator’s real keying and reading ability has never been understood.

A bad operating fault was sending a simple group like the RST about five times and then quite a complicated Club name/QTH once only—this happened time and again, with the inevitable query for a repeat. Has nobody ever taught today’s amateur CW operators that a proper ending has never been understood.

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As always in recent years, there was the MCC characteristic of playing it out over a narrow band of frequencies, with bunching in the 1830-1850 kHz area, resulting in a good deal of avoidable QRM. The feeling appeared to be “That’s where the action is so it’s there that we must get.”

Band Conditions

On the whole, Top Band was electrically quiet and the GM’s were getting down South early in both sessions. Some stations reported bad local-thunder-storm QRN for short periods. There was evidence of QSB over intermediate distances of 100 miles or so, rather a curious propagation effect on Top Band.

Some Europeans appeared, there being several OK’s on, who between them worked E11AA, GM3FXM, GM3OLK and GW3UCB for good Top Band EDX contacts under severe QRM conditions. Other EU’s noted in MCC logs were HB9J1, DJ4KW, DK3BJ and DL7AA (Berlin), all EU call signs well known on the 160-metre band. We are often asked “Why don’t you bring in the Europeans to make MCC more interesting?” The answer is that it would mean circularising all EU periodicals with the Rules (which they could have copied from our October issue, anyway) and the certainty that the support would not be significant for what is essentially a U.K. inter-Club contest. It is just not feasible to attempt to cater for everything that might happen on the band. As it was, for the first time in MCC, by Rule (6) stray contacts with EU’s were brought in to score as multipliers.

Station Equipment

Looking at the first three in the 1973 MCC, the lead station G3CXX ran a throttled back KW-2000A with choice of two aerials, an end-fed dipole at 150ft. above ground and a 5th-wire sloping at 45° with its top end 250ft. a.g.l. (Of course, up there with tall University buildings, they can rig up antennas of this sort).

G3SSO, Cheltenham, had a KW-2000 as 10w. Tx and a Collins 51-S1 Rx, into a Top Band dipole at 100ft. average height.

Over in Dublin, the Irish boys’ E11AA (and we were glad to see them doing so well in this 28th MCC) ran a KW-2000A as Tx, with a Hammarlund HQ-170 receiver and as aerial a dipole rigged as an inverted-Vee with its apex at 50ft.

Many Club stations worked with modified FT-101’s or KW-2000 transceivers and all the leading stations had large aerials—aiming to be half-wave end-fed or centre-fed dipoles, in either case involving space to get out the wire. There were also those using a quarter-wave wire with a counterpoise earth, or a “SRV” type with strapped feeders working against ground.

Operator Aspect

Most Clubs had at least two operators—some as many as six—working in turn either on the key or keeping the log, but it was no use having loggers who were slow. Several Clubs were able to enter more than one station.

The lead station, G3CXX, was well operated by G3RYU and G3ZSS, and to these two much credit must go for the show they put up. The second-placed station, G3SSO, GCHQ, Cheltenham, also had two ops., G3XDY and G3ZPY, and to these two much credit must go for the show they put up. The second-placed station, G3SSO, GCHQ, Cheltenham, also had two ops., G3MZV and G3SNN.

Over in Dublin the operators were E12CA, E18CC, E12CL and E12CC, with SWL assistance. Manchester University, signing G3VUM, had as operators G3XYD, G3ZPY and G3ZUJ. On the other hand, GM3FXM for Glenrothes “A” was a single-operator effort.

The Walton, Surrey, Contest Group, placed 7th, had as operators G4BEG, G4BJA and G4CCZ. Further down the placing, other multi-operator stations were Sutton & Cheam, with G2DMR, G3DCZ and G3LCH,
Above are the final corrected scores, in most cases less than totals claimed. It should be noted that only a few over-claimed score points and one or two multipliers too many could make a large difference to the final total.

<table>
<thead>
<tr>
<th>POSN</th>
<th>CLUB NAME</th>
<th>CALLSIGN</th>
<th>POINTS</th>
</tr>
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<tr>
<td>1</td>
<td>Manchester Technical Inst. Transmitting Society</td>
<td>G3CXX</td>
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<td>Govt. Communications Hq., Cheltenham</td>
<td>G3SSO</td>
<td>27,771</td>
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<td>Luttrellson Contest Group, Dublin</td>
<td>EI1AA</td>
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<td>Manchester University Radio Society</td>
<td>G3VUM</td>
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<td>GM3OLK</td>
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<td>Walton Contest Group, Solway Radio Club, North Staffs. Amateur Radio Soc.</td>
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<td>14</td>
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<td>G3GGS</td>
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<td>15</td>
<td>Maidstone YMCA Amateur Radio Society</td>
<td>G3TRF</td>
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<td>Wheatheath Contest Group, Grimsby</td>
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<tr>
<td>18</td>
<td>Cambridge University Wireless Society</td>
<td>G6UW</td>
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<td>19</td>
<td>White Rose Radio Society, Leeds</td>
<td>G3XEP</td>
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<td>20</td>
<td>North Staffs. Amateur Radio Society</td>
<td>G4BEM</td>
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<td>Conway Valley Amateur Radio Club</td>
<td>GW6TH</td>
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<td>Standard Radio Club, Hurstmonceux</td>
<td>G7NIS</td>
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<td>Southampton Radio Club</td>
<td>G3SOU</td>
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<td>East Kent Radio Society</td>
<td>G3LTY/A</td>
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<td>Edgware &amp; District Radio Society</td>
<td>G3ASR/A</td>
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<td>Thornton Cleveleys Amateur Radio Society, Lancs.</td>
<td>G4ATH</td>
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<td>Kingston &amp; District Amateur Radio Club</td>
<td>G3KIN</td>
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<td>37</td>
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<td>G3QHN</td>
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<td>Oxford University Radio Society</td>
<td>G3OUR/A</td>
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<td>39</td>
<td>Solway Radio Club, Cumberland</td>
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<td>40</td>
<td>Ely Amateur Radio Society, Cambridge</td>
<td>G3MRN/A</td>
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<td>Southdown Amateur Radio Society, Eastbourne</td>
<td>G3WQK</td>
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<td>42</td>
<td>Shrewsbury Amateur Radio Club, Bristol</td>
<td>G4AAG</td>
<td>3,805</td>
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<tr>
<td>43</td>
<td>Silverthorn Radio Club, East London</td>
<td>G3SRA</td>
<td>3,004</td>
</tr>
</tbody>
</table>

and Cambridge University, who had in their team G3CY, G3ZNU, G4AOL, G3ZAY, G3XZP and G3Z2H, - just the sort of participation one likes to see in an event like MCC.

Many Clubs worked from the home QTH of one member as not every Club has its own callsign and Hq. station. This was quite in accordance with Rule (4) and has always been an accepted feature of MCC.

What They Say

As usual in the MCC Report, we now quote verbatim some of the comments from the logs. These have been selected to give as fair a picture as possible.

"We feel lack of activity this year was due to abolishing Club code numbers." (Silverthorn, G3SRA). "Our main objective is not to win but to give some of our members contest experience. Last year's rules were better in that a code is much easier to copy than a QTH." (Shirehampton, G4AHG).

"Contest timing good and chance for that last pint!" (Bangor University, G3INV.

"High activity but not many interested in us." (Ely, G3MRN/A). "We think the scoring system was slightly in favour of GM/W; our main failing was a 2.8 kHz bandwidth; the TxF ran 10w. to a BD123 from a 12v. accumulator, with home-built 160m. Rx and dipole, QTH St. Catherine's College" (Oxford University, G3OUR/A). "We feel lack of activity this year was due to abolishing Club code numbers" (Silverthorn, G3SRA).

"What we really need is a simpler form of scoring." (Southdown, G3WQK). "High activity but not many interested in us." (Ely, G3MRN/A).

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"In general, we like the new points system" (Parley, G3FTQ/A). "It was often impossible to establish whether a station was a Club or not without resorting to the call book" (Kingston, G3KIN).

"The scoring system is good and seems fair all round but Rule 4 is as useless a rule as ever was devised (Edgware, G3ASR/A). Examination of the scoring ratio GM/GW to G makes it apparent that they will get almost double the points of English stations having the same number of contacts, and why should we have a multiplier? Do the rules stem from the fallacy that it is easier to work 400 miles than 50 miles on Top Band?" (East Kent, G3LTY/A). "What we really need is a simpler form of scoring" (Southdown, G3WQK).

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"In general, we like the new points system" (Parley, G3FTQ/A). "It was often impossible to establish whether a station was a Club or not without resorting to the call book" (Kingston, G3KIN).
but felt that counties should be scored either as multipliers or as extra points, not both” (Cambridge University, G6UW) . . . “Principle of scoring very good but contest exchanges should be more closely controlled by the rules, the word ‘Club’ being made a compulsory part of the exchange” (Sutton & Cheam, G2DMR) . . . “Most Clubs did not fully identify themselves. Will scoring system give bias in favour of non-G participants? Multiplier system generally liked” (Wheatstone, Grimsby, G4BJT) . . . “Whoever devised the rules must either be in the legal profession or he works for the Inland Revenue!” (Maidstone, G3TRF) . . . “The scoring system heavily loads the contest against G stations and is far too complicated” (Chiltern, G3CAR, G3CAR) . . . “General opinion that scoring system much improved on last year” (Kingsway Tech., Dundee, GM4AAF) . . . “Rules not specific enough as to what identification had to be sent” (Glentrothes “C”, GM3YOR) . . . “This was the first try-out at a contest by this Club and it was most enjoyable but we do suggest going back to the ident. code system” (Watson, G4AFS) . . . “A much better contest than last year’s with the multiplier to keep us searching for new ones. Thanks for organising a very enjoyable event”. (Walton, Surrey, G4BEG).

“The scoring system is ridiculous—Clubs in England stand no chance of winning with the double-point bonus for inter-G country working” (Manchester University, G3VUM) . . . “Contest thoroughly enjoyed as usual, though scoring took a bit of figuring out” (Leprechaun Contest Group, EI1AA) . . . “The scoring system is heavily biased for anybody except G Clubs and it would be surprising if any G station could be placed in the top ten overall scores” (UMIST, Technology Institute Transmitting Society, G3CXX).

We suggest that anybody having read through the foregoing comments, taken verbatim from the logs, should look again over the actual results, particularly in regard to the alleged scoring bias in favour of non-G Clubs!

And we must also record the fact that other useful and interesting suggestions which, regretfully, there is no room to discuss here—were put forward by many of the entrants.

It should likewise be mentioned that there was a good sprinkling of single-op. non-Club stations on throughout the Contest; they added considerably to its interest and helped to pile up the multipliers.

Final Comment

As to what form the next MCC is to take—or even whether it is desirable to have one at all—will be decided in due time.

For the present, we would like to thank all who supported the 1973 MCC, which from our point of view again turned out to be a good Contest, well worth the labour it entailed at our end.
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SALE: Heathkit GR-54 receiver, £25; Green 2-metre nuvistor converter, £5; Heathkit 3-SU beam switch, £10; Tech TE-15 GDO, £5; Taylor signal generator, £10; Joystick de luxe aerial and Joymatch 4RF. £7; also components and valves.—Burnard, 26 Northholme Gardens, Edgware, Middlesex HA8 5BB. (Tel: 01-952 65066).

EXCHANGE Or SELL: Eddystone EC-10 Mk. II with AC/PSU, good condition, £64. Exchange for Yaesu FG-50 (Netts.).—Box No. 5191, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H 0HF.

SELLING: Liner-2, new, £110; Heath HW-32A, 20m. SSB, with HP-23B PSU. HRA101, KW-103 and KW LPF. all new and unused (cost £135), accept £90, or will sell separately.—Ring Carey, G3HBM, 01-969 7027 (Romford).

SALE: Late model G3JCQ-type "Transistor twofilter" receiver, with HF linear amplifier and power supply. Bits and pieces, s.a.e. for lists.—Shannon, G3KKJ, QTHR.

EXCHANGE Or SELL: Eddystone EC-10 Mk. II with PSU and BSU, FOR Trio 9R-591S, plus £25 cash.—Hannah, 11 Lancaster Avenue, Skegness, Lincolnshire.

SELLING: AR88D receiver, excellent condition, £50; Heath DX-100U transmitter, unused, £80. Both with makers' handbooks.—Ring Duxbury, 01-727 7796.

FOR SALE: CD711S.2 'scope. very good condition, £35; TCS-12 with mains PSU. £12; 19 Set with mains Rx PSU. £7. All good working order.—Ring Allinson, Aspatria (Cumberland) 20243, evenings.

FOR SALE: Heath SB-401 Tx with all crystals, manual and spare valves, unused, £200.—Rawlings, G3RS. 20 Hedgeway, Guildford, Surrey.

SELLING: PM.I mains preselector, £6.—Bull, 50 Woodlesford Crescent, Moor End Road, Halifax (0422-53979), Yorkshire.

SALE: K.W. Valiant, good condition. £20.—Poole, G3YWX, QTHR. (Tel: Leeds 680645).

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FOR SALE: TA-33 Jr., £20. AR-22R rotator and control. little used. £20. approx. 30-vds. of 4-core cable. £4; Panda PR-120V Tx. £20. Will deliver up to 40 miles, or buyers collect.—Hattersley, G3PNJ. Hilton, Chesterfield, Derbys. (Tel: Chesterfield 6040 after 6 p.m.).

SALE: G3ADZ moving QTH at short notice and must dispose of: Vanguard 4m.; Hudson 108 dm.; Class-D No. 2 wavemeter; R.1132A; Joystick with ATU; large quantity of junk including valves and radio magazines. Buyers must collect. Balance by junk sale on Saturday, January 5th, 1974, at 2 p.m. —Haylock, G3ADZ, QTHR. (Tel: Liss 3314).
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FOR SALE: Yaesu FT-50B with crystal calibrator and handbook £50; Trio JB-500S with speaker and handbook £45. — Smith, 19 Hyde Road, Kenilworth (54609), Warms.

OFFERING: Yaesu FI-2100, new; BC-221M; Katsumi EX-9X keyer; Frequency meter 20-290 MHz; Frequency meter 375-725 MHz. Offers — Liming, 68XNM, QTHR. (Tel: East Horsley 9082, Surrey).

SALE: 25-ft. wood-lattice type boom for full size 3-ele. 20m. beam, weighs 25lbs., with four coats of paint. £10. Buyer collects. — Hattersley, G3FMN, Hill Top, Holymoorside, Chesterfield, Derbys. (Tel: Chesterfield 3940 after 6 p.m.).

STILL REQUIRED: Hallicrafters Sky Buddy receiver. — Littlewood, G3CPB, 11 Birch Grove, Chippenham (G070), Wilts.

WANTED: KW-600 or KW-1000 (or similar) linear amplifier. Details and price, please. — Breach, G10JO, 1 Massey Park, Belfast, N. Ireland.

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WANTED: The larger trimming tool for an AR88 receiver. — Jamison, 311 Old Glenarm Road, Larne, Co. Antrim, Northern Ireland. BT40 1TU.

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WANTED: The larger trimming tool for an AR88 receiver. — Jamison, 311 Old Glenarm Road, Larne, Co. Antrim, Northern Ireland. BT40 1TU.
FOR SALE: Yaesu Musen Rb FR-400SDX, mint 1973, in original packing, complete with handbook and kit of spare connectors, £155. Eddysonde 688X receiver, as new, £50. BC-453 (Q-Fiver) as new and unmodified, £5.—Davies, West Wit Cottage, Llanelwedd, Denbighshire. (Tel: Basingstoke 50014, after 9.0 p.m.).

OFFERING: AN/ APR-4 UHF receiver, tuning 3 to 1000 MHz, complete with three tuning units, recently serviced, price £20 or near offer. OR EXCHANGE for Eddysonde 730/4 receiver.—Parkins, 25 Watford Road, Kings Langley (63773). Herts.

SALE: AIM10 Dyce "Cambridge" two-metre Tx/Rx, times 144-146 MHz, with microphone and crystal, £30. Heathkit SWR Bridge, HM-15, £5.—Abel, G3ZHL, QTHR.

FOR SALE: Heathkit SB-102 transceiver with AC/PSU and SB-600, complete with CW filter, professionally wired, one year old, in mint condition, £200. Hy-Gain 18-AVT/ WB vertical Ac, perfect, £22. Telomast, 50 feet, with almost complete handbook. price £23.—Roberts, 9 High Street, Bala, Merioneth, North Wales, LL23 1AW. Short-wave receiver, complete with headphones, £16. WANTED: Good quality 12v.—Hobin, G3XIX, QTHR.

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