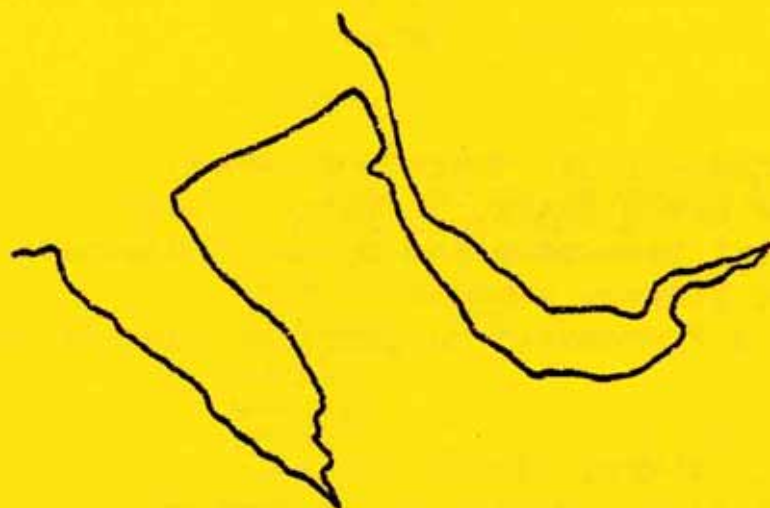


AUTUMN 1984

AIRWAVE

» 325 «



WIRRAL AND DISTRICT  
AMATEUR RADIO CLUB

# WIRRAL AND DISTRICT AMATEUR RADIO CLUB

## CLUB EVENTS

1984

AUTUMN

WINTER

All dates are WEDNESDAY, 8.00 for 8.15pm. at Irby, unless noted.  
D&W = Informal 'Drink and Waffle' at a pre-arranged pub, 9pm on.

### OCTOBER

- 3rd. D&W Hotel Victoria, Heswall.
- 6th.&7th. WEEKEND. 70/23cm. Region 1 Contest.
- 10th. 'Peacetime Duties of the CEPO.' Bill Holland, MCC.
- 17th. D&W The Basset Hound, Thingwall.
- 24th. Home Construction Comp. Judging, PLUS Film, (TBA)
- 31st. Activities Evening - Debate.

### NOVEMBER

- 3rd. & 4th. WEEKEND. 144 Mhz. CW Contest.
- 7th. D&W The Seven Stars, Thornton Hough.
- 14th. Equipment Demonstration by DW Electronics.
- 21st. D&W The Ridger, Newton.
- 28th. Social & Presentations Evening. (See inside.)

### DECEMBER

- 2nd. SUNDAY. 144Mhz. Fixed. Contest.
- 5th. D&W The Albion Hotel, New Brighton.
- 12th. Chairmans Night. G8MMM's surprise talk.
- 14th. FRIDAY. Christmas Party & Disco Night. See inside.
- 16th. SUNDAY. 70Mhz. CW Contest.
- 19th. D&W The Eastham Ferry Hotel, Eastham Ferry.  
MERRY CHRISTMAS
- 26th. NO meeting on Boxing Day.

### CONTEST INFORMATION

It is intended to enter all the above contests.  
For info. on times and sites, contact Phill G6SNO.

JANUARY AND FEBRUARY DATES INSIDE BACK COVER

Some information is provisional.

WIRRAL AND DISTRICT AMATEUR RADIO CLUB

THE COMMITTEE

FOR 1984

|                    |                 |       |                          |
|--------------------|-----------------|-------|--------------------------|
| CHAIRMAN           | GORDON NICHOLAS | G8MMM | 051-336 7143             |
| TREASURER          | SUSAN NICHOLAS  | G6ADO | 051-336 7143             |
| SECRETARY          | GERRY SCOTT     | G8TRY | 051-630 1393<br>227 1018 |
| PUBLICITY MANAGER  | NEIL McLAREN    | G4OAR | 051-608 1377             |
| SOCIAL MANAGER     | FRANK KNEALE    | G4DBG | 051-339 9623             |
| ACTIVITIES MANAGER | PHIL LANGFORD   | G6SNO | 051-677 1947             |
| NARSA REP.         | PETER DENTON    | G6CGF | 051-630 5790             |

This is the line-up following the Sixth Annual General Meeting, on 11th Jan.

AIRWAVE 325

Airwave 325 is the periodic newsletter of this Club, and is published three or four times each year as events and articles dictate. Articles for inclusion are always welcome.

Produced on behalf of the Club by

The Secretary,  
Gerry Scott, G8TRY,  
19, Penkett Road,  
Wallasey,  
Merseyside.  
L45 7QF

(New address as from 23/9/83)

CLUB MEETINGS

Meetings are normally held on the second and fourth Wednesday in each month, at Irby Cricket Club, Mill Hill Road, Irby. The Clubhouse is just off the main road between Irby and Greasby, about half-way along on the Easterly side. PLEASE park on the top car-park, and walk down, thus leaving the very limited space by the Clubhouse available for bar staff, guest speakers to unload etc. and the disabled.

DO NOT PARK ON THE DRIVE - IRBY C.C. REQUEST. They know from experience that it is not possible for an ambulance to pass.

CLUB 'NET' FREQUENCY IS 145.325Mhz.

The net frequency of 313 was decided upon in 1980, as being otherwise completely 'dead' in this area. The Club assisted the purchase of xtals for rock-bound users (as most were). Please maintain activity on 325. Remember, use it or lose it. It is in grave danger of being 'pinched' unless we continue to keep it going, thus making others QSY.

FROM THE CHAIRMAN.

Welcome to another edition of 'Airwave 325'. This edition sees the end of most of our outdoor activities for this year, but the shorter days will give longer evenings in the 'Shack', and the opportunity to catch-up on some of the things neglected during the summer, such building or mod'ing equipment, or spending some time keeping '325 alive. Don't forget this year's new trophy, donated by Dave G6LME, for the Club members best effort at home construction.

I hear that following Mike Dixon's talk on Microwaves that there is interest in the Club on the 70cm ++ scene. One of my favorite ideas for a club project is to have a 23cm repeater for the Wirral. We have an offer of a high site, all we need is the repeater.

Looking forward in the calendar of events, we are coming up to our 'social' season when we invite local radio clubs to join us for the evening. This is always a great way to put a face to a voice, particularly to those of our members working lots of local stations on 2m FM.

Final word, again on the social side, we are again holding our Xmas Disco, at the Club House, this year.... before the New Year.

73.. Gordon, G8MMM

FROM THE SECRETARY

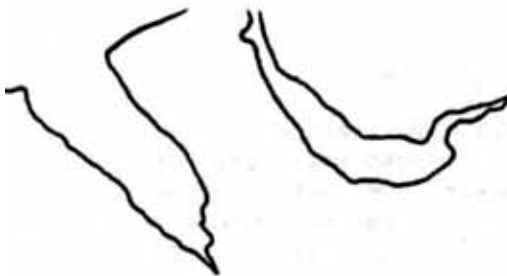
Hello to you all again, especially to our newer members who may be reading 'Airwave' for the first time. I hope that we have kept all of you in touch with the club events for the second half of this year via the use of "Update 325" and the club meetings, while the second edition of this mag. for this year has been gathering momentum during the past few months.

Without doubt, the past six months or so has been an extremely difficult period for almost every member of the committee, due to sudden changes of work schedules and events closer to home, of one form or another. However, we have won through the problems and maintained a high standard of meeting, as scheduled, through the year. Sometimes, this has called for re-scheduling of some events at quite short notice, to fit in with the information that we put out. I only wish that we had had the time to put out more in the way of 'Airwave' or 'Update' this year, because we know that it makes for greater awareness of club involvement for each member, leading to bigger meetings and generally a stronger and closer-knit membership. Help us to help you - try to write something for the next issue. In this way, your committee can spend more of its' precious time on more important things, rather than finding articles to go in the mag,, and the mag. will come from a wider selection of club members. The more contributions that we have, the sooner we have a new mag.

One last point about the contents. The page that I wrote in the last edition of 'Update' largely reflected events of earlier in the year, in particular how full the calendar had been and how well things were going. If I had more time, at the time, I would have written about the future events as well. I had one comment about that page, to the effect of "we know all that." True - if you happen to come to almost every meeting like he does, but the message was for the 50% or so that we hardly ever see at the club. So, let the past speak for itself.

As Gordon says above, around Christmas is our social season, with the events largely taking place at Irby, but remember, the clubhouse is not just for our use on Wednesdays - as members, you can go there anytime the place is open. Why not try it - you will be most welcome.

So, I hope that I'll be seeing you down at the club all through '85 plus.



# WIRRAL AND DISTRICT AMATEUR RADIO CLUB

G4MGR --- G8WDC

## SEVENTH ANNUAL GENERAL MEETING

WEDNESDAY, 6th. FEBRUARY, 1985

AT IRBY CRICKET CLUB, IRBY.

### AGENDA

1. Apologies for absence.
2. Approving the Minutes of the Sixth Annual General Meeting.
3. Receiving the Chairmans Report on the activities of the previous year.
4. Receiving the Treasurers report and approving the audited balance sheet.
5. Setting the Membership fee for each category of membership.
6. Electing a Committee, by ballot.
7. Opening remarks by the new years Chairman.
8. Noting any other buisness. (Limited to 30 Mins. maximum.)

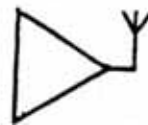
Nominations for any office must have been submitted to the Secretary before the start of the A.G.M., having been suitably proposed and seconded by two Corporate members. Only fully paid-up members shall be admitted to the A.G.M., that is to say, visitors must make themselves known and remain separate from the body of members during the meeting. They may act as observers. A quorum shall consist of 20% of the Corporate and Associate membership. Voting on members of office shall be by ballot of the Corporate membership, and simple majorities shall apply.

Gerry Scott,  
G8TRY,  
Secretary.



The Radio Society of Great Britain

Northern  
Amateur Radio Societies  
Association



THE RULES  
OF  
THE ANNUAL 'HOME CONSTRUCTION' COMPETITION.

Trophy kindly donated by Dave Elliot G6LME

ENTRANTS

Any paid-up member of the Wirral and District Amateur Radio Club.

PRESENTATION

At the W&D ARC Presentation Evening.

JUDGING

By the Committee using a points system. Each member of the Committee to give points out of a maximum of three, in each of the following aspects :-

- 1) Circuit complexity.
- 2) Quality of construction and finish.
- 3) Content of 'home brew'.
- 4) Originality of design.

A total of twelve marks.

Judging to be completed before the presentation evening, and articles for judging having been submitted no less than one month before. \*\*

The Committee reserve the right not to award if, in their view, none of the submissions are acceptable for judging.

\*\* It would be preferable for all submissions for judging to be presented for viewing by the Club, and the judging to take place subsequent to a meeting.

ELIGIBILITY

- 1) Any article either totally or partially home constructed.
- 2) Use of purchased P.C.B.'s is allowable.
- 3) Modifications to old equipment and 'black-boxes' is permissible.
- 4) Articles submitted must have connections with the Amateur Radio hobby.

SUGGESTED CATEGORIES FOR MARKING

- 1) Circuit complexity; Very complex, average, simple.
- 2) Quality of construction; High, average, poor.
- 3) Content of 'home brew'; Total, Major, Minor.
- 4) Originality of design; Total, Partial, Kit form.

G.A. Nicholas. G8MMM.

PLEASE NOTE

The 'Home Construction' rules and the 'Guidelines for Contests' are presented above and right, in draft issue.

The home construction rules you will have probably seen, and these have already been used for the competition. In the judges view, and with hindsight, some expansion of the marking system is needed.

The contest participation guidelines explain the situation about the background to contests, particularly when things go wrong. It is a summary of items that is usually made verbally, and put into print.

Any problems or suggestions about these, then contact the relevent cttee. member

## GUIDELINES FOR CONTEST PARTICIPATION

Firstly, many thanks for taking part in our Clubs contest. I hope you enjoy the contest and any associated social activity. The Club is very grateful for your help and support particularly if you have provided equipment to get us 'on the air'. We would, however, ask you to consider the following.

- 1) It is current Club policy to support contest activity and as such our contest manager operates with a very limited budget to cover as many contests as he wishes to operate during the year. Such funds are allocated with the prime purpose of settling non-avoidable costs, such as site fees etc..
- 2) The Club has an insurance policy which covers both Club and members equipment used on Club business against certain defined risks. In common with most insurance policies, it specifically excludes damage from causes such as misuse or from wear and tear etc.. The Club itself can accept NO LIABILITY for any damage to persons or equipment.

Club members who are kind enough to provide equipment are therefore requested to arrange such supervision as they feel necessary if they are not in personal charge of their equipment. They may also consider the possibility of an extension to their own insurance. Accidents do happen, and you may even drop your loan gear on the road outside the home QTH when loading.

A copy of the Clubs insurance policy is held by our Contest Manager and is available upon request.

REMEMBER - Treat all equipment the same as or better than you would treat your own.

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### A TRUE TALE

For a few hours one morning, the airwaves of one companys PMR system were silent. The reason was that the 'blue box' base station was having its' annual overhaul.

Shortly before lunch-time, the engineer had almost completed his task, and all that remained was to perform the final on-air test transmission. The silence of the radios in the fleet of vans was suddenly broken by the engineers voice "This is the Pye man .... Testing ...."

Instantly, as his carrier dropped, his test call was acknowledged with these immortal words "We'll have two steak and kidney, and one meat and potatoe."

FULL LIST OF NEW MEMBERS FOR ALL OR PART OF 1984

|                      |                        |
|----------------------|------------------------|
| Arthur Gallagher     | G1DBC John Tumath      |
| G4MJP Gordon Rouse   | G1DQP Michael Halls    |
| Margaret Rouse       | G4UDR Vic Allen        |
| G6HGI Peter Johnson  | G6HGI Edward Rixon     |
| Bryce Gibson         | G6XHF Simon Richards   |
| G6XLA Roy McCormick  | G1BYI James Moore      |
| G8REQ Frank Robinson | G6FNF William Redfearn |
| G1JFB David Robinson | G4KOY Roger Gill       |
| G1GUW Joyce Lamb     | G1DEV Ernest Hardwick  |

The first eight joined early enough to be included in the Jan. address list.

Thank you all for joining. We hope you have a long and happy association with our Club. We trust that by now both old and new members will have become firmly established with each other.

NEW CALLSIGNS

|                               |                            |
|-------------------------------|----------------------------|
| G4WFJ (SWL) David Porter      | G4YRG (G6ALH) Andy         |
| G4WUA (G6LLK) Geoff           | G4YXO ( SWL ) Cecil Marley |
| G4WVC (G6MDJ) Doug            | G4ZCA (G6XLA) Roy          |
| G4XVA (G6MCR) Peter           | G4ZRG (G6MFG) Bill         |
| G1GUT ( SWL ) Tom Worthington |                            |

CONGRATULATIONS

PLEASE NOTE

We like to keep our records up to date, but we can only do so if you tell us. So, if you change your callsign, address or phone number, including those for the works QTH, PLEASE let the Secretary know. It is often preferable to give people a ring at work during the day. We will naturally respect your wishes about confidentiality in any disclosure, especially with respect to the contents of the members address book.

On the subject of the members address book, could we please remind you that this is provided for the convenience of the membership only and in confidence. Copying in whole or part, by any means, is not permitted, nor is any unauthorised disclosure. It is to be regarded as an item of Club property for which the recipient member is responsible, and clauses 7 & 8 of the Club Constitution apply.

This reminder is made in everybodys general interest, in the hope that in doing so, the address book does not become an aid to the criminal fraternity. This is because some of the information in it is not generally available in the RSGB Call Book or any Phone book. We thank you to keep it safe.



### DISTRIBUTION OF MEMBERS

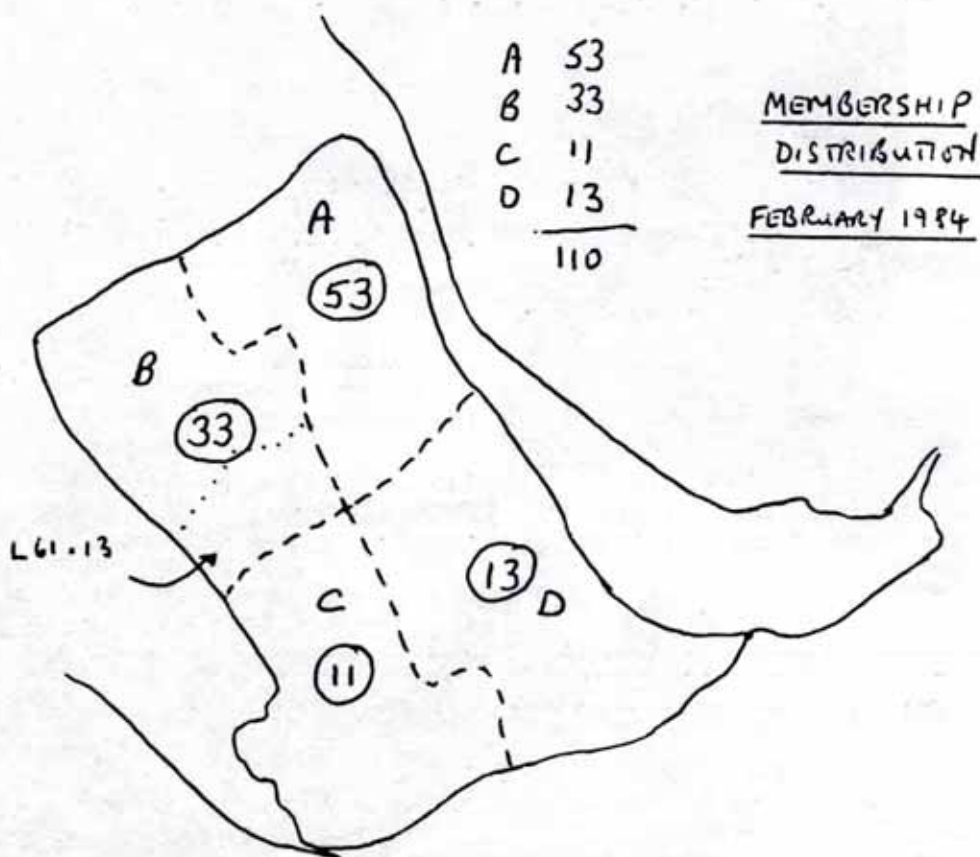
Of the total membership in the January 1984 Address List ( some did not re-new ) plus a few more who joined in Jan. and Feb., it was found that 110 of these had Wirral postcodes. Accordingly, a map of Wirral has been drawn-up to give some idea of distribution. This should give some idea as to why D&V's etc. are held where they are. It is estimated that this represents about one-third of the amateurs and S.L.'s on Wirral.

Area A L41 42 43 44 45 46  
No. 53 2 7 12 12 12 8

B L47 48 49 61  
33 8 5 7 13

Area C L60 64  
No. 11 6 5

D L62 63 65 66  
13 3 7 0 3



A map showing the boundaries of the post codes appears inside the back cover of the members address book.

### THINKING OF JOINING THE RSGB? - WHY NOT

But please note that the application forms have been changed from the familiar black and white to buff/brown/orange. These are less foemidable than the older ones and easier to fill out. If you want one, please ask the secretary.

FOR YOUR ENJOYMENT

November 28th. Social and Presentations Evening.

Presentation of this years prizes for DF and Construction  
Plus the pleasure of the company of amateurs from the  
Liverpool and District ARS and others.  
Plus Free Buffet. and also a Raffle.  
Special Guest Basil O'Brien G2AMV

Friday 23rd. November. 7.30 p.m.

Liverpool and District ARS Social Evening.

Once again, L&D have invited our members, wives and girlfriends  
along to their annual get-together with them.  
A very popular evening with both clubs, at the usual venue  
of the Conservative Club, Church Road, Wavertree. L 15.  
Food available. Talk-in on 145.550 S22

Thursday, 29th November. 6.00 for 6.30 p.m. at the Main Lecture  
Hall, Chester Zoo. (Use the Staff Entrance)

The Institute of Measurement and Control (Chester Section)  
Present

LISTENING TO SATELLITES

A talk by Mr. G.E. Perry, M.B.E., F.Inst.P.

Mr. Perry, who is now retired, is famous for his work with the  
Kettering Boys School.  
He will play recordings he had made over the years and describe  
how it is possible by use of relatively simple techniques to  
extract data from the transmissions.

(Thanks to David GLFB for the info.)

W&D ARC Christmas Party and Disco Night

Friday, December 14th. From 8 p.m. at Irby C.C.  
Well known DJ on the disco with most kinds of music.  
Late Licence. Raffle. Food. Good company!  
We have made it in time for Christmas this year.  
Bring the YL, XYL or OM. to another great do.  
TICKETS £1.50p (includes food) from Committee.

DON'T  
MISS  
THIS

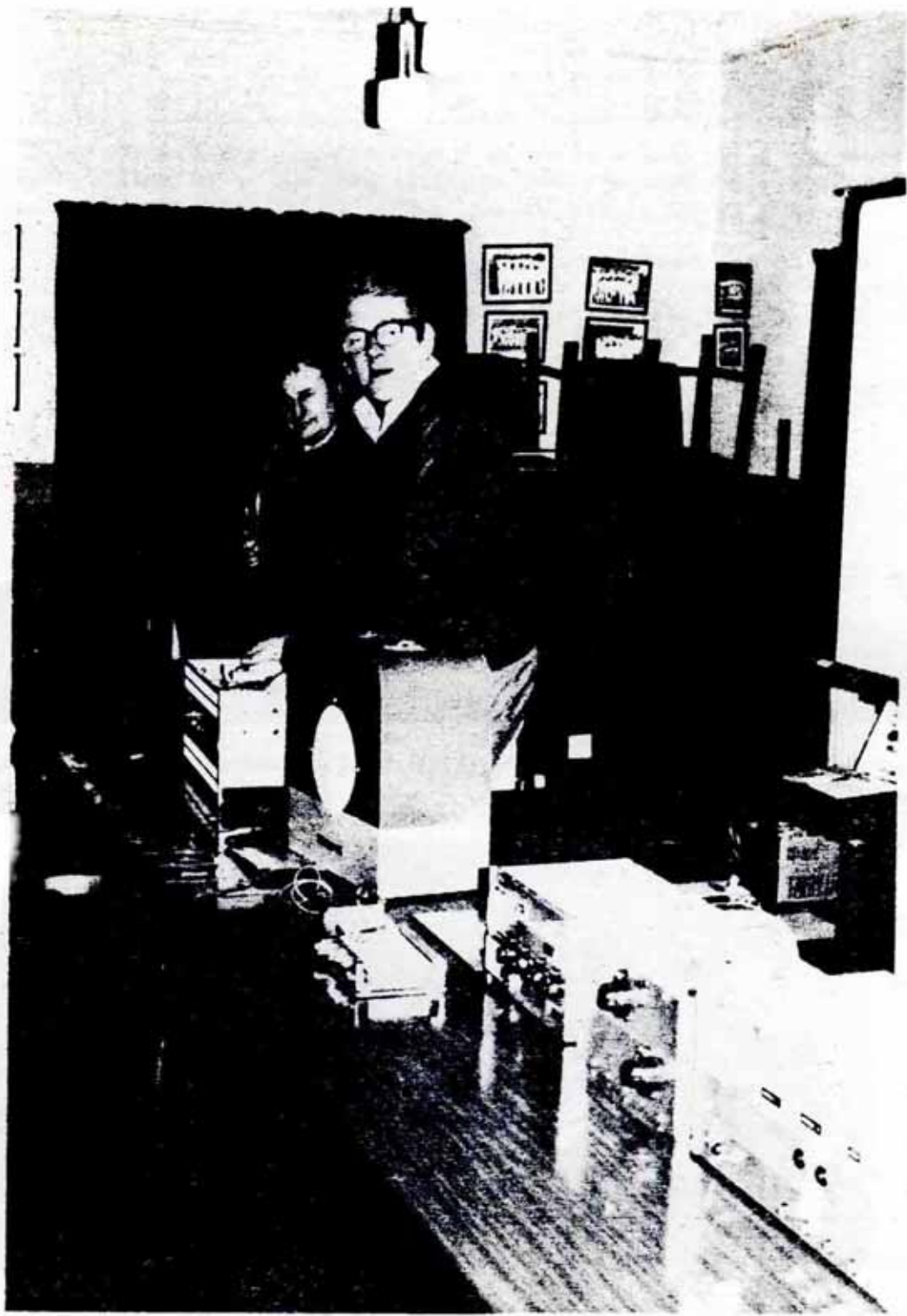


GOT YOURS YET?

CLUB SWEAT SHIRTS  
Navy Blue, White Logo  
Top Quality, UK Made,  
Polyester / Cotton  
More colours soon!

Contact Phil G6SNO



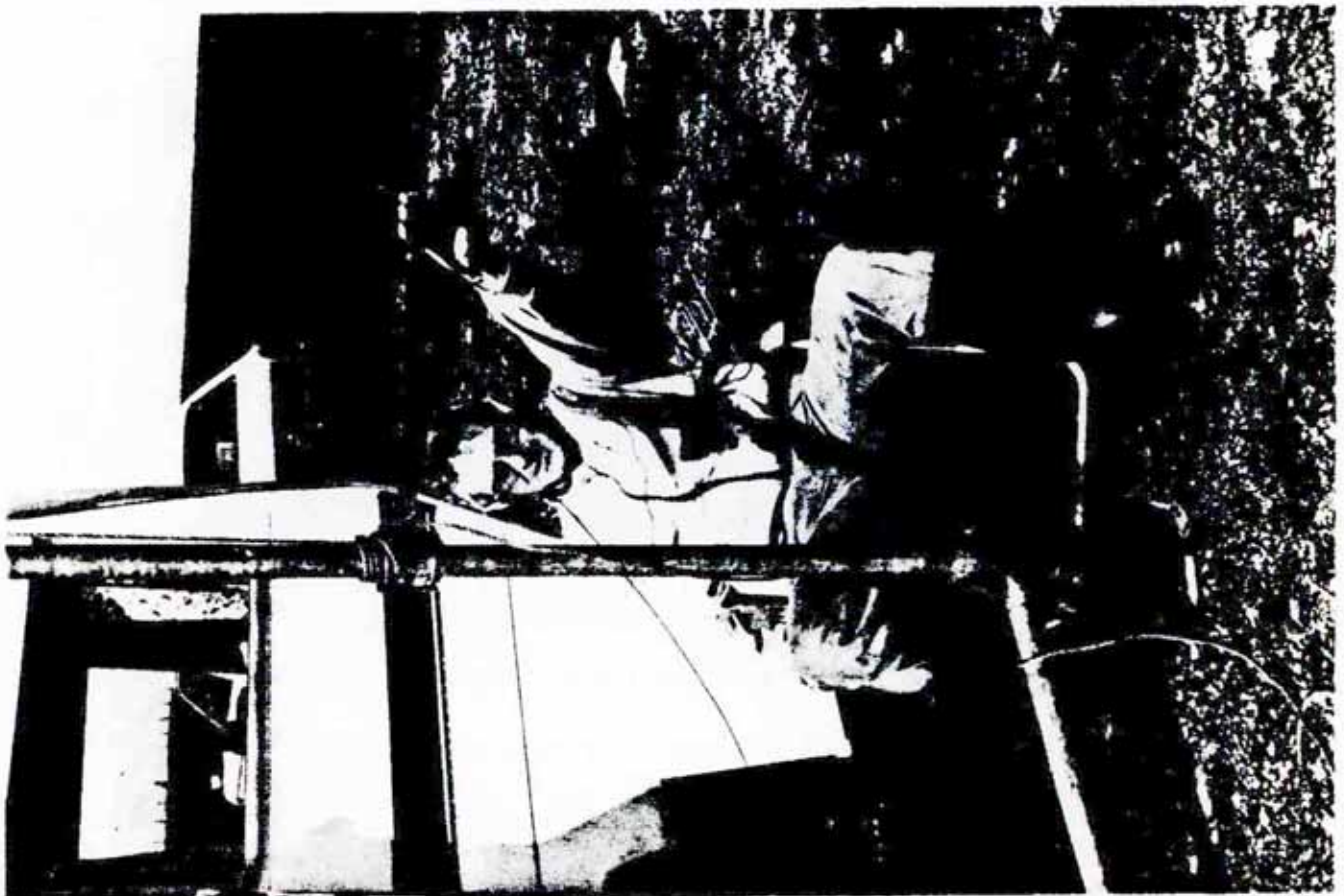


First HOME CONSTRUCTION CONTEST with  
DAVE GGLME summarising his impressions of  
first years entries with GORDON GEMMA



"Who forgot the mast !!!

4 x 19 ELE. YAGI S 70cms 70cms Trophy 1984



THE Armstrong/Rear Resting Rotator  
(Frank GBREQ)

# AN INTRODUCTION TO TRANSMISSION OF POWER

The transmission of power from a source to a load via a transmission medium, ie a line, is at its most efficient when the impedance of each is the same. To prove this, let us take a look at fig. 1. Try it yourself if you like.

Set up the circuit. Set  $R_L$  to 100 ohms and measure the voltages and currents, then set  $R_L$  to 200 ohms and do the same, repeating the procedure to a maximum of say 1100 ohms in 100 ohm steps. Calculate the power (P) using the formula  $P=V \times I$ , and then plot a graph of the results.

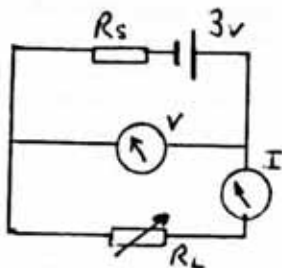
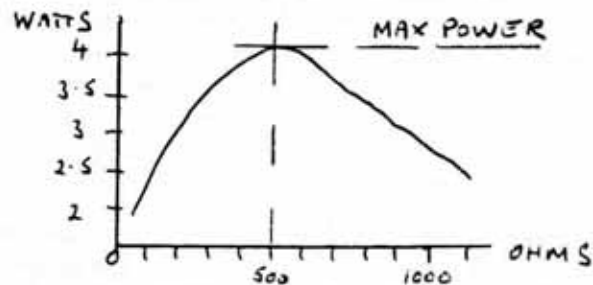


FIG 1



You should be able to see that maximum transfer of power occurred when the load resistor,  $R_L$ , equalled the source resistor,  $R_S$ . In this case the value was 500 ohms. Also, this example was worked using DC, but the same principles apply for AC, except that current in an AC circuit can be difficult to measure accurately. Generally, the power is calculated by measuring the AC rms voltage across a known load resistance or impedance, or at some given point in a circuit.

## Characteristic Resistance and Characteristic Impedance (when the network is reactive.)

Characteristic resistance ( $R_0$ ) is that resistance seen at the input of a network when the output is terminated in the same resistance, ie. in the networks below, if the output is terminated in 600 ohms, the input resistance is 600 ohms. (600 ohms is a value commonly found on audio equipment such as microphones.)

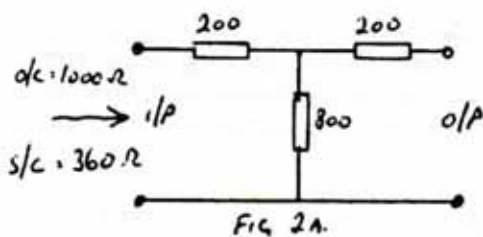


FIG 2A.

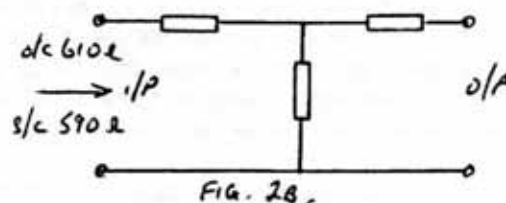


FIG. 2B.

In Fig. 2a, and with a little maths, if the output is open-circuit, then 1000 ohms is seen at the input. If the output is short-circuited, then 360 ohms is seen at the input. In Fig. 2b, this becomes 610 and 590 ohms due to the different values of resistance, which will also cause the two networks to have different overall losses.

$$\begin{aligned} \text{Now } R_0 &= \sqrt{R_{o/c} \times R_{s/c}} = \sqrt{1000 \times 360} & \text{or } \sqrt{610 \times 590} \\ &= 600 & \text{or } = 599.9166 \end{aligned}$$

Therefore,  $R_0 = 600$  ohms in both cases.

Lines, e.g. co-ax, twin-feeder or twisted pair, can be considered to be built-up from a number of reactive and resistive networks in series, so after a number of networks, the characteristic impedance ( $Z_0$ ) will be seen at the input, no matter what the output conditions. So, if you were to use a long length of lossy co-ax to your antenna, it could blow down in a gale but your SWR meter would not know the difference !

When considering reactive networks and lines, it must be appreciated that the impedance will change with frequency, therefore the characteristic impedance is often quoted at a given frequency.

Despite the correct matching of equipment, power will still tend to get lost, usually as heat or noise, and it is most useful to be able to work this out. The loss of lines and equipment can be expressed in terms of power ratios

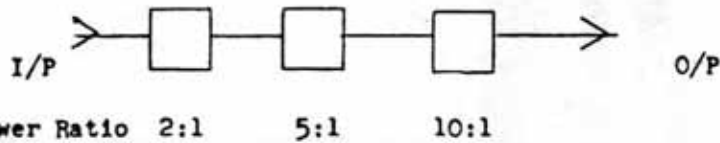


Fig. 3

Therefore, the overall power ratio is  $\frac{2 \times 5 \times 10}{1} = 100:1$

For example, I/P power = 1000 $\mu$ W, O/P power = 10 $\mu$ W Then loss = 990  $\mu$ W  
 " = 100 $\mu$ W " = 1 $\mu$ W Then loss = 99 $\mu$ W

Look at it this way, 1 watt to the QRP man is a lot to loose, but if you were running 100 watts then nobody would notice the difference if the power were to reduce by 1 watt.

The amount of power lost in a circuit is not always the same or as easy to calculate as was seen in Fig. 3. If the power ratios are anything like those in Fig. 4, then life could start to become complicated

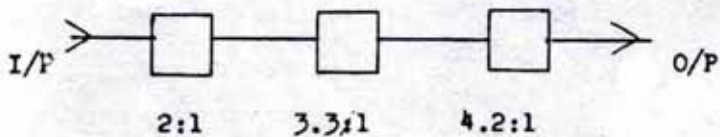


Fig. 4

It would be far easier to express the power ratios as their logs. and then to find the overall value of the power ratio by adding the logs. together. By definition, the log. of a power ratio is known as the Bel, (B), but as this is a large unit then decibels are normally used (dB's) and they are quite simply one tenth of a Bel.

$$\text{decibel} = 10 \log. \text{ Power Ratio.}$$

Now look again at Fig. 4. The overall ratio is ( 2X3.3X4.2 ). Not a sum to be done in the head, so find the logs. and add them together.

| No.              | Log.   | 10x Log. |
|------------------|--------|----------|
| 2.0 <sub>x</sub> | 0.3010 | 3.0      |
| 3.3 <sub>x</sub> | 0.5158 | 5.1      |
| 4.2              | 0.6232 | 6.2      |
| 27.71            | 1.4427 | 14.4     |

Therefore  
 LOG of Power Ratio = 1.4427  
 BUT the dB is 10x log. of Power Ratio,  
 So

OVERALL LOSS of Fig. 4 is 14.4427 dB's.

N.B. It is quite normal to round the figures to one decimal place, eg. 14.4 dB.

### MEASURING DECIBELS.

Up to now, the power ratios shown have been step-down ones, assuming losses. However, when some sort of power gain is involved as with amplifiers or antenna gains, then the ratios become step-up ones.

$$1000 : 1 = 30 \text{ dB loss.} \quad 1 : 1000 = 30 \text{ dB gain.}$$

Because of this, circuits can and are designed to accept various input powers, and a standard of reference is needed. 0dB is the standard (i.e. = x1), but this is only of any use if we know to what it is being referred.

Lets say we will use one milliwatt as the standard. So, to distinguish it from any other we may choose, a suffix letter is added - 'm' for milliwatt, Therefore we could use 0 dBm as a level of power on a circuit because now it means something.....This circuit has a 1 : 1 power ratio with ref. to 1 mW. ... which means that there is 1 mW at this point ....

Another standard is dBW (watts), and dBd and dBi are used to indicate 'with reference to a dipole' or 'with reference to an isotropic radiator' in the case of aerials.

$$\begin{aligned} \text{For example - } 1 \text{ mW} &= 0\text{dBm} & 1\text{W} &= 0\text{dBW} & 0.5 \text{ mW} &= -3\text{dBm} & 20\text{W} &= 13 \text{ dBW} \\ 1 \text{ mW} &= -30\text{dBW} & 20\text{dBW} &= 100\text{W} & 26\text{dBW} &= 400\text{W} & -6\text{dBW} &= 250\text{mW}. \end{aligned}$$

$$\text{i.e. } \text{dBm} = 10 \log. \frac{\text{POWER MEASURED}}{\text{POWER REFERENCE}} \text{ (mW)} \quad \& \quad \text{dBW} = 10 \log \frac{\text{PWR MEAS (W)}}{\text{PWR REP}}$$

A convenient way to measure the level of power in or on a circuit is not by using a wattmeter as such, but by using a voltmeter, and a wattmeter is usually, but not always, a voltmeter which has been suitably calibrated, sitting across a dummy load or else being of a high impedance so as it can be placed across the circuit under test, measure its voltage and display it in terms of power on a scale suitably calibrated for the impedance in use.

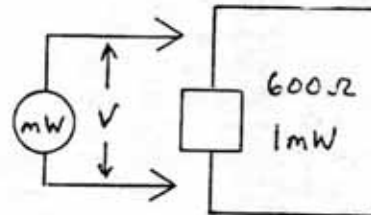
Take the case of the 600 ohm audio circuit - 1 mW at 600 ohm - 0.775 V

Convert the power formula into voltage formula,  
Now,  $P = I^2 R$  and  $I = \frac{V}{R}$  ( By Ohm's Law )

$$\text{So, } P = \left(\frac{V}{R}\right)^2 \times R = \frac{V \times V \times R}{R \times R}$$

$$\text{Therefore, } P = \frac{V^2}{R} \quad \text{and} \quad V = \sqrt{P \times R}$$

$$\begin{aligned} \text{For 1 mW at 600 ohm } V &= \sqrt{0.001 \times 600} \\ &= \sqrt{0.6} \\ &= 0.77459 \text{ Volts.} \end{aligned}$$



The voltage across the 600 ohm resistor is 0.775 Volts, 1mW of power is 0dB, so when a voltmeter is placed across the resistor it will read 0.775v, which could then be marked as 0 dBm. To work-out what other voltages would be in dBm's the previous formula given for dBm would have to be converted into a voltage one.

The same principles apply for any reference, and any impedance. Measurements at R.F. naturally bring their own problems.

The voltages at A.C. are all assumed to be r.m.s., and must take into account any forward voltage drops in rectifier diodes. If an oscilloscope is used to measure an A.C. voltage, it will show the peak-to-peak waveform, which is twice the peak voltage, and r.m.s. is 0.707 x peak.

TO BE CONTINUED

PRACTICAL APPLICATIONS AND SIMPLE HOME TEST GEAR

CONTESTS

THE RESULTS SO FAR - GW4MGR/P

I am sure that many of you are aware that as a Club we have been entering every VHF and UHF contest during 1984.

As you can see from the results we have had a few great successes and a few dissappointments. A lot of hard work goes into putting-on contest stations and I have got nothing but praise for the team of hard core enthusiasts and for those who give what time they can.

Our biggest problem at the moment is how to provide food and accomodation 2000 feet up in the Welsh mountains and until this one is solved then we must at times limit the number of people on-site ..... BUT ... in saying that, don't let it put you off joining us - we need all the help that we can get.

Phil G6SNO  
Contest Manager.

| <u>CONTEST</u>                    | <u>PLACING 1983</u> | <u>1984</u>    |
|-----------------------------------|---------------------|----------------|
| NFD 1983                          | 58 th.              | 26 th.         |
| 144 TROPHY (September) — — — —    | 63 rd.              | awaited        |
| 144 C.W. (November)               | 2 nd.               | -              |
| 144 FIXED (as G4 PKO) — — — —     | 61 st.              | -              |
| 144 C.W. (February 1984)          | -                   | 6 th.          |
| 432 FIXED (February 1984) — — — — | -                   | 4 th.          |
| SWALE ARC 432 (as G6 SNO/A)       | -                   | 2 nd.          |
| 144 / 432 (March 1984) — — — —    | -                   | 20 th./10 th.  |
| 432 C.W. (April 1984- as G3UVR)   | -                   | <u>1 st.</u>   |
| UHF / SHF — — — —                 | -                   | 11 th./ 10 th. |
| 144 SWL                           | -                   | 6 th.          |
| 70 MHz. (June) — — — —            | -                   | <u>1 st.</u>   |
| 1296 TROPHY (June)                | -                   | 11 th.         |
| 432 TROPHY (June) — — — —         | -                   | 8 th.          |

TOTAL = 14 CONTESTS THIS YEAR





# RADIO SOCIETY OF GREAT BRITAIN

This is to certify that

GW4MGR/P the station of the  
Wirral & District Amateur Radio Club  
was the WINNER in the OPEN SECTION of  
the RSGB "70MHz and SWL" Contest 1984



By order of  
the Council

*Janethum*  
Vice-  
VHF-A President



DIRECTION - FINDING COMPETITIONS

The Eileen Medley Challenge Cup D.F. Hunt. 27th. June.

The 'Fox' G8TRY and G4DBG Callsign G8WDC/P  
Location Bidston Moss A554 M53 Junction  
Start 1904 GMT. Finish 2034  
QSY The Lighthouse, Wallasey Village.

Posn. Call. Found Taken

|   |       |      |            |
|---|-------|------|------------|
| 1 | G6SNO | 1930 | 00h 26min. |
| 2 | G5MYX | 1938 | 00 34      |
| 3 | G8MMM | 1954 | 00 50      |
| 4 | G8UZZ | 1955 | 00 51      |
| 5 | G4OAR | 2001 | 00 57      |
| 6 | G8TCC | 2016 | 1 12       |
| 7 | G6IAD | 2018 | 1 14       |
| 8 | G1DBC | 2033 | 1 29       |
| 9 | G4NQX | 2034 | 1 30       |

NOTE

Team Call-signs only given.  
1 - 4 in each team.

Retired G6JZP @ 2028

Comments. A very pleasant evening, although a cool breeze was finding its way down the foxes necks, and damp grass on the Moss reached other parts of the anatomy. Due to change of vehicle, the linear got left at home. Some say it made it easier and some don't. All the teams, bar one, found the fox in reasonable time. What they did not know ( and neither did the fox for certain ) was that this was almost the exact location used for one of the first ever club D.F. hunts. G8NNS and G8PMW were the fox, but nobody found them - so the event had to be re-run. Improved skills rather than a good memory gave a good spread of results. Thanks to all who took part, with a special mention to Stuart, G4NQX, who came from Chester area to participate as a visitor.

The 'Revenge' D.F. Hunt, for the G8PMF Award. 25th July.

The 'Fox' G4PKO and G6XHF Callsign G4MGR/P  
Location Burton Wood, Burton  
Start 2005 BST Finish 2145  
QSY The Wheatsheaf, Ness.

Posn. Call. Found Taken

|   |       |       |            |
|---|-------|-------|------------|
| 1 | G5MYX | 20 48 | 00h 43min. |
| 2 | G6IIN | 20 53 | 00 48      |
| 3 | G6CGJ | 21 01 | 00 56      |
| 4 | G8UZZ | 21 14 | 01 09      |
| 5 | G8MMM | 21 15 | 01 10      |
| 6 | G8TRY | 21 43 | 01 38      |
|   | G1DBC | 21 43 | 01 38      |

Retired G6JZP

G6IAD - Did not find the fox  
but told of QSY.

Comments : An almost ideal evening for the event. Duncan and Simon put out a relatively weak signal from their lair in the woody undergrowth. In fact, the signal seemed to many entrants to be so weak that it could not climb up from the banks of the Dee, if the number of beams seen down by the shore is anything to go by. However, it took most stations under an hour to realise that the fox was not on the usual map sheet 108, which left a lot of teams short of the right map.

Needless to say, all the teams had a good discussion about it, and the interpretation of the rules, over a few drinks.

# SUNDAY DF HUNTS

| CALLSIGN<br>EVENT No | G4OAR               | G6SNO | G5MYX | G6IIM          | G1DQP        | G6JZP         | G1DBC    | G6CGJ          | G6HOX                 | FOX   |
|----------------------|---------------------|-------|-------|----------------|--------------|---------------|----------|----------------|-----------------------|-------|
| 1                    | 32 MINS<br>6 POINTS | 37    | 50    | From Home<br>1 | GAVE-UP<br>1 | 111<br>3      | -        | -              | -                     |       |
| 2                    | FOX                 | 75    | 3     | 55<br>6        | -            | ACCIDENT<br>1 | 80<br>4  | TALKED-IN<br>1 | -                     | G4OAR |
| 3                    | -                   | 26    | 1     | 58<br>5        | 1            | -             | -        | -              | -                     | G6ALH |
| 4                    | -                   | 6     | 4     | -              | 3            | -             | -        | -              | 5                     | G8UZZ |
| 5                    | -                   | 65    | FOX   | -              | -            | -             | 101<br>5 | -              | 112<br>TALKED-IN<br>1 | G5MYX |
| BEST OF<br>3         | 6                   | 18    | 11    | 12             | 5            | 4             | 9        | 1              | 6                     |       |
| TOTAL                |                     |       |       |                |              |               |          |                |                       |       |
| RESULT               | 5TH.                | 1ST.  | 3RD.  | 2ND.           | 7TH.         | 8TH.          | 4TH.     | 9TH.           | 5TH.                  |       |

WINNER OF EACH POINT - 6 POINTS 2nd-5pts. 3rd-4pts etc.  
 GIVEN-UP OR TALKED-IN 1 POINT.  
 BEST 3 OUT OF 5 MAXIMUM RESULTS SCORE.

1st. G-6 SNO. 2nd. G6IIM. 3rd. G5MYX

SUNDAY SERIES OF D.F. HUNTS.

# RAYNET

Since the last edition of 'Airwave 325' much has happened in RAYNET, some of which you may have seen in 'Update 325'.

Firstly, Alan Smith G4EFP, has taken over as Controller of the Wirral Group, whilst have taken up the vacant position of Merseyside County Controller. Mike, G6HMD is now the treasurer for the Wirral Group and three new positions have been established viz., A President - for which we are fortunate enough to have secured Basil, G2AMV ; A press / publications officer in the form of Will, G6FNF, and Gerry, G8TRY, as membership officer, who is handling renewals and new memberships.

A major presentation about RAYNET was given to the County Emergency Planning Officer (CEPO) and his scientific advisors. The presentation included a demonstration of portable, mobile and base station equipment, plus a recording of the exercise broadcast by Radio Merseyside last December and a video tape of the Group in operation. As a result of our activities, the Merseyside RAYNET organisation is now well established with the Merseyside CEPO who is supporting the Group in many ways. Future activities, particularly "peacetime emergencies" are being discussed, but more members are required to enable better cover to be offered - should a live emergency occur many more people would be necessary than we have members.

The Group were represented at the Pontins NARSA Rally with an excellent stand and display which was highly commended by many. Wirral Newspapers have published an article about the Group and its' activities, the report also included a photograph taken at the YMCA headquarters control room.

The Wirral Group have been active with the local St. John Ambulance Brigade on the half-marathon, the full-length Wirral Marathon and then the 'Astra Stages' car rally at Vauxhalls factory. Support has also been given to the SJAB at County level with events such as 'Mission England' at Anfield Stadium, the Tall Ships' race on the Wirral side of the river Mersey, and then the 'Mersey Marathon' in Liverpool.

• • • • •

Any offers of help and assistance are always welcome, particularly financial, so if you haven't renewed your membership to this Group yet, then please rush a cheque through to the treasurer, immediately. The new RAYNET Manual is now being issued free to each paid-up member, ask for your copy if you haven't already got one.

The Group meets at the YMCA in Birkenhead on the first Thursday in each month, at 7.30pm. All are welcome, especially those who are interested in emergency communications - members do not have to be licenced Radio Amateurs (but it helps of course!). Net nights are held every 10th, 20th, and 30th of the month on S8 (145.200 MHz.) at 8.00pm. local time. Expect to QSY if this falls on a Monday or Thursday, due to the 'White Stick' net.

Further information on RAYNET and the Wirral Group can be obtained from the Group Controller (G4EFP), his deputy John (G8UZZ) or myself.

73

Mike. G8RXB  
Merseyside County Controller.



COUNTY RAYNET CONTROL for the MERSEY MARATHON

L. to R. Mike HAMPTON GERRE, Joe McLoughlan G3NNR,

and KYL and Alan Smith G4EFP.



CLUB GARCÉS 4th JULY 1984

TO BT plc, A SUN.

Very few people will, by now, have failed to see an advert for the sale of shares in British Telecom.

You know the one - six people in shillocks walking across Goonhilly Down towards a sunset (or is it a sunrise?). Suddenly, just like the Wurlitzer at the Plaza, a dish aerial half bathed in sunlight, rises in front of them. Then comes the voice-over 'Share in BT's future'.

Now correct me if I'm wrong - but the dish is in sunlight, sun at approx. 30° elevation and shining from the right of the picture, and the people were walking towards the horizon where the sun was setting or rising. That makes two suns.

Is this what being made a plc does for you?

What have the Research people been up to?

Which button do you press to get that amount of power?

Are these people really on Porton Down?

Is this the real 'Power to the people' that EverReady

tell us about, or have the Duracells kept on going?

Confused? You should be. Find out more next issue if they don't find me first.

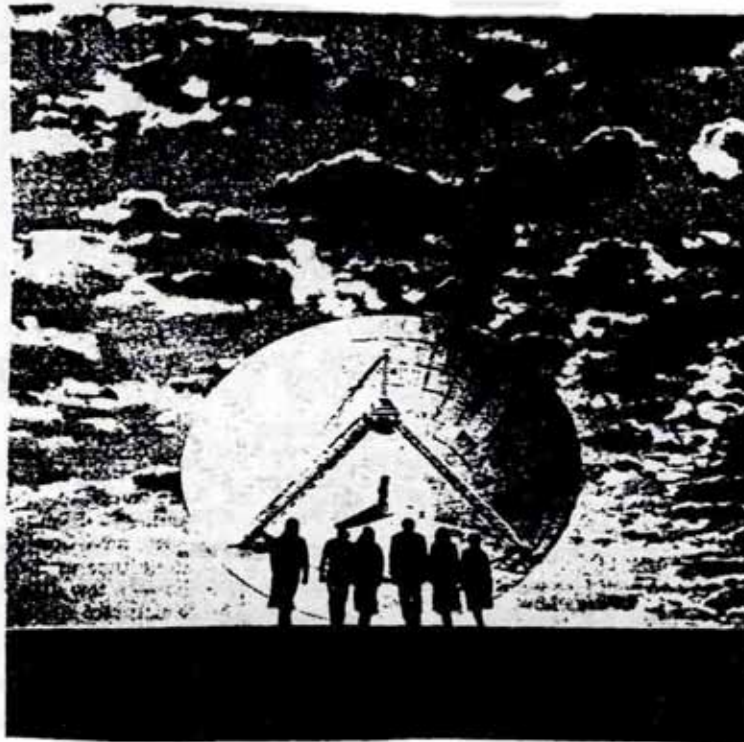


PHOTO: BT

WELL  
What do you  
think ?

On the subject of BT

Did you know that there is a telephone museum in London ? This is a 'living' museum, with working exhibits that you can actually try out in situ, as well as the usual static displays spanning around 100 years. All forms of telecommunications are on display, on two floors, and the displays are changed. Great for all the family on mini-weekends especially if the weather is not too good.

# Effective Screening

Colin Hammond

Many types of electronic equipment may be affected by stray signals of EMI or RFI. Typically, equipment such as computers, microprocessors, medical apparatus and navigational instruments which are highly sensitive and critical in operation may suffer interference from such mundane things as vehicle ignition, fluorescent lights, domestic appliances, welding equipment, etc. Such interference, which can cause errors in computer operation, or heart pacemakers to falter, may be avoided by suitably screening or shielding the equipment housing.

For effective screening it is necessary to provide a conductive surface which will attenuate the radiation. The screen contains (or excludes) electromagnetic energy by reflection and/or absorption to prevent outside signals affecting the apparatus or prevents the screened equipment from interfering with other electronic devices.

Although design is important, surface conductivity is the most important factor for frequencies between 1 and 10,000 MHz. The specific application will determine the effectiveness required of the screen. For non-critical cases, the attenuation of 10dB may be adequate; other systems may require levels in excess of 50dB. Most RF screening requires attenuation of 30dB or more and surfaces of high conductivity (low resistivity) are necessary. Where screening is a critical design criterion it is important that the system should be tested by the designer before it is specified.

The important testing and design parameters for screening layers are the coating weight (which helps control performance and cost) adhesion (which determines the bond between plastic and coating), corrosion and abrasion resistance of the coating (which determines its life and in-service effectiveness) and the surface resistivity (which will ultimately determine the attenuation). Coatings should be even in thickness, free from detachment and cracks and should exhibit the necessary conductivity.

Conventional screening of equipment in plastics housings includes the use of foils and tapes, plating, vacuum metallising, conductive paints and metal spraying. Sheet resistance of common materials are shown in Table 1. In general arc sprayed zinc can be applied at lower cost than other techniques and is more effective. (See Figs 1 and 2).

## METHOD OF SCREENING BY ARCSPRAYING

The plastic component is firstly cleaned of all release agents or surface chemicals and then lightly blasted with 80 mesh alumina grit to ensure adequate adhesion of the sprayed metal coating. Immediately after preparation the coating is sprayed using Arcspray equipment fitted with an EFS head. High atomising pressures are recommended to improve adhesion, coating densities and surface finish. Spraying current should not exceed 125A to avoid overheating the plastic and to minimise dust



production. Complex geometries should be initially sprayed at 50A. Spraying continues to give complete coverage to the surface to be screened.

Although .002 - .004 ins. deposit is adequate for most screening and all static discharge applications, additional material can improve attenuation. In certain narrow frequency bands (200 - 450 MHz and 850 - 950 MHz) as much as 20db improvement can be obtained by spraying a thick overlay of copper. Bond strengths to most plastics are over 300 lbs psi and may exceed 1,000 lbs psi.

TABLE 1: SHEET RESISTANCE OF COMMON SCREENING MATERIALS

|                       | Ohms/square/<br>per 0.0001 ins. |
|-----------------------|---------------------------------|
| Copper foil           | 0.0007                          |
| Sprayed Copper        | 0.0009                          |
| Aluminium foil        | 0.0001                          |
| Iron                  | 0.004                           |
| Sprayed zinc          | 0.002                           |
| Silver filled paint   | 0.1                             |
| Copper filled paint   | 0.2                             |
| Graphite filled paint | 150                             |

TABLE 2: BOND STRENGTH (PSI) TO PLASTICS

|                 |      |
|-----------------|------|
| Noryl           | 300  |
| Polycarbonate   | 380  |
| Structured foam | 425  |
| ABS             | 240  |
| Phenolic        | 450  |
| GF Nylon        | 1050 |

COATING PROPERTIES

In general an arcsprayed zinc deposit .002 - .004 ins. thick gives adequate signal attenuation and is equivalent to a .032 - .064 ins. thick pure zinc or aluminium casting or sheet over to range 1-10 GHz under plane wave conditions. Screening effectiveness is related to coating resistance as shown in Figs 1 and 2.

TABLE 3: COATING PROPERTIES

|                                 |           |
|---------------------------------|-----------|
| Coating density (% theoretical) | 90        |
| Coating weight (lb/ft/thou)     | .0334     |
| Hardness (Knoop)                | 142       |
| Surface finish (RMS)            | 55-100    |
| Coating Life                    | unlimited |
| Conductivity (.002 ins) (m/sq)  | 20        |

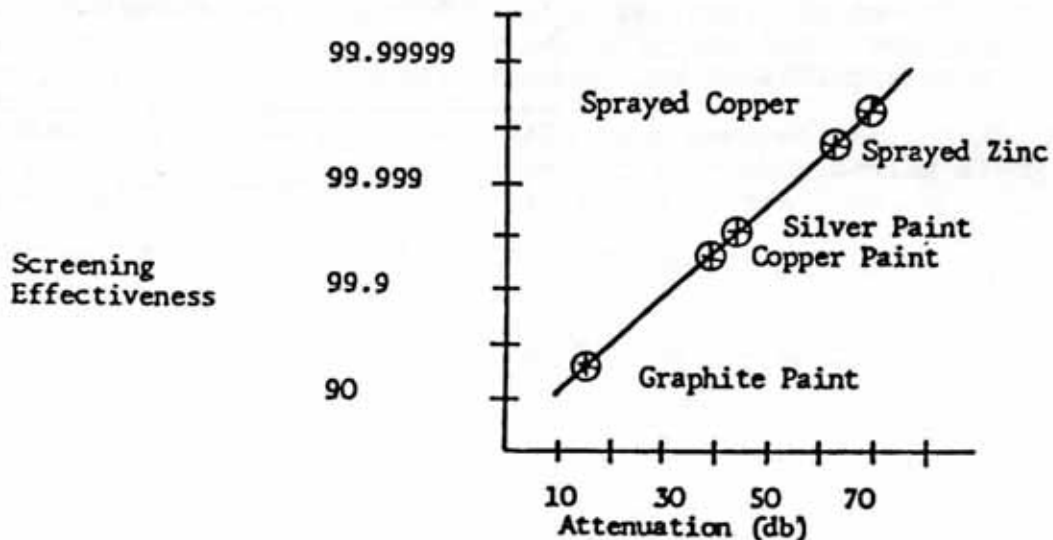


Fig. 2 Average Attenuation vs Sheet Resistance  
(at 100 MHz)

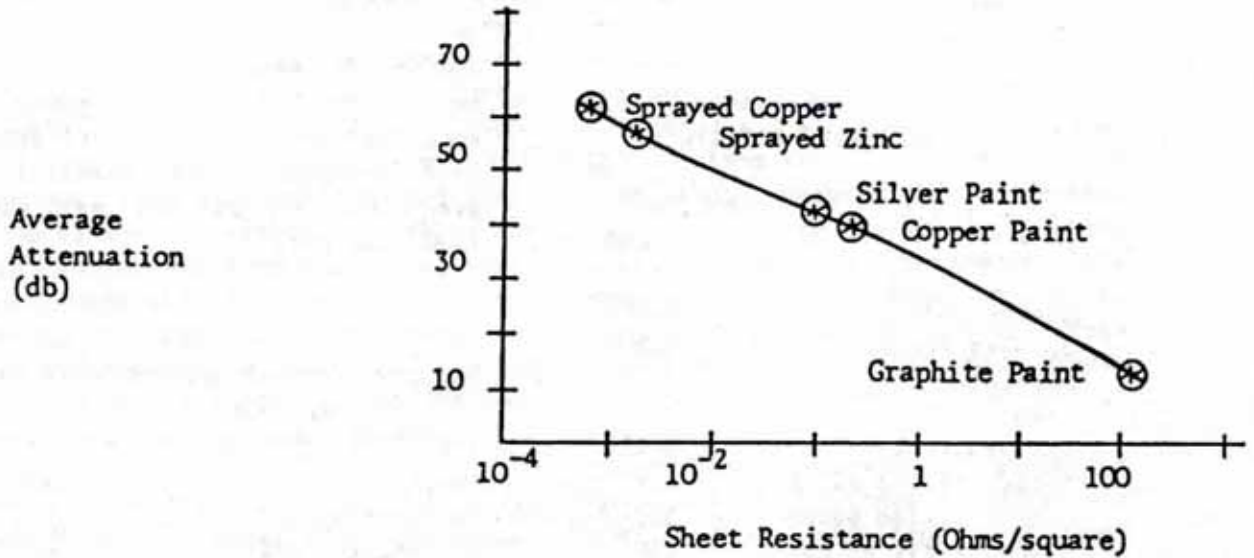
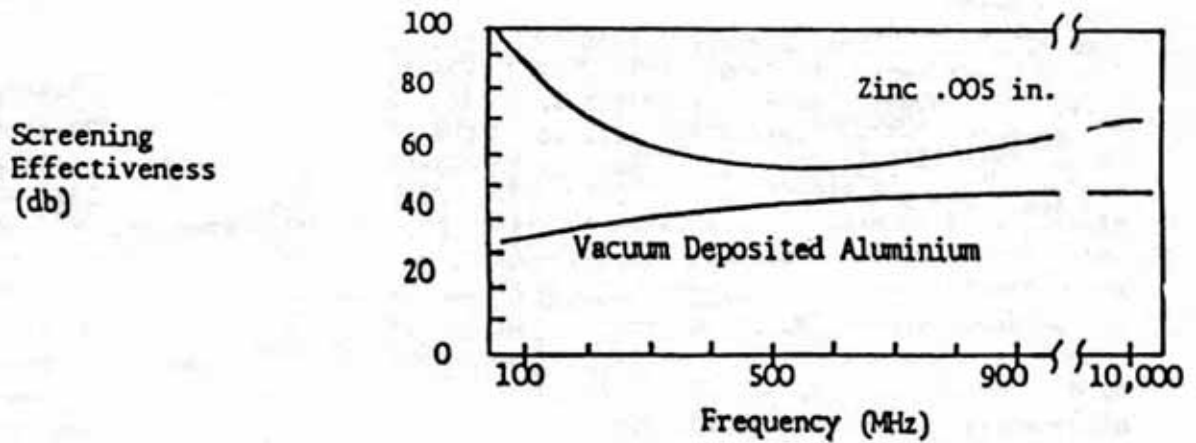


Fig. 3 Screening Effectiveness vs Frequency



REPRODUCED FROM 'DATACOM'

GOOD-BYE

To Susan and Ian Brooks  
G8SJE G8PMW

Ian is known to many as the Examinations Officer at 'Birkenhead Tech.' and later at Carlett Park CFE. Most of the RAE candidates of our club, indeed, on and around Wirral in general for the past seven years or so, will have had their applications and results processed by Ian and his staff. Ian was also the Club Secretary for two years, and served as Organiser / Controller for Wirral Raynet Group, and also at County level for a while. As time allowed, Ian liked to work on UHF, including satellites Arura and MS. Sue worked as a District Nurse.

We wish him and his family well on his move to a new admin. appointment in Dunstable.

HELLO

To Julie Ann Nicholas, and  
CONGRATULATIONS  
To Susan and Gordon Nicholas  
G6ADO G8MTM

On their new arrival. All F.B. 02.00 on 6th. September.

What do you do when you're not "playing radio" ?

It is well known that amateurs locally have an affinity for nurses, teachers (usually ending in marriage), Scouts, B.B., computers, photography, vehicles and things mechanical. (Be careful what you read into that list !)

But a new one on me was when I found out that one of our members had been missing from our circles for a while due to a bad case of amateur DRAMATICS.

I am referring to Robert, G8TSE, who has just finished appearing in 'The Mikado' at the Floral Pavilion, New Brighton. He was pictured along with the rest of the cast, in one of the local papers. The local societies normally add their own touch

N.A.R.S.A. REP'S REPORT.

Once again the time is coming around to the NARSA Exhibition. From next year, we are going back to a one day show at Belle Vue. The two-day Pontins show at Southport didn't turn out to be quite such a success, mainly because there is not enough room to get all the exhibitors in one room. Now that Belle Vue is a certain future venue we want to get back to being the best show in the country. Car parking is right on hand and the Motorways all pass close by.

The Club stand, and the other stands related to the Club, were all together, and put on a show which was a credit to everyone involved, and let's hope we can do the same again next year, i.e. 1985.

Last year I was elected to do two jobs for the NARSA, i.e. 'Trade Stand' and 'Club Stand' manager. This year the jobs are rolled into one, with the grand title of 'Exhibition Manager', and also another member of our Club, Pam Travis, is 'Assistant Exhibition Manager'.

So, let's hope we can all put on another show, just as good, in 1985. The Club gained £50 for their services, so try to have some of the members helping again at Belle Vue, and I will help all that I can.

Best Wishes to you all,

Peter Denton G6CGF

FOR SALE

1. IRE FF2 UHF portable, separate speaker/mic, good battery, quarter wave whip, original leather case, Ambit pre-amp, fitted LI, CR, 433.2.

£50.00

2. Ringo Ranger 2 meter co-linear antenna, fitted 6ft aluminium pole, complete, ready to mount,

£25.00

3. IOL 7561 Video terminal, 14" green screen, composite video input.

£25.00.

TELETYPE ASR 33

PLUS

PRINTER INTERFACE (PRINT ONLY)

Puts hard-copy onto the UK 101 etc.  
110 Baud.

£25

Gordon G8MEM QTHR

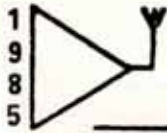
Contact G8MEM, Gordon, at the Club or on  
051 336 7143.

Mary, Mary, quite contrary,  
How did your Cambridge go?  
"With a flash and a bang,  
and melted bits down below."

With a Cambridge in the Kitchen  
And a Wessy on the wall,  
Does one put a Storno  
In the smallest room of all?

Working the contest group Venus  
The QRA's passed between us,  
But, tis said, one 'Maidens head'  
Gave more than enough happiness.

D.I.Y. VASECTOMY KIT  
USED ONCE  
A 'SNIP' at £5  
Contact - G8  
051-336



Northern Amateur Radio Societies Association

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# **BELLE VUE 1985**

**HYDE ROAD, MANCHESTER**

# **EXHIBITION & MOBILE RALLY**

**SUNDAY, MARCH 10th, 1985**

---

**Featuring Amateur Radio, Electronics,  
Computers & Tools**

---

*This One Day Show Caters For The  
Needs of All Enthusiasts*

---

*Many of the Associated Clubs put on  
show a stand on their own work.  
For the visitors to see, and to enter the  
Competitions*

---

*Most of the Big Traders will be Exhibiting  
and many of the lesser known specialists  
will also be there*

---

*Bring & Buy Stall*

EXTRACT FROM THE RULES OF IRBY CRICKET CLUB

5. CONDUCT

- (a) Any members who wilfully or by gross negligence damages any property of the Club or any property entrusted to the Club shall be liable to make good such damage at his/her own expense. The question of the damage being or not being accidental shall be decided by the Management Committee from such evidence as they may be able to obtain.
- (b) A member may be expelled by resolution of not less than two-thirds of members present at a Special General Meeting duly convened to consider the conduct of such members. No person whose membership has been so terminated shall be introduced by any other member as a visitor to any part of the Club premises.

6. CLUB PREMISES AND BAR

- (a) Any voting member, or lady member, may introduce a guest to the Club premises. Such guest must sign his/her name in a book kept for this purpose and no guest may be introduced to the premises more than six times in any one year.
- (b) Members or visiting teams and their guests and bona fide members of visiting Clubs may purchase intoxicating liquor for consumption on the Club premises on the day or days on which the visiting team plays on the ground.
- (c) No person under 18 years of age shall be permitted to purchase or consume intoxicating liquor on the Club premises.
- (d) Hours of Opening and Closing the Club Premises

Subject to the right of the Management Committee to open and close the Club premises at it's discretion the Club shall be open as follows:-

|               |       |       |                          |
|---------------|-------|-------|--------------------------|
| Weekdays..... | ..... | ..... | 10.00 a.m. to 11.30 p.m. |
| Sundays       | )     |       |                          |
| Christmas Day | )..   | ..... | 10.00 a.m. to 11.00 p.m. |
| Good Friday   | )     |       |                          |

Notice of the hours during which the Club premises will be open will be posted in the Clubroom.

- (e) Hours of Opening and Closing the Bar

Subject to the right of the Bar Committee to open and close the bar at it's discretion within the permitted hours the bar shall be open as follows:-

|               |       |       |                         |
|---------------|-------|-------|-------------------------|
| Weekdays..... | ..... | ..... | 11.30 a.m. to 2.00 p.m. |
|               |       |       | 4.00 p.m. to 10.30 p.m. |
| Sundays       | )..   | ..... | 12.00 p.m. to 2.00 p.m. |
| Christmas Day | )..   | ..... | 7.00 p.m. to 10.30 p.m. |
| Good Friday   | )     |       |                         |

The Bar Committee may on special occasions arrange for the supply of intoxicating liquor at other times subject to legal requirements

Notice of the hours during which the bar will be open will be posted in the Clubroom.

CLUB EVENTS - CONTINUED 1985

JANUARY

- 2nd. D&W at 'The Green Lodge.'
- 9th. Activities Evening.
- 16th. D&W The Saughall Massie (Hotel)
- 23rd. Junk Sale.
- 30th. D&W The Hotel Victoria, Heswall.

FEBRUARY

- 6th. Seventh Annual General Meeting. See inside.
- 13th. Film Night.
- 20th. D&W The Victoria Lodge, Tranmere.
- 27th. Equipment Demo. by local dealer. T.B.A.

MARCH

- 6th. D&W The Wheatsheaf, Ness.
- 13th. 'Reliability' Talk with slides from Jack Rowe, Plessey.
- 20th. D&W The Primrose, Liscard.
- 27th. T.B.A.

Note. Some of the above is provisional only, as some arrangements can be made 6 months earlier. CONTEST DATES will need to be inserted as and when known.

---

VERY LATE FOR SALE ITEMS

The station of G6CIC is going QRT, and is to be sold. Equipment includes -  
Icom IC 251 E Base station, plus L/S and PSU  
50' Mast, triangular, two section rigid.  
Sinclair Spectrum 48K, plus PSU and 40 games.  
All at reasonable prices. May haggle.  
Contact via Eric, G6HWD.



# RADIO SOCIETY OF GREAT BRITAIN

This is to certify that

GW4MGR/P the station of the  
Wirral & District Amateur Radio Club  
was the WINNER in the OPEN SECTION of  
the RSGB "70MHz and SWL" Contest 1984



By order of  
the Council

*Janethum*  
Vice-President  
VHF - A