

5MHz Experiment

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Chairman RSGB 5MHz Working Group

<http://www.rsgb-spectrumforum.org.uk/5MHz.htm>

5MHz in the UK

- Amateur access to 5MHz channels from mid-2002 to mid-2006
- Purpose to conduct experiments in
 - Emergency comms
 - Aerials
 - Propagation
- 5MHz Working Group (5WG) formed in Nov 2002.

5WG Membership

J W Gould, G3WKL, Chairman

G L Adams, G3LEQ (IARU Emergency Communications Region 1
Coordinator)

L W Barclay, G3HTF

P Gaskell, G4MWO (RSGB RCVS National Coordinator)

P Martinez, G3PLX

G Mossop, G0DUB (RAYNET representative)

C Thomas, G3PSM (Board Member, RSGB Spectrum Forum
Manager, RSGB HF Manager)

M Wood, G7VRT (Cadet Representative & Liaison)

G Williams, G4FKH (RSGB Propagation Studies Committee)

5WG Remit

To deal with all matters concerning the temporary 5 MHz spot frequencies allocated to the Amateur Radio Service within the United Kingdom on a Notice of Variation basis.

The Group will formulate and monitor experiments and communications exercises in line with the terms of the Notice of Variation, and at periods to be agreed, report relevant findings to the Primary User via the Radiocommunications Agency.

5WG achievements & ongoing work

- Coordinated scientific and emergency comms activities, reporting twice to RSGB Board, RA/Ofcom and MoD.
- Assess and make recommendations to Ofcom re NoV applications.
- Liaised and support given to individuals on their own experiments.
- Defined and coordinated a centrally run task, termed the “5MHz Experiment”
 - Commissioned and setup GB3RAL, 30th April 2004
 - Commissioned GB3WES late October 2004
 - Setup “consolidated log database” & publicised initial findings in RadCom Sept 2003

5MHz Expt: Overview

- An data collection task run by the 5WG to allow later analysis
- Data is restricted to certain broad categories to keep the number of variables down
- A strict reporting format is specified
- Goals:
 - Creation of an empirical equation for 5MHz propagation
 - Creation of a large database that anyone can subsequently analyse to research things that might include
 - Effects of different categories of aerial type
 - Long-term noise-floor changes

5MHz Expt: Log database

- 6151 separate entries in the Station Log & 6619 entries in the automatic beacon monitoring log
- All paper and e-mailed logs included, apart from
 - 7 with some data errors
 - 10 paper logs
- 360 different calls in the log
 - 2121 reports of GB3RAL
 - 79 stations logged more than 10 times
 - 11 stations logged more than 50 times
- Current issues
 - Data cleanup, e.g. typing & logging errors
 - Missing data, e.g. QTH Locator data

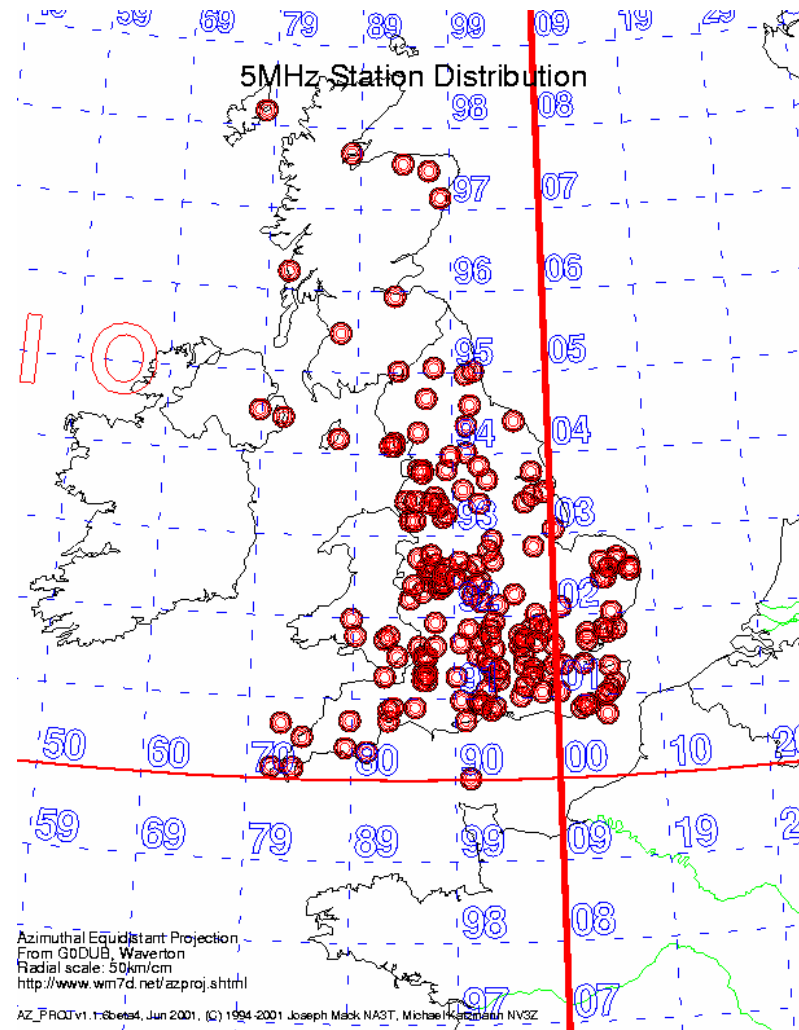
5MHz Expt: Stations Heard/Worked

| | | | |
|--------|-----|--------|----|
| G3ENI | 293 | G3JFS | 38 |
| G3ZUN | 239 | G3SET | 37 |
| G3ENO | 134 | G3LEQ | 35 |
| G3GHS | 111 | G3KTH | 33 |
| G3DVK | 94 | G3BPM | 33 |
| G0HNW | 84 | GI4VIV | 32 |
| G4JNT | 63 | G3PLX | 31 |
| GW0VMZ | 61 | G0DUB | 30 |
| G0MRL | 58 | MM1RAH | 28 |
| G0UOO | 51 | G4KUJ | 26 |
| G5BM | 51 | | |
| G8ABB | 49 | | |
| G3JKD | 43 | | |
| M0AFJ | 40 | | |

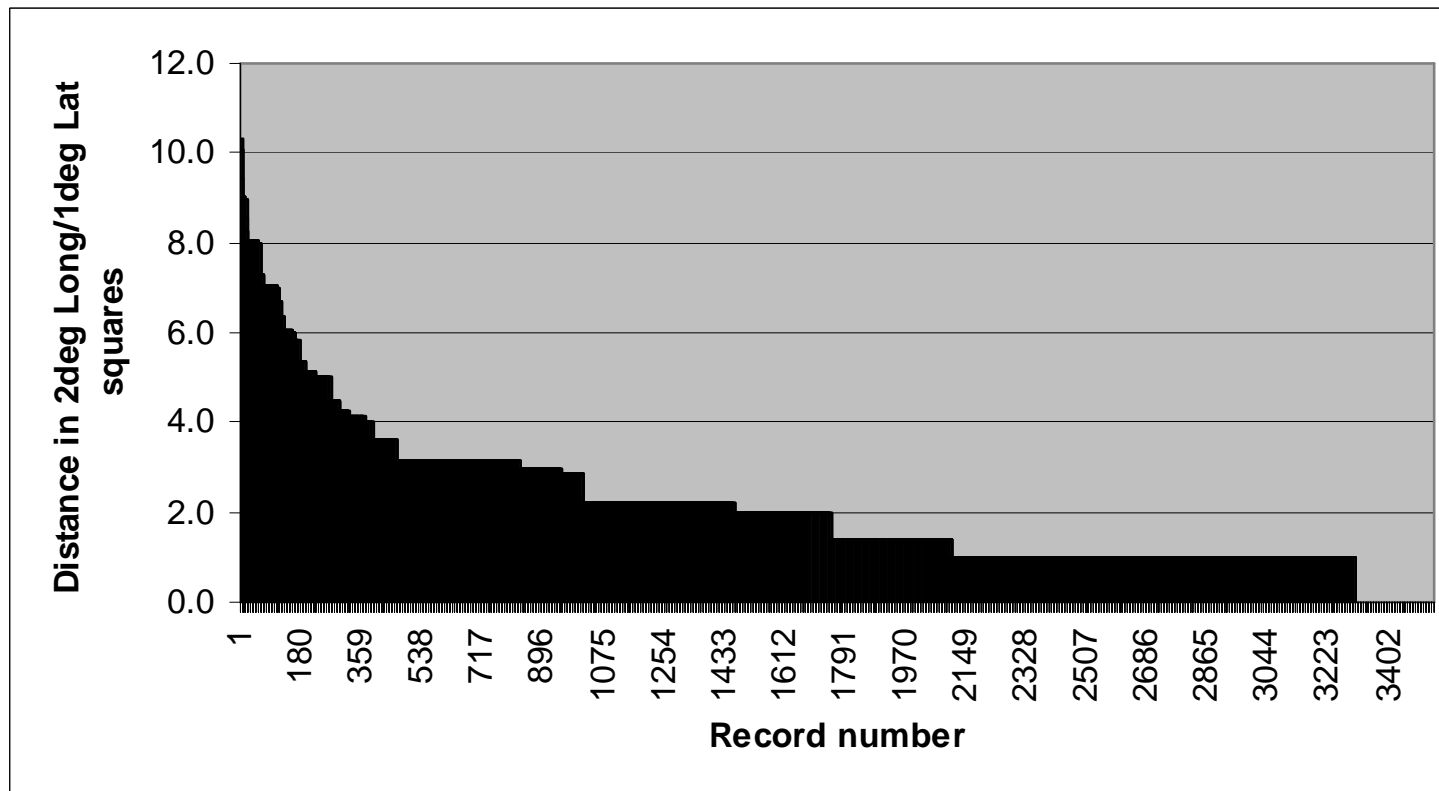
5MHz Expt: Stations submitting logs

| | |
|----------------|------|
| 2E0RGO / M3RGO | 1947 |
| G3ZUN | 413 |
| G3ENI | 374 |
| G8ABB | 258 |
| G3JNB | 251 |
| G4FKH | 250 |
| G3BPM | 231 |
| G3DVK | 166 |
| G8SAU | 166 |
| G0WTV | 160 |
| G3NPF | 140 |
| G3SET | 137 |

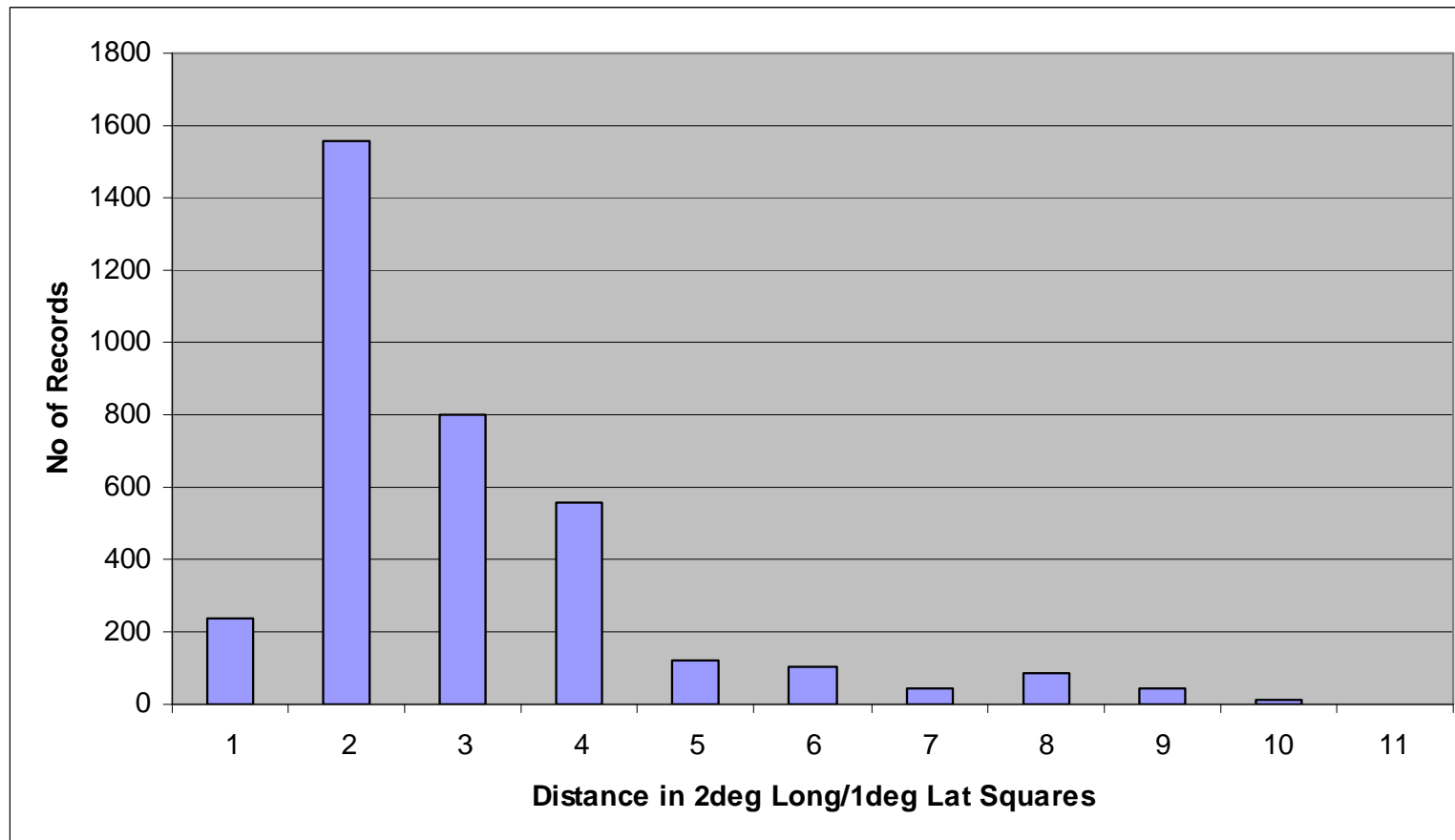
5MHz Expt: Station Distribution



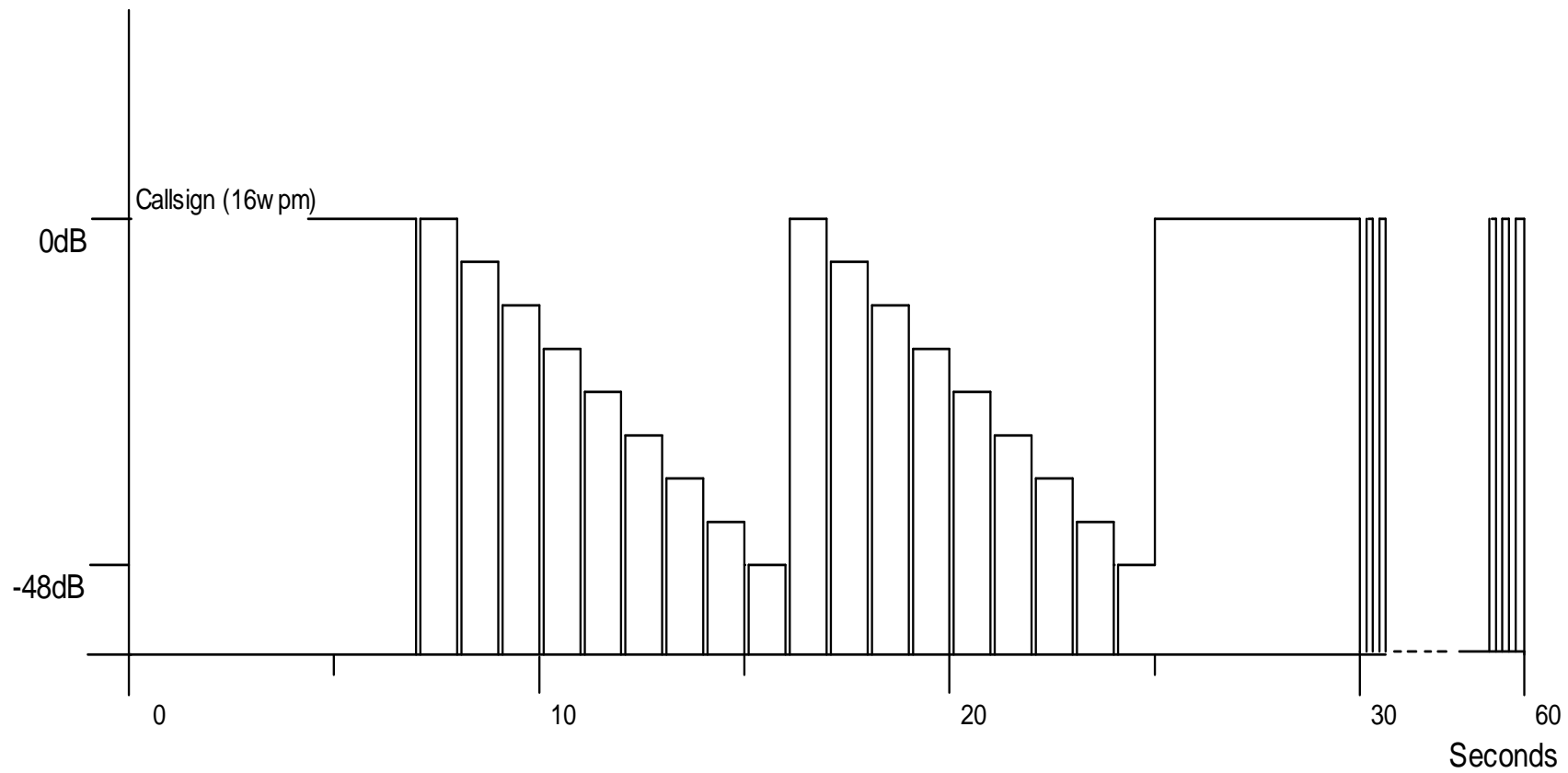
5MHz Expt: Path-length Distribution



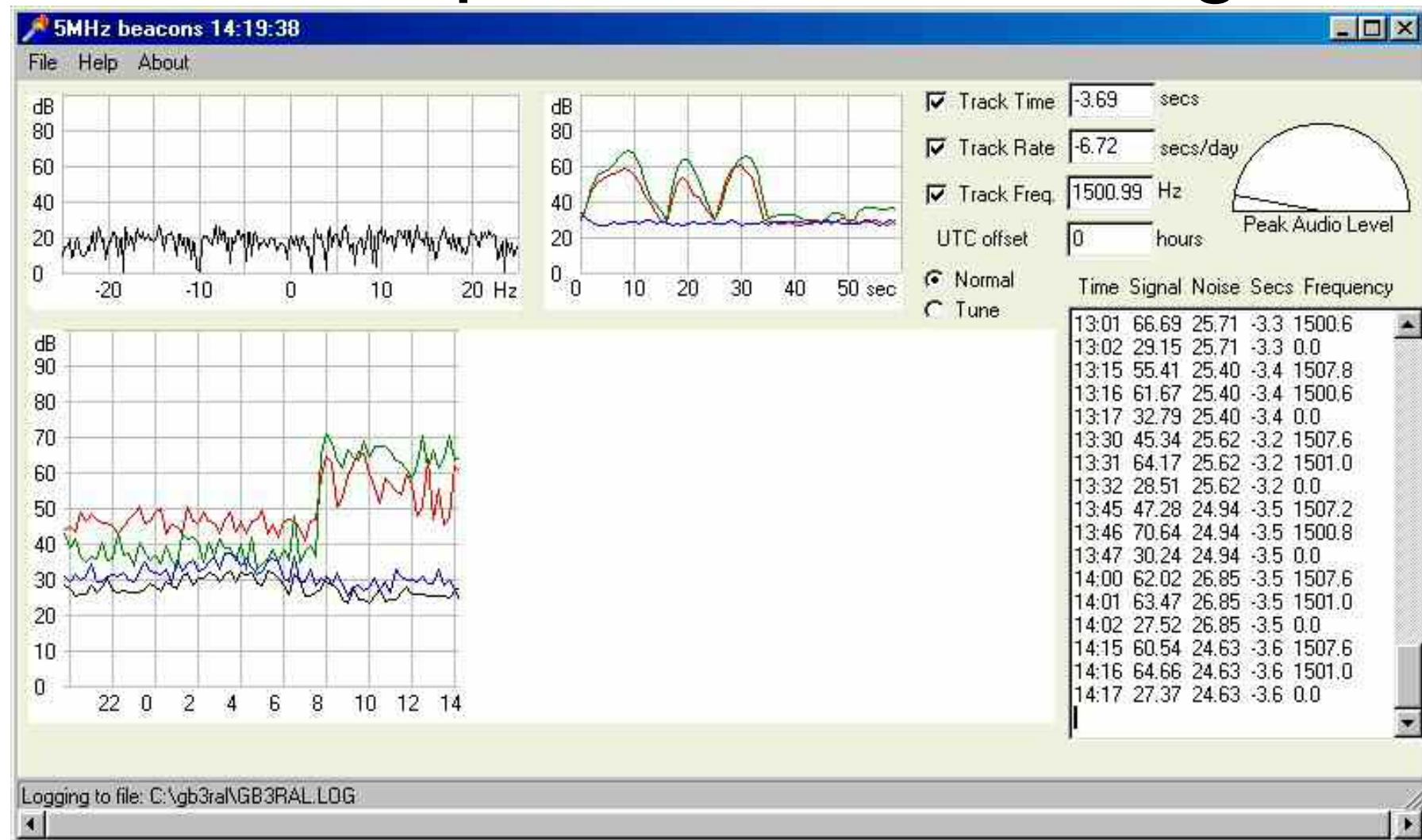
5MHz Expt: Path-length Histogram

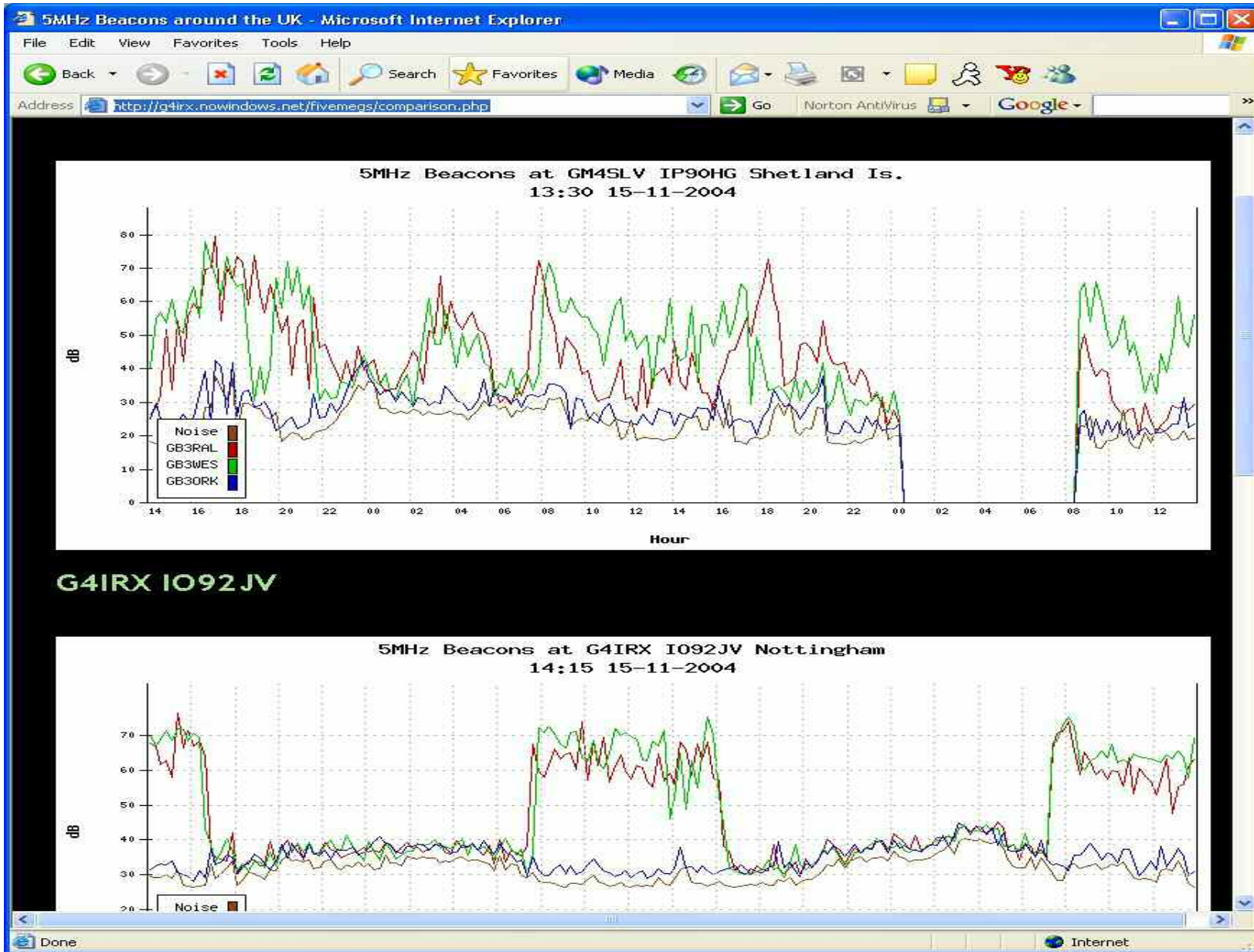


5MHz Expt: Beacon sequence



5MHz Expt: Auto-monitoring





<http://g4irx.nowindows.net/fivemegs/comparison.php>

5MHz Expt: Work in progress

- Log Database
 - Data cleanup
 - Import mechanism for data from G3PLX's beacon monitor software
 - Auto-compute path-length from QTH Locators
 - Report on the statistics of the data
 - Consider how to make it available to all
- Beacons
 - Install and commission GB3ORK
 - Update monitoring / reporting information
 - Consider issues re. companion beacons at 3.5 and 7MHz.
- Analysis
 - Prepare detailed plans for creating a 5MHz propagation model

5MHz Expt: Propagation model

Imagine a “mathematical” model that might contains the

$$\text{Quality of link} = \text{function} \{A(\text{Date})+B(\text{Time}) + C(\text{Solar Flux})+ \\ D(\text{distance})+E(\text{aerial})+ F(\text{orientation}) +G(\text{SINPO})+ \\ H(\text{Power})+I(\text{mode})\}$$

The “problem” is to represent the coefficients (A, B, C etc) in the right way, and then solve for their numerical values by comparing the “model” with the data in the log database.

Final Comments

Recently the MoD have reminded us that we need to be careful to use our access to 5MHz for the conduct of experiments, and not merely to use the channels for general amateur usage.

You are all therefore encouraged to do just that by

- Creating your own experiments and publishing the results.
- Making sure that your logs are of use to someone.
- Participating with the 5MHz Experiment, either by collecting data and/or later carrying out some detailed analysis.

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