

Taste of Research
Gough Yumu LUI
Engineer's Log Book

Week 4

• Monday 6th December 2010

Meeting with Binghao and Thomas in the morning as per schedule. Explained the problem with inSSIDer's behaviour which results in a reduction of samples recorded over time. A decision was made to continue testing, however, only on the dual core laptop and splitting the test length into half – therefore processing two GPX files for each test run to enable us to retain a large sample number. With this method, I am confident that we are able to make more than 180 samples per point. In order to enhance our ability to test cards – we have employed a battery and inverter to overcome the battery life constraint of my dual core laptop. The battery was placed underneath the bin, with the inverter placed underneath the laptop due to a lack of space on the trolley. Careful replacement of the bin was used to ensure that we don't distort the test results. It was decided that we would attend to special devices such as the Android phone, tag and the Nokia phone on Wednesday.

I decided to make a table of all the devices and test situation for the indoor testing:

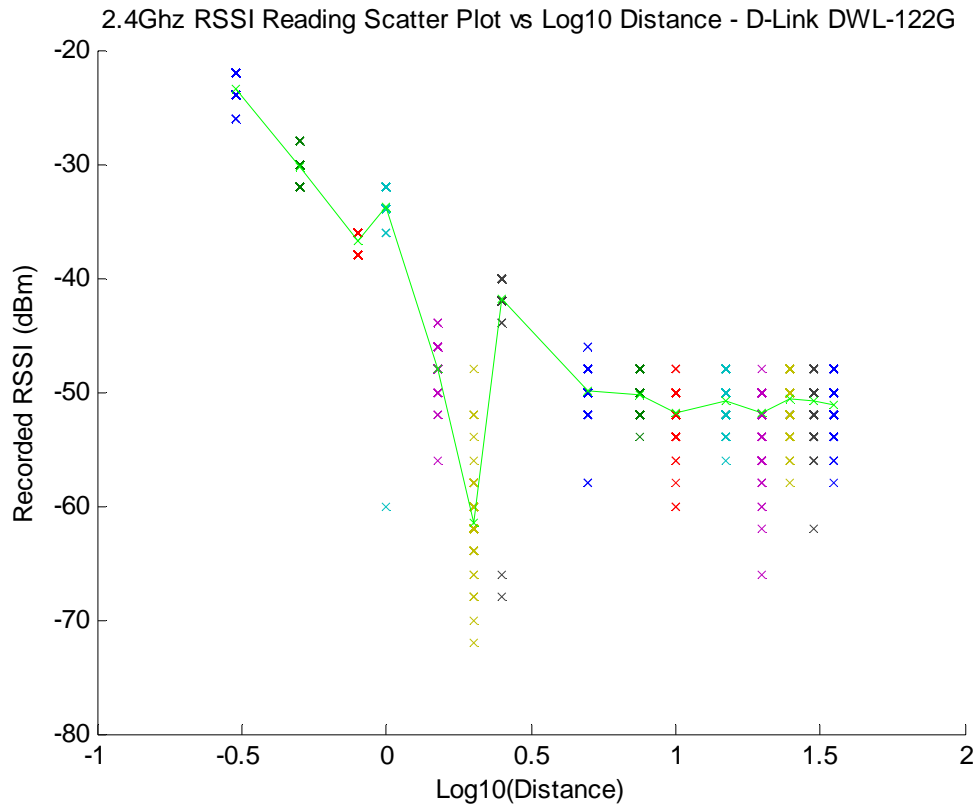
Number	Card	Status
1	Belkin Play	Tested but low number of samples
2	Netgear WG111U	Tested but low number of samples
3	Billion BiPAC 3011G –A	Tested
4	Billion BiPAC 3011G –B	Tested
5	Billion BiPAC 3011G –C	Tested
6	Netgear WPN111	Tested
7	Netgear WG111v2 –A	Tested
8	Netgear WG111v2 – B	Tested
9	D-Link DWA-140	Tested
10	D-Link DWL-122G	Tested Today
11	Netgear MA101	Tested Today
12	Diamond Digital A101 –A	Tested Today
13	Diamond Digital A101 –B	Tested Today
14	Broadcomm BCM4312	Not Tested
15	Intel Centrino 3945ABG	Not Tested
16	Intel Centrino 2915ABG	Not Tested
17	Atheros 5006UG	Not Tested
18	Android Mobile Phone	Not Tested
19	Roving Networks Wireless Tag	Not Tested
20	Intel Wireless N	Not Tested
21	Nokia N95	Not Tested

The number of samples for the tested D-Link DWL-122G card:

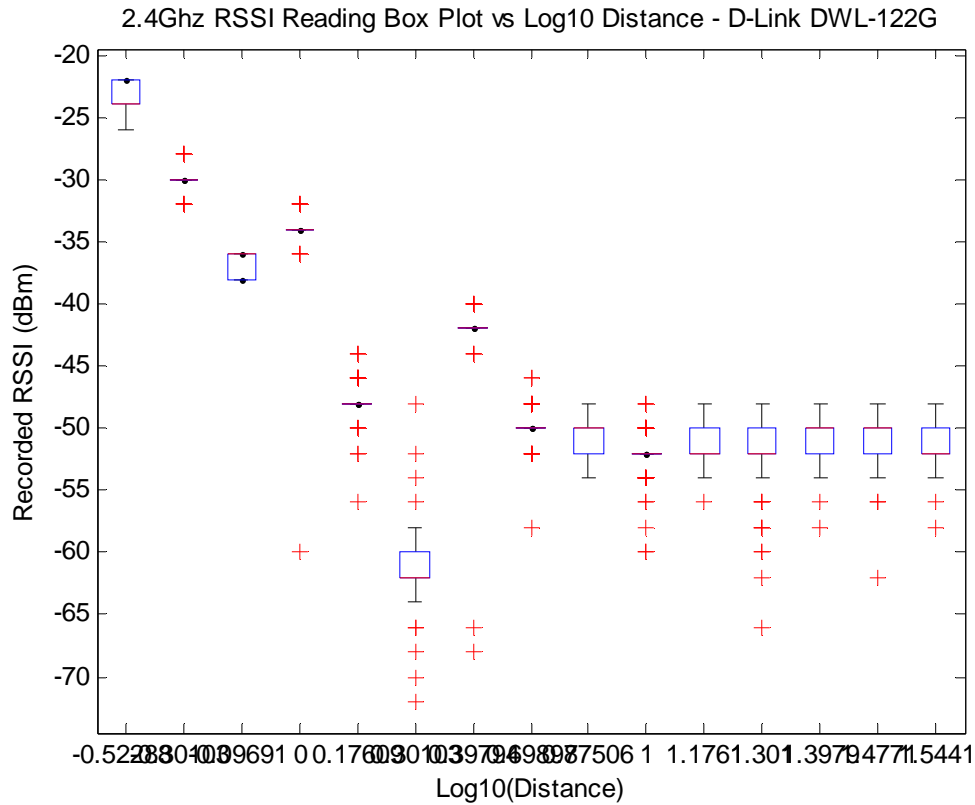
Distance	DWL-122G
0.3m	231
0.5m	224
0.8m	224
1m	227
1.5m	222
2m	219
2.5m	227
5m	222
7.5m	228
10m	226
15m	230

20m	220
25m	211
30m	223
35m	225

As you can see, all test points had more than 200 samples. This is in big contrast to what we had earlier. The scatter graph does show an anomaly at one point where the variance is quite big, however, there is not much noise as in some of the other cards that we have tested. One of the notable points of this card is that at larger distances, the signal readings seem to plateau to a nearly-flat signal strength that somehow suggests that the card isn't really capable of reporting the signal strength in a linear way.



The box plot for the further distances seem to overlap quite almost identically – it almost seems that I didn't move the cart – but I did! A significant result for positioning, I dare say.

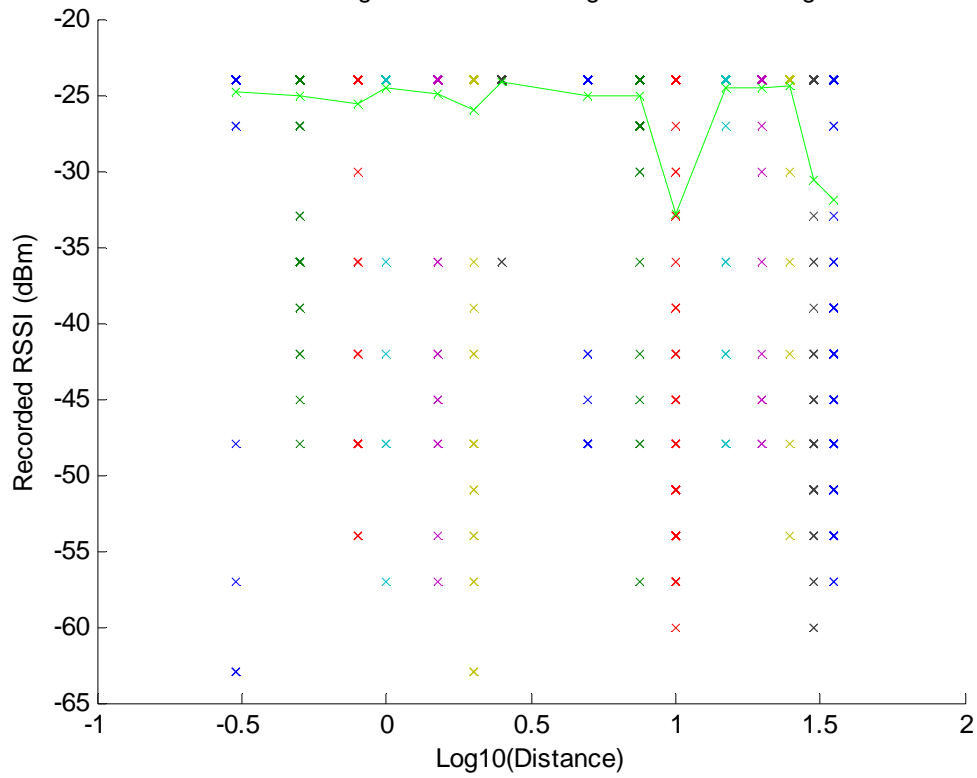


Then came the testing for the Netgear MA101 Wireless B card. The number of samples taken were:

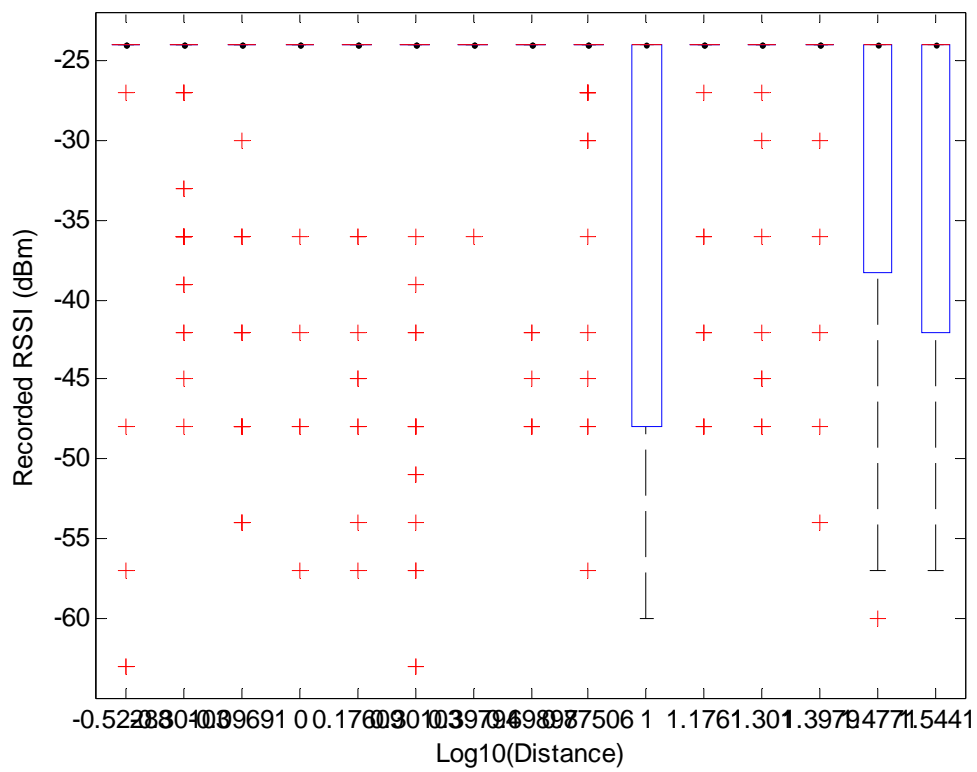
Distance	MA101
0.3m	233
0.5m	231
0.8m	229
1m	229
1.5m	228
2m	228
2.5m	224
5m	225
7.5m	229
10m	226
15m	226
20m	228
25m	228
30m	219
35m	222

Again, the number of samples are all over 200. A very nice result indeed. But if we look at the scatter plot and box plots, we can see that this card isn't really capable of reporting any realistic signal levels – the signals appear to be good at all points. Strange. Three points where the line dips down – they seem to coincide with a large amount of variance from the box plot.

2.4Ghz RSSI Reading Scatter Plot vs Log10 Distance - Netgear MA101



2.4Ghz RSSI Reading Box Plot vs Log10 Distance - Netgear MA101

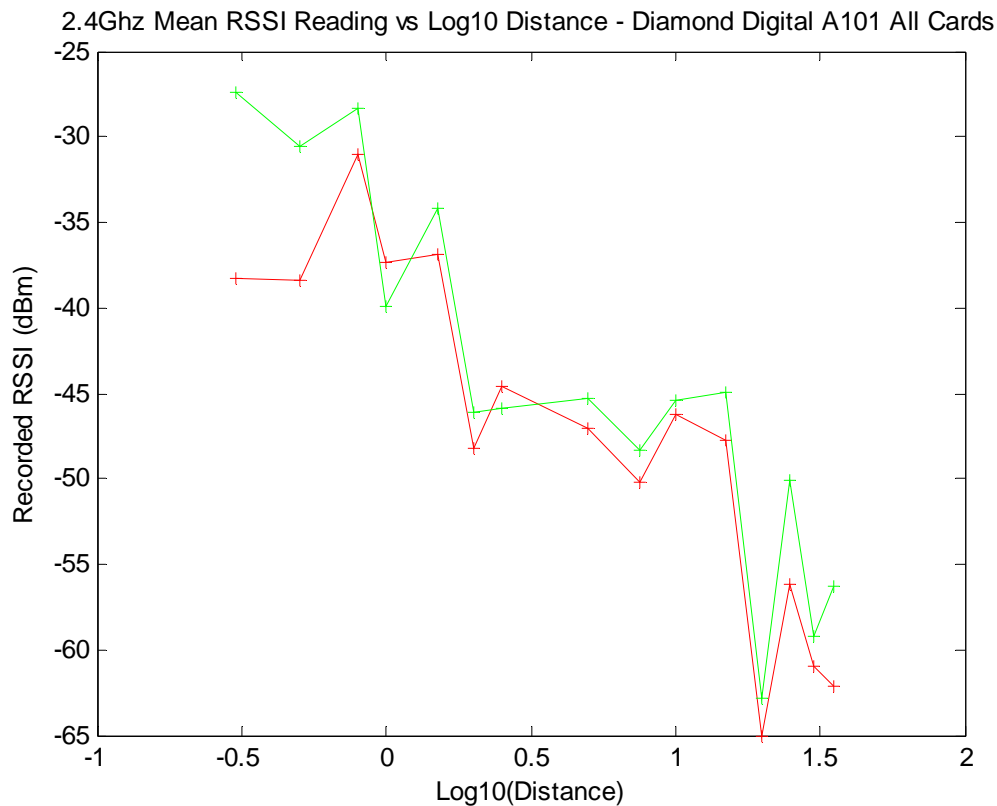


Testing of the first Diamond Digital A101 resulted in no issues, however, testing the second A101 caused the system to have a Blue Screen of Death and loss of 30 minutes of testing. After I had finished the testing and checked – I decided to immediately rerun the test so that we can gather all the lost data. That kept me to 8:00pm at the uni. The data was not immediately analysed because it was late. It was nice to see that the inverter and battery combination ran for the whole day without a complaint. The battery was left to charge.

- Tuesday 7th December 2010

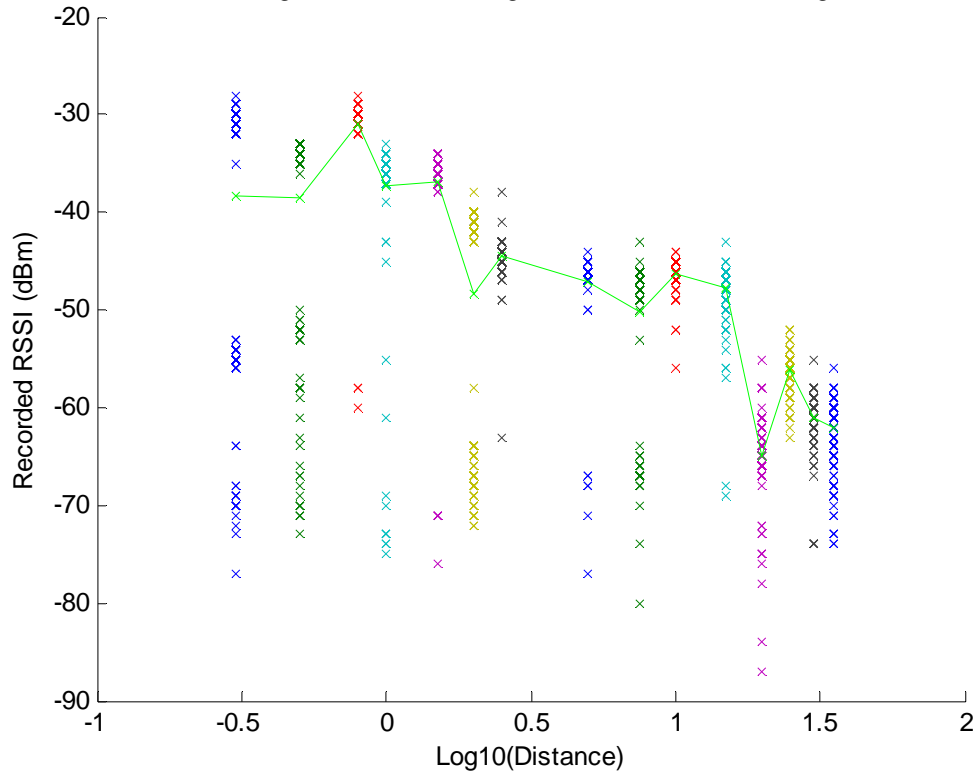
Have taken the day off due to a non-reschedulable Dental Appointment. Due to a very fortuitous event, they have agreed to perform surgery on me on Wednesday since somebody had cancelled their surgery – otherwise I would have to wait for nine months to have the surgery, which involves the removal of four wisdom teeth. Recovery time is estimated to be 10 days at the least for the swelling to be reduced, and as such I have called Binghao and let him know that I won't be able to come in until the New Year. In the interim, I have left all my equipment in SNAP Lab and I'll endeavour to do anything I can.

I have now converted all of the data for the A101 cards and plotted them in Matlab. Results are below:

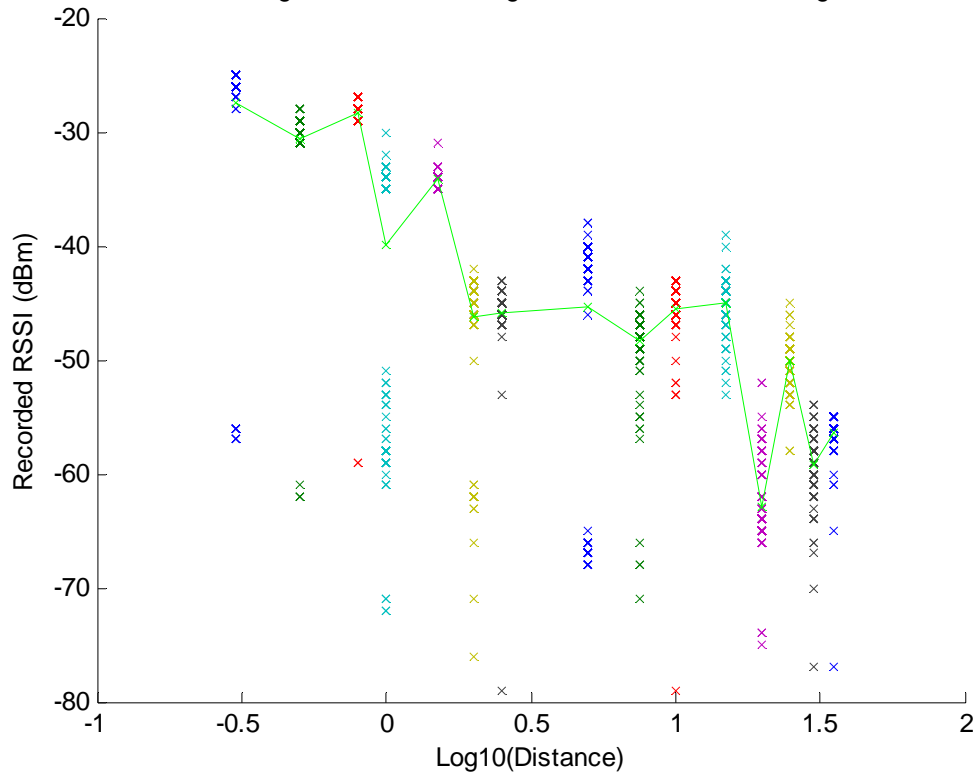


It seems that the two cards follow very similar trends, but at very close distance, one of the cards seems to have suffered more from near field effects than the other. The first card seems to produce more noisy data as well. This might be because the two antennas are actually quite spatially separated due to the large physical size of this particular dongle.

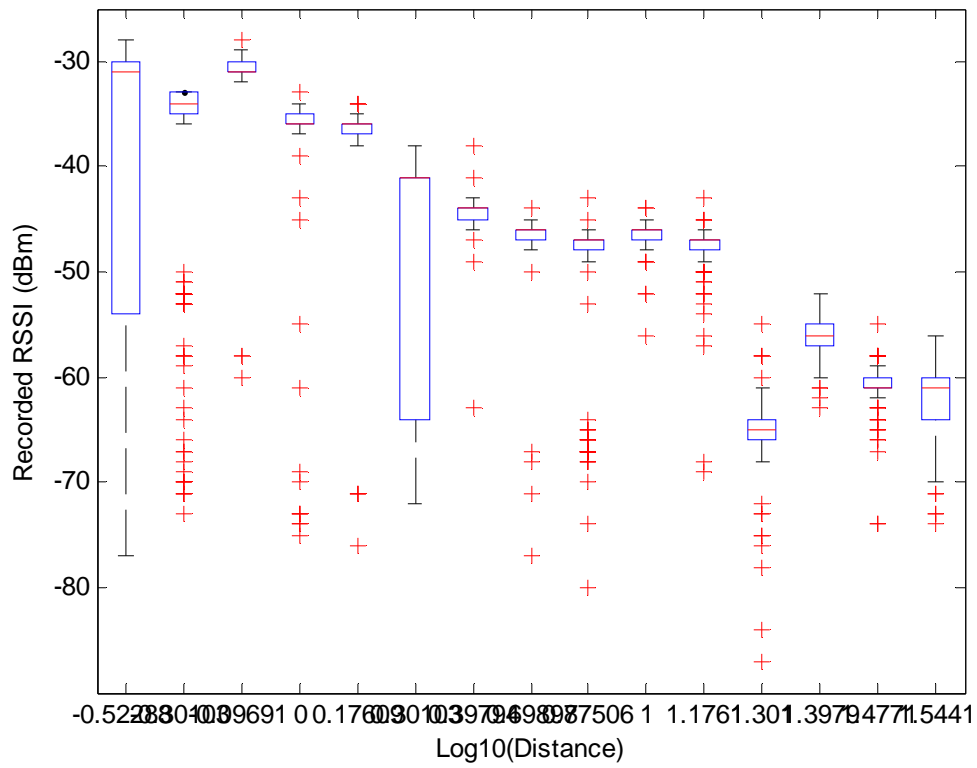
2.4Ghz RSSI Reading Scatter Plot vs Log10 Distance - Diamond Digital A101 Card A



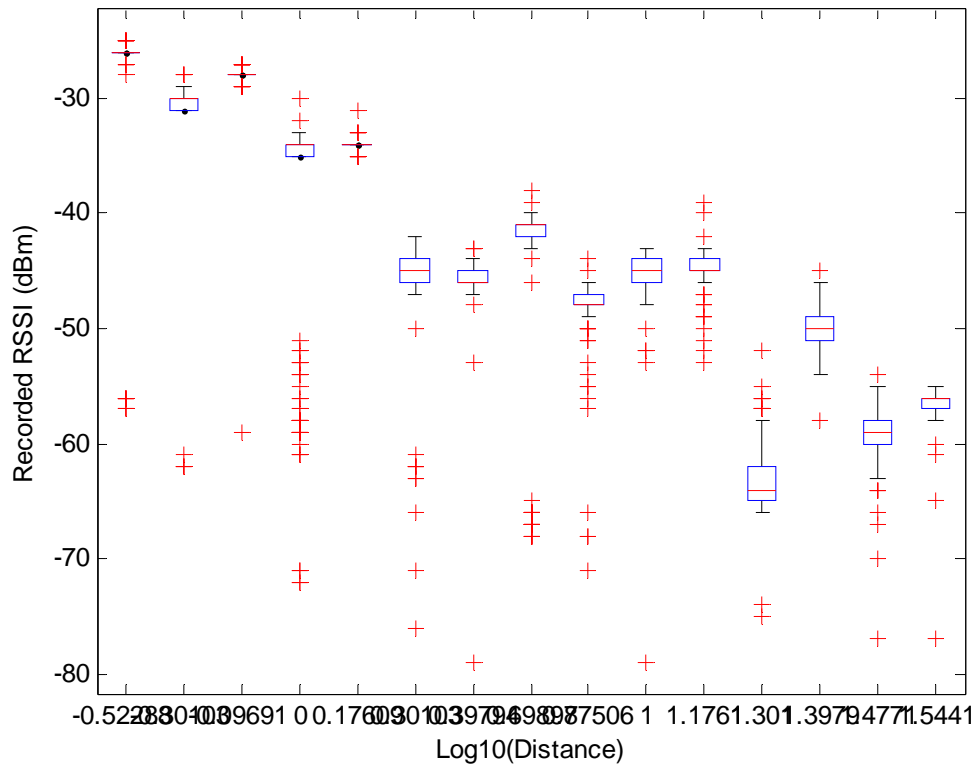
2.4Ghz RSSI Reading Scatter Plot vs Log10 Distance - Diamond Digital A101 Card B



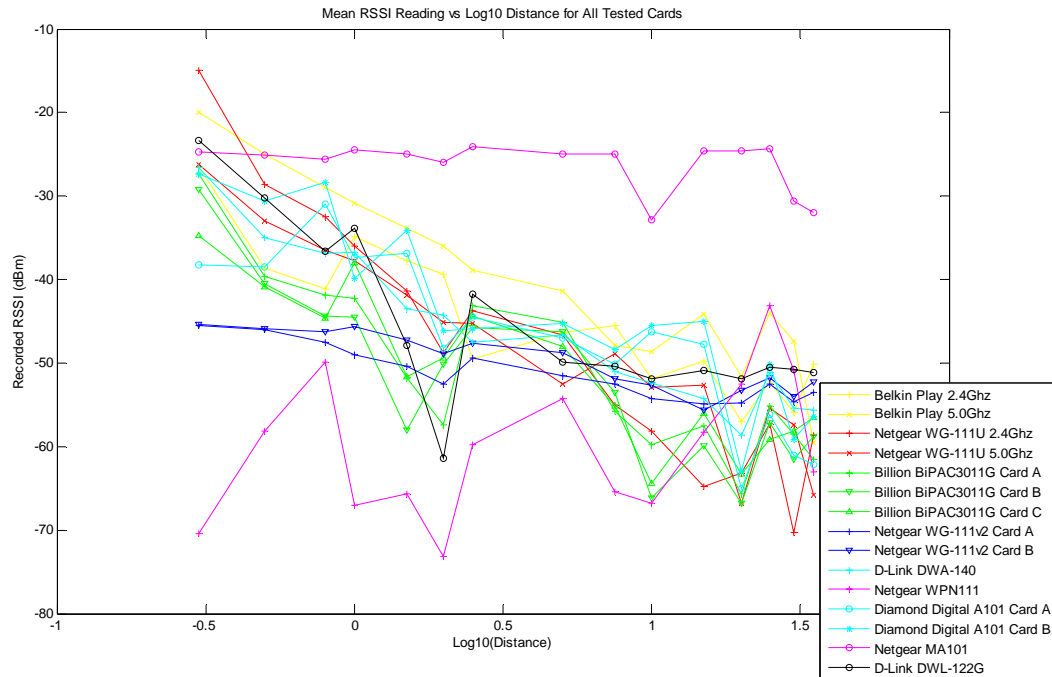
2.4Ghz RSSI Reading Box Plot vs Log10 Distance - Diamond Digital A101 Card A



2.4Ghz RSSI Reading Box Plot vs Log10 Distance - Diamond Digital A101 Card B




And just to keep us all updated on all the data collected thus far – here is an updated chart of all the means of all the cards tested thus far:



• Wednesday 8th December 2010

The surgery proceeded as expected. The recovery time is about 10-14 days till the swelling goes nearly completely away, but still, it will not completely heal for months. The medical certificate is shown below:



**CENTRAL SYDNEY AREA
HEALTH SERVICE**

☐ Balmain Hospital

☐ Canterbury Hospital

☐ Concord Hospital

☐ Rachel Forster Hospital

☐ Royal Prince Alfred Hospital

☐ Rozelle Hospital

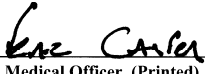
☒ United Dental Hospital

Medical Certificate


This is to certify that Mr. Garyh Lui (patient's name) was treated at/admitted to

to this hospital on 8/12/10 suffering from Operation for Impacted Tooth (diagnosis)

He/she will be unable to work from 2/12/10 to 13/12/10 inclusive.


 Medical Officer (Printed)

Page No.


 Doctor's Signature

8/12/10