

TESTS ON 19 DECEMBER 2007

OBJECTIVE

To vary Elevation and Azimuth at both locations to see if we could improve the signal levels over previous tests.

PREVIOUS RESULTS

Previous bests signal levels at Justin's end were -12 dB and at Rex's end -14 dB.

EQUIPMENT

- VK7TW Mike's Yellow Box
- VK7MO Mike's Big Box

RESULTS

After adjusting the alignment at firstly Justin's and then at Rex's end based on best reception by Rex the best signals were:

VK7TW -19 dB

VK7MO -16 dB

This means that despite alignment at both ends Justin could not get within 7 dB of previous results and Rex was still 2 dB down.

SPECULATION ON RESULTS

At the time of the tests Justin felt there was some haze that could have been increasing path losses.

The next morning Rex checked the alignment of his box on Empress Towers that had resulted from this optimisation and found that he was directed at the top row of windows and to the left side windows between the last two rows of windows. If in fact the telescope on the box at Rex's end is correct then this would infer that much of the energy was missing the building. Thus another possibility is that our procedure for alignment actually resulted in us optimising slightly off the building or on a different part of the building that was not quite as reflective. The problem is that we have while we can optimise one RXer when the TXer is fixed we really need to optimise the RXer with the TXer being varied in some systematic way so we can pick the best reflection point. This time due to the problem Justin had in receiving (tolerance frequency which was later fixed) we did the optimisation the other way around to last time and this could explain why we got a different result.

Another factor in the difference might be that we have found the beamwidth of the TX and RX is significantly different and perhaps by optimising for RX at Rex's end which turned out to be close to the edge of the building we produced a result such that Rex was TXing mostly off the building which would explain Justin's poorer result compared to the previous test when Rex adjusted the TX alignment while Justin measured the best result

I suspect a better way of doing this optimisation might be to send a continuous tone and measure signal levels on Spectran which would speed up the process and then for the TX station to systematically move across the building. All this would probably require more accurate and repeatable adjustments than we have at present.