

Consumer Question:

I am attempting to do a sight survey for a p2p wireless. My fresnel zone is about 6 meters, I have some smaller trees in the way. How much impact will a few branches have on my reception. Not looking for a specific answer, just some idea of the effect of tree branches on p2p wireless.

Background - 765 feet point to point

Antenna:

14db gain

50ft. above amsl on both ends

WiFi-PLUS response:

Lets talk about our New 3-D Multi-Polarized Science and Technology...

'GAINS CHANGED'

Introduction:

We will be talking about **three** gain figures (Categories) now, not just one:

- 1.) **GAIN**...the 'age-old' ('pure') (singularly polarized) 'gain' *(LOS test range)*
- 2.) **POLARITY GAIN** *(LOS test range)*
- 3.) **POLARIZATION DIVERSITY GAIN** *(Added near/non-LOS Real-World Gain)*

There has 'always' been "**GAIN**".

It is 'pure' gain seen in the laboratory test range.

With your 14 dBi antenna, 14 dBi of 'pure' vertical (singular) polarization gain will be seen on the analyzer using a reference vertically polarized [unity (zero) gain] antenna for testing.

If the reference antenna is tilted sideways, the gain of your 14 dBi antenna will show to be about -11 dBi or worse (~25 dB cross-polarization LOSS...14 - 25 = -11).

All of its gain is vertical; there is essentially no horizontal signal component...its total-of-all-polarizations **POLARITY GAIN** is 14 dBi.

And in an obstructed environment, where polarizations change and it can only receive the remaining still-vertically polarized signals,

its added **POLARIZATION DIVERSITY GAIN** is zero.

With our 18" MP-Tech. Beam, the 'pure' vertically polarized gain in the lab using, again, a singularly polarized reference (unity=zero gain) receiving antenna will be 10 dBi.

If a Multi-Polarized (unity=zero dB gain) receiving test Antenna (RECEIVING ALL the polarizations PRODUCED by the 18" MP-Tech. Beam) is used in the same LOS (~anechoic) field/chamber test, the **POLARITY GAIN** (Total-of-All-Polarizations 'pure' Gain) is 12 dBi.

NOW let's talk about the **THIRD GAIN**...The **REAL WORLD ADDITIONAL GAIN**...The **POLARIZATION DIVERSITY ADDED GAIN**:

The fresnel issue (diffraction) and the trees (mild polarization-altering) will reduce signal strength and quality and BER/throughput somewhat.

To help minimize that reduction with an MP-Tech. antenna similar in 'pure' [Category 1.)] or Category 2.) gain to your noted 14 dBi antenna, use our 18" BEAM...

It has 10 dBi of vertical polarization gain so here is what happens if it is used at only one end of the RF-link:

Its Obstructed Environment **POLARIZATION DIVERSITY added GAIN** quality will capture polarization-altered signals as well as the remaining (after the radio waves traverse the obstructed environment) vertically polarized signals.

The benefit to you (the polarization diversity added gain which will help Signal, BER, and Throughput) in this non-metallic, non-building-edge 'mildly' obstructed scenario is on the lesser side of 6-10 (+/-) dB.

If you use our 18" BEAM at both ends of the RF-Link, its **POLARITY GAIN** (seen in LOS) is 12 dBi in that its various polarizations are added together in phase (one MP-Tech. antenna produces all polarizations and the other receives all those polarizations.)...

From there, there is yet *additional* **POLARIZATION-DIVERSITY GAIN** in the obstructed environment [again, on the lesser side of 6-10 dB (+/-) in this mildly-obstructed environment although a bit more since here you would be using MP-Tech. antennas at BOTH ends of the link]... There is a better chance of getting strong usable signal at the end of obstructed pathways when producing all the polarizations, each one 'finding' its best polarization-altering path, and then receiving the best end-result signal by being able to receive all the polarizations. Either one particular polarized produced signal results in a single far-greatest magnitude (polarized) signal; or, as in a more 'mildly' obstructed environment, only polarization slantings of the produced signals occur, with in-phase added various polarized signals at the receiving antenna end.

[The HIGHER side of 6-10 (+/-) dB **POLARIZATION DIVERSITY** Obstructed Environment **GAIN** is seen when the obstructed path is of the reflective metallic (wall struts/water tower/bridge, etc.) and highly diffractive building edge type.]

In conclusion:

You will benefit from MP-Technology any time you replace a 'standard' type singularly polarized antenna **of a certain reported gain** with one of our MP-Tech. antennas with **similar category 1.) 'pure'** (Vertically) singularly polarized gain antennas.

And the greatest benefits will be seen when

- a.) replacing both ends of the link with MP-Tech. Antennas

and/or

- b.) being in a more highly obstructed (metallic/bldg. edge) environment.

Although Signal and BER and Throughput improvements are always seen by using appropriate software, the easiest method for seeing the MP-Tech. improvement is by finding a 'highly' obstructed path where the 'standard' style singularly polarized antenna system produces borderline connectivity (in-and-out) and there replacing the 'standard' antennas with MP-Tech. antennas of similar category 1.) 'pure' singularly polarized GAIN, or category 2.) 'pure' POLARITY GAIN.

[See chart next page]

	1.) (V. Pol. dBi) ['pure' GAIN]	2.) (Total Pol. dBi) [POLARITY GAIN] *	3.) [1.) or 2.)] + (6-10) dB [Additional POLARIZATION DIVERSITY GAIN]
MP-BULLET (dual-band 2.4/5.x GHz)	1	2.5	“
'5 dBi OMNI' (2.4 GHz)	2	3.5	“
High Gain 'Tube' OMNI (UWB and Freq.-Band specific models incl. 5.x Mobile)	4	5.5	“
'8 dBi Dual-Stack OMNI' (dual-band 2.4/5.x GHz)	4.5	6	“
'12 dBi Quad-Stack OMNI' (dual-band 2.4/5.x GHz)	6.5	8	“
'13 dBi Single Sector' (dual-band 2.4/5.x GHz)	9.5	10.5	“
4" '12 dBi BEAM' (2.4 GHz)	8	10	“
'WISPer' (UWB) [ROBUST Performer with 1 watt amp/pre-amp per Sector (X3) at 2.4 GHz—FCC OK with coax./conn. losses]	7	9.5	“
'17 dBi BEAM' (18" 2.4 GHz/8.5" 5.x GHz)	10	12	“
'18 dBi Quad-Stack Sector' (dual-band 2.4/5.x GHz)	12	13.5	“
TETRAD-M (2.4 and 5.x GHz models)	13.5	15.5	“
FUTURE 3' MP-Tech. DISH (UWB)	20.5 @ 2.4 GHz/27 @ 5.x GHz	25 @ 2.4 GHz/31.5 @ 5.x GHz ['EQUIQUADIMENSIONALLY' Multi-Polarized...All Polarizations of equal magnitude]	“

** The greater difference between columns 2.) and 1.) results in the higher Added Polar. Div. Obstruction Penetration (6-10 dB) Gains. **Therefore, the antenna models are listed from top to bottom in order of increasing Obstruction-Penetrating Abilities.***

[Note, however, that at times an omni-directional antenna may perform better in an obstructed environment by capturing the maximum usable signal from off-to-the-side, or behind, or even from above or below.]

[Note also that 'Stacked' Antenna models & the 'WISPer' also benefit from even further enhanced spatial diversity:

'Multi-Path Fractional Sinusoidal Additional's' added to our 'Geometric Spatial Capture of Signal']

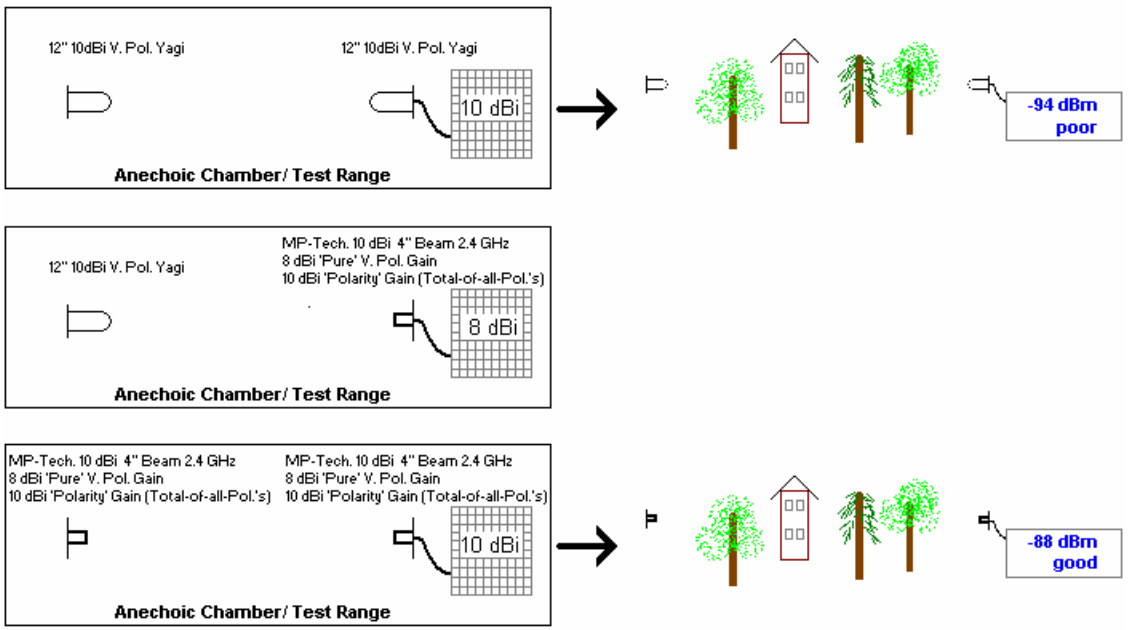
Example: Our '5' dBi OMNI is properly rated and should now (in that our 3-D Science and Multi-Polarized technology has "gotten the attention" and now being evaluated by larger players) probably be published as a 3.5 dBi OMNI.

The '5' figure is a blend between 3.5 dBi and $3.5 + (6-10) = 9.5-13.5$ dBi (in an obstructed environment) used in our beginnings to increase sales with an extremely ['pure' (Category 1.)/(with our technology)'pure polarity' Category 2.] 'Gain Focused' public.

Note: Some may focus on the 2 dBi Category 1. 'pure' singularly pol. gain figure for our OMNI here, and respectfully the Cat. 1 lower gain figures for our other antennas, so that they can attempt to justify applying higher power amps to our antennas.

However, in keeping with what the FCC/Canadian counterpart will, in their being familiarized with this new MP-Technology, see as appropriate, the total-of-all-pol. 'pure polarity gain' (total effective power transmitted by the antenna), Cat. 2. ratings should be published...

At this juncture, we should consider being entirely precise and 'keep educating'/'get the educated' sales-OEM's/.licensures.



Added 6 dB Pol. Diversity Gain