

APPLICATION NOTES

SOLECTEK NLOS TEST REPORT

SKYWAY 5000 SERIES—JANUARY 2004

SETUP

The base station with a built-in 90 degree sectoral antenna is mounted on a 20 foot tower on Solectek headquarter building (2 stories), as shown with a red star on the map to the right. The subscriber unit with a built-in 23dBi antenna (1 foot x 1 foot) is mounted on a Jeep. The Jeep was driven to places where near or non-LOS conditions are created. The testing environment was chosen to avoid severe NLOS conditions such as behind a large building.

The acceptable full throughput is defined as at least 15Mbps at 36 Mbps data rate.

TEST #1 : 1.7 Miles

The location is around a business park where LOS conditions can be established on a hilltop. The test site was moved back quite a bit behind so that the target site was completed invisible.

Location 1A: 1.7 Miles

The picture shows that there is no line of sight due to the earthen berm. The antenna on the Jeep is in fact pointed right at the middle part of the berm, about where the target base station antenna would have been located without the berm..

Result: Full Throughput at 36 Mbps

TEST #2 : 4.5 Miles

The location is in a housing community where the road meandered through townhouses.

Location 2A:

The picture shows the antenna being pointed to the middle part of the house, which blocks the LOS to the base antenna.

Result: Full Throughput at 36Mbps



Figure 1: Map of the general area.



Figure 2: Photo from Location 1A

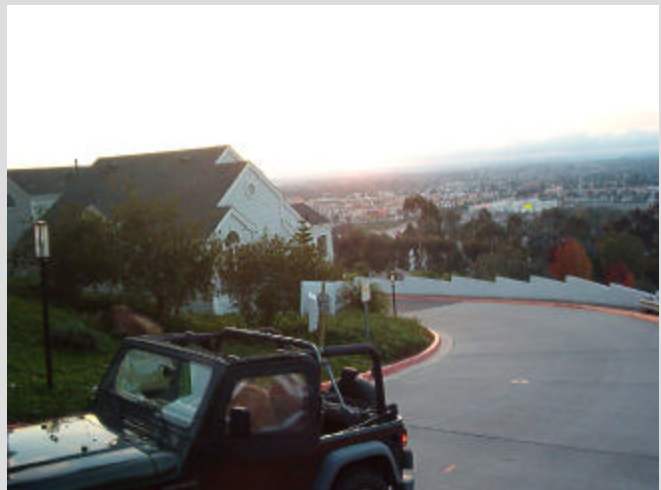


Figure 3: Photo from Location 2A:

TEST #2 : 4.5 Miles (Continued)

Location 2B:

The picture shows the tree on the right side that is in the path between the subscriber unit and the base station. The visibility was very poor due to several layers.

Result: Full Throughput at 36Mbps

Location 2C:

The picture shows a few feet of gap between two houses, through which the antenna is pointed. The base station is located at an off-angle and is not visible through the gap. There were trees and foliage in the foreground that further hampered LOS conditions.

Result: 80% of Full Throughput at 36Mbps

TEST #3 : 7 Miles

Location 3A:

The subscriber antenna is mounted behind an elevation rise approximately 200 feet away from the antenna. The antenna is pointed directly at the dirt and brush in front. The target base station lies far beyond the dirt hill.

Result: 75% (5-7Mbps) of Full Throughput at 18 Mbps

Location 3B:

A more complex environment than Location 3A. In front of the antenna is the paved road, layers of brush and other structures in the foreground that completely blocks the LOS path to the base station. The RF path is through 5 feet of thick brush, several trees, and a car about 50 feet away. directly at the bottom of the brush in front.

Result: 75% (5-7Mbps) of Full Throughput at 18 Mbps

CONCLUSION

It is seen from this test that at least near LOS is easily established up to 7 miles of distance between using SkyWay 5000 Multipoint network.

Users are still recommended to establish LOS wherever possible for more dependable results, but near or in some cases non-LOS links can be fairly easy to set up.

Extra link margin due to the high power radio made it possible to stretch NLOS to 7 miles as well as some fairly difficult NLOS links at shorter distances.



Figure 4: Photo from Location 2B



Figure 5: Photo from Location 2C



Figure 6: Photo from Location 3A



Figure 7: Photo from Location 3B