

WHITE PAPER

RELIABILITY OF RADIO NETWORK SOLUTIONS FOR BUSINESS

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Reliability of radio network solutions for business

The purpose of this white paper is to give the reader an appreciation for the reliability methods used in the engineering of the radio solutions being deployed by AirSpeed Telecom to deliver carrier grade IP or TDM connectivity. In the engineering of our microwave radio links, AirSpeed Telecom use industry standard reliability methods to ensure each link performance meets the required availability.

For instance, the quality of a microwave signal over a given "path" or "link", the term used to refer to the two-way transmission of the radio signal from point A to point B, is governed primarily by the engineering practices employed in the design stages of the network. A microwave path, properly engineered and designed, will provide dependable transmission of network traffic with an availability rate of 99.999%, (availability is the percentage of time a path is operational, or available, for transmission of traffic), which is much higher than the typical guarantee of most copper or fibre leased-line facilities.

AirSpeed Telecom use radio planning software tools to ensure link performance is correctly calculated. Our installation engineers commission radio links against these engineering results, which in turn ensures a high reliability of our network service.

The following points highlight some considerations in the calculation of link reliability.

1. Line of Sight (LOS) Survey

AirSpeed implements radio systems that require line of sight between the customer site and AirSpeed tower infrastructure. Although there are technologies that will support Near to Non line of sight capabilities, these technologies are primarily designed for DSL type services with best effort support in mind. It is difficult to design and meet high levels of link availability without line of sight. It is for this reason that AirSpeed has chosen to deploy LOS licensed radio technology in order to guarantee our reliability and meet our Customer Service Level Agreement (SLA).

2. Frequency Band

A major consideration in the link design is the selection of frequency band. To give a general rule of thumb, we would implement 38GHz frequency for a short link distance and 6GHz for very long link distance. As an example, AirSpeed currently operate links from 0.1km up to 89km between point A and point B; the 0.1km link operating at 38GHz and the 89km link operating at 6GHz. Higher frequency bands (i.e. 38GHz) are more susceptible to weather conditions, however if designed within the boundaries of maximum path distance, the same performance i.e. 99.999% availability can be achieved. AirSpeed works within the guidelines set forth by ComReg (Irish Communications Regulator) in the selection of specific frequency bands during the link engineering design stage.

3. Link Capacity

Depending on the customer requirements, a single AirSpeed customer radio link can support between 1Mbps and 155Mbps. AirSpeed backbone radio links support up to 800Mbps capacity. The capacity engineering is important as it is a key factor in determining the antenna size and transmit power of the radio.

4. Antenna Size

Upon verification of details above, and operating the planning tool with the appropriate rain region for Ireland, we can adjust the antenna size in order to design the link to the required system performance. Antenna size for customer connections, typically are between 300-600mm in diameter. For backbone links, these antenna can be as large as 3m in diameter.

Should you wish for a more detailed explanation of our engineering design, please feel free to contact AirSpeed Telecom with your specific requirements on locall 1890 799 899 or e-mail us at sales@airspeed.ie