



Strike Group Australia 1/263 Toombul Rd, Northgate QLD 4013

- p 1300 792 044
- f 1300 792 054
- e sales@strike.com.au

Strike Alpha Cradle

One key feature of the Strike Alpha Cradle is to boost mobile phone reception thereby increasing call quality and decreasing the number of dropped calls. To what extent the Strike Alpha Cradle does this, means considering the many factors that affect mobile phone reception. **The below checklist would help you troubleshoot your antenna:**

Please make sure your Alpha cradle is connected to an antenna

- If not then antenna boosting cannot work; we recommend Strike branded antennas.
- ✓ If your Strike Alpha cradle is connected to an antenna, what brand and model is it?
 - If it is not a Strike or RFI antenna we can't guarantee performance as we don't know the quality of the antenna or the real frequencies other antennas are tuned to.
- ✓ Doing a field test on most mobile phones is not an accurate way of measuring signal boost. In test mode they can display "potential" power delivered to phone antenna that is measured in negative dbm. The real figure can be different.
 - Note that in many cases, especially when signal is relatively strong, the phone cradle will not provide any visual antenna boost, this is considered normal.
- ✓ Has any testing been done? Is there another cradle or antenna/available to test with?
 - When comparing to other cradles it is best to do a performance test or ensure that all conditions (vehicle, weather etc) are all identical. The following can affect antenna performance: wind, humidity, rain, cloud cover, UV radiation, other devices, phone positioning, antenna positioning etc. In short, it is very difficult to test accurately unless in a controlled environment.

Factors Affecting Mobile Phone Reception

- 1. **Distance and Direction of the nearest mobile phone tower**. You must be within range of a mobile phone tower and the range can vary depending on the transmission power of the tower as well as the transmission power of the mobile phone. This is why different phones can have vastly different call quality.
- 2. **Transmission Power**. The transmission power of the phone tower is always greater than the transmission power of the phone which could mean that you have 5 bars on your phone yet you are unable to carry on a conversation. In this case you may be able to receive but unable to transmit leading to poor call quality.
- 3. **Environment**. Environmental factors such as geography can affect coverage as a signal that has a direct line of sight with a cell tower will be stronger than a signal that is having to go through obstacles such as mountains, buildings, trees etc. Even the time of year can affect reception as in summer there will be more foliage on trees than in winter which can lead to decreased signal. Some materials that signals pass through such as metal reflects signal. Even wind direction can affect signal quality.

STRIKE ALPHA ANTENNA REPORT

4. *Network Congestion*. Busy towers will drop calls and diminish quality as towers have a finite amount of capacity.

Solutions to Mobile Phone Reception

External Antenna. Select the right antenna to suit the environment and your range of coverage can double. Antennas do not increase the output of the signal but do help to transmit and capture signals that otherwise might be lost due to obstructions created by the environment. For a regional solution, the antenna that gets the best results is the Strike B2 Antenna.

Strike Alpha Cradle. Select a phone specific cradle that has a correctly positioned antenna booster within it that is tuned to suit the mobile phone network where the phone is being used

Strike's research and development department are continuously looking for ways to increase the performance of our Strike Alpha Cradle range. As a result Strike's engineers have introduced a new internal antenna coupler that has been tailored for Australian conditions.

Please see detailed antenna report below that compares Strike's Gen 3 and Gen 4 Antennas:



EFFICIENCY

The efficiency of an antenna relates the power delivered to the antenna and the power radiated or dissipated within the antenna. A high efficiency antenna has most of the power present at the antenna's input radiated away. A low efficiency antenna has most of the power absorbed as losses within the antenna, or reflected away due to impedance mismatch.

Efficiency is one of the most important antenna parameters. It can be very close to 100% (or 0 dB) for dish, horn antennas, or half-wavelength dipoles with no lossy materials around them. Mobile phone antennas, or wifi antennas in consumer electronics products, typically have efficiencies from 20%-70% (-7 to -1.5 dB). The losses are often due to the electronics and materials that surround the antennas; these tend to absorb some of the radiated power (converting the energy to heat), which lowers the efficiency of the antenna.

The higher the percentage of the efficiency the better the antenna is.

STRIKE ALPHA ANTENNA REPORT

Points to Note

A mobile phone cradle and antenna will not boost a signal that is not there. A phone must be within transmission and reception range of a tower to successfully carry on a call. By selecting a Strike Alpha Cradle and the correct external antenna to suit the environment will yield your best chance of success in higher call quality.

- ✓ What network is the phone using and how much signal is obtained without antenna connection?
 - Some networks like little coverage in regional areas and as such an antenna and cradle cannot assist given that it is impossible to boost zero signal (Alpha cradles and antennas boost existing signal, if existing signal is zero then impossible to boost)
- ✓ The Alpha cradle 4th generation antenna connector has been tested as the best performing passive connection for Australian mobile frequencies (700, 850, 900, 1800, 1900, 2100, 2600+ Mhz).



- VSWR stands for Voltage Standing Wave Ratio, and is also referred to as Standing Wave Ratio (SWR). SWR is a function of the reflection coefficient, which describes the power reflected from the antenna. It is determined from the voltage measured along a transmission line leading to an antenna. Often in industry, antennas are screened (pass/fail criteria) based on SWR specifications (SWR specs). This is a method of measuring the antennas passively to determine if they are properly tuned in a quick manner. The antenna is measured with a network analyzer, and the SWR as a function of frequency is recorded. SWR alone is not sufficient to determine an antenna is functioning properly, gain, efficiency and radiation patterns are other important measurements to be considered).
- ✓ The higher the gain the better the antenna is.
 - The term Antenna Gain describes how much power is transmitted in the direction of peak radiation to that of an isotropic source. Antenna gain is more commonly quoted in a real antenna's specification sheet because it takes into account the actual losses that occur. An antenna with a gain of 3 dB means that the power received far from the antenna will be 3 dB higher (twice as much) than what would be received from a lossless isotropic antenna with the same input power.



The term Antenna Gain describes how much power is transmitted in the direction of peak radiation to that of an isotropic source. Antenna gain is more commonly quoted in a real antenna's specification sheet because it takes into account the actual losses that occur. An antenna with a gain of 3 dB means that the power received far from the antenna will be 3 dB higher (twice as much) than what would be received from a lossless isotropic antenna with the same input power.

The higher the dB (closer to 0) the better the antenna is.



VSWR – Voltage Standing Wave Ratio

500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 (MHz)

VSWR stands for Voltage Standing Wave Ratio, and is also referred to as Standing Wave Ratio (SWR). VSWR is a function of the reflection coefficient, which describes the power reflected from the antenna. It is determined from the voltage measured along a transmission line leading to an antenna. Often in industry, antennas are screened (pass/fail criteria) based on VSWR specifications (VSWR specs). This is a method of measuring the antennas passively to determine if they are properly tuned in a quick manner. The antenna is measured with a network analyzer, and the VSWR as a function of frequency is recorded. VSWR alone is not sufficient to determine an antenna is functioning properly gain, efficiency and radiation patterns are other important measurements to be considered.

The closer VSWR to 1 the better the antenna is.

More Information

All tests and measurements in this report have been conducted by and **independent** laboratory. See below for more detailed figures.

✓ The antenna radiation performance was measured in an Anechoic Chamber as per the setup below.



✓ Below are the Antenna Radiation Patterns for the Strike Gen 4 Alpha Antenna









