

Application Note

Setups for testing 5G interference with Radio Altimeters

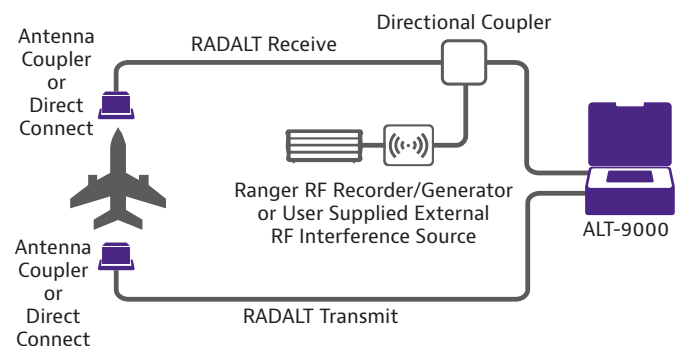
Now that the potential for 5G interference of an aircraft's Radio Altimeter (RADALT) is being discussed industry-wide, the next question is "How to test an aircraft's Radio Altimeter to determine if it is susceptible to 5G interference".

VIAVI has a long history of designing and manufacturing avionics test solutions, including RADALT test solutions. The following information will focus on the latest VIAVI universal RADALT test set, the ALT-9000, but the information is relevant to all VIAVI RADALT test sets, including the ALT-8000 and ALT-8015. Use of the ALT-8000 or ALT-8015 for this application will assume the RADALT under test has previously been confirmed to work with the test set to be used.

When testing an aircraft's RADALT for 5G interference, the best solution is a real-world test. However, there are many issues with this type of testing, including unknown RF levels from the 5G tower received at the aircrafts RADALT antennas. So, the best alternative is a controlled environment test with predictable and repeatable interference signal sources being introduced to the aircrafts RADALT while the system is functioning normally. That is where the ALT- 9000 comes in. The ALT-9000 can simulate static altitudes or climb/descend scenarios while controlled user-defined interference signals are inserted into the aircrafts RADALT receive path.

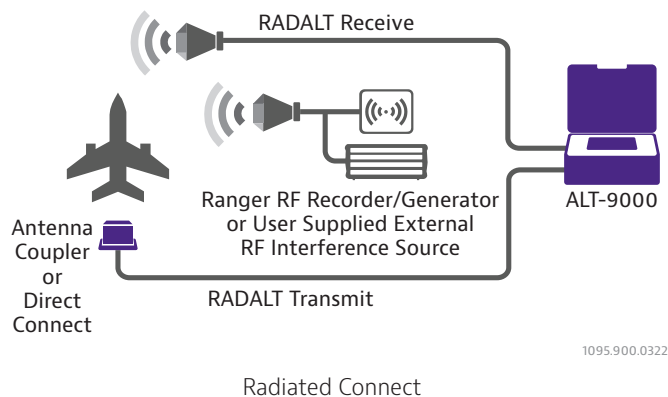
Below are two examples of how the testing may be accomplished using the ALT-9000 to simulate real-world conditions to the aircrafts RADALT system.

The "Direct Connect" method utilizes a direct connection between the ALT-9000 and the RADALT RX/TX connectors or by using the antenna couplers supplied in the ALT-9000 kit to couple to the aircrafts RADALT RX/TX antennas. A directional coupler, or similar device, may be used to insert the interference signals directly into the aircraft's RADALT return path.



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The “Radiated” method utilizes a user-supplied antenna installed on the ALT-9000 UUT:RX coax to radiate the return signal back to the aircraft’s RADALT receive antenna. The RADALTs transmit connector or aircrafts RADALT transmit antenna will be connected to the ALT-9000 UUT:TX by direct connect or antenna coupler, much like the Direct Connect method. The RADALT return signal will then be radiated back to the aircraft’s RADALT receive antenna. This allows the interference signals to be radiated to the aircrafts RADALT receive antenna from various angles and distances, providing a more real-world test environment.



For additional information on 5G interference and other VIAVI test solutions that can aid in 5G interference testing, visit the VIAVI website and read the [“5G and Avionics Technologies Harmonization”](#) eBook published by VIAVI. Or contact Terry Jarboe, terry.jarboe@viavisolutions.com, office, +1 913 324 3120.