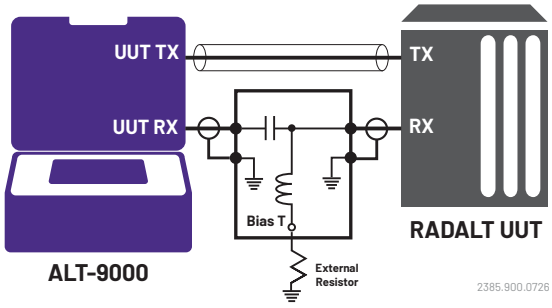
Passing UUT Built-In Test

Use a BIAS T to simulate the power-on antenna-connection test required by some Rad-Alt systems.

Problem: The ALT-9000 does not complete the DC path to ground to allow preventing the Unit Under Test (UUT) Built-In Test (BIT) from passing.

Study Method: Radio Altimeter systems in aircraft have a requirement to perform a BIT periodically while in operation. The transmit port will ordinarily perform a return-loss measurement to determine whether there is an issue with the transmitter feed line or transmit antenna. The receiver port uses a DC path to ground as the indicator that a receiver antenna is connected, and there is continuity through the receiver feed line from the antenna to the receiver input port. The UUT:RX output of the ALT-9000 is capacitor-coupled and does not present a DC path to ground when directly connected to the unit under test. As a result, the unit under test will not pass its BIT test and will not operate or display a radio altitude. The UUT may not energize the transmitter as indicated on the ALT-9000, as no measurable power (a dialog box may be present stating no measurable power).



Bias T connection with external resistor

The UUT status should be identified as either normal operation (passing BIT) or flagged (BIT error) when testing issues are encountered. On radio altimeters that require a DC path to ground, the operator must provide a Bias T (DC block) with the appropriate resistance to ground connected between the test set and the UUT receiver port. The resistance should be a value that duplicates the DC resistance of the receiving RADALT antenna ordinarily used in the aircraft. To determine the DC resistance for the Bias T, use an ohmmeter to measure the resistance of the antenna at the antenna coaxial connector. Select a resistor close to the value measured and connect to the DC in port of the bias T. Ensure that the Bias T is connected to the UUT and the test set in the correct orientation. The capacitive port of the Bias T is connected to the ALT-9000. The Bias T port with a DC connection to ground is connected to the UUT receiver port.

Conclusion: When direct port testing using the ALT-9000, and you receive a message that there is no measurable power, double-check that you are correctly connected to the UUT. (UUT TX to ALT-9000 UUT TX and UUT RX to ALT-9000 UUT RX). Also determine if the radio is passing BIT test and if not determine the cause. The radio may require a DC block on the RX input to simulate an antenna being connected to the RX port.

Contact Us: +1 800 835 2352 | avcomm.sales@viavisolutions.com.

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