Improving Aircraft RF Systems Reliability
VSWR Tester Survey Report by

Bird Technologies®

www.aspen-electronics.com
Tel: +44 (0) 208 868 1311
E-mail: sales@aspen-electronics.com
This report follows work undertaken by Bird Technologies and a major Airline / Aircraft Manufacturer.

- Lynn Strube.
- Gregg Moffett.
Today’s commercial aircraft have multiple RF systems each with a number of antennas.
Network Analysers (Field Fox N9914A) are currently used to perform Return Loss (RL) testing of SATCOM antennas in C-Check.

- This tester may be considered as complicated and therefore not suggested for quick VSWR flightline troubleshooting of all RF systems.
- Requires complicated set-up and disassembly of aircraft to access antenna. Readings are plugged into a spreadsheet, and require engineering evaluation.
- Testers are currently used overseas for SATCOM antenna testing only during C-Check.
A review of VSWR Testers

The U.S. military currently performs flightline VSWR testing using the Anritsu Network Analyser on aircraft.

- Analysers are used for flightline FIM troubleshooting and phase checks.
- Requires trained user set-up by specialised Comms technicians.
Introducing the Bird Technologies SiteHawk SK-4500-TC

- Handheld, easy to use. Facilitates both simple Go/No-Go testing, as well as in depth testing.
- Settings/parameters may be saved and loaded externally via USB or Bluetooth.
- Performs VSWR, Return Loss and Distance to Fault.
• Airlines, Bird Technologies and Field Service Representatives completed trial testing of the Bird SiteHawk on July 26, 2016 on two aircraft.
• Testing of SATCOM (High & Low Gain Systems), ATC and TCAS were completed.
• Tests confirmed the validity of testing from EE rack, ease-of-use, ability to identify faulty antennas and cables and the distance to fault function.
• Testing accomplished on an aircraft with a repeating faulty SATCOM system.
Bird SK-4500-TC TCAS Testing example

Simple to Test - Less than 5 Minutes...

- Testing of all 6 antenna element circuits was performed easily from the EE rack; less than 5 minutes to test and verify integrity of cables, connectors and antennas.
- If faulted, distance to fault on the individual cable/antenna element would be provided.
Bird SK-4500-TC - Chronic SATCOM Fault

• Test of Chronic Satcom Fault.
  • We performed a VSWR test using the Bird Sitehawk SK-4500-TC.
  • Reading from the EE rack, the very simple to use tester showed “Receive” frequencies passed.
  • However, the “Transmit” frequencies rose above the RED limit line of 2.1; peaking at 2.6 VSWR.
  • The tester identified the root cause of the Satcom failure as a bad Low Gain Antenna.
  • Testing was completed in only a few minutes.
• Test of Chronic Satcom Fault.
  • New antenna tested when received from stock. Results were excellent.
    • VSWR did not exceed 1.2 when measuring both RECV and TX frequencies.
  • Maintenance changed antenna. Aircraft op checked good and has flown good since replacements.
Bird SK-4500-TC For Aircraft Maintenance

Following these trials and the evaluation of the Bird SiteHawk it became clear that the Bird SiteHawk is an ideal instrument for Aviation professionals.

Easy to use and light weight, the Bird SiteHawk, together with a range of accessories provides avionics technicians with a complete solution for all aircraft RF systems applications.