

Failure Report for Baseline Active-Baluns Used for the LWDA

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January 9, 2007

Introduction

During the installation and testing of the LWDA two baluns were found to exhibit anomalous behavior and were subsequently replaced. One of the baluns presented a slight gain imbalance, and the other suspect balun provided less gain than expected on one polarization.

These baluns were shipped to Emhiser Tele-Tech where they were subjected to a failure analysis by Gib Curtis without cost to the LWA project. Gib's report is reproduced here in its entirety.

Failure Report from Emhiser Tele-Tech, Inc.

Failure Analysis of LWDA Baluns

Emhiser Tele-Tech Inc.

December 6, 2006

Unit #22

Unit had an approximate loss of 10 dB gain in one of the 4 input channel pathways.

Testing confirmed this loss of gain. Unit was opened and each pathway was separately tested and inspected. On the channel in question it was found that the Gali-74 amp was not achieving its full gain. This gain block was replaced and the gain returned to nominal.

It is not known what caused this gain block to lose gain. In future builds, a powered burn-in may be able to eliminate semiconductor gain blocks that do not perform as advertised over the lifetime of the unit.

Units #24

Unit had an approximate loss of 1 dB in one of the 4 input channel pathways.

Initial inspection found that the input connector on the line in question had been damaged by improper assembly with the mating RF cable assembly. The 3 "fingers" of the female center conductor had been bent and pushed out of the way by center conductor of the male portion of the connector on the cable assembly. The male portion of the connector on the cable assembly was inserted between the outside of the center conductor and the Teflon insulator, when the ground nut is then screwed into place the internal fingers of the center conductor are then pushed out of the way. This creates a permanent condition

where the connector cannot be properly assembled. This damage creates an inconsistent connection of the RF line through the connector.

Initial testing could not recreate this loss of gain. Upon further testing, it was found that by manual manipulation of the input connector this loss could be recreated.

Unit was opened and inspected and found to have a possible cracked DC blocking capacitor on the input RF line. Replacement of the capacitor and replacement of the RF connector returned the gain to specification.

It is recommended that proper training and care be taken in the assembly of the balun to the cable assemblies to reduce or eliminate this type of damage to the RF connectors. The cracked capacitor is most likely caused by mechanical stress on the capacitor. This could be caused by dropping the unit, or torque and bending motions on the connectors. Stress during assembly is possible but unlikely as the unit passed electrical test after final assembly. All of our processes will be reviewed to see if an issue that could possibly cause this problem can be found.

Units are currently repaired and working as specified. Internal electrical assemblies will need to be installed into the chassis and the chassis resealed before being returned to service. These repairs are not covered by warranty. Final cost for testing/repair is \$100.00.

Gib Curtis
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