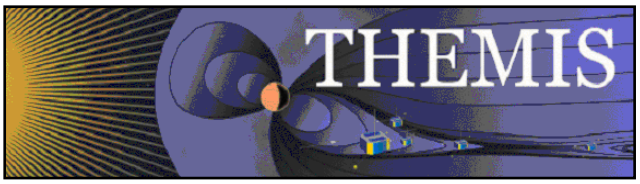

Problem/Failure Report
THM_PFR_173

PFR-173 Title: F2 Transponder needs resistor change and diplexor re-test

Assembly : Transponder	**SubAssembly : Diplexor / Receiver**	
Component :	**Units Affected:**	**Units fixed:**
Originator: Ellen Taylor	- x - - - -	- x - - - -
Organization: Swales/UCB	**Date: 5/3/06**	
Phone: (510) 643-4054	**Email :** ertaylor@ssl.berkeley.edu	

Failure Occurred During (Check one √)

□ Functional test □ Qualification test □ S/C Integration □ Launch operations √ Other (Flight Assy)

Environment when failure occurred:

√ Ambient	□ Vibration	□ Shock	□ Acoustic
□ Thermal	□ Vacuum	□ Thermal-Vacuum	□ EMI/EMC

Problem Description

All THEMIS Transponders had to be returned to the vendor, L3 Comm, for two reasons:

1. After reviewing the L3 Comm Diplexor acceptance data packages, the GSFC RF group felt no units had gone through sufficient testing for multipaction.
2. The performance measured by L3 on transponder S/N 103 was -17 dBc with the 16 kHz command subcarrier and 1 kbps command data enabled. The original specs for spurious emissions call for -45 dBc.

Analyses Performed to Determine Cause

1. See various discussions and e-mails pertaining to THEMIS Diplexer Manufacturing Travelers Review by GSFC RF Group.
2. L3 proposed replacing two resistors in the receiver slice to improve the loop filter performance for extraction of the coherent reference signal. The resistors are accessible when the top cover is removed and expected improvement 10 dB in spurious emissions. The resistors are to be changed on all units.

Corrective Action/ Resolution

As Probe F2 was integrated and undergoing testing at JPL, the transponder had to be removed after Environmental Testing and returned to L3 Comm. This PFR can be closed after the unit has been returned and integrated back onto Probe F2.

Update 6/10/06: The transponder was returned to UCB and re-integrated onto Probe 2 on 6/5/06 without issue.

Acceptance:

MAM: Ron Jackson_____; MSE: Ellen Taylor_____

PM: Peter Harvey_____; Cognizant Engineer_____

Date of Closure_____