

MIT/IL SOFTWARE ANOMALY REPORT

1.1 ORIGINATOR: P. Volante		1.2 ORGANIZATION: MIT		1.3 DATE: 2-20		1.4 ORIGINATOR CONTROL NO.		MIT REPORT NO. ILNY 39 PROGRAM Luminary PROGRAM REVISION 69	
1.5 DESCRIPTION OF ANOMALY: In R21 the K=60 Counter is set before the antenna repositioning to the mode center, and the RR self track enable is removed after the repositioning. The order of these must be reversed, since the repositioning decrements the K=60 counter.									
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1.6 DESCRIPTION OF RUN: None									
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- MIT ANALYSIS -									
2.1 CAUSE: Coding incorrect									
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2.2 RECOGNITION: Examination of coding									
CONTINUED ON PAGE									
2.3 MISSION EFFECT: Possible premature 503 alarm (Designate fail in R21)									
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2.4 AVOIDANCE PROCEDURE: Manually slew antenna to mode center if it is 50°-60° away.									
<i>Not Necessary</i>									
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2.5 RECOVERY PROCEDURE: Recycle on 503 alarm or select R24 or do R23 manual acquire									
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2.6 PROGRAM CORRECTION: Fix coding									
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2.7 RECOMMENDED DISPOSITION (Fix, Work-around, etc): Fix in Luminary 1A work - around in Luminary									
CONTINUED ON PAGE									
2.8 RECOMMENDED RE-TESTING: <i>Verify K not decremented during the mode center repositioning in R21</i>									
CONTINUED ON PAGE									
3.1 NASA DIRECTION:					2.9 MIT/IL SIGNATURE: <i>[Signature]</i>				
3.2 NASA/MSG SIGNATURE:					4.1 CLOSING ACTION TAKEN: See attached page G.W.C.				
					CONTINUED ON PAGE				
3.2 NASA/MSG SIGNATURE:		3.3 ORGANIZATION:		3.4 DATE:		4.2 SIGNATURE:		4.3 ORGANIZATION:	

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1.1 ORIGINATOR: G. W. CHERRY		1.2 ORGANIZATION: MIT		1.3 DATE: 2-20		1.4 ORIGINATOR CONTROL NO.		REPORT NO. LNY 39
PROGRAM LUMINARY								PROGRAM REVISION 69

EXPLANATION: LUMINARY, unlike SUNDANCE, completes RR auto designation in two phases. In coasting flight (the only concern in LUMINARY I) R61 and R60 are called just before the RR designate routine and the LM Z-axis is maneuvered along the LGC state - vectors LOS to the CSM. The first phase of designation in the designate routine commands the RR to the center of mode 1 (which corresponds to the LM Z-axis and therefore approximately to the LOS to the CSM); when the RR is found to be within 1/2 degrees of the Z-axis this phase of designation is complete. The 2nd phase of designation starts when the 1st phase is complete. In this phase the LOS to the CSM is periodically computed; the radar is commanded along this LOS; The track enable is sent when the RR is within 1/2 degree of the LOS; and the data good signal is waited for.

The only substantive "anomaly" in the routine is that 60 commands to the radar in total are allowed for both phase 1 and phase 2 of the designate process. In other words, if 30 commands are used to bring the radar to within 1/2 degree of the Z-axis only 30 commands remain to bring the radar within 1/2 degree of the LOS and acquire the data good signal. Normally this should be enough. If 60 commands total are not enough, alarm code 503 is displayed (RR antenna designate fail) and the astronaut can respond with a re-cycle (V32E) to allow another 60 passes.

RECOMENDED PROCEDURE: If FL 05 N09 (503) occurs at the end of the first designate, respond with a re-cycle. FL05N09 (503) is not likely to be due to this anomaly, however

FURTHER ACTION REQUIRED: I have noticed that LUMINARY GSOP section 4 is rather cryptic and puzzling in this area of R21 description. In particular, line #70 of R21 does not show how the command to mode center is accomplished by the V41 N72 logic. For example, the references to the LOCK-ON FLAG and LOS CM FLAG are dangling. I would like someone to amplify and clarify this portion of the GSOP, for LUMINARY and LUMINARY IA

ACTION: Walker Kupfer, Harry McOaut, Bob White, please improve the GSOP in this area. Prepare clarification as soon as possible.

ACTION: Peter Volante, please repair LUMINARY IA.

ACTION: Peter Volante, Bruce McCoy, please prepare a program note for LUMINARY

George W. Cherry

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