

# MIT/IL SOFTWARE ANOMALY REPORT

MIT REPORT NO. <b>LMY 65</b>
PROGRAM <b>LUMINARY</b>
PROGRAM REVISION <b>97</b>

1.1 ORIGINATOR: <b>P. Adler</b>	1.2 ORGANIZATION: <b>MIT/IL</b>	1.3 DATE: <b>5/12/69</b>	1.4 ORIGINATOR CONTROL NO.
1.5 DESCRIPTION OF ANOMALY: In both targeting and burn programs, the LAMBERT subroutine can either A) give bad Velocity Required or B) continue iterating, i.e., tie up the computer for an indefinite, possibly unbounded, time. <div style="text-align: right;">CONTINUED ON PAGE</div>			
1.6 DESCRIPTION OF RUN: Anomaly pointed out in TRW memo A-201: 4/23/69: Questionable Items in Luminary 97 Listing <div style="text-align: right;">CONTINUED ON PAGE</div>			
- MIT ANALYSIS -			
2.1 CAUSE: Coding Error. ITERCTR, a counter that limits the number of iterations performed in the LAMBERT subroutine, is no longer set (to 20 or 5 as AVERAGE G is off or on) before LAMBERT is called. Thus <div style="text-align: right;">CONTINUED ON PAGE 2</div>			
2.2 RECOGNITION: A) $V_G$ incorrect; may be difficult to detect. B) Comp. Acty stays on for a long, indefinite period. <div style="text-align: right;">CONTINUED ON PAGE</div>			
2.3 MISSION EFFECT:  <b>Unknown</b> <div style="text-align: right;">CONTINUED ON PAGE</div>			
2.4 AVOIDANCE PROCEDURE: <b>None</b> <div style="text-align: right;">CONTINUED ON PAGE</div>			
2.5 RECOVERY PROCEDURE: <b>Reselect program</b> <div style="text-align: right;">CONTINUED ON PAGE</div>			
2.6 PROGRAM CORRECTION: <b>Restore coding to set ITERCTR before calling LAMBERT</b> <div style="text-align: right;">CONTINUED ON PAGE</div>			
2.7 RECOMMENDED DISPOSITION (Fix, Work-around, etc): <b>Fix</b> <div style="text-align: right;">CONTINUED ON PAGE</div>			
2.8 RECOMMENDED RE-TESTING: <b>Special test with trace to show ITERCTR being set.</b> <div style="text-align: right;">CONTINUED ON PAGE</div>			
3.1 NASA DIRECTION:		2.9 MIT/IL SIGNATURE: <i>[Signature]</i>	2.10 DATE: <b>5/13/69</b>
CONTINUED ON PAGE		4.1 CLOSING ACTION TAKEN: <b>Fixed in LUMINARY 1A Rev. 99 J. W. Cherry</b> <div style="text-align: right;">CONTINUED ON PAGE</div>	
3.2 NASA/MSO SIGNATURE:	3.3 ORGANIZATION:	3.4 DATE:	4.2 SIGNATURE:



# MIT/IL SOFTWARE ANOMALY REPORT

1.1 ORIGINATOR: P. Adler	1.2 ORGANIZATION: MIT/IL	1.3 DATE: 5/12/69	1.4 ORIGINATOR CONTROL NO.
-----------------------------	-----------------------------	----------------------	-------------------------------

MSC REPORT NO. LNY 65
PROGRAM LUMINARY
PROGRAM REVISION 97

2.1: ITERCTR is left at its previous setting. For targeting programs this is the high-order part of the Y-component of the vehicle velocity as extrapolated to intercept time (VATT1 from INTEGRVS) (in reference coords. scaled B29 or B27 for Earth or Moon respectively). For the prethrust portion of burn programs (S40.1), the previous contents of ITERCTR is the same VATT1, only in this case the extrapolation has been done to TIG (time of ignition).

If LAMBERT does not converge (very rare), it will go on trying until ITERCTR is decremented to 0. If ITERCTR was initially less than or equal to 0 it will never reach 0 due to the method of decrementing. This gives case B. If ITERCTR is left as a small positive number, then LAMBERT may exit before a valid  $V_R$  is generated. This is case A.