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LUMINARY Memo #103

To: Distribution  
From: C. Schulenberg  
Date: 6 August 1969  
Subject: LUMINARY Revisions 108 - 113

Correction to LUMINARY Memos #85 and 91: The correct value of the padload RADSKAL, if the LGC is to correct LR measurement readings for doppler shift, is 2DEC 2556.4562 B-21.

Major Changes Incorporated into Revision 108

- 1) The code in the Pinball routine that had been deleted as part of the implementation of PCR 797.2 was re-inserted since the PCR had been subsequently cancelled.
- 2) PCR 816 was implemented. (Modify R03 to Permit Astronaut Setting of 1 degree Deadband) Implementation of this change required moving the flagbit AORBSFLG from bit 5 of flag 13 (DAPBOOLS) to bit 5 of flag 5. In addition, a new flagbit, DPBS2FLG was created and put in the former position of AORBSFLG.
- 3) PCR 839 was implemented. (R12 and LR Re-position Routine Improvements) As a result of this PCR two former flagbits were deleted and replaced with two new ones: NO511FLG replaced SCALBAD (bit 3 of flag 11), and LPOS2FLG replaced READLR (bit 6 of flag 11).

Major Changes Incorporated into Revision 109

- 1) Anomaly LNY89 was repaired. (State vectors may be integrated backwards by P00 integration while LGC is in P27) In order to fix this anomaly the creation of a new flagbit was deemed advisable:

POOHFLAG, bit 15 of flag 3, is set by the P00 integration job and reset whenever V37 is used to select any program other than P00.

- 2) Anomaly LNY-90 was repaired. (Display conflict between P63 and V97 between TIG and TIG +26) This anomaly was fixed by connecting the descent guidance equations to Servicer at TIG and making the guidance check the status of a new flagbit ZOOMFLAG (bit 8 of flag 5). If ZOOMFLAG is set the landing guidance equations are executed, but if it is reset all guidance is bypassed and just the display of noun 63 is performed (except when V97 is on the DSKY). ZOOMFLAG is reset at TIG -5 and set at TIG +26 by the throttle-up task.
- 3) Anomaly LNY 81 was repaired by creating two new erasables for shaft and trunnion commands, TRUNNCMD and SHAFTCMD.
- 4) ACBR #43 was implemented. Assembly Control Board Request #43 changed the displays put up by the Ascent, Descent, and Aborts from "R-type" displays to "non-R" displays. This causes one less vac job to be set up every 2 seconds during these programs.
- 5) ACBR #44 was implemented. This change results in the Ascent and Abort guidance performing a STOPRATE if thrust does not meet the criterion of the Thrust Magnitude Filter (ATMAG). Formerly a ZATTEROR was performed.
- 6) PCR 847 was implemented. (Eliminate Possible Lock-out of Pitchover from P12, P70, and P71).
- 7) PCR 832.2 was implemented. (Remove restriction of running R05 only in P00).
- 8) PCR 848 was implemented. (Prevent RR ECDUs from Stealing LGC Memory Cycles).

### Major Changes Incorporated into Revision 111

Note: Revision 111 was made in order to fix assembly problems in Revision 110.

- 1) PCR 841 was implemented. (PGNCS Derived Attitude Rates on FDAI Error Needles). Verb 60, formerly used to switch the LR to position 2, was re-assigned the function of commanding the DAP to display vehicle rates on the error needles. The task of switching the LR to position 2 was assigned to verb 59, heretofore a spare verb. As part of this PCR a new flagbit was created: NEED2FLG (bit 15 of flag 0).

### Major Changes Incorporated into Revision 112

- 1) PCR 854 was implemented. (Provide a Flexible Method for Crew to Modify RLS). As part of this PCR a new noun was created which the astronaut can load with the desired displacements of the landing site. (Noun 69: R1 = DELTA Z COMP., R2 = DELTA Y COMP., and R3 = DELTA X COMP. - all components are scaled at whole feet.) In addition six new padloads were added to the W-Matrix area that must be initialized to zero, DLAND - DLAND +5.
- 2) Anomaly LNY 91 was repaired. (CDU Fail Program alarm is given in P20 when it is not an alarm condition - during an RR CDU Zero).
- 3) PCR 853 was implemented. (Restrict V35 to P00) An operator error indication will result if Verb 35 is keyed in if the LGC is not in P00 or in a state resulting from a fresh start.
- 4) ACBR #L3 was implemented. (Make the erasable for R3 in noun 49 unshared).
- 5) PCR 842 was implemented. (Modification of criteria used to determine DAP phase plane parabola intercepts.)

Major Changes Incorporated into Revision 113

- 1) PCR 355 was implemented. (Begin Reading LR Velocity as soon as Velocity Data Good Appears).
- 2) PCR 284 was implemented. (VGTIGs on Coast/Align downlist). Words 27, 28, and 29 of the Coast/Align downlist (formerly Delta Beta, Delta Theta, RR shaft error counter, and RR trunnion error counter) were placed by the vector VGTIG.