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LUMINARY Memo #58

TO: Distribution
FROM: C. Schulenberg
DATE: 17 December 1968
SUBJECT: LUMINARY Revisions 62 - 64

Major Changes Incorporated into Revision 62

- 1) Necessary coding was re-inserted into the DAP 1/ACCS routine in order to zero the erasables ALLOWGTS and INGTS every pass when in the ascent configuration.
- 2) PCR 616 was implemented (Accumulate and Downlink Jet Control Torque).
- 3) STG anomaly #42 was corrected in R24 by zeroing RADCADR after the call to R61 initiated by a V32E to the V16N80 display.
- 4) An attempt was made in R10 to correct the forward and lateral velocity monitor logic for an extreme case of needle behavior.
- 5) The value of RDESGAIN (the gain used by DODES) was restored to the GSOP value.
- 6) The constant TRIMACCL (used by Descent Guidance) was changed to conform to the GSOP.
- 7) The constant HIGHESTF (used by Descent Guidance) was changed to conform to the GSOP.

Major Changes Incorporated into Revision 63

- 1) A missing instruction was re-inserted into DAPIDLER. Without the instruction the job 1/ACCSET was being set up with a random priority.
- 2) The values of the APS minimum impulse parameters K1VAL, K2VAL, and K3VAL (used by P42) were corrected. PCN 652 was written to document this change in the GSOP.

- 3) The constant FMAXPOS (used by Descent Guidance) was changed to conform to the GSOP.
- 4) The implementation of PCR 623 (Use same noun numbers for P32 and P33 in Luminary and Colossus 2) was completed. The noun tables had been changed correctly in an earlier revision but the programs had not been modified to put up the new nouns.
- 5) Noun 87, used by R52 and AOTMARK, was changed to use two unshareable erasables so that whatever values were loaded would remain intact.
- 6) PCR 258 was implemented (Redefinition of vertical rise velocity cutoff).
- 7) PCR 634 was implemented (Correct design flaw in R61/R65 for high LOS rates).
- 8) The forward/lateral velocity monitor in R10 was corrected so that an accurate record of the cross-pointer needle positions would be kept under all instances.
- 9) Sundance anomaly Y89 was fixed in Luminary. This prevents IMU compensation from being lost if NBDONLY occurs when a V40N20E is in progress (with DRIFTFLG set) or when a V47E is done (with DRIFTFLG set and the IMUSE flag reset).
- 10) A new erasable was defined and two instructions were added to the DAP NEEDLER routine to prevent needle jitter in the Mode 1 FDAI display.
- 11) PCR 632 was implemented. (Allow astronaut to continue landing display when radar does not achieve position #2) A V34E to the flashing V05N09 R1=00523 display issued by R12 will now terminate R12 but allow a landing to continue.
- 12) Coding was added to the AOTMARK routine to allow 5 marks in P57.
- 13) The 01412 abort (Descent ignition algorithm not converging) was changed from a POODOO (GO-TO-R00) abort to a simple alarm.
- 14) In the descent guidance equations an index value was changed in order to conform to the GSOP. Formerly only two passes instead of three were being made through the quadratic guidance equations in the ignition algorithm of P63.
- 15) PCR 635 was implemented (FINDCDUW gain change for CSM-docked burns).

- 16) A program error was fixed in the MFREF routine of P57.
- 17) A program error was fixed in the R12 LR data incorporation logic. The updated delta-H and delta-V were incorrect by a factor of 2.
- 18) The erasable RGU was moved so that it no longer overlays RN1. This corrected a downlink problem for the landing programs since RGU is on the downlink, but was being overwritten by RN1 every two seconds.

Major Changes Incorporated into Revision 64

- 1) A precautionary resetting of the interpretive pushlist pointer was added to the P63 ignition algorithm.
- 2) PCR 640 was implemented (Remove the instabilities and excessive overshoots from the RR designate routine, R21).
- 3) The variance computations for range-rate incorporation in P20 were modified to increase accuracy.
- 4) A check was added to the logic in R12 that lights or extinguishes the two DSKY fail lights for the LR in order to avoid modifying the lights if a lamp test (V35E) is in progress.
- 5) An erasable problem was corrected for the P63 ignition algorithm.
- 6) LUMINARY anomalies LNY 6 and LNY 9 were dispatched by inserting coding into PINBALL that truncates inputted channel numbers in V11N10E XXXXXE and V21N10E XXXXXE to be octal 777 or less.