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LUMINARY Memo #156

To: Distribution
From: D. Densmore
Date: 9 June 1970
Subject: LUMINARY Revisions 159-163

Revision 163 was released on May 4, 1970 as LUMINARY 1D.

The following changes were incorporated into Revisions 159-163.

1) (PCR 310)

The time to call the 511 Alarm was changed from 2 to 10 seconds.

- a) A counter, 511CTR, was defined in erasable at WCHPHOLD +1, which had been a "FILLER" within the P60s overlay.
- b) 511CTR was initialized to FOUR to cause the 511 alarm to be issued after 10 seconds in just before doing the POSTJUMP to BURNBABY after initializing landing radar.
- c) Routine 511? in the MUNRETRN section of SERVICER was rewritten to call the 511 Alarm only on the fifth pass through (i. e. after 10 seconds). 511CTR is decremented each time through until it equals +0. Then the alarm is issued and -0 is placed in 511CTR to cause it to branch around the alarm in the future.
- d) Routine POSCHNG? in the same area was changed to set 511CTR to FOUR to re-enable the 511 alarm.
- e) NO511FLG which is no longer used under the new logic, was deleted.

2) (PCR 942)

HLROFF was moved from sharing with MKTIME to sharing with DELLT4. It turned out that MKTIME was used by the landing radar as well as the rendezvous radar. The comments for MKTIME were changed to note this to avoid a repetition of this mistake.

3) (PCR 307)

Original implementation of this PCR was corrected to place TSIGHT and CURSOR on the downlist in that order rather than in the reverse order. TSIGHT is now word 99 of the lunar surface align downlist; CURSOR is word 100.

4) (PCR 1027)

- a) V58 (TEROFF) was changed to branch to GOPIN rather than falling into V68 (TEROFF) to turn off the terrain model. It is not useful for the terrain model to be turned off here because one might sometime want to turn the landing radar off and then later back on. In that case the terrain model would be inhibited and not re-enabled.
- b) Coding in the terrain model formerly used DELTAH as a temporary storage register with intermediate DELTAH computations as well as the final one. DELTAH is on the downlink, however, and one of the intermediate values could have been transmitted. The coding was changed to use the push list for intermediate storage.

5) (PCN 1036)

This PCN modified PCR 996 to specify that NODOP07 flag be set by V37. This was to ensure that the uplink summing would not be done in flight even if the bit should not get set properly by the padload. This is important because UPSUM shares with ABDELV. This change (setting NODOP07 in V37) was made.

6) (PCR 996)

Fresh Start was changed to leave NODOP07 alone when doing SWINIT initializations of the flagwords. This way once it is set not even a fresh start can clear it. This bit is used to prevent system tests in flight.

7) (Anomaly L-1C-06)

The original implementation of this moved the ENGINOF1 call to turn off the engine on a V37 to before average G is turned off in order to turn ullage off immediately if it is on. However it was moved out of INHINT and to a place with the wrong SUPERBANK setting. These two things were done at the new location.

8) (Anomaly L-1C-03)

A change was made to fix V59 LR repositioning. LRBYPASS is now checked to check for P63, P64 or P66, instead of just checking for P63, in the case that Average G is on.

9) (ACB L-25)

The master ignition routine was changed to enable erasable programs to use it. TCFs were changed to TCs, CAFs to CAs, and one BZF to a CCS construction.

10) (PCN 1037)

- a) The STOPRATE was removed from P66 initialization because it interrupted any attitude control of the spacecraft when RODs are skipped.
- b) The setting of REDFLAG was removed from P66 initialization; it is not necessary to reset it since the redesignation monitor is terminated when P66 begins.
- c) A STOPRATE was provided when a 1466 alarm occurs because attitude rates should be terminated when the PGNCS is having difficulty controlling the spacecraft.

11) (PCR 1021)

Four erasables in the landing padload overlay of W-matrix were deleted as they should have been with the original implementation of this PCR (use precomputed LR transformation matrices from fixed memory): LRALPHA, LRALPHA2, LRBETA1, and LRBETA2.

12) (PCR 896)

VSELECT was to have been put on the downlist as word 116 of the Ascent/Descent downlist, following the CDUs. TRKMKCNT was formerly in that location. It appeared that there was no place else to move TRKMKCNT so VSELECT was defined to share with it. VSELECT is the X, Y, or Z LR beam associated with VMEAS. TRKMKCNT is temporary mark storage.

- 13) When TLAND replaced AGSK and AGSK went to E6 the EBANK=AGSBUFF no longer set the right EBANK for AGSK and, although no cuss resulted, a **2**CADR defined for AGSINIT had the wrong EBANK. The declaration was changed to EBANK= AGSK.