

APOLLO SPACECRAFT SOFTWARE CONFIGURATION CONTROL BOARD
PROGRAM CHANGE REQUEST

NUMBER (Completed by FSB)

MIT-PCN

688

1.0 COMPLETED BY ORIGINATOR

1.1 ORIGINATOR A. KLUMPP	DATE 1/9/69	1.2 ORGANIZATION MIT	APPROVAL <i>J. W. Cherry</i>	DATE 1/16/69
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1.3 EFFECTIVITY LUMINARY 1A	1.4 TITLE OF CHANGE Guidance Frame Erection Check
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1.5 REASON(S) FOR CHANGE
See Data Amplification Sheet

1.6 DESCRIPTION OF CHANGE
See Data Amplification Sheet

2.0 SOFTWARE CONTROL BOARD OR FLIGHT SOFTWARE BRANCH
DECISION FOR VISIBILITY IMPACT ESTIMATE BY MIT

2.1 <input type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED	2.2 REMARKS:
2.3 SOFTWARE CONTROL BOARD OR FLIGHT SOFTWARE BRANCH SIGN OFF	
DATE	

3.0 MIT VISIBILITY IMPACT EVALUATION:

3.1 SCHEDULE IMPACT	3.2 IMPACT OF PROVIDING DETAILED EVALUATION
3.3 STORAGE IMPACT	3.4 REMARKS:
3.5 MIT COORDINATOR	
DATE	

4.0 SOFTWARE CONTROL BOARD ACTION

4.1 <input type="checkbox"/> IMPLEMENT AND PROVIDE DETAILED CHANGE EVAL. <input type="checkbox"/> PROVIDE DETAILED CHANGE EVALUATION <input type="checkbox"/> DIS-APPROVED	4.2 REMARKS
4.3 SOFTWARE CONTROL BOARD SIGN OFF	
DATE	

5.0 MIT DETAILED PROGRAM CHANGE EVALUATION

5.1 MIT COORDINATOR	5.2 MIT EVALUATION
DATE	

6.0 SOFTWARE CONTROL BOARD DECISION ON MIT
DETAILED PROGRAM CHANGE EVALUATION

6.1 <input type="checkbox"/> START OR CONTINUE IMPLEMENTATION <input type="checkbox"/> DISAPPROVED OR STOP IMPLEMENTATION	6.2 REMARKS:
6.3 SOFTWARE CONTROL BOARD SIGN OFF	
DATE	

APOLLO SPACECRAFT SOFTWARE CONFIGURATION CONTROL BOARD

-DATA AMPLIFICATION SHEET -

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PROGRAM CHANGE
REQUEST NO. 688PREPARED BY: Klumpp
DATE: 69 01 09ORGANIZATION:
MIT/ILCONTINUATION SECTION (REFER TO BLOCK NUMBER AND TITLE
ON PROGRAM CHANGE REQUEST FORM)

1.5 Reasons for Change

The landing guidance equations are solved in a floating coordinate frame which is presently erected each pass thru the guidance equations. The consequence of erecting the guidance coordinate frame (GCF) backward, (rotated 180 degrees about the vertical) is that the LM turns upside down and crashes. This phenomenon has been observed in several independent simulations. The targeting for the previous one-phase trajectories made it impossible for the GCF to be erected backward. With many of the trajectories presently being considered, the criteria precluding backward erection are no longer met. However, it can be shown that the GCF will always be erected forward provided it is only erected when time-to-go is between certain limits. These limits are a function only of the targeting. With the proposed change, trajectory restrictions are eliminated, and we can permit trajectories which are far closer to the desires of the FCSD than were previously considered possible. Without the proposed change, certain of these trajectories would be precluded.

1.6 Description of Change

- A. Establish 4 erasable cells in the W matrix along with the descent targeting parameters for the storage of time-to-go limits for the braking and approach phases.
- B. Branch around erection of the GCF whenever time-to-go is outside the limits for the current phase.

REMARKS

TP#21812