APOLLO SPACECRAFT SOFTWARE CONFIGURATION CONTROL BOARD PROGRAM CHANGE REQUEST

NUMBER (Completed by FSB): 700

1.0 COMPLETED BY ORIGINATOR

1.1 ORIGINATOR	DATE	1.2 ORGANIZATION	APPROVAL	DATE
G. Cherry	1/15/69	MIT/IL	G. W. Cherry	15 Jan 1969

1.3 EFFECTIVITY: Luminary 1A

1.4 TITLE OF CHANGE: Improve the Rate-of-descent Mode (P66) Performance

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 ☐ APPROVED ☐ 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: baseline 15 March 1969

3.2 IMPACT OF PROVIDING DETAILED EVALUATION

3.3 STORAGE IMPACT

3.4 REMARKS:

3.5 MIT COORDINATOR: J. W. C.

DATE: 15 Jan 1969

4.0 SOFTWARE CONTROL BOARD ACTION

4.1 ☐ IMPLEMENT AND PROVIDE DETAILED CHANGE EVAL. ☐ PROVIDE DETAILED CHANGE EVALUATION ☐ DISAPPROVED

4.2 REMARKS

4.3 SOFTWARE CONTROL BOARD SIGN OFF

DATE

5.0 MIT DETAILED PROGRAM CHANGE EVALUATION

5.1 MIT COORDINATOR

DATE

5.2 MIT EVALUATION

6.0 SOFTWARE CONTROL BOARD DECISION ON MIT DETAILED PROGRAM CHANGE EVALUATION

6.1 ☐ START OR CONTINUE IMPLEMENTATION ☐ 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. 700	PREPARED BY: G. Cherry DATE: 1/15/69	ORGANIZATION: MIT/IL

CONTINUATION SECTION (REFER TO BLOCK NUMBER AND TITLE ON PROGRAM CHANGE REQUEST FORM)

1.5 1. Neil Armstrong has mentioned that if the rate-of-descent mode program (p66) is entered from P64, P65, or P67 with a high sink rate that a very large number of clicks must be enterd with the ROD switch. Furthermore, some of these clicks seem to get lost. Neil suggested that we explore a scaling change which would command greater change then 1 ft/sec/click.

2. Pete Conrad has mentioned some difficulties with P66 on the LMS. When he was changing the attitude of the spacecraft rapidly and simultaneously commanding a change in descent rate via the ROD switch, the system seemed to come up with a different rate from the one intended and commanded.

1.6 Design improvements are currently being studied. One design change proposed at MIT which would help with the problem Neil noted would be to establish a pad-loaded descent rate on the first entry to P66. This pad-loaded value could be, say 5ft/sec, and if the astronaut entered P66 while descending at 15 ft/sec the program would immediately without ROD switch clicks adjust the throttle to establish 5ft/sec descent rate. This modification might allow us to retain the present scaling, 1ft/sec, for fine descent rate adjustment.

Another modification being explored is to examine higher sample frequencies for measuring descent rate, accounting for input ROD clicks, and adjusting the throttle. The engine can react to a commanded change within one second, but the program changes the command thrust only once per two seconds.

The optimization of τ_A in Fig. 3.4.4-15 (page 5.3-137) will also be undertaken.

REMARKS