

GEORGE C. MARSHALL SPACE FLIGHT CENTER
HUNTSVILLE, ALABAMA

Memorandum

Thru: ~~Mr. Kampmeier, R-ASTR-BV~~ *Rec'd*
6/27/68

TO Mr. Simmons, I-I/IB-U

DATE June 27, 1968

FROM Chief, G&C Systems Analysis Branch,
R-ASTR-NG

In reply refer to:
R-ASTR-NG-96-68
CMcMahan/FHopkins/lw/876-8476

SUBJECT AS-205/CSM-101 Final Flight Data Document (FFDD)

1. Enclosed is the subject FFDD for delivery to the IU contractor in accordance with the requirements of contract NAS8-14000.
2. Copies of all documents cited in the enclosure have been delivered to personnel of the IU contractor.

Sat (B)
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J. E. Blanton
for M. Brooks

1 Enc:
a/s

Approval:

F. B. Moore
for F. B. Moore
Chief, Guidance and
Control Division

FINAL FLIGHT DATA DOCUMENT
for the
AS-205/CSM-101
LVDC FLIGHT PROGRAM

Astrionics Laboratory
George C. Marshall Space Flight Center
Huntsville, Alabama

24 May 1968 *

Enc 1'

AS-205/CSM-101 Final Flight Data Document

This document presents the final revision of the constants to be used in the LVDC flight program for the AS-205/CSM-101 mission. The flight program including presettings shall be as established by the AS-205/CSM-101 Final Mission Defining Document dated 22 December, 1967, plus subsequent approved change orders plus the following new data:

1. Time tilt and guidance presettings shall be as given in
 - a. Operational Trajectory Data Report, May 15, 1968, "AS-205/CSM-101 Launch Vehicle Operational Trajectory." Non-wind biased time tilt shall be used.
 - b. Presettings related to accelerometer backups shall conform with paragraph 5 of this document.
2. The M/F filter constants shall be as given in "AS-205 Presetting Recommendation," R-ASTR-F-68-74, April 26, 1968.
3. The active telemetry stations and their locations are given in "Launch Vehicle Real Time Network Support for the SA-205/CSM-101 Mission," I-MO-R-52.1-68, May 8, 1968.
4. The flight sequence of events is given in ICD 40M 3360A plus IRN's. Certain pairs of events in time base 4 must retain the time separation prescribed by the ICD even though a time base update may be received between the events. The program must include logic to prevent a time base update from altering the times between the pairs of events listed below:

<u>EVENT</u>	<u>TIME IN T4*</u>
Passivation "B" Enable	0.5
LH ₂ Tank Passivation	0.6
Valve Open Enable	
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LH ₂ Tank Passivation	0.6
Valve Open Enable	
LH ₂ Tank Passivation	2.7
Valve Open Disable	
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<u>EVENT</u>	<u>TIME IN T4*</u>	
Flight Control Computer	3.5	
S-IVB Burn Mode Off "A"		
Flight Control Computer	3.7	
S-IVB Burn Mode Off "B"		
<hr/>		
LOX Tank Vent Valve	43.2	
Boost Close On		
LOX Tank Vent Valve	45.2	
Boost Close Off		
<hr/>		
LH ₂ Tank Vent Valve	1263.4	2933.0
Boost Close On		
LH ₂ Tank Vent Valve	1265.4	2935.0
Boost Close Off		
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LOX Tank NPV Valve	5062.0	
Open On		
LOX Tank NPV Valve	5064.0	
Open Off		
<hr/>		
Telemetry Calibrator		
In-flight Calibrate On		
Telemetry Calibrator	See paragraph 6	
In-flight Calibrate Off		
<hr/>		
TM Calibrate On		
TM Calibrate Off	See paragraph 6	

* Times shown are as given in ICD40M33605A and IRN's through R-18. If subsequent revision to the ICD shifts the event pairs to different times or adds more occurrences of any event pairs, the revised or additional occurrences shall also be subject to the critical events logic.

5. The presettings for the accelerometer backup routine shall be as follows:

F₁, First Stage Thrust: 7,600,000 kg-m/sec²

F₂, Second Stage Thrust Pre PMR: 992,061.29 kg-m/sec²

F₃, Second Stage Thrust after PMR: 842,655.61 kg-m/sec²

M₁, S-IB Mass Rate: 2,814.22 kg/sec

M₂, S-IVB, Pre PMR Mass Rate: 239.14539 kg/sec

M₃, S-IVB after PMR Mass Rate: 201.69072 kg/sec

M₀₁, Mass At First Motion: 585,217.8 kg

M₀₂, Backup Mass at S-IVB 90% Thrust: 133,336.0 kg

6. The following special sequence shall be programmed to occur at each telemetry station acquisition while in orbit. The items listed shall be removed from the timed flight sequence list in timebase 4.

Special Sequence
Initiated by Telemetry Station Acquisition

Telemetry Calibrator				
In-Flight Calibrate On	0010	0010	IU 23	Acq+ 60.0
TM Calibrate On	0100	1010	S-IVB62	Acq+ 63.0
TM Calibrate Off	0000	0111	S-IVB63	Acq+ 64.0
Telemetry Calibrator				
In-Flight Calibrate Off	0001	0010	IU 24	Acq+65.0

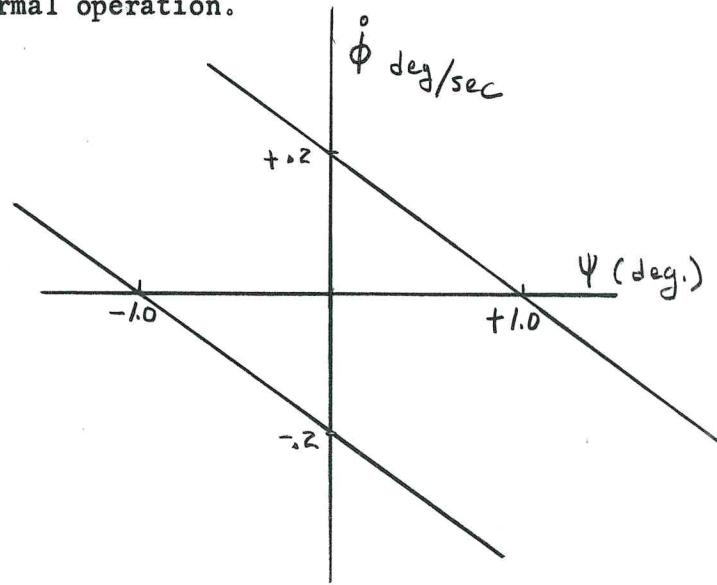
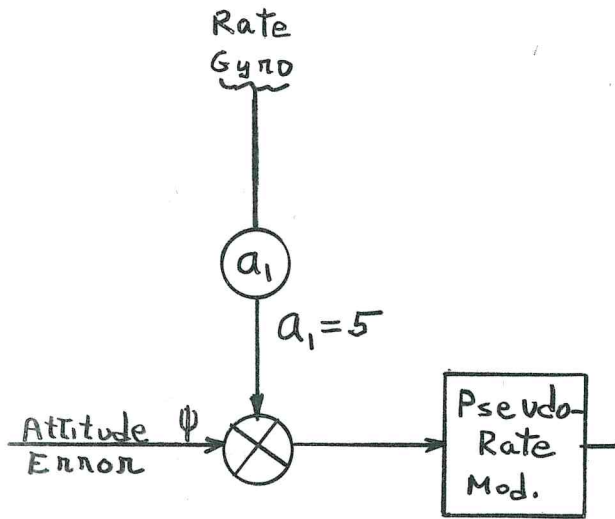
TABLE 1
 MAXIMUM EXPECTED S-IVB ATTITUDE RATES FOR USE IN
 EVALUATION OF LEM RECONTACT DURING WITHDRAWAL

<u>CONDITION</u>	<u>MAXIMUM PITCH VELOCITY</u>	<u>MAXIMUM YAW VELOCITY</u>	<u>MAXIMUM ROLL VELOCITY</u>
1. Saturn IB/S-IVB a. No platform failure, ±1° deadband	±.0152°/s	±.0142°/s	±.048°/s
2. Saturn IB/S-IVB a. Platform failure, no attitude deadband	±.170°/s	±.170°/s	±.170°/s
3. Saturn V/S-IVB a. No platform failure, ±1° deadband	±.015°/s	±.015°/s	±.051°/s
4. Saturn V/S-IVB a. Platform failure, no attitude deadband	±.170°/s	±.170°/s	±.170°/s

Enclosure 1

FIGURE 1

A. Pitch yaw and roll deadband for normal operation.



B. Pitch yaw and roll deadband for operation under platform failure conditions.

