

GEORGE C. MARSHALL SPACE FLIGHT CENTER
HUNTSVILLE, ALABAMA

Memorandum

TO : Mr. Simmons, I-I/IB-U
Through: ~~Mr. Kampmeier, R-ASTR-BV~~
REM

DATE: July 17, 1967

FROM : Chief, Guidance and Control
Systems Analysis Branch, R-ASTR-NG

In reply refer to:
R-ASTR-NG-56-67
CMcMahan/FHopkins/lw/876-8476

SUBJECT : AS-206, S-IVB restart alternate mission flight
program definition

1. The attachment provides initial information for use in establishing the LVDC flight program for a proposed AS-206 restart mission (Enclosure 1).
2. The information contained in the attached alternate mission definition is based in part upon ground rules and agreements established in the following:
 - I-I/IB-E-186-67, April 19, 1967, "Saturn IB - S-IVB backup mission."
 - R-AERO-P-249-67, June 5, 1967, "Saturn IB - S-IVB restart backup mission."
 - I-I/IB-E-335-67, June 6, 1967, "Minutes of backup AS-206 S-IVB restart mission."
 - R-AERO-P-264-67, June 14, 1967, "Saturn IB, AS-206 restart mission meeting."
 - I-I/IB-E-363-67, June 23, 1967, "AS-206 backup S-IVB restart mission IBM software meeting."

Additionally, certain mission criteria, particularly restart and second burn orientation, orbital maneuvers, and sequencing, have been established on the basis of undocumented discussions between R-ASTR-NG and other MSFC offices. Any corrections or additions to this information should be communicated to Mr. McMahan, R-ASTR-NG, as soon as possible.

SAT IB

A. E. Blanton
Lr M. Brooks

1 Enc:
a/s
Approval:

for *E. B. Cassaway*
F. B. Moore
Chief, Guidance and
Control Division

cc:

I-I/IB-E, Mr. Germany
I-I/IB, Mr. Mann
I-I/IB-U, Mr. Hight
R-AERO-FM, Mr. Hardage
R-AERO-P, Mr. Jackson
R-P&VE-VOO, Mr. Byers
R-ASTR-N, Mr. Moore
R-ASTR-NG, Mr. Brooks
R-ASTR-NG, Mr. McMahan
R-ASTR-NG, Record file/branch file
R-ASTR-X, Reference file

AS-206 S-IVB RESTART ALTERNATE MISSION DEFINITION

PURPOSE: The purpose of this mission is an orbital restart test of the S-IVB stage. The mission profile is to simulate AS-501 restart environment.

CONFIGURATION: S-IB-6, S-IVB-206, S-IU-206, SLA, and NC (Nose Cone) #2. There will be no spacecraft or LM.

MISSION CRITERIA
& FLIGHT PROGRAM
REQUIREMENTS:

Launch Pad 37B

Launch azimuth 72°

Into Orbit Boost: Use AS-205X guidance presettings and end conditions until specific parameters are available.

Orbit: Approximately 100 nm circular. NC/SLA/S-IVB/IU remain attached for restart

S-IVB EMR #1 is 5.5: 1,

S-IVB EMR #2 is 4.5: 1 for 13 sec, then closed loop PU.

Restart preparation sequence to be the same as 501 and begun as a function of time during the second revolution following acquisition of the U. S. West Coast. Backup will be by DCS generalized Switch Selector Command.

Orbital Maneuvers & Second Burn: Launch vehicle to maneuver to local horizontal hold ($\pm 1^\circ$), nose leading, position I down starting 10 to 20 seconds after insertion. It will hold this local attitude until 30 seconds prior to second ignition at which time it is to hold the existing inertial attitude. This inertial attitude will be held during second burn and until 30 seconds after second J-2 cutoff at which time local horizontal, nose leading, position I down attitude is to be re-attained then held throughout mission lifetime. The S-IVB APS system shall be used for maneuvering, as required, dependent upon boost or coast operation.

Second burn cutoff will be commanded by fuel depletion.

COMMUNICATION
COVERAGE:

Total communication coverage is mandatory during restart preparation, restart, and second burn including cutoff. Station acquisition and loss shall be determined by on-board navigation in order to make post second-burn coverage independent of orbital uncertainties. As a backup to starting telemetry coverage for the second burn coverage, acquisition shall have a time backup 10 seconds before nominal Guaymas acquisition on second orbit; and loss shall be inhibited until after subsequent nominal Bermuda loss.

SEQUENCE OF EVENTSAND TIME BASES:

Pending availability of a specific sequence, it is recommended that the AS-206 sequence be used for time bases up through TB3.

TB4 will be the first coast period and will be similar to TB5 on AS-501 with over-station events controlled by navigation rather than by time.

TB5 will be restart sequence and will be similar to TB6 on AS-501.

TB6 will be the second coast sequence and will be similar to TB7 on AS-501 with over-station events controlled by navigation.