

R-ASTR-NG-156
WChubb/lw/876-7418

Memorandum

TO Mr. McNair, Secretary,
Flight Mechanics, Dynamics, Guidance and Control Panel, R=AERO-P

DATE JAN 11 1965

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

SUBJECT Definition of Maximum Expected S-IVB Attitude Rates
for Use in Evaluation of LEM Recontact During Withdrawal

1. In order to fulfill the requirements of agenda item 11.8 of the eleventh Flight Mechanics Panel Meeting, a study had been made to determine the maximum expected S-IVB attitude rates for use in evaluation of LEM recontact during withdrawal. Table 1 contains the results of this study. Following are the assumptions used in preparation of this table:

- a. Rate gyro uncertainty $\pm .12^\circ/\text{s}$.
- b. Rate gyro channel electronic circuitry uncertainty $\pm .03^\circ/\text{s}$.
- c. Rate gyro "a₁" gain equals 5 for normal operation.
- d. Rate gyro "a₁" gain equals 50 for operation under platform failure conditions.

Deadbands for normal and platform failure conditions are shown in Figure 1.

J. L. Mack
J. L. Mack

2 Enc:
a/s

Approval:

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

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SAIT 1/13/65

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for Use in Evaluation of LEM Recontact During Withdrawal

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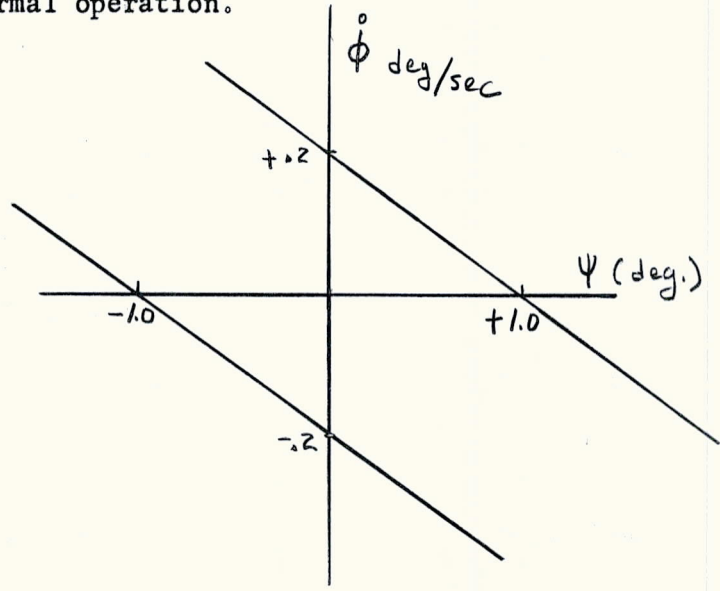
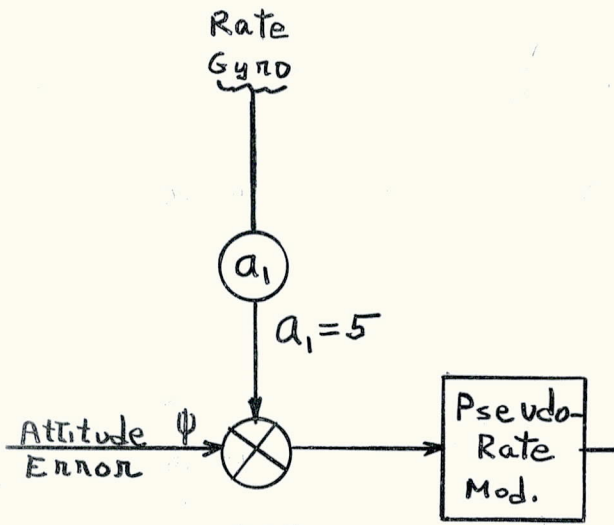
TABLE 1
 MAXIMUM EXPECTED S-IVB ATTITUDE RATES FOR USE IN
 EVALUATION OF LEM RECONTACT DURING WITHDRAWAL

<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.

