

# MSC INTERNAL NOTE 66-FM-50

APOLLO

COMMAND MODULE  
GUIDANCE COMPUTER SOFTWARE  
REQUIREMENTS

MISSION AS-205

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1. GENERAL

The AGC functional requirements for Mission AS-205 are largely satisfied by the programs and routines described in R-507, MIT/IL Systems Operation Plan for AS-204.

Except for changes directed or approved by MSC, the programs, routines, and associated equations described in R-507 will apply directly to AS-205. In addition, all properly approved changes to present or future editions of R-507, although nominally relating to AS-204, will automatically extend to AS-205 programs and documents.

2. REQUIREMENTS IN ADDITION TO, OR DEVIATING FROM, AS-204 REQUIREMENTS

a. Requirements for Experiment S-16, "Trapped Particle Asymmetry." These requirements are as follows:

- (1) Orient a spacecraft-fixed sensor to a specified position relative to the local magnetic field,  $\vec{B}$ , in accordance with MSC-supplied equations. The orientation is to take place when the spacecraft is in the region of the "South Atlantic anomaly," presumably for about 10-15 minutes per orbit for up to seven consecutive orbits. The desired sensor orientation requires maintaining the S/C +Y axis along  $\vec{B} \times \vec{R}$   $\pm 2$  degrees, where  $\vec{R}$  is the earth-centered radius vector, and the S/C -Z axis is displaced 32 degrees, 31 minutes,  $\pm 2$  degrees from  $\vec{B}$ .
- (2) Monitor time to go to anomaly; when this time becomes zero, monitor latitude and longitude of the spacecraft.
- (3) Provide astronaut control or override of initiation of CDU drive, based on latitude/longitude display and known contours of equal field strength, in order to avoid wasting RCS fuel.

b. Requirements for Experiment S-17, "X-Ray Astronomy." These requirements are to provide downlink attitude angles and optics angles as

often and as accurately as possible. The optimum specifications are as follows:

- (1) Angles relating S/C to stable member once per second with an error of 1 arc minute or less.
- (2) Optic angles once every other second to 1 arc minute.

c. Additional Requirements. These requirements are as follows:

- (1) In SPS orbital prethrusting programs, provide an astronaut the option to specify "heads up" or "heads down" for the SPS burn.
- (2) During Launch Phase, calculate and display sideforce parameters. The equations necessary and times to start and end the calculation will be furnished by MSC.