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**BELLCOMM, INC.**  
1100 Seventeenth Street, N.W. Washington, D.C. 20036

**SUBJECT:** S/C 101 Software FACI,  
Case - 310

**DATE:** October 10, 1967

**FROM:** W. G. Heffron

MEMORANDUM FOR FILE

~~TOP SECRET~~

On October 4, 1967 MIT held the First Article Configuration Inspection (FACI) on the Sundisk software program, intended for use in S/C 101. This inspection is held to review the condition of the program before it undergoes final verification and release for safe manufacture and flight.

Because the program has been under configuration control since September 21, 1967, errors which have been discovered since then have not been corrected. Some are serious, namely,

1. P11 (Earth Orbit Insertion Monitor) is not restart protected. If a restart occurs, "engine fail" is assumed leading to abort preparations.
2. P05 (G&N Startup) has a 3 second period with restart vulnerability. One of the time clocks would be lost, fouling up computer operations.
3. P23 (Midcourse Navigation) sighting data (angles, time) is not on the down list. Ground inspection of this data is vital to verification of on-board navigation capability.
4. Polarity of attitude commands to Saturn may be wrong. Verbal contact with MSFC suggest all ICD's may be wrong.
5. Pressing "mark reject" and "error reset" should force a "fresh start" (Useful if computer hangs up incorrectly--this happened on pad with AS-501) but nothing happens.

There are 4 other minor errors. H. W. Tindall directed that these errors be corrected and that testing begin forthwith.

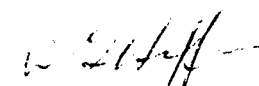
Considerable systematic testing has been accomplished including:

1. Every significant branch point for both computer logic and crew procedures has been exercised in tests.
2. Every line of GSOP crew procedures and equations has been compared with the software coding.

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3. Every alarm has been tested.
4. Every "extended verb" (special routines for displays, usually) has been tested.
5. Some 225 tests have been run on the digital autopilots.
6. Tests have been run on the digital simulator, the hybrid simulator and in the G & N Systems Test Laboratory.
7. Additional tests have included deliberately incorrect procedures, operation by untrained people and such to search for unanticipated problems.

Revised GSOP crew procedures (ch. 4) and equations (ch.5) will be issued. Autopilot description (ch. 3) will be complete in preliminary form about November 1, 1967.

  
W. G. Heffron

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T. M. Crawford-NASA/MAP  
T. A. Keegan-NASA/MA-2 ← COPY TO  
M. F. Sedlezak-NASA/MAP  
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