

*J. Newins
A. Down*

MIT Management Development Plan Meeting #9

12 December 1967

1. Sundance Development Plan

Handouts of the level 3 test status and the level 3, level 4 matrix were presented and discussed. R30 and R63 were again highlighted as possible pacing items. The starting of level 4 testing utilizing 13 people was briefly discussed. More work is required in the scheduling of level 4 testing and also co-ordination is needed between 23A and 23B to define the schedule that 23B needs for test support data.

2. Group 35 Personnel

In response to the action item of last week, it was stated that A. Green, R. Filene and H. Thaler were assigned to assist group 23B and that they would be available through level 4 testing of their programs/routines in Sundance, Luminary and Colossus.

3. Luminary PCR

PCR #4 "Closed Loop Utilization of DPS Throttle During Braking Phase" needs amplification as to which flight program should contain this modification.

Action Item - G. Cherry is to prepare a memo outlining MIT's interpretation and effectivity of this PCR or have NASA/MSC reissue the PCR with a more definitive explanation of what Mission Program is to contain this change.

4. AAP

It was mentioned that R. Ragan, L. Larson and N. Sears had given a presentation to C. Mathews of NASA on MIT/IL proposal for AAP.

5. Colossus Development Plan

An updated Colossus Development Plan was handed out and discussed. A GSOP review of Sections 4 and 5 was held this week and proved to be a very beneficial effort for the programmers and the corrections made to the GSOP.

Action Item - Fred Martin should develop MIT's position on the deletion of TLI and this position should be presented to NASA/MSC.

6. Sundisk/Colossus Section 3

The following schedule was presented for the Section 3 of the GSOP for Sundisk and Colossus.

- A. A legible draft of Sundisk Section 3 will be ready by December 22, 1967. A few copies of the draft will be bound and copies sent to K. Cox and G. Gimball of NASA.
- B. It is anticipated that the blue cover publication will become available about 1/25/67. This one month delay was questioned; further investigation is to be made by J. Dahlen to see if the publication cycle can be reduced.
- C. A legible draft of the Sundisk Autopilot Verification Results will be completed by 1/5/68. J. Vittek is responsible for editing and publishing.
- D. Certain changes must be made to the Sundisk Autopilot in order to support the Colossus GSOP. These changes include;
 1. R 03 interface
 2. Saturn (P15) Compatibility
 3. Fixing all identified Sundisk discrepancies and operational notes.

The R03 interface should be established by 1/17/68 to support level 3 testing. The other changes should be incorporated into the Colossus program by 1/31/68 and on that date a legible draft of the change pages to the Section 3 of Sundisk will be available.

The change pages, Sundisk Section 3 and an appropriate cover letter, will serve as the interim control document for the autopilots. A blue covered Colossus Section 3 should be available 2/18/68. Any autopilot changes after 1/31/68 will be done by PCR/PCN procedures.

Action Item - J. Dahlen is to investigate the reason for the one month required to type and publish Section 3 of Sundisk.

7. NASA Action Item

The action item to NASA for V-GAMMA polynomials and ranging functions for Return to Earth was discussed. NASA (G. Sabionski) stated that V GAMMA polynomials co-efficients and the Ranging Functions would not be available until some time after 12/15/67. In the meantime MIT will use the Auge Kugel method for the Ranging Functions and the old 504 polynomial coefficients.

8. Sundisk PCR's

PCR's that are being received for Sundisk are more work than the presently assigned Maintenance Group for Sundisk can handle. Efforts should be made to have PCR's for Sundisk disapproved so that the main efforts of MIT can be focused on Colossus.

9. Sundisk Boost Polynomials

MIT received an unofficial sixth order Boost Polynomial for Sundisk in response to an Action Item originated on 5/2/67. MIT is presently using a third order polynomial and will continue to do so unless official direction is received via the PCR procedure.

10. Erasable Memory Utilization

A presentation was given by A. Laats on the advantages and disadvantages of using the erasable memory in lieu of the fixed memory for programs like Prelaunch, Self Test, etc.. To accomplish the above would require:

1. Addition of a Fixed Memory Buffer Routine for communication.
2. Assembly and Manufacturing System for Erasable Memory Programs.
3. Modifying the "Store" instruction.

The changes to the "Store" instruction in the Interpreter were considered the most serious because of the change in execution time. It was stated that there might possibly be an execution time problem during Ascent and Descent but that this increase in execution time would be in effect negligible to the problem if it does exist.

It was decided that this change should be implemented and that the H-1800 would be used for Erasable Memory Assembly until the 360 was ready.

11. Hybrid Simulator Status

A. Sundance Level 4

1. Cockpit Operational - 12/15
2. LM Dynamics (LM-3) - 12/15
3. Rendezvous Radar - 12/8
4. Optics Displays (for P-52) - 12/20

Level 5

1. Radar Range/Range Rate displays - 2/16
2. Optics Displays (P51, COAS) - 1/12
3. SPS Backup - 2/16

B. Colossus Level 4

1. VHF Ranging - 1/15
2. Lunar Orbit Capability - 1/5
3. CSM Dynamics - 1/19
4. New Bending - 2/23

Level 5

1. Super Circular Engr-1/5
2. Dual Active Rendezvous - 3/22
3. Boost & Abort - 2/23

C. Luminary Level 4

Level 5

- *1. Dalto Software (drives) - 1/19
- *2. Dalto Calibration - 3/1
- 3. Dalto Interface (Software) - 2/16
- 4. Landing Radar - 2/16
- 5. Lunar Launch Capability - 3/8
- 6. Lunar Orbit Capability - 1/5

- 1. None defined as of
12/12/67

* These milestones not yet agreed to by J. Nevins. A memo is to follow.

Action Item - Program Managers should review this schedule for compatibility with their level 4 and 5 testing plan and schedule.

12. Data Exchange Procedure

Action Item - J. Dahlen is to develop inhouse procedures for the handling of Data. These procedures should be compatible with the NASA ASPO organization for Data Exchange.

13. GSOP Section 6

It was recommended by J. Dahlen that Section 6 be continually updated. This was excepted at the meeting if 23S could support this effort.

14. DAP Development Plan

The responsibility for Section 3 of the Sundance GSOP has been transferred to W. Widnall

W. Widnall has reorganized the GSOP slightly and added addition items to be contained in the Section 3.

Because of the large amount of work to be done in the autopilot area and the unavailability of experienced personnel W. Widnall also requested that direction and priorities be provided him by management.

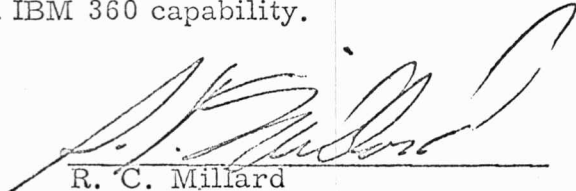
The DAP Verification Plan for Sundance will be available on 12/15/67.

The utilization of D. Keene in areas other than the DAP was questioned.

Action Item - W. Widnall is to present at the next meeting a Development Plan for the DAPs.

15. Action Items -

- A. R. Battin is to report on the investigation of what runs could be directed to the H-1800 facility and why this is not presently being done.
- B. R. Wieser is to investigate the change over from the H-1800 to the IBM 360 to see what can be done to accelerate the completion of a full IBM 360 capability.



R. C. Millard

RCM/km

Attendees

R. Ragan	J.S. Miller	F. Martin
D. Hoag	G. Cherry	N. Sears
R. Wieser	J. Dahlen	W. Widnall
R. Battin	E. Copps	R. Millard
L. Larson	W. Marscher	D. Lickly
P. Peck	P. Felleman	K. Greene
G. Sabionski(NASA)	A. Laats	J. Vittek

cc: Attendees

J. Sutherland	J. Henize	R. Morth
M. Hamilton	R. Scholten	P. Engle
L. Linehan	C. Schulenberg	M. Johnston
J. Kernan	A. Kosmala	J. Saponaro
W. Kupfer	E. Copps	J. Nevins