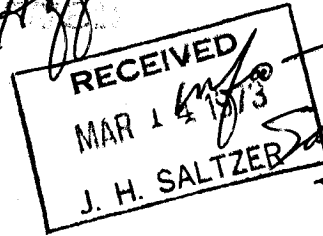


*Jerry*  
Reminder: please  
furnish me with the  
"Argonet Master Plan"  
as we discussed.  
Thanks - *Bob Hoffman*



To: List of Attendees

cc: JR Steinberg

Subject: FORUM Minutes of 3/6/73

Attendees: WJ Burner  
CT Clingen  
RC Daley  
JW Gintell

RM Gross  
RE Hoffman  
ED Kleinow

RA Roach  
LJ Ryan  
DR Vinograd  
SH Webber

A. H6180 Hardware Status

- two more Processor design problems fixed; more FCO's installed; expecting a large number of EIS updates to be installed starting next Monday.
- experiencing an elusive problem associated with opening and closing the panel on the operator's console.
- Mem-B and Mem-C were interchanged (as agreed at last FORUM).
- Ohlin completed study of MG power distribution measurements; we will be running at about 125 amps/leg even with the full two-million words of Bulk Store.

B. H6180 Software Status

- ran all day yesterday with full two-word two-way interlacing of memory.
- Card Reader and Card Punch DIM's are installed and working; Processor reconfiguration still not operational.
- RUNOFF and BCPL are not installed, will be needed by end of this week; GCOS and DEBUG are running fine.

C. Communications, Consoles, Terminals

- two of the Honeywell lines have problems, suspect LSLA.
- Burner reports that the TERMINET-300 (to be used as the Primary Initializer Console) may possibly be delivered next week; if not, then we won't get one for 4-6 weeks; this unit will be maintained by GE, not Honeywell.

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D. Progress on "Service"


- up to 22 users now simultaneously on system.
- running two full shifts on Saturday and Sunday; shutdown is now at 0400 on weekdays.
- had 24 crashes in 5 days last week.
- "Operator Interface" is underway.
- B39 operators are starting to complain about print quality on PRT202.
- two major groups of Systems Programmers have been moved from 645 to 6180; these two groups represent more than half of the total usage by the Multics Project.
- the "Carry Service" seems to be working OK.
- next week, we may begin to allow "selected users" to run test cases and trial problems.
- Roach to make comparison tests using the script(s).


E. Tech Square

- Bulk Store, Serial #02, is scheduled for update next Thursday.
- had a bad weekend--interface problem between CPU-B and Mem-D caused by bad cable; Kleinow isolated and fixed.

F. Miscellaneous

- the meeting closed after an extended discussion of the Master Plan with particular emphasis on target dates; pages 2-5 were revised.

  
R. E. Hoffman  
Account Manager, MIT

P.S. --The revised pages of the Master Plan are attached to these minutes. Also attached is a copy of a recent article from the MIT Tech. 

## Multics in operation, available to students

By Gary Cuscino

For its total efficiency, sophistication, and ease of utility, Multics (Multiplexed Information and Computing Service) ranks among the most advanced computing systems developed to date.

As pointed out by Jeff Broughton '75, member of the Student Information Processing Board (SIPB) executive committee, "Multics isn't a machine; it's a philosophy. It was designed to be a computer utility and it has come pretty close to that ideal design."

This original philosophy was conceived eight years ago, when a committee of MIT professors under the auspices of Project MAC in conjunction with General Electric, Bell Telephone, and the Advanced Research Projects Agency of the federal government set out to design an ideal time-sharing system.

The superiority of Multics is owed to several key features. First, it is endowed with a "virtual memory," which simply means the computer's memory space is practically limitless. If a program in the core is referenced, the machine will be able to use it directly, and if it is unreferenced the machine will automatically search its memory and bring it into core without the user's intervention.

Second, the system has "dynamic linking." It executes a program without any prior arrangement that it will be called and automatically "links," as it were, back to the user's program without halting execution.

Third, the system is fairly reliable in that much of the information it contains is stored on back-up tapes, so that if the

system should crash, all is not lost. Also, the user can specify exactly who he wants to have access to his file.

Users of Multics claim that utilization of its software is easier than any other system. It may be learned faster, has more powerful commands, and has the ease of being operated from a type-in terminal. It is extraordinary among other systems in that it is almost completely written (95%) in a higher level language, PL/I, instead of the usual assembler language.

Multics, however, is not without its shortcomings. "It has not yet achieved its goal of being a 24-hour-a-day computer utility available for use like electricity or water," according to Broughton. "It does not support dynamic graphics, use of fields longer than 256K [1024 words of information], is unwieldy, and tape reading isn't particularly good."

Multics will first be available commercially in 1974 on the Honeywell 6180 for a price of 5 to 7 million dollars. MIT has had its working system of Multics for two years, and the hardware, at this time, is housed in 545 Tech Square, on the third floor of the Computation Center under tight security.

When asked if the Multics system is open to students who are not already well-initiated into the use of computers, Broughton's answer was a definite yes; he said that time on Multics is available for use on "general projects, learning a language [PL/I, LISP, APL, FORTRAN, BASIC, and ALGOL], or for help in doing problem sets, can be obtained by applying directly to SIPB."

<u>Person Responsible</u>	<u>Target Completion</u>	<u>Activity</u>
<u>A. Field Engineering</u>		
Kleinow	COMPLETE	--move HQ to B39
Steinberg	COMPLETE	--agree to 6180/645 priority
Kleinow	COMPLETE	--space planning in B39
Ohlin	COMPLETE	--FED schedules for both buildings
Hoffman	03/22/73	--establish PM schedule for 6180
Kleinow	03/26/73	--move all parts and tools and documentation from 545TS to B39
Burner	09/28/73	--FED parking facilities
<u>B. Hardware</u>		
Ohlin	COMPLETE	--7/9-track conversion schedule
Ohlin	COMPLETE	--install Development-355
Ohlin	COMPLETE	--review power distribution
Ohlin	03/13/73	--coordinate immediate Bulk Store updates
Burner	03/15/73	--ARPANET hardware (the Gumpertz GISMO)
Gross	03/23/73	--remove second PRT202 from B39
Steinberg	03/23/73	--relocate PRT300 from 545TS to B39
Ryan	03/26/73	--DSS181 (move 3 DSU181 and MPC181)
Burner	04/01/73	--wire between B39 and 545TS for ARPANET
Clingen	04/02/73	--Peripheral switch installations
Ohlin	04/02/73	--move Bulk Store from 545TS to B39
Gintell	04/02/73	--Development System Channels (PSIA)
Hoffman	04/02/73	--deliver 4 more DSU190's
Gintell	04/15/73	--high-speed communications hardware (Bisynch, etc.)
Burner	05/01/73	--IMP in B39 (spur from IMP in 545TS)
Hoffman	05/11/73	--swapout model-E card reader
Hoffman	06/01/73	--removal of dual-645 system
Hoffman	09/01/73	--MTS500 installations and MTS400 phase-out
Ohlin	12/31/73	--coordinate Processor updates
Hoffman	03/31/74	--improved PRT300 font

<u>Person Responsible</u>	<u>Target Completion</u>	<u>Activity</u>
<u>C. Communications</u>		
Ryan	COMPLETE	--dataset and telephone schedule
Chlin	COMPLETE	--hard-wire terminals for Development Machine
Ryan	COMPLETE	--publish telephone numbers
Ryan	03/21/73	--Tuck Modems for Dev. Machine (6 MIT dialups)
Burner	05/01/73	--communication to ARPANET
Ryan	06/01/73	--coordinate equipment transfer
Roach	06/01/73	--incorporate high-speed lines (ARDS)
<u>D. Operations</u>		
Ryan	COMPLETE	--new reporting forms and logs
Ryan	COMPLETE	--record keeping for Development System
Ryan	COMPLETE	--placement of operator consoles and Daemon consol
Ryan	COMPLETE	--operator schedules for both 545TS and B39
Ryan	COMPLETE	--distribution of output
Roach	COMPLETE	--carry-tape service (incl. 7/9-track tape coordination)
Ryan	COMPLETE	--initiate backup tapes for both systems
Ryan	03/21/73	--establish signup procedures
Ryan	04/02/73	--recorded telephone message (258-7700)
Roach	04/02/73	--support tasks for Development System
Ryan	05/01/73	--special arrangements for Tech Square users
Ryan	05/01/73	--operator training
Ryan	01/15/74	--Printer/Reader/Punch relocations

<u>Person Responsible</u>	<u>Target Completion</u>	<u>Activity</u>
<u>E. Software</u>		
Gintell	COMPLETE	--IOM/355 software (except for PIM)
Gintell	COMPLETE	--non-hardcore conversion (GCOS, debug, runoff, etc.)
Daley	03/15/73	--BASIC
Roach	03/15/73	--library installation tools
Roach	03/16/73	--wrap-up 645 installations
Gintell	03/20/73	--dynamic reconfiguration
Steinberg	05/01/73	--AML/IML
Gintell	10/01/73	--MTS500
Gintell	12/31/73	--EIS integration
Gintell	04/06/73	--EIS"Stage 1"
Gintell	06/22/73	--DSS190 (Dual-channel)
Gintell	08/24/73	--DSS190 (shared MPC)
Saltzer	COMPLETE	--LISP
Saltzer		--ARPANET
<u>F. System Assurance</u>		
Roach	03/15/73	--make installation tools operational
Roach	04/02/73	--review installation procedures
Roach	04/02/73	--dump analysis and reporting
Roach	04/02/73	--train people
Roach	04/02/73	--establish system performance base-line
Roach	04/02/73	--hardcore installations
Roach	04/02/73	--non-hardcore installations
Roach	04/15/73	--expand quality assurance
Roach	05/01/73	--system testing
<u>G. System Acceptance</u>		
Daley	03/27/73	--performance test (except TTY-DIM/355)
Daley	04/02/73	--reliability test
Daley	05/01/73	--TTY. performance

<u>Person Responsible</u>	<u>Target Completion</u>	<u>Activity</u>
<u>H. System Programmers</u>		
Gintell	COMPLETE	--schedule individual moves for about 70 people
Clingen	03/15/73	--resolve criteria for usage of Multics Project
<u>I. Move the Users</u>		
Burner	COMPLETE	--establish two-system pricing strategy
Daley	COMPLETE	--make PL/I and FORTRAN Documentation available
Daley	COMPLETE	--establish conversion consulting service
Roach	03/15/73	--install check object and other tools
Daley	03/15/73	--implement two-system pricing software
Daley	03/15/73	--detailed <u>cooperative</u> move plan for big projects
Roach	03/15/73	--non-transfer of obsolete software
Daley	03/15/73	--give selected subsystem writers early access to 6180
Daley	03/30/73	--make all other user documentation available (three publications)
Steinberg	04/01/73	--document user/operations interface changes
Daley	04/15/73	--establish on-line consulting service
Huffman	03/31/74	--make 6180 manuals available
Burner		--establish rates
Burner		--recompilation service
Burner		--register and move users onto 6180
Burner		--plan for pulling the plug on the 645 (remember CTSS?)
Saltzer		--network users
Burner		--non-paying users