

Modules

digital INTEROFFICE MEMORANDUM

DATE: August 29, 1969

SUBJECT: ENGINEERING REPORT FOR AUGUST

TO: Stan Olsen ✓

FROM: Al Devault

CNC:

The project plan and software specs have been written. The part program buffer design is complete and its interpreter has been coded. The servo interface design is approaching completion and the control panel interface design has been started. An enclosure mock-up has been built and evaluated. Teletype reader error correction has been tried successfully. All software formats now exist in preliminary form.

MODULES:

Applications completed: K series

- University of Virginia - Telescope to 8/I
- Federal Products - Machine tool control
- Research Appliance Corp - data logger
- Battelle (R series) - Write only, DECtape control
- MBLE (M & K series) - Five station data acquisition to 8/L
- Barnes Drill - Honer control
- Western Electric - Control of diode fabrication machine
- McPherson Instrument - Machine Control

Applications in process for:

Telephone Sales and Service, - K series; DuPont, -K series; Collins Radio, - M & K series; Fairchild, - analog and digital interface to 8 family computer; Western Elevator, - K series.

M series modules developed:

- M738 - 12 bit counter buffer Interface
- M107 - Device selector
- M108 - Flag module
- M737 - 12 bit computer output interface
- E100 - PANELAID Board for 12 bit Interface
- M401 ECO to eliminate the possibility of double pulse output requires the removal of eight components and the replacement of three components.

K series Engineering:

The Control Handbook gally proofs have been read and corrected, 80% of photos have been taken of new products, drawings have been reviewed and returned for correction. The K-series

K series Engineering cont...

Logic Lab prototype is completed and has been tested. The Lab has been used on several occasions to solve some engineering problems.

K series modules being developed:

- K990 - Timer Component Board
- K211 - Programmable Driver
- K410 - 5 Lamps with Drivers
- K432 - Timer Manual Control
- K960 - Plug Board with Cables
- K724 - Interface Shell (empty)
- K982 - Transformer Mounting Panel
- K984 - NIXIE Panel
- K658 - 4 amp 125 V DC Driver
- K725 - Interface Shell with PANELAID to make a small scanner system

cc

Traditional Prod.

digital


INTEROFFICE MEMORANDUM

DATE: September 2, 1969

SUBJECT: ENGINEERING REPORT - AUGUST - TPL

TO: Stan Olsen
cc: R. L. Lane

FROM: Jim Milton



The following projects are current.

DA07M - 3 Cycle Data Break for PDP-7

A RF09/RS09 disk for final testing is not expected until March/April, 1970. This job is not being pushed but being maintained. Wiring is complete.

MM01 - PDP-8/I Extended Memory on PDP-8

The prototype is now being wired. An MM8I is expected from Production in September. No units have been sold so this job will remain a relatively low priority until all parts come together without personal attention and without pushing to see if the normal in-house system is workable.

RK08/RK01

This project is progressing satisfactorily but has slipped about two weeks in nine weeks. The possibility of using the Memorex 630 with the RK08 control was carried out in hope of solving some delivery problems brought about by RS08/RF08 problems. This investigation showed that a control for the Memorex and a monodisk would be a nightmare so the idea was dropped.

CHEAP TAPE PROJECT

Agreement was reached at a recent meeting of the Traditional Product Line, the PDP-12 Line and the PDP-8/Line on the general usage and design goals of a cheap tape. This project will be funded by the PDP-8 Product Line and conducted under the direction of the Traditional Product Line when personnel are found. Hopefully, this project will start before the end of September.

Background

The retrofit of PDP-9 software on the PDP-7 has been essentially completed and only requires the blessing of the Programming group before it is put in the Library. A great deal of time has been spent on this project which should have been a simple job. We have learned that "minor" program changes to large programming systems are non-trivial and hardware dependant program bugs require a special type of programmer - one of the old school hardware expert/programmer. Unfortunately, we have few of these left in the Company.

el

PDP-9/15

1. VT15 Graphic Display

The processor prints and run list for the VT15 were just received from ADS and are now being checked. A wired model should be available mid-September and a fully-operational system by mid-October. Slippage in ADS and analog debugging problems account for the month slippage.

Conrac has returned a "no bid" to the front end specification and it appears quite certain that Kratos will receive the front end contract. An agreement has been reached with Kratos whereby DEC will assume the manufacturing rights of the front end should Kratos default.

2. LK35 Keyboard Option

A redefined prototype keyboard has been ordered from Controls Research allowing a lower contour on the board. We are checking into various manufacturers as potential second sources and have at least one good potential.

3. Writing Tablet

This option is now in the proposal stage. A proposal was written to the various product lines indicating our willingness to design a tablet that will be cross-product-line compatible. Response is now being awaited.



INTEROFFICE MEMORANDUM

SUBJECT: Status Report

DATE: August 19, 1969

TO: Jerry Butler

FROM: Herve Lavoie *HEL*

- 1. VT15 ROM Project
- 2. Cheap Slow Memory Project
- 3. 30 and 50 Nanosecond Delay Line Evaluation (3rd Source)
- 4. Unscheduled Projects
 - A. Core Tester
 - B. Purchase Specification on Mem Cor Resistors
 - C. Synchronized AC Line Noise Generator

jem

1. VT15 ROM Project

I spent three full weeks this last fiscal month evaluating the system. I encountered large capacitive discharge problems and instability. The bench evaluation is now completed and circuit revisions have been made in the circuit layout department. I will not release this ROM to production until the VT15 prototype #2 is checked out and this ROM has been re-evaluated in the system (approximately September 15, 1969).

2. Cheap Slow Memory Project

I have been assigned to this project in partnership with Rony Elia-Shaoul. I will be responsible for the interface from the memory to the CP. Also, I will be responsible for the controlling of signals and timing.

3. 30 and 50 Nanosecond Delay Line Evaluation (3rd Source)

We have evaluated delay lines from Technitrol and found them to be satisfactory for our use. Tom Kennedy has been notified.

4. Unscheduled Projects

A. Core Tester

My technician, Dave Carlson, built a pulse transformer core tester specifying volt microsecond limitations. We will spot check all vendors' products in the future with this tester.

B. Purchase Specification on Mem Cor Resistors

C. Synchronized AC Line Noise Generator

Dave will build such a generator in the next fiscal month.

digital INTEROFFICE MEMORANDUM

DATE: August 26, 1969

SUBJECT: Status Report

TO: Jerry Butler

FROM: Rony Elia-Shaoul A.E.S.

The major projects I have been working on during the month of August are the following:

1. Peripheral Power Supply
2. Phase Lock Clock
3. The Time State Generator Card
4. Slow Memory

jem

1. Peripheral Power Supply

A complete test on the North Electric power supply has been made and an evaluation report has been issued. A mechanical and electrical design review meeting with the users of such a power supply, Quality Control, and Field Service people has been scheduled. A new prototype will be received from North Electric incorporating all of the suggested changes resulting from the design review meetings. The new mechanical layout has been completed and reviewed. Production units are expected to be ordered by the end of September.

As far as a second source is concerned, two other companies besides Wanlass have been contacted and are willing to build such a power supply. Wanlass' first prototype did not satisfy our mechanical requirements and they will have another try at it.

2. Phase Lock Clock

A prototype board of the VFO has been received from the Model Shop. Jitter is the major problem we are facing with this prototype board; and we are working on it now.

3. The Time State Generator Card

The M775 module has been released to production and a tester along with test procedure has been designed. I'll stop referring to this project in my future status reports.

4. Slow Memory Project

Orientation with the PDP-11 stacks and organization has been started. A meeting with the PDP-11 memory group has been scheduled this week. A 4K/19-bit memory stack has been ordered from Ampex to be used in our evaluation. I expect to get involved deeper in this project by next month and a project schedule will be drawn by then.



INTEROFFICE MEMORANDUM

DATE: August 26, 1969

SUBJECT: Status Report

TO: Jerry Butler

FROM: John Swanson

1. Mechanical Configuration
2. Peripheral Equipment Checkout

1. Mechanical Configuration

The unit assembly drawing for the basic PDP-15 has been completed. Included in this drawing are:

- (a) exploded isometric view showing cabinet assembly, cooling assembly, logic and cable placement, and mechanical details
- (b) power harness mechanical installation and connection information

2. Peripheral Equipment Checkout

The list of peripheral equipment options which have been operated successfully with the PDP-15 now includes Magtape, DEctape, DEC Disk, Multistation Teletype Control, Calcomp Control, and Card Reader.



INTEROFFICE MEMORANDUM

DATE: August 26, 1969

SUBJECT: Status Report

TO: Jerry Butler

FROM: Joe Zeh J.3.

1. RP09/RP15
2. PDP-9/15 Bus Switch

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1. RP09/RP15 Control

The VFO circuit has been received from the Model Shop. Rony Elia-Shaoul is presently bench-testing the prototype.

The wirelist has gone through four revisions. A card deck has been made from the fourth and a panel is now being wrapped. The panel should be completed on 8/29/69. Stu Osborne is having a second prototype panel bussed.

Drafting is approximately 70% completed. Outstanding drafting requirements are the unit assemblies, wiring diagrams, cabling diagrams, and updates to the block schematics.

There are some module requirements which have not yet been received. Fred Cutting is trying to expedite those orders.

Four Memorex 660 units have been placed on line with the prototype RP10 control. Three of the units were production units from PSC. The fourth was an engineering unit accompanied by four PSC engineers. The engineering unit ran immediately, and for two days without error. The three production units required one week's work before they ran on line. Problem areas were untested modules, unmodified modules, poor QC, and power grounds.

2. PDP-9/15 Bus Switch

We have received 30 multiplexer modules (M625A) from the Model Shop. These modules will be used in the prototype PDP-15 bus switch. The bus switch design has not yet been scheduled.

digital

INTEROFFICE MEMORANDUM

DATE: August 20, 1969

SUBJECT: Status Report

TO: Jerry Butler

FROM: John Elsbree

JE

Presently, I am involved with the following projects:

1. G888 - IC Manchester Reader/Writer
2. KM15 - Memory Protect Option
3. KT15 - Memory Protect and Relocation Option

jem

1. G888 - IC Manchester Reader/Writer

A working model of Rev B has been received from the Model Shop and tested in the system. Everything appears to be satisfactory. The paper work for release to production has been started.

2. KM15 - Memory Protect Option

The design of the KM15 is complete. Kent has the sketches and has completed the paste-ups. He is now working on the corrections. Preliminary Engineering Specifications are 90% complete.

3. KT15 Memory Protect and Relocation Option

Work has started on the design of the KT15. Several questions have come up as to exactly how it should function. These questions must be answered before design can be completed.



INTEROFFICE MEMORANDUM

DATE: August 8, 1969

SUBJECT: Status Report

TO: Jerry Butler

FROM: Dennis O'Connor

The following is a list of active projects that I am now working on:

1. PDP-15 Power Supply and Power Control
2. Local Regulation of +5V Logic
3. Modules for Peripheral Usage
4. Integrated Circuits Purchase Specifications
5. PDP-15 Memory
6. PDP-15 Memory Parity Option
7. Read Only Memory for VT15
8. Cheap Slow Memory

jem

1. PDP-15 Power Supply and Power Control
All prints have been signed off. The 715 power supply's production release has been issued. There will be an ECO generated to correct some print errors, but it does not affect the supply itself.
2. Local Regulation of +5V Logic
A transient evaluation on a per-rack basis has been completed while running Basic Exerciser.
3. Modules for Peripheral Usage
All modules have been designed for our present requirements.
4. Integrated Circuits Purchase Specifications
Corrections are being made on the last three IC specifications.
5. PDP-15 Memory
 - A. System operating points for all vendors are being established.
 - B. Data Ram Corp. is building a prototype stack due in late August.
 - C. An Incoming Inspection Technician has been trained for PDP-15 stacks.
6. PDP-15 Memory Parity Option
Prints for the option have gone down to ADS.
7. Read Only Memory for VT15
The ROM is being evaluated at present and the design does meet the design goals that the VT15 requires.
8. Cheap Slow Memory for PDP-15
A schedule is being drawn up and a proposal is being written. The design of the circuitry and logic system will be divided between H. Lavoie and R. Elia-Shaoul.

INTEROFFICE MEMORANDUM

DATE: August 27, 1969

SUBJECT: Status Report

TO: Jerry Butler

FROM: Ralph Dieter

1. ACT15
2. DW15 Tester
3. PDP-15 Memory Exerciser
4. 715 Power Supply Tester
5. Wiring Harness Tester
6. LT19D, E, F, H

JCM

Status Report
August 27, 1965

1. ACT15

- A. First CP/IO station ready. The second needs the heat chamber final assembly and checkout. The third and fourth stations are nearly done - need heater installed and final checkout.
- B. ACT-15B (I/O Bus Tester) - Four units done and have latest changes; units 5 and 6 are about to be checked. Waiting for production to supply four more.
- C. ACT-15M (Memory Bypass) - Done. Mods to be finished. The only real hang-up is the availability of up-to-date memories; this should go away fairly soon.
- D. Quick Verify/Auto Accept Stations - About 90% complete; awaits ACT-15B's and checkout with PDP-15.
- E. Overall System - Work has been slowed by the vacations of many people. The Operator's Procedure has been started along with several other elements of the documentation. Most of the system is complete, there remains 101 small details to be cleaned up before the system can be "sold" to production.

2. DW15 Tester

Done. Recent modifications have been made. Manual not done. John Pratt has been spending his time on the API option.

3. PDP-15 Memory Exerciser

First unit delivered to production, presently being used for training. Specially modified unit delivered to incoming inspection. Third unit in checkout; the other three are in various stages of assembly/checkout.

4. 715 Power Supply Tester

Done. Delivered to incoming inspection two weeks ago. The "cooking station" are waiting for parts; one is done and three more are in process.

5. Wiring Harness Tester

Almost complete. Not much done since last month due to other priorities.

6. LT19D, E, F, H

The prints are in Drafting checking and await final Engineering Specifications and test procedures. My vacation has slowed this process.



INTEROFFICE MEMORANDUM

DATE: August 27, 1969

SUBJECT: Medium Computer Engineering Status Reports
for the Month of August 1969

TO: Stan Olsen

FROM: Jerry Butler

CC: J. A. Jones

Attached please find the Status Reports of the Medium Computer Engineering Group. Of major interest are the following activities:

1. PDP-15 I/O Processor
2. BB15 Option Panel
3. PDP-15 Processor
4. ACT15B
5. TC08/09/15 DEctape Controls
6. VT15 Graphic Display
7. LK35 Keyboard Option
8. Writing Tablet
9. VT15 Read Only Memory
10. Cheap Slow Memory
11. Manchester Reader/Writer
12. KM15 - Memory Protect Option
13. KT15 - Memory Protect and Relocation Option
14. Peripheral Power Supply
15. Phase Lock Clock
16. Peripheral Equipment Checkout
17. RP09/RP15 Diskpack Control
18. PDP-9/15 Bus Switch
19. PDP-15 Memory Parity Option
20. PDP-15 Memory
21. PDP-15 Power Supply and Power Control
22. PDP-9/15 Testers
23. LT19D,E,F,H

Attachments
jem

digital

INTEROFFICE MEMORANDUM

DATE: August 27, 1969

SUBJECT: Status Report

TO: Jerry Butler

FROM: Joe Godbout *JG*

1. PDP-15 I/O Processor - 100% complete
2. BB15 Option Panel
3. PDP-15 Processor

jem

1. PDP-15 I/O Processor

100% complete

2. BB15 Option Panel

Wirelist finished for API, memory protect (without relocate), and memory parity. Card deck should be ready in about a week after checking is complete.

3. PDP-15 Processor

(a) Memory protect traps have been added to system.

(b) EAE is designed but will require relayout of step counter and AC shifter; and the EAE control card has to be laid out completely. EAE will require pull-up's for keeping signal inactive when EAE is not purchased.

(c) The multiplexer circuit change is 70% checked and looks at this point like it will operate successfully.

digital

INTEROFFICE MEMORANDUM

DATE: August 27, 1969

SUBJECT: Status Report

TO: Jerry Butler

FROM: John Pratt

1. ACT15B (I/O Bus Testers)
2. BB15 (KA15, MP15, KM15)

jem

August 27, 1969

1. ACT15B (I/O Bus Testers)

Four testers are operating. One frame is ready to be checked out. Production Engineering has "dropped the ball" by failing to deliver eight wired panels. Five panels were promised for the week of August 25-29. As of yet (August 27), none have been received.

Continued checkout and training of test line personnel will resume this week.

2. BB15 (KA15, MP15, KM15)

A preliminary wirelist has been received and checked. A wired panel could be obtained by September 15.

digital

INTEROFFICE MEMORANDUM

DATE: August 26, 1969

SUBJECT: Status Report

TO: Jerry Butler

FROM: Dave Lazuka

- 1. 360 Interface Installation
- 2. TC08/09/15 DEctape

jem

1. 360 Interface Installation

Two weeks of this month were spent at McGill University installing an interface between an IBM 360/75 and a PDP-8. The diagnostic program which runs in the PDP-8 caused most of the problems in this installation. Due to the high speed of the 360 I/O channel, the program was not capable of keeping up. It is interesting to note that this problem never showed up before because all other interfaces were to a slower 360.

2. TC08/09/15 DECTape

The DECTape projects made little progress because of the time spent on the 360 Interface installation. Also, the PDP-15 has pushed the TC08 down the priority list as far as collection of modules and other parts are concerned.

It is also taking ADS an unreasonably long time to complete the TC15.

digital

INTEROFFICE MEMORANDUM

DATE: August 26, 1969

SUBJECT: Status Report

TO: Jerry Butler

FROM: Len Halio



1. VT15 Graphic Display - 90% complete, 1 month behind schedule
2. LK35 Keyboard Option - 5% complete, ahead of schedule
3. Writing Tablet - specification stage

jem

WIN

PDP-12



Programming





INTEROFFICE MEMORANDUM

DATE: August 15, 1969

SUBJECT: STATUS REPORT PDP-8 SOFTWARE

TO: Larry Portner ✓

FROM: Chuck Conley

My status report will be necessarily brief this month.

PDP-8 Disk System PIP

It looks like we finally made it through Product Test.

RF08 Disk System Software

Chuck McComas seems to be well ahead of schedule.

8K FORTRAN Disk I/O

Nearly complete, but moving very slowly. Dick Palmer needs a lot of help, which I have been unable to give for lack of time.

8K Programming System

Overview has been held. We are working on functional specifications. This is our most exciting project.

Stand-Alone BASIC

Moving very slowly. We have a fair idea where we want to go now. We should be able to have a project plan and PIF completed by September 8th.

Other software

Revised PAL-D tape submitted to Program Library. Software Maintenance is working on Editor, DDT, and Floating Point package revisions. ALGOL and POLY-BASIC either have been or are about to be sent to DECUS.

Chuck



INTEROFFICE MEMORANDUM

DATE: August 21, 1969

SUBJECT: STATUS REPORT - APPLICATIONS SOFTWARE

TO: Larry Portner

FROM: Mauritz Fredriksen

I. Graphics (PDP-9)

A. VPØ9 Package has been accepted by Product Test, with a great deal of praise. Rolf Hubert was responsible for the good work done.

B. VT15 Project - Although some planning and design (including a preliminary schedule) has been done on the project, it has been discovered that no paper work (PIF, etc) has been submitted. Gus is currently preparing Project Plan, PIF, and GANTT chart.

The preliminary schedule estimates completion of package to be 31 January 1969.

There are still some problems with hardware design of the character generator, but the engineer is hoping to have this solved shortly.

II. Statistics - (PDP-9)

A. Development of the second phase of STATPAC, involving Analysis of Variance and Factor Analysis is proceeding on schedule and has reached the following estimated state of completion:

1) Analysis of Variance :

- a) Design 90% compl.
- b) Coding 85%
- c) Debugging 85%
- d) Documentation 30%

2) Factor Analysis:

- a) Design 80%
- b) Coding 50%
- c) Debugging 0%
- d) Documentation 0%

3) Bob realistically estimates completion to be 30 Sept.

B. Peter Watt commented very favorably on the completed system (phase 1) as described in the STATPAC manual ("looks like quite a good system").

III. Physics Project (PDP-9)

A. Conversion of existing PHA programs to work in List Mode. (with data-breaks).

- 1) Coding is completed
- 2) Debugging has been proceeding for 2 weeks, but, with only minimal computer time at which both PDP-9/L and ADC interface are working is even more rare.
- 3) Under ideal conditions (machine availability and workability) there would be about 2 more weeks of debugging. Problem: ADC interface is to disappear in a few weeks.

B. One of the PHA programs has been re-written for DEC tape formats required to run with the Advanced Software. Debugging of these rather complex changes cannot proceed before debugging of List Mode changes, which must take precedence due to temporary availability of ADC interface.

IV. Automated Logic Design System

A. Project Plan and GANTT chart completed 15 August.

B. Overview scheduled for 28 August.

C. Work is proceeding on preliminary specification.

D. Current plan is to make extensive use of PDP-14 software.

V. CNC Project (PDP-8/L)

A. First Overall system design review held 18 August.

B. To date, the following has been accomplished:

- 1) Familiarization with NC operations.
- 2) System core map completed.
- 3) Preliminary program specifications completed.
- 4) Approx- one-third of code completed.

VI. LAB-8/Histogram

A. Both programs are written, but some core rearrangement is needed and final checkout be done.

B. Documentation is being done on both programs.

C. All work should be completed by 31 August.

VII. TSS/8

A. Current plan is to submit TSS/8 to Product Test by the first week of September. Testing (and acceptance) will be in three phases.

- 1) Getting on the air; making systems; largely a test of documentation.
(P/T est. 2-3 weeks)
- 2) System performs as specified by (new) TSS/8 Manual. (P/T est. 1-2 months)
- 3) Testing of CUSP's (P/T est. 3-4 months)

B. All coding (including automatic logout features) is completed.

C. What remains:

- 1) Clean-up of source files to allow correct assembly of all configurations.
- 2) About 2 weeks of machine availability for final debugging.

NB: Machine has been down a lot lately and completion of debugging has slipped accordingly.

VIII. GLC system specification (PDP-8/PDP-10).

A. Feasibility studies for determining the exact method of peak analysis and detection is proceeding;

B. User-oriented part of system design is about 40% completed, and includes:

- 1) All basic system commands and their functions.
- 2) Operation of system editor (completed)

3) Internal file structure of the PDP-8 system. (To the user, both systems will appear virtually identical.)

C. Most basic technical decisions have been made and are reflected in the preliminary technical specification issued 14 August.

IX. PDP-10 Real-Time monitor

A. Tony Lauck's specifications have been read and seem to be in line with requirements of GLC-10.

B. First meeting is scheduled for Monday, August 25.

C. Project has not yet been officially initiated; this will not occur for another few weeks, while preliminary discussions and study proceeds.

8/21

Subject: Software Manuals.- August, 1969

To: Larry Portner

From: G. Arnold

We increased by one software writer during August, when John Nestor joined us on August 11th, bringing us up to full strength again. John is working with Cecil Brooks on PDP-8 projects, freeing Marty Kaye to help Bob Jeans on PDP-12 and Biomedical projects.

We have an offer out to Gene Milner, an experienced software writer from Honeywell EDP, and prospects of adding a trainee. Milner is needed for PDP-11, where Glenn Prinkey is writing a master plan for documentation development. Glenn will present this to you and Hank Spencer next Thursday morning, 8/28.

The Gordon Bell plan for publishing the PDP-10 software documentation in paperback was accepted, and we are now launched on a crash schedule to update the Time-sharing MONITOR manual, and get this "PDP-10 Reference Handbook" printed by FJCC. The simplified introduction to time-sharing, which I would prefer to do first, has been put off to about March, 1970.

George

ACTIVITY REPORT

AUGUST

PDP-9/15 Manuals

A. In Production

Printed by:

- | | |
|--------------------------|------|
| 1) 15/10 Software System | 9/15 |
| 2) 15/10 Users Guide | 9/15 |
| 3) MACRO-15 | 9/15 |
| 4) 339 Buffered Display | 9/15 |

B. In Progress

- 1) 15/20 Advanced Monitor Software Systems
- 2) 15/20 Users Guide
- 3) PDP-15 Utility Manual
- 4) STRAN Manual

PDP-11 Manuals

A. In Progress

- 1) GPS-1 Manuals, PAC-11, ED-11, ODT-11, IOX-11.

REMARKS

Two immediate efforts, the completions of the INDAC-8 manual and the development of a PDP-11 documentation plan have diverted my efforts from the PDP-15 projects; however, I am ably supported in the PDP-15 area by J. O'Connor.

Glenn E. Brinker

ACTIVITY REPORT

PDP-8/I SOFTWARE DOCUMENTATION
August-September 1969

20 August 1969

AUGUSTSubmitted for Printing:

Paper Tape System User's Guide
DEC-08-NGCC-D (updated)
Floating-Point System, Programmer's Reference Manual
DEC-08-YQYA-D (indexed)
PAL-D Assembler, Programmer's Reference Manual
DEC-D8-ASAB-D (updated & indexed)

Printed:

Introduction To Programming C-18 (corrected & updated)	8/1
Disk Monitor System DEC-D8-SDAB-D (updated & indexed)	8/12
Symbolic Editor, Programmer's Reference Manual DEC-08-ESAB-D (indexed)	8/14
8K FORTRAN, Programmer's Reference Manual DEC-08-KFXB-D (updated & indexed)	8/14

SEPTEMBERIn Progress:

Time-Sharing System User's Guide
DEC-T8-MRFB-D (major revision)
Time-Sharing System Manager's Guide
DEC-T8- -D (new)
INDAC-8 Operator's Guide
DEC-08-GGDA-D (new)
LAB-8 Histogram Program, User's Guide
DEC-LB-U11A-D (new)
User's Bookshelf, October 1969
Software Manual Update, October 1969
Programming Languages
(new)

Scheduled from Printing:

Paper Tape System User's Guide DEC-08-NGCC-D (updated)	9/19
Floating-Point System, Programmer's Reference Manual DEC-08-YQYA-D (indexed)	9/15
PAL-D Assembler, Programmer's Reference Manual DEC-D8-ASAB-D (updated & indexed)	9/22
User's Bookshelf, October 1969	9/30
Software Manual Update, October 1969	9/30

Cecil Brooks

digital

INTEROFFICE MEMORANDUM

DATE: August 26, 1969

SUBJECT: STATUS REPORT

TO: LARRY PORTNER

FROM: GERRY HARRINGTON

Only one PDP-10 was shipped in August, Carnegie-Mellon.

Scheduled for September are:

Stanford Research
Bochum
Stevens
University of Washington

ISC #2, NSA and Catholic University, not shipped in August will probably carry over into September.

Patch release #3 has been prepared and is being verified in house.

The 4S50 monitor listings were delivered by the printer on August 22.

sh

DATE:

SUBJECT: Status Reports

TO: Larry Portner

FROM: Marv Horovitz

Ed HiltonRP09 * Address Test: Done. Need Hardware and Program Debugging.RP09 Random Exerciser: Same as Address Test. Should get hardware in about a month.Ray Bernier

PDP6/10-516 TAPE CNTL/136 DATA CNTL - Very little accomplished for the past two weeks due to CP10/DC10 projects - Program status is as follows:

PART I - Completed, ready for debugging.

PART II - 70 % coded.

PART III - Remains to be coded. (Intend to use my TM10 part 3 for this section.)

Anticipated completion date - end September.

PDP-10 - CP10 Card punch - Program and tapes verified - Ready for submission to Library.

PDP-10 - DC10 Data Line Scanner - Project halted for evaluation.

R. Whitton

PDP-15 Hardware Index Register - 98 % coded and approximately 75 % debugged. There is no debugging time available at present as PROTO #2 has been shipped to Wescon Show.

CRO3B for PDP-15-Modifications and Improvements for this PDP-9 program are 100 % coded and 95 % debugged. Awaiting time on PDP-15.

M743 MODULE PROGRAM FOR LTD - 100 % coded and only the last test of a slowed output needs to be debugged. However, it appears as if inadequate hardware may make this test impossible to do.

R. Christopher

PDP-8I, 8L HSP-3502A Printer Test - Program has been modified, since last report, due to a change in the IOT's. I will begin debugging the new portions as soon as the hardware is available.

PDP-8I 630 Disk Pack Tester,
PDP-8I 660 Disk Pack Tester - both programs are completely coded, and documentation has been started. Nothing further, along the lines of debugging or documenting, can be accomplished until some decision is made by engineering concerning the status of the hardware.

RP15 Instruction Test - No progress has been made. Needed information should be presented to me by next week.

RP15 Formatter - no change in status.

J. Kirchoff

PDP-8 INCREMENTAL TAPE DATA RELIABILITY TEST

Coding for the program is complete. Final debugging in process. Estimated completion September 1, 1969.

MODULE PROGRAMS FOR "LTD"

M719 - Finished.

M750 - Unable to diagnose module due to board layout.

G. Zagars

DC08-F, -H OFF-LINE TEST - The documentation and the program are complete except for a few additional comments in the latter.

DC08-F, -H ON-LINE TEST - One additional function ("Echo" mode) is still to be implemented and debugged. Shooting for a completion date of August 29.

K. Chapman

MS478 - Has been eliminated from the design.

M718 - Has also been eliminated from the design.

M742 - 10% coded. Estimated completion date is 9/29/69

E. Bouse

M117 - Finished
M119 - Finished
M745 - 80% coded - done 9/19/69

B. Corbin

RP10 DISK PACK INTERFACE DIAGNOSTIC

Part 1 - Flag Test - Done
Part 2 - Control Test - Done
Part 3 - Data Test - 95% coded and debugged.
Part 4 - Data Channel Test - 100% coded and 75% debugged.

R. Koller

TYPESET 8 SYSTEM EXERCISER - Preliminary version has been evaluated by Field Service. Changes will be implemented and a preliminary version released to Program Library by September 15, 1969.

TYPESET 8 TROUBLESHOOTING PROGRAM - No work has been done on this project in order to complete PDP-15 programs.

EXM15 - PDP-15 EXTENDED MEMORY TEST - Program coding and debugging is complete. Documentation remains to be done. The Auto-Acceptance version of this program should be done by September 15, 1969.

ACT15 SYSTEM - On Auto-Acceptance and High Speed Dump Library of programs has been started. Additional PDP-15 programs will be added as they are completed.

R. Shoop

M112 - 100% coded - 95% debugged
M113C - 100% coded - 95% debugged
M113D - 100% coded - 95% debugged
MS513 - 100% coded - 95% debugged
M224 - 50% coded

KB8I - 50% coded - awaiting further hardware development.

Ken Whitney

M105 - Because of a design change a new program will be coded.
M707 - Still needs debugging time. Because of down time of the "LTD" (Past 3 weeks) this module is at a standstill.
M206 - Finished
M216 - Finished
M104 - Needs LTD debugging time. (See M707)
M738 - Started coding August 18, 1969, 50% coded at this time.

M. Sturak

RF09DL, in preliminary form, has been released to engineering 8/22/69. Documentation is 35% completed.

J. Richardson

PDP-15 MEMORY TESTS

The basic (4K) Checkerboards, Extended Memory Checkerboard and Extended Memory Address diagnostics are 100% debugged. Documentation is 50% complete. These programs will be submitted to the PDP-15 program library after the MACRO-15 diagnostic assembler is completed.

PDP-15 I/O BUS TESTER

Parts 1 and 2 are 100% debugged.
Part 3 is 90% coded.

PDP-15 DP BASIC EXERCISERS

The 4 and 8K version are debugged. Both need an IAC and SWHA instruction test added. Documentation is 50% completed.

Ed Kenney

RM10 DRUM

Programs released to Library.

VTO3 CHARACTER DISPLAY TEST

Two week planning effort entering final week. Test design and coding should be underway on or before scheduled date of 9/1/69.

PDP-9,15 SYSTEM EXERCISER

DEctape version being developed by Ed Hilton. My involvement now consists of occasional consultation.

Ed Steinberger

KV8I DIAGNOSTIC - Program is complete, signed off, and in the library.
PDP-14 ROM DIAGNOSTIC - No change
PDP-14 DIAGNOSTIC - Using the 8L - No change.
PDP-14 ROM VERIFIER - Program is complete, but I may want to add some niceties in the near future.
PDP-15 API DIAGNOSTIC - Program is complete and runs on the PDP-15 prototype.
VT15 - This project has been given back to John Rodenhiser.
CONT15 (ACT 15 CONTROLLER) - This program has been revived again, I have received memos requesting changes which will be implemented in the near future (there is no rush at present).
PROGRAM LIBRARY DUPLICATOR SYSTEM - There are a few changes I would like to implement into the program to make life easier for the operator. The hardware has been running OK for the last few days so things are looking up.

Robert Brain

M107 - The program is coded but not debugged because the LTD is down.
LTD RELIABILITY TEST - This program is also in the debugging stage.

Earl Haight

RF09 DISK SYSTEM

RF09 Disk Data Test is now being cleaned up, this clean-up has slipped some what due to a high priority request from production for the RF08 Diskless.

RF09 MULTI DISK TEST - This test has been completed, and submitted to D. Vonada and D. Zereski for sign off.

PDP-15 - The PDP-15 Instruction tests are now being cleaned-up, and are waiting for the PDP-15 assembler.

RF08 DISK SYSTEM

Diskless for the RF08 has now been altered to run on the existing logic, Clean-up of the documentation will now start.

J. Hittell

PDP-8 GASCHROM ANALOG ACCEPTANCE PROGRAM - expect delivery of program from Vender first week of September.

PDP-8 AF04 DIAGNOSTIC - One unit shipped, program is in preliminary release form.

PDP-8 AD01 DIAGNOSTIC - Program adequate to assist in Engineering Checkout and is being used for same. Improvement being made on a weekly basis.

PDP-15 - Original EAE Part 1 being converted from PDP-7 format to 9 format. Needs testing and document change.

PDP-11 PROCESSOR TEST

There were 15 ready to run on the model, all have been run except for two test. They are illegal address and reserved instruction test.

PDP-11 I/O DIAGNOSTIC

There are both a PC05 and a TTY connected to the model, both seem to be working. Expect to run test on both units this week. The model does not have the capability to interrupt which has caused us to rewrite part of the I/O Tests.

P. Coyne

M214, M115 - Coding and editing complete; awaiting resurrection of "CMT" to begin debugging.

M753 - Errors in original schematic have made a small amount of re-coding necessary. 95% complete.

W. Beckett

PDP-11 MEMORY TEST - The following memory test program have been run on the PDP-11 Breadboard Hardware.

1. BASIC ADDRESS TEST (UP)
2. BASIC ADDRESS TEST (DOWN)
3. NO DUAL SELECT ADDRESS TEST
4. PATTERN PROPAGATOR TEST
5. 1's SUSCEPTABILITY TEST
6. MOVING 1's and 0's TEST
7. WORST CASE NOISE TEST
8. RANDOM DATA TEST

W. Beckett, con't

The CORE HEATING TEST could not be run because of a lack of time-out trap and interrupt facilities in this particular Breadboard configuration. In the process of testing discrepancies in the mechanization and operation of certain instructions were discovered. Engineering information concerning the manipulation of byte bound operations still needs greater clarification, along with specifics concerning the mechanization of address mode 7 (INDEX). Due to the fact that the present Breadboard has a slower operating bus (than that intended for the prototype), the successful running of memory noise and disturbance tests are considered of value from a demonstration point only.

C. Alsing

PDP-11 Partitioning of CP is 2 weeks ahead of schedule, will be done in one week.

PDP-11 MODULES - Group is on schedule.

PDP-14 MODULES - Group is on schedule.

PDP-15 MODULES - Falling behind schedule due to unavailability of module circuit schematics about 10 weeks.

DATE: August 22, 1969

SUBJECT: August Status Report

TO: Larry Portner

FROM: Bill Melesky

I. ADS & Manufacturing SupportA. Vector Analysis

Vacation, leaves-of-absence, machine down time, and problems uncovered during our initial testing have prompted me to keep the package one more month for testing. Expected release date to Drafting is now late September or early October.

B. Wire Wrap

Basic system software has been debugged and shipped to Canada with the hardware. A start has been made on coding the extra features for the system. Final debugging of the system with the added features may have to be done on sight in Canada. Estimated completion date is still mid or late September.

II. Automated Distribution Lists

Phase I is finished and working. (Of course data collection will go on indefinitely.) Work on Phase II, which is Program Library oriented, has been directed toward:

1. Familiarizing Bob Wright with the concepts of the system.
2. Determining the best information flow between all groups to get the Program Library oriented information matched to the information in the Field Service hardware file.
3. Designing the software update program and the check list and price list output program. The hardware file revision program is written and is being debugged.

III. Software Product Test

Following is a summary of programs that passed into or out of Product Test during August. A more detailed report on status of work in process will appear in the monthly Programming Dept. Status Report. In addition, the current PDP-10 test priorities are Fortran improvements first, planning disk service tests second, and planning tests for SOUP third.

<u>PRODUCT LINE</u>	<u>ACCEPTED</u>	<u>REJECTED</u>	<u>SUBMITTED & IN PROCESS</u>
PDP-8			RF08 PIP DF32 PIP Quick Point DDT-8 Lab-8 Basic Averager
PDP-9	VPA		DDT-9
PDP-12		L8SIM	

IV. Software Maintenance

Realignment of PDP-10 maintenance proceeded very smoothly. Responsibility for PDP-9 & 15 system software maintenance has been removed from the Maintenance group, but there is some question as to just where it is. Somewhere between Development and Peter Goldstern I guess. At any rate, the realignment of the two PDP-9 personnel requisitions went smoothly. I am now finally free to concentrate on PDP-8 maintenance and Traditional Product support.

V. Software Information Service

Jan Prinkey started work August 18th as an Aide to replace Susan Chittendon. One more aide is needed to come up to full budget strength. However, the added manpower has already enabled us to plan a bigger, more informative end-of-month traffic summary report. The first issue of the expanded report is planned for September.

VI. Program Library

Bob Wright has completed his training program and is now in full control of the Library. Special Systems seems to have solved the problems with the new 4 station punch;

August 22, 1969/BM

it has been running since Tuesday, the 19th. The old 4 station punch is acting poorly and Field Service seems to be quite ineffective in remedying the problem. I will pursue the Soroband punch project with Tom Stockebrand when he returns from vacation. Also, I will investigate a DEC tape copy system based on a PDP-8 with 4 tape drives and report on the anticipated costs.

mld

DATE: August 25, 1969

SUBJECT: PDP-11 Status Report

TO: Larry Portner

FROM: Hank Spencer

1. The various parts of GPS-1 are on schedule, except for some relatively minor variations. These amount mostly to reasonable re-arrangements, except for the following:
 - a. Two versions of ODT will be released, one of which allows 1 breakpoint, has few features and takes less than 500 words. The other has 8 breakpoints, lots of features and takes less than 900 words. The first is a true subset of the second in use and almost in code, and both will be covered by one user manual. This has almost no effect on the schedule.
 - b. One week of David Knights time is being diverted into looking into the feasibility of a 4K interpreter and addressing the FOCAL vs. BASIC question, at Nick Mazzaresse's request.
2. The PDP-11 steering committee has been formed and meets weekly. It is very encouraging to learn that such people as Production, Field Service and Training are gearing up for the advent of the -11.
3. Engineering appears to be progressing relatively smoothly, with the major exception that the disc is completely up in the air. The DF32 (32K, \$6K) is nowhere and replacement is unclear. This brings up questions like disc-pack, DEctape, RF08, etc.
4. Post GPS-1 scheduling and manpower remain a major problem. The search for technical giants to do the monitor and fortran continued to fail. I believe a workable alternative (which might take somewhat longer) is to have McGowan do the monitor (with my help) and hire someone to work for him, and to have Knight do fortran after he does the interpreter. This has the added advantage of using known in-house talent. Roger Willis is coming in December and could be used in either Monitor or Fortran projects.

mld

DATE: August 21, 1969

SUBJECT: STATUS REPORT

TO: Larry Portner ✓

FROM: Roger Pyle

I. Allied Computer Systems (Document Reader)

Contract is signed and returned to customer. Bill Klein is working on the project and will be making a Project Plan.

II. Automatic Liquid Loading System

No contract is in yet. Bob Green is leaving. Pete Kilbourne (I hope) will take it. Marv will do the diagnostics. A project plan will be forthcoming from Bob before he leaves.

III. PPG

Harvey is trying to expedite the hardware and finalize the contract. A P.O. for hardware is in. It might be deferred until a year from now if we can't deliver hardware. As soon as the job is finalized he will form a project plan.

IV. SEM

We have lost 2 man weeks in the Fredriksen transition. George Berry is learning the IO (finishing TSS/8 BASIC by this week.) Peter is fairly satisfied with conditions.

Some hardware problems exist but they are not identifiable as problems until August 32. I have seen Quotron I/O running and things look good.

DATE: August 21, 1969

SUBJECT: PDP-15 Software Development Status

TO: J.J. Murphy, Jr.
cc: L. Portner

FROM: Martha Sifnas

GENERAL

The delivery of Programming Department PDP-15 continues to slip. Monday, August 18, 1969 was the last quotation. As of today, August 20, 1969, there seems to be no hope of seeing the computer before next week, August 25, 1969. I'll believe it when I see it.

The fluctuating state of our PDP-9's (they have been down more than up) since their move to building 3 is also adversely affecting our progress.

PDP-15 Proto #2 was available to us for four hours/day for a week and a half, July 28th to August 6th. That time was about 50% useful since only 8K was working, most of the console keys were not working, we were helping to debug hardware, etc.

ASSEMBLERS

Some testing of CAP15 was possible on Proto #2. More is needed and awaits delivery of our own PDP-15. Paul Morin has spent time "shrinking" MACRO-15. PDP-9 down-time and the lack of a PDP-15 prevents testing progress. In the meantime, he has gone ahead with the coding of the imbedded DECTape I/O interface for both MACRO-15 and FORTRAN IV.

FIV COMPILER

Preliminary testing of FIV for 12K systems and 4K output is completed. Final testing awaits the PDP-15.

Glenn Wicklegren is in the process of revamping error message output in the Compiler to allow more detailed error diagnostics for 16K and greater systems and possibly some core saving for the 8K version.

FIV OTS

We have decided to make OTS arithmetic package improvements a two pass operation in order to provide improved performance to PDP-9 customers who will be receiving system V4C. Emphasis is, of course, being placed on the routines singled out in Jim Bell's report.

"Pass 1" has been coded* and testing will begin when Bill DeSimone returns from vacation on August 25th.

DDT

Glenn Wicklegren's new DDT has been submitted to Product Test. His design specification has been published from which Claude Proteau is writing a user's manual.

LINKING AND SYSTEM LOADERS

PDP-15 Stage I (including 12K systems) Linking and System Loader mods have been coded, documented and debugged by J. Murphy. Some more extensive testing will be done upon arrival of our own PDP-15.

CHAIN, EXECUTE

H. Krejci's new and improved CHAIN and EXECUT, originally designed for B/F, is coded and ready to be interfaced into the PDP-15 Keyboard Monitor System. A specification of requirements for interfacing has been written and is about to be published.

UPDATE

A new version of UPDATE with bug corrections has been submitted to Product Test by Glenn Wicklegren. He is presently incorporating a CRUNCH feature which will allow, while updating, the removal of all local symbols and optimization of DECTape block storage to improve library access time and free up DECTape storage (a critical need since we are running out of space on system tapes). The CRUNCH feature reduces library or relocatable storage by an average of 40%.

* Pass 1 includes conditionalization of the timing routines to measure progress with each change.

PIP

PIP is in the stage of final testing and is awaiting computer time by Julie Wolfberg.

DTCOPY

The super fast DEctape copy utility program has been coded and is awaiting computer time for testing by Julie Wolfberg.

KEYBOARD AND I/O MONITORS

Some preliminary coding has been done. A PDP-15 is needed for Julie Wolfberg to test the I/O Monitor. More coding changes by myself are required in KM-15.

PUNCH

Julie Wolfberg has coded up changes to PUNCH for 12K systems and the PDP-15 .ABS loader. Computer time (both PDP-9 and PDP-15) is required for testing to begin.

8TRAN

Minor coding changes (IAC instruction) have been made to the PDP-8 to PDP-15 translator (8TRAN). Again a PDP-15 is required for testing.

DOCUMENTATION

All elements of the Utility, MACRO-15 and PDP-15/10 System Manuals have been reviewed and we are awaiting their publication.



INTEROFFICE MEMORANDUM

J. Portner

DATE: August 15, 1969

SUBJECT: PDP-9 Software Development Status

TO: Larry Portner✓

FROM: Jim Murphy

cc: Martha Sifnas

MAGTAPE SOFTWARE SYSTEM

The Keyboard Monitor System has been accepted by Product Test. Pete Wilson is in the process of completing documentation that is necessary for the general release of the software package. Due to his other commitments, documentation has proceeded at a slow pace.

DECtape/Disk Software

Monitor version V4C has been submitted to Product Test. It contains many bug fixes and improvements (such as DTF., FORTRAN oriented DECtape handler) from the V4B system. Once accepted this system will be automatically distributed to all customers free of charge.

B/F Monitor System

We have delivered about 15 preliminary systems to the field and one to Product Test. The amount of requests for the system has detracted from our further development as Claude must test each and every system before shipment. We have notified the field to screen requests and to forward only the critical ones. Some will be sent documentation only to prepare for B/F when they receive it.

At a meeting held yesterday, with Martha, Claude and myself, it was determined that October 15 was now a realistic date for delivery of the general distributable system to Product Test. This change in date is due to many things:

- a) machine down time
- b) unexpected number of preliminary versions
- c) bugs discovered by us and/or the field
- d) necessary improvements discovered by us and/or the field
- e) and our desire to make available a system that won't bounce back on us.

I feel that since customers that have the hardware and need the software now can have it now, the delay can be lived with and will be beneficial to all.

CR03B Card Reader Handler for BATCH Processing

Paul Morin has yet to correct problems discovered by Product Test due to higher priority commitments. It should be done within the next two weeks.

FOCAL

FOCAL without EAE has been accepted by Product Test. We have corrected the EAE version which is now being produced tested. The package will be in the Program Library by the end of August.

PDP-10Submitted for printing

COBOL, preliminary language manual, August, 1969 (new) 8/25
 System User's Guide, August, 1969 (major revision) 8/27
 TECO; August, 1969 (minor revision) 8/27
 Time-Sharing Monitors, September, 1969 (major revision) 9/5
 AID, August, 1969 (minor revision)
 FORTRAN IV, August, 1969 (minor revision)
 Software Manual Update, September, 1969 9/5
 Logic Manual (Formerly Maintenance Memos), August, 1969 (major revision)
 COBOL Language, Supplement No. 1, Sept., 1969 (new) 9/12
 Advanced BASIC, September, 1969 (major revision) 9/15
 Single-User Monitor, Sept. 1969 (minor revision) 9/22

In Progress

Science Library and FORTRAN Utility, being researched for changes before reprinting
 MACRO-10, being researched for changes before printing
 PIP, being researched for changes before reprinting
 DDT, being researched for changes before being reprinted
 PDP-10 Reference Handbook (previously PDP-10 Time-Sharing Handbook)

Comments

The Time-Sharing Monitor Maintenance Memos are being republished with two additional "memos" as a Program Library Writeup entitled PDP-10 Logic Manual. This is the first of what is hoped will be a complete upgrading of informal documentation to library writeup or manual status.

PDP-10 Reference Handbook is to be prepared for FJCC

PDP-12Available

The CLINI-LAB 12 System Description was printed August 15th in time for the show in Denver.
 LAP-6/DIAL is again in hold, being retyped and addendum incorporated.

In Progress

(Sections 1 through 10 and Glossary)
 CLINI-LAB 12 System User's Guide has been submitted for review to Wisconsin, Tod Loebel, George, Max and Ron. Ray Lindsay indicated that only a few Xerox copies should be needed for LINC-8 users (Oct. 1). Tentatively, preliminary version for PDP-12, 1-1-70.

LAP-6/DIAL version 2 has not been scheduled - G. Thissell anticipates only relatively minor changes and additions will be required to the present manual.

DATE: August 21, 1969

SUBJECT: STATUS REPORT

TO: LARRY PORTNER

FROM: MIKE MANUGIAN

1. Still No Bryant Disk on System 40

Production agreed to begin on-line checkout of the Bryant disk on system 40 on July 14. They did not begin until July 16. From that day, they had 3 weeks of checkout time which consisted of 3 hours of 1st shift stand alone every day, Monday through Friday. We were forced to take this production responsibility since production refused to do it, and we felt responsible for our Bryant software project and we needed the disk for remote time-sharing operation.

Today is the 38th day since on-line checkout was scheduled to start. As of this date Bryant acceptance has not yet begun. I have been told that the acceptance test will take at least 120 hours. Since we cannot spare time weekdays, Acceptance will have to take place on weekends. This means that at the earliest, the Bryant disk will be available to programming as a ?maintainable? piece of hardware on Monday September 8. As far as I'm concerned, this date is ridiculously optimistic.

2. Still No Disk Packs For the Programming Department

Last week a skinless RP10 and three RP01s none of which were accepted in case anyone is laboring under that misconception appeared at system 40. We moved the group to system 2. They have been connected for a total of about 4 working days and to date the hardware has not functioned satisfactorily. In addition to RP10 problems there are hardware interfacing problems which I presume become the responsibilities of the programming department, since we must get the things to work.

Hardware which is not maintainable by field service (and I wouldn't ask them to touch this package although they voluntarily spent a lot of time on it) degrades the rest of the system. I have managed to secure a commitment from engineering to support the disk pack hardware, but this really hurts. It is a hard cold fact that a system must be supported by a group which is responsible for the system. Division of responsibility for hardware on a single system leads to disavowal of all responsibility by all parties.

The disk packs were not ready for programming without a wetnurse. Still we were forced to accept them.

3. Remote Operations on System 40

This week we attempted to run system 40 remotely. The result was a failure.

There were three main stumbling blocks:

- 1) It took too long to transfer files to and from DEC-tapes. Waits of 30 minutes to an hour were not uncommon.
- 2) Manipulation of DECTapes was too cumbersome. All files on a DECTape had to be transferred on any I/O transfer.
- 3) It was impossible to get listings and other hard copy quickly.

Beginning Friday we will be back in local mode with eleven teletypes on system 40.

We will be going back to remote operation in about eleven days with the following changes:

- 1) and 2) a new FILE CUSP will be written which will:
 - a) Allow the user to recover control of his teletype as soon as he has specified his command. The user may then continue to work as the stacked commands are processed.
 - b) Allow the user to specify the transfer of one or more individual files.
 - c) Allow the user to zero a DECTape.
 - d) Allow the user to request that a DECTape directory be written on his disk area.
 - e) Allow the user to request a HELP message explaining remote operation.
 - f) Allow the user to check on the status of the file transfers he has initiated.
- 3) We are in the process of hiring a runner who will carry all listings to teletype rooms at frequent intervals during the day, thus reducing the wait for hard copy remotely.

4. New Personnel

Jean Gabrish will be handling secretarial and some administrative duties beginning Monday September 8.

She will be handling scheduling requests, project-programmer number requests, and will assist in the administrative area of system CUSP maintenance and updating for the PDP-10s.

We are currently looking for a computer operator and a stock boy/runner.

5. System 2 for PDP-10 Development

Beginning next week more time on system 2 will be devoted to PDP-10 development only. All other users will be required to use system 40.

DATE: August 21, 1969

SUBJECT: PDP-10 CUSP STATUS REPORT

TO: LARRY PORTNER
HARTLEY LA DUKE

FROM: NICK PAPPAS

COBOL

Compiler development is now about 3 weeks behind schedule. The slip is mainly due to a design problem associated with the Perform Verb. The Operating System is at least 2 weeks behind schedule in the I/O area. The non-I/O area is ahead of schedule. The test program coding is proceeding faster than originally planned. The present schedule deficit of the test programs should be made up by the end of September.

On the whole, I am not worried about the schedule shipping significantly. Major problems in the implementation have been fewer than I had anticipated.

On the support side of the project, I would like to report that the production of the COBOL manual has dragged on to the point where SEVEN months will have elapsed between the submission of the draft and the completion of printing. I have not investigated this problem, but I suspect that the VERY bad relations between our Tech Writing group and John Bellantoni's group is a major part of this problem. Fully 4-5 months of the 7 have been occupied by reviewing, typing, proofreading, etc. The COBOL project has put a strain on Mike Manugian's computer operations and, Mike has done quite a bit to accommodate us. Until we receive reports on how much computer time we are using, I will not know if my original estimates are at all accurate.

Sort/Merge

Ed Nemeth and I have been in contact with various Software houses capable of designing a sort/merge. By purchasing the design outside, we will acquire the expertise we lack internally. This sub-system is central to any COBOL system. When the funds for the purchase of the design are available, this project will be able to proceed. If this project is not started soon, our plans for COBOL will have to be altered since Sort/Merge is so vital to a useful COBOL system.

FORTRAN

The implementation stage of this project is just beginning. An important matter, as yet unsettled, is the writing of a new FORTRAN manual. Hartley is to deal with George Arnold about the scheduling of this manual. We have a proposal from an outside group for writing the manual. Product Test has begun the test programs. Coding of test programs should be completed by September 15.

DATE: August 21, 1969

SUBJECT: PDP-10 STATUS REPORT

TO: LARRY PORTNER

FROM: HARTLEY LA DUKE

Disk Service

Three disk pack drives are on system #2, but Tony Wachs has had little success in using them. ISC expects hardware on September 1, but no software. Computility expects packs on September 15 with software. We need two weeks of solid checkout before shipping, so September 1 is the deadline for working disks.

Jim Bell is now project leader of the full disk service project. A design review was held on August 19. We hope to begin coding next week (August 25). Features that may possibly be deferred are being decided upon.

Communications

680I software was sent to Computer Center Corporation. DC10E arrived on system #2 (without cabinet). Project is not behind schedule in spite of hardware delays.

Real Time

Chris White has been moved to the disk service project. Maury Fredricksen's group is doing a real time monitor for contracts, so we are attempting to combine their project with ours.

Maintenance

The three people on CUSP maintenance have transferred from the Maintenance Group to PDP-10 Software Development. In addition, Alan Frantz is working full time on monitor maintenance.

sh

Biomedical

PDP-10

PETE

Special Projects

DATE: 4 September 1969

SUBJECT: Monthly Progress Report

TO: Pete Kaufmann

FROM: Joe St. Amour

cc: Ken Olsen

✓ Steve Sobel

Disk problems have utilized most of Special Projects' manpower during the past month. All work on Printer projects was stopped in order that we could put more manpower into this area. A separate report is attached which outlines present status on the RS-08 Project.

We have hired two additional people during the past month who will be assigned to do work in the disk area. Gowri Sankar has a Ph.D. in Mechanical Engineering, and Gary McFall has extensive experience in head development. We have critical need for an experienced electrical person and are working closely with Personnel on this matter.

The mechanical portion of the TU-10 looks excellent, but the electronics is running somewhat behind schedule. Major effort is going into this area so that we will have a complete machine available for the Fall Joint Computer Conference.

A proposal will be available sometime in September for a 75 ips tape transport.

Preproduction of the DECTape is almost complete, and we expect to deliver units to the Product Lines sometime during the week of 8 September.

Mechanical Engineering and Industrial Design have been working closely with the PDP-10 Group, and we have reached an agreement on using the new style cabinet with slight modifications for the K110.

Roger Melanson has completed a report on the Automated Drafting System which outlines current situation and future potential in this area. Discussions have been held with the

Engineering Committee, and we expect to finalize this through another discussion with the Engineering Committee on 11 September. Indications are that the Automated Drafting System will continue, that improvements will be made, that some Engineering discipline will be required to make this system effective and that better control and better maintenance of the PDP-6 computer will be necessary.

/gp

DATE: 4 September 1969

SUBJECT: Large Disk (RS-08) Status

TO: Central Planning FROM: Joe St. Amour
cc: Operations Committee
Marketing Committee

Production and shipment of disks will resume during the week of 2 September. A number of significant problems have been solved, but the corrosion resistance of the unit is still uncertain. Units shipped must operate within a restricted environment. Meanwhile, work continues to create a surface that will meet existing environmental specification.

Surfaces to be used for initial shipments will consist of approximately fifteen with fourteen micro-inches of rhodium (produced late July, early August), approximately ten from previously rejected December-through-February disk production and up to two-hundred with fourteen micro-inches of rhodium as produced under a controlled process instituted 29 August 1969. Tech Met will continue producing with the above controlled process until demonstrated improvements are ready for implementation (approximately eight to twelve weeks away).

Evaluation of "controlled process" disks will take place during the weeks of 2 September and 9 September. It is expected that they will be superior to all previous items except possibly the December-through-February production. Since they are untried, this performance estimate is based on surface evaluations with an electron beam microscope.

A tentative plan outlining Nashua Corporation's (parent Company of Tech Met) development program will be available within one week. Their initial efforts will be aimed at the aluminum and copper substrate finishing, cleaning and plating where most of our problems seem to occur. Samples will also be available with the addition of an electro polishing operation which seems to offer the potential for superior characteristics.

Large Disk (RS-08) Status

Joe St. Amour

4 September 1969

Page 2

Present thinking calls for Tech Met to become strictly a production operation, running with now existing specifications. All technical development will be done through the Nashua Corporation. Information on the overall plan will include Nashua personnel assignments at the Tech Met Operation.

The attached sheets indicate developments which have occurred during the past five weeks of effort.

Weekly reports will be issued regarding status until such time as we are fully under control.

The DF-32 disk surface has also gone through significant changes since the first of the year, and its corrosion resistance is not what it was previously (still superior to RS-08).

Since Tech Met cannot identify all the changes, and since the production process has been relatively stable since early June and the DF-32 continues to work, we have decided to make no changes until we are certain what must be done to produce positive results. Disk surfaces are still our number one priority and will continue to be so until a proven solution is in hand.

/gp

SUMMARY

DISK EFFORT

25 July thru 2 September 1969

1. Corrosion

Increased from eight to fourteen micro-inches of rhodium.

Identified contamination buildup under head as varnish (not frictional polymer).

Possibility that head glues to disk at stop, peels rhodium at start to allow corrosion identified by head print.

Changed cleaning procedures to eliminate contamination buildup. Early tests indicate success. Need added tests to be sure.

Air-conditioned environment shows less corrosion than non-air-conditioned environment.

Corrosion is now random throughout disk, not identifiable by head position.

Some corrosion occurs in shipment; similar surfaces in their plant do not corrode. Changed packing to use sulphur-free paper inside plastic bag. Was in cardboard carton; felt differences in air pressure could cause sulphur, etc. contamination.

Corrosion less with circumferential polish than with cross polish. This possibly is the reason the DF-32 surface has better corrosion resistance.

Changed to circumferential polish (evaluated samples and have proven that it works).

Will evaluate electro polish which eliminates burnishing which traps contaminates and leaves rounded surface defects (versus peaks) for better plating.

Corrosion, and with its magnetic defects, seem to occur due to faulty copper plating. This could start at aluminum substrate and/or contaminated plating bath. The copper builds up with a number of small holes (.0001 to .0005 in diameter). In addition cleaning after polishing is not adequate.

2. Glitches and Switch Drop-ins

These drop-ins were thought to be caused by improper surfaces. Cause was traced to heads. Head ferrites are being grounded and wires to coils are being redressed to eliminate this defect.

3. Adaptive Timing Track Writer

Have developed concept whereby we can use a surface with over one-hundred small errors. Will pursue as insurance policy and for possible future use. About six to eight weeks of logic design are required.

4. Second Sources

a. Disks - Burton Magnekote doesn't have total capability to do what is required. After two weeks into program, we dropped them and concentrated entire effort on Tech Met. We will have to become our own second source; urgency will depend on Nashua Corporation program and response.

b. Heads - Have heads from two other vendors in house to evaluate in complete units. Have set lower priority on this pending completion of present programs.

5. General

Closed loop purging system needs more time. System evaluated showed heavy contamination buildup and corrosion.

Gold-plated disks are not an improvement. Will need head work and closer quality control to make heads fly consistently.

Super-smooth surface improves corrosion resistance but will not consistently fly heads.

Gold under rhodium contributes nothing to corrosion resistance. It has been dropped at this time. ("Old" disks had no gold.)

Built, debugged and installed surface tester at Tech Met's Plant. Second unit of improved design is now being debugged.

DATE: August 26, 1969

SUBJECT: Progress Report

TO: Grant Saviers

FROM: Cary Levine

cc: Joe St. Amour ✓

1. Went over existing RF/RSØ8 Maintenance Manual and associated circuits and made technical corrections in the manual so that the September 23, 1969 publication date will be met. Saw to it that the flow of signals was correct, or made the necessary changes for it to be correct. Also, made corrections in "language" so that there will be no doubt in one's mind as to the meaning.

2. Ran tests on various T.M.I. disks to determine what the effect of different thicknesses of Rhodium have. Found that a thicker Rh plating has little effect, if any, on the baseline noise level, but on the other hand, the signal itself decreased in amplitude as the Rh thickness increased. The shape of the pulse remained quite consistent. The tests were run on disks that had from 8 μ " to 20 μ " of Rh with the Co-Ni being 12 μ ". Flying height was as specified for usual conditions.

Also revamped writing and reading logic of the tester so that only one revolution would be written or read at a time, rather than many revolutions as was the previous case. This was to facilitate finding a bad location on the disk, if any exist, since under previous conditions, this could not be done. Proceeded to look for "glitches" that were present at one time, but are very hard to reproduce.

3. Conferred with Bev Young on preliminary goals of the Peak Detector. Quite a bit of work remains to be done on this.

/bca

DATE: August 28, 1969

SUBJECT: Monthly Progress Report

TO: Bill Owens
Grant Saviers
Ed Corell
✓ Joe St. Amour

FROM: Charles Youse

In my third month at Digital, the pace has quickened to a dead run. The month has been given primarily to the study of the problems with the RF/RSØ8.

1. Study of several 16" discs, using Don Vonada's disc surface tester, showed two kinds of "Drop In."
 - A. "Pinhole"
 1. Locked to a certain location.
 2. Fixed Amplitude
 3. Reverses sense when direction of magnetization reverses
 4. Seen in read only mode
 - B. "Glitch"
 1. Stays within 1 micro second of a certain location on the disc
 2. Amplitude different on each pass. May disappear for several minutes
 3. Does not reverse sense
 4. Seen only in Write-Read mode
2. A working RSØ8 requires a perfect recording surface. If this is beyond the state of the platers art, or causes too great burden of cost, the system must adapt to plating imperfections. This can be done with a more sophisticated track writer, which would include a surface evaluator, and allow us to live with "Pinholes". I am currently designing such a track writer.
3. An experiment which charged the recording heads to 15v DC produced synthetic "Glitches". Naturally occurring "Glitches" should be eliminated by grounding the heads. (Ferrites)
4. The grounding within the RSØ8 will be improved, though no specific trouble can be traced to the grounding when all the connections are made.

August 28, 1969
Monthly Progress Report
Page II

5. I looked at two printers during the month. One, the Clevite 4800 Electrostatic, I have reported on. It is very fast, expensive, and inflexible. The other is the offering of the Data Printer Corp of Cambridge. This is a conventional line printer with one magnetically actuated hammer per column. It should be seen as an example of how to squeeze cost out of a mechanical printer. Unfortunately, Data Printer Corp lacks any production facilities to meet our needs.
6. I have been working on the logic for a small matrix printer, short of the process electronics which would tie us to a particular printing process. A read-only memory for the character font is an area of major interest. MOS holds promise of lowest cost, but for now, a diode matrix looks like the most practical arrangement.

/cg

DATE: August 27, 1969

SUBJECT: RSØ8 Support - Progress Report

TO: Grant Saviers
Ed Corell
Joe St. Amour ✓

FROM: Bill Owens

Evaluation of Failures

RSØ8 and DF32 recording surface failures have been examined and primary conclusions are:

1. Contamination at the Cu/NiCo interface provides seeds for corrosion. Some of this contamination causes magnetic deterioration of the surface during shipment to us, so that flaws are visible when the package is opened. Other contamination remains buried but shows up later after prolonged exposure to moisture.
2. Polishing of the RSØ8 surface is inferior to that of the DF32 resulting in poor corrosion protection. Plating of the Rh and NiCo may also be porous adding to the problem.

My feeling is that until this contaminant problem is solved at the vendor, we will be able to ship units only if extreme care is exercised in keeping moisture away from the disk surface. I will try to determine a safe humidity level for prolonged operation.

Head/Disk Interaction

The heads we buy from Data Magnetics have major problems. The first is ferrite pole piece alignment. This alignment is at times very poor and generally very inconsistent. The average head does not come close to meeting our spec. This poor alignment causes severe scratching of the disk surface and reduces the signal amplitude. This poor alignment is related to poor ferrite/alumina bonding technique.

The second major problem involves the relatively large holes or pores in the ferrite and alumina pieces. The holes are gathering places for various kinds of debris; the most troublesome being water and head cleaner. These chemicals are transferred to the disk surface on contact stopping and provide the solvent needed to form electrolytes with the salts contaminating the plating. Until we solve the plating problem the only

August 27, 1969

solutions seem to be to thoroughly degas heads before use; or clean heads in a cleaner which will not cause corrosion or polymer problems; or use head materials having substantially lower pore volume.

Sample heads from Ferroxcube and Applied Magnetics show gross improvements in all areas over the Data Magnetics heads. Heads adhere to disks because of the capillary action of a liquid at the head/disk interface. We are pretty sure the liquid starts out as head cleaner which probably absorbs water from the atmosphere; may get polymerized too.

Disk Surface Tester

Surface tester mechanics will be completely assembled and aligned by Thursday, August 29, 1969. This is nine working days from original conception of this mechanism. The electronics will be completed on Thursday also. Debugging can start August 30.

Production Fixture/Aids

A microscope stand to aid in head ferrite alignment inspection has been built and is in use.

A new disk handling tool is being built. Estimate one week to completion.

The need for more tools is being evaluated.

The major tool being worked on at present is the head load adjustment tool. Expect to have a prototype by September 8.

QC/PC

George Beckner is the major force working this evaluation. Detailed recommendations will be made on September 1, but initial feelings are that 1) material flow and job assignments within the clean room lack efficiency, 2) incoming inspection and handling of parts is inadequate in some cases, 3) certain new or changed assembly aids may be required, and 4) implementation of ECO's is lagging.

Disk Copper Surface Contaminants

A copper disk plated at Tech-Met has been sent to MMR for

an analysis of impurities on surface in an attempt to provide T.M.I. with clues to plating contaminant. Also plan to send them NiCo disk if first tests are meaningful. Contaminants on copper surface may be poorly preserved, while those buried under NiCo plating should be well preserved.

14 μ inch Rh Ten Day Tests

Units were run for five days and stopped for five days. Three were in non A/C environment. Four were in A/C environment. Tests are really inconclusive because all units did not pass diagnostics perfectly before start. None in non A/C environment passed diagnostics after test.

Three of the A/C units passed diagnostics both before and after test. One was marginal.

The transient glitch apparently associated with head grounding clouded diagnostics.

Visual examination of the seven surfaces showed severe head imprints which could be wiped from the surface on all units. Corrosion in the non A/C units was well advanced in one case. The non A/C units all showed more severe corrosion than did the A/C units. Corrosion was at random places on disk surfaces. Even the A/C units however were developing pits but at a very slow pace.

12 μ inch Gold Disks

One gold disk surface passed 145 contact start/stops with relatively little deterioration of the surface. Magnetic examination of that surface was inconclusive due to transient glitch or other intermittent tester problems.

Only carefully selected heads having superior ferrite pole piece alignment would fly on the gold. Heads having abnormal protrusions would drag on the relatively "sticky" gold surface and would not fly. The start/stop tests were run on carefully selected heads.

The gold discs showed all of the corrosion problems present in the normal disk only at a retarded rate. plating imperfections were present.

/bca



INTEROFFICE MEMORANDUM

Steve Sobel

DATE: 29 August 1969

SUBJECT: Monthly Progress Report

TO: Joe St. Amour

FROM: Arnold Sherman

cc: Pete Kaufmann
Ken Olsen

IBM Compatible TU-10

The breadboard prototype has continued undergoing testing during this period. The read-after-write magnetic head assembly with its associated tape guidance was installed and tested during this period. This system worked out well and will be used in production. Static skew could be adjusted by use of the tape guides so that the sum of static and dynamic skew was well within allowable limits for a 45 ips tape transport. No move will, however, be made to eliminate electronic deskewing until the TU-10 A through D are tested.

Upon receipt of the plenum casting and power supplies next week, a mechanically complete prototype will be assembled. This prototype will be complete except for harnessing, plug-in modules and hinged plastic front cover.

Mechanically, we are now making modifications requested by Industrial Design and preparing production drawings. Electrically, the control electronics have been built and operate satisfactorily. The read-write electronics are presently undergoing tests.

IBM Compatible Transport - 60 kc

Investigation indicates that there is a need for 75 ips tape transports. We are presently investigating the best way of fulfilling this need. In order to reach a conclusion concerning this, we are visiting HP and Ampex concerning the purchase and/or licensing of their tape transports. In addition, we are investigating the possibility of upgrading the design of the TU-10 in order to achieve 75 ips performance. This work is, of course, of lower priority than completion of the TU-10, and a preliminary proposal should be completed during September.



INTEROFFICE MEMORANDUM

DATE: September 2, 1969

SUBJECT: DECTape Monthly Progress Report

TO: A. Sherman

FROM: E. Luttig

cc: J. St. Amour

- A. All machine drawings are signed off including the tape guide assemblies.
 - 1. A modification drawing (machining) is required in order to make the tape guides compatible with the T555 transports.
- B. All parts have been received for the preproduction run with the exception of the following:
 - 1. 60% of the tape guide assemblies which were incorrectly passivated. These are due Tuesday September 2, A.M.
 - 2. Panel overlays - will be ready for installation on Tuesday September 2.
 - 3. Reel hubs - production quantities are ordered and will be at the preproduction line on Wednesday September 3.
- C. Checkout of the preproduction units has begun and I expect that the majority of the units will be completed by September 5, 1969.
 - 1. No modifications will be initiated during the preproduction cycle, with the exception of corrections for catastrophic failures. Any desired modifications will be made only after product line test reports have been received and a final design review has been held.

/bca

Monthly Progress Report
Arnold Sherman
Page 2

DEctape

The preproduction units are being assembled, and checkout of these units should start next week. Though this is behind schedule, it is progressing satisfactorily.

/gp

digital

INTEROFFICE MEMORANDUM

DATE: August 29, 1969

SUBJECT: Monthly Progress Report

TO: Arnold Sherman

FROM: Jacob Ginsberg

TU10 Capstan Servo Design has been completed during the first week of the month to a stage where the capstan performed as per specification. The first prototype built was not suitable physically to be used on the transport. This resulted in building the complete circuit on double board.

With respect to the proposal of the TU80 I spent the second week of the month in California visiting Ampex, T.R.W., and Hewlett-Packard. The results of this trip are on a special report. The only part of the trip I would like to make a note of in this report is the visiting of T.R.W. Semiconductor Division. The reason for visiting them was the IC servo which they have now available for controlling the speed of a motor which draws up to 10 amps using a tachometer feedback. This unit was demonstrated on DEC's premises during the first week of August and one of the TU10 motors was given to T.R.W. so they can design a specific circuit for our application. The results of the trip were satisfactory and I believe we can use the IC for the TU10 capstan servo both reliably and economically. A plug compatible board to the servo circuit I designed should be built and evaluated in the next month. The remainder of the month was spent partially troubleshooting the servo board and implementing some minor changes on it. The rest of the time was spent preparing information for the TU80 proposal which should be ready for preliminary presentation in about two weeks.



/bca

DATE: August 26, 1969

SUBJECT: TU-10 Progress Report

TO: Arnold Sherman
cc: Joe St. Amour

FROM: John Bardone

The first Deck Plate Casting of the TU-10 has recently been machined. The Quality Control Department informs me that all primary tolerances were satisfactorily met and that there were no machining difficulties throughout the process. I have since assembled all mechanical components to the Deck with the exception of the plenum vacuum casting, which is due in-house this week. When this unit arrives we will have two transport prototypes mechanically ready to operate.

The reconfigured tape guiding mechanism I discussed in my last report, has been completed and tested. Preliminary results from these tests indicate that all static skew may be zeroed out by the adjustable guide posts and dynamic skew levels are well below the maximum acceptable values. The machining process for these guides has reduced the manufacturing time by 60%. I am presently conducting a design study to determine the best locations for the components associated with the head mounting plate; i.e. the tape cleaner, E.O.T. - B.O.T., and keeper assembly. All these components will be aligned on the plate with a specially machined jig which will reference off the tape guide surfaces. I have aligned heads by this method in minutes. The present guiding technique permits a tape path of such smooth lines that tape loading may be accomplished in less than eight seconds with minimal manual dexterity on the operator's part.

A final area I have addressed myself is to the buffer column covers. The present layout uses glass laminated to a punched-out sheet aluminum cover plate which has one-half inch strips down the center of each column for tape viewing. Further, this allows the cover plate to be hinged from the deck eliminating the need to juggle glass. The approach is aesthetically pleasing and mechanically functional.

/bca

DATE: August 26, 1969

SUBJECT: Monthly Progress Report

TO: Ed Corell

FROM: George Beckner

cc: Joe St. Amour

Buz Doucette (PR69-D)

Bill Owens

Grant Saviers (RSØ8)

Progress was made in three main areas this past month:

PCO4/5's

PR68-D (Type Setting Reader)

RSØ8 Disk

PCO's

The first draft of the PCO4 Manual is out for review and will be signed off this week. Preliminary copies will be available to ship with the first PCO4 units which are now in Systems and scheduled for shipment in September. Work on the new Plastic Bezel which will reduce PCO cost (approximately \$10-12 per unit) is still being carried on. This cost reduction should be in place by January 1.

PCO4/5

Production is now gearing up and starting to roll. Approximately 20-30 production units have been built to date. Small problems have been noted and accumulated over this start-up period. One large ECO will be written to clean these up in the coming month. Final sign-off to build should also take place in the coming month.

PR69-D (Type Setting Reader)

An Engineering Model was built this month. Testing has been completed on the basic reader section and testing of the total unit is planned to be completed this week. The Design Review Board met for the second time and approved the Engineering Unit. Plans to build five preproduction units are now underway. Drafting has already estimated time and cost and will start work on September 2 and finish in four weeks. Effort in the coming month on this project will be in the areas of a Mechanical Engineering interface with Drafting and development of the front vacuum cover with a local vendor.

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August 27, 1969
Monthly Progress Report

RS08

Three areas in this program were given limited study in the past two weeks: Tools & Fixtures, Quality Control, and Production Control. My effort in this program will be confined to recommendations, tool and jig sketches, material flow/ assembly area outlines, and assembly procedures. A weekly report to Bill Owens will cover in detail what work has been done and what work will be done on this project.

/bca



INTEROFFICE MEMORANDUM

DATE: August 22, 1969

SUBJECT: Monthly Job Report, August 1969

TO: Joe St. Amour

FROM: Loren Prentice

cc: Pete Kaufmann
Ken Olsen

PDP-10 Projects - Dave Nevala

RP10, RP01, RP02 Disk and Control

All design is completed and drafting done. Prints will be signed off when schematics and cable models are through drafting.

PDP-10 Projects - Ira Morris

KI10 (Central Processor)

First model or prototype will be fabricated by Mechanical Engineering with the aid of incomplete drafted drawings and engineering sketches. Drafting is under way. A complete set of signed off prints will be turned over to F. Fortin for the first 10-group prototype on or about Jan. 1st.

ME10 Memory

We have notified Fred Fortin that we lack information to complete this project.

MD10 (Mass Memory)

We are awaiting the receipt of the unit from Ampex.

PDP-10 Projects - Alan Lyons

A proposal showing cost savings on the PDP-10 system by changing from the old style cabinets to new style H950 cabinets has been presented to the PDP-10 group. We have built three cabinets, all H950 style, with various panel and indicator arrangements and placed them alongside old style cabinets in the PDP-10 Computer Room. Jack Carroll has made photographs of the new cabinets.

K110 (Central Processor)

A model of the new console has been built and demonstrated that the method of access to bulbs from the front is sound. Several modifications must yet be made.

Switch Tester for Push Button Switches

A switch tester has been designed for push button switches and the work has started on this in the model shop.

VT04 Display Terminal

Bids for construction of the console in fiberglass have been sent out. Drafting is under way on the rest of the unit. Ira Morris made a trip to Winner Mfg. Company in New Jersey to ascertain their facilities and capabilities of this company to produce this part.

PDP-15 - William Minor

The last prints have been signed off. All that remains is the remote console and trouble shooting. Lack of decision and interest on the part of the 9-group appear to be the controlling factors concerning the remote console. Bill is working with the production engineers to get the first run of these machines into production. Some ECO's are pending. He will review the status of ECO's and the parts on hand with the production engineer.

PDP-11 - Dave Nevala

Detail drawings of mechanical parts are progressing well. Most of these drawings can be signed and released next week. Presently 150 sets of the power supply parts and 150 sets of the chassis and console parts will be ordered next week. The two largest problems remaining are (1) to properly specify and integrate a tilt slide for the unit; taking a vendor and placing an order for the die castings to replace the sand castings; (2) completion of the super cover for the table top model.

PDP-12 - Stan Znamierowski

We received on August 15th, PDP-12 production problem reports. These are being evaluated and ECO's written where necessary. Some items in the report have been taken care of previously.

RF/RS09

On "Hold" from production.

PDP-14

Production start-up problems and initial phases of product improvement are under way. De-bugging mechanical package for the Read Only Memory.

CNC

Stan is having a cardboard and wood mock-up made to evaluate design alternatives.

RS09 Timing Track Writer - Bill Minor

The first model is completed and drafting should be signed off Monday, August 25th.

Standard Bezels for H950 Cabinetry

ECO's have been signed off for changes to the bezel latch used to support the new plastic material. We are awaiting inspection reports on 12,000 pcs. now in the house. If necessary these will be reworked to the proper specs so that the difficulty that has been experienced with removal of the bezels can be alleviated.

Two sets of tests have been run in the past month at Branson Sonic Power to prove this as a method of assembly of the insert to the molded section of the bezel. The one remaining problem is to prevent flash occurring from the weld during this operation. The last test was to prove this was a complete fiasco as the wrong material was sent to Branson. These tests will be rerun during the week of August 25th with the proper material.

The ECO on the 8 system cabinet has been signed off.

H950J Doors

Bob Niro has received and shipped the doors to the customer. He will also place the extra door on the cabinets in stock. The prints are signed off and in the files. The H950 cabinet drawings have been ECO'ed to include the new doors.

RK08/RK01

This is a new memory system, was for CMD1101 disk cartridge-type memory unit. Layout has proceeded as far as the prints from the vendor will allow. The detailed information needed will be obtained upon arrival of the units now in transit. The only problem seems to be the power supply cooling.

VR12

A prototype table top model was built and is being painted. An all-steel model will be evaluated as soon as possible. Design work is completed on changes to the high voltage supply.

Commercial Packaging - Jim Lawrence

The packing of 1-2-3 options, these are in 1943 mounting panels and represent the greatest single source of problems in shipping, have been discussed. Samples must be made for trial packages.

The first issue of the Packaging Manual has been distributed to those persons directly connected with packaging and QC operations.

A trial will be run on the PDP-14 package by shipment of common carrier to Chicago and return by air freight.

A three-way recording accelerometer has been purchased and received and will be used in a program on GDI100 card readers in a coordinated effort with Al Erny.

The last two weeks have been spent on an RS08 humidity problem. We are working on two approaches. The first approach is expected to be in test over this weekend and is estimated to take approximately five days. We are trying to get a better than two-week delivery from Duplicon of a formed part to seal off the motor section only.

Industrial Design - Jim Jordan

Jim has spent considerable time with Alan Lyons and PDP-10 Engineering regarding the change from the old to the new cabinets in form of memos and in collaboration to prepare models, sketches and diagrams to demonstrate the superiority of one over the other. He says he is almost finished the comparative analysis of digital and analog products, comparing them competitively with our own. A good many renderings have been made of an

exhibit system and work is ready to be started on a model pending approval of carpet color and logo by Ken. Jim's proposal for ruggedized PDP-11 should be reviewed, by us as soon as possible.

Loren

Production Eng.



INTEROFFICE MEMORANDUM

DATE: August 25, 1969

SUBJECT: PRODUCTION ENGINEERING STATUS REPORT - AUGUST

TO: P. Kaufmann
K. Olsen

FROM: R. W. Puffer

cc: S. Sobel

PDP 11

We have worked extensively with the Product Line during the last month to develop a detailed pilot production plan for the 11. Although several slippages have taken place in the engineering schedule, the most serious being a relayout of a power supply module, the project is under control. Within a month we will have a PDP 11 Production Engineering office consisting of an engineer, a technician, and a material coordinator working full time on the project under the supervision of Bill Vaillancourt. This level of effort is appropriate considering the size, scope and time scale of this project.

PDP 12

We shipped 15 systems in August against a beginning of the month plan for 15. The materials flow has improved greatly as has the technical competence of the checkout technicians. We still require releases for 3 modules. A new group of technicians, now in 12 school, will be on the line in two weeks and will allow us to build up to 35 machines per month.

PDP 14

We are at our planned build rates and production is going smoothly. No further report will be submitted until our production rate changes.

PDP 15

Engineering slippages have resulted in a new allocation that slows the planned build-up in the second and third shipment months. The KP15 logics delivered last month had serious design and wiring problems. The EAE (Extended Arithmetic) option is not yet completely designed. We will ship 5 in October as planned but, because EAE's are required for almost all systems, we will ship 5 rather than 15 in November.

PRODUCTION ENGINEERING STATUS REPORT - AUGUST

R. W. Puffer

August 25, 1969

Page 2 of 3

VR 12 - XY Display

Released to production!

RM10B - Bryant Drum

Units are coming up quickly; the device looks good. Release to production next month.

RP10 - Memorex Control

1 unit was shipped internally in August with four 630 drives. The 660 is still on engineering hold.

TU56 - Dectape Transport

Pilot run units perform well and will be going to the Product Line for acceptance testing next month. Project continues one month late.

TU10 - Tape Transport

Mechanical design is on schedule but electronics are at least one month late.

PC04/05

Shipments will start in September.

RF/RS08 - Disk Memory

45 diskless units are complete. The engineering task force effort has disclosed both plating and head problems. With good disk surfaces scheduled in next week, we will resume limited shipments the following week.

TR02 - Incremental Transport

Release to production is waiting for release of the M307 which is a PDP 12 product line module that requires further design effort to make it perform to specification.

MD 10 - Fast Memory

Vendor slippages have delayed the project one month.

PRODUCTION ENGINEERING STATUS REPORT - AUGUST

R. W. Puffer

August 25, 1969

Page 3 of 3

GLC8 - Gas Chrom

Contrary to incorrect information reported last month, we cannot ship without extensive software rework which is scheduled for March completion. We are working with Ron Noonan to tie down inventory dispositions.

mjm



INTEROFFICE MEMORANDUM

DATE: August 26, 1969

SUBJECT: PROCESS ENGINEERING MONTHLY STATUS REPORT

TO: P. Kaufmann
K. Olsen

FROM: T. Stockebrand

cc: S. Sobel

I was on vacation half the month. This month please read the individual reports. Highlights below:

Canadian Wirewrap

Being installed on schedule now.

AWT # 2

Assembly proceeding down here. 3 weeks late as last month. Completion - 1 October 1969.

Solder Blowhole

Process Changer which solves the problem has been made.

IC Insertion

Operational. Production test underway.

Automatic Cable Stripper

Complete. Works fine.

Alkaline Ink:

The final testing and evaluation of alkaline soluble ink is underway. About four hours a day, one screener screens with alkaline ink. The boards are inspected and either accepted for etch or washed for rescreening. By August 29, we will know for sure just how alkaline ink fits into our system.

Drilling:

Drilling has been investigated. Various equipment and procedure set-ups have been looked at, and by August 29, a summation report of my findings will be published. Drill resharpening is an issue here also.

Cross-Sectioning:

Cross-sectioning is at a satisfactory state. By August 25, a report will be completed which will demonstrate how cross-sections are made.

Termination:

August 29 will be my last day as I must return to school for a semester. Before I leave I will transfer my information and projects to John LaBate who will take over and finish.

(1) Wire Wrap in Canada:

The installation of thirty (30) stations in Canada is on schedule, the first ten will be on line within a week, the second ten in two weeks, and the third group of ten in four weeks. During the next three weeks, we will re-work the interface for the second group of thirty.

(2) AWT #2:

We are about three weeks behind on this project. Hardware is being assembled and the cabeling should start next week. Estimated completion date - end of September.

Solder Blowhole Problem:

PTH process changes have been made that solve this problem. The most important changes are plating for a 2 mil thick copper wall with a minimum allowable condition of 1.2 mils and plating 1 mil lead-tin with the bath low in both organic and inorganic impurities. Drills are being changed every 4000 hits, resulting in a smoother hole for more uniform plating. Daily cross-sectioning of holes is being done as a process control for monitoring copper and solder plating thicknesses and smoothness of drilled holes.

I C Insertion Machine:

The cut-clinch blades have been redesigned to improve the holding of the I C in the P C board. The new blades are working in production now with good results. Spares are available when they wear out.

Wave Soldering:

The new Hollis wave soldering machine has arrived and will be set up for trial run and acceptance before shipment to Puerto Rico. The conveyor width is adjustable and will accept boards from 1 to 12 inches wide. Hollis is completing development of a wave mark for this machine to eliminate taping of the gold fingers.

New Jumper Taper Machine:

A new design to provide increased capacity for Puerto Rico is 40% complete.

1. Automated degrease conveyor for Canada complete and operating.
2. Daymarc tester mechanical reject in process of rework.
3. Fixture to mount 288 and 144 Pin Connector blocks on Mtg. bars without Roll Pins is complete and at Raytheon in Waltham for evaluation.
4. Jumper Taper Machine on Paper and parts ordered. On line 4-6 weeks.
5. Hot/Cold Shock test tank complete and operating.
6. Bridgeport project: New Hydraulic unit received. Waiting for pulse motors and computer.

Job Report

Fred Haefner

8/21/69

N.C. Insertion:

We completed the debugging of the hardware to run two inserters, and moved the computer to the insertion area.

We are now about a week away from having a program that will run two inserters.

Model Shop:

Information search and data collection for possible solutions is still in process. I expect to have a plan and some conclusions ready by the end of September.

DEC Standard 030:

For the next two to three weeks I intend to refine the rough draft which was completed on 8/20/69.

Tolerance:

An attempt will be made to improve the tolerances on the step and repeat board used in P. C. layout. (Fabrication will be done by an outside shop in a controlled atmosphere).

Silk Screen:

New layout has been implemented - follow up remains on the nitty gritty.

Drilling:

I plan to justify the purchase of a drill re-sharpening machine. Major problem is determining the quality of the drill after re-sharpening.

Decals:

New labels and methods are being sought to improve the present Decal application, in the assembly area.

- 1) Data base conversion for Fred Haefner is completed.
- 2) Artwork Generator program completed, waiting for Hardware problem to be corrected (Les Goldman)
- 3) George Gerolds program completed. (status same as last month)
- 4) Library status same as last month except for a few additions.
- 5) Starting on ROM program for Dave Widder Friday August 22, 1969.

Job Report

Richard Reynolds

8/21/69

Module Support:

FCC Cable Stripper - The first one was completed with all changes made and is now in operation in module assembly area. The second was completed and sent to Puerto Rico.

A feeder and cutter have been purchased for the FCC. A pre-feeder is now in the drawing.

ROM:

The valves, with fittings, as well as the wiring, have been completed. Work on the frame will continue. Should be completed by the end of September.

FCC Cable Stripping:

Two machines have been completed. One has been sent to Puerto Rico, and the other is in operation in Module Assembly. A third machine is under construction for the Model Shop.

The Proposal from H. J. Reusch Company for a rotary slitter has not been received as of yet.

A feeder and cutter for FCC and flat coax has been purchased from Artos Engineering; delivery next week. The Control Logic has been built.

The Prototype Rom loom is about eight (8) weeks behind schedule, it now looks like it will be operational by September. Most of the hardware is in, and is now being assembled. The controlling computer has been received and the basic interface is complete, those several extra features must be added. The computer program is being written.

May 29, 1969

The attached lists are those found in our dead storage files. The lists are compiled of old projects and new, and are divided into file drawers according to their corresponding Group Managers (Vice Presidents).

Newer schedules are kept in the large books in the kitchen. Each week these schedules should be added to the books after a Schedule Review Meeting. After six months have been accumulated in the books, they should be taken out and put into dead storage along with the others.

SCHEDULE REVIEW

NICK MAZZARESE

PDP-8I Production Engineering
PDP-8I Electrical Design
19" Cabinet Design
LINC8I Logic & Pre-Production
LINC 8I Mechanical Design
Typesetting
GLC-8
DCM Breadboard
PDP-8 System Software
PC01 Redesign
Automatic Integrated Circuit Tester #1
AMT #4
Advertsing
680I
Computer Special Systems
PDP-8/I/L Diagnostics
360 Interface for PDP-8 & 9
Small Computer Maintenance Manuals
EDP Systems
DC08
PDP-8 Disk Software
Time Shared PDP-8
PDP-8/S Peripherals
DFMA Disk File Mark Assembler
Printed Circuit Back Panel
ECO Procedure
PDP-8/I Table Top Version
PDP-8, 9, 10, and Misc. Maintenance Manuals
PDP-8/L Peripherals
PDP-8/I Development
Technical Publications
PDP-8/I Diagnostics
PDP-8 & 9 to S/360 Data Link
ECO Control/Print Distribution

SCHEDULE REVIEW
STAN OLSEN

PDP-9 Options

339 Display

338 Display

Paper Tape Duplicator

TU20, TC59, and TC58

Ceramic Modules

A Series Modules

Plastic Modules

RC09 Disk

Module Engineering

PDP-9 4K Software

PDP-9 Disk File, PDP-9 I/O, AMT IV, TU20

PDP-X Peripherals, Mechanical Design, Software, Processor, and Memory

PDP-9/L Memory

SCHEDULE REVIEW

WIN HINDLE

LINC I Development Summary

PDP-10 Systems, Processor, Peripherals, and Engineering

PDP-10 Maintenance Manuals

MA10 Memory

PDP-10 Peripheral Engineering

VR12

PDP-10 Diagnostics

RP10, RM10B, RA10, LT37

TU79 Engineering

RM10B

RA10

PDP-10 CUSP, Peripherals, and Memory

LINC Clinical Lab Hardware and Software

CP10

PDP-10

VP10 Display

SCHEDULE REVIEW

PETE KAUFMANN

DECtape Testing
RF08/09, RS09/10 Disks
LA20 Line Printer
Special Projects
Digital Testing System
Process Engineering
ADS Implementation
20 Microsecond Character Generator
Industrial Design
ADS & Mfg. Support
Misc. Mechanical Engineering
Automatic Wire Wrap Checker
TU56 Cost Reduced DECTape
DF512 Disk
U.K. Production
Facilities Planning
Quality Control
Signal Averager
IC Tester
PMA-8 Production
PC Board Capacity, Soldering, and Touch Up
30 Gage Semi-Automatic Numerical Control Wire Wrap
Data Processing
Production Engineering
Automated Drafting
Strate Engineering
Computer Lab
Cheap Tape