dec INTEROFFICE MEMORANDUM

DATE May 31, 1962

SUBJECT

TO K. Olsen

FROM Gordon Bell

I need some kind of indicator assembly for 18 maintenance lights which get mounted inside the cabinet. The lights require lables. The modular assemblies I designed that were like memory driver holders (10 x 18 lights) were too elaborate finally and costly.

dec INTEROFFICE MEMORANDUM

DATE May 31, 1962

SUBJECT OUTSIDE SIGNS, BLDG. 5

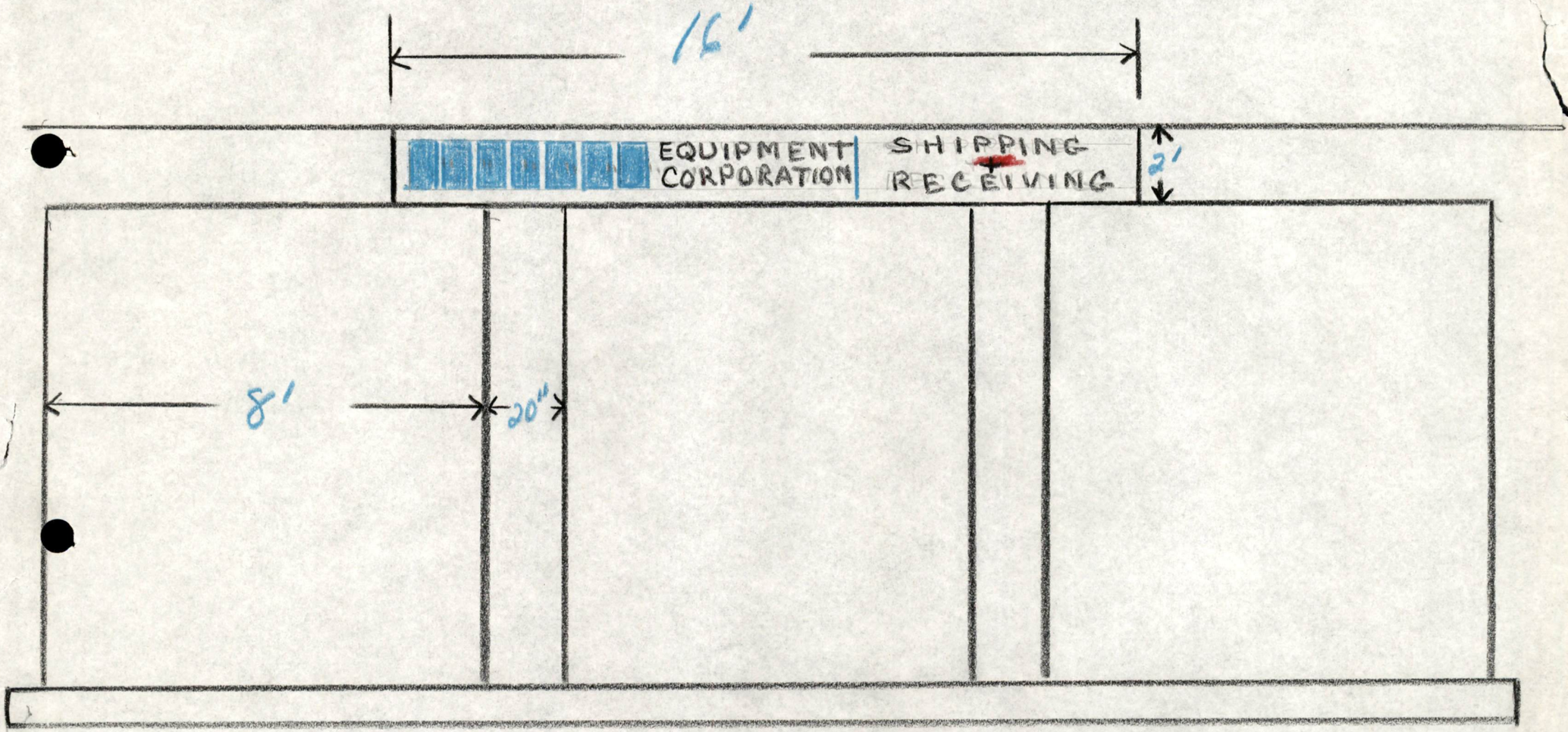
TO Ken Olsen FROM Jack Atwood

Frank Howland has made two quick roughs on new signs for the outside of Building 5 to be put up when Raytheon pulls out.

One sign is to go over the three doors at the receiving docks, replacing the present Digital, Raytheon and Servodyne signs. The other is to replace the present Raytheon sign at streetside.

We may want to add other listings to any streetside sign, such as "Production" or "Computer Division," and we may want to reduce the size of the listings in relation to the company name. However, this gives us a starting point.

I have two suggestions with respect to these signs. First, we should trace our trade mark on the blanks as a guide for Marchant. The job he did on the present Building 5 sign was pitiful. Second, an inside-illuminated plastic sign might go very well ~~as~~ at streetside. Since ~~it~~ their will not be at our main administrative entrance, ~~it~~ The sign might as well be doing a good day-and-night promotion job for us at the same time it is showing people the way into Building 5.


16'
EQUIPMENT CORPORATION
SHIPPING
RECEIVING
2'
8'
20"


EQUIPMENT
CORPORATION
PERSONNEL
PURCHASING

dec INTEROFFICE MEMORANDUM

DATE May 31, 1962

SUBJECT THIRD FLOOR, BUILDING 12

TO Ken Olsen FROM Jack Atwood

I would like to use approximately three days of the carpenters' time next week to complete the partitioning on the Third Floor of Building 12. The only "critical" materials involved would be some 24 feet of the old Raytheon partitioning, which could be made up of random-width panels. The end effect would, I believe, be highly satisfactory, both in the overall appearance of the area concerned and in working conditions for the people occuping the work spaces.

The moves I would like to make are these:

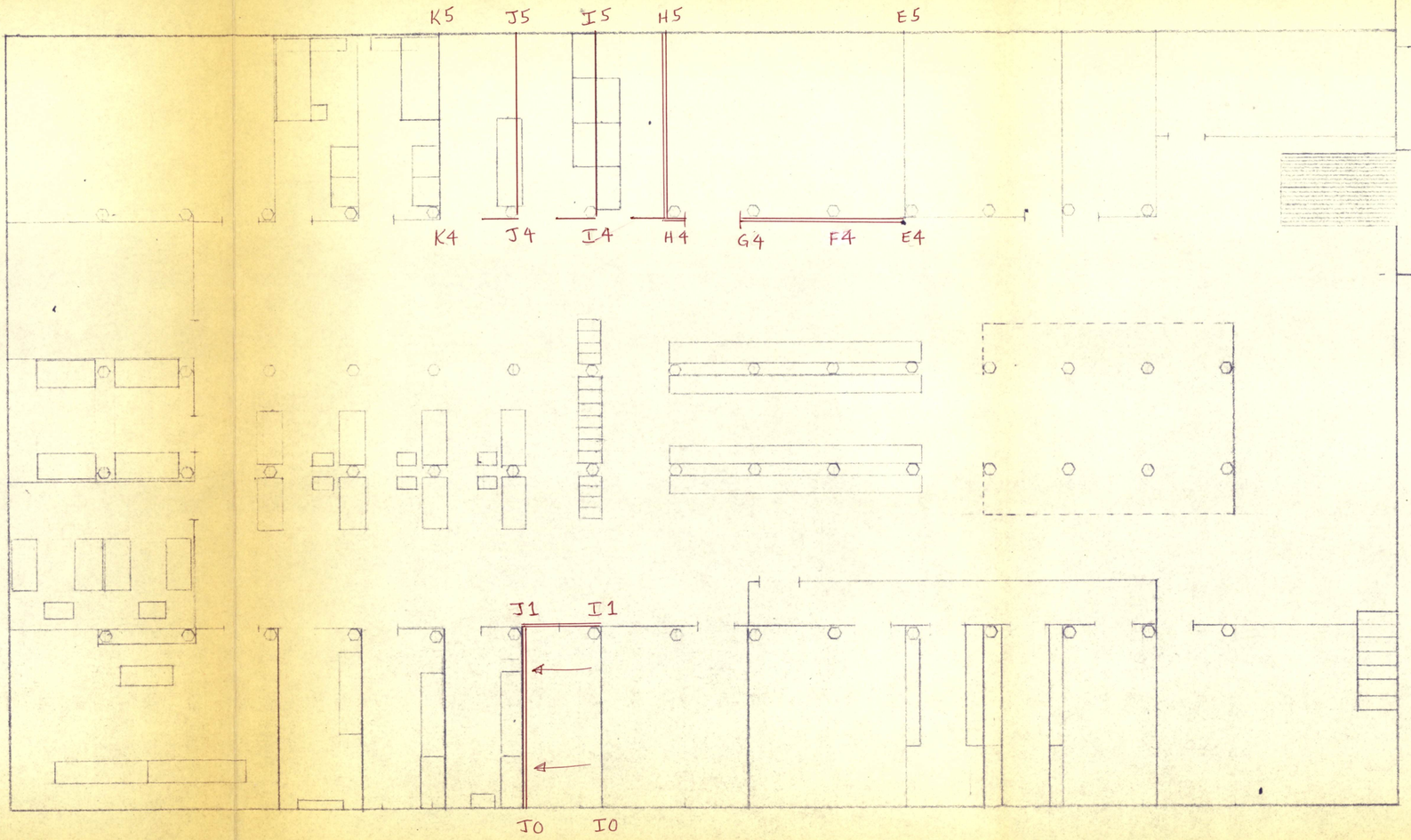
1. To expand the size of the present telephone room by one bay as requested by the Telephone Company. This should be done by July, according to the latest word I have had. It can be accomplished by moving the sheetrock wall presently located between I0 and I1 to new location J0-to-J1 and adding a sheetrock wall between I1 and J1.

2. To move the Raytheon partitioning presently located between J1 and J0 to new location J4-to-J5 to form, for the time being, an art workroom.

3. To enclose the area bounded by E4, E5, H4 and H5 with a 12-foot sheetrock partition to form a photo studio in which we would have maximum control over lighting conditions. A double doorway (without doors) between G4 and H4 would allow fairly large objects to be moved in and out.

4. To add Raytheon partitioning between I4 and I5 to form an office on one side for Gert Loynd, who needs to have a place where she can keep all her direct mail operations under control, and a workroom on the other side for the direct mail list work now being done in the area to be taken over for telephone gear.

If you have no objections, we will go to work on this the first of the week.



Buildings 12 and 3 F

COMPANY CONFIDENTIAL

INTEROFFICE MEMORANDUM

DATE May 31, 1962

SUBJECT Computer Delivery Schedule - May 31, 1962

TO Ken Olsen
Stan Olsen
Ben Gurley
Jack Smith

FROM H. E. Anderson

	#1	#2	#3	#4
May	Beckman #2	ADX-5	ADX-4	
June	LRL	CRC#1	CRC#2	MIT
July	ADX-2	DEC*		
August	ADX-6	Honeywell* (Minneapolis)		
September	ADX-7	United Aircraft		
October	ADX-3	Adams		
November	ADX-8	Honeywell* (St. Petersburg)		
December	AEC (Canada)	JPL#2* **		
January	AF#4*	Itek*		
February	NSA*	Mass. General*		
March				
April				
May				

* Tentative Orders
** Lease

COMPANY CONFIDENTIAL

dec INTEROFFICE MEMORANDUM

DATE May 28, 1962

SUBJECT

TO Ken Olsen
Dick Best
Ben Gurley

FROM Bob Savell

The Purchasing Department has been instructed to order from Nolik Products Company some Danger High Voltage labels. They have a bright red background with black letters and are approximately 3" wide x 1" high. These will be installed inside the CRT housing on Display Type 30 and 31.

When the Type 30-A Display was shipped to the Bedford Air Show, the top cover on the shroud was properly fastened to the bottom shroud with the six cover screws. It should not have been left in a condition where it could be lifted off without removing these screws. I hope that such was not the case at the show.

dec INTEROFFICE MEMORANDUM

DATE 25 May 1962

SUBJECT Works Committee Meeting 24 May 1962

TO Kenneth Olsen
Harlan Anderson
Stan Olsen
Ben Gurley
Maynard Sandler
Dick Mills
Dick Best

FROM Judith Ebner

The following is what I abstracted from the Works Committee Meeting on Thursday, 24 May 1962 and from my preliminary meeting with Dick Best, Don White and Russ Doane on Tuesday, 22 May 1962.

A Library committee consisting of Dick Best, Russ Doane, Don White, Ben Gurley and Judith Ebner will meet periodically to discuss Library problems.

"Library" will be responsible for the following:

1. Books - (Check with Mrs. Gurley with reference to the possible use of a cataloging service -- Wilson, etc.)
2. Semiconductor Catalogs
3. External Reports Files
4. IBM Files
5. Lincoln Lab Files
6. Computation Books - (Set up system of control)
7. Thesis Papers - (To be bound)
8. Military Specification Books
9. Company Confidential Memorandum Files
10. Patent Files - (DEC Patents to be seperated from others - file to remain in numerical order)
11. College Catalogs
12. P.D.P. File - (Ben Gurley to go over this with me)
13. Cambridge Communications Files
14. Maps - (This was not brought up at the meeting but we have had frequent calls for street maps and have a few on hand)
15. Magazines - (Submit list to Mr. Ken Olsen from which he will select those which will represent library subscriptions)
16. Magazines in Lobbies - (Seperate Subscriptions)
17. Catalog Files - (To go with Purchasing Department when this department relocates in Building 5)

In the interim the Library has the responsibility of organizing the catalog files so that they are in top operating condition. The hiring of the necessary file clerks for this job was agreed upon. Also, the hiring and training of a permanent clerk to take charge of the catalog files.

The Telephone Books will be a part of the Purchasing Department.

The Competitors file to go to Brad Towle.

If there are any changes, please let me know, since I plan to use this memorandum as a basis for operation.

24 May 1962

Scientific Method

Dick Best

Judith Ebner

May I first give you a very brief introduction to how I use language and point out the difference this makes in my approach to anything in which I engage.

First....I try to make my language have as close a resemblance to what I am talking about as is possible. Mostly I try to use verbs instead of nouns since I recognize that I am talking about a process ...a continuous active world of events...therefore nouns or labels do not serve me very well since they are static whereas verbs denote action, and so more accurately describe the event.

I try to date and index my statements thereby keeping them as much in tune with what I am talking about as possible.

Third I try to realize that no matter how much has been said, there is always more to be said. This would apply to talking about a person, thing or event since all are a part of a total process and in a constant state of change; there is always more to be said. And so I add etc. to all my sentences.

This is, of course, an oversimplification, of the scientific method which I am applying.

However, taking this thinking as a base...DEC becomes the total organism...under constant change. The Information Retrieval Center (Library is the static label) is a part of this organism through which information flows. The people involved in this operation must be aware of the need for having information flow being more important than just storing it. They must be interested in and aware of the need of searching for information. Research must seem necessary to them...not a nuisance. They must constantly be aware of the total organism (DEC) and think how a bit of information is related to the total organism and through whom it must flow in order to serve the best overall purpose.

The following pages and exhibits will show what is presently a part of (Library) Information Retrieval Center; projects still to be done; suggestions and floor plan as to how to organize the new section; a proposal of an engineering service which would affect a saving in valuable engineering time...no doubt affect drafting, etc., etc. Also, how many people of the above type, would be needed to carry out this total service. (In fact, you very rarely find them; so they would have to be trained...but you would have to start with a "research-type-thinking-person".)

dec INTEROFFICE MEMORANDUM

DATE 24 May 1962

SUBJECT A or The ? Scientific Method

TO Dick Best

FROM Judith Ebner

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dec INTEROFFICE MEMORANDUM

DATE May 23, 1962

SUBJECT STORAGE SHELVES

TO Ken Olsen

FROM Jack Atwood

We have utilized a large number of 36"x 30" shelves in setting up our new areas in Buildings 12 and 3. They have been most helpful in getting our printing, mailing and storage areas efficiently organized.

We drew on the supply of shelving in Production Stock, as suggested, as long as all the necessary parts - shelves, legs and braces - were available. When the supply of certain parts was exhausted, we ordered the additional shelving needed to finish the job.

That we did not incorporate the five or six 36" x 20" or 30" x 24" units left behind when the stockroom was moved is not a reflection on the usefulness or desirability of this shelving. It results from the fact that neither size is as suitable to our needs as the 36"x 30" units.

We deal basically in 8 1/2" x 11" and 8 1/2" x 14" materials and increments of these sizes. A 36" width allows us to store 8 1/2" units four wide or 17" units two wide with a minimum waste of space. A 30" depth lets us store 11" or 14" units two deep.

In setting up shelving of this sort, we try to stay as flexible as we can. We know that at any time we may have to pick up and move, so we keep it unitized for easy take-down and reassembly. We also know that shelving which has paper stock on it today may have to be used for catalogs or binders or some other item tomorrow.

Our aim is not to waste money by purchasing new shelving when some other types are already available. Our aim is to save money by installing the most universally useful shelving the first time around so that, when our requirements change, we will not have to go to the expense of erecting different types of shelving to meet each new need.

Incidentally, even though these shelves are usually linked together in groups, each 36" section is put together as an individual unit and is completely detachable and reusable in a different orientation. In other words, each section is in itself a piece of working equipment, just like a table or a desk or a filing cabinet. Since the cost of these units must be somewhere in the neighborhood of $35.00 to $40.00, I wonder why they should be capitalized and thus become part of our cost center overhead instead of being classified as "operating expenses" like other under-$200.00 items.

cc: Henry Crouse
Maynard Sandler

INTEROFFICE MEMORANDUM

DATE May 23, 1962

SUBJECT

TO Production Methods Group FROM Ken FitzGerald

Due to the increased production demands upon the Chromicoat area, it has been very difficult to handle the quality and quantity necessary. Therefore, this area is in need of review and revision. There are many ways to increase the quantity from the Chromicoat area, however we must also concern ourselves with quality, since we are using Chromicoat as a decorative coloration on aluminum. In examining our present situation, it seems that the only possible way of increasing production would be to increase the number of pieces handled per time, in other words, instead of handling four or five pieces on hooks on a stick, make it eight of ten pieces. But, because of the size of our tanks and weight of the pieces, it seems wasteful to employ any mechanical devices for picking up and moving these sticks from one tank to another.

The next logical step is to make the tanks bigger and employ an overhead pick-up and moving device. This device could be tied into a conveyer type system where the pieces would be run off from the tanks through a large loop for air-dry and give plenty of room for de-racking and packing. Our present vapor degreaser and the dumb-waiter parts from Building 12 could be utilized in this system. Tanks for this system should be in the neighborhood of 36 inches wide, 48 inches front to back and 36 inches deep. However, this leaves us with a floor loading figure of approximately 225 lbs. per sq. ft. and smaller tanks would put us back to approximately what we have now. Our present tanks give us a floor loading figure of 227 lbs. per sq. ft. which is already 127 lbs. higher than our suggested save load in Building 4.

A third alternative which Ken Olsen has discussed with me is the possibility of using large automatic type spray washing, rinsing, and chromocoating machines. However, the estimated cost figures on these has scared me away, since they averaged between 25 and 50 thousand dollars. I have also been advised by Mr. W. G. Boeuf of the Oakite Products Corp. that we should not even consider this unless we are presently using tanks in the neighborhood of 3,000 gallons and they are not sufficient, for our production demands. Also, Mr. G. H. Collins of the Amchem Products Corp. is working up a quotation for this, but he also felt we wern't ready for an extensive operation of this kind. Mr. Jerry Maltz of the Magnus Chemical Co. is working up a quotation and has given me a preliminary cost figure of $34,000. I should get a firm quotation from them in about another 5 weeks.

Breakdown of costs:

1. Duplication of our present chromocoat system, less degreaser.

a. Two stainless steel tanks at $230. each	=	$460.00
b. Three mild steel tanks at $60. each	=	$180.00
c. One drip tray, $80.	=	$ 80.00
d. Three heater s & controls at $106. each	=	$318.00
e. Two drying racks at $25. each	=	$ 50.00
TOTAL		$1,088.00

2. Larger chromocoat tanks measuring 48 inches, front to back, 36 inches wide, and 36 inches deep. Overhead lifting and shifting device with conveyer, but less degreaser.

a. Two stainless steel tanks at $302. each	=	$604.00
b. Four mild steel tanks at $75. each	=	$300.00
c. Drip tray, at $90.	=	$ 90.00
d. Three heaters & controls at $106. each	=	$318.00
e. Lifting mechanism (dumb waiter) NC		
f. Conveyer system $475.00	=	$475.00
g. Labor installation - 4 days at $56. per day	=	$224.00
Total		$2,111.00

3. Automatic or Semi-Automatic type washing machine with conveyer system, less degreaser as stated above, the cost of this unit will range about $35,000.

We still have not licked the problem of color variations on our color chromocoat work, but our results lately have been much better than in the past. When I was in Cleveland, a couple of weeks ago, I talked with a Mr. W. G. Bouef of the Oakite Products Corp., told him our problem and he recommended we try using a PH meter to read the level of our tanks and re-constitute from a concentrated stand by source as soon as any flexuation from PH was noted. However, when I returned and talked to a Mr. Woodwell, local Oakite representative, he felt that we would be wasting our time and money with the PH meter as the variations in PH were not enough to show on our PH scale. I presently have a PH meter on trial which I hope to evaluate myself and decide whether or not it would be worthwhile. The cost of this meter is approximately $330., a more sensitive meter can be obtained for about $400. If the PH is constant, the temperature is constant, and time is constant, it seems reasonable to expect our color should also be constant. If this does not give us the constant color then it may be necessary to investigate other methods of coating and coloring our parts.

Distribution:

Ken Olsen ✓
Maynard Sandler
Bob Hughes
Loren Prentice
C. Kendrick
Jack Smith
Dick Krachone

INTEROFFICE MEMORANDUM

DATE May 23, 1962

SUBJECT PDP-4 Prototype for DEC Computation Center

TO Roland Boisvert
Arthur Hall
Jim Myers
Bob Savell
Jack Smith
Ben Gurley
Ken Olsen ✓
Richard Mills
Dit Morse
Stan Olsen

FROM Gordon Bell

This memo is intended to clarify delivery of the peripheral equipment, specified by Ken Olsen's memo regarding the DEC Computation Center. The Central Processor PDP-4 is ready for delivery to DEC.

1. 1 - Tape Unit with a type 51 Control.
2. Burroughs Card Reader.
3. Anelex Line Printer.

Eventual equipment may include:

1. Type 30 Display.
2. Up to four tape units.

The above equipment should be operational by June 15. A summer programming staff will be using PDP-4 for some of their work. The first production-type problem will undoubtedly be mailing list manipulations, since all data are available to start the project. This project should provide sufficient subroutines for subsequent programs.

INTEROFFICE MEMORANDUM

DATE May 23, 1962

SUBJECT 4th and 5th Floors - Building #5

TO Kenneth H. Olsen FROM L. Prentice

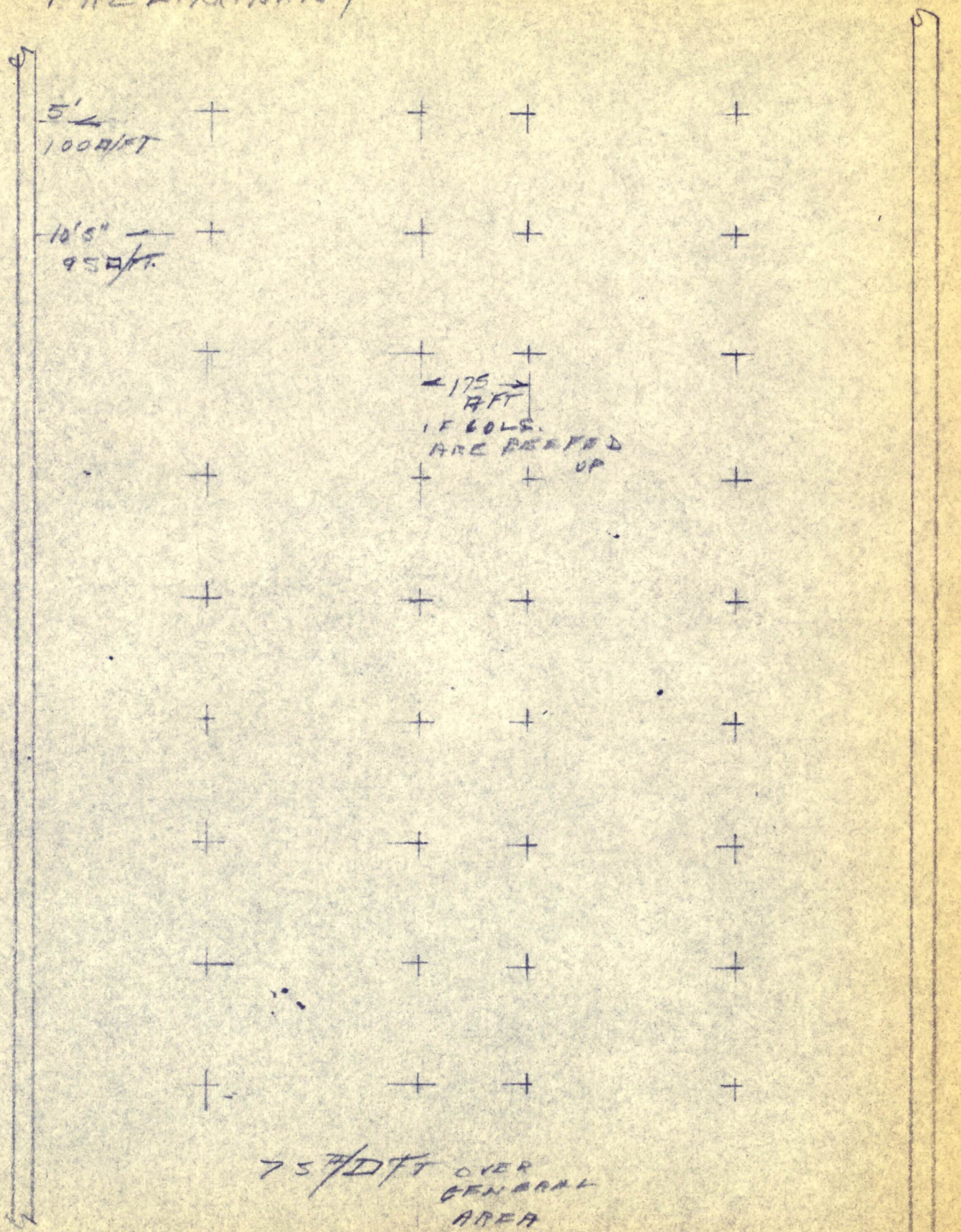
Floor Analysis:

We have asked Liberty Mutual Company to make a survey of safe floor loads in Bldg. 5. Mr. Tom Harrison, Engineer of that company stopped in and gave me a verbal recommendation this past week. General recommendations are that the floors are safe for 75 lbs. per sq. foot, live load. This is due to a large part to the spacing of the beams and the slenderness ratio of the columns. The plank floor will hold a concentrated loading of possibly 240 lbs. per sq. ft. A loading of perhaps 20% could be obtained directly over the columns or over the line of columns and the first 10± 5" from the outside walls could be loaded to 95 lbs. and the first 5 lbs. 5 feet in from the outside walls to 100 lbs. These loads could probably stand a safe overload of approximately 10 to 20%. We have overloaded one section with trchorethelyene, - 55 gallon drums and I have asked George Brown to move these and spread them over a larger area which he has done. This means in general, that the floor loadings over there are not as good as they are in Bldg. 4, by approximately 25% and that we should be very careful in the distribution and loading of heavy equipment.

# # #

cc: R. Mills

PRELIMINARY FLOOR LOADING REPORT



75#/DFT OVER GENERAL AREA

PLANNING WILL TAKE CONCENTRATED LOAD OF 240#/FT.

LBP 5/21/62

INTEROFFICE MEMORANDUM

DATE May 22, 1962

SUBJECT Status of PDP-4 Project/Request for Review

TO Ben Gurley
Ken Olsen
Harlan Anderson
Stan Olsen
Richard Mills
Dick Best

FROM Gordon Bell

Introduction:

I would like to review the PDP-4 project relative to production, sales, and engineering. The goal is to form a plan which can be carried out within the framework of DEC organizational policies (regarding growth, management, etc.). The most important factor in the formation of a plan is assumptions regarding sales for a certain production rate, (or production, assuming a certain sales rate). Therefore, I would like to discuss the sales-production schedule for the coming fiscal year in order that a profit and loss statement and general forecast plan can be made.

Prototype/Programming Status:

At this time, the PDP-4 prototype is ready to be turned over to the computation group of DEC for general internal use. The Anelex Line Printer is to be connected by June 15, and a Magnetic Tape System and Card Reader must be connected prior to June 15. A Card Reader/Magnetic Tape/Printer, PDP-4 should enable most of DEC's computational problems to be solved including addressing, payroll, and inventory control. A second DEC machine will be available July 7, for operation with the module testing operation. At this time, module testing with machine, though relatively straightforward, requires a large amount of peripheral equipment, design, and programming effort.

The MIT summer people, will devote time to module testing, DECAL modification, (PDP-1), PDP-4 software, and DEC computation problems.

Production Status:

The second PDP-4 will be ready for checkout in 2 weeks. The schedule is:

	From Production	Module Delivery	Customer Delivery
Foxboro-Nabisco	June 7		July 31*
DEC-Modules	June 21		July 1
Corning	July 5		Sept. 15

*Final delivery, actual delivery is July 1 to Special Systems Group for integration of system.

Group Functions:

PDP-4 Group:

1. Coordinate the manufacture of the standard PDP-4 according to a schedule derived by the PDP-4 group. Checkout the PDP-4 and integrate checkout with Quality Control.

2. Provide consultation in special applications.

3. Supply a Project Engineering Group* and specifications to Sales department.

4. Apply standard DEC I/O equipment to PDP-4.

5. Provide documentation and documentation control.

6. Design special equipment for PDP-4 (including Mag Tape Systems and Input-Output Equipment) when necessary.

7. Provide backup to field service department.

8. Provide initial training class to Sales department.

The Sales Department:

1. Proposal negotiation/sales/order processing.

2. Customer liason.

   a) Programmer training
   b) Machine care training
   c) Field service during warranty

3. Distribute programs, maintenance manuals, etc.

4. Special applications, Project engineering*.

5. Shows/displays.

6. Advertising, printing, etc.

Magnetic Tape Group:

1. Deliver operating type 50 Tape Units, and type 52 Tape Control.

2. Consult (or design) special tape control.

I/O Group:

1. Deliver I/O equipment including scopes, card equipment, printers, etc.

Production:

1. Manufacture wired mounting panels.

2. Manufacture stock items: power supplies, cabinets, consoles, etc.

3. Manufacture and test modules.

4. Order necessary manufactured parts (readers, core starters, etc.).

Special Systems Group:

1. Apply the PDP-4 to special problem, and be responsible for complete system (given, PDP-4 at a preassigned time).*

Engineering:

1. Design all modules, power supplies, power controls, memory systems, and system components.

2. Documentation.

a) Provide mechanical drawings
b) Provide documentation storage
c) Control documentation changes

Accounting:

1. Do Cost Accounting to predetermined specifications.

Mechanical Design:

1. Provide consultation to Drafting department, and be responsible for mechanical prototype design.

*May be handled by a project engineer within computer group, sales, or special systems group.

Present PDP-4 Group:

Gordon Bell - Project leader, Documentation controller, special design, group planning.

Dit Morse - Programming, special applications, sales.

Steve Lambert - Project Engineer, coordinator system aspects of PDP-4, work on system design, work with checking programs.

Dave Pinkney - Technical controller, design checkout procedures, responsible for reliability of PDP-4.

Bill Colburn - Production liason, provide working drawings to production, handle delivery of PDP-4 to checkout.

Larry Conley - Work on production details, assist in programming.

Al Yurkstas - Documentation.

Bill Kellicker - (on loan to Drum System) - integration work, production testing.

George Rice - (Sales) - Liason with sales, project engineer for Nabisco system including literature and manuals.

Bob Buyer - (Engineering) - F-41, F-45 descriptions.

Summary:

I would like decisions made regarding PDP-4 in order to proceed with future production-Sales plans. These plans are particularly vital, considering that approximately 3-5 summer programmers will be with us.

INTEROFFICE MEMORANDUM

DATE May 21, 1962

SUBJECT Summer Employer Program (Other than Production)

TO K. Olsen
H. Anderson
S. Olsen

FROM Bob Lassen

The following are people (other than Production) who have been hired for this summer:

Engineering

Programmers (High School students)	- 2
Programmers (M.I.T. students)	- 3
Electrical Engineers (M.I.T and Cornell students)	- 4
Professor Edwards (Dick Best)	
Edson DeCastro (Jon Fadiman)	

Sales

Electrical Engineers (Univ. of Connecticut and M.I.T. students)	- 2
Technician	- 1

Systems

Technician	- 1

Advertising

Clerks	- 2

Accounting

Clerk	- 1

Note: H. Anderson has a cost breakdown which outlines the monthly costs of both permanent and summer employment offers as of 5/21/62.

dec INTEROFFICE MEMORANDUM

DATE May 21, 1962

SUBJECT SUMMER EMPLOYEES PROGRAM, PRODUCTION

TO K. Olsen
H. Anderson

FROM Maynard Sandler

cc: S. Olsen
R. Mills
R. Lassen

As we have done in previous summers, we plan to hire a number of people for "summer work only". Our open vacation plan means that we must augment our capabilities if we are to maintain production levels.

The areas which we must cover are:

1. Janitors and Maintenance
All of our janitors will qualify for two weeks of vacation this year. We should have three or four young boys to help with plant cleanliness-three of last year's summer boys are returning.

Raytheon will move out and our Building #5 move program will require 5-6 helpers. We already have one and have applications for several additional boys.

2. Assembly
I would like to plan on 20-25 girls for Assembly and Inspection work. At this time we have 6 girls already returning or newly hired. Offers have gone out to additional girls and we have at least 9 other good prospects.

3. Production Control and Stockroom
The fiscal year end inventory and vacations pose a special need for help in this area. One accounting school student and one industrial engineering student have been hired and I want to add two summer clerks and a stockroom helper to this group.

4. Wiring and Test
I plan to use summer students in wiring and test to ease the vacation burden. I believe 5-6 boys could be used here to good advantage. We already have 2

SUMMER EMPLOYEES PROGRAM, PRODUCTION (con't.)

boys on file who might fit this category.

I have talked with Personnel about my thoughts on the criteria for choosing from among the summer job applicants. We should weigh favorably those young people who:

(1). Have done well in school
(2). Are taking courses of study which may be of value to us
(3). Seem to be earnest and sincere about their education and this opportunity to earn
(4). Are children of our good employees. Good workers are usually good parents.

4

dec INTEROFFICE MEMORANDUM

DATE May 18, 1962

SUBJECT The Computer to Mass General Hospital

TO Dit Morse
CC Ken Olsen ✓
Ben Gurley

FROM Gordon Bell

Yesterday, I talked with Bill Lennon and Steve Large of MGH. Lennon will be out to visit us on Monday, June 4 regarding their programming. MGH is considering our computer. They plan on being able to use Fortran on the computer. What Lennon has done so far is to write a Fortran at MIT, in COMET language. His Fortran so far has compiled a few Fortran statements for PDP-1. The program of course isn't completely debugged but he feels confident that this will not take very much time to finish. The thing remaining before there is a Fortran to PDP-1 compiler which works on the IBM 7090 is machine language subroutines for PDP-1, which suppossedly won't be a great time consuming project.

When Bill Lennon visits us he is going to make a proposal for writing some compilers. Some of the possibilities are a list handler using the existing COMET for PDP-1 or compilers in list language for running on PDP-1 or in the list language we would write a second list language for the PDP-1 so that the compiler could be written on PDP-1. I think what he proposes must be carried out by September. I think we should meet with them and listen to his ideas to see how well they can be carried out. He has a co-worker who is also quite capable. What they have shown so far seems to indicate that they might be able to carry out what they propose.

COMPANY CONFIDENTIAL

dec INTEROFFICE MEMORANDUM

DATE May 16th, 1962

SUBJECT Computer Delivery Schedule - May 16th, 1962

TO Ken Olsen
Stan Olsen
Ben Gurley

FROM Harlan E. Anderson

	#1	#2	#3	#4
May	Beckman	ADX-5	ADX-4	
June	LRL	CRC #1	CRC #2	MIT
July	ADX-2	DEC		
August	ADX-6	Honeywell* (Minneapolis)		
September	ADX-7	United Aircraft		
October	ADX-3	Adams #1		
November	ADX-8	Honeywell* (St. Petersburg)	Adams #2*	
December	AEC (Canada)	JPL #2	AF #4*	

Potential Orders: Itek, Cap Canaveral, NSA, JPL #3, JPL #4.

*Tentative Orders

Harlan E. Anderson

dec INTEROFFICE MEMORANDUM

DATE May 10, 1962

SUBJECT PDP-4

TO B. Gurley
G. Bell

FROM Jack F. Smith

cc: K. Olsen
H. Anderson

It was agreed at our meeting of May 12th to construct three PDP-4 systems. Delivery dates of systems to Checkout June 7, June 21, and July 5.

I have taken the following steps to assure these delivery dates.

Assignment of EN and JN

PDP-4-2	Foxboro	EN 2210	JN 100-1284
PDP-4-3	Dec #2	EN 2286	JN 100-4759
PDP-4-4	Corning	EN 2287	JN 100-4760

We are currently wiring the first system here at DEC. The second system will also be wired here. Wiring will not begin until May 24th on the second system because of expected engineering changes during the next two weeks. The third system will most likely be wired by an outside vendor.

I have received a new modified print of the operator control panel from Drafting. A requisition has been written for the construction of (3) panels, required delivery date May 24th. This required delivery date has been confirmed. Art work has been checked and is available for silk screening.

To date the new end panel has not been designed. What I plan on doing is having Scott mark up a print and rework a standard end panel which will arrive May 17th. I have talked to Scott and there seems to be no problem here.

Requisitions for cabinets have been written with required delivery dates of May 24th, June 7th, June 14th. These dates have been confirmed, which will enable plenty of time for the installation of equipment.

PDP-4 (con't)

Our biggest problem seems to be with the delivery of the Digitronics reader 2500. Presently we have on order two readers, the first of which has a delivery date of June 15th. This date is not adequate and I am trying to move it up; you will be informed of any additional changes.

The table has not been redesigned. Scott is now working on the redesign and is confident that it will be ready on time.

Power supplies have been ordered and are available. Cables have been ordered and will be available.

I plan on meeting with Jim Myers on the module requirement tomorrow.

INTEROFFICE MEMORANDUM

DATE May 9, 1962

SUBJECT

TO K. Olsen
H. Anderson
B. Gurley
G. Bell

FROM Steve Lambert

Charlton Walter and three others from AFCRL visited the plant late yesterday, May 8th, to see the progress being made on the two CRC machines. He seemed to be pleased with everything that he saw with exception of the Color Display. He was disturbed over the fact that the Color Display takes 250 micro seconds to display a point. Another thing that bothered him was the convergence of the red, green, and blue. The third problem was that the red did not look like a pure red.

We had working for him today: the precision display operated by the tester; info exchange between the two CRC computers; Mag. Tape 52 on one computer; Mag. Tape 51 on the other computer; F-M A-D transfer; and Color Display operated by the display tester.

I mentioned to Charlton the possibility of generating a new display which would have built into it a character generator, operational amplifiers that would generate curves, circles, lines, etc. In addition it would operate through the use of a high speed channel where two word transfers would be requested. These words would contain the necessary info for generating display commands.

Eunice Cronin mentioned that AFCRL may order another Tape Control 52 and that they have also decided to purchase a standard black and white display.

While talking with Charlton, he hinted that AFCRL may order another PDP-1 in the near future.

dec INTEROFFICE MEMORANDUM

DATE May 9, 1962

SUBJECT Instruments Electronics Automation Internation Exhibition

TO Aynne Manning FROM Millie Omifracke

I received your memo this morning and I contacted the commercial department of the British Consulate in New York City (Tel: MU 2-6820), and I am sorry to say that I have little additional information to give you concerning this Exhibition.

The data sheet you sent to me pretty much summarizes the type of exhibits that are going to be presented so I won't go into that. However, according to the women I spoke with they have little information themselves. She did have a memo sent to them in January which states that at that time there was a waiting list of exhibitors for this show, and she suggested that it was probably too late to make any arrangements for exhibiting. She did,however, give me the name and address of the organizor whom we would have to contact in reference to this. The address is:

Industrial Exhibitions Limited
9 Argyll Street
London W1, England

I feel quite sure that our interest was as an exhibitor, but for yourinformation just in case Ken is interested in attending this show they are charging 5 shillings (??) for one day and 10 shillings for the entire week. She did tell me that the charge for overseas visitors (Americans, and etc) is $0.00. In other words they are welcoming them Free of Charge.

I am sorry that I could not be more helpful. I do hope that this will give you a little more to go on.

Thanks very much for your memo and if I can do anything for you let me know.

dec INTEROFFICE MEMORANDUM

DATE May 9, 1962

SUBJECT Visit to Wentworth Institute

TO ✓ Kenneth Olsen
Stan Olsen
Harlan Anderson
Ben Gurley
Bob Hughes
Gordon Bell

FROM Steve Lambert

On Monday, May 7, 1962, I visited Wentworth Institute--the purpose being to investigate the need for Laboratory Modules in the Electronics Class.

The gentlemen with whom I spoke were Mr. Powers, Assistant Head of Electronic Department, and Mr. Kain, Instructor, Semi-Conductors. I also spoke to Placement Directors, Mr. Nickerson, and Mr. Linton.

Mr. Powers and I had a lengthy discussion on the use of modules for classroom demonstration purposes and laboratory experiments. He mentioned that Bob Lassen and Bob Hughes had discussed sending some Classroom modules for the use of demonstration during lectures. I tried to find out what Mr. Powers had in mind as to types of modules he would like to receive. His response was that he really didn't know what he wanted, although he had general ideas on what might be necessary. In discussing the course involved in teaching Digital principles, it became evident that Mr. Powers would most likely need sets of Laboratory modules for use in laboratory experiments.

Not knowing what we had available, I suggested that we send Wentworth 20 modules of whatever we could obtain so that the instructors could get used to our logic symbols and methods.

While talking to Mr. Kain, he mentioned that Digital had sent him a large quantity of transistors and he expressed his appreciation for them. They have already been put to use by the students for various laboratory assignments.

Wentworth now has a Heathkit Analog Computer and a Minivac Training Computer for Lab. use. Approximately one-third of their systems class is devoted to Servo, Analog and Digital principles. However, by giving them Laboratory modules possibly more time may be devoted to Digital principles alone. The Systems class consists of four hours of lecture and four hours of lab. per week.

One good reason for sending Digital modules to Wentworth is to inspire students to look at Digital as a future job prospect.

dec INTEROFFICE MEMORANDUM

DATE 5/8/62

SUBJECT Partial Organization Charts

TO Internal PDP Distribution List FROM Computer Sales Group

Due to some degree of confusion regarding the specific names of various groups and personnel associated with these groups at Bedford Air Force Base (Hanscom Field) the attached partial organization charts have been assembled.

Group I

A.F. Systems Control (AFSC)

↓

Electronic Systems Division (ESD)

↓

Operational Analysis Laboratory (OAL)

Machine: "Universal Controller"

Key Personnel: Dr. Herbert Rubenstein
Mr. Charles R. Brown
Dr. Richard Hayes

Group II

A.F. Cambridge Research Laboratories (AFCRL)

↓

Electronic Research Division (ERD)

↓

Computer & Mathematics Sciences Laboratory (CMSL)

Machine: Dynamic System Simulator

Key Personnel: Mr. Charlton M. Walter
Miss Eunice C. Cronin

Communications Sciences Laboratory (CSL)

Machine: 1. Binary Storage Rack
2. Logical Connector
3. System Module Kit

Key Personnel: Mr. Weiant Wathen-Dunn
Lt. Neil Jagoda
Lt. Philip Lieberman

dec INTEROFFICE MEMORANDUM

DATE May 7, 1962

SUBJECT ADVERTISING DEPARTMENT ORGANIZATION

TO K. H. Olsen ✓ FROM J. L. Atwood

CC H. E. Anderson
S. C. Olsen

It should be helpful to you in reviewing the personnel requisitions from this department to know how the people we are asking for will fit into our overall operation. The attached exhibits should give you this information. They are:

1. A copy of our weekly schedule of morning "work-in-progress" review meetings and afternoon planning sessions. The purpose of the morning meetings is to touch base quickly with members of the department to check on the progress of jobs already in the works. The afternoon sessions, which include only the persons immediately concerned, are to check on our efforts in the various areas of activity which we should be covering.

2. A list of these activities or functions with examples to show what the titles cover.

3. A proposed table of organization for the department, showing the various specialists I feel should eventually be available to service the company's advertising, sales promotion, public relations, and graphic arts requirements. The names of persons already on the staff and assigned to particular jobs are shown in the appropriate boxes.

4. A list of these specialists by job title together with a brief job description on each.

The table and the descriptions indicate the lines of responsibility I would like to set up in order to assure proper supervision of each person in the department without overloading any one individual with supervisory duties.

Two things are worthy of special mention. First, the job titles are not necessarily the titles these individuals presently hold, nor are they necessarily the titles we will finally settle on. Second, the job list (No. 4 above) is broken down into five groupings based on responsibility, professional requirements and projected salary levels. The maximum and minimum rates for these groups might be: Classification A, $200 plus; Classification B, $150 to 200; Classification C, $100 to 150; Classification D, $75 to 100; and Classification E, $62 to 75.

ADVERTISING DEPARTMENT WEEKLY SCHEDULE

Time	Monday	Tuesday	Wednesday	Thursday	Friday
0830-0900	Production Group: Jack Helene Jackie Alex Bruce Jim Frank	Graphic Arts Group: Jack Helene George Bob Warren Barb	Production Group: Jack Helene Jackie Alex Bruce Jim Frank	Direct Mail Group: Jack Jackie Gert Fran Nan Carol Stacia Flo	Production Group: Jack Helene Alex Bruce Jim Frank
1300-1330	Promotional Publicity	Operational Publicity	Inquiry Processing	Operational Publications	Promotional Advertising
1330-1400	Promotional Publications	Special Events	C & SF Mailings	Operational Aids	Technical Publications
1400-1430	Promotional Aids	Plant Improvements	Special Mailings	Technical Articles	Industrial Design
1430-1500	Employment Advertising	House Organ	Bulk Mailing	Biweekly or Dept. Notes*	Trade Shows

* Biweekly and Department Notes on alternate weeks

ADVERTISING FUNCTION EXAMPLES

Promotional Publications: Module Catalog, PDP-1 Manual, Logic Handbook, Customer Catalogs.

Operational Publications: Plant Facilities Brochure, Employee Handbook, Recruiting Folder.

Promotional Advertising: Space advertising intended to promote the sale of modules, computers andsystems.

Operational Advertising: Employment Ads and Spots.

Operational Publicity: New Space News Release, New Appointment Releases.

Operational Aids: Employee Badges, Employee Orientation Program

Special Events: Armed Forces Day Exhibit, Open Houses, Plant Tours.

Plant Improvements: New In-Plant Direction Signs, Lobby Renovation Program.

Inquiry Processing: Forwarding of requested literature and up-dating of direct mail list.

Customer and Sales Forces Mailings: Mailings of selected material to persons on the customer list and on the sales staff.

Special Mailings: Employee Mailings, Show Mailings, "Opinion Leader" Mailings.

Bulk Mailing: Monthly mailing to all persons on direct mail list.

Promotional Publicity: New Product and New Literature Releases, Cooperative Publicity with Customers and Vendors.

Promotional Aids: Product Photographs, Sales Force Binders, Special Displays.

Trade Shows: Promotional Exhibitions.

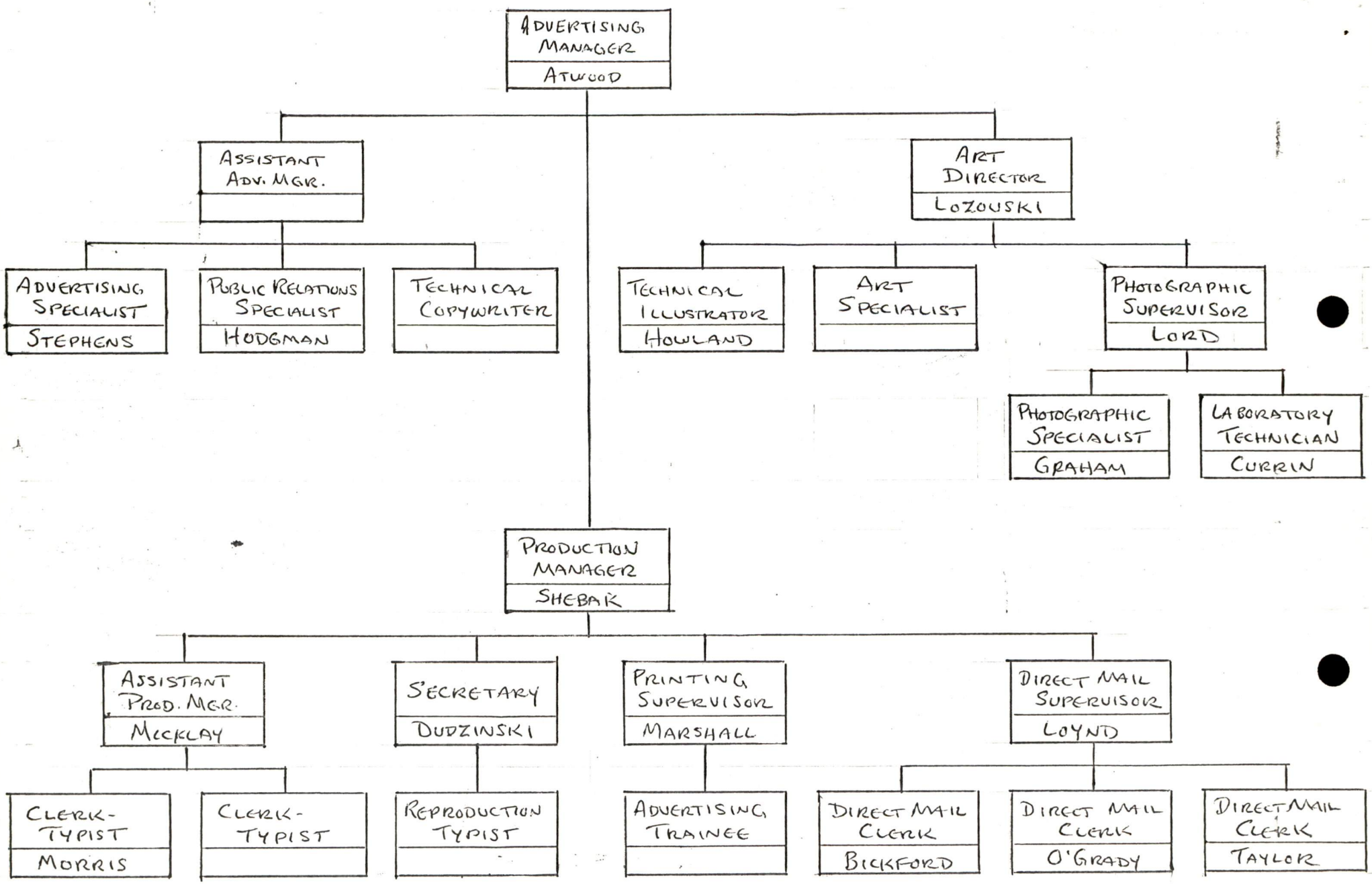
Technical Publications: PDP-1 Maintenance Manual, Replacement Schematic Books, Input-Output Manual.

Technical Articles: Feature stories on Digital engineering accomplishments.

House Organ: Monthly Employee Publication.

Industrial Design: Carton Designs, Packaging, Labels, Test Data Cards.

Graphic Arts Service: Office Forms, Production Positives, Printing, Collating, Binding.



PROPOSED TABLE OF ORGANIZATION - ADVERTISING DEPARTMENT

ADVERTISING JOB DESCRIPTIONS

Job Title	Duties
	CLASSIFICATION A
Advertising Manager	Overall responsibility for advertising and public relations effort and supervision of department personnel.
	CLASSIFICATION B
Assistant Advertising Manager	Responsible for promotional and operational publications, promotional and operational advertising, and monthly bulk mailings. Supervises advertising and public relations specialists and technical copywriter. Manages department in absence of the advertising manager.
Art Director	Responsible for layouts, design and finished art and for plant photography. Also responsible for certain industrial design and plant improvement projects. Supervises technical illustrator, art specialist and photographic supervisor.
	CLASSIFICATION C
Production Manager	Responsible for production and distribution of advertising material, for certain outside professional services, and for job control and cost accounting. Supervises assistant production manager, printing supervisor, direct mail supervisor, and reproduction typing projects handled by secretary.
Advertising Specialist	Responsible for trade shows, promotional publicity, sales aids, inquiry processing, customer mailings, sales force mailings, and special mailings.
Public Relations Specialist	Responsible for employee publication, operational publicity, technical articles, training aids, and special events.

Job Title	Duties
Technical Copywriter	Assists in the preparation of technical material by the assistant advertising manager and the advertising and public relations specialists. Supervises preparation of graphics for technical manuals.
Photographic Supervisor	Responsible for all in-plant photographic operations. Supervises photographic specialist and laboratory technician.
Technical Illustrator	Responsible for all illustrations of a technical nature for departmental projects. Assists in the preparation of layouts and mechanicals.

CLASSIFICATION D

Assistant Production Manager	Responsible for certain supplies and services, departmental inventories, and for collating, binding, and shipping of printed material. Assists with all phases of advertising production and handles the work in the absence of the production manager. Supervises two clerk-typists.
Printing Supervisor	Responsible for all in-plant printing operations, for the securing of printing supplies and for the maintenance of printing and binding equipment. Supervises advertising trainee and keypunch operator when latter is doing presswork.
Direct Mail Supervisor	Responsible for the processing of inquiries and mailings and maintenance of the mailing list. Supervises three direct mail clerks.
Art Specialist	Assists in the preparation of mechanicals for printed material. Handles sign work, special displays and other similar assignments.
Photographic Specialist	Assists with all in-plant photography, particularly copy camera work, for advertising and production.
Secretary	Processes departmental correspondence and handles mail distribution. Does reproduction typing.

Job Title	Duties
	CLASSIFICATION E
Laboratory Technician	Operates darkroom. Handles stats, photoprints, photographic typesetting, and photocopying.
Direct Mail Clerk	Responsible for the packaging and forwarding of all mailings, requested literature and literature for shows.
Direct Mail Clerk	Responsible for keypunching of all new direct mail information. Also fills in on small offset press when needed.
Direct Mail Clerk	Assists with the maintenance of the direct mail list and types mailing label sets.
Reproduction Typist	Types material for reproduction and does simple paste-ups.
Clerk-Typists	Assist with typing, filing, collating, binding, and mailing. Are shifted from assignment to assignment as needed.
Advertising Trainee	Responsible for all receiving in Building 12 and for forwarding of completed jobs. Fills in when needed, either on the press or in the darkroom.

dec INTEROFFICE MEMORANDUM

DATE May 4, 1962

SUBJECT TELEPHONE PROCEDURE

TO All Employees

FROM Brad Towle

The Plant Telephone System is currently equipped with eight local (Maynard) lines and four Waltham lines. Four Mission (Arlington) lines will be added in the near future. These lines will be used for calls to Boston and the Boston Suburban area. For the present the Waltham lines should be used for this purpose. All other calls should be placed over our local (Maynard) lines. From unrestricted (Red dot) telephones, dial 9 for a local line, 8 for a Waltham line.

Transferring Calls - If you wish to have a call transferred, flash the plant operator by rapidly depressing and releasing the telephone button. Incoming and outgoing calls placed through the switchboard can be transferred. Outgoing calls dialed direct from your telephone cannot be transferred.

Incomplete Calls - When the Telephone Company operator is unable to complete your call due to a busy signal or no answer and you wish her to keep trying the call, be sure to give her your name and/or extension number.

211 and 213 Page Lines - Whenever you are paged to dial 211 or 213, an outside call is waiting for you. Dial the number and identify yourself. You must speak first, the person calling is waiting on the line.

Night Set-Up -

Paging - If you wish to page someone after 5:30 P.M., dial 260 and page the party's name directly through the telephone mouthpiece.

Answering - To answer calls after 5:30 P.M., dial the following:

Long ring - Dial 211
Long bong - Dial 213

After 5:30 P.M. calls cannot be transferred.

Please do not call the Switchboard for services such as being called when an outside line is available or an extension is cleared. While these services are a convenience, heavy telephone traffic makes them difficult to render except in cases of extreme urgency.

TELEPHONE DIRECTORY

NIGHT PAGING	260

NIGHT SET UP

TO ANSWER	SOUND	DIAL
LOCAL	RING	211
WALTHAM	BONG	213

IN PLANT PAGING

DIAL LISTED EXTENSION

IF UNANSWERED DIAL 266 FOR PAGING SERVICE IF REQUIRED

GIVE PAGING OPERATOR NAME OF PERSON YOU WANT AND YOUR EXTENSION

DO NOT CALL SWITCHBOARD FOR PAGING SERVICE

WEST COAST OFFICE
JOHNSON T
LARSEN K
JENNINGS J
8820 SEPULVEDA BLVD
LOS ANGELES 45 CALIF
ORCHARD 0 0690 AC213

WASHINGTON OFFICE
BURLEY J
DUNN L
724 14TH ST NW
WASHINGTON 5 DC
NATIONAL 8 4262 AC202

NEW YORK OFFICE
DENNISTON D
OMIFRACKE M
730 BROAD ST
CLIFTON NEW JERSEY
473 7800 AC201

MAYNARD OFFICE
MAYNARD TWINOAKS 7 8821
WALTHAM TWINBROOK 9 0510

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PRODUCTION CONTROL	253
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PRODUCTION STOCK RM	238
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RECEPTION PURCH	325
RICE G	206
RITTER L	338
ROUGEAU J	349
RUTSCHMAN J	217
RENWICK C	329
SALES	344
SALES DINING ROOM	306
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SAVELL R	239
SHUFLAT D	285
SHEBAK H	225
SHEET METAL SHOP	230
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TOWLE E	347
TRACEY M	294
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WARDIMON D	293
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WHITE D	241
WHITE L	335
WILSON R	318

MAY 1962

Beginning May 1, 1962, eleven airlines will put into effect a "no-show" compensation policy. A "50% of fare charge" will be enforced for passengers holding confirmed reservations and failing to show up for the flight.

It will be your responsibility to be sure to have your reservations cancelled whenever necessary. The person who has made your reservations can call in to cancel them. The airline will then return a written notice verifying that the reservation has been cancelled.

If you must cancel at the last minute, be sure to tell the airline to send written acknowledgment of the cancellation to: Digital Equipment Corporation, Maynard, Massachusetts. Otherwise, if we do not have verification of cancellation in writing, we will have to pay the "50% of the one-way fare charge".

The airlines, on the other hand, will pay "50% of fare compensation" for "denial of boarding". This means that if you arrive at the airport with a confirmed reservation, but through internal error, the airline cannot give you your reservation, we will receive a "50% of fare compensation". However, this will not be paid if the whole flight is cancelled. The compensation will be paid only when the airline cannot give you your reservation even though the flight is in operation.

INTEROFFICE MEMORANDUM

DATE April 30th, 1962

SUBJECT

TO FROM

Dick Best

Modules - RB
JC, DW, DW, AF, JH

Mechanical Engineer - LP
KF, KD, SM, RC

Drums - TJ

Special Systems - JF
DT, DW, LB, FG

Drafting - RM

Ben Gurley

PDP-1 - AB
JS, TL

PDP-4 - GB
SL, DP

Tape - ?
RB

Programming - GB
DM

In-Out - RS
JC, WF, WC

Medical - ?

- continued -

Stan Olsen

Computer Customer Relations - RB
RW

ADX - NM
EH
LG
DM

Applications - BS

PDP-1 Sales - JK

Lab Modules - ?

System Modules - ?

COMPANY CONFIDENTIAL

To: K. Olsen
H. Anderson

From: R. Mills

Plant Space

	Floor No.	Square Feet	Date Leased	Rental Cost Per sq. ft.	Rental Cost Annual
Building #12	1	8,500	4/1/59	.36	3,060.
	2	8,600	8/27/57	.42	3,600.
	3	8,500	4/1/59	.36	3,099.96
Building #3	3	4,000	4/1/59	.36	1,440.
	3	4,000	4/1/60	.30	1,200.
	3	5,000	10/1/60	.30	1,500.
	3	10,000	4/1/61	.30	3,000.
Building #4	3	13,000	7/14/61	.50	6,500.
	4	13,380	7/14/61	.41	5,500.
Building #5	4	48,000	7/1/62	.50	32,500.
	4	17,000			
	5	68,000	5/31/62	.32	21,000.
Total		207,980			$ 82,399.96

Note: Average cost per square foot - 37.6 ¢

April 26, 1962

dec INTEROFFICE MEMORANDUM

DATE April 26th, 1962

SUBJECT Power and Lights in building 5.

TO Kenneth H. Olsen FROM George Brown

MAIN POWER:

Located near post 28C (1600 amp service) in area now controlled by Raytheon.

LIGHTS:

Circuit breaker panels - 60 amp - 3 phase - 4 wire. Located on posts 6C - 10C - 14C - 18C and 39A. Scotch light tape identifies circuit breakers to be left on at night.

Circuit breaker panels located on posts 22C - 26C - 30C - 33C and 40C in area now controlled by Raytheon.

POWER:

1. Production area:

Switch on outside wall near post 5A controls outlets on drill bench.

Switch on post 7A controls production benches at posts 5, 6 and 7.

Switch on post 9A controls production benches at posts 8, 9 and 10.

Switch on post 11A controls production benches at posts 11, 12, 13 and 14.

2. Solder Dip Department:

Switches on outside wall of building near posts 6D, 9D and 11D.

3. Component Test Department:

Switch on post 15B.

4. Final Test Area:

Switch on post 18B and 20A.

5. Cabinet Assembly Area:

Switch on post 27A.

6. Silk Screen Department:

Switch on wall over etch tanks controls lights and power.

# # #

digital EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

Memo: 4/26/62

To: Ken Olsen

From: Don White

Subject: U. Ill 2301 Scanner.

1. No reply has been received from U. Ill. re letter sent 12 April 1962.
2. Horizontal deflection system is debugged, but we are awaiting delivery of some metal film resistors for vertical. These should be in today or tomorrow – we can work on hor. local defl. in the meantime, and can check vert as soon as resistors are installed (probably Friday).
3. Expected ~~delivery~~ shipping date is now about May 3, although we may still make May 1.

Ayme
Please get latest date on this.

mopping things up
Dr. [illegible] MDT W. [illegible]

241

INTEROFFICE MEMORANDUM

DATE April 19, 1962

SUBJECT BBN Meeting on DECAL

TO ✓Ken Olsen
H. Anderson
B. Gurley
B. Beckman

FROM R. Mills

I talked with Dave Mittleman this morning regarding a meeting with them on final settlement on DECAL programming. Doctor Labate is away for the rest of the week but Bill Pickett called later and confirmed a Tuesday, April 24th meeting at 3:00pm at their place and Doctor Labate will be there.

Dave was at a loss to understand why we should feel that a meeting was necessary in order to settle the DECAL matter since it appeared to be a pure obligation of $10,000. in our letter which we would be obligated to pay and that would be the end of it. All I said was, that under the circumstances we didn't feel that we were obligated to pay the full $10,000. due to amountsthat had already been expended. After this, he agreed that we should have a meeting.

# # #

dec INTEROFFICE MEMORANDUM

DATE April 19, 1962

SUBJECT Meeting with Vic Martinelli, of Lybrand Ross Bros. on Cost Center Operation

TO K. Olsen
H. Anderson

FROM R. Mills

On April 17, Vic Martinelli came up from the New York Office of Lybrand Ross Bros. to go over the progress we have made on the Cost Center System. We covered considerable area for the time involved but were unable to get a detailed discussion of the Internal Purchase Order system, but he will submit his thoughts on this as well as several other matters which will be discussed.

Introduction: Our status report resulted in covering the following areas:

1. Coding:

Our new coding of seven (7) digits, the first two (2) being cost center, the next being one (1) expense or inventory, the next four (4) being job number, was well received.

2. Balance Sheet and Profit & Loss:

He was quite relieved to find that we will not be setting up now to prepare balance sheets and profit and loss statements by cost centers. This was the one area that he and Bill Casey had grave doubts about due to the tremendous amount of work necessary to generate the final report, with tangible results, in their minds, being somewhat obscure.

3. Flow Charts:

We went over the manufacturing Job Order Flow Chart that we had prepared, in detail to which he had no comments, except to say that it seemed simple and straightforward and had the necessary ingredients. We also presented our Internal Purchase Order Flow Chart which he would like to consider and submit recommendations.

4. Cost Center Assignments:

We went over the list of Cost Centers we had prepared and found him in agreement with our approach of having as few as possible in the beginning with the expansion possibilities later.

5. Product Line and Cost Center Compatibility:

He agreed with us that the product line and the cost center concepts were compatible and that our coding as mentioned above would give us the desired

5. (continued)

results since the missing element in the coding number was the product line but that these grouped quite readily from the base material.

6. Present Reports to Management:

We showed him all of the reports which we submit to management each month of a product line and profit and loss and balance sheet natrue, and he stated that the reports that we were submitting followed his concepts.

Specific Areas Covered:

1. Budgets:

He agreed with our concept that budgets are a must and that they could not be adequately generated until we are able to tell management and the cost center managers what the costs are by area.

2. Monthly Reporting Procedures:

We went over our present list of reports generated every month by IBM and accounting, finding general agreement on his part with the exception of indirect labor and he felt that a more detailed definition of this area should be made. We explored this in some detail coming to the conclusion that some of the indirect labor definitions fall into the semi-variable area of overhead expense calling for an additional coding on our indirect labor reporting to tell us things, as how much for supervision, cleaning, down time, inventory costs, waiting for material and miscellaneous.

3. Overhead Expenses:

We went through our list of variable and fixed expenses, at his having no disagreement with this other than to add another category of semi-variable expenses. This area has always been a rather hot one as far as Accountants are concerned and I do not feel that this is an area to get excited about at the present time. We discussed briefly price volume relationships generation from figures that we would be preparing and found no problems.

4. Overhead Rates:

The major area covered here was "one time charges" and the removal from overhead expenses of same, and the effect of year-end inventories. What we are driving at here is our ability to reduce the value of year-end inventories by the amount of "one time charges" contained in same, in order to lower our tax bill for the current fiscal year. There is envolved here primarily, obsolete and rejected goods, moving expenses and other loss time factors, which are of a non-recurring nature and which end up in inventories due to our overhead charging base which includes same.

4. (continued)
He concurred with this approach and will discuss this with Mr. Aldrich our new account representative of Lybrand - Ross Bros. in Boston.

5. Labor Loaned to Other Cost Centers:

Our question to Vic, was what basis of overhead charging he felt was equitable on labor loaned to other cost centers. His reaction was immeadiate and emphatic that to use any other basis than the rate of the performing cost center would prove to be distorting in that this labor was using the facilities of the performing cost center with no relationship with the facilities of the loaning cost center. As you know we have felt this way all along.

6. Obsolete and Rejected Goods:

We discussed here the distortions created in overhead expenses due to charging obsolete and rejected goods into overhead rates. He agreed with us by proposing that we use an accrual basis thereby flattening out the year with a final adjustment in June. See one time cost discussion above.

7. Internal Purchase Order:

Due to the ramifications of this subject and the limited time available we passed this over for our next session.

8. Cost Clerks:

This was concerned primarily with the use of cost clerks and whether they should be in the cost centers involved or whether they should be in a central area under our cost department. He felt that the ramifications of using cost clerks is something he would like to consider and will submit his recommendations in a letter to us.

9. Use of Lybrand, Ross Bros. & Montgomery:

We proposed that a senior -junior or junior -senior type of person from Lybrand come here to work under our direction to prepare written procedures, manuals and flow charts. He had nothing to add to this and felt that these areas would use this type of man to full advantage. I expect to hear Monday April 23, regarding the availability of this man.

Phasing:

By using the Lybrand, Ross Bros. & Montgomery man and having seen the material we have presented to him, he felt that we would be able to make our July 1st, starting date on time. To some extent this conclusion rests upon the use of the Internal Purchase Order and the establishment of controls for same, although we have worked our tentative control program for Internal Purchase Orders from a base of all cost centers using the Job Order System.

Conclusions:

Vic felt that we had made good progress and was much relieved to find that our balance sheet and profit and loss statements by cost centers was not being considered at the present time.

a) He believes that we will make our July 1st starting date on time.
b) We planned, subject to your approval, to have further sessions with Vic and possibly with Bill Casey from the Boston area.
c) He liked our new cost sheet which shows direct labor, direct materials and overhead for each cost center expending effort on a particular job.
d) Future meetings should be on a more detailed basis to cover Internal Purchase Order, definitions of indirect labor, cost clerk use, and customer breakdown into manufacturing orders.

# # #

INTEROFFICE MEMORANDUM

DATE April 18th, 1962

SUBJECT

TO Dick Mills

FROM Kenneth H. Olsen

We bought a Cathotometer, which is a lead screw mounted microscope, for testing the precision spray scope which we are making for the University of California and CRC. There is a vague possibility that we may use this machine again, but it is not at all likely and so I think we should expense it off as one of the costs of making these two machines. It is such a very special purpose device that I think we would be giving a false impression if we added it to our list of capital equipment.

Kenneth H. Olsen

Ken,

This unit was charged as a display development item to EN 1064 in Feb. #1.781.50

dick

PAINTING

1. Ken Olsen's new office
2. Stairways to Building 3
3. New front hall closet, First Floor, Building 12
4. Windows, posts, rest room// entrances, etc.

CARPENTRY

1. Finish front hall closet, First Floor, Building 12
2. Underlayment in men's room, First Floor, Building 12
3. Order materials for lobby
4. Cover window in new plate room
5. Cut switchboard entrance door
6. Replace defunct wind deflectors where necessary
7. Close lobby windows, install air conditioner(s)
8. Cover window top of front door
9. Install folding closet door in lobby
10. Panel side walls of lobby
11. Sheetrock outside wall and, where needed, inside wall
12. Revamp receptionist's booth

ELECTRICAL

1. Install incandescent lights and 30 amp. outlet in new plate room
2. Install switch and outlet for fan in new plate room
3. Install lights in Ken Olsen's workshop
4. Lights and power for CRC computers, Building 5
5. Lights and power for new pressroom
6. Corridor lights, Building 3

PAINTING - NEXT ROUND

5. Ken Olsen's workshop
6. Fan and window closure in new plate room
7. Closet and switchboard doors, First Floor, Building 12
8. Wind deflectors
9. Outside and inside walls of lobby

MAINTENANCE

1. Sand and Fabulon stairways to Building 3
2. Tile keypunch and men's rooms, First Floor, Building 12

dec INTEROFFICE MEMORANDUM

DATE April 17, 1962

SUBJECT Report on Results of Newspaper Employment Advertising

TO K. Olsen
H. Anderson
S. Olsen

FROM Bob Lassen

Attached is a summary of people who were hired in February and March of 1962 and by what means they were contacted.

Out of a total of 73 hires, 34 were as a direct result of newspaper advertising. There is no way of measuring how many of the others may have first learned of our company through newspaper advertising.

For several weeks Alec Stevens and I have been evaluating the effectiveness of newspaper advertising and we have instituted some cut backs particularly in the Boston Globe. Basically we have eliminated a few of the local papers and we have confined the Globe to Mechanical, Technical and Drafting people only. We have also reduced Globe advertising to every other week. I feel very strongly, however, that the Boston Globe employment section is widely read by non-professional people. Our interview response from the Globe over the past several months has been good.

I do feel however, that we can do an even better job in selecting the most effective media. This can be done by constantly reviewing the results - perhaps on a monthly basis.

We are also starting to learn that certain areas provide particular types of help. Although the attached summary gives no credit to Worcester and Lowell papers, we have found that these areas have served us fairly well in the past with respect to Mechanical and Drafting people. Although the interview response in these areas is fairly good the quality of the applicant leaves something to be desired therefore we probably can save money by being more selective in these two areas.

It is my opinion that newspaper advertising is effective and that it is necessary if we wish to hire sufficient numbers of competent people to fill our growing needs.

In view of the above and in view of the findings on the attached summary sheet, I propose that we continue employment advertising on an increasingly selective basis as we gather more facts and that we budget ourselves to a maximum average of $3,500 per month. We should bear in mind that the amount of money spent for employment advertising will largely depend upon the urgency of our need for new people.

In passing it is interesting to note that the fees charged by an employment agency for the 34 people hired through newspaper advertising would have amounted to approximately $4,000. However, most agencies do not effectively handle lower levels of hourly and clerical people.

cc: R. Mills
M. Sandler
J. Atwood

People Hired in February and March 1962

	Agencies	Employee Contact	Friends	Radio	Schools	Local Papers	Boston Globe	Worcester and Lowell Papers
Assemblers (includes Mother's Shift and Quality Control		4	9			9	1	
Mechanical			1			6	1	
Clerical	2		1	1	2	5		
Customer Service		1					1	
Sales		1						
Application Engineers	2							
Technicians and Wiremen		2	1		3	4	4	
Electrical Engineers							1	
Purchasing						1		
Shipping/Receiving		1	2			1		
Accountant	1							
Len Rittner	1							
Programmer		1						
Production		2						
Technical Writer		1						
Totals	6	13	14	1	5	26	8	0

INTEROFFICE MEMORANDUM

DATE April 13, 1962

SUBJECT Filter for Handle Sanding Machine

TO Loren Prentice

FROM Kenneth FitzGerald

I have investigated three companies which make filters suitable for our Handle Sanding Machine.

The Cuno Engineering Corp. has a line of fiber cartridge filters, porous metal filters, wire wound filters in the cartridge form and the metal edge type rotating filters both automatic and hand operated. I feel that none of these types would be suitable for our operation because of the amount of material to be removed. The replaceable cartridge type would be expensive and the metal edge type would require too much attention and cleaning.

The sales representative from Cuno Engineering was also of the same opinion.

Frank Parker Company of Waltham, handles the Barnsdrill line which is a traveling filter paper type which seems to be the best for our operation. They have models that will handle our machine for a cost of $1038.30 exclusive of a tank and tote box. These are items which we would have to purchase or manufacture ourselves.

Commercial Filters Corp., represented by Larco Inc., of Newton Highlands, has the same type machine as the Barnsdrill, however, the actual filter area is larger, more in the neighborhood of 30 x 48 inches as compared to approximately 15 x 15 inches on the Barnsdrill. Total cost of this machine would be $937. including tote box and pan.

Estimated cost of filter paper for these two machines is about the same approximately, $.50 per 8 hour day.

Conclusion:

I recommend that we propose a number 3048AF Model D Delpark filter by the Commercial Filters Corp., represented by Larco Corp., 49 Winchester St., Newton Highlands 61, Massachusetts. Cost $937.00

# # #

ra/

dec INTEROFFICE MEMORANDUM

DATE April 12, 1962

SUBJECT Title Block Format On Drawings

TO Ken Olsen FROM Roger Melanson

In the past six to eight months we here in the Drafting Department have learned much in the use of Title Blocks tailored for DEC. As the saying goes, "We got our feet wet." Through experience, establishment of a Quality Control Department and sending of work to outside vendors I felt, as others did, a necessity to revise our Title Block. Monday was the day of reckoning and I designed a new Title Block. On Tuesday a meeting was held with Loren Prentice, Klaus Doering and Ken Fitzgerald. We discussed every aspect in detail and agreed on the Title Block attached.

The following is a list of trouble areas we have with the exsisting form.

1. Title Block not large enough.
2. Drawing number block not large enough.
3. No adequate space for a revision letter.
4. Notes to be placed in one area on the drawing, and not in a half dozen places.
5. Material block not large enough.
6. Hole Legend, to cut drafting time.
7. Paint specifications and finishes not adequately documented.
8. Revision column not large enough.

To initiate the new form into our system, we need new pre-printed vellums. Frank Kalwell and I have discussed the prices with Modern Blue Print Company.

Attached is a P. O. for your approval.

dec INTEROFFICE MEMORANDUM

DATE April 12, 1962

SUBJECT SUGGESTED CHANGES FOR FIRST FLOOR, BUILDING 12

TO Ken Olsen FROM Jack Atwood

This floor plan shows in red the changes already decided and several additional changes which might be considered. The purpose of the suggested changes would be to provide more space in the machine room and to group the management people in such a way as to allow easy communication and better traffic control.

The suggested changes are:

1. To remove the wall between H3 and H4 and to move the wall between H2 and H3 to a new location between J2 and J3. Also to extend the glassed wall to J2.

2. To cut an access door in the wall between J4 and the East Wall and to locate IBM supervisory personnel in the room presently occupied by Dick Mills.

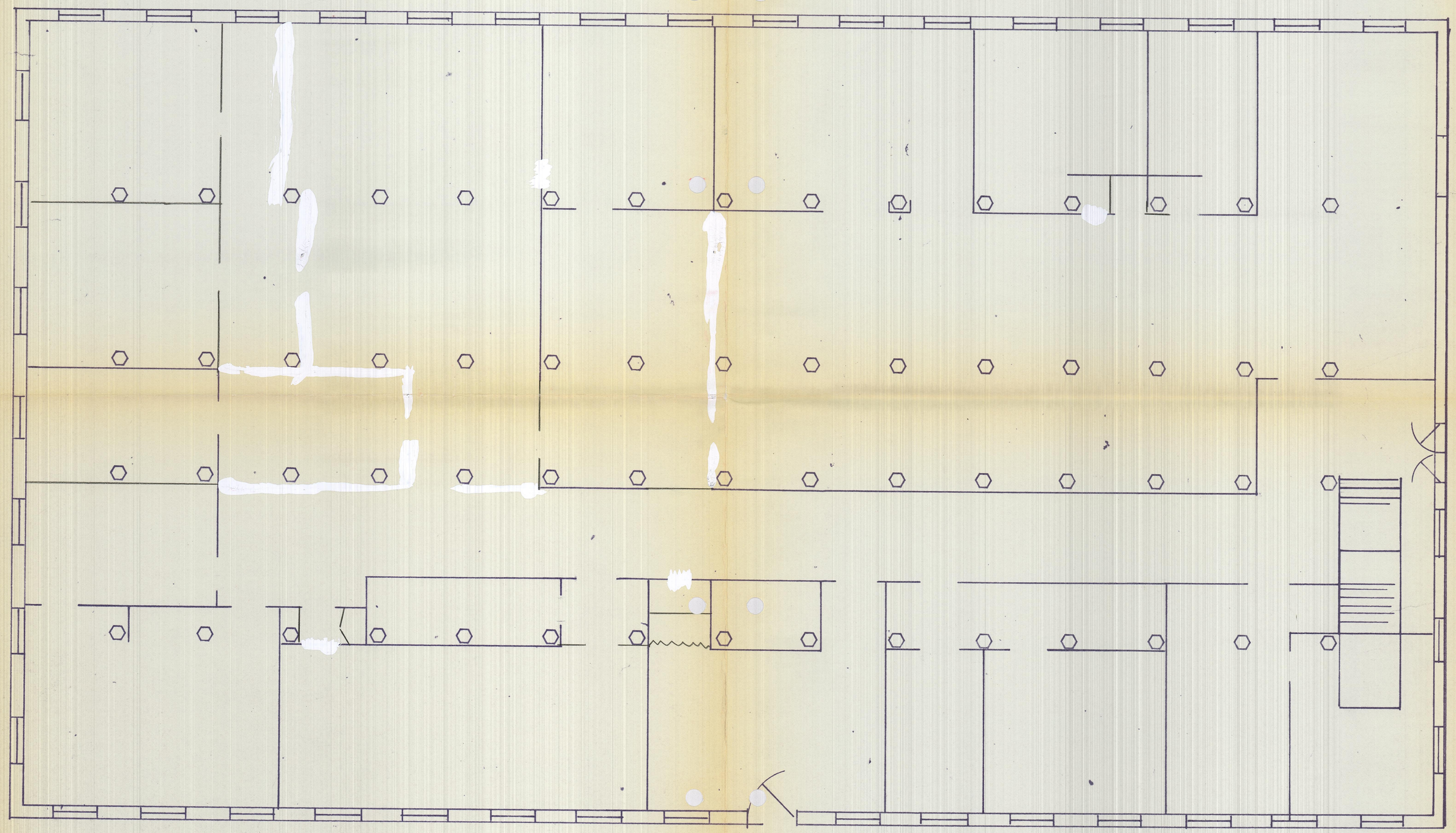
3. To move the wall between M4 and the East Wall to N4, to cut a door in this wall, and to move the wall between L3 and N3 to a new location between N4 and the North Wall. This would provide new office space for Dick Mills.

4. To move the wall between M3 and M4 to a new location between N3 and N4 to form an office which could be used by the Payroll Section, for example, until it is needed as an executive office.

5. To move the wall between L2 and N2 to a new location between N2 and the North Wall (this could be quite a trick) to form two offices for administrative assistants.

6. To remove the walls between L2 and L3 and the pegboard between J2 and K2.

P.S. A second plan attached shows the changes made.



SCALE:

0 5 10 15 20

IN FEET

FIRST FLOOR BLDG #12

DICIC MILLS

IBM SUPERVISORY

PAY ROLL (FOR NOW)

ADMINISTRATIVE ASSISTANT

ADMINISTRATIVE ASSISTANT

MOVE OVER

MOVE OVER

MOVE

REMOVE

CUT DOOR

REMOVE

MOVE OVER

EXTEND GLASSED WALL

O4 N4 M4 L4 K4 J4 I4 H4 G4 F4 E4 D4 C4 B4 A4

O3 N3 M3 L3 K3 J3 I3 H3 G3 F3 E3 D3 C3 B3 A3

O2 N2 M2 L2 K2 J2 I2 H2 G2 F2 E2 D2 C2 B2 A2

O1 N1 M1 L1 K1 J1 I1 H1 G1 F1 E1 D1 C1 B1 A1

SCALE:

0 5 10 15 20

IN FEET

FIRST FLOOR BLDG #12

dec INTEROFFICE MEMORANDUM

DATE April 11, 1962

SUBJECT Cost Center Assumptions To Be Cleared

TO K. Olsen
H. Anderson

FROM R. Mills/B. Dill/A. Pontz

The following items regarding our new cost center accounting operation need to be resolved before final lock-up of some forms and precedures is made:

1. The attached list of cost centers and expected cost center managers needs to be approved.

2. That the cost center manager as listed on the attached list will be the operating head, and will be able to make decisions affecting his inventory, production and charges to other cost centers. This includes preparation of all internal purchase orders thru the cost center clerks.

3. Supervisors who now have several cost centers under their jurisdiction will act in an overall guidance capacity operating primarily as consultants to the cost center managers.

4. There shall be a detailed inventory record for each cost center as follows:

   Work in Process
   Finished Goods

   Note there are no raw material inventories maintained by individual cost centers as it is assumed these will be assigned as a specific responsibility of manufacturing for central servicing of all cost centers.

5. The following reports must be prepared by each cost center:

   a) Profit and Loss Statement
   b) Balance Sheet
   c) Summary of Overhead Expense Items - less Recharges
   d) Direct Labor Reports by Operation
   e) Summaries of Amounts charged against Job Orders - Monthly

6. All cost center records will be maintained by cost center clerks under the supervision of the Cost Department. These records will include: 1) Cost Center Job Orders, 2) Recharges from cost centers to other cost centers, and general ledger accounts, 3)Inventory Records, 4) Job Order Control Numbers.

7. When an order is received in the company, we need to have an agreement as to the process of registering the order, releasing the order, breaking the order down

7. (continued)

into modules and options and establishing firm cost centers who will be responsible for ordering all sections of any order. Once this is done, the establishment of job orders under the coding system as given below, will be automatic. We have sketched out a plan for accomplishing the above which I will be glad to describe if you so desire.

8. Will Manufacturing Production Control prepare all internal purchase orders for the manufacturing departments, or will the cost center manager receive them directly.

9. We need the following approvals:

Purchase order on Invoice Coding to start immeadiately.

Internal purchase order to start by May 1st.

COST CENTER MANAGERS

Number	Description	Manager
10	Silk Screening	G. Bouthiller
11	Module Assembly	G. Porrazzo
12	Final Test - Modules	H. Norton
13	Sheet Metal	J. Gill
14	Sub-System Assembly	
15	Final Assembly - Checkout - Computers	
16	Final Assembly - Checkout - Systems	
20	Maintenance (Includes Carpenter Shop)	
21	Production Control	M. Sandler
22	Quality Control	R. Hughes
23	Model Shop	G. Gerelds
50	Home Office Sales	S. Olsen
60	Field Sales - Los Angeles, California	T. Johnson
61	Field Sales - Washington, D. C.	J. Burley
62	Field Sales - New Jersey	D. Denniston
100	General Administrative	R. Mills
101	Purchasing	H. Crouse
102	Personnel	R. Lassen
150	Advertising	J. Atwood
250	Modules - Engineering	R. Best
251	Systems - Engineering	J. Fadiman
252	Computers - Engineering	B. Gurley
253	Drafting	R. Melanson
254	Machine Shop	L. Prentice
255	Test Equipment	R. Hughes

Employment Advertising

	1961 July	1961 Aug	1961 Sept
Boston Globe	202.40	—	92.40
Boston Herald —	—	—	—
Arlington Herald			
Beacon			760
Enterprise		5400	6300
Framingham	10990	17780	23660
Waltham	—	9240	13860
Suburban Free Press	—	—	—
Lowell Sun	108.00	365.20	595.00
Worcester Telegram	120.12	351.26	560.70
Minute Man Pubs	—	—	—
Chronotype Pubs	—	—	—
Fitchburg	—	4470	—
Leominster	—	4500	—
Herald Publishing	—	—	—
Burlington News	—	—	—
WSRO	—	30840	—
WKOX			
Total.	540.42	1,438.76	1,693.90

NG COSTS

1961 OCT	TOTAL	1961 NOV	1961 DEC.	GRAND TOTAL
92.40	387 20	233.20	511.50	
—	—	—	—	
50.00	50 00	50.00	106,00	
—	7.60	223 68	410.00	
205 50	322.50	125.00	230.75	
172 20	696.50	212.10	63.00	
128 80	359.80	61 60	1250	
56.42	56.42	84.63	—	
373.45	1441.65	320.04	—	
802 48	1834.56	675.06	253 89	
31.36	31 36	280 48	178.75	
—	—	46.50	—	
329 42	374 12	105 56	158 34	
66 00	111 00	24.00	63 48	
75 00	75 00	—		
—	—	—	110.00	
—	308.40	72.00	72 00	
		153 00	400	
2,383 03	6,046.11	2,656 85	$ 3,174.21	$ 16,933.28

JANUARY 62	1,819.48	
FEBRUARY 62	6,897.95	
MARCH 62	6,433.69	
TOTAL	15 15 12	15 15 12
		$ 32 08 40

A-M-T E 19
$ 51 000

dec INTEROFFICE MEMORANDUM

DATE April 11, 1962

SUBJECT

TO Ken Olsen

FROM Roger Melanson

Would it be possible to attend the National Microfilm Association's 11th annual convention to be held April 25 - April 27, 1962 at the Mayflower Hotel in Washington, D. C. Convention theme will be "Microreproduction: The Threshold to Tomorrow."

dec MEMO

DATE 4/6/62

TO Ken FROM Jack

Are we restricted to incandescent lights in the new booth or may we use fluorescents? What with the new ballasts and all (and the fact that we use fluorescents throughout the plant), it seems as though we might be able to get away with the fluorescents

DAP 984

dec INTEROFFICE MEMORANDUM

DATE April 10, 1962

SUBJECT Additional Discounts on Future ITT Orders

TO K. Olsen, H. Anderson, S. Olsen, R. Mills, M. Sandler, B. Gurley

FROM Nick Mazzarese

A meeting will be held in Mr. Ken Olsen's office today, April 10, 2:30 pm to discuss:

1. Discounts on future ITT orders
2. Subcontracting of module construction and testing to ITT

In order that you may prepare your thoughts before you come to the meeting, a brief outline of the items to be discussed is included.

The present discount system offers 10% off on orders of six or more computers. ITT presently has such an order in effect. In order to act as an inducement for ITT to place firm orders (orders not easily cancelled), it is proposed that a more attractive discount schedule be used.

The proposed system is as follows:

1. An initial order which is subject to cancellation by ITT can be placed for up to 12 computers. This would be similar to their present order.

2. Orders for additional computers would be on a firm basis (cancellation would be subject to a heavy penalty), and would be subject to additional discounts.

The discounts would be as follows:

6 computers	11% discount
12 computers	12% discount
18 computers	13% discount
24 computers	14% discount
30 computers	15% discount
36 computers	16% discount
42 computers	17% discount
48 computers	18% discount

dec INTEROFFICE MEMORANDUM

DATE April 6, 1962

SUBJECT DEC Preferred Parts List

TO Ken Olsen

FROM Gordon Bell

Today, I found that two switches and an indicator assembly have been specially purchased to include in the console of the PDP-4. I eventually will have to sign the drawings and at this time the parts list may have a standard DEC too people oriented number to include these special but then standard switches. I don't think the purchase of the switches was in any way warranted, but occured because of a temporary design expidient caused by my technician's consultation with drafting. In the future, I have asked Roger Melanson to call my attention to any special items in PDP-4 designs.

I feel that unless something is done to control this situation, we will have an ever increasing number of parts that probably are unnecessary and as such add to the confusion simply because no one knows what is available in the stockroom. For quite some time I have wanted to see a preferred parts list which is stocked and I think we must have this. I have inquired into the situation, but unless an edict is forthcoming to control the situation we will continue "out of control".

Perhaps the Standards Committee (Whoever they are) is also interested.

INTEROFFICE MEMORANDUM

TO: Ben Gurley
Ken Olsen
Harlan Anderson
Stan Olsen
Dick Best
Bob Hughes

DATE: April 2, 1962

FROM: Ed Harwood

Sometime between 5:00 on Friday and 8:30 Saturday, 4 sockets in the Beckman machine were broken and no note to the effect left by the person or persons who caused this accident. To replace these plugs will require approximately 1 1/2 days of wiring.

dec INTEROFFICE MEMORANDUM

DATE March 30, 1962

SUBJECT

TO Ken Olsen
Harlan Anderson
Stan Olsen
Ben Gurley
Gordon Bell
John Koudela
Nick Mazzarese
Jack Atwood

FROM George Rice

A conference is planned by the above persons on Monday, April 2, in Stan's office. The general discussion will pertain to the PDP-4. The immediate interest will be the sales brochure to be distributed at the up-coming W.J.C.C.

AT 2: PM

7.5 ⟌ 3500

INTEROFFICE MEMORANDUM DATE: March 28, 1962

SUBJECT: The PDP-J for Massachusetts General Hospital, Dr. Ervin

TO: Ken Olsen
Ben Gurley
Harlan Anderson
Stan Olsen

FROM: Gordon Bell

I have just talked with Dr. Ervin at MGH about our computer gift. I have previously talked with Steve Larch at MGH and he gave the PDP-4 specifications to Ervin. Ervin's initial comments were:

1. He felt the PDP-4 was a "lovely little machine" which would handle all sorts of jobs and could be pushed around the laboratory and integrated with experiments. He personally felt that he could keep it busy full time.

2. For a number of possible applications, people wanted to do statistical analysis, crystalography processing, fourier analysis and general tabulating. The nearly common language for these people in Fortran. The methods they currently use for the solution of the problems is to get 7090 time. They feel that a computer such as PDP-1 could almost fill the need the 7090 is currently serving, provided a Fortran or "as advertized DECAL" was available.

We talked about the NIH and he said that their philosophy was:

1. Six large computing installations such a 7090's would be scattered throughout the country for large production runs.

2. A large number of very small machines would be scattered in individual laboratories.

He felt that the machine that is currently serving this function is the CDC-160. There are presently about 6 160's in fairly key spots throughout the country including Airborne Instruments Laboratory, (for NIH) and the Albert Einstein Institute in New York. In both cases, DEC tried to persuade them to use a PDP-1 and I believe we probably didn't sell hard enough or the price was against us. Of course, they might be better off with a PDP-1 provided the programs were available.

He told me about the Linc computer, but wasn't too enthusiastic. He felt that the word size and 1K memory were limiting. He also feels it will be useful, but was dubious that individual laboratories would buy the parts and assemble it by hand, in fact, he said he didn't know of anyone who was willing to undertake the assembly of a kit.

He was enthusiastic about the PDP-4 because of its apparently low price (CDC-160 range), its command structure, flexibility, word length and general capabilities. He felt for it to be useful, we must settle software details and then we can get into medical work the 160 is currently doing.

He feels that PDP-4 must have IO equipment such as PDP-1. He also feels that the PDP-1 could serve the need for the larger backup machine of the larger laboratories. Here speed is more important (fast multiply especially).

Ervin is going to be writing a letter very shortly retelling his thoughts about PDP-1/PDP-4 which may verify the above.

Let's get some programming policies for PDP-1, and let's change the programming policies for PDP-4.

INTEROFFICE MEMORANDUM

DATE March 27th, 1962

SUBJECT

TO Harlan Anderson
Jack Atwood
Barbara Charnock
Bob Lassen
Dick Mills
Stan Olsen
Maynard Sandler

FROM Kenneth H. Olsen

If I remember correctly we are planning to give the 19th as a company holiday. The day after this is Good Friday and then Easter weekend. I think that our attendance will end up being relatively poor on Good Friday and so I think we might consider doing what several other companies are doing and that is giving the 20th off instead of the 19th. If we were not so far behind in production, maybe we could give both of them off, but right now this is definitely out of the question.

I think that we should consider this right away and make a decision because the date is coming up very quickly.

There is normally a disadvantage in not taking the regular holiday because people with children like to have the same day off that their children have, but this is not a problem at this time because most schools have the whole week off.

Kenneth H. Olsen

OK with me!
K.H.O.

dec INTEROFFICE MEMORANDUM

DATE March 23, 1962

SUBJECT Outside Vendors

FROM Jack Smith

TO K. Olsen
H. Anderson
S. Olsen
M. Sandler
B. Hughes
H. Crouse

After the meeting with Electro-Circuits, I have formed the following conclusions and opinion, and also suggest the following actions that should increase our module output.

I am quite sure that Electro-Circuits have the capabilities and interests at this time to increase their delivery of modules to us. However, it is the rate of increase that is greatly in doubt. They have stated that within one month's time they will be delivering to us 500 modules per working day. Taking into consideration the history of our past dealings with them and my personal knowledge of their supervisory personnel and their training methods, I surely question this number. But whatever increase is made by their striving for this quantity is our gain. Even if the number is 300, we have gained units. It is my opinion that their rate of unit output for us has been sidetracked somewhat by new contracts with Western Electric. How much this will affect their productivity of our product is still a big question. Too big a question, I feel, on which to gamble. We must, therefore, continue to seek a second source that will work on the same basis as Electro-Circuits. If a "situation" ever arises we can always cut back on our required number of units from both sources. In the past, we have been burned too often by having one vendor as our only source of supply for boards, capacitors, cores, diodes, etc.

These people are quite clever and we can gain a great deal of knowledge from them. They have been in the printed circuit business for a long time and thoroughly know the field. However, solder dipping is a completely new undertaking for them. This I have learned from my visits to their plant and in conversations with their personnel. Samples they have shown us have been very well done, and if they are as clever as I think they are, painstakingly produced. We must, therefore, be very bold and give them as much of this operation as they can handle. But initially, we must spend a great deal of time on plant visits to see that this painstaking care is being taken on

a production basis. I feel Electro-Circuits is a good vendor and in time will be able to deliver the quantity and quality type unit we demand. Since these people have many commitments, I feel that we must keep after them in order to protect our own interest.

It is my opinion that there are three courses to be taken to increase our productivity of modules: more personnel for our own capabilities, more automation, and more outside contracts. To date, increasing our own personnel has been fruitless. Automation has a great deal of promise, but is too slow in its process of introduction. Therefore, we are left with the only one remaining course--- outside vendors. We must cultivate them, train them to our standards, but most of all we must expedite and motivate them to deliver to our quality and quantity demands.

dec INTEROFFICE MEMORANDUM

DATE March 23, 1962

SUBJECT Telex Line Printer

TO Ben Gurley

FROM Gordon Bell

The systems engineer from Telex will be here on Wednesday at 10:00 A. M. to discuss the Line Printer/DEC interface, print wheels, etc.

The printer will arrive May 1, 1962.

CC: Bob Savell
Ken Olsen

# # #

INTEROFFICE MEMORANDUM

FROM: JIM BURLEY

TO: Ken Olsen

DATE: March 22, 1962

Recent competitive information received by this office is as follows

1. 3Cs TCM Report M-1 on "Transistorized Core Memory Systems", their S-PAC Series TCM

This is a 23 page general descriptive brochure which includes a block diagram of their basic system and 8 photographs.

2. Ramo-Wooldridge - "AN/UYK-1 (TRW-130) Computer Description M250-1U16".

This is a 24 page brochure describing their "Stored Logic" Multiple Purpose Computer in rather complete terms. Price $83,500.

There is also a 9 page brochure entitled "Standard Peripheral Equipment Group" for the AN/UYK-1 (TRW-130) Computer System.

We will be happy to furnish photo copies to anyone interested in these brochures.

dec INTEROFFICE MEMORANDUM

DATE 3-16-62

SUBJECT Organization of Computer Applications Analysis and Programming (CAAP) at DEC

FROM John Koudela

TO K. Olsen
H. Anderson
S. Olsen
B. Gurley
D. Mills
G. Bell
B. Beckman
J. Atwood

The Computer Applications Analysis and Programming (CAAP) function for DEC Computers can, quite naturally, begin and develop on many fronts. Computer Sales require problem analysis, proposal preparation, demonstrations, and program library explanations. Computer training requires that programming classes be conducted and special, individualized attention be given to help solve specific programming problems. Computer design often requires high-level programming considerations to maximize the usefulness of the finally designed equipment. Computer checkout and maintenance requires computer programming indoctrination, and must be supplied with test and diagnostic programs. Advertising, accounting, and computer production require programming knowledge and ability to solve many of their own applications using DEC Computers. Even more important are the CAAP responsibilities to the customer: the organization, development, maintenance and distribution of a general purpose program library and the secretarial and promotional functions required to develop and maintain a highly active user's group.

CAAP is important for many reasons. Above all, however, is that, historically, well-designed computers, newly introduced by new entrants to the computer industry have initially been sold with little or no real sales effort. After the first year or two, continually greater sales effort must be exercised and this effort must be strongly supported by a highly capable CAAP group.

To assure steady and sound growth of the CAAP function at DEC, it is proposed that well-defined goals and responsibilities be outlined and put into effect now to prevent the development of inefficiencies in the future.

The primary goal should be to centralize all CAAP functions under the managerial responsibility of the Sales Department.

This can and should be done because programming contains many elements which together form a common denominator that can best be manipulated and expanded by general purpose programmers.

It is necessary for proper coordination and definitive responsibility assignment of the overall CAAP function. The proper organizational location is the Sales Department because CAAP's most important function is to support the computer sales effort. If, in addition, the requirement be stipulated that the "general purpose programmers" be sales oriented, all of the various programming interests mentioned above will be satisfied. For example, test and diagnostic routines are important in both the initial sales effort and those necessary to "keep the customer sold". This, of course, is in addition to our own checkout and maintenance operations. Demonstrable applications from our own advertising, accounting, and computer production departments serve to expand our computer market. Programming associated with equipment design would be at the source of market feedback and could function as an important link between computer sales and computer design regarding present and future equipment requirements. CAAP, so organized, should be directly supervised by a competent, experienced, sales oriented programmer who, in turn, is directed by the Sales Manager.

The specific organization and corresponding responsibilities of the CAAP group can be quite naturally delimited from all of the above considerations as follows:

1. CAAP Manager. This person would be responsible for integrating and coordinating all CAAP operations. His major aim should be sales support. If available, it is suggested that Mr. Roland Silver be considered for this position.

2. Programmer-Analyst for Design, Checkout, and Maintenance. This person would be responsible for the development of test and diagnostic routines; analysis of programming and operating requirements of present and future computer products; and sales and design liaison. If available, it is suggested that Mr. Harrison R. Morse be considered for this position.

3. Programmer-Analyst for Sales Proposals and Applications. This person would be responsible for the development of demonstration routines; that portion of technical sales proposals requiring problem analysis, program running time estimates and sample programming; and the development of programs for DEC's own applications. If available, it is suggested that Mr. J. Martin Graetz be considered for this position.

4. Programmer-Analyst for Education and Program Library. This person would be responsible for developing and conducting programming courses for prospects, customers, and DEC personnel and for organizing, building, maintaining and distributing the master program library. If available, it is suggested that Mrs. Beverly A. Clohset be considered for this position.

5. DECUS Coordinator. This person would be responsible for promoting the development of a highly active user's group; coordinating user's activities as they effect DEC; and the preparation and publication of the DECUS Newsletter. If available, it is suggested that Mrs. Elsa L. Newman be considered for this position.

6. Clerk-Typist. This person would be responsible for all of the general clerical and typing requirements of the CAAP group and in particular would prepare Flexowriter tapes and operate off-line tape duplication-verification equipment.

All members of the group would be engaged in the general development of the master program library, including the development of automatic programming routines, and in the preparation of various programming materials.

The basic materials to be produced and distributed by the CAAP group, on a continuing basis, should be:

1. Program Writeups
2. Program Tapes
3. Program Listings
4. Technical Memos
5. DECUS Newsletters

Currently available examples of "Technical Memos" are:

1. Permanent Memorandum, M-1138, Type 15 Memory Switching for the PDP-1.

2. Permanent Memorandum, M-1139, Specifications for Model FIO-DEC Flexowriter.

3. Permanent Memorandum, M-1140, Programmed Magnetic Tape Control Unit for the PDP-1 (Type 51).

As a rule, information concerning the use of DEC Computers is disseminated through Programming Manuals, Systems Manuals, Maintenance Manuals and advertising literature. Very often, however, it is necessary to pass on some of the information to the users of DEC Computers before revisions to manuals are complete or before any other provisions for publication are made. Therefore, the issuance of a series of Technical Memos would provide for a rapid means of communication of pertinent technical information to DECUS members and all concerned. Needless to say, such memos would also serve as valuable sales tools.

The DECUS Newsletter, on the other hand, would represent a digest of DEC and DECUS computer activities and present a kind of "periodic progress report" to all users. Of particular importance is the progress associated with the development of programs to be contributed to the user's program library. In general, the Newsletter would be the main instrument for promoting a highly active user's group.

Many interests exist concerning the types and formats of program writeups, tapes and listings and how and when they are to be distributed. Several of these interests may be listed as follows:

1. The desire of DEC to minimize the volume of programming materials to be reproduced and distributed.

2. The need for customers to obtain a "basic library" soon after their order has been placed (e.g., often programming must begin long before computer installation and program tapes as well as writeups must be supplied because computer time may be obtained at another PDP-1 installation other than our own).

3. DEC checkout and maintenance personnel require machine language formatted tapes of test and diagnostic routines as opposed to the symbolic formatted tapes normally distributed and required by customers.

To satisfy all of these interests in the best possible manner, including many conveniences and intangible benefits, the following distribution plan appears to be the only one that is feasible:

1. Each checkout and maintenance technician will be provided with his own, personal set of test and diagnostic routines. These will be continually updated by the CAAP group. Tapes will be in machine language format for ready, convenient use. Personnel possessing such a set of tapes and writeups are individually responsible for maintaining them much in the same manner as they are for their individual tool kit.

2. Customers have been designated by the DECUS By-Laws to be DECUS Installation Members having one, named person to act as their representative (i.e., DECUS Delegate). At the time an order is placed for a computer and the Construction Requisition is prepared, the DECUS Delegate is to be sent one, complete copy of the "Basic Programming Library", (such a "library" has been at least partially defined). Insofar as possible, each routine in this library will have two corresponding tapes: a DECAL Symbolic tape and a DECAL Loader tape. This will enable the user to verify assembly-compiler procedures for the symbolic tape against the already verified loader tape. Each DECUS Delegate will receive complete updating service regarding the Basic Library only. The DECUS By-Laws also provide for "interested parties" to become Individual Members. Since such members do not have DEC Computers, but can provide useful services to DECUS, they should be entitled to receive only the program writeups for the Basic Library.

Note that rather than passing the Basic Library tapes through the hands of the checkout personnel and delivering them, in turn, with the computer, the case of mutilated and lost tapes cannot possibly occur. Furthermore, checkout personnel are generally not interested in symbolic formatted tapes and the routines used to reduce them to machine language tapes.

The preparation and distribution of program listings should be highly minimized. All test and diagnostic routines should have listings, but in general, customers can easily produce their own listings from the symbolic tapes provided to them from the Master Program Library.

INTEROFFICE MEMORANDUM

DATE March 15, 1962

SUBJECT Proposal for Mechanical Inspection Procedures for All Parts Manufactured by Digital Equipment Corporation (Sheetmetal and Machine Shop)

TO Quality Control Committee FROM Klaus Doering

Because of the confusion and time losses about this subject in the past there is an urgent necessity to clear the following procedures.

Everybody is invited to give suggestions that might help for completion or improvement.

1. The third copy of all "work requisitions" along with one set of all necessary drawings will be sent to the Mechanical Inspection Department at the same time the "work requisition" is submitted to Ken FitzGerald.

2. If a drawing change is made after the placement of the work requisition, the originator of the requisition must notify Ken FitzGerald by memo, furnish new prints to shop and inspection, and decide about continuance of job (rework or scrap).

3. If the item has been manufactured and sent to inspection before the change comes through, it will be inspected according to the original requisition print and sent to stock, or delivered as requested on work requisition as "OK" part.

4. In the case of a "reject", where the item has not been manufactured according to drawing specification, Inspection will notify Ken FitzGerald by sending back the work requisition with a "reject" mark and the requisition drawing prints on which he finds the details of the reject.

5. The rejected item is then moved to the reject room where the shop will pick it up for final determination.

Proposal for Mechanical Inspection Procedures for All Purchased Parts.

1. Inspection gets a "purchase order drawing print" together with each "inspection copy" so that it will be known according to which drawing the vendor manufactures the item.

2. If a drawing change is made after the placement of the "purchase order", the originator of the purchase order must notify Production and Purchasing by memo, furnish new prints to them and Inspection and decide about continuance of order (rework or scrap).

3. If the item has already been manufactured and sent to Inspection before the change notice comes through, it will be inspected according to the original purchase order drawing print and if it is alright sent to stock as an "OK" part.

4. In case of a "reject", where the item was not manufactured according to the drawing specifications, Inspection notifies Purchasing immediately by sending back the inspection copy marked REJECT, and the "purchase order drawing print" with details about the reject. The purchase order originator also gets notified about the reject. He will contact Purchasing in order to decide which action to be taken.

5. The reject item goes into the "reject room" near Receiving.

6. In case of an "OK", the inspection copy with the OK mark is sent back to Purchasing by Inspection.

7. The OK items are moved to "stock".

8. The purchase order originator gets notified about the OK.

CC: Ken Olsen
Stan Olsen
Richard L. Best
Ben Gurley
Jon Fadiman
Maynard Sandler
Robert Hughes
Loren Prentice
Ken FitzGerald
Henry Crouse

dec INTEROFFICE MEMORANDUM

DATE March 13, 1962

SUBJECT Mucon Capacitors

TO Aynne Manning

FROM Henry Crouse

Per conversation between Mr. Prince and Henry Crouse.

Mucon Capacitors

NC200B

25 - 99----------$40.00/C

100 - 499---------- 35.00/C

500 - 999---------- 32.50/C

1000 - 4999---------- 31.00/C

5000 ---------- 30.00/C

NC-82

25 - 99---------- 30.00/C

100 - 499---------- 25.00/C

500 - 999---------- 21.00/C

1000 - 4999---------- 17.50/C

5000---------- 15.00/C

Delivery - Stock

D. Murphy

INTEROFFICE MEMORANDUM

SUBJECT: Computer Project Teams

DATE: March 13, 1962

TO: All Computer Department Personnel

FROM: Ben Gurley

The assignment of personnel to computer projects through ITT #4 is as follows:

Computer	Project Leader	Personnel
CRC-1 CRC-2	Steve Lambert	David Pinkney Francis Fortin Herbert Millman
SRL LRL	Robert E. Savell	Robert Reed Leo Gossel Donald Sordillo Martin Appel ** Rental Technician
Beckman-2 Field Installation on BBN, etc.	Ed Harwood	John Shields * Paul Gadaire * Donald Murphy John O'Connel John Williams
ADX-4	Al Blumenthal	Thomas Leonard Allan Samuels ** Allan Walker ** Thomas Psilekaris

* Primarily working on field service or installation.
** Temporary personnel.

In addition to the above there is a special team of Roland Boisvert (project leader) and Mel Arsenault devoted to checkout of Magnetic Tape Controls.

INTEROFFICE MEMORANDUM

DATE March 9, 1962

SUBJECT PDP-1 Maintenance Manual

TO Ken Olsen
cc: Harlan Anderson
Stan Olsen
Jack Atwood

FROM Ben Gurley and Bob Beckman

NOTE: Decision requested by March 12, 1962

Attached is a copy of information supplied by Cy Burton of Cyburtek. The second and third pages constitute a proposal for additional material to be included in the PDP-1 Maintenance Manual. This additional material would involve a charge of $3200 in addition to the original charge of $12,320.

It is recommended that this additional charge be authorized.

The original agreement with Cyburtek on the writing of this manual provided for adjustment of the estimated price on the basis of the page count of the final version. Any reduction in number of pages would be credited to us by Cyburtek. Any increase in the page count required our approval.

Even though most of the work represented by this change proposal has already been accomplished, Mr. Burton made it plain that if we objected to the increased cost he would withdraw the proposal. We would still have the benefit of most, it not all, of the work involved.

Cyburtek's performance in the writing of this manual has been more than satisfactory. Their work in editing and correcting certain of our drawings has been extremely valuable and the general quality of their work is quite high. It is felt that the additional charge is quite reasonable and that it should be approved.

By copy of this memo Jack Atwood is requested to confirm, in writing, the implied commitment of his department to typing the remaining portions of the preliminary draft.

CYBURTEK CORPORATION
March 6, 1962

CURRENT STATUS

PDP-1 MAINTENANCE MANUAL

Chapter	Estimated Pages	Actual Pages	Added Text
Front Matter	15	15*	--
1 - Introduction	3	3	--
2 - General Description	16	24	8
3 - System Function	40	72	32
4 - Installation	8	9	1
5 - Operating Procedures	31	40	9
6 - Control	45	62	17
7 - Arithmetic Unit	33	48	15
8 - Memory	25	25	--
9 - Input-Output	30	30*	--
10 - Computer Operations	16	16*	--
11 - Circuit Analysis	60	70*	10
12 - Maintenance	63	63#	--
	385	477	92

* To be delivered to DEC prior to March 31, 1962

DEC data not yet available.

Drawings Prepared by Cyburtek

Editing and correction of 28 PDP-1 logic drawings. . . . . --
Chapter 2 - Layout Drawings 2
Chapter 3 - 4 Drawings Revised 1
Chapter 7 - Flow Charts 2
Chapter 10 - Flow Charts 7
Chapter 12 - Large Layout Drawing. 6

18

CYBURTEK CORPORATION
March 6, 1962

PROPOSAL FOR ADDITIONAL MATERIAL TO BE INCLUDED IN DEC MAINTENANCE MANUAL FOR PDP-1

	Pages
Added text for basic manual (details on following page)	92
Drawings prepared by Cyburtek	18
Text for: (1) Type 15 Memory Extension Control (including necessary changes to other portions of manual affected by installation of Type 15 Control); (2) Multiply Algorithm; and (3) Divide Algorithm	20
Editing and correction of 28 PDP-1 logic drawings	no charge
	130
Less typing rebate*	30
	100
Proposed change: 100 pages @ $32	$3,200.

* Mr. Jack Atwood has suggested that his department would prefer to do the final typing for two reasons: (1) he would prefer using the DEC Mid-Century Executive typeface, and (2) he expects to have surplus typing time available. Cyburtek will still take full responsibility for editing the preliminary draft and incorporating the changes requested by DEC.

Added Text for Basic PDP-1 Manual

Total additional text = 92 pages. Written because:

(1) Topics not included in original Cyburtek proposal, but subsequently suggested by DEC or Cyburtek; e.g. logic related to optional in-out equipment, added programming and operating information, terminology, power control and marginal check equipment, addition algorithm, and circuit analysis for nine power schematics and ten other circuits not included in the original outline.

(2) Data furnished by DEC subsequently to September 18, 1961; e.g. standard sequence break system, revisions due to memory control type 15, etc.

dec INTEROFFICE MEMORANDUM

DATE March 9, 1962

SUBJECT Technical Writing for PDP-1 Options and PDP-4 Manual

TO Ken Olsen
cc: Harlan Anderson
Stan Olsen
Ben Gurley
Gordon Bell

FROM Bob Beckman

As a result of discussions with Cy Burton of Cyburtek the following arrangements have been made:

1. After completion of a current commitment Cyburtek will give DEC's requirements first priority over all other customers. In return, DEC agrees to supply periodic estimates of the work required.

2. With the exception of Bill English, all Cyburtek writers are available at this time to devote full time to DEC's requirements. This impressive sounding statement boils down to Don Michalek, who is presently working on the maintenance chapter of the PDP-1 Manual; Phil Rulon, a former employee who has rejoined the firm; and Cy Burton himself.

3. Bill English, on a part time basis, will supervise the work of Michalek and Rulon. English will be available to devote full time to DEC's work in mid or late April.

This rather nebulous sounding arrangement has the following advantages:

1. Cyburtek has shown itself capable of doing an above average job of technical writing.

2. Most Cyburtek personnel are already well checked out on DEC equipment, methods, and terminology.

3. This arrangement gives us most of the advantages of an in-house technical writing department, while at the same time avoiding most of the disadvantages.

4. The arrangement is verbal and subject to change at any time.

The following disadvantages should be noted:

1. The arrangement is verbal and I'll have to devote some time to making sure they stick to it.

2. Cyburtek's greatest asset (as far as we are concerned) is Bill English, and Bill will not be available to devote full time to our projects until mid or late April. However, once Bill is free he can pitch right in without requiring a training period. I seriously doubt that any other writer that might be available could start today and be as effective as Bill English by the end of April.

At the present time the priority for technical writing on computers appears to be as follows:

1. Completion of basic PDP-1 Maintenance Manual

2. Mag Tape Options

3. PDP-4 Maintenance Manual

4. Other PDP-1 Options

In view of the above and unless directed otherwise I will channel Cyburtek's activities in the following manner:

1. Don Michalek will continue to work on the maintenance chapter of the PDP-1 Manual. Memoranda requesting the information and/or interview time required will be forwarded to the personnel concerned.

2. Phil Rulon, under Bill English's part time supervision, will start work immediately on the Mag Tape Options.

3. Don Michalek, as soon as he completes his work on the maintenance chapter, will start on the other options.

4. As soon as his other commitment is complete, Bill English will start work on the Mag Tape Options and the PDP-4 manual. The intention here is that English's primary efforts will be on PDP-4, with part time supervision of Rulon and Michalek in their work with the Mag Tape and other options.

5. As soon as PDP-4 drawings and other information are available, Bill English will take suffcient time from his present job to prepare a detailed outline for the PDP-4 manual. At that time he will be able to give us a firm completion date. The present estimate, which I feel is not too overly optimistic, is that we can have the PDP-4 manual in preliminary form by mid June.

Firm completion dates on the Mag Tape and other options will be established as soon as the outlines for these items are completed.

It is suggested that interim PDP-4 information in a form similar to the F15, but slanted more toward maintenance, be produced in-house to cover the period from June 1st to June 15th, and to act as back-up in case the June 15th date slips.

dec INTEROFFICE MEMORANDUM

DATE March 9, 1962

SUBJECT High School Science Fair

TO Kenneth H. Olsen FROM Robert T. Lassen

Mr. George Guinard of the Billerica Memorial High School has asked us to participate in a Science Fair to be held at the High School on March 23 (day and evening) and March 24 (evening).

I told him we were interested in the development of young people but that we were in the midst of preparing for a show.

I promised to advise him of our plans as soon as possible.

dec INTEROFFICE MEMORANDUM

COMPANY CONFIDENTIAL

DATE March 8, 1962

SUBJECT Future ITT Orders

TO Mr. K. Olsen
Mr. H. Anderson
Mr. S. Olsen
ITT File

FROM N. Mazzarese

The subject of future ITT orders was discussed at a meeting attended by R. Hughes and R. Lane of ITT and H. Anderson and N. Mazzarese of DEC.

It was generally agreed that the basic problem is how to handle orders for more than 12 computers; specifically, the easy cancellation plan presently in use is not workable for larger orders.

Our main interest is to have some assurance that ITT would not cancel out on us; i.e., if we were to build up capability to produce three or four machines/month for them, we could lose a considerable capital investment in production expansion.

To this end, we made the following proposals:

1. Firm orders for all computers above 12.

2. Longer lead time, 12 to 18 months, on individual computers to allow us to prepare for a high manufacturing rate.

3. ITT should build up an inventory of computers without options. Options could be added upon sale to customer.

4. We would produce up to a maximum of four computers a month.

5. One ordering approach might be the sliding window -- a standing order for 12 firm machines with one year's lead time on each machine. This could be ended at any time by not ordering the computers for a given month. Each month, new machines would be ordered, and machines ordered 12 months ago would be delivered. If machines were missed, a heavier cancellation than presently used would be paid.

COMPANY CONFIDENTIAL

ITT's main considerations were:

1. Six month maximum lead time on an order.

2. The need for a vendor who can supply up to four machines/month. They agreed it would be necessary to build up to a maximum of four/month on a gradual basis.

Essentially, what they want is a concrete proposal on what our capability is. Perhaps we should be careful in this area. With ITT's tremendous manufacturing capability, they would like us to say we can only handle X/month. They will then propose that we license them to build all over X/month, where X is any number we choose.

A proposal which meets both of our requirements is as follows:

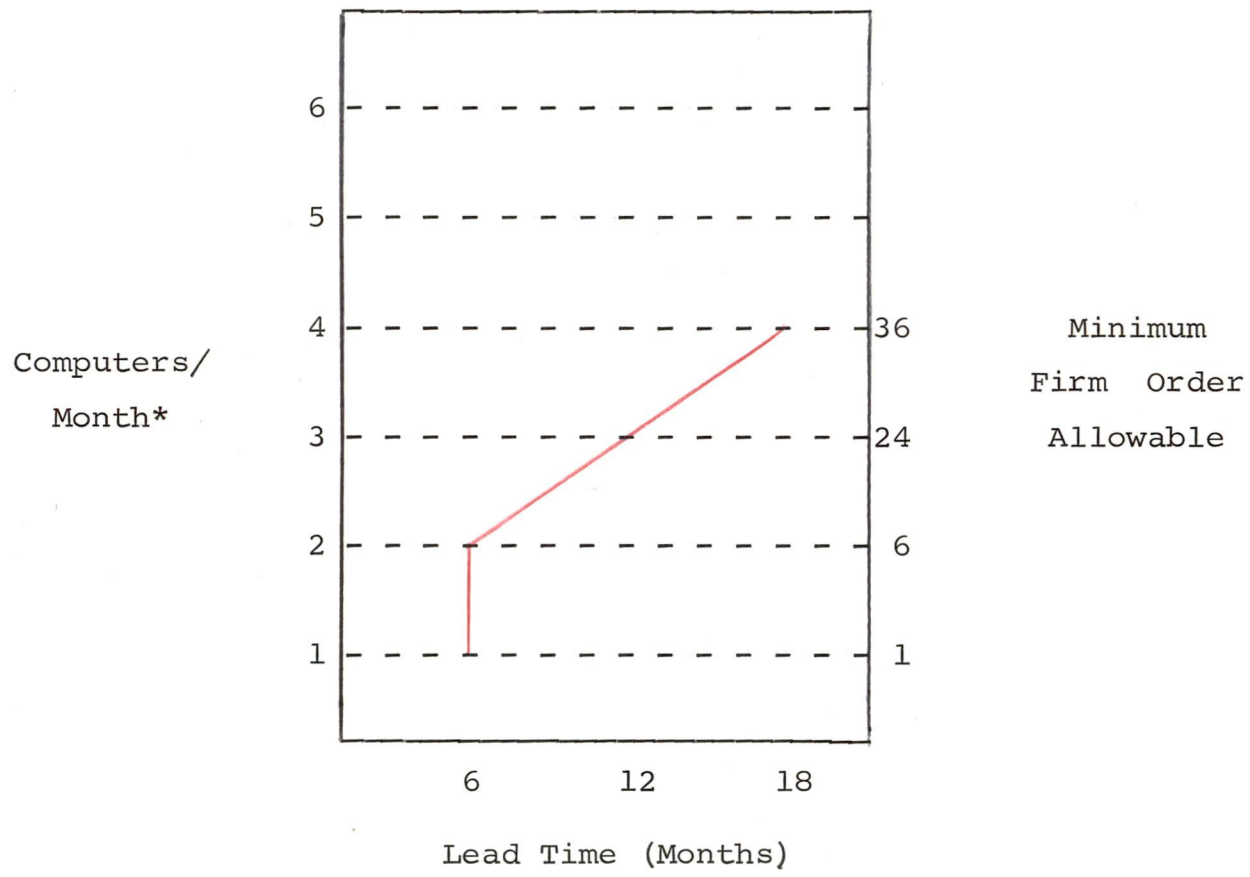
We accept an order for an additional 12 computers under our present arrangement. Any computers ordered above this amount should be firm. On six months' notice, we will deliver two computers/month for a minimum of six months. On one year's notice, we will deliver three computers/month for a minimum of one year. On 18 months' notice, we will deliver four/month for one year.

For firm orders of this nature, a cash deposit should be made upon placement of order. This would equal the cancellation charge for the computer ordered. In general this cancellation charge will be high, but could be arbitrated if the computer was sold to another customer.

A revised discount policy should be considered.

First, any of ITT's options on which we are not now giving a discount should be reviewed. This has already been done on the Sequence Break System with the decision being to give a discount.

Secondly, firm orders could have an additional discount over and above the 10% now offered. This should be geared to the quantity ordered and based upon cost accounting history for the ADX series.



*Includes both firm and non-firm orders

INTEROFFICE MEMORANDUM

SUBJECT: Marginal Checking Procedures, Press Release DATE: March 5, 1962

TO: K. Olsen FROM: A. N. Blumenthal

The detection of deteriorating components in digital devices presents a problem quite different than that of non-digital electronics. In the latter, such components usually show their effects in some overt manner such as reduction in output amplitude, loss of gain, change in frequency response or some other analog effect that can be observed as it develops. The discrete quantum nature of a digital computer's output effectively conceals these changes until the actual point of failure is reached, at which time the machine abruptly becomes useless.

Obviously a need exists for detecting incipient troubles before they cause failure. It has been found possible to do this by varying power supply voltages, effectively creating the effects of advanced deterioration, and taking note of the allowable margin.

The quest for greater reliability in our digital computer line has led to the adoption of an extremely stringent marginal checking procedure. The entire machine is first marginal checked at room temperature. All low margins are corrected and it is ascertained by means of test programs that the entire system is solidly operational.

In the second phase further aging effects are induced by operating the machine at elevated temperatures. A portable plastic tent, designed for the purpose is placed over the entire machine and, with the aid of electric heaters, the temperature raised to 110° F. The entire marginal checking procedure is repeated, again, making whatever repairs or alterations are necessary to bring the margins within acceptable limits. The high temperature test has revealed the existence of marginal transistors, noise, and places where timing is excessively critical. The design changes instituted as a result will have effects beyond that of merely improving the reliability of the individual machine being checked.

dec INTEROFFICE MEMORANDUM

DATE March 5th, 1962

SUBJECT

TO Stan Olsen
Harlan Anderson

FROM Kenneth H. Olsen

Irving Berg from Maynard Industries called on Friday, March 2nd and requested that we assign one man to take care of all our relations with Maynard Industries. Right now he talks to different people for different things and sometimes gets different answers. I think we should assign this task to George Brown or John Culkins. What do you think?

Kenneth H. Olsen

Ken OK for everything except lease type things which I assume he did not mean

Andy

dec INTEROFFICE MEMORANDUM

DATE March 3, 1962

SUBJECT MANUFACTURING INVENTORIES

TO K.H.O.
H.E.A.

FROM M. Sandler

Inventories are a dynamic input which must be analyzed and interpreted both as a condition of and a determinant of our company policy and activity.

We have for some time been on a steep growth slope and must at this time take a long, hard look at the status and trend of our various inventories. Are our inventories adequate for what we plan to do ? Are they in excess of need? Can we determine what our inventories should be?

At present we maintain three basic inventories:

1. Raw Material.
2. Work-In-Process.
3. Finished Goods.

Raw Material Inventory includes all material, equipment, and components used directly in our products. We do have assigned Part Numbers and maintain control records of receipts and issues of raw material. In order to find answers to the above questions, we are presently engaged in classifying and coding our various raw materials into meaningful categories, (Resistors, Capacitors, Transistors, Special Computers and/or Systems components and equipment, etc.) so that we may intelligibly examine the structure of our inventory.

Work-In-Process Inventory at present is broken down into Module WIP (Open Jobs and Manufactured Parts in stock), Systems WIP (EN Job Numbers), and Computers WIP (EN Job Numbers). We are presently working on parts and subassembly lists and codes which will prove meaningful in answering inventory questions.

Finished Goods Inventory is made up of modules in stock at manufacturing cost. There normally will not be any Computer or Systems finished stock.

Until this work is done, however, we should examine our present inventories with our present knowledge.

We have set an immediate goal of 10,000 modules per month. We look for 8,000 - 10,000 units on the shelf for shipment, 10,000 - 12,000 units in process, and probably should have 8-12 weeks raw material available in light of extending pro-

curement lead times (6-12 weeks presently).

Assumptions for Modules production are:
Average Manufacturing Cost per unit = $30.
Average Material Cost is 60% Manufacturing Cost = $18.
WIP Value is 50% at any given moment.

Special Systems are being produced at the rate of 4-5 monthly, and we here assume one Memory Tester, two Core Testers, and one Special System to be produced per month:
Average selling price for Memory Testers is $55,000., manufacturing cost $22,000.
Average selling price for Core Testers is $24,000., manufacturing cost $12,000.
Average selling price for Special Systems is $22,000., manufacturing cost $11,000.

Special Materials for Systems comprise approximately 10% of Manufacturing Cost (presently included in Raw Material Inventory).

Thus, total Manufacturing Cost Special Systems is

M.T.	$22,000.	Material	$2200.
C.T.	$24,000.	Material	$2400.
S.S.	$11,000.	Material	$1100.
	$57,000.		$5700.

Computer production aims to produce at 2-3 per month--- (computers plus options is equivalent of 4-5).

We assume $125,000. selling price, $50,000. manufacturing cost, and special material equipment 35% of manufacturing cost.

The attached table summarizes the above calculations.

Inventories are fluid. In our situation of increasing demand, inventory values flow from purchase orders to receipts into Raw Material to issues of material to Work-In-Process to completion of WIP to Finished Goods. Our total inventory should be as summarized. Within that total the various inventories will fluctuate according to how effectively we balance the entire operation of our procurement and production endeavors.

INVENTORY STRUCTURE

-ESTIMATED-

	LOW	HIGH	REMARKS
RAW MATERIAL			
Modules	$360,000.	$ 540,000.	8-12 weeks @ 18/unit
Systems	11,400.	14,000.	8-12 weeks
Computers *(1)	140,000.	210,000.	8-12 weeks 35% mfg. cost
	511,400.	764,000.	
WORK-IN-PROCESS			
Modules	150,000.	180,000.	10-12,000 units 50% mfg. cost
Systems *(2)	28,500.	35,000.	50% mfg. cost
Computers *(2)	100,000.	125,000.	50% mfg. cost
	278,500.	340,000.	
FINISHED GOODS			
Modules	240,000.	300,000.	8-10,000 units on shelf at mfg. cost
totals	$1,029,900.	$1,404,000.	

*(1) January Inventory was $149,000.
*(2) Includes Modules

INTEROFFICE MEMORANDUM

DATE March 2, 1962

SUBJECT Delivery Status of Major Components

TO Ken Olsen
Harlan Anderson
Stan Olsen
Dick Best
Ben Gurley
Bob Savell
Jon Fadiman
Dick Whipple
Ed Harwood
Nick Mazzarese
Derick Chin
Bob Hughes
Jack Brown
Jack Smith
Maynard Sandler
Steve Lambert
Al Blumenthal
Gordon Bell

FROM Henry Crouse

The following is the delivery status as of this date March 2, 1962.

Vendor	Description	Delivery Schedule
Ampex Computer Products	4096 x 19 Memory Stack	1 unit - 3/26/62 1 unit - 4/2/62 1 unit - 4/9/62 1 unit - 4/16/62 1 unit - 4/23/62 1 unit - 4/30/62
Anelex Corporation	High Speed Printer	1 unit received balance of 4 not scheduled
Digitronics Corporation	Readers	3 units - 2/20/62 2 units - 2/28/62 1 unit - 3/5/62 3 units - 3/15/62 2 units - 3/30/62* 2 units - 4/5/62 2 units - 4/15/62* 2 units - 4/15/62 1 unit - 4/30/62* 1 unit - 4/30/62

*5 units to be painted blue

Vendor	Description	Delivery Schedule
Fabri-Tek, Inc.	16 x 32 x 16 Memory Stack	4 units - 5/1/62
Ferroxcube Corporation	4096 x 19 Memory Stack	5 units - February 6 units - March 3 units - April
Friden, Inc.	Friden Flexowriter	1 unit - 5/16/62
Packard-Bell Corporation	Multiverter M2-12B-B	1 unit - 3/31/62
	Multiplex EM3	1 unit - 3/31/62
	SH3 Sample-Hold Amplifier	1 unit - 3/31/62
Potter Instrument Company	Magnetic Tape Handlers	1 unit - 5/15/62* 2 units - 5/22/62* 2 units - 5/29/62* 2 units - 6/5/62* 1 unit - 6/12/62 1 unit - 6/12/62* 2 units - 6/19/62* 2 units - 6/26/62* 2 units - 7/3/62* 2 units - 7/10/62 2 units - 7/17/62* 1 unit - 7/24/62*
Soroban Engineering	Computeriter, 16" carriage	4 units - 4/30/62 2 units - 5/15/62 2 units - 5/30/62 balance of 2 units to be scheduled
	Computeriter, 12" carriage	4 units - 4/15/62 balance of 6 units to be scheduled
Teletype Corporation	BRPE-11 Punch	4 units - 2/28/62 2 units - 3/5/62 3 units - 3/15/62 3 units - 3/30/62 6 units - 5/5/62 7 units - 5/15/62 8 units - 5/30/62
Vermont Research Corp.	Magnetic Drum	1 unit - 4/9/62

*17 of 20 units to be painted blue

dec INTEROFFICE MEMORANDUM

DATE February 28, 1962

SUBJECT Report on trip to Far East, February 10 through February 25, 1962.

TO Stan Olsen FROM Jonathan Fadiman

c.c.: Ken Olsen
Harlan Anderson
Dick Mills

The five days of February 13 through February 17 were spent installing the Memory Tester 1516D in Hong Kong. The address of the Company there is Ferrotec, Ltd., 650 Castle Peak Road, Kowloon, Hong Kong, telephone 806963. The managing director there is Mr. Kenneth D. Wallis. The system arrived on time with no damage and was installed with no serious problems. The machine is considered acceptable by Mr. Wallis. There are a few minor things that we have to take care of and send them, mostly some revised drawings.

I spent February 18 through February 22 in Tokyo, Japan. During the four business days that I was there I visited 8 companies and three trading companies, and the prospects look excellent for the sale of our memory test equipment. My interpreter was Mr. John T. Yamakawa of Nagashima Assoc.

On Monday morning February 19, I visited the Totsuka Plant of Hitachi, Ltd. The people I spoke with were Mr. M. Hirai and Mr. H. Mandai and Mr. I. Oikawa. They have ordered one Memory Tester 1516 and one Automatic Core Tester 2113 with a CH58 Handler. The order is being placed through their associated trading company, Nessei Sangyo, and then through RCA International. Everything has been approved except that there is some delay in getting the money approved from the Japanese ministry of trade. However, these orders are definite.

Monday afternoon, I visited the Nippon Electric Co. known as NEC, at Kawaski. Also there, were some people from Tohoku Metals, which is associated with NEC. The people I visited were Mr. Takasaki, Manager of the Engineering Department, and Mr. Nakamura, Chief of the Chemical Section. They definitely want and need both an Automatic Core Tester and a Plane Tester. However, they will not have the budget approved until summer time, when they will be placing orders with us. They would probably prefer to deal directly with us because of the greater ease of engineering discussions. They will definitely send an Engineer here to learn about the machines.

On Tuesday morning, February 20, I visited the Ofuna Plant of Mitshubishi. This is probably the largest engineering concern in Japan. They are extremely anxious to order both an Automatic Core Tester an an Automatic Plane Tester and probably are our most immediate prospect next to Hitachi. They would prefer to deal independently with us. They would like me to check on the availability of some improved probes for the Ramsey Handler. The people I saw there were Mr. M. Minakami and Mr. H. Ide.

On Tuesday,afternnon I visited the Fuji Electric Co., Ltd. The people I spoke with there were Mr. Seikin Kobayshi, Mr. M. Sakaurai, Mr. E. Shiratori, and Mr. M. Torii. Also present at the meeting was a representative from Nissho. Fuji definitely wishes to work through Nissho as a trading company. They are going to need one Core Tester and one Plane Tester in about 3 months. Their preference is definitely for DEC. Mr. Kobayshi says that he is the one that introduced DEC to other Japanese companies. Evidently all the companies work very closely together and he was a little upset that I hadn't contacted him first thing upon arriving in Japan and thanked him for his part in helping us. I preceded to thank him as best I could on the spot.

On Wednesday morning, February 21, I had a meeting with the Tokyo Electronics Co., Ltd. known as TDK. We had the meeting in my room at the Imperial Hotel. Present were Mr. Jun Kadono and Mr. Yu Hata. They at present have one Reese Core Tester and one Reese Plane Tester, and they are very unhappy with both of these. They expect their business to expand considerably very shortly; indeed their business is already expanding and they are perhaps the foremost producer of cores. Therefore, they are definitely going to need more equipment and they definitely wish DEC equipment. These prospects should materialize some time during the summer. They definitely wish to work through a trading company, either Rikei or Nissho. The feeling is that Nissho is the better company.

On Wednesday afternoon I visited the Oki Research Laboratory at Shinagawa. I talked there with Mr. Atsushi Fujii. They have already ordered one Reese Core Tester but the ministry of trade has not yet approved the amount of money. However, I expect that they will. They previously ordered a Reese Plane Tester but then cancelled the order because they decided the price was too high and they didn't like the specifications of the Plane Tester. They may need new equipment in the future and would tend to buy ours. However, they are certainly less interested than some of the other companies with whom I have spoken. They wish to work through a trading company, and personally think Nissho is better than Rikei.

On Thursday morning, February 22, I visited the Central Research Laboratories of Hitachi, Ltd. I spoke there with Mr. K. Marata, Mr. S. Kurokawa, Mr. H. Mashima and Mr. Y. Onishi. They are most interested in an Automatic Plane Tester and also somewhat in an Automatic Memory Core Tester. Their general feeling however is that they would like one if possible with better than a 0.1 microsecond rise time, in other words, a better machine than we can at present deliver. They are doing advanced research in very fast cores and also a good deal in thin film work. They may however, decide to buy our existing equipment as I told them that though we are working on improved machines, it would be quite a while before we can deliver such equipment. They definitely wish to deal through a trading company, both for importing purposes and also for after-service. However, they will send an Engineer to our plant.

On Thursday afternoon, February 22, I visited the Sunamachi factory of the Tokyo Shibaura Electric Co., known as Toshiba. I visited Mr. Hiroshi Aoyama and Mr. M. Tezuka. They are interested only in our Automatic Core Tester, since they manufacture cores but do not string planes. The other factory of Toshiba has just purchased a Reese Core Tester and a Reese Plane Tester. The Sunamachi factory wishes to see how the Reese Core Tester works out before ordering ours. They are already making efforts to buy an Automatic Core Tester and are putting the money in the budget. Their general feeling is that they would prefer to buy our equipment. However, in order to justify this, they must first see how the Reese equipment works out. I went there with a representative of the Rikei Co. Toshiba definitely wishes to deal through a trading company and the people who first approached them was Rikei.

In general, all of these companies are interested in our equipment and we ought to sell about 8 to 10 machines with a total volume of business of $400,000. to $500,000. within the next 18 months. All companies will definitely send an Engineer to this country to learn about our machine at the time of checkout. Each of these companies have been given one copy of our complete catalog and one copy of the 1516 manual and one copy of the 2102 manual. They were informed that the manual should be kept as "Company Confidential" and were for their own use only. Prices were quoted directly as follows:

Memory Tester 1516 basic price - $54,400.
$500. 50 cycle power
$700. display scope
$1,500. installation trip
Total - $57,100.

This price is for the 1516 with plug-in-units for 64 x 64 x 64 only. I mentioned that to buy the system without the word address portion would cost $8,200. less, and to buy the 1514 would cost $2,000. less.

Prices quoted on the Automatic Core Tester 2113 was as follows:

Basic machine $21,000.
Plus $500. for 50 cycle power
Total $21,000. not including installation trip. If a separate installation trip is required, the total price would be $23,000.

Core Handler prices were quoted at $6,500. for the CH58, $7,900. for the CH60, and $9,600. for the CH70. The last price was in error; it should be $9,800. and I will send a letter to the firms giving them this information. Delivery times were quoted as 10 to 12 weeks on an Automatic Core Tester and 14 to 16 weeks on an Automatic Plane Tester.

On Monday evening, February 19, I visited with the Rikei Trading Co. I met Mr. Isamu Hosoi and Mr. Shohei Shiraiwa. They are a small company, very actively trying to get our business.

On Tuesday evening, I met with the Nissho Co. Ltd. I talked with Mr. Minoru Yokochi and Mr. Yoshiro Yokota and Mr. M. Takekawa. Nissho is quite a large trading company, also very actively seeking our business. They have a branch office in New York which might be useful to us. They definitely have some engineers available for service. Of all of the trading companies, they seem like the best for our purposes if we were to choose a trading company.

On Wednesday evening, February 21, I met with Shoshin Shoji Kaisha, Ltd. and talked with Mr. Harry Harigae and Mr. S. Fujino, the President. This is a much more sophisticated trading company, quite large, composed of people used to be part of Mitsubishi. They also seem to be quite good and they also seem like a very good trading company, rather less aggressive in seeking our business.

My general feeling is that we are going to have to work through a trading company with many of the companies in Japan. A few of the reasons were stated in a letter from Shoshin Shoji of which I have sent a photo copy to Stan Olsen. Possibly however, it is not necessary for us to choose a certain company and work only through that one. However, we should definitely quote prices directly to the factories and also provide service mostly ourselves, and insist that an Engineer from the factory come to DEC in order to learn about the machines. Engineering discussions should still be held directly between DEC and the Engineers at the Japanese company buying the equipment. We must never make the mistakes that Reese has made in leaving after-service to a rather poor trading company.

# # # #

bbb

2/28/62

Dear Ken:

Since the floor plan problem has already cost me half a nights sleep, I might as well sit down here in the wee hours and review in my somewhat fevered script a few of the reasons for my original proposal.

The four main things I tried to take into account were these:

(1) Provision for maximum working efficiency,
(2) Provision for proper supervision,
(3) A method of controlling floor traffic, and
(4) Presentation of an organized and businesslike appearance to visitors.

You will notice, if you look at the plan, That people within the department would be able to perform virtually all their duties in the same general area of the floor - without circulating here and there and back and forth.

You will also notice that the major portion of the non-departmental traffic would be confined to ~~the~~ approximately 20 feet in from the stairs. ~~They~~ Most people will be seeing Helene, in the first office, or Florence or Jackie, at the front desks. This not only saves time and steps but it discourages the "happy wanderers" who turn up in the organization from time to time.

Helene was given an office, not only because her duties are heavily supervisory in nature (and she will probably rate supervisor pay come July), but also because of the amount of production handling she takes care of which can only be done efficiently in a quiet spot. The Friden (or key punch) I planned to locate in the Switch room, which is adequate for containing the noise and not good for much else. Besides John Caulkins would like part of This space for his brooms, ladders, etc.

Maynard's office was an obvious choice for me, since it has full-height walls. This would mean I could hold a private conversation in my own office for the first time ever — at Digital. Having the two copy boys together in one room and the two artists together in another makes sense here — just as it does in engineering. Admitted that they may not always talk copy or art (nor do the engineers always talk engineering), they work together closely and can use much of the same equipment in common to good advantage.

The classroom is just that. Our whole group still has a great deal to learn about advertising, public relations, sales promotion, and the graphic arts. ("Professional improvement," Jay calls it.) Out of a whole floor, I think we can get one room where we can keep our periodicals on file, have our reference books, put up a chalkboard, and really move into this training bit.

The display workshop is an obvious need, and this plan locates it near the art department, the photo studio, and the work benches — all of which can be useful.

The graphic arts section, as I have laid it out, offers several advantages. First, it provides the extra width needed in the camera room. Second, it reduces the amount of walking around required in the darkroom. Third, it puts the pressroom and the studio in close proximity — so that processing any given job is an in-line operation. And we had planned on the janitor's using the pressroom sink.

By locating our files at the front of the "office" section and our literature racks at the back, we not only control traffic, but we also block the ~~visitors~~ sloppier operations (collating, binding, etc.) from the visitors' view until they reach that portion of the floor. And arranging the storage ~~file~~ cabinets along the side, we create an inner work area and a back "hallway" for general traffic.

This arrangement puts the girls handy to and in full view of those of us who call on them all during the day to do special jobs. It keeps the artists handy to copy, and both groups handy to me. It enables Helene to work closely with me on any production or cost center problems she may have. And it keeps George's group all under his watchful eye.

Ventilation I do not feel would be a problem if we extended the grille across the back of the room and used only the literature racks at the center and our low files at the front for dividers.

I realize that your first pass at the floor plan means less construction, but I can't help feeling that now is the time to set this up right. And to me, "right" is the way that will give us the best control, the highest production, and the nicest front to show our visitors.

It would be virtually impossible for me - or anyone else who must talk with people in person or on the phone - to work next to the pressroom, as it shows on the new plan. And the plan calls for stripping the negatives in one area, making the plates on the opposite side of the floor, and running the press at the other end of the floor. Putting the pressroom where I have shown it provides a dual-purpose sink and lets the pressman keep the press running while he is exposing more plates. Also I feel quite strongly that we should stay with the change from stalls to offices which we adopted when we moved into Building 4.

Please understand that none of these suggestions is a matter of personal pride ~~and~~ with me. I simply want - as ever - to have my operation running and looking ~~as~~ in such a way that it reflects credit on the Company. Neither my wife nor my mother (the only two I could really hope to impress) is that deeply interested in where the pressroom is located.

Jack

dec INTEROFFICE MEMORANDUM

DATE February 22, 1962

SUBJECT Ed Fredkin's Computer

TO Ben Gurley
Ken Olsen
Harlan Anderson
Dick Best

FROM Gordon Bell

I have just talked with Ed last night in regard to his ideas on a large computer. The principle is beyond reproach, in that a large machine is the sum of a series of small machines or parts. I think everyone who has ever thought about a machine at some point believes this. Ed wants $'s for this idea, but I feel it needs a bit of development in order to produce a machine from our 30 mc, logic and glass delay lines.

I propose that we hire Ed to present seminars on the organization of this machine. Interested parties are invited, but the above parties should be <u>required</u> to attend.

INTEROFFICE MEMORANDUM

DATE February 21, 1962

SUBJECT MIT Liason

TO B. Gurley
H. Anderson
K. Olsen

FROM Gordon Bell

MIT is proceeding with some fairly major plans for time sharing and these include:

1. A drum connected with TX-0/PDP-1.

2. Multiple consoles on each machine.

3. A sequence break system which is significantly different than Type 20. A break cycle 0 would be added which gets the sequence break address from one of 16 registers, and then dismisses almost indirectly through these 16 registers.

4. A disc file system.

I think a policy should be formulated to benefit DEC-MIT, similar to Ferranti-University of Manchester.

None of the above items, as they exactly stand, would serve as prototypes for DEC products. The ideas are fairly sound, but vast, and with help in the idea filtering, detailed engineering design, drafting, and fabrication, they might succeed, provided their programming staff will stick with the job to get the executive routine written. I have suggested they work with a prototype model shop of some type.

The arrangement:

1. MIT would design hardware.

2. MIT would consult with DEC on design.

3. DEC would draft, (both Block Schematics and wire listings) and fabricate the designs.

4. DEC would make internal PDP-1 modifications.

5. MIT would test the design. DEC might pretest some designs (in case of consoles).

Eventual problem areas include:

1. Modifications to central processor for larger system. Handling of their specific documents.

2. Plans may make a number of programs incompatible with present PDP-1's (for example they want a command to save all program flags, special iots, sbs, etc.).

3. Projects are open ended in nature.

4. Great discontinuities of project manager at MIT.

5. MIT take over of DEC through job shop nature.

6. The pricing would have to be almost cpff due to open end projects.

7. (We have already quoted $500 as price to prepare wiring diagram, and wire their designs from Block Schematics.

DRUM SYSTEM STATUS

A present problem is the MIT drum system. They want their integrated system for 2 machine control, priority, independent timing, etc. The delivery date is in May, and since their change of design has been relatively late in coming, delivery may be a problem. The read-write and selection portions of the drum are being constructed. I have the first available engineer assisting in the drum projects. MIT's project manager will come to DEC twice each week and talk to drafting room in regard to the MIT design, and get engineering consultation. There is about 2 man weeks of drafting, and 4 mounting panels. MIT would make modifications to PDP-1 from plans drawn by DEC. MIT would do the system testing, and pay DEC when the system is delivered to MIT. The price would be the present drum system plus additional hardware. The delivery date would be a function of MIT design dates.

dec INTEROFFICE MEMORANDUM

DATE February 20, 1962

SUBJECT Multiply for MIT Machine/MIT Machine Use

TO B. Gurley
H. Anderson
K. Olsen
S. Olsen

FROM Gordon Bell

Jack Dennis has asked us to check on the veracity of an old rumor that DEC plans to "loan" MIT a high speed multiply-divide option.

Professor Caldwell of the Nuclear Group is starting to use the MIT machine prior to the ordering of his machine. I've gotten some calls from him since I knew him at the TX-0, and refered him to BBN for some programming. Our Sales Department should contact him to help him process his order for a PDP-1.

K. Olsen

INTEROFFICE MEMORANDUM

DATE: February 20, 1962

SUBJECT: Sales-Ordered Equipment Delivery Dates

TO: All Engineers

FROM: Arthur Hall

A system to assure reliable delivery dates of equipment ordered from Sales was worked out today (2/20/62) at a meeting attended by H. Anderson, M. Sandler, J. Myers, R. Savell, E. Harwood, and A. Hall.

To get this system started on the right foot it will be necessary for all engineers to take the following steps:

1. If you have placed any order with Sales (modules, power supplies, etc.) which you are not positive has been received and confirmed by Jim Myers contact him immediately and verify the order.

2. If a verified order shows an incorrect Required Delivery Date or lists the wrong module types or quantities, the correct information must be sent to Jim Myers in writing by Thursday morning (2/22/62).

3. Any equipment orders which are known at this time but have not been placed should be sent to Jim Myers before Thursday morning (2/22/62).

DATE: February 19, 1962

SUBJECT: Departmental and Project Responsibility in the Computer Division

TO: All Computer Division Engineers
K. Olsen
H. Anderson

FROM: Ben Gurley

Final Assembly and Wiring (Ed Harwood)	To deliver a computer to checkout in the configuration and on the date agreed upon by Final Assembly and Wiring and by the Computer Order Manager (COM).
Checkout (Al Blumenthal)	To deliver to Final Assembly and Wiring (FAW) on the date agreed upon by the COM and FAW a computer checked out to the extent formally agreed upon. To have the computer checked out to the agreed extent by the dates agreed upon so that checkout of peripheral equipment is not delayed. To provide checkout of the final system on the date and to the extent agreed upon by checkout and the COM.
Tape Department (Jack Brown)	To deliver to the COM on the correct date a completed Tape Unit or Tape Control, checked out so that it can be started in on-line checkout on the agreed date (a complete Tape Unit or Control means one which the Tape Department has ordered all parts and modules for, checked out and scheduled) all the COM does is to negotiate a delivery date and take delivery.
Peripheral Equipment Dept. (Bob Savell)	The responsibilities of this Department are the same as those of the Tape Department except that they deal with Displays, Card Readers and Punches, etc.
Computer Order Manager (COM)	To assure himself that all dates now scheduled are realistic and to change them if necessary (and practical) to a date which can be met. To schedule future project interim dates by negotiation with the various Computer Division and outside departments (and/or vendors). To notify all affected departments if a computer or part of a computer will be later than the scheduled date(s) and to re-schedule when necessary.
Computer Administration	To assist the COMs and departments in scheduling by plotting areas of probable heavy time and material demands. To assist in dissemination of schedules and engineering information. To bring to the attention of COMs and departments possible troubles which may affect schedules.

The Computer Order Manager has ultimate responsibility for the internal and external delivery dates of his project.

The Department Head has complete responsibility for all phases of his department's work necessary to deliver a completely finished product to the Computer Order Manager on the agreed upon date.

DATE: February 19, 1962

SUBJECT: Computer Department Scheduling

TO: K. Olsen
H. Anderson
S. Olsen
J. Myers
M. Sandler
J. Smith
K. FitzGerald
L. Prentice
H. Crouse
R. Melanson

FROM: Ben Gurley

The accuracy of Computer Division schedules is completely dependent upon accurate time estimates from Production, Sales, Sheet Metal, etc. These departments should quote dates which allow a reasonable period of time for engineering changes, delays and inaccuracies of outside suppliers, sickness, etc.

In addition to allowing a reasonable time period for promised dates, departments supplying parts and services to the Computer Division must deliver requested parts on time without being asked and must notify the person who requested the part or service if the part or service cannot be supplied on time. The Computer Division cannot schedule accurately or operate efficiently without this assurance.

If any department feels that it cannot predict delivery dates with a sufficient degree of confidence or notify the requesting person of a delayed delivery date, see me.

dec INTEROFFICE MEMORANDUM

DATE February 19, 1962

SUBJECT Formica Table Top from Norman E. Hallowell in North Acton, Massachusetts

TO Kenneth H. Olsen

FROM Henry J. Crouse

The formica is available in 5 x 12 sheet sizes in the following colors: solid black, solid white, linen pattern, pearl pattern, sequins pattern, spindrex pattern, skylark pattern, melano pattern, cherry peakwood, No. 24-CR-85, walnut, No. 94-N-25 and frost walnut, No. 92-N-22. The cost of the table in walnut would be $128.00 and in a solid white or black $134.00. The table would be constructed exactly as those tables we now use on the computers only in the boat style with straight lines.

K Olsen

DATE: February 19, 1962

SUBJECT: Project Assignments

TO: PDP Distribution List plus:
J. Smith
J. Myers
K. FitzGerald
G. Gerelds
P. Bonner
S. Miller
H. Crouse

FROM: Arthur Hall

These people are responsible for the projects listed. If there are any changes in configuration or delivery date they should be notified as soon as possible.

Computers:	ADX-0	Jack Brown
	Beckman-1	Ed Harwood
	CRC-1	Steve Lambert
	SRL	Bob Savell
	CRC-2	Steve Lambert
	LRL	Bob Savell
	Beckman-2	Ed Harwood
	ADX-4	Ed Harwood
	ADX-5	Steve Lambert
	ADX-2	Steve Lambert
	ADX-3	Steve Lambert
	DEC	Bob Savell
	ADX-6	Steve Lambert

Departments:	Final Assembly & Wiring	Ed Harwood
	Checkout	Al Blumenthal
	Tape Units and Controls	Jack Brown
	Displays, Card Readers & Punches, Printers	Bob Savell

dec INTEROFFICE MEMORANDUM

DATE February 16, 1962

SUBJECT Martin Whitmer

TO K. Olsen
H. Anderson

FROM Bob Lassen

The following are some observations made by Mr. Thomas J. Troup (Cryovac Division, W.R. Grace Company), concerning Martin Whitmer.

Whitmer worked for Troup for approximately one year in the area of Financial Analysis. This work apparently involved researching the financial operations of various departments and reporting his findings to top management. It included such areas as Investments, Profit and Loss, Forecasts, and Sales. Troup felt that Whitmer was mentally equipped to do this job but indicated that his prime interests were in Sales-Marketing.

Troup thinks Whitmer is an intelligent person and a good thinker. He feels that Whitmer would be somewhat of a "calculated risk" since he was never "really put to the test" in top management project work. He does feel however, that Whitmer possesses the mental ability and potential to grow into higher level work.

Troup also indicated that he was well liked and that he handled himself well with his associates. He was especially adept at reporting to and dealing with his superiors.

DATE: February 15, 1962

SUBJECT: Sequence Break Priorities for ADX Systems

TO: PDP Distribution List FROM: Bob Reed

Equipment	Priority	Subsequence	Device Completion	TTT Address
Mag Tape (CA=FA)	0	4	2	4
Mag Tape (End of Record)	0	5	3	5
DAD	0	7	6	7
Paper Tape Reader	1	0	0	20
Real Time Clock	1	1	4	21
Paper Tape Punch	2	0	1	40
*ILU Group 0	5	0→7		120→127
Group 1	5	10→17		130→137
Group 2	6	0→7		140→147
Typewriter	10	0	5	200
*OLU Group 0	11	0→7		220→227
Group 1	11	10→17		230→237
Group 2	12	0→7		240→247

* Priority group 5 subsequences should be prevented from interrupting priority group 6 subsequences. Priority group 11 subsequences should be prevented from interrupting priority group 12 subsequences.

dec INTEROFFICE MEMORANDUM

COMPANY CONFIDENTIAL

DATE February 15, 1962

SUBJECT Actual Cost - Universal Controller for AFC

TO Ken Olsen
H. Anderson
R. Mills

FROM E. Simeone

I have made a detailed analysis of the manufacturing cost of the computer and options (Universal Controller) sold to the Air Force Command at Bedford. The purpose of the analysis was two-fold; first, to arrive at an accurate actual cost, and second, to see if all materials were properly charged to the job or if materials used were incorrectly charged to this job. This of course, would affect the accuracy of the cost.

Two EN numbers were assigned to this project. EN 2053 consisted of the computer, an A-D converter and a stimulus synchronizer. EN 2094 covered the CRT model 30A display. A summary of the total cost of these two jobs is as follows:

EN 2053 (Computer, A-D Converter, Stimulus Syn.):

		Total	% of Total Cost
Direct Labor:			
Engineers - (190 hours)	$ 761.82		
Technicians - (1545 hours)	3,942.16	$ 4,703.98	8.7
Overhead:		2,906.41	5.4
Direct Materials:		12,483.26	23.0
Manufactured Parts:		10,233.96	18.8
Finished Goods:		23,928.63	44.0
Outside Contractors:		35.00	.1
Totals:		$ 54,291.24	100.0 %

It is our opinion that the maximum estimated cost of the stimulus synchronizer and A-D converter is $2000. and the balance of $52,300. represents the actual cost of the computer.

COMPANY CONFIDENTIAL

EN 2094 (CRT - Model 30A):

		Total	% of Total Cost
Direct Labor:			
Engineers	$711.33		
Technicians	924.99	$ 1,636.32	25.0
Overhead:		917.15	14.1
Direct Materials:		2,475.50	37.9
Manufactured Parts:		731.57	11.2
Finished Goods:		672.53	10.3
Outside Contractors:		94.50	1.5
Totals:		$ 6,527.57	100.0 %

In addition to the cost of theses EN jobs, there was labor, materials and overhead totalling $941.72, charged to field service.

Attached is a summary of materials used and a description of labor performed on EN 2053.

A proper analysis of the direct labor presented a problem due to the lack of a job description or operation being reported on all the daily job tickets. I made no attempt to analyze the engineering cost as the job tickets did not show the necessary information. The attached analysis of the technicians labor represents 84 % of the total engineering and technician labor cost.

(See Attachments)

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EN 2053: MATERIALS

DIRECT:		Total	%of Total Cost
Transistors	$ 293.48		
Memory Stack	6,210.00		
Reader	2,300.00		
Teletype Punch	811.43		
Computer Writer	2,210.00		
Swivel Chairs (2)	105.84		
Misc. Parts	552.51	$12,483.26	26.8%
MANUFACTURED PARTS:			
Cabinets	$ 606.32		
Plates & Filler Strips	278.06		
Wiring & Misc. Jobs	9,349.58	$10,233.96	21.9%
FINISHED GOODS:			
Mounting Panels	$ 651.51		
Power Supplies	1,390.67		
Tape Pin-Patch Cords	14.80		
Modules	21,871.65	$23,928.63	51.3%
TOTAL MATERIAL COST:		$46,645.85	100.0%

COMPANY CONFIDENTIAL

EN 2053: TECHNICIANS LABOR

	Hours	Dollars	%
Wiring & Lacing	244.50	$ 547.62	13.9
Checkout	726.25	2,089.46	53.0
Cable	46.00	94.66	2.4
Paperwork	86.00	250.58	6.4
Misc. & Unclassified	442.50	959.84	24.3
Totals -	1,545.25	$ 3,942.16	100.0 %

DATE: [redacted]ruary 15, 1962

SUBJECT: Ess Gee Proposal - Tape System

TO: Stan Olsen
Ken Olsen
Harlan Anderson
Ben Gurley
John Koudela

FROM: Jack Brown

Al Wachtill (914-LY-2-8620) of Ess Gee Electronics explained their tape system needs on the weather bureau job.

They have a modified 7090 called a 7094 which presently has both 729 II and 729 IV transport stations. Under program control, they want to write on either type 729 at either density and then switch the transport on to a PDP which would then read the information, make a few calculations, write back on the tape and then switch it to the 7094.

The tape control we would supply would have to:

1) Check longitudinal parity.
2) Write and read end of file markers.
3) operate without the 7094 power.
4) Drive up to eight drivers.
5) Operate with either speeds or either density.
6) compute while reading or writing.
7) Be delivered by October 1.

It should gather write and scatter read.

It need not:

1) automatically correct for all zeros even mode characters
2) have double rank reading

Considering the fact that we have not yet decided exactly how we should build such a control, when present production pressure will ease, our desire to design a control before we promise delivery, and the Ess Gee credit rating, it was decided not to approach the program on a crash basis.

I told Wachtill therefore that:

1) We are going to have such a control in the future but would not promise it by October 1.
2) We expected it would cost approximately $65,000 (CDC similar unit by the way sells for $82,000).

The October date essentially said no to their proposal and will probably result in their using a different computer. We may or may not have additional follow up with Ess Gee.

dec MEMO

DATE February 14, 1962

TO Ken Olsen FROM Jack Atwood

This isn't nearly as bad as I've made it sound here. A lot of our time is, of necessity, spent on general chores - gathering background information, experimenting with new techniques, performing simple housekeeping chores, and the like.

In addition, the implementation of the cost center system itself took a great deal of time during January.

However, this report provided the vehicle for an effective reminder that we are responsible to our "customers" and that our jobs depend on how well we bear that responsibility.

DAP 984

dec INTEROFFICE MEMORANDUM

DATE February 13, 1962

SUBJECT ADVERTISING DEPARTMENT OVERHEAD

TO Advertising Crew FROM Jack Atwood

The first run-off of labor charges under the Cost Center system provided one real shocker. To wit:

38.6% of our labor costs for the month of January were charged to miscellaneous numbers.

In other words, nearly half of our month's labor could not be charged back to specific jobs. It simply went into our departmental overhead.

Can you imagine a business where the labor cost on each job that was billed had to be doubled in order to meet the total payroll? Can you imagine how long such a business would continue to attract customers?

Well, that is just what this figure means. It tells us that, in order to pay everyone, we would have to charge nearly twice as much as we should for labor alone on every job. Add to that other costs which run high because we are a new "business" - paying for new equipment, charging off spoilage, defraying the expense of on-the-job training, etc. - and it puts us in a tough competitive position.

And don't forget what we talked about when the new system went into effect. We will soon be in competition - with Samuels Studio, Murphy & Snyder, a dozen or so commercial art services, and literally hundreds of advertising agents and agencies. If the other cost centers in the company don't like the price they have to pay for what we do, they will be perfectly free to look elsewhere. Enough of this type of thing could put us out of business.

So what are we going to do? We're going to start getting some of this miscellaneous labor under control. Obviously it will never disappear entirely. There are certain jobs we do which are strictly overhead operations connected with the general functioning of the department. But we can do better than 38.6%, and we're going to.

One of the first things which showed up in the run-off was that the miscellaneous labor charges for time-clock personnel amounted to only 19.7%, as compared with 42.6% for staff and clerical. That shows us that George, Bob and Warren have already established good habits in accounting for their time. They know what jobs they have been working on, and they charge their time to the jobs. And it shows that the rest of us, in many cases, don't bother to charge the job, either because we forget or because we just don't care.

Another interesting figure was the percentage of total miscellaneous time which could be accounted for by function. Only 21.8% of this time could be traced back to administration

and operations, public relations, sales promotion, technical publications, industrial design, photography, and printing. The rest - a thumping 78.2% - was charged to just plain miscellaneous.

That should be enough to give you the picture. Now here are a few new rules:

1. We are setting up a number of new job numbers which are to be used in place of 0900 whenever possible. These should help get the 78.2% figure back into line.

Public Relations - Miscellaneous	150-1900+
Sales Promotion - Miscellaneous	150-3900+
Technical Publications - Miscellaneous	150-5900+
Industrial Design - Miscellaneous	150-6900+
Photographic - Miscellaneous	151-7900+
Printing - Miscellaneous	151-8900+
February Administrative Duties	150-0903*

These are to be used whenever time cannot be charged to a specific job. They are to be used sparingly, and they are to be used wisely. If something you are doing, for example, has a general bearing on our sales promotion activities but is not chargeable to a specific job, charge it to 3900 not 0900. Use 0900 only as a last resort. A few of us will use 0903 for certain jobs we are asked to do which are definitely outside our normal area of responsibility.

2. Whenever you use a 00 job number, as above, fill in the "Job Description" line on the card. (This line need not be filled in otherwise.) Florence will circle 00 numbers appearing on the time cards, and she and I will check them to see if the numbers used are appropriate.

3. If you are in doubt, leave off the job number. Just write in the job description. That will help us to spot areas where there isn't a clear delineation.

4. If you are working on a job which you believe should have a number but doesn't, leave off the job number and write in the job description. This will help us get new numbers assigned promptly but without keeping you waiting to complete your time card.

5. We are renaming Function 9 (the first digit of the job number). It will now be "Cost Center" instead of "Department." The job number for miscellaneous is still 0900, but it should be 150 or 151 depending on which cost center is actually involved.

6. We are also making several changes in operation numbers, descriptions and designations. We are adding:

18 Personnel (to cover interviewing and orientation)

54 Proofreading

We are expanding these definitions:

32 Finished Art and Mechanicals

50 General Typing and Clerical (to include filing, etc.)

And we are transferring to Cost Center 150:

52 Reproduction Typing

54 Proofreading

That's the message for the day. In all truthfulness, it may be a job-saving one. Of all the departments in the company, we are probably the most vulnerable to outside competition. So we must try the hardest to be able to justify what we do and what we charge for it – if we want to stay in business.

dec INTEROFFICE MEMORANDUM

DATE February 13, 1962

SUBJECT Silk Screening

TO K. Olsen

FROM Jack Smith

cc: M. Sandler
L. Prentice
K. Fitzgerald

This memo is in regard to your memo of February 12th concerning silk-screen panels for special projects. Our present work load has been scheduled to enable the integration of all special project panels. Approximately 15% of our time has been allotted to special projects.

It currently takes 3 days for the screening of any special project panel. The cycle is as follows: The first day when the order is received, the screen is made up. The second day is for panel screening and drying time. The third day is for inspection and delivery of panel to Engineering.

A man is being transferred from Maintenance to Silk Screening in order to release a third man to be trained in the silk screening process.

dec INTEROFFICE MEMORANDUM

DATE February 12, 1962

SUBJECT The Computer Division's PDP-4 Policies

TO Ben Gurley
Harlan Anderson
Stan Olsen
Ken Olsen

FROM Gordon Bell

I would like to have a series of short meetings regarding the policy of the PDP-4 Subdivision in the following areas:

1. Relationship to DEC as a Cost Center.

2. Relationship of Sales, Customer liason, and customer installation and tracing.

3. Organization in development and production phases.

   a) Management, planning, marketing, control

   b) Technical directives

      i) Mechanical Engineering
      ii) System Design
      iii) Programming
      iv) Customer Applications
      v) Special Projects
      vi) Documentation

The discussions would yield a set of policy notes for people within or near the group, defining areas of responsibilities.

dec INTEROFFICE MEMORANDUM

DATE February 12, 1962

SUBJECT Present Design Goals for PDP-4

TO Ben Gurley
Harlan Anderson
Stan Olsen
Ken Olsen

FROM Gordon Bell

To this date, the design policies for PDP-4 have been:

1. A slightly bigger than minimum general purpose computer, with flexibility to extend in size. Expandability required in control applications, documented to provide a nicely defined, simple module nest.

2. Reliability to be a maximum.

   a) Standard DEC modules.
   b) Documentation to be complete.
   c) Built in facilities for testing - (Repeat for memory testing).

3. Maximally production oriented machine.

   a) Documentation structure and control.
   b) Register checkout as modules.
   c) Design simplicity for production testing.
   d) Substitution checking.

For the last few months I have been working on a policy for documentation. I feel it is the most important design variable. Documentation seems to provide:

1. Means of retracing design.
2. Means of monitoring design progress.
3. Control for changes in production.
4. Working drawing for production, checkout and maintenance.
5. The communication path with production, from design.
6. Description of machine operation.
7. Parts lists.
8. Customer information.

The amount to which each of the above items fulfill these goals are not independent and present a fine linear (or perhaps non-linear) programming problem. The problem is especially interesting if cost or time is considered.

The design of PDP-4 has been complete for some time, and I would like to discuss the documentation problem in more detail before issuing the rules for writing down the logic for production.

The wiring may be done by a wire list, depending on the success of present experiments with lists.

INTEROFFICE MEMORANDUM

DATE February 9, 1962

SUBJECT SYSTEM MODULE PACKAGING

TO Ken Olsen FROM Jack Atwood

In response to your memorandum of January 30th to Stan and me, I have worked with Old Colony Container Company on the design of a System Module package which I believe fulfills each of the requirements you laid down - and more.

This package is inexpensive. It prices out at 7.6 cents, exclusive of the plastic inner wrap, in quantities of 25M. This price includes two color printing to our specifications.

It is fast to assemble. It requires only a simple rolling motion as the flaps are turned in to form the basic package. In this respect, it is similar to the package we are now using for our Laboratory Modules, which I am told is fast and easy to assemble.

It is useful, both before and after it is opened. It stacks well on the shelf, and it offers excellent protection both during storage and when shipment is made. It offers adequate space for identification markings, which help to speed the inventorying of stock and the assembly of shipments.

In addition, it offers outstanding advantages as a shipping container. It can be used by itself as the sole container for a single-unit shipment. It can be assembled in cartons without the need for special dividers, partions or fillers.

It is completely reusable. It can be opened easily for incoming inspection and closed up again with equal ease. It can be used as a storage container by the customer, either stacked on a shelf or on end in a file drawer. In a legal-size file drawer, three units can be stood side-by-side - without special hangers or retainers.

And in the event the customer wishes to return the unit to us for any reason, the same package can be used as the only shipping container needed.

Perhaps most important, it permits complete flexibility in the placement of components on the board. The construction is such that all components are well protected, whether or not they protrude above the level of the handle.

dec INTEROFFICE MEMORANDUM

DATE February 9, 1962

SUBJECT Trip to Johns Hopkins

TO Stan Olsen

FROM Bob Hughes

cc: √Ken Olsen
Harlan Anderson
Dick Best
Ben Gurley

I was somewhat horrified to find that at the installation where Bill Shotts is located, all of our system type plug-in units are mounted in 1906's and had front panels with 1/2" rubber strips which run the length of the mounting panel to keep the plug-in units in their sockets by compression. Bill Shotts stated that if they were not held in with compression they wouldn't run. His particular troubles were that his Laboratory Modules ran for a year with no trouble, then the banana jacks had to be turned in the banana jack sockets in order to keep the units running. He is also having trouble with the fatigue of the phosphor bronze connections in our amphenol sockets. I found one contact which was fatigued and did not grasp the 55 thousandths feeler gauge. I gave Bill the feeler gauge and advised him that when they had problems making contact that they measure all the springs for 55 thousandths with a slightly grasping force and if he found any that wouldn't grasp at 55 thousandths that he insert a scribe on each of the leafs of the socket contact and bend them slightly inwards so that they would grasp the socket. I think we ought to buy Amphenol connectors with beryllium copper contacts right away.

He stated that he had problems with the banana plug connections on the back of the 1906 mounting panel. He also stated that the 4201's which they have would only "progate carry" 8 digits in 1906 mounting panels, but that some people in their Lab find no difficulty in propagating "carry" 14 bits when they use taper pin mounting panels. He blames the contact resistance in the 1906 banana jacks and sockets. We should look into this problem.

We promised Bill Shotts that we would send him the price and literature on the 2309A burst generator.

J. F. Gulick and Joe Harlan modified the 4301 delay on the short end of the range as they wanted short delays. We once made the arbitrary decision that the short end of the delay should be 2.5 microseconds. The capacitor which we normally use is 2200 uuf. The capacitor which they used was 470 uuf. I expect this may cause them trouble so we should look into this to make sure the unit has operating margins. They had about 12 bad plug-in units which we agreed to repair.

Mr. H. H. Knapp wants to be put on the mailing list and we should send him literature immediately. His address is: 8621 Georgia Avenue, Silver Springs, Maryland.

Dick King wants to know how he can make an analog to digital converter and mix two inputs together; in other words he wants to be able to take either of two inputs and gate them so that he can make a conversion on either input.

Mr. Schwastic (is that the correct spelling?) is having problems when he uses 4106s to mix pulses into pulse amplifiers. He has discovered that the pulse amplitude into pulse amplifiers deteriorates as a function of time. We suspect this is because of bad 2N412 transistors. He stated these units gave no trouble when used as regular logic inverters. We agreed to give him some 2N1305s.

Mr. Janusz mentioned that 4110's stretch pulses when they are used to "or" pulses, sometimes to as wide as one microsecond. This hasn't given him any trouble and he doesn't have any time bind, but I guess he was surprised. We should ask Dick Best if he has any strong feelings on the 4110 in this regard.

I think you agreed to get secret clearance for Jim Burleigh so that he can visit their Lab frequently.

INTEROFFICE MEMORANDUM

DATE February 9, 1962

SUBJECT Martin T. Whitmer - Reference

TO K. Olsen
H. Anderson

FROM R. Lassen

The following are some comments made by Mr. Joseph Welch Jr., Market Development Mgr., Cryovac Div. of W.R. Grace & Co:

Mr. Whitmer's principal duties as Product Manager of Thin Film Packaging was to develop new markets primarily through direct contact in the field. He performed this job well and is considered to be a good external contact man.

Welch feels that Whitmer has above average intelligence, but he is not exceptionally creative or imaginative. He likes to attack a tangible problem and has good follow through and determination.

Whitmer has a pleasant manner and gets along well with people - a nice guy with a good family background.

He would not antagonize people while dealing with them; however, adjusting to changing situations is not one of his strong points.

Welch feels that his working background is somewhat limited especially to qualify for high level management project work.

My general impression was that Welch thinks highly of Mr. Whitmer, but that he does not consider him to be outstanding. He has no serious reservations about his job performance with Cryovac, but he doubts whether he is sufficiently well-rounded to carry out diversified management studies.

I have been trying to reach a Mr. Thomas Troup who is one of Cryovac's financial executives, however, he is out of town.

dec INTEROFFICE MEMORANDUM

DATE February 6, 1962

SUBJECT Meeting at ITT on January 30, 1962

TO Ken Olsen
Harlan Anderson
Stan Olsen
ITT File

FROM Nick Mazzarese

The meeting was held at 320 Park Avenue, N.Y.C., ITT World Headquarters, and was attended by H. Anderson and N. Mazzarese of DEC and R. Hughes and R. Lane of ITT.

Agenda:

1. Circuit Schematics (Unresolved)

2. Marking of Packages (Unresolved)

3. Schedule Confirmation and Documentation (Firm configuration and new schedule will be mailed to us by ITT. We have preliminary information on these items.)

4. Renegotiation (They are still looking into this.)

5. Spares (We have provided them with spare parts ordering information for modules. We have yet to furnish them with a list of spare mechanical parts.)

6. ITT was Undercharged by $5,000 on ADX-0 Purchase Order (They will rectify this.)

7. Maintenance Training will begin on February 5, 1962 at ITT.

8. Unfinished Business

   a. Reprice Sequence Break

   b. Reprice Line Unit Duplex Switch

9. Discussion of purchase order for 48 computers

This last item should be discussed in a little more detail. The discussion on this subject began with our laying out the possible pitfalls for both DEC and ITT in a large order of this size; specifically, we pointed out the problem that we could have if they

were to cancel our orders. We also indicated that an order for 48 computers in a given year starting immediately would perhaps be too great a burden on our production capabilities.

Bob Hughes agreed that any order for as many as 48 computers should be handled differently than their initial order for 12. He mentioned the following specific possibilities:

1. They would definitely build all their own line units from ADX-5 on.

2. They would, in all probability, build their own tape and tape control units.

3. They would consider building their own extra core storage.

4. They would be willing to commit themselves to a large portion of this order without a cancellation agreement as we have in our present contract.

5. The orders could be spaced on a gradually increasing basis, building up to a rate of four a month - maximum.

It is interesting to note on this subject that the people at ITT have a marketing staff of about 30 people just selling ADX Systems. It seems by the law of averages, that they should be getting many orders soon.

So far as our delivery technique on this large order goes, we mentioned that we would take the approach taken by IBM in quoting delivery dates; that is, we would only give delivery upon receipt of order. We would not commit ourselves to a large, long range delivery schedule projected into the future until we had received a firm order.

Bob Hughes mentioned several times that they were dead serious about this large quantity order. They were not kidding!

They need the following information from us, however, to adequately plan for the advent of an order of this nature:

1. A specific quotation on what our production capability is.

2. What is the largest order that we would accept?

3. What is the largest delivery rate we could sustain?

4. What additional conditions might we want to attach to an order of this size?

INTEROFFICE MEMORANDUM

DATE February 5, 1962

SUBJECT Record of Trip to Visit Brooks Research Corporation in Rochester, New York

TO Ben Gurley
Ken Olsen
Stan Olsen
Harlan Anderson

FROM Bob Savell

On Friday, January 26, John Koudela and myself visited a Mr. Kurt Enslein at Brooks Research Corporation in Rochester, New York to discuss the possible purchase, being instigated by him, of a PDP-1 and some special equipment to go with it. We also talked with a Mr. Tom Keenan who is the director of the Computation Center at the University of Rochester and a Mr. Harold Iker who is working at the university using the 7070 computer there to work on problems in psychology and psychiatry.

Mr. Enslein is trying to buy a PDP-1 with National Institute of Health funds. He has a personal interest in getting a PDP-1 since he has a problem to solve, and would like to have a computer of this sort to work with. He would like to try and convince Doctors at the university hospital that the PDP-1, or some other computer, would be a useful device to use for keeping track of a patient's condition in the operating room by means of analog inputs of EEG, EKG data, etc. He would also like to have the computer installed at the university or at the university hospital so that he himself would not have to operate it, but would have it available for his use. Both John's and my impression was that he is probably going to have a tough time trying to convince them that they need a computer. Mr. Keenan and Mr. Iker both seemed to have a very negative attitude toward the whole thing. Mr. Enslein claims that if he can't get the computer in the university or the university hospital, that he has been told that National Institute of Health would provide funds for him to run the computer in his own company. In any event, he would like a quote from us on a PDP-1 system which has has outlined to John and also on a CRT equipped with photo-multiplier and film transport to read 70 millimeter chest X-rays into PDP-1 and also a 12-channel analog to digital converter to use for inputing the operating room data.

The A to D converter for inputing the operating room data would have to handle mostly frequencies lower than 20 cycles per second and very rarely frequencies as high as 60 cycles per second. It would be provided with any reasonable amplitude voltage inputs we requested, preferably around the 1 volt level. The converter should be able to convert at a rate of 20,000 conversions per second, have approximately 10 to 12 channels input, and approximately 1% conversion accuracy. John says that we have quoted on a system similar to this for some other customer before, so that the quote on this one should be no problem.

The requirements for the scanning device to read in 70 millimeter X-rays are as follows: The number of elements per picture should be somewhere between 10,000 and 30,000. The device should be able to differentiate approximately 8 to 10 levels of intensity information. The size of the raster must not change more than ±1/2%. The stability of the raster should be not more than ±1/2%. Spot size can be anything less than 1% of raster size. He would like to read this data from PDP-1 to magnetic tape with one pass per frame, so at the tape speed it would take approximately 1 second per picture to input his data.

Since the film would only move one frame per second, a simple film transport would be sufficient. It should have automatic film advance. The accuracy of positioning is not important since all the data will be taken in one pass. He would be willing to trade resolution for the number of levels of intensity available. In other words, i.e., for 10,000 picture elements, he would want 8 levels of intensity but if 40,000 elements were present only 2 levels would be required he says.

He has also asked Image Instruments to quote on this scanner system with an analog to digital converter and a mag tape to use simply for the purpose of getting the X-ray data onto tape. The tapes would then be processed on another computer.

He also expressed interest in shaft encoder inputs similar to those used on the TX-2 but did not ask us to quote on them.

One thing that seemed to throw all of us a bit was the high cost of our added memory modules with respect to the cost of the basic computer.

February 1, 1962

Holiday Schedule - Calendar Year 1962

K. Olsen
H. Anderson
S. Olsen
M. Sandler
R. Mills

Bob Lassen

The following is a holiday schedule including movable days as suggested by the Personnel Committee:

January 1	- Monday
April 19	- Thursday
May 30	- Wednesday
July 4	- Wednesday
September 3	- Monday
November 22	- Thursday
November 23	- Friday - Movable Day
December 21	- Half Day
December 24	- Monday - Movable Day
December 25	- Tuesday

We may run into a problem if we are not given permission to work on such days as November 12th (Monday).

Ken

Everyone approves of this schedule. If it's OK by you we'll post it on the boards.

Bob

INTEROFFICE MEMORANDUM

DATE February 1, 1962

SUBJECT Request for price quotation from Dr. Philip Hamilton of Itek Laboratories for a Flying Spot Scanner System

TO Ben Gurley
Ken Olsen
Harlan Anderson

FROM Bob Savell

Dr. Philip Hamilton of Itek Laboratories called last week and requested a price quotation on two scanners to be delivered in September 1962. The specifications are as follows:

The system does not include the CRT's or the tube mountings nor does it include any tables or cabinets. Each unit must drive two deflection yokes and two focus coils. They were considering buying the yokes and focus coils, but if we wish to quote on these as part of the package, this is agreeable.

The device is to be a flying spot scanner which scans one line in 30 milliseconds with a raster height of 3000 lines. I told him we could expect retrace in this system might take 50 microseconds and this was agreeable to them. I still cannot get any further specifications from them as far as accuracy, stability, and so forth, other than the unit will operate in normal room temperature and that reasonable type accuracies and stabilities consistent with the type of presentations are expected. They are more interested in short term stability than long term stability as they will be scanning one picture in approximately 90 seconds and would not want things upset in the middle of a picture. If things change over a longer time than this they are not particularly concerned.

The quote for these two units must be in by February 15. Do we wish to make a quote?

digital equipment corporation
MAYNARD, MASSACHUSETTS

dec INTEROFFICE MEMORANDUM

DATE February 1, 1962

SUBJECT ADX-0 Delivery Date

TO K. Olsen
H. Anderson
S. Olsen
A. Blumenthal
B. Gurley
A. Hall
E. Harwood
ITT File

FROM Nick Mazzarese

A review of the ADX-0 rework schedule indicates that we are presently about four work days behind. This would mean delivery of the computer on February 20th if we assume Saturday work is continued.

The slippage can be accounted for by the following facts:

1. Late delivery of console. (2 days)

2. Late delivery of modules (at least 5 days) due to DX priority of other jobs.

3. Electrical Modifications more involved than anticipated. (5 days)

In addition, ITT would like some additional modifications made on their Line Units, which will take a few days more. It appears, therefore, that the overall delivery date of ADX-0 will be approximately February 23 or eight days late.

Subject: PDP-4 Cabling

To: Harlan Anderson

Date January 31, 1962

c.c.: Ken Olsen ✓
Ben Gurley
Ed Harwood
Richard Best
Stan Olsen

From Gordon Bell

The enclosed sketch describes the PDP-4 cabling problem and gives a rough layout of the cabinets.

The specifications for the "IO NEST" or "LO MODULE" are not quite firm. I'm trying to solve the problem for the average process control case, and it's difficult to specify an average number of 9 or 18 bit output variables. This average number drastically affects the space required for drive selection (3/4 - 1 1/2 modules/device selected) and cable outputs. The present system will conveniently select 64 inputs and 64 outputs.

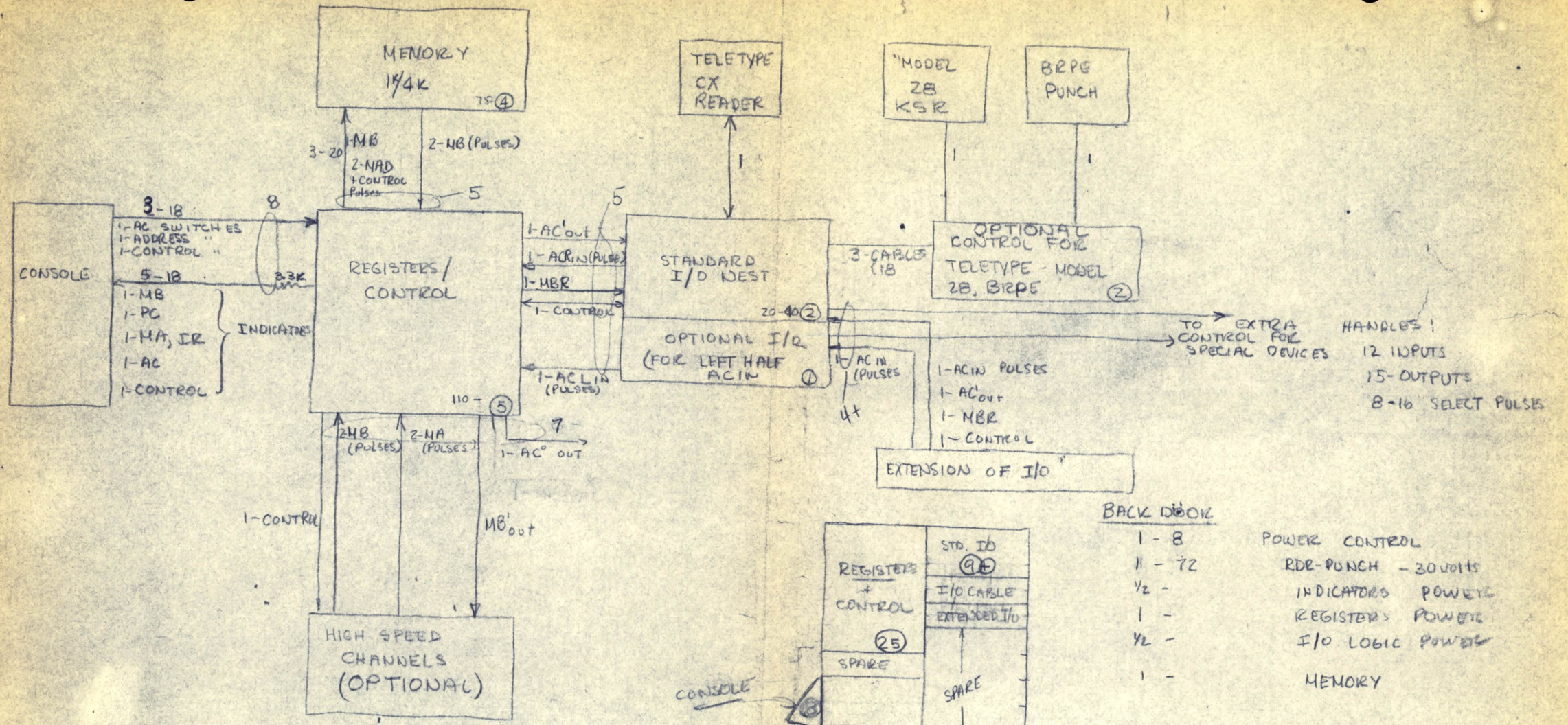
All inputs and outputs are to and from the AC. The MB, and MA are available for direct data interrupt too. I'm currently thinking of allowing only 9 bit input to the AC, with an option for the remaining 9 bits, perhaps the whole thing is initially wired up. Taper pins will be used in the "IO MODULE" so that data are fed directly in to the MODULE. A taper pin block will be provided for AC outputs. The MB outputs (both sides) are used to select the I/O device.

I need help with the cable problem!. Is it possible to have 25 cables eminating from a section of 110 modules? Is there a better way to handle series resistors than:

1. Resistors on sides of panel (see Type 52 Tape Control).
2. Blocks over modules with series resistors. (PDP-1)
3. 1669 packages
4. A plug-in-unit extender like device with series resistors.
5. Cable with a series resistor at sending in.
6. A taper pin block (3 x 20) with 3.3 K ohms, rather than 0 ohms fron to back resistance.
7. The use of a pin space and overhead block for series resistor and cable connector. From a wiring list standpoint, the cables in central part will yield a list at least x 25 x 18 or 450 cards long.

I would appreciate suggestions, and might even yield to edicts.

# # # #



SKETCH OF PDP-4 CABLING
(INTRACABINET)

dec INTEROFFICE MEMORANDUM

COMPANY CONFIDENTIAL

DATE January 31, 1962

SUBJECT Plant Visit to Somersworth and Dover New Hampshire - January 27, 1962

TO Ken Olsen
Harlan Anderson
Stan Olsen
M. Sandler
J. Smith

FROM R.F. Mills

SOMERSWORTH, N.H.

The property we saw is item 81 in the book entitled " Industrial Properties in New Hampshire" presented to us by Mr. Allen P. Chase, Industrial Agent for the New Hampshire State Planning & Development Commission.

First Impression:

We met Mr. Filion, Mayor of Somersworth and Mr. St. Lawrence, President of the Somersworth National Bank, at the bank and then drove about a mile and a half to the plant, which is located right on the river next to a dam. The first impression of the plant was that it had been left there to slowly rot away, and this proved to be the case once we got inside. There are 50,000 sq.ft. in three brick buildings; 37,000 sq.ft. in the main mill consisting of 5 floors, sprinklered with a very small elevator and heating system in desperate need of repair. The windows - most of them broken - were open on some floors, which has allowed the weather to enter and do a real job on the floor. The building was as filthy as I have ever seen and the estimate of the cost to bring this building up to a point where we would be able to occupy it including, increasing the heating capacity, bringing in power, a general clean-up, painting, new floor in one area, putting in new mens and womens toilets on each floor would run in the field of $100,000.00 +.

Purchase Price:

The stated purchase price before we went up there was $20,000. and while we were talking to the two men, theyexpressed the opinion that it probably could be bought for $15,000. and as the day progressed for $10,000. and at the very end the statement was made that we could probably buy it for almost anything. Maynard, Jack and I all felt that there was some hope here, since the purchase price was so low and the taxes on the building were $475.00 per year, but after going to Dover, we completely wrote off the Somersworth plant as being quite undesirable for many reasons, which will show in the investigation summary attached.

DOVER, N.H.

First Impression:

This property is item 80 in the same book as mentioned on page 1 of this memo. This is 50,000 sq.ft. on the third floor of the old Pacific Mills in the center of Dover; with a 13 ft. ceiling, sprinklered, with elevators, loading dock at street level in the rear, which we did not see. This property is in like-new condition with full power, very clean, well painted and it looks as if all we have to do is move in and start work. We all voted for this property due in large part to its excellent condition, location, the attitude of the city government as evidenced by their Mayor, Mr. Stuart Shanes, Mayor Pro-Tem, Mr. Tuttle and the following members of the Development Commission: Mr. Carl Frieze, General Manager of Eastern Air Devices, who are in the floor above and the floor below and Mr. Ellis, District Manager of the N.H. Public Service Corp. These men represent the first businessmen government in Dover for many years, having thrown out "politicians" and are now trying to put the city government on a business like basis and in particular to encourage new industry.

Prices of Property:

The 50,000 sq.ft. was quoted at 24¢ a sq. foot, which would be $12,000. per year or a little less than half of what we pay for the same space and is better space than we now have here. They gave us evidence of the fact that this price is subject to negotiation, which seems to me a lower price. Any negotiations would be handled through the Dover Industrial Corporation, in Dover, N.H. which is headed up by Governor Powell and our dealings would be directly with him. Mr. Hugh Hamilton, who normally handles these arrangements for Governor Powell, is away for four months.

Future Contact:

It was left that we would contact them for the labor information which we asked them to put together for us and which are the questions as listed on the investigation summary attached.

MANCHESTER, N.H.

Allen Chase of the New Hampshire Planning and Development Commission called me Monday to set up an appointment to see some more property in Manchester, New Hampshire which he feels would be "just right" for us, with an available labor supply far exceeding anything that would be available in Dover. We tentatively plan to go up there this Saturday February 3rd.

# # # #

COMPANY CONFIDENTIAL

INVESTIGATION SUMMARY

	Dover	Somersworth
1. Building Area:	50,000 sq.ft.	50,000 sq. ft.
2. Cost:	24¢ per sq.ft./$12,000. per yr.	$5, - 20,000.00
3. Repair Cost:	None	$100,000.00
4. Real Estate Taxes:	Included in rent	$475. on present valuation
5. Power:	Installed	To the buildings only
6. Water:	Available	Gallongge rights to river water City water available
7. Personnel Feeding	In Town/possibility installing, in plant-some machines	In Town
8. Heat:	Included in rent	Needs to be completely redone-package unit & HDT boiler, not in good condition/requires survey
9. Labor:		
ages?	Unknown	Unknown
How Many?	Unknown	Unknown
Areas to draw from?	Portsmouth, Dover, Somersworth - in New Hampshire Berwick, York, Ogunquit, Sanford - in Maine	
Past work experience?	Stated as high quality-semi skilled and skilled help	Unknown
Rates of pay?	Unknown	Unknown
Cost of living index versus Mass.?	Unknown	Unknown
10. Other Industry:		
How long there?	GE - 15 years no union	Unknown
How many have left, & who are they?	None, because of help and conditions	None, because of help and conditions
Special fringe benefits?	None	None

11.	Schools:% of taxes for schools	Information to follow	46%(50%of school children in Parochial Schools
12.	Corporation Taxes:	There are no Franchise or Income Taxes on Corporations in N.H. and the only tax they have is a property tax which is the same basis as a personal property tax - on all property in the plant of stock nature at Dec. 31 of each year, which is taxed at the Towns tax rate.	
13.	Individual Taxes:	There are no wage or personal property taxes in N.H. on individuals - the only taxes they have are a Real Estate Tax, and a 3% State Sales Tax, and a 4.25% dividend and interest tax.	
14.	Freight:		
	What are truck rates per 100 lbs/electronic parts?	Unknown	Unknown
	Available truckers are:	M&E and Garvey	M&E and Garvey
	Air Freight?	No schedule	No schedule
	Nearest freight - Boston		
15.	General Transportation:		
	Air?	None	None
	Bus?	Greyhound/Trailways	Greyhound/Trailways
	Train?	None	None
16.	Travel trom Boston?	75 miles	app. 90 miles
17.	Building cost per sq.ft?	Estimated for basic frame & sm. area for offices, $8.00 per sq. ft. They built 38,000 sq.ft for $300,000. in their new industrial park	
18.	Workmans Compensation per $100. ?	Unknown	Unknown
19.	Town Financing?	100% financing	None
20.	Banking Facilities?		
	local:	National Bank	National Bank
	Boston Affiliation:	Unknown	National Shawmut Bank of Boston First National Bank of Boston

INTEROFFICE MEMORANDUM

DATE January 31, 1962

SUBJECT Stockroom Proposal

TO Ken Olsen

FROM Ken Fitzgerald

c.c.: Loren Prentice
Maynard Sandler
Dick Mills
Dick Best

Since I have taken over the Sheetmetal Shop, I have been trying to make sure that all jobs are sent to the Production stockroom or the person that ordered them as soon as they are completed. I have noted that when these parts arrive on the third floor of Building 12, they do not seem to have the facilities, personnel or space to handle them. At the present time, there is in the neighborhood of 5 or 6 pallets and carts with completed Sheetmetal items, just sitting around. Within a very short time, this is going to mean a complete and utter state of chaos.

I propose that the Company set up a Mechanical stockroom for all Machine Shop and Sheetmetal Shop items that are used continually and that probably will not be changed in design or finish. There should also be provision for storing obsolete parts for future replacement sale or rework. There is a tremendous amount of these parts, but the depth of stock on them now is very small. A person would have to be hired to do just this one job which would consist of things such as analyzing current and future production needs, stock on hand, and availability of the stock necessary to maintain an adequate supply. This person would then issue orders to either the Shops or Purchasing for the necessary parts required for minimum standards. This person would have to spend quite a bit of time initially with parts lists and project engineers, determining what minimum quantities should be. I realize that this is going to mean a tremendous amount of money tied up in stock and space, however, I feel it is quite necessary. This Stockroom would also maintain stock on standard hardware or purchased mechanical parts and he would be the prime requisitioner of materials from the Shops. This is something that I have been trying to get the Production people to do, but as I said previously, they just do not have the time, people, or facilities for this. This stockroom would still be under the direct supervision of the Production department, since all of the parts and materials in the stockroom are used in Production.

At the present time this is the only solution that I can see, to eliminate the problem of having three separate and distinct areas of this company ordering parts individually from the Shops. When this is done, it means that there is always conflicting priorities and delivery dates. It will also be quite a simple matter to allocate the necessary Shop time to handle the demands of this stockroom and then schedule about 25% of Shop time for experimental development and special panel work.

If this plan is adopted, it will mean that Mechanical Change Notices will also be sent to the stockroom where the stock disposition is handled and the originator of any Mechanical Change Notice can check stock before determining what the stock disposition should be. Also it will then be possible for Drafting to assign stock numbers to all of the parts on a parts list. As you know at this time, the DEC stock number column on all the parts lists is blank, and parts are requisitioned by drawing title or in some cases drawing number. This is not an efficient way of ordering stock.

# # # #

bbb

H. Olsen

MEMO TO: All Engineers

FROM: Barbera Stephenson DATE: 1/29/62

Our module write-ups for our new catalogue are progressing to the last stages. We now need any corrections which you have for our present literature on the 3000 Series (excluding training modules and classroom modules) and the 5000 and 6000 series. Our deadline for the 3000 Series corrections is Wednesday at 5:00 and for the 5000 and 6000 Series corrections, it is Friday at 5:00. I'm sorry to be in such a rush, but thank's for your patience.

dec INTEROFFICE MEMORANDUM

DATE 1/29/62

SUBJECT Accessory Products Policy

TO Stan Olsen FROM Ted Johnson

Our successful sales performance in the past has been highly dependent on our ability to fill customer needs quickly. In the last few months, we have had to work with drastically extended delivery on almost all modules. I am sure these problems will be solved, but want to call your attention to the availability of accessory units, (mounting panels and power supplies) as a particularly embarassing problem.

Since these units and their component parts, particularly metal work, are basic and well-defined, and since the cost of maintaining an extensive inventory of these parts would be very small relative to transistors and modules, can we not get ahead once and for all on these items and maintain a minimum inventory adequate to provide almost immediate delivery to the customer and our own systems engineers? If metalwork is the bottleneck, I would suggest having a large quantity of these items jobbed out to establish this basic inventory.

This is the kind of obvious and basic problem that can be lost in the maze. I have expressed this concern before and urge a solution. It is very nice to be able to offer mounting panels before modules and irksome to both customers and sales personnel to have to wait for such a basic item. I think we should view them apart from the modules themselves, which we are now apparently doing, and deal with this problem.

Ted Johnson

dec INTEROFFICE MEMORANDUM

J 29

[redacted]

SUBJECT ITT

TO Ken Olsen FROM H. E. Anderson

Bob Hughes telephoned this morning regarding our meeting in New York on Tuesday. One item that he would like to have some preliminary discussion on is the quantity of units to be included in the next purchase order. They anticipate placing this order in about two months from now and would like to have us consider quantities as high as 48 machines for the next 18-month period. I said I would discuss this with you before going to New York on Tuesday morning.

My first thoughts are the number is too large to fit into the existing purchase order format where they can cancel virtually all of the computers at no penalty. As a minimum, some part of that quantity would probably have to be firm. Otherwise we would have to expand anticipating the full quantity, and yet they might cancel almost all of them.

Another consideration is that such a large order would make us more dependent on ITT than ever before. If our normal computer business is going to expand a similar amount during the time period, perhaps it is not too bad from a balance standpoint. Of course, if our normal business expanded that much and ITT expanded that much, the volume would be overwhelming.

Later today or Monday I would like to talk to you more about this, so we have some sort of a party line ready for the meeting on Tuesday.

# # #

dec INTEROFFICE MEMORANDUM

DATE January 23, 1962

SUBJECT Dynasert Machine

TO

K. Olsen
H. Anderson
S. Olsen
M. Sandler
G. Gerelds
L. Prentice

FROM Jack Smith

Our Dynasert machine was set up yesterday in the Model Shop. The idea is to leave the machine there until we have it perfected for productive use. After the successful running of a few lots, it will be placed into direct production. I intend to ask George Gerelds and Loren Prentice for their help on this project.

dec INTEROFFICE MEMORANDUM

DATE

January 23, 1962

SUBJECT

TO Change in Procedure

FROM

Jack Smith

B. Maroney cc: K. Olsen
C. Fuller M. Sandler
K. Peirce J. Fadiman

Starting today, Special Systems will place all their mechanical parts orders directly with the respective shops. This will eliminate Production as an intermediate. This will of course require Production's help and cooperation with this transition. In the future, Production will of course be expected to cooperate with them with any problems that may arise. All outside orders that we now have outstanding will be turned over to Special Systems. This does not relieve Production of their responsibility to work with them in seeing that these orders are received on time.

January 23, 1962

SUBJECT: Proposed Computer Division Procedures

TO: PDP Distribution List

FROM: Arthur Hall

Confusion has resulted from the mixture of formal and informal procedures used in implementing Change Orders, Purchase Orders and Production Orders. A comprehensive set of procedures is being set up to eliminate this confusion. The attached document lists some of the suggested procedures (some of which are being followed partially now). Any comments or suggestions for changes and additions should be sent to Arthur Hall.

COMPUTER DIVISION PROCEDURES

It is suggested that the following changes in company and Computer Division policy be adopted to govern the increasing complexity of Computer Division operations.

Computer Construction Requisitions will be written jointly by Sales and the Computer Division to insure complete agreement on terminology and customer requirements. Changes and/or additions to Construction Requisitions will also be jointly discussed before release. A written and dated copy will then be sent to the Computer Division.

From this Construction Requisition the Computer Division will order from Production the necessary wired mounting panels, mechanical parts, power supplies etc. giving the date each unit is required and listing the engineer who will be responsible for each unit. Production will reply in writing confirming (or changing) the dates and telling the Computer Division the EN #'s assigned to the ordered units. (It is neither necessary nor desirable for Production to concern themselves with the customer assignments of units.) The computer system will be given a customer identification when it reaches Checkout. Peripheral equipment will be given a customer identification when it has been attached to a customer's computer for checkout.

Changes to a unit in Production will be accepted only in written form and only from the Computer Division. (Verbal notice of changes serve only as advance warning and do not replace the formal written change.) Changes to a particular unit will refer to an EN #. Change Orders not listing an EN # will be assumed to affect all units now in Production and all to be produced in the future. Work from Production and PIUs from Sales will be expected (exactly as ordered) on the date requested unless advance written notification of a delay or change is received by the Computer Division. Any change to any computer or part of a computer must be channeled through the Computer Division regardless of origination. The originator of any

change will be fully responsible for complete follow-up of the change and for notifying persons upon whose work the change will have a peripheral effect.

The Computer Division will be responsible for initiating work orders for Production and PIU purchase orders for Sales and for insuring that mechanical, electrical and delivery date changes reach Production and Sales in sufficient time to avoid delay. Non-released, unchecked or marked-up drawings may accompany a Change Order or an original order however it remains the sole responsibility of the engineer releasing the order to supply released drawings at the earliest possible date and to replace and destroy the unreleased drawings (to avoid future confusion).

The Computer Division will keep a file on each computer. This file will contain; the customer's name, the EN #'s of the computer system and its Options and Special Features, complete drawings, parts lists and specifications of that computer (including paint #'s and samples, if available, photographs if available), copies of all work orders and change orders involving the EN #'s comprising the computer system, a list of the PIUs (and their serial #'s) and copies of all mail and telephone correspondence (including Trouble and Service Reports) following the shipping of the computer.

PIUs will be released by Sales (or the Stockroom) to the Computer Division accompanied by a detailed listing of the modules, their serial #'s and the EN #'s on which the modules were ordered. (Ideally, a copy of the Customer Order which was originally submitted to order the PIUs could be used since it already lists most of the information). PIUs will never be released to any one in the Computer Division without their signature (not initials) and the EN #'s on which the modules are drawn. Sales must keep track of the #'s and types of PIUs drawn on an EN # and insure that no more PIUs are released than have been ordered.

Production will be solely responsible for ordering and expediting all purchased parts which are part of an order from the Computer Division. Regardless of the point of origin, purchase orders for long-lead-time parts for production orders must be routed through Production. Receiving will never leave ordered material in the Computer Division without receiving a legible signature acknowledging its receipt.

Arthur H. Hall III

dec INTEROFFICE MEMORANDUM

DATE January 23, 1962

SUBJECT Meeting of Jan. 22, 1962

TO K. Olsen
M. Sandler
J. Fadiman
H. Crouse
D. Wipple
L. Butterworth
F. Gould

FROM Jack Smith

In the future all mechanical parts for Special Systems will be ordered directly from the respective shops. This will eliminate Production Control as an intermediate. Special Systems people responsible for the generation of these orders will contact Ken Fitzgerald for the necessary forms and procedure to follow. Each order will have a "wanted by" date noted. If the date cannot be met by our shop, Ken Fitzgerald will notify the responsible party. It will then become the responsibility of Special Systems to place a Purchase Requisition with Purchasing (Bob Blackwood) to have the work done outside.

Wiring Requisitions will be placed with Production for the wiring of all logic panels. Forms and procedure will be supplied by Production (Jack Smith) for this purpose. On each Requisition there will be noted a "wanted by" date. If the date cannot be met, the order will be sent outside and Special Systems will be notified of the delivery date. It will then be the responsibility of Special Systems to contact Purchasing for status of delivery.

If the above does not conform with your formulated conclusions of the meeting, please notify me as soon as possible.

MEMO TO: Ken Olsen

DATE: JANUARY 22, 1962

FROM: ELSA NEWMAN

Here is your copy of the very latest "Modules for Sale" price list. The prices are correct as of January 15, 1962. Those missing have not been released as of today. The items listed will be included in the new catalogue (to be published by March 14, 1962).

You are urged to review the 1000 series in the existing DEC catalogue and to submit any corrections you may wish to incorporate. In addition to review of the 1000 series, please review the following 4000 series:

Distributed on Ditto'd "write-ups" for Brown DEC Book	Presently written up in Official Catalogue
4202	4105
4218	4106
4303	4111
4604	4201
4667	4209
4676	4301
4677	4410
4677A	4603
	4401

Your comments and criticisms will be very helpful especially if received before Friday, January 26, 1962.

JAN 1 5 1962

DEC MODULES FOR SALE

Model #	Description	Price
51	Negative Current Driver up to 1 amp (Vacuum Tube)	$212
52	Negative Current Driver up to 1 amp (Solid State)	760
61	Positive Current Driver up to 1 amp (Vacuum Tube)	212
62	Positive Current Driver up to 1 amp (Solid State)	760
71	Current Voltage Calibrator, 0-1 amp across 1 ohm resistor or 0-1 v	500
75	Bias Panel for use with 52 and 62 Current Drivers	82
103	6 Inverters	113
110	2 Six-input Negative Diode NOR	89
201	Flip-Flop, Buffered, Set, Reset, Complement, Carry, 2 Inverters	130
302	Delay (One Shot)	147
402	Variable Clock	147
406	Crystal Clock (500 kc to 5 Mc)	140
410	Pulse Generator (Schmitt)	115
501	3 Level Standardizers,	140
602	2 Pulse Amplifiers, 2 Inverters	100
650	Tube Pulser, 10 v Out (0-1 Mc)	105
667	4 Negative Level Amplifiers, 0 to -15 v Out	120
668	3 Positive Level Amplifiers, 0 to +4 v Out	140
710	Power Supply, 10 v, 0.5 amp; 19 inch	125
722	Power Supply, +10 v, 1 amp; -3 v, 1.2 amp; -15 v, 6.5 amp; 19 inch	305
728	Power Supply, +10 v, 1 amp; -15 v, 8 amp; 17 inch	
730	Dual Variable Power Supply, 0-20 v, 2.5 amp each; 19 inch	280
734	Variable Power Supply, 0-20 v, 2.5 amp, 17 inch	215

DEC MODULES FOR SALE

Model #	Description	Price
743	Dual Power Supply, 15 v 8.5 amp each; 19 inch	$
749	Power Supply for Current Drivers 51 and 61, 19 inch	281
750	DC Power Cable for 901	3
765	Bench Power Supply for Testing DEC Modules all Voltages Variable	400
766	Power Supply for Current Drivers 52 and 62, 19 inch	510
772	Dual Power Supply, 36 v, 5 amp each; 17 inch	
801	Relay, Single Pole, Double Throw	89
901	19" Mounting Panel for 9 Laboratory Modules	100
901C	49½" Mounting Panel for 10 Classroom Modules	150
911	10 Patch Cords, 2, 4, 8, 16, 32 or 64" long	9
912	100 Taper-pin Patch Cords, 2, 4, 8, 16, 32 or 64" long	18
921	Laboratory Module Test Power Cable	10
922	System Module Test Power Cable	25
950	Assembled Blank Laboratory Module, Board not Copper Clad	9
951	Unassembled Blank Laboratory Module, Copper Clad Board	9
1000	12 Clamped Load Resistors, 1,500 ohms each	
1001	18 Clamped Load Resistors, 3,000 ohms each	
1002	18 Clamped Load Resistors, 10,000 ohms each	
1103	6 Inverters	108
1104	4 Inverters	89
1105	5 Inverters	98
1110	2 Six-input Negative Diode NOR	75
1111	2 Six-input Positive Diode NOR	75
1113	6 Two-input Positive Diode NOR	123
1115	2 Three-input and 2 Four-input Positive Diode NOR	100
1117	3 Five-input Positive Diode NOR	87
1130	3-bit Parity Circuit (OR of 4 three-input Negative Diode ANDs)	180

DEC MODULES FOR SALE

Model #	Description	Price
1150	Binary-to-Octal Decoder, Selected Output at -3 v, Others at gnd	$150
1151	Binary-to-Octal Decoder, Selected Output at gnd, Others at -3 v	150
1201	Flip-Flop, Buffered, Set, Reset, Complement, Carry, 2 Inverters	133
1204	2 Flip-Flops, Buffered, Set, Reset, Complement, 2 Inverters, No Carry	173
1209	2 Flip-Flops, Buffered, Set, Reset, 2 Inverters	168
1213	4 Flip-Flops, Shift or Read-in Gates	154
1304	Delay (One Shot)	130
1310	Tapped Delay Line up to 1 microsec	91
1311	2 Tapped Delay Lines up to 0.2 microsec	78
1404	Variable Clock	130
1406	Crystal Clock (500 kc to 5 Mc)	160
1410	Pulse Generator (Schmitt)	105
1501	3 Level Standardizers,	150
1502	6 Level Standardizers,	115
1540	Sense Amplifier for Core Memories	141
1546	Sense Amplifier for Core Memories	150
1547	DC Difference Amplifier, 0 to -10 v In, 10 mv Difference Saturates Output	180
1550	X10 AC Difference Amplifier, 20 Mc Bandwidth	400
1552	Sense Amplifier for Core Memories	105
1554	Dual Output X10 AC Difference Amplifier	400
1556	DC Slice Amplifier, 0 to -1 v In, 5 mv Difference Saturates Output	150
1561	2 Six-bit or 1 Twelve-bit Deposited Carbon, Digital-to-Analog Converter Network	133
1562	-10 v Reference Supply	140

DEC MODULES FOR SALE

Model #	Description	Price
1563	2 Eight-bit Wire Wound, Digital-to-Analog Converter Network	$180
1564	14-bit Wire Wound, Digital-to-Analog Converter Network	180
1566	BCD 3 Digits + Sign, Wire Wound, Digital-to-Analog Converter Network	200
1568	12-bit Metal Film, Digital-to-Analog Converter Network	180
1606	Pulse Amplifier with Dual Outputs, 2 Inverters, Five-input Negative Diode NOR	108
1607	3 Pulse Amplifiers, 3 Inverters	130
1608	2 Pulse Amplifiers with Dual Outputs, 2 Inverters	120
1616	Pulse Amplifier, a 1606 with 5 v, 0.5 microsec Out	108
1667	6 Negative Level Amplifiers, 0 to -15 v Out	145
1669	9 Indicator Drivers from DEC Levels	58
1671	BCD Decoder and Light Driver	96
1672	Level Converter, DEC-709/709-DEC, 2 Pair	120
1675	9 Indicator Drivers with No Input Resistors	58
1677	4 Single-ended Bridges for Driving DAC's 1561, 1563, 1564, 1566 and 1568	140
1678	3 Bus Drivers with Input Gates, -3.5 v Out into 100 ohms	120
1681	3 Power Inverters for Driving Large Loads or Co-axial Cable	80
1682	3 Bus Drivers, +6v into 75 ohms, 2-input Inverter Gate on each Driver	150
1683	Half Binary-to-Octal Decoder, +55 v Out	107
1684	4 Bus Drivers with Single Ended Bridges, -3 v Out	125
1685	4 Bus Drivers, -3 v Out, 1 microsec ramp	128
1687	3 Level Amplifiers, +6.5 v to -6.5 v Variable, 10 ma Out	

DEC MODULES FOR SALE

Model #	Description	Price
1689	DEC-to-IBM 7090 Converter, 4 Circuits, +8 v into 93 ohms	$
1703	9 Switch Filters, Converts Switch Closures to DEC Levels	30
1901	19" Mounting Panel for 25 System Modules	150
1903	19" Mounting Panel for 20 System Modules	125
1904	30" Mounting Panel for 43 System Modules	200
1905	24" Mounting Panel for 33 System Modules	175
1906	19" Patch Cord Mounting Panel for 20 System Modules	260
1907	Cover Plate for 1901 and 1903	9
1909	19" Taper-pin Mounting Panel for 25 System Modules	220
1910	19" Taper-pin Mounting Panel for 20 System Modules	185
1913	19" Mounting Panel for Type 52-62 Current Drivers	45
1914	19" Mounting Panel for 25 System Modules, Marginal Checking Switches, Chromecoat	150
1915	24" Taper-pin Mounting Panel for 33 System Modules	250
1916	17" Mounting Panel for 22 System Modules	140
1917	24" Mounting Panel for 33 System Modules, Marginal Checking Switches, Chromecoat	175
1918	19" Wire-Wrap Mounting Panel for 25 System Modules	220
1919	Power Cable from 722 Power Supply to Spad Lugs	3
1923	19" Wire-Wrap Mounting Panel for 20 System Modules	185
1950	Assembled Blank System Module, Board not Copper Clad	6.50
1951	Unassembled Blank System Module, Board Copper Clad	6.50
1954	System Module Extender	20
1955	Assembled Punched-hole System Module "Vector" Board	7
1960	System Module Puller	2
3101	6 Inverters	47
3101C	6 Inverters, Classroom Module	62

DEC MODULES FOR SALE

Model #	Description	Price
3102	6 Inverters (MIL Symbology)	$ 49
3102C	6 Inverters (MIL Symbology) Classroom Module	64
3110	2 Six-input Negative Diode NOR	43
3110C	2 Six-input Negative Diode NOR, Classroom Module	58
3112	2 Five-input OR-NOR (MIL Symbology)	55
3112C	2 Five-input OR-NOR (MIL Symbology) Classroom Module	70
3114	2 Five-input AND-NAND (MIL Symbology)	55
3114C	2 Five-input AND-NAND (MIL Symbology) Classroom Module	70
3201	Flip-Flop, Buffered, Set, Reset, Complement, Carry, 2 Inverters	63
3201C	Flip-Flop, Buffered, Set, Reset, Complement, Carry, 2 Inverters, Classroom Module	78
3203	Flip-Flop, Buffered, General Purpose (MIL Symbology)	72
3203C	Flip-Flop, Buffered, General Purpose (MIL Symbology) Classroom Module	87
3301	Delay (One Shot)	74
3301C	Delay (One Shot) Classroom Module	89
3302	Delay (One Shot) (MIL Symbology)	76
3302C	Delay (One Shot) (MIL Symbology) Classroom Module	91
3401	Variable Clock	67
3401C	Variable Clock, Classroom Module	82
3407	Crystal Clock (5 kc to 500 kc)	160
3410	Pulse Generator (Schmitt)	57
3410C	Pulse Generator (Schmitt) Classroom Module	72
3602	2 Pulse Amplifiers, 2 Inverters	65
3602C	2 Pulse Amplifiers, 2 Inverters, Classroom Module	80
4105	5 Inverters	44
4106	6 Inverters	49

DEC MODULES FOR SALE

Model #	Description	Price
4110	2 Six-input Negative Diode NOR	$ 43
4111	2 Six-input Positive Diode NOR	43
4112	6 Two-input Negative Diode NOR	68
4113	6 Two-input Positive Diode NOR	68
4114	2 Three-input and 2 Four-input Negative Diode NOR	54
4115	2 Three-input and 2 Four-input Positive Diode NOR	54
4116	3 Five-input Negative Diode NOR	47
4117	3 Five-input Positive Diode NOR	47
4125	4 Pulse Inverters each driven by 2 Negative Capacitor-Diode Gates	54
4126	6 Pulse Inverters each driving a Positive Capacitor-Diode Gate	68
4127	6 Pulse Inverters each driven by a Negative Capacitor-Diode Gate	68
4128	2 Pulse Inverters each driving 4 Positive Capacitor-Diode Gates	40
4129	2 Pulse Inverters each driven by 4 Negative Capacitor-Diode Gates	40
4139	8 Two-input Positive AND Gates OR'ed into an Inverter	33
4141	a4139 with Logic Interconnections made by Wiring between Lugs on Board	33
4150	Binary-to-Octal Decoder, selected Output at -3 v, Others at gnd	90
4151	Binary-to-Octal Decoder, selected Output at gnd, Others at -3 v	90
4152	Binary-to Octal Decoder, selected Output at -15 v, Others at gnd	90
4153	Binary-to-Octal Decoder, selected Output at gnd, Others at -15 v	90
4201	Flip-Flop, Buffered, Set, Reset, Complement, Carry, 2 Inverters	69
4202	2 Flip-Flops, Buffered, Shift Right, Shift Left, Complementing, Read-in	84

DEC MODULES FOR SALE

Model #	Description	Price
4209	2 Flip-Flops, Buffered, Set, Reset, Complement, 2 Inverters, No Carry	$ 79
4213	4 Flip-Flops, Shift or Read-in Gates	96
4214	4 Flip-Flops, Set, Reset, No Gates	96
4215	4 Flip-Flops, BCD or Binary Counting, General Purpose	90
4216	4 Flip-Flops, Shift and Read-in Gates	100
4218	4 Flip-Flops, Jam Transfer	96
4301	Delay (One Shot)	80
4303	Integrating One Shot	91
4401	Variable Clock	72
4407	Crystal Clock (5 kc to 500 kc)	160
4410	Pulse Generator (Schmitt)	59
4504	IBM 7090-to-DEC Converter, 6 Circuits, +5 v to +1.5 v In; -3 v and gnd, Out	74
4603	3 Pulse Amplifiers, 3 Inverters	89
4604	3 Pulse Amplifiers, Standardizes to 0.4 or 1.0 microsec pulse	92
4610	Pulse Amplifier, 30 v into 100 ohms	150
4667	6 Negative Level Amplifiers, up to -15 v Out	70
4676	Intensity Amplifier for Scope Display	100
4677	4 Single-ended Bridges for Driving DAC's 1561, 1563, 1564, 1566 and 1568	75
4677A	4677 with Lower Output Resistance	100
4680	3 Solenoid Drivers, -30 v, 0.5 amp Out	60
4681	3 Solenoid Drivers, -70 v, 0.5 amp Out	75
4682	3 Solenoid Drivers, +30 v, 0.1 amp Out	180
4685	8 Negative Level Amplifiers, -30 v Out	58
4686	5 Positive Level Amplifiers, up to +20 v Out	70

DEC MODULES FOR SALE

Model #	Description	Price
4688	Intensity Amplifier for Scope Display, Programmable Amplitude	$ 65
4689	9 Indicator Drivers from DEC Levels, 100 ma Out	62
5101	6 Inverters	138
5202	Flip-Flop, Buffered, Set, Reset, Complement, Carry, 2 Inverters	160
5310	Tapped Delay Line up to 0.25 microsec with Pulse Amplifier	170
5401	Variable Clock	173
5403	Crystal Clock (5 Mc to 10 Mc)	160
5602	2 Pulse Amplifiers, 2 Inverters	125
6105	5 Inverters	125
6106	6 Inverters	138
6202	Flip-Flop, Buffered, Set, Reset, Complement, Carry, 2 Inverters	160
6208	2 Flip-Flops, Buffered, Set, Reset, Complement, 2 Inverters, No Carry	230
6310	Tapped Delay Line up to 0.25 microsec	114
6311	2 Tapped Delay Lines up to 0.05 microsec	97
6401	Variable Clock	173
6403	Crystal Clock (5 Mc to 10 Mc)	160
6603	3 Pulse Amplifiers, 3 Inverters	164
	Blank Panel $5\frac{1}{4}$" x 19"	5
	Blank Panel $3\frac{1}{2}$" x 19"	3.50
	Taper-pin Crimper Tool	27.80
	Taper-pin Inserter Tool	15.80
	Taper-pin Extractor Tool	6.60

Ken Olsen

SALES CALL REPORT

DIGITAL EQUIPMENT CORPORATION · MAYNARD, MASSACHUSETTS

FIRM: Electronic Image	DATE: January 22, 1962
DIVISION:	SALESMAN: B. Stephenson
STREET: 803 Massachusetts Avenue	NATURE OF CALL: ☐ VISIT ☐ PHONE ☒ OTHER: Visit Here
CITY: Lexington / STATE: Massachusetts	

CONTACTED MR. Dr. Weinikoff	MR.
MR.	MR.
MR.	MR.

SUBJECT

REMARKS (CONTINUE ON BACK OF SHEET)

Dr. Weinikoff came out to pick up plug-in units which they had ordered and also to visit our plant and see our production facilities. The units they ordered are for prototype which they are demonstrating in the near future. If he likes this, they expect to start selling it. They expect to sell about a 1000 of them, each one involving about $5000 worth of units. This, of course, would amount to a considerable amount of money and he wonders if we would consider manufacturing these in a single package on smaller cards and so forth. I told him that we had never done such a thing in the past, but that for an order of

PROMISED

FOLLOW-UP DATE	PHONE NUMBER	AREA CODE

PERTINENT FACTS FOR LOCATING PLANT

DF 404

this size, we would certainly be willing to consider the possibility. I also explained that it would depend somewhat on our production schedule at the time and the delivery schedule they would be interest in.

cc: Ken Olsen

$\frac{8}{16} - \frac{3}{16} = \frac{5}{16} + 1 - \frac{7}{16}$

dec INTEROFFICE MEMORANDUM

DATE January 22, 1962

SUBJECT PIU Mounting Panels

TO Bob Hughes
Ken Olsen
Maynard Sandler
S. Olsen

FROM B. Gurley

In the course of a phone call from Tom Stockebrand of Lincoln Laboratory, he mentioned that they had received some bad mounting panels. I don't remember the exact details, but of 10 or 12 units, 4 or 5 were bad. Several had upside-down connectors, some were parallelograms, and one or two had incorrect wiring to the MC switches. I believe there were one or two other flaws which I don't recall.

dec INTEROFFICE MEMORANDUM

DATE January 15, 1962

SUBJECT **WORKMANSHIP AND QUALITY CONTROL MANUALS**

TO Bob Hughes, Chief
Quality Control Division

FROM Elsa Newman

I am in need of a draft of policy for your new division which could be incorporated in the Quality Control Manual that we are working on.

Is there someone in your division who is working on the standards for both Quality Control and Workmanship and specific requirements for those parts that we use (Standards Manual)? In attempting to coordinate these three books, it is necessary for me to know where I can get the raw material. I have seen the list of components which is presently being prepared in Production, but I am afraid that I will not be able to use this list for another three months. I have asked that it be reviewed in part, that is, a few pages at a time. I was told that this would not be possible. At the present time there are 59 hand-written drafts prepared by Cathy (Maynard's secretary). I estimate this has taken her approximately two months. At this rate it will be two more months before the pencilled drafts are written. It is then proposed that this draft will be reviewed for accuracy and completeness. I can't see anybody waiting to review 170 pages of pencilled draft, and I hope nobody does.

I would like to meet with you or whomever else in your department is responsible for the Workmanship Manual and Quality Control Manual procedures, so that we could actually approve a final draft of at least four or five pages, which could be printed by Jack and issued as part of a manual. This would do two things. This would definitely establish the existence of a manual for DEC and encourage the completion of additional pages which would be incorporated later. (not too much later, either)

I see no reason why we have to wait until a whole book is ready when we are dealing daily with only parts of it. If we could do Silk Screening or Module Assembly or Wiring Techniques or some particular phase of DEC, we would be making progress. It is a shame that we cannot get a few pages done and the book issued before the inevitable rush which Jack will have when the IRE pressures begin.

To summarize:

1. We must finish 4-5 pages and issue a Workmanship Manual in the white binders which Jack now has and in accordance with instructions from K. Olsen (Nov. 10).

2. Tomorrow is not too soon for the meeting I request.

Copies to: K. Olsen, B. Stephenson

COMPUTER PLANNING REVIEW COMMITTEE

Meeting of January 11, 1962

Present: Ken Olsen, Harlan Anderson, Stan Olsen, Dick Best, Ben Gurley, Ed Harwood, Jim Myers, Jack Smith, Maynard Maynard Sandler.

Jack Smith reported on status of major components for computer orders:

MEMORY STACKS

	Required	Available	Status
Jan.	13	13	--
Feb.	7	--	-7
March	3	9	-1
April	2	--	-3
May	2	--	-5

Note: Available means on hand and promised vendor delivery.

Decided to order 12 stacks from Ferroxcube to be delivered starting in February and will review status February 1st.

READERS

	Required	Available	Status
Jan.	6	9	+3
Feb.	2	2	+3
March	3	2	+2
April	2	--	--
May	2	--	-2

At least 3 spares are required in addition.
Decided to order 10 Readers for delivery starting in February.
Henry Crouse to investigate delivery and price status.

PUNCHES

	Required	Available	Status
Jan.	6	6	--
Feb.	2	3	+1
March	3	8	+6
April	2	--	+4
May	2	--	+2

Spares are need here too.
Decided to order 20 Punches, delivery starting in March at the rate of 5 per month.
Henry Crouse to investigate delivery status and quantity discount levels.

SOROBAN TYPERWRITERS

	Required	Available	Status
Jan.	6	(on order	-6
Feb.	2	-11---No	-8
March	3	firm del.	-11
April	2	promise.	-13
May	2		-15

Decided to order 20, delivery to starting March at the rate of 5 per month.
Henry Crouse to press for delivery information.

Jack Smith reported that he has set up Donnelly to do more work on cabinets.

Ben Gurley showed scheduled need for modules and distributed copies of these scheduled needs.

Decided on further meeting to discuss sequence.

Short discussion of needs and limitations for increasing module production.

dec INTEROFFICE MEMORANDUM

DATE January 5, 1962

SUBJECT Japanese Business

TO Ken Olsen
Harlan Anderson
Stan Olsen
Jon Fadiman

FROM R. Mills

This morning Stan and I went down to the Foxboro Company to see Charles Schwarzler, Vice-President - Marketing, in order to obtain some first hand information about doing business with the Japanese. Charlie has had nine trips to Japan and served on a Presidential Commission with six other members to study United States Business in Japan. He is a man well versed in international matters and his interest is deep enough to encompass not only the traditional concepts but the economic and cultural aspects as well. We spent most of the morning with him and following is a summation of the result:

People:

General

The Japanese people like to live by rules and like to have everything defined specifically. Their first agreement had several areas which were left purposely general and the Japanese did not rest until these general areas were made very specific. If the government tells a business that they should do a certain thing, this thing is done unquestionably with the government obviously the supreme voice. He had found them easy to do business with and much easier than Europeans. His comment about the British is worth noting - once an agreement is written with the British, they then go off and try to find some way in which they can do the absolute minimum thing to come within the meaning of the contract, on the otherhand, the Japanese accept the agreement at face value, meaning the tenor, and until a specific statement is changed by an agreement, they will not try to circumvent it. Charlie attributes this to their love of rules and the fact that the Ministry of International Trade is an absolute power in Japan and governs everything that goes into a contract. The impression he left with us was, that the Ministry of International Trade is trying at all times to foster fair agreements and to create a good image of Japan.

Social:

1. Laughter:

Loud laughter is disliked very much by the Japanese. Women do not count for very much in Japan and hence they are allowed to laugh and giggle at all times, with no apparent affect.

(social continued)

2. Seating:

It is especially important for an American to watch this since he is supposed to sit in a very strict protocol code.

3. Parties:

It is very poor taste for an American to refuse to go to a party or out for an evening with the Japanese since all entertainment expenses are fully deductible in Japan this may very well prohibit several Japanese from enjoying themselves at the expense of the company and Government and the guest is merely the vehicle of accomplishing this. Charlie emphasized that this would be a very serious affront. The saving grace here is, that the parties always have Geisha girls who are nothing more than hired entertainment and go home at ten o,clock with the party being over very shortly thereafter, usually within fifteen minutes, so that it is quite easy to get to bed by eleven or twelve o,clock of an evening.

4. Conferences:

If a group in a room are enjoying a joke, and all Japanese enjoy humor on about the eighth grade level, and another man comes into the room, all enjoyment stops, the conversation goes back to the very beginning to build up the entire story so that the man joining the group does not feel that he was the source of the enjoyment. It sounds extremely sensitive, but apparently very important.

5. Traveling:

Air travel recommended and only by Japanese Airlines as they give the shortest route and the best service. Always arrive at the destination, in this case Tokyo, in the afternoon or early evening as you will be met by the Japanese and expected to go on to business discussions at a time when you would be quite tired from traveling. Their habit is to have an itinerary all laid out and only after close association may the American make a recommendation that the itinerary be changed. He recommends taking approximately $800.00 in cash with a letter of credit through a Tokyo bank for $2000. available. The Imperial Hotel is highly recommended as it has two sections, one old and one new. He prefers the old, and it is centrally located. Do not rent a car as taxis are cheap, a ride costing 70,80, or 90 yen being scaled according to the size of the car. Do not drink water or eat uncooked greens as these are sources of bacteria problems. At all times eat what is offered and he recommends a person having a "strong stomach", as you are apt to be eating grasshoppers and many other so called exotic items. He recommends a one day stay-over in Honolulu for rest with a few days on the beach.

Passport and Visa: He recommends that a passport be obtained and a Business Multiple Entry Visa, so that you can go in and go out with no trouble for two years.

Business:

1. Trading Companies:

He says that even now he has great difficulty and sometimes absolutely cannot palce in perspective the function of the Trading Company. These are sometimes owned by the company you are doing business with or business is funneled to the Trading company through one of the members of the Trading company sitting on the Board of Directors of the customer. They serve a useful function in many instances such as translating services, which he states are almost impossible to obtain in the Boston area, since the language is so difficult and the possibility of finding a technically minded Japanese is next to impossible. They also provide translators to accompany the American on his rounds of Japanese companies, this is a must and here it is important to note that the transltor is usually seated way at the end of the table from the American and about the only way Charlie has been able to get the translator near him is to say that he is hard of hearing and upon that they let him move closer. He states here that their courtesy, which is a tradition, means nothing to them analogous to kicking someone in the shin as you walk by and then saying excuse me and then when you get half way along say to yourself, " Oh, I kicked that man in the shins ". A sort of inbred reflex with little serious meaning.

2. Ministry of International Trade:

Nothing will be accomplished by the American company until they have a working relationship with the Ministry of International Trade. A relationship is developed only upon a call from the Japanese company that they are interested in the American company. Since they regulate everything that goes into an agreement this seems quite basic.

3. Prices of Products:

They have an agreement with the Japanese that the prices of their products will be FOB Foxboro and this is the one point that they allow considerable latitude to the Japanese since the obvious inference here was that the Japanese charge higher prices than Foxboro and they let them get away with it. How much higher, he didn't say. His justification for this was that they are required to maintain inventories and service the equipment.

4. Market Potential:

They estimated that they would have a $1,000,000. market in Japan and underestimated it by a factor of 5, he felt that this was rather traditional and should be kept in mind when making out the contract or agreement, since they would have written theirs quite differently if they had known that they were going to do so much business. I have some direct knowledge of this, since the Japanese upon seeing that the volume was going to be over a million, started agitating for a lower royalty payment. A scale of payments would have handled this quite well.

5. Technical Skill:

One of the biggest mistakes that American companies make is underestimating the technical skill of the Japanese. He feels that the Japanese are far more thorough with their investigations of possible ways of building, checking, and operating equipment, including use of different materials, than we are. The Japanese have constantly embarrassed Foxboro engineers with their very thorough analysis of Foxboro products with their (the Japanese) ending up knowing more about Foxboro equipment, than Foxboro engineers. He feels that they could copy and improve any piece of equipment mechanical or electrical.

6. Patents:

If a piece of American equipment is patented in Japan the Japanese will not copy it! Patents are very easy to obtain and the Japanese feel that since they make it so easy to obtain patents, if an American company does not do it, that American company is not interested in having an exclusive.

Proposed Procedure for DEC:

1. Who to go?

That Stan Olsen obtain a Passport and Visa immediately for a departure date of approximately the 19th of January.

2. Length of Trip:

Leave U.S. approximately January 19th, for arrival in Tokyo on the 18th with no stop-over in Honolulu on the way over, but with a stop on the way back to rest. This will give the 19th and a half day Saturday, all plants are open on Saturday, through the 26th, arriving back at DEC on the 29th or 30th of January. Jon Fadiman to go to Japan February 10th, to make the rounds of prospective customers on a technical basis for one week; to arrive back at DEC on the 19th of February.

3. Financial Arrangements:

Let each man take $800.00 in cash and we arrange with the National Shawmut Bank of Boston, whose correspondent in Tokyo is the Bank of Tokyo, a letter of credit for each man in the amount of $2000.00.

4. Prospective Customers:

I have been able to obtain from the Department of Commerce in Boston, the full Japanese addresses of the following companies:

Hitachi Ltd.
Central Research Laboratory
Tozuka Electronics Plant

(Hitachi Ltd. cont.)

New Marunouchi Bldg.
12 Marunouchi 2 - Chome
Chiyoda - Ku, Tokyo, Japan

Mitsubishi Electric Mfg. Co. (TV & radio)
3-2 Marunouchi, Chiyoda - Ku
Tokyo, Japan

Fuji Communication Apparatus Mfg. Co.
3-2 Marunouchi, Chiyoda - Ku
Tokyo, Japan

Tokyo Shiboura Electric Co. Ltd.
2 Ginza Higashi 5-Chome Chuo-Ku
Tokyo, Japan

Tokyo, Denki, Kagakii Electronics (Mfrs. of Mag. cores)
123 Kanda Naka Machi Chi yoda - Ku
Tokyo, Japan

Tohoku Metal Industries Co. Ltd. (Mfrs. cores.)
10 Suwa Wakiminami, Koriyama
Sendai - (Miyagi, Japan)

5. Department of Commerce at U.S. Consulate, Tokyo:

It was recommended that we first spend 3 or 4 days at the Department of Commerce in Tokyo and gave us the name of the man he worked through, Mr. Oliver Bongard, who is in charge of trade development in Japan. He gave them an extremely high recommendation. He recommended that we arrange our itineraries with Japanese companies after we arrive in Japan and simply mention in our letters to our prospective customers, that our representative was going to be in Japan and would be in contact with them to determine their interest in our products. He did not recommend that we send a copy of this letter to a Trading Co. since they are quite agressive and would take over the trip and slow down the process substantially.

Summary

It is extremely important that the man going to Japan be on a high level in the Company and that his authority be made explicit and extremely clear to the Japanese, in order that they will honor his commitments. He cited his own case of going to Japan himself, and the next person that went was the Executive Vice President, they accepted him and did not accept Charlie after that; the next person that went was Ben Bristol, the President, they accepted him and did not accept Rex Bristol or Charlie Schwarzler after that. It was necessary that letters be written to explain in clear concise terms the express authority of each one of these people to negotiate, before the Japanese would do anything

further. The pattern evolving from all this, seems quite clear, in that the Japanese appreciate straight forward bargaining, honor agreements and contracts primarily because of the Ministry of Trade's regulations, like to live by rules with everything spelled out quite clearly, will not copy if the item is patented, have a high degree of technical skill, have a growing economy and if notified bdforehand of the schedule of the American, they will not be offended if you get up and leave a conference at a given time. They do not like to have their plans upset due to a strong sense of orderliness and above all do any negotiating in a 1,2,3, basis like you would for an eight year old.

National Shawmut Bank of Boston:

I contacted Linc Barber at the Shawmut before going down to Foxboro, and find that the use of the Irrevocable Letter of Credit, since the amount is charged to the Japanese customers account before the letter is issued, is the usual way of doing business and would not in any way create any bad feeling on the part of the Japanese. He also said that transfers of funds between DEC and Tikyo could be made in a matter of two or three hours. Their correspondent bank is the Bank of Tokyo and most of their Japanese experience has been of a mechanical transfer of funds nature and not of a bargaining or negotiating type.

# # # #

dec INTEROFFICE MEMORANDUM

DATE January 9, 1962

SUBJECT Anelex Printers

TO Harlan Anderson FROM Arthur Hall

Re your request of this afternoon:

Anelex is sending us, on a RUSH basis, six copies of their drawings of all their standard characters. We have here an index giving a description (but not a representation) of all their characters if you need it for reference.

I got from IBM a description of the Fortran characters and the punched card holes they represent. The only character not found on a standard typewriter is a lozenge ⌑ . All these characters are standard with Anelex.

Any change in the print roll from the DEC configuration (Printer #2) will cost $1,550 (plus $30 per character for any non-standard character) regardless of the extent of the change. This is in addition to the price of the printer and does not affect the quantity discount on our order.

Separate print rolls may be ordered for $1,290 and installed in the field in 4-5 hours under ideal conditions. If the separate print roll is different in any respect from previously ordered rolls, the charge is $1,290 plus $1,550 plus $30 per new character.

I will distribute the Anelex character sets when they come.

Arthur Hall

cc: Ken Olsen
Anelex File

dec INTEROFFICE MEMORANDUM

DATE January 19, 1962

SUBJECT Modifications of ADX-0

TO K. Olsen
H. Anderson
G. Bell
R. Boisvert
B. Gurley
E. Harwood
B. Hughes
L. Prentice
B. Reed
J. Smith

FROM Nick Mazzarese

The following is a list of tasks to be performed on ADX-0; the work will be performed by the individuals indicated:

Retrofit Items Listed on Purchase Order from I.T.T.:

1 - ILU Group

1 - OLU Group

1 - TU type 50

1 - type 12

1 - type 12 (not to be installed until notified by I.T.T.)

1 - type 15 Mod

2 - Group of 16SBS

Retrofitting we will do by February 15

ROLAND BOISVERT

1. 3 Type 50 TU (New Style)
2. 1 Type 52 TCU (New Style)
3. Repaint white plate on transport

ED HARWOOD

1. 1 ILU Group
2. 1 OLU Group
3. 2 type 12
4. 1 -type 15 Mem. Switch
5. 2 -SBS Expansion

ED HARWOOD CONTINUED

6. Replace time relay in Power Control (C.P.)
7. Update Punch Power Control
8. Redo Power Wiring, dress it up
9. Support 2W Resistors
10. Clean up memory
11. Marginal checking

LOREN PRENTICE

1. Operator Control Panel (Rework existing); Include Mem. 15 mod.
2. Long Doors; all Blue
3. Holes in bottom of cabinet (MF & LU)
4. Add Door Stops
5. Fix Plenum Doors
6. Add air seals
7. New connectors for TCU cables
8. Remount Line Unit Connector Panel
9. TU Racked Together
10. End Panel Color - white
11. Rework damaged end panel
12. TU's in new frames
13. Replace trim strip
14. Build Crates - CP, LU, tapes, etc.
15. Beef up bottom pans
16. Put on all casters

WILLIAM NEWELL

1. Check all in-out gear

JACK SMITH

1. Memory Cabinet painted to match main frame
2. Line Unit will use doors of M.F. for its rear doors.

BOB HUGHES

1. Inspection
2. Temp. test

dec INTEROFFICE MEMORANDUM

DATE 18 January 1962

SUBJECT Price of Retrofit Jump Field and Hi Speed Channel Connection for ADX Series

TO

K. Olsen
H. Anderson
S. Olsen
G. Bell
B. Gurley
D. Mills

FROM Nick Mazzarese

The following selling price has been quoted to I.T.T. for a 4th Hi Speed Channel Connection.

1. Price of 4th Hi Speed Channel Connection

a. Production Prices

1-1105, 1-4603, and 3-4127. Price	$ 489
Installation	50
Total	$ 539

b. Prototype Design Modification

Engineer	$ 200
Technician and Drafting	800
Total	$ 1,000

Selling Price: $2,500

2. The following selling prices have been quoted to I.T.T. for modification of Memory Field Control Type 14 to Memory Field Control Type 15.

a. Installation time

Two days are required to install this feature if the computer is available 24 hours a day; optionally, it can be installed in five, 8-hour days.

The basic price of $10,000 for the Memory Field Control remains unchanged.

For machines to be retrofitted at DEC in Maynard, an additional $2,800 will be charged (for example, ADX-0). For machines to be retrofitted at Paramus (for example, ADX-1), an additional $3,100 will be charged.

dec INTEROFFICE MEMORANDUM

DATE 18 January 1962

SUBJECT 50 cps Input Power Option for I.T.T.

TO K. Olsen
H. Anderson
S. Olsen
B. Gurley
D. Mills

FROM Nick Mazzarese

An option has been offered to I.T.T. which will allow the operation of our standard PDP-1 machine on 50 cycle input power. It is assumed that the source of power will be 50 cycles at 117 volts using a two or three wire system. In applications where only 220 volts is available, it is recommended that a 220 to 110 volt stepdown transformer be provided. It is not our intention to provide this to our customers; however, it should be recommended that electrostatic shielding be used on the stepdown transformer.

A price breakdown has been made on a sub unit basis and is presented in what follows.

1. Central Processor

a.	729 Power Supply Modification 12 units at $75 each	$ 900
b.	735 Power Supply Modification 1 unit at $150 each	150
c.	Reader 1 unit at $375 each	375
d.	Punch 1 unit at $63 each	63
e.	Typewriter No change in price	---
f.	Drafting Technician One man for two weeks	800
	Total	$2,288

Selling Price: $3,500

2. Tape Unit

Power Supply Modification	$ 75
Parts obtained from Potter Instruments	750
Installation	300
Total	$1,125

Selling Price: $1,000

3. Tape Control 52

Power Supplies	$ 300
Installation	200
Total	$ 500

Selling Price: $500

4. Line Units (Group of 8)

Cost	$ 75

Selling Price: $100

5. Memory Tape 12

Power Supplies Total	$ 150

Selling Price: $200

Copy for Stan Olsen
Ken Olsen

BI MONTHLY PROGRESS REPORT

Elsa - Jan 3, 1962

From: Elsa (Technical Editor - FF A
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Two months with DEC is like four months anywhere else. Even with Thanksgiving, Open House, Christmas Party, Christmas Day and New Years to break up the continuity of orientation, work goes on somehow. I was assigned the editing of our popular Logic Handbook less than two weeks after my first day. At that time I was already immersed in the rather thick sales catalogue and was trying to materialize a status list of several categories of modules - "with or without adequate literature, some or none, etc." I worked through Dick's "Book", but soon found all kinds of other interesting information to classify like "proposed" items or "under construction". There seemed no end of items as they were juggled from one category to another. Other uses for the list evolved and Barbara (who wanted a description of each item) gave it her blessing as two AID girls typed. We must now issue an addendum to the 28 page memo circulated about December 5th. 386 items had been reviewed and classified for sales purposes. I made many notes on my Index to DEC's Active Schematics and I was learning about DEC modules. But, I had to work on the Logic Handbook at home. Bob Beckman's proposed 4th edition was my text book. Barbara checked my progress from time to time. As I learned more about digital logic, two needs became apparent; one to revise the present Logic Book rather than issue a new book. If time permits both might be published.

On December 1st I was present at a conference preliminary to the preparation of a combination DEC Workmanship Manual and Quality Control Manual. After several days probing and review of present QC Manual a compendium of typed sheets was stapled and entitled DEC Workmanship Manual. On December 12th copies were given to Ken Olsen, George Gerelds, Bob Hughes and Ben Gurley. Jack Atwood now has covers and I am trying to coordinate efforts to the end that at least one chapter (Silk Screening or Wiring) and be issued now.

Between December 12th and Christmas (after fixing tree, etc, etc.) the scope of the revision of the Logic Book has been jelling. Several pages have been written and a memo to Stan suggesting a questionnaire. Minor assignments were completed and a never ending study of competitor's catalogues, Workmanship Manuals, Standards Manuals, Quality Assurance Procedures, Administrative and Sales Policies is ever under way. I have suggestions for the format of a DEC Quality Control Manual and Procurement Control. I hope that when the pressure is off the sales catalogue, I will be allowed to help with a DEC Policy and Procedures Manual and set up its distribution. I'd like to keep the quadruple flip flop working on all "fours".

We need a standardized clerical manual too!