INTEROFFICE MEMORANDUM

DATE July 29, 1966

SUBJECT Status of Contributions as of July 3, 1966

TO Ken Olsen
Harry Mann
Stan Olsen
Win Hindle
Nick Mazzarese
P. Greene
M. Ford
J. Jones
M. Ruderman
B. Garvin

FROM R. Dill

The I. R. S. Statutes grant corporations a tax deduction to the extent of 5% of taxable income. If a corporation has contributions in a given year in excess of 5%, the excess over 5% may be carried over for 5 years, however, the current years contributions must be considered first then the prior year's carry forward is eligible.

The following table shows the amounts of contribution carry forward and the year by which it must be used:

Fiscal Year of Contribution	Amount of Excess Carry Forward	Carry Forward must be used by---	Amount of Before Tax Income DEC must have in Addition to Current Year
1964	$ 78,214	1969	$ 1,564,300
1965	244,734	1970	4,894,700
1966	248,256	1971	4,965,000
	$ 571,204		$ 11,424,000

Since 1964 DEC has had a carry forward every year and if this continues DEC will eventually lose its carry forward.

Our current status is such that if DEC did not make any contributions over the next 3 years, at the same rate of profit as in fiscal 1966, we would be able to take full advantage of our contributions through July 3, 1966. Stated still another way, it will take $67,200,000 in sales at our current before tax rate to generate enough profit to take advantage of our existing contributions. At the current rate of taxes (i.e. 48% for corporations) the actual tax dollar loss would amount to $274,175.

RFD/clw

INTEROFFICE MEMORANDUM

DATE July 28, 1966

SUBJECT: Capital Equipment

TO: Stan Olsen
Nick Mazzarese
Win Hindle
CC: Ken Olsen ✓

FROM: Harry S. Mann

At our last meeting on capital equipment budgeting, Nick Mazzarese asked if we could establish some sort of goal.

In response to this, I have studied the performance of electronic and office machinery companies. It seems to me that the best measure to start with is annual sales dollars for each dollar of assets being used in the business. A good target for us is $1.90 of annual sales for each dollar of assets employed. In 1963 and 1964 our performance on this basis was $1.91 and $2.03. In 1965 it chopped to $1.39 and in 1966 increased to $1.51. Although I didn't develop the goal using past DEC performance, it is clear that we have achieved it in the past and hopefully can do so in the future.

Using a sales goal for 1967 of $39,000,000 the assets employed would be set at $20,500,000. Accounts receivable, cash and other assets would require approximately $7,500,000 of this total leaving $13,000,000 for inventories and capital equipment. The latter includes equipment we lease to customers, leasehold improvements and machinery and equipment.

As of the end of fiscal 1966 inventories totaled $7,034,000 and capital equipment $1,612,000 or a total of $8,648,000. If we assume a proportionate increase in each of these amounts, capital equipment could increase to $2,400,000 and inventories to $10,[illegible]00,000. Depreciation and amortization during 1967 will be approximately $500,000. Adding this figure to the increase in net value ($2,400,000 - $1,612,000) we arrive at a target of $1,288,000 for the amount of additions we can support in fiscal 1967 for capital equipment, leasehold improvements and equipment on rental to customers.

These figures include the foreign operations as well as Maynard and are only valid if we meet our budgeted sales of $39,000,000. At our meeting on Friday, July we can discuss this further.

HSM/clw

CONFIDENTIAL

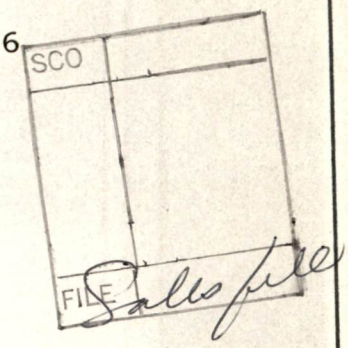
dec INTEROFFICE MEMORANDUM

DATE July 28, 1966

SUBJECT Space

TO Harry Mann
Nick Mazzarese
Stan Olsen
Win Hindle

FROM Ted Johnson



I am primarily interested in several space objectives:

1. Get communications and "sales administration" physically together.
2. Separating T. Mc Inerney's area from Tech. Pubs. to some degree and getting his group close to the literature storage area, and possibly the exhibit storage area (although that is much less key).
3. Being as close as possible myself to the people I need to work with (marketing, product line managers, and personnel) I can make do with distance to personnel and accounting.
4. Having an area that will push sales to the forefront for visitors, instead of being too tucked away.
5. Possibly being closer to field service, although this is not so critical.
6. Having the Northeast Office set up quite well in space and quality of quarters, with proximity to a good entrance/exit for customers and ease of coming and going.
7. Reasonably comfortable quarters (air conditioning), to attract good secretaries, general comfort and image for interviewees and visitors, including quiet conference room and work areas.

I might as well indicate my ideas for optimization, although I recognize it's a general problem.

1. Move the Sales Floor to Bldg. 5, either where accounting is or where purchasing is now.
2. Move accounting to Bldg. 12 as an administrative area. Why couldn't personnel go there as well.
3. Put programming on the top two floors of Bldg. 12, with the computer on the top floor, making that the demo area (machines of all types, and really jazzing it up). Then the area would be more or less accessible to both marketing and programming. Also, it gets the noise away from the first floor. Is there any reason why the tab room and EDP area couln't be up there as well??
4. Centralize Sales Administration (I suppose there is also an argument for having sales administration close to accounting and

shipping.

If the above doesn't click, then I argue that I gain little by a move to the 3rd floor, Bldg. 12. I also doubt if it can be air conditioned very well. How about moving sales to the 1st floor. Perhaps accounting could still go to the 2nd floor and programming on the 3rd, with a demo area made in the corridor area close to training. That would be very convenient for the programmers (up a small ramp and down the corridor) and be convenient and conspicuous, which I think the demo and program library areas should be.

Other ideas

It seems to me that we are misusing the top floor of Bldg. 5. If we had one long floor set up with serially progressing computer products, with offices along one side and feed-in stations along the side, the effect would be most impressive. As it is, I think the floor is a mess.

I also suggest we increase janitorial service (floor sweeping) during the day, to encourage more tidy habits. I can't believe we aren't paying dearly for the sloppiness of some checkout and engineering areas.

I am strongly in agreement with Larry Portner on the need to make our programming area look like we really have something. He is, to my great pleasure, taking the program library seriously.

TJ/jss

dec INTEROFFICE MEMORANDUM

DATE July 28, 1966

SUBJECT Technicon

TO Ken Olsen
Stan Olsen
Win Hindle
Nick Mazzarese
Mike Ford
Ron Smart
Dave Denniston
Rick Merrill

FROM Mort Ruderman

Rick Merrill and I visited with Technicon's Mr. Al Brooks, their consultant Dr. Flores from Steves College, and spent a short time with their president, Mr. Whitehead. Reasons for the meeting were as follows: to get Rick Merrill more familiar with blood analyzers, since we have many customers inquiring of us as to the use of PDP-8's in this application, and to have Rick Merrill meet the people at Technicon to work rather closely with them in the next few months for programming support.

Technicon holds two User Symposiums annually which are held this year on October 17, 18, and 19 in New York City, and November 2, 3, and 4, in Paris. They have three thousand attendees at each of these symposiums of their existing customers. This is a fairly high level seminar with papers being given by both their users and technical people within Technicon. Technicon runs the whole show in that they house, feed, and entertain the entire group of attendees. Last year when they announced their multianalyzer at each of these symposiums, they took a dozen orders right there, on the spot. We are planning to have an operating PDP-8 hooked to a number of autoanalyzers processing the data and outputting the results. This is a fantastic opportunity for DEC to be able to participate in this symposium. The charge to us will be to support them, and seeing that the system is there and operating throughout the symposium.

I am suggesting that Rick Merrill, between now and October, have as his first priority, support to Technicon to

1. Become most familiar with the application, and
2. See that we do attend both of these symposiums with an operating system.

As you can see, this has great advantage to us, other than just assisting Technicon, and the possibility of selling Technicon many PDP-8's and 8/S's as an OEM, but if we should lose Technicon, then we have had exposure to all of their customers. This is a market similar to pulse height analyzers, and typesetting, however, I feel it is more straight forward and will require minimum support and effort. What we will try to do is get a 6 channel analyzer on-line to the PDP-8 with 2 other single channel autoanalyzers. These analyzers put out six 60 peaks per hour, per channel, and the two single channels put out 20 peaks per hour. They will fix it up so that we will only have to detect peaks and print out percentage concentration with a preformatted procedure. Attached is the Technicon summary of our meeting on July 22, 1966.

Rick Merrill is to have an answer by July 30, 1966 as to the effort needed to have an operating program for both symposiums, and what additional support he will need.

Technicon is hiring a programmer as soon as possible, and there is a possibility that they will have a full time programmer with some PDP-8 experience within the next two weeks. We are suggesting that this programmer come to DEC under Rick Merrill's supervision to get the coding for the symposium written, debugged, and operating, and also, in the same manner, become knowledgeable with the PDP-8.

In this manner, it looks like if we give them full support for the symposium, we can ace out any competition. First of all, no one else has delivered them a machine or can offer them the support capability in such a short time. It is my estimation that for the program that we want to operate at the symposium, there is sufficient time to do this.

The hardware that will be needed will be the 139 multiplexer and a high-speed paper tape reader, and a second teletypewriter onto their PDP-8. If you have any questions, I would appreciate hearing from you as soon as possible, because I intend to go ahead with this immediately.

Mort

MER/sb

technicon INSTRUMENTS CORPORATION
AutoAnalyzer®
ARDSLEY (CHAUNCEY) NEW YORK
Telephone: 914-693-1000 10502

JUL 26 1966

July 25, 1966

Mr. Morton E. Ruderman
Manager, Biomedical Marketing
Digital Equipment Corporation
Maynard, Mass. 01754

Dear Mr. Ruderman:

Mr. Brooks is away this week but has asked me to forward a copy of the enclosed report to you.

Very truly yours,

TECHNICON INSTRUMENTS CORPORATION

Gloria D. Cubbin

Gloria D. Cubbin
(Secretary)

GDC:gdc

Encl - Visitor Report

VISITOR REPORT

DATE: 22 July 1966 - 9:30 A.M. to 1:45 P.M.

PLACE: Technicon

PERSONS ATTENDING

Technicon	Digital Equipment Corp.
E.C. Whitehead (part time)	R. Merrill
Dr. I. Flores	M. Ruderman
A. Brooks	

It was agreed that an effort should be made to have a system in operation at the Technicon symposium this October. Further, the programming should be done from the point of view of producing a good demonstration and not the final software package for our system.

DEC is determining the extent to which they can supply help for programming for the Technicon Symposium in October. There are two possibilities which should be provided for:

1. Technicon will be able to provide a programmer with little or no experience on the PDP-8 and little information about AutoAnalyzers and he is available in 2-3 weeks.
2. Technicon, though continuing to search for a programmer, does not have one available as in (1).

The proposed AutoAnalyzer configuration for the demonstration system is as follows:

1. A survey Multi-12
2. Simultaneous electrolyte analyzer (Na, K, Cl, CO_2).
3. Simultaneous BUN GLU autoanalyzer
4. PBI analyzer

The Multi-12 will produce analog data directly in concentration units as 0 to 10V signal. Digital signals available are a contact closure to signal specimen completed and a contact closure to signal determination completed. The computer will monitor for noise, slope (and alarm when out of phaseness is detected) and results falling out of practical limits, and prepare a tabulation of these results with any suspect of results properly flagged.

The single channel (peak producing) autoanalyzers will be fitted with tapped, linearized retransmitting slidewires. In addition, zero set and calibration pots will be included so that crude calibration can be performed. The analog signals available will therefore be concentration functions and the computer need only be programmed (for purposes of the demonstration) to do peak picking.

Since GLU, BUN and electrolyte testing is performed on a single sample, the results of these determinations should be organized into one tabulation. AutoAnalyzer delays for each of these tests may have to be specified at a later date.

As soon as possible, Technicon's Programmer should be made available to work with Mr. Merrill for a period of time at DEC. Additionally, DEC is to provide a one-week training course in programming the PDP-8 computer for Messrs. John Grady and Al Brooks of Technicon, - dates of these training courses to be determined.

There was some discussion on the PDP-8S and it was agreed that this machine may have the capability of serving smaller AA installations.

Mr. Ruderman is to contact Mr. Whitehead in a few days to arrange for his visit on Friday, July 29.

Al Brooks

AB:gdc

DISTRIBUTION

E.C. Weiskopf
E.C. Whitehead
Dr. I. Flores
Dr. N. Gochman
J. Grady
M. Pelavin
G. Rowe
G. Rubin

DEC
R. Merrill
M. Ruderman

dec INTEROFFICE MEMORANDUM

DATE July 28, 1966

SUBJECT Data Technology, Inc.

TO Ken Olsen
Stan Olsen

FROM Ted Johnson

Tom Quinn has asked that we look into DTI. This 5 or 6 year old company in the Sunnyvale (Bay) area is approximately 100 employees, and is primarily a manufacturer of modules. As of a year or so, they are owned by Fairchild and use their circuits.

It would be useful to know their prices (what a component vendor has to charge for functional modules).

Sy Sterling represents them. I have a brochure and will ask Sy for a price list. Perhaps Saul can have someone analyze the price and performance on a markup and a DEC comparison basis.

TJ/jss

dec INTEROFFICE MEMORANDUM

DATE July 28, 1966

SUBJECT Computer Software

TO K. Olsen ✓
H. Mann
N. Mazzarese
J. Jones
M. Ford
H. Crouse
E. Havey
M. Ruderman
D. Grill
L. Portner
J. Shields
E. Havey
S. Dinman
A. Alexanian
H. Shepherd
R. Richardson
E. Harwood
D. White

FROM Ilse Peters - Program Library

WE ARE OUT OF PAPER TAPE.

This means that we no longer can supply any software with machines being shipped.

We cannot make up any tapes for customers or in-house use.

Our need is 6 cartons per week - and we expect this to increase when the new machines will be shipped.

INTEROFFICE MEMORANDUM

DATE July 26, 1966

SUBJECT Down to the Sea in Ships (Lamont Observatory)

TO Nick Mazzarese FROM Mike Ford

cc: Ken Olsen ✓

The following is a report on the status of the Lamont Observatory project:

1. Lamont was upset because they had not received the support in programming that they expected, and because their PDP-8 was several weeks late in arrival. These failures endangered Lamont's plan of evaluating the PDP-8 as a position calculator in their Transit Satellite Navigation research, because of the imminent departure of the experimental ship. They are now reasonably happy. The details are as follows:

   a. It has now been clearly established that their machine was held up because the Columbia University purchasing department was slow in processing the order and sending along to us.

   b. They now have their machine. (We still do not have their paperwork!)

   c. Lamont was told by our New York Office at the outset of this venture that we would not commit ourselves to doing their program. However, we did express some interest in "helping" them and Bob O'Hagan has done a lot of work in creating a program for them. They are satisfied with this effort, but they now do not feel the program is exactly what they want and the program will not be completed before the experimental ship carrying the PDP-8 leaves port.

   d. As a back-up effort, they have written a FORTRAN program which Wayne Dengel and Dave Dodge have spent a lot of time during the past week helping them to complete it in the NYO. This program is still too large for a 4K PDP-8.

e. We have agreed to have Henry Burkhardt spend one day helping them to further reduce this program to a usable size.

2. They now plan to complete their FORTRAN program and a PAL III program before flying the computer to Iceland to meet the ship in about 30 days. With a few days of help from Henry, they should accomplish this task with time to spare. Thus, we have made the following arrangements with them:

   a. Henry will visit them next Thursday and advise them on how to arrange their FORTRAN program, and help them lay out their PAL III program. He will keep in touch with them on a weekly basis until they finish the task.

   b. A field service man will accompany the PDP-8 while it is on board the ship to insure continuous operation during the voyage.

3. The question of who will take responsibility for O'Hagan's unfinished program still remains unanswered.

Mike

ejb

K. Olsen

INTEROFFICE MEMORANDUM

DATE 26 July 1966

SUBJECT Computer Quantity Discount Plan

TO List FROM John Allen Jones

Enclosed you will find the final draft (I hope!) of the Computer Quantity Discount Plan. It contains all suggested changes and improvements and should be ready for field distribution.

In addition, two contracts are enclosed: a quantity agreement (blanket), and a cumulative agreement. These agreements have been checked by the company-attorney and have been modified according to his suggestions. It should be fairly easy to alter these agreements to suit the requirements of your product line.

I suggest that this plan be presented at the coming Sales Meetings (starting August 1). If this is agreeable, the plan will be discussed as a part of the PDP-9 training session.

Let me know if you have any questions or suggestions.

26 July 1966

Subject: Computer Quantity Discount Plan - Final Draft II
(supersedes Final Draft I
of 11 July 1966)

To: M. Ford
W. Hindle
H. Mann
N. Mazzarese
K. Olsen
S. Olsen
H. Painter
M. Ruderman
T. Johnson

From: John Allen Jones

cc: A. Alexanian

1. The last page of this memo contains a list of Number of Systems vs Discount. The rules that apply to it are as follows:

2. Computer system quantities are computed for individual types i.e., PDP-8, PDP-8/S, PDP-7/9, PDP-10, LINC/8. No intermixing is permitted.

3. There are two types of quantity discount agreements, blanket and cumulative. Individual agreements must be signed for each computer type that the buyer wishes a quantity discount. Discounts will not be given if no agreement has been signed.

4. The discount period covers one year of scheduled deliveries. No deviations from this period will be permitted.

5. If a blanket order is in effect all systems receive the indicated discount. If a cumulative agreement is in effect, each system is priced as the order is received. If more than one system is ordered at a time, each receives the full discount of the total cumulative number of systems that this last order places in effect.

6. Blanket orders yield large discounts. However, if the BUYER fails to release for delivery during the contract year, the number of systems called for on the quantity discount agreement, he will be billed for the unearned discounts on equipment already invoiced. This amount will be due and payable at the end of the contract year. It is the customer's responsibility to release orders for the individual systems sufficiently in advance that they may be scheduled during the one year period. It is the

responsibility of the salesman to keep the customer informed of the current lead time for the kinds of systems he uses.

7. Delivery positions are not reserved until each system order is released by the BUYER. Any customer change order that calls for slippage of a scheduled delivery will be considered a cancellation. Assignment of a new delivery position will be made on the same basis as a new order.

8. Order cancellations that occur close to delivery dates cost DEC money. Our standard terms and conditions permit us to bill a customer up to 100% of the system price, if he cancels. In practice, the following schedule will be used. Each cancellation must be handled by the cognizant product line manager.

Order cancellations received in excess of 8 weeks prior to scheduled delivery are accepted without charge.

Cancellations received between 4 and 8 weeks prior to scheduled delivery are subject to the following charges:

Standard equipment	5% of total price
Special systems (including by-outs like line printers)	20% of price of special system

Cancellations received less than 4 and 8 weeks prior to scheduled delivery are subject to the following charges:

Standard equipment	20% of total price
Special systems (including by-outs like line printers)	100% of special system price. Delivery is at customer's option

Cancellation orders must be in writing.

9. There will be no retroactive credits or discounts.

10. In the event that the BUYER wishes to increase his blanket

order, he should issue a change order revising the total upward. The resultant higher discount level as determined from the Discount Schedule applies only to all new order releases that are received after the upward revision.

11. The 338 Display System and 680 Communication System are often purchased as peripherals to one of our larger computers. Under this circumstance, the BUYER has the option of taking the discount level of his large computer system, or writing a quantity agreement for PDP-8's and use these systems to contribute to his PDP-8 discount level.

12. The following equipment is never discounted:

1. Discs
2. Drums
3. Mag Tape Transports
4. Line Printers
5. Teletypes (except as delivered on the basic computer system)
6. Card Readers
7. Plotters and Plotter Controls
8. Field installed add-ons (unless field installation is necessitated by DEC's inability to deliver the complete system).
9. Special Systems

13. The standard DEC warranty, documentation, and services (except training) apply to all machines sold under this contract. There is no charge for training courses (one man per course) for any system sold without discount. The standard training charges apply for people who wish training courses on discounted systems.

14. Any customer who presently has an OEM agreement has two options:

1. Continue with the existing agreement and use the new plan at the end of the life of the old one or,

2. Cancel the OEM agreement, pay for unearned discounts, and start on the new plan.

Subject: Computer Quantity Discount Plan - Final Draft II - 26 July 1966

Scheduled for Delivery

Number of Systems	Discount
1	0%
2 - 3	5%
4 - 6	10%
7 - 9	12%
10 - 14	15%
15 - 24	18%
25 - 49	22%
50 - 99	25%
100 - 199	26%
200 - 499	27%
500 - 999	28%

DIGITAL EQUIPMENT CORPORATION

PDP-9 Cumulative Discount Agreement

with

_____

buyer

effective period _____, 19__ through _____, 19__

This is an agreement between the BUYER and Digital Equipment Corporation (DEC) for the purchase of 1 or more PDP-9 computer systems for scheduled delivery during the effective period of the agreement. BUYER will receive discounts, as shown below, based on the cumulative number of systems he has on order for delivery during the effective period of this agreement.

Discount Schedule

PDP-9 Systems Scheduled for Delivery Within One Year

Quantity	Discount
- 1	0%
2 - 3	5%
4 - 6	10%
7 - 9	12%
10 - 14	15%
15 - 24	18%
25 - 49	22%
50 - 99	25%
100 - 199	26%
200 - 499	27%
500 - 999	28%

A. The cost of each system (at the appropriate discount) is computed as each order is received. The placement of additional orders does not reduce the price of existing orders, whether delivered or not.

B. A PDP-9 system, for all purposes of this agreement, is one that contains at least a PDP-9 I/O section, CP section and an 8K memory section. Other equipment that may be purchased for connection to a PDP-9 system is listed in the price list, F-92.

C. All components of a PDP-9 system are subject to the appropriate discount with the exception of:

1. Discs
2. Drums
3. Mag Tape Transports (IBM Compatible)
4. Line Printers
5. Teletypes (except as delivered on the basic computer system)
6. Card Readers
7. Plotters and Plotter Controls
8. Field installed add-ons (unless field installation is necessitated by DEC's inability to deliver the complete system).
9. Special Systems

D. Purchase orders for all systems to be discounted under this agreement must be received by DEC with sufficient lead time so that normal delivery can be scheduled by DEC during the effective period of this agreement.

E. The provisions of this agreement do not place DEC under any obligation whatsoever to continue the manufacture or sale of any equipment.

F. Delivery positions are not reserved until each system order is released by the BUYER. Any customer change order that specifies slippage of a scheduled delivery will be considered a cancellation unless by written agreement from DEC. Assignment of a new delivery position will be made on the same basis as a new order. If the new delivery position is beyond the effective

period of the contract, the system will not be discounted. Such a slippage will correspondingly reduce the quantity discount level of the agreement. Unearned discounts are due and payable at the end of the effective period of the agreement.

G. Additions to configurations already on order must be placed as a separate purchase order. Any addition to a given configuration must be received by DEC 90 days prior to the scheduled date of delivery.

Deletions from configurations already on order are subject to the cancellation clause.

H. DEC's standard Terms and Conditions shall apply to any orders released against this Discount Agreement. The standard DEC warranty and services apply to all machines sold under this agreement with the exception of training. There is no charge for training courses (one man per course) for any system sold without discount. The normal charge is incurred for training courses for discounted systems.

_____

buyer

by_____ by_____

_____, 19__ _____, 19__

D. The provisions of this agreement do not place DEC under any obligation whatsoever to continue the manufacture or sale of any equipment beyond the terms of this agreement.

E. If the BUYER fails to release for delivery during the effective period of this agreement, the number of systems required under this agreement, the BUYER agrees to pay for the unearned discounts on equipment already invoiced. This amount will be due and payable at the end of the effective period of this agreement and will be determined in accordance with Schedule A attached hereto.

F. In the event that the BUYER wishes to increase his blanket order, he should issue a change order revising the total upward. The resultant higher discount level as determined from Schedule A applies only to all new orders that are received after the upward revision.

G. Delivery positions are not reserved until each system order is released by the BUYER. Any customer change order that specifies slippage of a scheduled delivery will be considered a cancellation unless by written agreement from DEC. Assignment of a new delivery position will be made on the same basis as a new order. If the new delivery position is beyond the effective period of the contract, the system will not be discounted. Such a slippage will correspondingly reduce the quantity discount level of the agreement. Unearned discounts are due and payable at the end of the effective period of the agreement.

H. Additions to configurations already on order must be placed as a separate purchase order. Any addition to a given configuration must be received by DEC 90 days prior to the scheduled date of delivery.

Deletions from configurations already on order are subject to the cancellation clause.

I. DEC's standard Terms and Conditions shall apply to any orders released against this Discount Agreement. The standard DEC warranty and services apply to all machines sold under this agreement with the exception of training. There is no charge for training courses (one man per course) for any system sold without discount. The normal charge is incurred for training courses for discounted systems.

_____

buyer

by_____ by_____

_____, 19___ _____, 19___

Schedule A

Discount Schedule

PDP-9 Systems Scheduled for Delivery Within One Year	Discount
- 1	0%
2 - 3	5%
4 - 6	10%
7 - 9	12%
10 - 14	15%
15 - 24	18%
25 - 49	22%
50 - 99	25%
100 - 199	26%
200 - 499	27%
500 - 999	28%

7
7-26-66 K72

TO: TED JOHNSON / KEN OLSEN
FROM: GERRY MOORE

DR. HARENBACH OF AEG WILL VISIT MAYNARD ON MONDAY, AUGUST 8. I WILL PICK HIM UP IN MORNING AT PARKER HOUSE. HE IS INTERESTED IN TALKING ABOUT PDP-8/S AND PDP-9. HE IS ALSO INTERESTED IN TALKING APPLICATIONS AND SEEING OUR QUALITY CONTROL PROCEDURES. TED, CAN YOU ALERT APPROPRIATE PEOPLE SO WE CAN GIVE HIM A GOOD SHOW? KEN, WILL YOU BE THERE TO GREET HIM FOR A FEW MINUTES. YOU MAY RECALL, YOU MET HIM WITH KLAUS AND ME IN FRANKFURT."

INTEROFFICE MEMORANDUM

DATE July 21, 1966

SUBJECT Trip to Europe

TO Ken Olsen

FROM Mort Ruderman

Following are the contacts and the background information on the individuals who, if at all possible, I would like you to visit.

1. Dr. Hans Peterson
   Roslagstulls sjukhus
   Valhallavagen
   Stockholm, Sweden

Dr. Peterson is very instrumental within AutoKemi Swedish Government and the medical profession in Sweden. They are presently buying expanded PDP-8's, and have interest in 8/S's and LINC-8's. I consider them one of our finest prospects in biomedical.

2. Mr. Erling Dessau
   15 Vedstadsgrven
   Copenhagen, Denmark

Mr. Dessau is very influential within Danish technical circles. He is coming to M.I.T. for six months in the Fall, where we should have an opportunity to work rather closely with him. You met Mr. Dessau during your last trip to Denmark.

3. Professor M. Bergstrom
   Department of Physiology
   University of Helsinki
   Helsinki, Finland

Professor Bergstrom has a Spear Micro-LINC Unit, #4 or #5. It is not clear why he purchased the LINC from Spear. Again, if you could visit with him, it would be a good opportunity to inquire as to the potential market for laboratory computers in Finland.

Phoned

RCANY 213 T 1019+
DIGITAL MAYN

DIGITAL READING

WQMUMYY
MSG NO 978
TO KEN OLSEN
FROM JOHN LENG

I WOULD LIKE TO MISS MEETING YOU ON SATURDAY MORNING UNLESS ABSOLUTELY URGENT.

ROD BELDEN WILL BE IN GERMANY.
I WILL BE IN MAYNARD WHEN YOU GET BACK AND WOULD LIKE TO DISCUSS OUR PRODUCTION PROPOSAL WITH YOU THEN.

SUGGEST YOU VISIT REISTEDT AND JANSSEN AT TELARE AND POSSIBLY WALSTAM OF ARENCO AND TELARE. I WILL ALERT THEM TO YOUR POSSIBLE VISIT.
AGA PEOPLE WILL BE IN MUNICH FOR A MEDICAL SHOW.
SUGGEST NOT TO GIVE ANY ENCOURAGEMENT TO TELARE BEYOND OUR CONTRACT ENDING JULY 67. WE ARE ENDEAVOURING TO WORK MORE CLOSELY WITH ARENCO AS OEM AND TO PHASE OUT TELARE.
MY HOME PHONE NUMBER IS PANGBOURNE 2532 IF YOU WANT TO CALL SATURDAY.

INTEROFFICE MEMORANDUM

DATE July 20, 1966

SUBJECT Digital Small Computer Handbook: Outline and Schedule

TO K. Olsen.
S. Olsen
N. Mazzarese
S. Dinman
W. Hindle
M. Ford
J. Jones
H. Painter
M. Ruderman
H. Burkhardt
D. Ward
E. Steinberger
J. Richardson
E. Hendrickson
R. Clayton
B. Delagi

FROM Allen Kluchman

Attached is the outline for the Digital Small Computer Handbook. The following schedule must be met to get copies to N.E.C. in Chicago on October 3.

July 22

First draft distributed to above list.

July 25

First draft returned with comments and corrections.

July 27

Final draft to typesetter.

August 12

Complete book to printer.

October 3

Copies at N.E.C.

As agreed, the first press run will be 75,000 copies. The next run will be in about six months and will produce another 175,000 copies. The split run will allow the second edition to contain better information and allow us to improve on the presentation. Revision of the book will begin as soon as the first edition is published.

Outline

I. Primer

A. Introduction: The use of small computers in the sciences and engineering.

B. How problems are approached with small computers: three examples.

1. control system

2. biomedical experiment

3. physics experiment with numerical analysis

C. What must be known to use the computer: Course workbook material.

II. Three representative computer handbooks

A. PDP-8 (F-85)

B. PDP-8/S (F-85/S)

C. LINC-8

III. Products

A. Family of Eight

B. PDP-9

C. Peripherals

D. Modules

E. Logic Lab

dec INTEROFFICE MEMORANDUM

DATE July 20, 1966

SUBJECT Mailing Lists - Field Offices

TO Ken Olsen
Stan Olsen
Ted Johnson
Nick Mazzarese
Win Hindle
John Jones

FROM Tim McInerney

The Elliott Business Machines, Inc., representative has given us the following information regarding their addressing machines:

	MODEL	PRICE EACH
1.	Model 880 Electric (automatic) operating rate - 1500 pieces/hr. lease/option - $20.50/month - buy 10% off price - 3 years	$557.00
2.	Model 808 (manual) operating rate - 800 pieces/hr. lease/option $11.70/month - buy 10% off price - 3 years	$337.50
3.	Mark II Addresserett (manual)	$129.50

STENCILS

.Type 32 spaces pica type across line
.5 lines - room for ZIP code
.available in 9 colors for coding, $3.00 per 100
.have to be typed moist-preparation kit - $25.00
.storage cabinet - 4 drawer - capacity 500 - $17.75
.up to 10,000 clear impressions guaranteed
.lightweight and space saving-100 stenciles in 5 inches of space.

The Mark II Addresserette is strictly a small-operation type unit and is not recommended for lists of over 100 names.

There is a yearly service contract for the #880 and #808 with a $50.00 charge on each unit.

With one of these machines in each field office (machine model depending on list size), it would be possible to keep their lists, on the stencils, up-to-date and immediately available for a quick local mailing to their lists, or for shipment back here to Maynard for a large mass-mailing to the entire field office list. We could also handle their individual mailings from Maynard.

The updating and maintenance of these lists would be under the complete control of the field offices with the Direct Mail Department in Maynard acting as a service orgainzation only.

I'd like to have your ideas and suggestions concerning the above.

TJM:kge

We decided that Dave Denniston should handle this entire matter from his end. cc 7/21

INTEROFFICE MEMORANDUM

DATE July 20, 1966

SUBJECT Data Trends' PDP-8

TO Ken Olsen

FROM Al Alexanian

Reference: A. J. C. Hughes Letter dated July 15
B. Frank Kalwell Letter dated July 15

Reference letter "A" is signed by Mrs. J. C. Hughes, wife of the Company president.

The shipping delay was caused by the poor shipping practices and communications of our carrier (Bekins Van & Storage Co.). DEC Maynard and the New York Office had direct contact with Bekins Van & Storage Co. on numerous occasions. As a result of DEC's constant "badgering," Bekins located the misdirected equipment in their warehouse located approximately 30 miles from Data Trends, Inc. The equipment was finally delivered as noted in Mrs. Hughes letter.

Reference letter "B" was sent to Bekins to call attention to DEC's displeasure with services rendered and, further, to suggest a possible customer relation reconciliatory action by Bekins.

I spoke to Dave Denniston on the Wats line on July 19, 1966, relative to reference letter A. Dave is located in the same building with Data Trends. He has a good work relationship with key Data Trends personnel (i.e., President and Vice-President).

The procedure for shipping equipment is as follows:

1. Sales Administration generates an SBA when the material is ready for shipment.

2. The packaged equipment and the SBA arrive at the shipping area at approximately the same time.

3. The SBA instructs the Traffic Department to send a TWX to the applicable Branch office listing all shipping arrangements. (i.e., carrier, way bill number, time of departure, approximate time of arrival.)

4. The Branch Office shall inform the Customer and relay all pertinent shipping arrangements. The customer is obligated to arrange for insurance in all cases where the contract terms are F.O.B. Maynard.

Dave Denniston and I agree that an exception should not be made to Data Trends. In our effort to better service all customers it would become difficult to make special arrangements for one individual. This would also create a situation which would be inconsistent with established DEC policy. A real problem would develop if a complete change of personnel in the Sales Administration Department occurred (similar to one month ago). Special conditions and agreements might be overlooked resulting in damaged shipment claims becoming DEC's responsibility.

I think a letter to Data Trends explaining DEC's policy and interest in overall customer service, along with continued good relations from the New York Office will reconcile Mrs. Hughes.

Thank you.

Al Alexanian

Cl Corporation

DTI

DATA TRENDS, INC.

1259 RT. 46, PARSIPPANY, N. J. 07054
TEL. 201-334-1515

15 July 1966

Mr. Kenneth Olsen, President
Digital Equipment Corporation
Maynard, Massachusetts

Dear Mr. Olsen:

Would you be kind enough to direct this request to the proper person to execute since we feel it is of the utmost importance. According to our O.E.M. agreement with Digital Equipment Corporation, the moment a P.D.P.8 is shipped we are responsible for insuring it.

We received a P.D.P.8 July 13, 1966, that, according to an invoice received June 18, 1966, had been shipped June 10, 1966. The invoice was our only formal notification of the shipment and for nineteen days no one seemed to know the true whereabouts of this computer, though we were legally responsible.

Our request is that, the day a shipment is to be made, you people notify our insurance agents, Despard & Co., 161 William Street, New York, New York 10038, attention of Mr. Warren Reynolds so that they can cover it as it leaves Maynard. It is necessary to give Despard & Co. the name of the shipper, the waybill number or a copy of the bill of lading, and means of transportation. We would then like you to advise us: (1) of the shipment, (2) of the fact that Despard & Co. has been notified, and (3) when we will receive the computer.

Unless we are otherwise notified, I will assume these conditions are in force as stated.

With best regards,

J. C. Hughes

J. C. Hughes

JCH:lb

DATA TRENDS, INC.

1259 ROUTE 46 PARSIPPANY, NEW JERSEY 07054
TELEPHONE: (201) 334-1515

PURCHASE ORDER

NO. 5150-4

DATE July 15, 1966

THIS ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, PACKING SLIPS AND BILLS OF LADING. INVOICE PROMPTLY IN DUPLICATE.

TO:

Digital Equipment Corp.
1259 Route 46
Parsippany, N. J.

SHIP TO: (SAME AS ABOVE UNLESS OTHERWISE NOTED)

REQUISITION NO.	REQUISITIONER	CONTRACT NO.	VENDOR CODE	F.O.B.	ITEM-ACCOUNT NUMBER
					2101
VIA ☐ BEST WAY		DELIVERY REQ'D.	TERMS NET 30 DAYS		

ITEM	QUANTITY	DESCRIPTION	PRICE	TOTAL

AMENDMENT TO P. O. 5150 - July 15, 1966

It is hereby made a condition of this Purchase Order that all shipments will be insured as follows:(Insurance premium to be paid by DTI)

Notification to be sent to: Despard & Co.
161 William St.
New York City, N.Y.
Att: Mr. Warren Reynolds

Required Information: Name of carrier
Waybill No. and/or copy of Bill of Lading
Means of Transportation

It is also made a condition of this Purchase Order that Data Trends & Co. will be notified as follows:

1. That Despard & Co. has been notified.
2. Date shipment is scheduled to reach Data Trends, Inc.
3. Name of carrier
4. Waybill No. and/or copy of Bill of Lading
5. Means of Transportation

DATA TRENDS, INC.

BY

BY J C Hughes

Acceptance of this order constitutes acceptance of all conditions herein stated.

This order must not be filled at higher prices than last QUOTED or INVOICED without authority of the Purchasing Agent.
The specific quantity ordered must not be changed without the Purchasing Agent's permission in writing. Purchaser reserves the right to cancel this order or any portion of same if delivery is not made when and as specified, time being of the essence of this order.

COMPLETE AND RETURN ACKNOWLEDGMENT COPY IMMEDIATELY

DATA TRENDS, INC.

1259 ROUTE 46 PARSIPPANY, NEW JERSEY 07054
TELEPHONE: (201) 334-1515

PURCHASE ORDER

NO. 5150-4

DATE July 15, 1966

THIS ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, PACKING SLIPS AND BILLS OF LADING. INVOICE PROMPTLY IN DUPLICATE.

TO:

Digital Equipment Corp.
1259 Route 46
Parsippany, N. J.

SHIP TO: (SAME AS ABOVE UNLESS OTHERWISE NOTED)

REQUISITION NO.	REQUISITIONER	CONTRACT NO.	VENDOR CODE	F.O.B.	ITEM-ACCOUNT NUMBER
					2101
VIA ☐ BEST WAY		DELIVERY REQ'D.	TERMS NET 30 DAYS		

ITEM	QUANTITY	DESCRIPTION	PRICE	TOTAL

AMENDMENT TO P. O. 5150 - July 15, 1966

It is hereby made a condition of this Purchase Order that all shipments will be insured as follows:(Insurance premium to be paid by DTI)

Notification to be sent to: Despard & Co.
161 William St.
New York City, N.Y.
Att: Mr. Warren Reynolds

Required Information: Name of carrier
Waybill No. and/or copy of Bill of Lading
Means of Transportation

It is also made a condition of this Purchase Order that Data Trends & Co. will be notified as follows:

1. That Despard & Co. has been notified.
2. Date shipment is scheduled to reach Data Trends, Inc.
3. Name of carrier
4. Waybill No. and/or copy of Bill of Lading
5. Means of Transportation

DATA TRENDS, INC.

EXPECT TO SHIP ON _____ (DATE) VIA _____ BY _____

BY _____ (AUTHORIZED SIGNATURE) FOR _____ (COMPANY) BY J C Douglas

ACKNOWLEDGMENT

DIGITAL

EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS
Area Code 617 - 897-8821 - 646-8600 — TWX 710 - 347-0212

REMIT TO: DIGITAL EQUIPMENT CORPORATION
P. O. BOX 1685
BOSTON, MASS. 02105

DATE INVOICED	INVOICE NO.
6/16/66	27366

REFER TO THIS NO. ON ALL INQUIRIES

SOLD TO
DATA TRENDS, INC.
1259 ROUTE 46
PARSIPPANY, NEW JERSEY 07054

SHIP TO
JUN 29 1966

JUN 20 REC'D

F.O.B.	TERMS
MAYNARD, MASS.	NET 30 DAYS

DATE TYPED	CUSTOMER ORDER NO.	PART.	COMP.	SALESMAN	SHIP VIA
6/16/66	5150-1		C		BEKINS VAN LINES

DATE REQUIRED	STOCK ROOM	RENEG.	CUST. CODE	SALES OFFICE	STATE CODE	D.E.C. NO.	DATE SHIPPED
			0618	5	31	15050	6/10/66

ITEM	QUANTITY Ordered	Shipped	Due	DESCRIPTION	SER	UNIT PRICE	AMOUNT
	1	1	0	PDP-8 STANDARD MACHINE WITH FRAME	8B	15,580.00	15,580.00
	1	1	0	ASR 33 TELEPRINTER (ON-LINE)	"	900.00	900.00
	1	1	0	CAB-8B DEC CABINET	"	1,000.00	1,000.00
	1	1	0	MAINTENANCE MANUAL, PDP-8	"	50.00	50.00
	1	1	0	PROGRAM WRITE UP	"	25.00	25.00
	1	1	0	PROGRAM TAPE	"	40.00	40.00
	1	1	0	MAINTENANCE MANUAL, TELETYPE MODEL ASR 33, VOL. 1 & 2	"	4.00	4.00
				SUB TOTAL			17,599.00
				LESS 2% ON ITEM 1 and 2			329.60
							17,269.40
				BEKINS VAN LINES B/L SHIPPING CHARGES TO BE BILLED AT A LATER DATE.			
				FREIGHT CHARGES			
							17,269.40

FORM DE 50-43-9/65

ITEMS NOT SHIPPED COMPLETE ARE ON BACK ORDER AND WILL FOLLOW SHORTLY.

WE HEREBY CERTIFY THAT WE HAVE COMPLIED WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED.

PLEASE PAY LAST AMOUNT SHOWN ABOVE

ORIGINAL INVOICE - CUSTOMER

BEKINS VAN LINES

COMBINATION STANDARD HOUSEHOLD GOODS BILL OF LADING AND EXPENSE BILL

The initial carrier issuing this bill of lading is the carrier named hereon as issuing carrier.

Received property tendered, pursuant to order for service (if any) and subject to the classifications and tariffs, rules and regulations in effect on the date of the issue of this bill of lading: SHIP HOUSEHOLD GOODS DESCRIBED BELOW FROM FOR TRANSPORTATION AND DELIVERY TO

SHIPPER	DIGITAL EQ	CONSIGNEE	DATA TRENDS
ADDRESS	THOMPSON AVE	ADDRESS	1259 ROUT 46
CITY	MAYNARD MASS STATE	CITY	PARSIPPANY NEW JERSEY STATE
ISSUE DATE	6/14/66	NOTIFY	PHONE

References throughout this contract to the carrier mean any person or corporation in possession of the property tendered, under this contract. Every service to be performed by carrier hereunder shall be subject to all of the terms and conditions, whether printed or written, set forth herein, including those on the reverse side, all of which are hereby agreed to and accepted by shipper for himself and his assigns.

DESCRIPTION OF PROPERTY: One lot of household goods as described in 17 M.C.C. 467:

☐ LOADED DIRECT ON VANLINER_____, ☐ AS PER LIST ATTACHED, CONSISTING OF_____PIECES, NUMBERED_____

NOTICE: Unless a different value for the entire shipment is declared in the paragraph below, the shipper hereby releases and declares the value and limits the liability of the carrier to not exceeding 30 CENTS PER POUND FOR EACH ARTICLE as provided in the contract terms and conditions printed on the reverse side hereof (See especially Section 1).
Shipper hereby declares the value of the entire shipment to be $_____and hereby releases and limits value and liability of the carrier as provided in the contract terms and conditions printed on the reverse side hereof (See especially Section 1).

Declaration of Documents, Specie, Extraordinary Valued Articles:

All advances and lawful charges must be paid in cash, money order or certified check before carrier delivers or relinquishes possession of the property unless otherwise indicated below by carrier.

APPLIANCES SERVICED

☐ T. V. ☐ RADIO-PHONO
☐ WASHER ☐ FREEZER
☐ DRYER ☐ _____
☐ REFGTR. ☐ _____

ITEMIZATION OF PACKING CHARGES AND SPECIAL INSTRUCTIONS, IF ANY:

Rec'd 7-13-66 Data Trends Inc.

DATE	TRIP NO.	EQUIPMENT NO.	DRIVER OR CARRIER	FROM	TO
6/12/66	288-206	X402 V7183	TIMPANARO	MAYNARD MASS	PARSIPPANY NJ

No. BN 2688

WEIGHT, RATE AND CHARGES ARE SUBJECT TO CORRECTION

WEIGHT	750	LBS. @ $ 6.25	CWT.	$	46.89
PACKING (AS ITEMIZED ABOVE) DUE					
PICK UP DUE					
STORAGE AT ORIGIN DUE					
WAREHOUSE HANDLING DUE					
APPL. SERV. CHGS. (AS ITEMIZED ABOVE) DUE					
OTHER			DUE		
OTHER			DUE		
VALUATION CHARGE (SHIPPER'S TRANSIT PROTECTION) $		@	¢ per $100		
SUB TOTAL					46.89
PAID ON ACCOUNT TO					
SUB TOTAL					
DELIVERY DUE					
STORAGE AT DEST. DUE					
WAREHOUSE HANDLING DUE					
OTHER			DUE		
OTHER			DUE		
TOTAL TO BE BILLED BY			(ENTER INFO.* AT RIGHT)		46.89
TOTAL C.O.D.					

RECEIVED above listed goods in good condition.

JUL 13 RECD JUL 13 REC'D

Signed

RATE BASED ON TARIFF NO. 116D MILEAGE 45

RATING OFFICE 207 DATE RATED 6/24/66

PICKED UP BY PARKER 207 DATE 6/24/66

LOADED BY TIMPANARO DATE

DELIVERED BY DATE 6/27/66

ORDER REC'D BY

ORIGIN SERVICE FEE DUE 207

DELIVERY DESIRED 207

FOREGOING SHIPMENT RECEIVED ON ABOVE DATE (CONTENTS AND CONDITION OF PACKAGES UNKNOWN) SUBJECT TO DECLARATION (IF ANY) OR RELEASE, TERMS AND CONDITIONS HEREIN.

ISSUING CARRIER BEKINS VAN & STORAGE CO

PER BEKINS VAN LINES CO AGENT

BY KD

BILLING INSTRUCTIONS * PER P.O. OR GBL NO.

BILL TO: DIGITAL EQ CO
MAIN ST MAYNARD MASS

STG. AT DEST. AUTH. ☐ YES ☐ NO ☐ IF LIMITATION DAYS

PAYMENT RECEIVED BY

No. BN 2688

FORM HI-60 1-64

FOR INTERSTATE SHIPMENTS

8. CUSTOMER ORIGINAL

cc: Ray Michel

Attachment "B"

digital equipment corporation

MAYNARD, MASS. 01754
TWinoaks 7-8822 TWX MAYN 816

July 15, 1966

Mr. Kip Slodden
Bekins Van & Storage Co.
1560 Providence Highway
Norwood, Massachusetts

Dear Kip:

I am writing you in regard to a recent shipment (PDP-8) via Bekins to Data Trends, Inc., Parsippany, New Jersey. The referenced shipment left Digital Equipment Corporation on June 10, 1966 via Bekins and arrived at our customer's installation on July 13, 1966; a total of 33 days transit time.

This has created much ill-will with one of our excellent accounts. I cannot understand the reason a shipment from Maynard to New Jersey would take 33 days.

Perhaps you could send your representative to visit our Sales Manager in our New Jersey office, Mr. Dave Denniston, 1259 Route 46, Parsippany, New Jersey, as soon as possible in an attempt to reconcile Dave and perhaps at Dave's recommendation reconcile the customer?

Please advise me of your action and check points so such situations will not arise again. Thank you.

Yours very truly,

Frank A Kalwell

Frank A Kalwell
Traffic Manager

FK/cam

digital MEMO

DATE 7/19/66

TO Ken Olsen FROM Paul Chambers

We have set the date at Camp Ararat for our outing - Saturday, September 17, 1966.

All other arrangements are under way. Do you have any specific points you'd like us to look into this year?

I have the feeling that the Softball League would like to play their championship game at the outing. This could be scheduled early morning or late afternoon so it will not interfere with the use of the field by the children for games, races, etc. Do you have any objection to this idea?

Cleared ok. ec 7/20

Paul Chambers
/jh

dec INTEROFFICE MEMORANDUM

DATE July 18th, 1966

SUBJECT Year End Sales Summary - Toronto Office

TO Ken Olsen, Maynard FROM Si Lyle, Toronto

July 1st marks the beginning of a new year and the end of the first year of operation of the Toronto Office. The office was open for 11 of the 12 months of our fiscal year. The office got off to a good start in modules and eventually started to gain ground in the computer field. It also made a mark in the special products field by convincing Northern Electric, Bramalea to use our pulse current generators, sense amplifiers and discriminators rather than continuing to build their own.

The office also managed a few firsts. The first PDP-8/S in Canada, possibly even the world, was sold to the Hamilton Institute of Technology. The first PDP-8 typesetting system in Canada was sold by the Toronto Office to the St. Catharines Standard. The first system house O.E.M. module contract in Canada was also obtained by the Toronto Office.

The Toronto Office, up until recently, has been staffed by Si Lyle and Marg Pratt. Bob Borbas joined the staff in May after completing his engineering course.

The sales for the 11 months have totalled about $300,000. This includes PDP-8's to the University of Toronto - Dentistry, Westinghouse, and Ferranti; a PDP-8/S to H.I.T., and a typesetting PDP-8 system to the St. Catharines Standard. The module sales have included logic kits to the University of Toronto - Electrical Engineering; Bell Telephone Training School; H.I.T. - Electrical Department; McMaster University - Physics; and Applied Computer Technology. The number of module users has been brought up to 18 including an O.E.M. for $40,000. from the 3 that existed when the office was opened. Module sales reached a minimum plateau of $10,000. per month late in 1965 and have been increasing steadily. The interesting fact of our sales is that they have been increasing steadily from a few thousand dollars a month when the office was opened to about $60,000. per month.

All of the PDP-8 systems sold here had a number of peripherals on them. DECtapes are included on the Dentistry and Westinghouse machines and is being added to the PDP-8 presently at the University of Toronto - Physics.

WHAT'S NEXT

The quota established for the office for the fiscal year 66/67 was set some time ago at $700,000. It appears that this is achievable and

(con'd)

INTEROFFICE MEMORANDUM

DATE July 14th, 1966.

SUBJECT

TO FROM

in fact the local objective is $1,000,000. That also appears to be possible, particularly with the introduction of the PDP-9.

The number of computers in the area will increase significantly once deliveries start this fall. To provide service a field service representative who has recently been hired will be trained at Maynard and then brought back to the office.

Apart from the encouraging sales outlook and the establishment of a local service capability, the office will also change its training setup. The past year 2 day classes on logic and real time computers have been held monthly in the office. Since office space is now at a premium and the course has grown to the point where some of the larger companies send engineers on a regular basis, we intend to move the class out to a local hotel and charge a registration fee. Also the class can be made larger (presently restricted to 15) and held possibly every 6 weeks rather than every 4. The fee for the course will probably be $25. which will cover notes, lunches, coffee breaks, etc. The classes have proven to be an excellent sales tool and with new surroundings they will probably be even more effective.

Si

Si

cc: Ken Olsen, Maynard
cc: Stan Olsen, Maynard
cc: Nick Mazzarese
cc: Win Hendle
cc: Ted Johnson
cc: Mike Ford
cc: John Jones
cc: Denny Doyle, Carleton Place
cc: Bob Borbas, Toronto

INTEROFFICE MEMORANDUM

DATE July 18, 1966

SUBJECT PDP-7 Static Electricity Problem - Interim Report

TO Ed Harwood
Nick Mazzarese
John Jones
Ken Olson

FROM Don White

We (Al Ricketts and I) hooked up the computer and got things to fail, thanks to the Van De Graff Generator.

The easiest failure to induce was an alteration of memory, usually resulting in the machine's cal ing out. Grounding the doors stopped this.

The majority of problems now seem to occur at CP - I/O Interface. Apparently the discharge induces sufficient difference between CP and I/O Grounds to:

1. Cause false information transfer into the ac
2. Generate PC +1 via the skip channel
3. Probably generate I/O P's (though these are more difficult to evaluate since the reaction of the computer is dependent on MB and AC contents).

One way of stopping the problems is to float the CP and EAE; and ground only the I/O. We have some nylon screws on order (delivery promised Monday a.m.) to accomplish this.

New machines should take another approach-- Bring both sides of pulse amp outputs over the cables and ground only at the receiving end.

You'll hear more after we float the CP.

dec INTEROFFICE MEMORANDUM

DATE July 18, 1966

SUBJECT Product Line Managers Authority

TO Ken Olsen FROM Harry S. Mann

I would like to clarify your position in respect to the authority vested in the Product Line Managers to order outside surveys. Specifically we paid a bill this week in an amount of $9,430. to Computing Technology which was authorized by John Jones and Nick Mazzarese. The bill was for a competitive software survey and analysis on 8 selected computers.

I have mixed emotions on this kind of an expenditure. We do not specifically budget for items of this type but include their costs as part of the overhead or burden portions in the Product Line Marketing Expense areas. To the extent that we approve the budget of the Product Line, by inference, we are approving any expenditures which they care to make as long as those expenditures are within the budget.

In spite of this implied approval, I believe there are certain types of expenditures which the Product Managers should submit either to you or to a group such as the Product Managers Group since they are unusual or non-recurring. I believe that this type of an expenditure would fall into that category.

Perhaps we ought to discuss this at one of the Product Line Managers Meetings in the near future.

Harry

Harry S. Mann

HSM/clw

dec INTEROFFICE MEMORANDUM

DATE July 15, 1966

SUBJECT DEC'S Standard Terms and Conditions

TO Ken Olsen

FROM Frank Kalwell

cc: S. Olsen
H. Mann
T. Johnson
W. Hindle
N. Mazzarese
J. Shields
J. Jones
M. Ford
P. Greene
H. Painter
D. Testa
A. Alexanian

Enclosed are copies of our DEC's Standard "Terms and Conditions." Prior to our reordering additional quantities for use by all department's perhaps the above listed personnel wish to comment on possible changes or additions??

Please forward suggested changes or additions to my attention prior to July 25, 1966. All suggestions will be reviewed by the various product lines and initiated if such suggestions are feasible. Product Line Managers please include warranty on new Computers being introduced.

Thank you.

Frank Kalwell

TERMS AND CONDITIONS

The following are the terms and conditions under which Digital Equipment Corporation, hereinafter called DEC, sells its products.

PRICES — Prices are exclusive of all federal, state, municipal, or other government, excise, sales, use, occupational, or like taxes now in force or enacted in the future and, therefore, are subject to an increase equal in amount to any tax DEC may be required to collect or pay upon the sale or delivery of the items purchased.

DELIVERY — 1. Delivery will be made F.O.B. DEC's plant, Maynard, Massachusetts. The time of delivery is the time when the product to be delivered is ready for pickup by the carrier.

2. DEC shall not be liable for any damages or penalty for delay in delivery or for failure to give notice of delay when such delay is due to the elements, acts of God, acts of the purchaser, acts of civil or military authority, priorities, fires, or floods, or epidemics, quarantine restrictions, war, riots, strikes, differences with workmen, accidents to machinery, car shortages, delays in transportation, delay in delivery by DEC's vendors, or any other causes beyond the reasonable control of DEC. In any such event, the delivery date shall be deemed extended for a period equal to the delay.

3. Title to the products shall pass to the purchaser upon delivery thereof by DEC, and upon delivery the purchaser shall be responsible for and bear the entire risk of loss or damage to the products.

4. Products held for the purchaser or stored for the purchaser shall be at the risk of the purchaser. The purchaser shall also be liable for the expense of holding or storing products at the purchaser's request.

SHIPMENT — In the absence of specific instructions DEC will select the carrier.

TERMS — Terms are net cash with order except where satisfactory open account credit is established, in which case the terms are net 30 days from the date of invoice. DEC will issue invoices on delivery in the case of all products.

DATA AND PROPRIETARY RIGHTS — DEC normally supplies all the necessary data for the proper installation, test, operation, and maintenance of its products. Portions of this data are proprietary in nature and will be so marked, and the purchaser agrees to abide by the terms of such markings. DEC retains for itself all proprietary rights in and to all designs, engineering details, and other data pertaining to any products specified in the contract, all discoveries, inventions, patent rights, etc., arising out of the work done in connection with the contract or with any and all products developed as a result thereof, including the sole right to manufacture any and all such products.

PATENTS — The purchaser agrees to notify DEC of all claims that any DEC equipment infringes a United States patent.

If notified promptly in writing of any action (and all prior claims relating to such action) brought against the purchaser based on a claim that the equipment infringes a United States patent, DEC will defend such action at its expense and will pay the costs and damages awarded in any such action, provided that DEC shall have had sole control of the defense of any such action and all negotiations for its settlement or compromise. In the event that a final injunction shall be obtained against the purchaser's use of the equipment or any of its parts by reason of infringement of a United States patent, or if in DEC's opinion the equipment is likely to become the subject of a claim of infringement of a United States patent, DEC will, at its option and at its expense, either procure for the purchaser the right to continue using the equipment, replace or modify the same so that they become noninfringing, or grant the purchaser a credit for such equipment as depreciated and accept their return. The depreciation shall be an equal amount per year over the lifetime of the equipment as established by DEC. DEC shall not have any liability to the purchaser under any provision of this clause if any patent infringement, or claim thereof, is based upon the use of the equipment in combination with equipment or devices not made by DEC, or in a manner for which the equipment was not designed. No costs or expenses shall be incurred for the account of DEC without the written consent of DEC. The foregoing states the entire liability of DEC with respect to infringement of patents by the equipment or any part thereof or by their operation.

WARRANTY — 1. **FLIP-CHIP MODULES** — All Flip-Chip modules (shown in Catalog C-105, as revised from time to time), are unconditionally guaranteed against defects in workmanship and material under normal use and service for a period of ten years from date of shipment. DEC will repair or replace any Flip-Chip modules found to be defective in workmanship or material within ten years of shipment for a $5.00 per unit handling charge. Handling charges will not be applicable for one year after delivery.

Flip-Chip modules must be returned prepaid to DEC. Transportation charges covering the return of the repaired Flip-Chip modules shall be paid by DEC. Please ship all units to:

Digital Equipment Corporation
Module Service Department
146 Main Street
Maynard, Massachusetts 01754

No modules will be accepted for credit or exchange without the prior written approval of DEC.

2. **SYSTEM MODULES, LABORATORY MODULES, HIGH CURRENT PULSE EQUIPMENT** — All System Modules, Laboratory Modules and High Current Pulse Equipment are guaranteed against defects in workmanship and material under normal use and service for a period of one year from date of shipment. DEC will repair or replace any System Module, Laboratory Module or High Current Pulse Equipment found to be defective in workmanship or material within one year of shipment.

System Modules, Laboratory Modules and High Current Pulse Equipment must be returned prepaid to DEC. Transportation charges covering the return of the repaired System and Laboratory Modules shall be paid by DEC. Please ship all units to:

Digital Equipment Corporation
Module Service Department
146 Main Street
Maynard, Massachusetts 01754

No modules or High Current Pulse Equipment will be accepted for credit or exchange without the prior written approval of DEC.

3. **COMPUTERS, COMPUTER OPTIONS, AND OTHER DEC SYSTEMS** — All of this equipment is warranted free from defects in material and workmanship for the period of time applicable to the type of equipment:

PDP-6 — 6 months
PDP-7 — 3 months
PDP-8 — 3 months
LINC — 6 months
MEMORY TEST SYSTEMS — 6 months

The warranty period begins on the date of installation. Any component which fails during this period will be either repaired or replaced at DEC's option.

4. All above warranties are contingent upon proper use in the application for which the products were intended and do not cover products which have been modified without DEC's approval, or which have been subjected to unusual physical or electrical stress or on which the original identification marks have been removed or altered. These warranties will not apply if adjustment, repair or parts replacement is required because of accident, neglect, misuse, failure of electric power, air conditioning, humidity control, transportation or causes other than ordinary use.

5. The foregoing warranties are in lieu of all other warranties expressed or implied, and of all obligations or liabilities on the part of DEC for damages, including but not limited to consequential damages arising out of or in connection with the use or performance of the equipment.

ACCEPTANCE TESTS FOR COMPUTERS, COMPUTER OPTIONS AND OTHER DEC SYSTEMS — Prior to shipment, DEC will place the equipment in good working order including successful operation of the equipment using test procedures and/or programs, established by DEC, which are applicable to the equipment. All acceptance tests will be run by DEC personnel at the DEC factory upon five days' written notice to the Purchaser, in order to allow a representative of the Purchaser to witness the acceptance tests. The acceptance test report signed by the DEC representative (and by the Purchaser's representative if he attends and witnesses the acceptance tests) will be sufficient to establish that the equipment has satisfactorily completed the acceptance tests.

INSTALLATION OF COMPUTERS, COMPUTER OPTIONS AND OTHER DEC SYSTEMS — The equipment will be installed and placed in good working order including successful operation of the equipment using test procedures and/or programs, established by DEC, which are applicable to the equipment. The Purchaser shall make available a suitable place of installation with all facilities as specified in DEC's Installation Manual. The Purchaser shall furnish all labor required for unpacking and placing the equipment in the desired location.

FIELD INSTALLATION OF OPTIONS — Standard field installation charges are 5% of the option's list price with a $200 minimum and $5,000 maximum plus travel expense.

SUBSTITUTIONS AND MODIFICATIONS — DEC assumes the right to make substitutions and modifications in the specifications of equipment designed by DEC providing that such substitutions or modifications will not materially affect the performance of the equipment.

TOOLS — DEC shall retain title to and possession of any models, patterns, dyes, molds, jigs, fixtures, and other tools made for or obtained in connection with this contract.

CONTRACT — A valid contract binding upon DEC will come into being only as of the time a formal written contract signed by an authorized agent of DEC at Maynard, Massachusetts is dispatched to the purchaser by DEC.

CHOICE OF LAW — This contract is made in, governed by and shall be construed in accordance with the laws of the Commonwealth of Massachusetts.

ERRORS — Stenographic and clerical errors are subject to correction.

DEVIATIONS — Deviations from these terms and conditions are not valid unless confirmed in writing by an authorized agent of DEC at Maynard, Massachusetts.

SUPPLEMENTARY TERMS AND CONDITIONS OF SALE

Applicable to the Sale of Products (excluding developmental, experimental, and research types) for U.S. Government End-Use

The following terms and conditions of sale apply to sales for U.S. Government end-use when the Government contract number is specified on your order.

1. **INSPECTION** — DEC agrees that such products will be subject to inspection and test by the Government under the same arrangements that apply to contracts between DEC and the Government for directly supplying the same or similar products.

2. **BUY AMERICAN ACT** — To the extent required by the Buy American Act (41 U.S. Code 10a-d), DEC agrees to deliver only such products as have been manufactured in the United States substantially all from supplies mined, produced, or manufactured, as the case be, in the United States.

3. **WALSH-HEALY AND EIGHT HOUR LAWS** — In the performance of work under your order, DEC agrees to comply with the applicable provisions of the Walsh-Healy Public Contracts Act (41 U.S. Code 35-45) or the Work Hours Act of 1962 as amended (40 U.S. Code 327-332), whichever is applicable, and official regulations and determinations thereunder, and will save you harmless from any claim or liability because of DEC's non-compliance.

4. **NONDISCRIMINATION IN EMPLOYMENT** — In the performance of work under your order, DEC agrees not to discriminate against any employee or applicant for employment because of race, creed, color, or national origin in accordance with Executive Orders 10925 and 11114 as amended.

5. **TERMINATION** — You may, by written notice to DEC, terminate any order, in whole or in part, to the extent that such termination is made necessary by a termination in whole or in part, or modification, by the Government of the prime contract upon which your order is based. In such event, the respective rights and duties of DEC and the Purchaser will be in accordance with the provision of ASPR, Section 8-706.

6. **RENEGOTIATION** — DEC agrees to abide by the applicable provisions of the Renegotiation Act of 1951 (P.L. 9, 82nd Cong.) or the Vinson-Trammel Act as amended and extended (34 U.S. Code 496, and 10 U.S. Code 311), which is applicable, with respect to orders containing notice that either of said Acts is applicable, and agrees to insert in sub-contracts thereunder the provisions required by the applicable Act.

7. **MILITARY SECURITY REQUIREMENTS** — The provisions of the "Military Security Requirements" clause in ASPR, Section 7-104.12 will apply to any order involving access to classified information.

10/10/65

digital EQUIPMENT G. M. B. H. KÖLN

INTEROFFICE MEMO

DATE July 15, 1966

SUBJECT Dr. Marenbach's visit to DEC.

FROM Peter Herke

TO Ken Olsen
Stan Olsen
Nick Mazzaresse
Ted Johnson
Dave Cotton

JUL 20 1966

Re. my memo July 4.

The date of Dr. Marenbach's visit has been changed to August 8. He will be at the plant ca. 9 a.m. onwards and returns to Germany that night.

noted Ken

Peter

dec INTEROFFICE MEMORANDUM

DATE July 13, 1966

SUBJECT REVISED EMPLOYMENT AGREEMENT

TO K. H. Olsen
H. Mann
S. C. Olsen
W. Hindle
N. Mazzarese

FROM Bob Lassen

Attached for your review is a copy of our revised employment agreement recently written by Bob Cesari and reviewed by Dick Testa.

Paragraphs 5 and 6 were added to the agreement by Dick Testa to cover new employees who may still be employed elsewhere (paragraph 6). See attached.

Also attached for comparison is a copy of our old agreement.

The new agreement will be discussed at the next Product Line Managers' meeting on Monday, July 18.

RTL/jfr
Enclosures

digital **MEMO**

JUN 2 1966

PERSONNEL

DATE 6/1/66

TO Bob Lassen FROM Harry Mann

Please initiate the use of the attached new Employment Agreement at your earliest convenience. Also I would suggest that we advise all employees who have signed the older forms or this new one to make required disclosures to a particular individual. Possibly Dick Best would be a logical person.

BLAIR BUCKLES & CESARI
PATENT AND TRADEMARK COUNSEL
89 STATE STREET
BOSTON, MASSACHUSETTS 02109
(617) 742-3340

STAMFORD OFFICE
500 SUMMER STREET
STAMFORD, CONN. 06902
324-6155

JOHN C. BLAIR
ROBERT A. BUCKLES
ROBERT A. CESARI
RONALD J. ST. ONGE
W. HUGO LIEPMANN
JOHN F. McKENNA
ROBERT A. CAHILL
CHARLES I. SHERMAN

May 23, 1966

Mr. Harry S. Mann
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts

Re: Employment Agreements, File 83-020

Dear Harry:

Some time ago Dick Testa suggested some changes in the Digital employment agreement, relating to inventions and trade secrets. I go along with most of these suggestions, and they are incorporated in the enclosed draft.

I suggest that for new employees you substitute this form.

Sincerely,

Bob

Robert A. Cesari

D/jpl
Enclosure

EMPLOYMENT AGREEMENT

Maynard, Massachusetts

In consideration of my employment hereafter by Digital Equipment Corporation, a Massachusetts corporation (the "Corporation"), I hereby agree as follows:

1. I will make full and prompt disclosure to the Corporation of all inventions, improvements, modifications, discoveries and developments (all of which are collectively termed "developments" hereinafter), whether patentable or not, made or conceived by me or under my direction from the date of this agreement until I leave said employment, whether or not made or conceived during normal working hours or on the premises of the Corporation.

2. Upon request of the Corporation, I agree to assign to the Corporation all developments covered by paragraph 1 and any patents or patent applications covering such developments and to execute and deliver such assignments, applications for letters patent and other documents for use in any and all countries whatsoever as the Corporation may direct and to cooperate fully with the Corporation in prosecuting such applications and in otherwise securing to the Corporation full protection of the same. I understand that after I formally disclose a development under procedures instituted by the Corporation, the Corporation may decide that it is not interested in exploiting the development and in such case it may release the development to me outright or grant me such lesser rights in the development as it may decide.

3. I will also assign to the Corporation any and all copyrights and reproduction rights to any material prepared by me in connection with my said employment.

4. During the course of my employment by the Corporation, I may learn of confidential information relating to the Corporation. Confidential information includes matters not generally known outside the Corporation, such as various developments, inventions, improvements, methods, etc., relating to the products and services marketed or used by the Corporation, and also

general business operations of the Corporation (e.g., relating to sales, costs, profits, organization, customer lists, pricing methods, etc.). I agree not to disclose any confidential information to others or to make use of it, either during or after my employment by the Corporation, whether or not such information is produced by my own efforts, except as expressly permitted in writing by the Corporation. Also, I may learn of apparatus, methods, ways of business, etc., which in themselves are generally known but whose use by the Corporation is not generally known, and I agree not to disclose to others such use, either during or after my employment by the Corporation, whether or not such use is due to my own efforts.

5. My obligations under this agreement shall survive the termination of my employment regardless of the manner of such termination, and shall be binding upon my heirs, executors and administrators.

Witness my hand and seal

Signature _____(Seal)

Date _____

Witness _____

RJT:mag 7/7/66

PERSONNEL
JUL 8 1966

M E M O R A N D U M

TO: R. Lassen

FROM: R. Testa

RE: Revised Employment Agreement

Here are two additional paragraphs which were drafted to reflect our telephone conversation. Paragraph 5 may catch more people than is intended, e.g., the gas station employee at the time of employment. If you narrow paragraph 5 too much, you would lose some coverage. Paragraph 6 is narrower in scope.

If you incorporate these paragraphs in your standard form, would you please send me a copy for my files.

5. At the time I begin my employment with the Corporation I will not be employed by or acting on behalf of any other person, corporation or firm.

6. During the term of my employment by the Corporation I will not become employed by or act on behalf of any other person, corporation or firm which is engaged in any business or activity similar to or competitive with that of the Corporation.

R J Testa

dec INTEROFFICE MEMORANDUM

Dec Tech
327-3180

DATE July 6, 1966

SUBJECT Employee Agreement

TO Bob Lassen

FROM Ken Olsen

Will you talk to our lawyers about an employee agreement which we can ask all new employees to sign at the same time they sign the patent agreement. In the agreement, they will state that they are not in the employ of another company or working in the interest of another company. This should be a very straightforward thing which everyone ought to be happy to sign, but for those people where there might be some doubt that they are a spy for another company, it would be interesting to have a document that you can really stress as they join the Company.

Will you try to get this together before next Monday and have this and the present patent agreement ready so that we can discuss them at the Product Line Managers meeting. If you could send them out to the Product Line Managers and Harry Mann before Monday, it might be a very short discussion.

Ken

ecc

INTEROFFICE MEMORANDUM

DATE July 11, 1966

SUBJECT Proposed Quantity Discount - Revision II

TO John Jones

FROM Harry S. Mann

CC: D. Cotton
M. Ford
W. Hindle
N. Mazzarese
K. Olsen ✓
S. Olsen
H. Painter
M. Ruderman

I feel your write-up of the proposed discount policy is a good reflection of the concensus of a hectic meeting. The only thing in your memo with which I take exception is the cancellation comment. I don't recall this being discussed. In any event, I feel this is a separate problem.

Our standard terms and conditions provide a proper guide for cancellation charges. In the case of cancellations at the convenience of the government, we have a special problem since government regulations prevail and, hence, any policy we establish is without meaning in such cases. For all other cancellations, we can charge up to the full selling price of the order cancelled. What we do in practice is a matter of business judgment.

I suggest we not define cancellation charges on a general basis but treat them on a case-by-case basis with possibly a committee set up to act on proposed charges. We could establish figures such as you have proposed as minimum charges with higher charges applied where justified.

Harry S. Mann

HSM/clw

INTEROFFICE MEMORANDUM

DATE 11 July 1966

SUBJECT Tight Inventory Control - Increasing Cost of DECAN M'f'g

TO Stanley Olsen
CC Ken Olsen
Rod Belden
Harry Mann
Henry Crouse
Nick Mazzarese
Cy Kendrick
Jack Smith
Denny Doyle

FROM Bill MacGregor-Carleton Place

I am in Maynard today having brought down 100 R210 modules for Jack Smith's PDP-8 production line. This trip will cost $200 and will increase the invoice price from $8.00 to $10.00/module. If I had been given parts on time and allowed to schedule my production properly, this cost would now be less than $7/module.

I requested parts for 400 modules (2 weeks production) in Jan.,'66 as a buffer. My request was granted, but the parts have never been available. These parts represent $8,000 of inventory; this will be turned over at an average rate of 2 weeks, or 26 time/yr. If our inventory costs us 10%/yr., this would cost about $31. Our present rate of assembly is 12 boards/girl/day - or .66 hrs./board or a wage cost of 80¢. Total assembly and test represents 1.8 hrs. at a wage cost of $2.25/module and this can be reduced to 1.6 hrs. at a wage cost of $2.00/module. Overhead to June was 250%. Variance to June will force it higher than 300% for July - August and Sept. An acceptable overhead rate for a small routine operation, such as this, should be 150%. This means that a price of $5/module is not impossible, and $6/module quite realistic.

On 23 June, I took parts for 600 R210 modules to Canada. We started to process the boards and components on Monday, 27 June; assembly started 29 June. On 6 July (3 working days later), I received a TWX and a telephone call that DEC PDP-8 production is out of R210 modules. People gave up their Saturday so that I could have 100 to bring down with me yesterday.

Jack Smith tells me that the probable requirement for R210's for July will be 1,000. If this is true, and each one costs an extra $3 or more because of poor planning, the cost to DEC will be more than $3,000 for the month of July and it could have been prevented by spending $31.00.

We, in Canada, are questioning the wisdom of our continuing this prgram. It is pointless to strive for low manufacturing costs under the circumstances.

Bill MacGregor

BMcG/mel

dec INTEROFFICE MEMORANDUM

DATE July 8, 1966

SUBJECT

TO K. Olsen

FROM C. Kendrick

CC G. Porazzo

Gloria Porazzo and Cy Kendrick looked carefully at all assembly areas to determine if there were any areas where the handling of modules could be improved.

In most areas the plastic or metal trays that were designed for Area "B" handle the modules very well. There is room for improvement in the way modules have been stacked in the handle-stamping area. In the past, modules have been stacked in piles on the bench with no protection between them. We are now stacking them neatly in boxes with a layer of non-corrosive paper between them as the handles are added.

dec INTEROFFICE MEMORANDUM

DATE July 8, 1966

SUBJECT Response to PDP-8 Space Advertising

TO Ken Olsen

FROM Charles Kotsaftis

I was recently discussing our PDP-8 space advertising campaign with Jacob Meiry of M.I.T. Aeronautical Engineering Department. I mentioned your comment about the unfavorable reaction in Europe to some of the ads. Mr. Meiry, who has spent considerable time in Europe, thought that the subtle or sophisticated humor of the ads was typically American and would not necessarily be taken in the same vein by Europeans. In short, what may be good advertising here would not necessarily apply in Europe due to cultural differences.

Mr. Meiry further commented that this was a typical mistake of American firms in European markets, and he suggested that a European advertising firm might be more in tune with European advertising tastes. Personally, Mr. Meiry enjoyed the ads and appreciated their humor.

dec INTEROFFICE MEMORANDUM

DATE May 27th, 1966

SUBJECT Advertising Campaign

TO Ken Olsen, Maynard

FROM Si Lyle, Toronto

Dear Ken:

After having spoken to most of the DEC users in this area, including the very strong supporters, opinions seem to run 40% for and 60% against our recent advertising campaign. Many express the viewpoint that any one of the advertisements in a series of hard-sell advertisements would have been more effective. However since they were nearly all soft-sell and at a low pitch, they felt that they really did not do justice to the product lines.

Si

Si

dec INTEROFFICE MEMORANDUM

DATE 13 May 1966

SUBJECT Advertising Poll thru Sales Newsletter

TO Elsa Carlson **FROM** Jack Richardson

The number of responses which I have received from people reading our most recent ads by Kalb and Scheider has been small. However, the three who did respond were not encouraging. The ad which they saw was the PDP-8 and the "Teddy". The raw data is compiled below:

1) Dr. J. Jovanovich, University of Manitoba, Physics Department - saw the ad; said that it didn't tell him anything and seemed disappointed at this.

2) Mr. B.A. Holmlund, University of Saskatchewan, Biomedical Engineering - saw the ad prior to my visit; didn't recognize that it was the same Digital that I represented or that it was advertising the PDP-8(?). Read the ad in front of me but simply put aside the ad with no comment and we went back to discussing his application.

3) Dr. John MacDonald, University of British Columbia, Hybrid Computation and Biomedical Engineering - hadn't seen the ad; read it in front of me; laughed loudly for 30 seconds and said, "That's not the DEC I used to know." (He is personal friends with about 10 or 15 people on DEC's staff.)

My interpretation of the above raw data is that the people who know us are not moved by the ads. In general, I don't think they changed their attitude toward Digital in either direction but the ads didn't tell them anything.

My personal feeling is that the ads are just a little too cute for the product we sell but I do not have strong feelings. Incidentally, the two page spread on the LINC-8 in Scientific American was very well received. Dr. Pearce of University of Victoria read it completely and said it helped him understand what the LINC-8 could do. He will likely buy a LINC-8 within 2 - 3 months.

I would be glad to summarize what I think should be in our ads, but that would be the topic of another memo.

Jack.

JER:jp Hi, Elsa!

dec INTEROFFICE MEMORANDUM

DATE 10 May 1966

SUBJECT Advertising Poll

TO E. Carlson

FROM D. Doyle

I have mixed feelings on our ads - we have had a lot of critical comment which I am sure is similar to what Ken found in Europe, but the ads do give an air of confidence and "big company-ness", which doesn't really raise comment of any type.

Tell Ken that I am trying to get product line managers to agree to a few ads in Canadian journals, and if there is anything he can do to support me, I would even accept the Smith Brothers with the beards again.

Best regards.

Denny

DJD:jp

dec INTEROFFICE MEMORANDUM

DATE May 9, 1966

SUBJECT Advertising Poll

TO Elsa Carlson

FROM Ray Schwegler

I am not a sales type, but let me enter my reaction to the Advertising Poll.

From an advertising agencies viewpoint, the new ads are most successful. I am sure that the eye is attracted by the unconvential approach. Readership is no doubt very high. The ad agency is successful; it has sold its product, the ad. On the other hand, has it sold our product? Does the ad convince the reader the indeed Digital does make fine machines?

LINC-8 has distinguished itself for restraint in the advertising approach. A few soft sell ado will do the LINC-8 no harm as a cotton candy approach will not harm any computer chances of success. But can you imagine a steady diet of cotton candy?

Let's not let the circus become a side show. It will give us a freakish name.

1. ADVERTISING POLL. From Ken Olsen. "I received some negative reactions to our latest ads during my trip to Europe. The feeling was that these were a little too lowbrow for the European audience.

"I would like to hear from more people in the field as to what their own reaction is, and that of their customers, to our ads. Please address them to Elsa Carlson and I will enter into the Sales Newsletter the results of this informal Poll."

from John Leary. I think they are just great!

digital MEMO

DATE 5/9/66

TO Elsa Carlson FROM Ken Weir - Palo Alto

In response to Ken Olsen's request in Newsletter, #192.

To draw an automotive analogy: VW uses, in the advertisments, a great deal of humor — I prefer to think of PDP-8's as "Mustangs" or more likely, "Jaguars". I would prefer to see more dignity in our ads.

Regards,

Ken

dec INTEROFFICE MEMORANDUM

DATE July 8, 1966

SUBJECT Allen Bradley Resistors

TO Kenneth H. Olsen ✓
Harry Mann
Win Hindle
Stanley C. Olsen
Nick Mazzarese

FROM Henry J. Crouse

The Sales Engineer from Allen Bradley, Mr. Jack Harvey, informed me that Allen Bradley will not guarantee delivery of our resistors to us for the next year. The reason is that they cannot be guaranteed of a supply of copper for their lead wire and he is suggesting that we place our one (1) year's requirement of resistors with him and take them as we need them.

We will not have to inventory a significant share of resistors at this moment, and I don't advise that we do. Since Allen Bradley does less than twenty-five (25) per cent with the military, government priorities mean very little with them and we will be treated like all of their customers on a first come first serve basis.

Cy Kendrick and Paul McGaunn are working on the summary of all the resistor requirements forecasted and we will place purchase orders against that schedule.

Henry J. Crouse

dec INTEROFFICE MEMORANDUM

DATE: July 7, 1966

SUBJECT: PROPOSED RULES REGARDING TIME CLOCKS, LUNCH BREAKS, AND LOITERING DURING WORK HOURS

TO: Kenneth H. Olsen FROM: Bob Lassen

cc: Paul Chambers

In order to stop early line ups at the time clocks, company cafeteria, and coffee machines, etc., we should have a few simple concise rules which must be uniformly and regularly enforced by all DEC supervisors.

I propose the following:

1. Employees will not be allowed to line up at the time clocks, cafeteria, or vending machines prior to 10am, 12 noon, 3pm or 5pm.
2. Employees will not punch out prior to 10am, 12noon, 3pm or 5pm unless they are leaving the plant because of sickness or personal reasons. People who leave the plant for other than business purposes must punch out at the time they leave the plant.
3. A clean-up time should be allowed prior to 12 noon and 5pm. Several supervisors have suggested a warning bell to indicate the start of the clean-up time.
4. Employees who remain in the plant during lunch will be permitted to punch in and out the same time provided they do not leave the plant. Employees who leave the plant during lunch period must punch out when they leave the plant and in when they return to work. (Jack Smith feels that double punching should not be allowed at all).
5. Punching another employee's time card is forbidden without exception.
6. Time cards must never be taken from the assigned racks unless the supervisor approves a change in location because of a temporary transfer of the employee to a new work area. Time cards must not be taken out of the plant.

7. All DEC supervisors and managers have the right and the responsibility to question employees who are loitering and to report same to the employee's supervisor.
8. Other than normal work shifts must be approved by the appropriate department manager and the Personnel Department in writing.
9. Each supervisor should keep a list of employees who are authorized to work during other than normal work hours.

In addition all department heads must insure adequate supervision for people who work other than normal work hours. Second and third shift operations should be monitored and observed regularly. Perhaps senior people should be assigned to observe second and third shift operations.

RTL/srb

INTEROFFICE MEMORANDUM

DATE July 7, 1966

SUBJECT STORAGE

TO Ken Olsen

cc: Rod Beldon
Jack Smith
Ed Harwood

FROM Loren Prentice

The storage of parts and in-process goods on the floors of building #5 are going to become extremely acute and this is not a problem that is going to get better. It is going to get steadily worse. I suggest that we start thinking about this now and for a first proposal I propose that we use building #3 for storage area because it is near the center of operations and the transportation problems are somewhat better to all areas including the new location of the PDP-6 group. Also, that we find more space on the first floor of building #5 for crating to relieve the small area now used for that on the 5th floor so that that may be used for storage of goods in process.

INTEROFFICE MEMORANDUM

DATE July 6, 1966

SUBJECT Module Handling Procedures

TO Win Hindle
Ken Olsen

FROM Bob Savell

Within the Large Computer Engineering Department the following steps will be taken to improve the means of handling modules.

(1) All solder repairs will be made using a vacuum "solder sucker" to clean out holes. Hitting the module on a hard surface to remove solder will not be permitted.

(2) Modules will be stored and transported in plastic module boxes whenever more than a few modules are involved. All projects using modules must have a supply of these boxes in their working area.

3) Care will be taken not to place anything other than other modules on top of modules that are laid down on benches.

(4) Modules being transported in boxes must be handled gently, not dropped or thrown.

INTEROFFICE MEMORANDUM

DATE July 5, 1966

SUBJECT Scrap

TO Kenneth H. Olsen ✓
Harry Mann

FROM Henry J. Crouse

We estimate a return of $19,400 per year on the scrap programs presently in operation.

There are four general areas:

I. Precious Metals

Gold (etch boards) from Sel-Rex

Platinum (strates) from Dupont

Silver (strates) from Dupont

Gold resistor ink (strates) from Dupont

Palladium (strates) from Dupont and Electro Sciences

All sold to Precious Metals Recovery, Division of Sel-Rex.

Value estimated at $5,000 - $7,000 per year.

II. Trichloroethylene

General Chemical reclamation $7,000 - $10,000 per year.

III. Metal scrap, from sheet metal and machine shops, occasionally from stockroom and other areas.

Sold to Samuel S. Lerner.

Value average of $76.00 per week, fluctuating from $40.00 to $140.00.

IV. Copper, copper leads, etc.

Sold to Bea and Bea Metals.

Value only one check to date $150.00 for two barrels collected since April 1.

Estimated average value of scrap accumulated, whether collected or not,

from end of March to date, $300.00.

AVERAGES to $900.00 per year.

Henry J. Crouse

digital EQUIPMENT G. M. B. H. KÖLN

INTEROFFICE MEMO

DATE July 4, 1966

SUBJECT

FROM Peter Herke

TO Ken Olsen
Stan Olsen
Nick Mazzarese
Howie Painter
Ted Johnson
Dave Cotton

Dr. Marenbach of AEG (the German equivalent of Foxboro) will be visiting the U.S., and tentatively plans to visit Maynard on August 5. Since this conflicts with the sales meeting I'm drawing your attention to his visit now in the hope that you'll manage to see him sometime during the day. It seems that he pretty well makes all the decisions for computer purchases at AEG, and both PDP-9 and 8/s details would be of great interest to him. AEG could become the greatest European OEM customer; at present they have 3 PDP-8's on order of which one is delivered.

Please advise me, if you will definitely not be available.

Peter Herke

Peter Herke

dec INTEROFFICE MEMORANDUM

DATE 1 July 66

SUBJECT 5-Year Awards

TO Ken Olsen
Bob Lassen

FROM Ken Gold

Today I went through Jack Atwood's 5-year-pin records to determine the best way to set up a presentation ceremony.

I found his purchase order to L.G. Balfour Co. for 25 tie clasps and 10 women's pins...they were delivered to Digital March 21st. With the small balance already on hand, this was enough to cover all those employees who became eligible for pins during 1965.

However, in the meantime while Jack's order was being manufactured at Balfour, several other employees were becoming eligible. I have determined that as of June 30,1966, 46 men and 16 women had reached the five-year milestone. This means that the purchase order should have been for a much greater number.

I called L.G. Balfour Co., and asked how quickly they could provide additional pins. The minimum necessary time is six weeks. With this in mind, there are two possible courses of action:

1. We schedule the awards dinner for late in August (when more pins will be delivered), and run a substantial story in On Line announcing the affair and attaching much importance to it.

2. Even considering the shortage of pins, we go ahead anyway and hold an awards dinner, in July. We would then tell 17 individuals with the most recent anniversaries that their pins would be delivered to them as soon as received from Balfour.

In any case, I think it should be a dinner, starting after work hours in the cafeteria...because there are 62 recipients involved. The cafeteria is the only in-house facility capable of handling this number, and after working hours would be the only time that it would be empty

I talked with John Tobin, and he will provide us with whatever menu we request, and give us a good break on the cost.

With 62 people receiving pins, there should be high news value

associated with the event. I will take pictures, and send appropriate news releases to papers throughout the area,(and a nice spread in On Line, of course). The employees involved should enjoy, and be proud to see,their pictures and names printed in the publications they read at home.

These are my suggestions for 5-year-pin presentation; but if anyone comes up with a better plan, I'll be happy to help put it in operation as soon as possible.

In the future, I will see personally that 5-year-pin orders are placed well in advance of needs. I propose to arrange dinner presentations twice a year, in December and July. This would result in groups that average 30-40 individuals. Also, my plans for substantial in-house recognition and newspaper publicity in nearby communities should provide even more significance to 5 year's service with Digital.

Ken Gold

digital EQUIPMENT G. M. B. H. KÖLN

INTEROFFICE MEMO

JUL 5 1966

DATE June 30, 1966

SUBJECT Alumina Flip-Chip-boards

FROM Gerry Moore

TO Tom Stockebrand

cc: Ken Olsen

Sorry to be so long in getting you info on a German ceramic supplier. I see your memo (enclosed) was typed exactly two months ago. Problem is, it took this long to get a quote.

I visited 4 firms at the Hannover fair; Rosenthal, Steatit-Magnesia, and two others. At first the Rosenthal salesman said they would provide a quote. Then, an older man who overheard us, walked up, looked at the specs, and said they couldn t do it. He recommended CTC.

Of the two nameless firms, one didn t make alumina. The other did and offered a quote but never came through. They did not look very promising, anyway. They could not nearly meet the flatness spec.

I just received the enclosed quote from Stemag. As you see, prices per 100 get down to DM 225.--, which is 56 cents each. It sounds rather expensive. This is for a flat piece of the desired thickness.

Please let me know if you want me to persue this further with Stemag. I m sending, under separate cover, samples of their substrates.

Also, if you know the name of any other suppliers over here, let me know.

for Gerald T. Moore

INTEROFFICE MEMORANDUM

DATE June 29, 1966

SUBJECT

TO K. Olsen ✓

FROM D. Kuyamjian

cc: R. Clayton
H. Crouse

Regarding your memo of 1 June to Henry concerning a replacement for the RM561A, I wish to appraise you of our progress to date.

1. None of the scope manufacturers mentioned in your memo are able to meet the tube size requirement with a standard product.

2. Bionic Instruments and General Atronics are preparing quotations based on the specifications attached. (See Bionic's budgetary). Both of these people would have to develop a tube for us.

3. I am presently contacting other manufacturers, and will advise you of any positive results.

4. Please advise me of any other parameters you feel are important.

PRELIMINARY SPECIFICATIONS
x - y Oscilloscope
For Linc - 8

Electronics

Bandwidth:	1 mc
Gain:	low gain (signals 10V) option: gain of 4
Accelerating Potential:	3000 V
Sweep Circuitry:	none
Sensitivity:	5 - 10 V fs
Intensification:	gatable dc coupled intensification circuitry to be operated as follows: the computer will supply x and y voltages; the beam will be displayed after having been properly positioned.

Oscilloscope to be all solid state if possible

CRT

Face:	square, flat, 5" minimum
spot size:	.005" to .010"
Phosphor:	fairly persistant, such as P25
Graticule:	no internal graticule

Mechanical

Depth:	not to exceed 14"
Heigth + Width:	not stringent
Mounting:	to be rack mounted

BIONIC INSTRUMENTS, INC.

formerly Biophysical Instruments, Inc.
221 Rock Hill Road, Bala Cynwyd, Pennsylvania • (215) TEnnyson 9-3250

June 22, 1966

Digital Equipment Corp.
Bldg. 5
Thompson St.
Maynard, Mass.

Attn: Mrs. Kuyamjian

Dear Mrs. Kuyamjian:

As per our recent phone discussions, we would like to be your supplier for your requirements of a scope unit to replace the model 561 you are now using. Upon receipt of the more complete specifications we will be pleased to supply a firm quote.

On the very rough idea of your requirement, we estimate these can be made in the area of $250.00 to $400.00 each in the quantites discussed. We further estimate that if you are able to supply a D.C. voltage from other power supplies of 300-400 V, that this will reduce the price by $25.00 to $30.00

This is based on using a 5" tube, 3 KV anode voltage, identical horizontal and vertical amplifiers, bandwidth to 100 KC, etc., as discussed.

We will furnish these quotations at no obligation to Digital Equipment Corp., and look forward to receiving more detailed information.

Very truly,

Ed Schempp

ES/gs

Gerry Moore's German "Pep-Up" Letter cc. KH Olsen from Ted

digital EQUIPMENT G. M. B. H. K Ö L N

INTEROFFICE MEMO

DATE June 28, 1966

SUBJECT Digital's future in Germany

FROM Gerry Moore

TO All D E GmbH employees

We at Digital have the benefit of an association with a very unique and interesting company. It is an association loaded with opportunities for the talented, the ambitious, and the energetic. I'm not sure we all appreciate that.

We have to spend a great deal of time dealing with the many problems that normally do arise (and will continue to arise) in a dynamic and growing company such as ours. We spend time tracing lost shipments, checking on overdue shipments, calming customers who are anxious over equipment that's not working, trying to get correct paperwork from Maynard, et., etc. As a result, we sometimes get a distorted picture of our company. It is, of course, natural that the many shipments that go alright and the many machines that function properly don't occupy our thoughts. We never hear about them.

One thing that we should realize is that our company makes truly excellent equipment. Did you know, for example, that a PDP-5 delivered to Hoogovens in 1964 has operated for close to 11,000 hours without ever having a single failure? This is truly a fantastic record. I sincerely doubt that any computer manufactured by any company has ever compiled a record even remotely approaching this. Once every 2 or 3 months the Hoogovens machine is taken out of service for 2 hours to have a marginal check performed. No part has ever had to be replaced during these checks. Otherwise the machine has operated continuously 24 hours a day, 7 days a week. Although this has been one of our most outstanding records, we have many, many other machines in the hands of satisfied customers. These machines perform faultlessly day in and day out and you never hear of them.

I say that our company is unique. Digital Equipment has been in existence only 9 years and has compiled a record that has confounded financial experts. Though we have been one of the smallest companies in the computer field, we have consistently earned a handsome profit. None of the giants in the industry, with the exception of IBM, has been able to do this. And what has been done with this profit? It has been used to develop new and better products and to finance expansion.

digital EQUIPMENT G.M.B.H. KÖLN

INTEROFFICE MEMO

DATE June 28, 1966

SUBJECT Digital's future in Germany

FROM Gerry Moore

TO All D E GmbH employees

An example of the way corporate earnings have been used to finance expansion is seen right here in Germany. Although the German subsidiary buys equipment from the parent firm for an artificially large discount, GmbH has also depended upon large cash advances (or deferred payments on purchased equipment) in order to finance its operations. GmbH is not yet fully self sufficient and presently owes the parent firm a considerable sum.

Digital's growth has been quite astounding. Consider the most recent 3 year period. World-wide sales have been:

year ending June 30,	1964	$ 11,000,000.
" " "	1965	$ 15,000,000.
" " "	1966	$ 22,000,000.

This latter figure is, of course, an estimate at this point and should be considered extremely confidential.

We can expect this growth record to continue. We are shortly going to introduce several exciting new products. We have been very competitive in the past and will continue to be more so in the future.

The overall growth of the parent firm and its subsidiarie has been even more dramatic in this subsidiary. A year ago, GmbH had 6 employees and was just opening its 2nd office. Today we have 12 employees and 3 additional people will start with us by Oct. 1. Meanwhile, we continue to look for new people. The Cologne office is now moving into larger, more adequate quarters. Before the end of the year, we will open a field service office in Holland. Our future is unlimited and depends only on our own personal limitations. We are being given the products to sell and the means to sell them. When the sales level reaches the point where we can justify it, we will undoubtedly begin to manufacture in Germany.

digital EQUIPMENT G. M. B. H. KÖLN

INTEROFFICE MEMO

DATE June 28, 1966

SUBJECT Digital's future in Germany

FROM Gerry Moore

TO All D E GmbH employees

That brings me, at last, to the point that I have been leading up to. Although everyone knows this, it bears stating: We are basically a sales organization. It is so important for everyone to appreciate the meaning of this that I will repeat it.

WE ARE A SALES ORGANIZATION.

And this has implications for everyone; not just for those we call salesmen. All of us have a lot of customer contact. We are all, in effect, salesmen. Good field service is an important adjunct to sales. Proper customer relations by our secretarial and administrative staff is also an important adjunct to sales.

Since we all are sales people, it is important for us to know how to behave like sales people. The first thing everyone should appreciate is that he or she represents the company. Not the customer, the company (and that means the Corporation and all its subsidiaries) pays us our salaries. Not the customer. And not anyone else. In return, the company expects our loyalty to the interests of the company. We should strive to put the companies best foot foreward. You should never ally yourself with a customer, or other party, in a conspiracy against the company. This creed, for example, says that it is an unforgivable sin to make excuses for mistakes to the customer by saying "They do this to us all the time in Maynard", or "This isn't the first mistake our accounting department has made", or "I can't seem to get that secretary to write neat letters". Such statements to our customers about other members of our organization are sins punishable by excummunication. The tenth commandment of the "Ten Commandments for Selling Us" issued to visiting salesmen by the Charles S. Martin Co. of Atlanta is: "Thou shalt not be disloyal to the company which pays thy bread and wine, for then I shall distrust thee, too". It is a good creed to remember. If, after considering all its problems and faults and having balanced these against all of its assets, you don't consider your company one of the hottest ones going, then you should seek employment elsewhere with a company to whom you can be loyal.

digital EQUIPMENT G. M. B. H. KÖLN

INTEROFFICE MEMO

DATE June 28, 1966

SUBJECT Digital's future in Germany

FROM Gerry Moore

TO All D'E GmbH employees

The secret to our success in the future will be, just as it has been in the past, the continuous reward of talent and extra effort. We will continue to be a company of maximum opportunity as opposed to a company of maximum security. This is the way I want it; I hope you do too.

Gerry Moore

Gerald T. Moore

INTEROFFICE MEMORANDUM

DATE June 24, 1966

SUBJECT ARENCO - Forthcoming Visit

TO Ken Olsen
Nick Mazzarese
Howie Painter

FROM Ted Johnson

We are expecting a visit from Mr. L. P. Akselsson, Purchasing Agent of Arenco, on July 7th. He will be accompanied by Mr. Ing Strinnvik who is from Arenco in the U.S. (Teterboro, New Jersey)

Arenco is the parent firm of Telare and, recently, Mr. Walstram of Arenco has taken over control of Telare and there is some possibility that Telare will be dissolved. We are quite dissatisfied with the past performance of Telare and are seriously considering dropping Telare. Because of Arenco and the whole Swedish Match Company (the Walburg millions) parent owner, we want to move very carefully. Also, Arenco could be a good customer. I would like the people to whom this memo is addressed to be on hand to visit with them.

TJ/mr

Attachment

Le HOP.

A R E N C O E L E C T R O N I C S A B

SIKTGATAN 11, VÄLLINGBY 1 • PHONE: 89 00 60 • CABLE: ARENCO STOCKHOLM • TELEX 102 64

ARENCO ELECTRONICS

Engineering Department
Digital Equipment Corporation

MAYNARD, MASS.
U S A

YOUR REF.	YOUR LETTER	OUR REF.	DATE
		PÖ/Bw No 2822/66	June 17, 1966

Gentlemen:

We have been in touch with your representative in England regarding interface problems to PDP8. As our problems are rather technical in nature and as these problems must be solved before July 20, 1966, we have been advised by Mr Reistedt, Telare, to write to the Engineering Department, DEC.

We estimate our need of computers to one hundred units during a ten year period of time. The PDP8 itself will fit well in our project but there are some questions regarding the interface to peripherals that first must be clarified in more detail. We have got the following requests:

1. Do you recommend the use of Data Communication System 680 in our system?

   Please send us detailed technical descriptions and logic diagrams on system 680 in order to enable AREL to judge the applicability of system 680.

2. We plan to use Bryant PhD 170 drum (130 Megabits) as our massmemory. We are, however, somewhat uncertain about the construction of the controller to PDP8. It would be of great importance to us if you would draw the logic diagrams of this controller for us. With your experience in this field it is probably possible to do it in a very short time. We are convinced that your helping us with the controller will be of great mutual benefit as we are strongly considering to use your modules in the system and as PDP8 will be much more competitive if it is also possible to offer a massmemory as a peripheral.

If you have any questions regarding our requirements, please contact our Mr Paul Östling.

As our purchasing manager Mr L-P Akselsson is going to visit the USA in the beginning of July he would be pleased to visit your plant. His address is: Att. Ing Strinnvik, Arenco Machine Company, Inc., 500 Hollister Road, Teterboro, N. Y.

With pleasure awaiting your reply, we remain

Very truly yours,
ARENCO ELECTRONICS AB

ARENCO ELECTRONICS AB

Specification

1. 15 duplex operating teletypewriter-lines (KSR no type reader or punch).

   Input to computer

   150 messages (each consisting of 9 characters) per hour from each teletypewriter-keyboard.

   Output from computer:

   Maximum 40 messages (each consisting of 400 characters) per hour to each teletypewriter-printer.

2. 15 duplex operating serial lines.

   Input to computer:

   50 messages (each consisting of 9 characters) per hour from each duplex line.

   Output from computer:

   50 messages (each consisting of 9 characters) per hour to each duplex line.

3. Massmemory (PhD 170) using the data break facility. Sector transfer consisting of 256 words (1 word = 12 bits) between the memory and the computer. One word transferred every 14 /us.

   Input to computer:

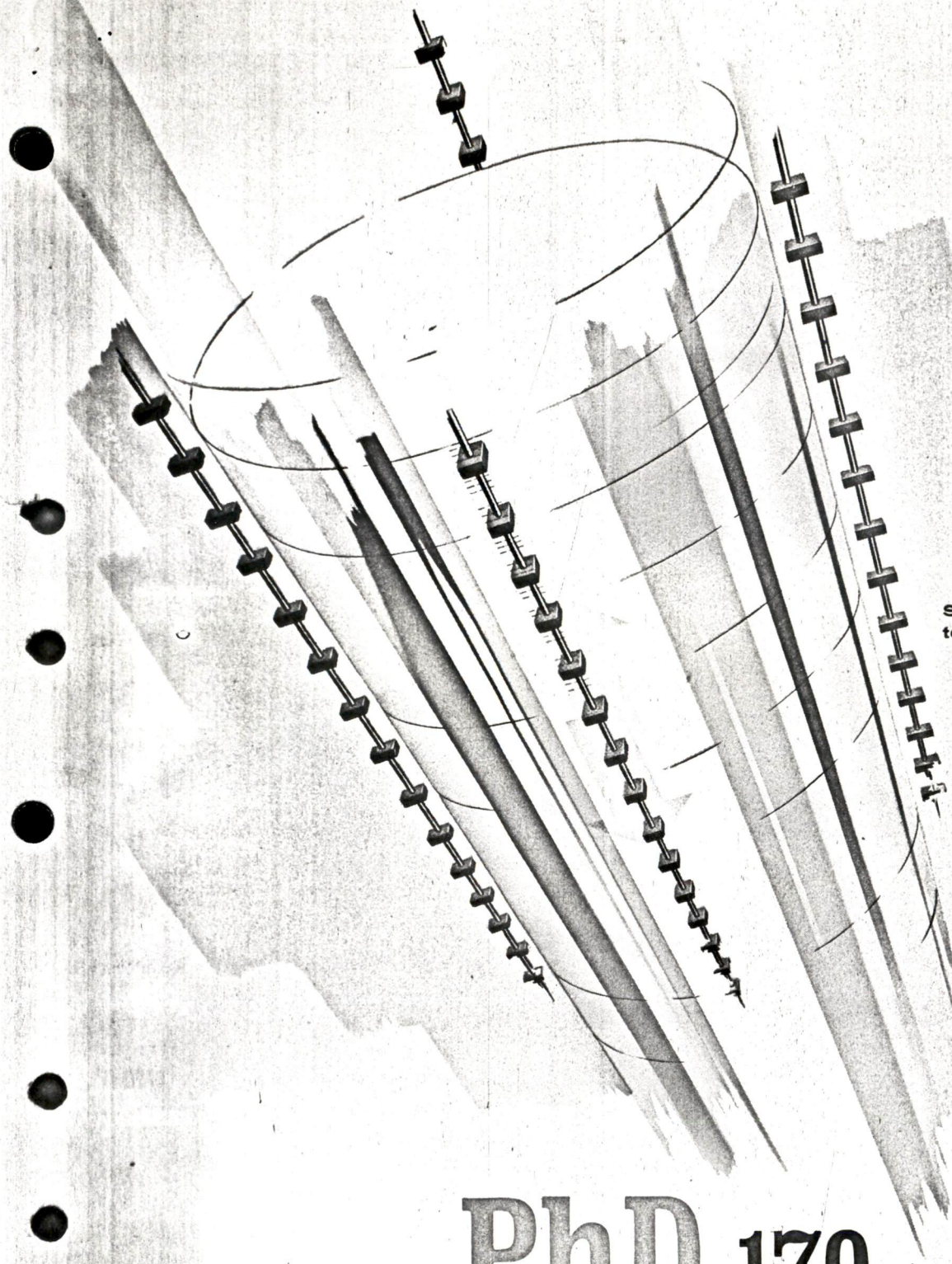
   50000 sectors/hour

   Output from computer:

   200 sectors/hour

4. In the meantime the computer is working with list procedures.

Paul Set
Enclosure 2



Simultaneous multiple access
to more than 21 million bytes!

BRYANT PhD-170

RANDOM ACCESS MASS MEMORY

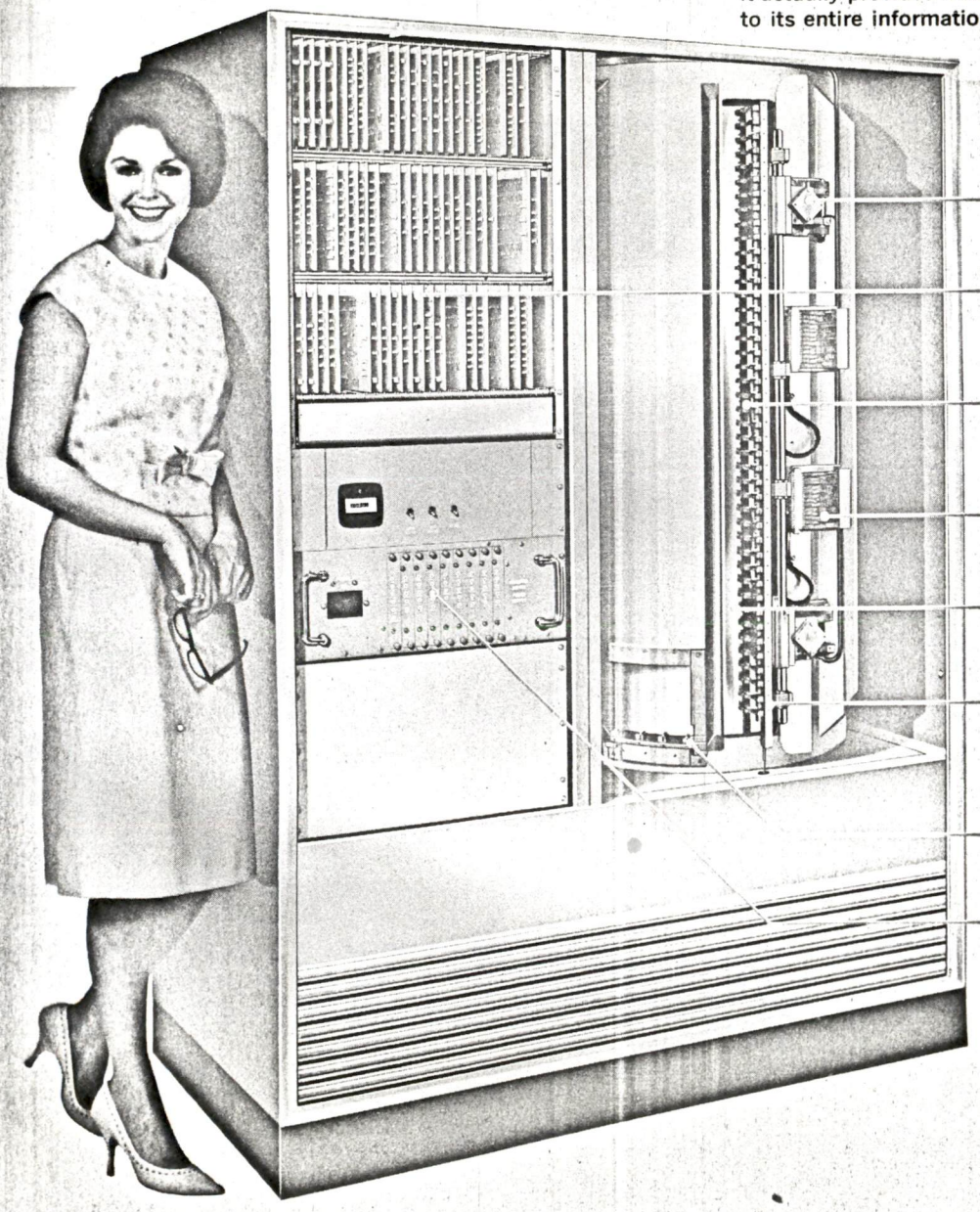
BRYANT PhD-170: the first mass simultaneous multiple access to its entire

VISUALIZE, if you will, a cylindrical drum upon whose surface over 170 million bits of data can be magnetically recorded in 2752 separate tracks. Mounted vertically around this drum are one, two, three, or four groups of independently positionable write/read heads — up to 43 per group — arranged so that the corresponding heads in each system can gain access to the same data stored in any one of 64 assigned tracks at the same time.

This, briefly, is the Bryant PhD-170—a new breed of random access mass memory so unique in concept, so inherently reliable and versatile in operation that it can readily be used for a whole new range of advanced on-line applications. Examples: As a massive information storage and retrieval system for inventory control, banking, stock market transactions, actuarial calculations, directory references — airline reservations and telephone switching systems — buffer storage for scientific and edp computers, process controllers, and data communication terminals, just to mention a few.

For, unlike previous true mass memories, the Bryant PhD-170 is not limited to writing in or reading out only a small portion of its total data storage capacity at any given time. Nor is its remarkable accessing capability dependent upon the use of an excessive number of costly heads and/or elaborate multiplexing selection and write/read circuitry.

Instead, this simple new mass memory requires only 43 discretely positionable heads to serve all of its 2752 tracks. And, if equipped with two or more such write/read systems, it actually provides independent simultaneous multiple access to its entire information store of up to 172,825,600 bits!



"Safe-Set" Head Interlock—A simple automatic fail-safe actuating device that assures non-contact start/stop operation.

Electronic Interface—Write, read, head select, and logic electronic circuit modules available in standard or special systems designed to meet your specific needs.

Read/Write Heads—All heads are high density aerodynamic "flying" Uni-Just® units proved in use by years of reliable service in many Bryant Auto-Life Drums.

Signal Preamplifiers—Provide a gain factor of approximately 5 to the playback values fed to the read amplifiers.

Magnetic Storage Drum—Smooth, hard plated surface is special high density, high reliability magnetic recording material.

Positionable Head Bar—Up to four access systems with up to 43 heads each can either be used to address the same information simultaneously or up to four different data stores independently.

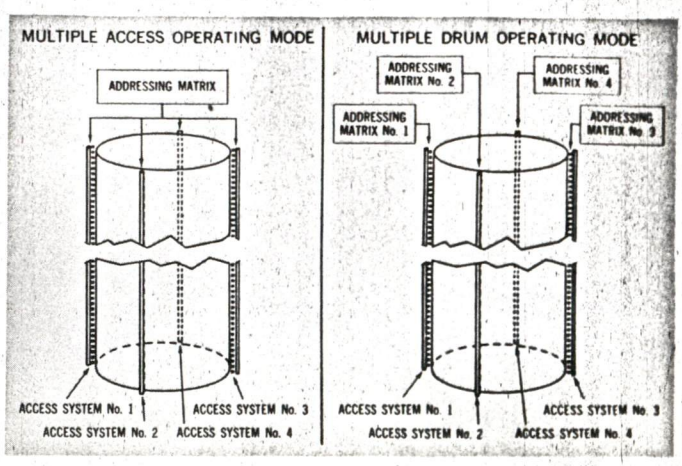
Fast Access Heads—Non-positionable units provided to serve various fast access data, register, or clock functions.

Address Preamplifier—Standard unit provides customer address signal amplification for two positionable access systems.

memory capable of providing independent information store—over 170 million bits!

Operating Modes—As shown at right, a Bryant PhD-170 having more than one access system offers exceptional programming flexibility. In the Multiple Access operating mode, all 43 heads in each access system can be addressed through one matrix and all can write/read over the entire recording surface of the drum. If operated in the Multiple Drum mode, 10 heads in each access system can be addressed through separate matrices at different frequencies to write/read on 640 tracks. In both modes, the PhD-170 can serve several computer and/or data processing installations at the same time.

Transaction Rates—Very high transaction rates can also be achieved with the PhD-170. For example, using a 2000-byte message length, a 1200-rpm/two-access drum memory can be multiplexed to perform nearly 200,000 transactions per hour. Four access systems would allow the drum to service two processors at this same rate.



CHARACTERISTICS OF BRYANT PhD-170 RANDOM ACCESS MASS MEMORY

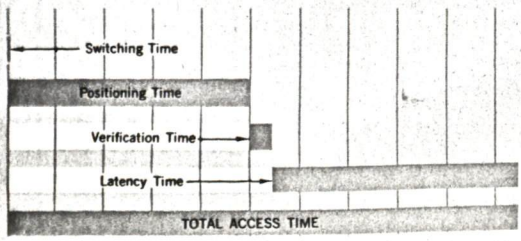
PARAMETER	SPECIFICATIONS
Drum length	43 inches
Drum diameter	20 inches
Drum speed (nominal)	1200 (or 1800) rpm
Drum surface speed	1250″ per second
Time to reach operating speed	5 minutes
Data tracks (maximum)	2752(1)
Fast-access data, register or clock tracks	16(2)
Track width	0.010 inch
Track-to-track spacing	0.015 inch

PARAMETER	SPECIFICATIONS
Data Storage Capacities:	
General data—per track	62,800 bits, or 7,850 bytes(3)
—per drum	172,825,600 bits, or 21,603,200 bytes
Fast-access data, register or clock—per track	62,800 bits, or 7,850 bytes
—per drum	1,004,800 bits, or 125,600 bytes
Data heads—per positioner	43 max.
—per drum	172 max.
Fast-access data, register or clock heads—per drum	16(2)
Inductance—for half coil at 140 Kc	10 (±1) microhenry
Resonant frequency (nominal)	7.0 megacycles
Termination impedance	1 kilohm

PARAMETER	SPECIFICATIONS
Recording mode	Self-clocked, phase modulated
Pulse repetition rate (nominal)	1.2 megacycles
Pulse density	1000 bits per inch
Playback (from preamplifiers)	75 millivolts (avg.)
Power requirements	208-volt, 3-phase, 60-cycles
Power demand per phase—start	9.7 kilowatts
—run	5.1 kilowatts
Current demand per phase—start	27 amperes
—run	14 amperes
Ambient temperature range—non-operating	—30° to +130°F
—operating	60° to 90°F
Ambient humidity range—operating	10 to 80% relative

NOTES (1) With the maximum capacity configuration, a total of 16 tracks are available for fast-access data, register and clock functions. (2) To provide a large fast-access capacity in conjunction with general storage, one fast-access data, register and clock track can be added to the drum for each three general storage tracks removed. (3) Values shown based on 8 bits per byte.

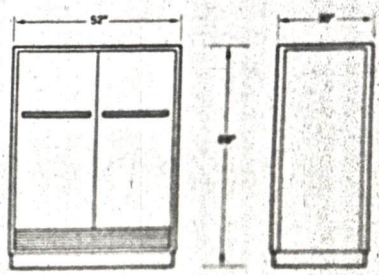
Diagram Breaking Down Total Access Time



	BEST CASE Sequential, Track to Track	WORST CASE Full Stroke, Track 0 to 63 or 63 to 0
Switching Time	μs	μs
Positioning Time	25ms	50ms
Verification Time	5ms	5ms
Latency Time	0ms	50ms
TOTAL ACCESS TIME	30ms	105ms

Times shown above are based on use of 43 data heads and one head positioning system. Positioning time includes time to energize solenoid valve plus time for motion and settling. Access time for fast-access data heads is μs to 50ms.

Physical Specifications/Dimensions and Weight



Total weight, installed—1500 pounds.

Every part and every component—whether newly developed or thoroughly established by successful prior use—must be approved by this Design Review Committee before it can be incorporated in new Bryant products.

Departments represented on the Committee include those responsible for product design, reliability engineering, value analysis, manufacturing, application engineering and customer field service functions.

"Total Product Assurance" Concept is the Key to Bryant Quality

One reason why Bryant has become the world's leading independent producer of memory drums and disc files is its concept of "total product assurance." For when you buy Bryant equipment, you can be sure that: 1) Its design is based upon proven principles of operation and performance. 2) Every outside purchased component is the very finest obtainable. 3) Every precision part and assembly is controlled to the highest known standard of accuracy and quality. And 4) every finished product has been subjected to thorough computer-simulated testing prior to shipment to assure the ultimate in value and reliability.

Other Bryant customer services include complete installation of equipment by qualified factory engineers, a special training school for instruction of your personnel, and an inventory of spare parts—many having assigned federal stock numbers—to assure prompt field replacements when necessary.

BRYANT COMPUTER PRODUCTS

A Division of EX-CELL-O Corporation

850 LADD ROAD □ WALLED LAKE, MICHIGAN 48088 □ Telephone 313/624-4571 □ TWX 810/231-7190

Publication No. BCPB-109-5-65
First Printing May 23, 1965

Litho in U.S.A.
5M—A.P.

INTEROFFICE MEMORANDUM

DATE June 23, 1966

SUBJECT Technicon

TO Ken Olsen
Stan Olsen
Nick Mazzarese
Mike Ford
Ron Smart
Dave Denniston

FROM Mort Ruderman

Ron Smart and myself visited with Mr. Milton Pelavin and Mr. Brooks from Technicon on Friday, June 17. Mr. Al Brooks again is their Computer Applications Engineer, and Mr. Pelavin is their Systems Engineer. I had talked with Mr. Brooks previously that week. Mr. Pelavin called inquiring about mostly discount questions and the relative cost of our expanded memory versus namely SCC's in Texas.

Mr. Whitehead who is the President of Technicon is presently in Europe. However, he called Mr. Pelavin early this week, asking him how the evaluation of SCC and DEC was coming. Mr. Whitehead is to return this week and hopefully make the decision. Areas of specific concern are as follows:

1. The cost of additional memory
2. Why the first system in the OEM discount arrangement is not discounted.
3. Some sort of arrangement that will make the system that we'd deliver to Technicon, a propriatory system.

We began by detailing what our present OEM is. Also, we went into what our proposed OEM discount schedule will hopefully be in the near future. They seemed satisfied in the answer to question #1, in that yes, prices of additional memory will be reduced by the first of the year, with the assurance that these would be very competitive to what other manufacturers presently quote for an additional 4,000 words of memory.

The answer to question #2 of why the first computer is list price, was that that is our policy and today in time, we are not about to deviate from that. They seemed to appreciate this, however, I am sure that this question will come up again in any further negotiations we have

with them. On question #3 as to a propriatory system, I left them with the assurance that we could do some logical design and packaging configurations that would give it some sort of propriatory significance. The things I indicated, such as we could silk screen the PDP-8 front panel that might read Technicon Model 1000, or whereas they might be buying large quantities of Receive Only teletypes, we would design the LTO-8 so that it would operate specifically in Receive Only for their system, and by doing same probably be able to reduce the price of the system. Also indicated that we probably could come up with a nice packaging arrangement in the new PDP-9 cabinet for the system configuration that they specify. Also indicated that we are willing to do things like paint cabinets their colors, or make superficial exterior changes that would have the outward appearance of being a system delivered by them. I told them that we could not give any propriatory or exclusive arrangement to packaging a PDP-8 with standard I/O for them only, and not available to anyone else. They seemed to be quite understandable.

The system configuration that we spoke about was as follows:

PDP-8, $18,000
2 R033's @ $825 each, $1,650
1 LT08A @ $1,200
2 LT08B's @ $1,200 each, $2,400
1 Type 189, $1,450
1 Type 139, $2,000
3 A100, @ $100 each, $300
Total Cost: $27,000

With this system, under the new discount schedule, for a quantity of 100 machines it would fall into the 27% discount area, or $19,600. They also asked to list down the same system using the serial PDP-8. The change here would be to replace the 189, we would have to replace this with the Type 138E. The total cost of this system would be $20,020. Using the same multiplier, the system would be $14,500. It would also fall into the 27% discount area. This one just makes the 27 with the

standard PDP-8 just falling short of the next discount level under the new OEM arrangement. I also indicated the following:

Delivery of a basic PDP-8 configuration they asked for in August, less the R033 capabilities for a firm quantity purchase order. A complete system delivered as one unit, could be delivered in September, 1966, and if they chose to put DECtape on the same system, October, 1966. The first delivery of the serial PDP-8 is for September, 1966. We could not tell them at that time when we would be able to deliver them one. Indicated that for a large quantity purchase, we would make every effort to get them one of the first 8S's.

Things to expect in the next few weeks are: a phone call from Mr. Whitehead to Ken Olsen, probably rediscussing some of the areas that we discussed this past week. The areas that they will probably re-emphasize are will we give them a specific price on the reduced memory cost. Under what arrangements will we discount the first system to OEM. If this goes well, then I would assume that these people will visit in the next few weeks, to sit down and make final negotiations and arrangements.

Other areas that I indicated, that for a large purchase, we would probably assign one individual to be responsible for their account that would keep in very close contact with their desires and needs, similar to what we are doing for Foxboro right now.

MR/sb

File

INTEROFFICE MEMORANDUM

DATE June 23, 1966

SUBJECT EXHIBIT SYSTEM

TO Ken Olsen
Stan Olsen
Nick Mazzarese
Win Hindle
Tim McInerney
Paul Rawson
Rod Lopez-Fabrega

FROM Jim Jordan

We are all interested in presenting our products in the most effective way possible. I believe an exhibit system is the best way to do this.

A system allows us flexibility to use, virtually, all exhibit spaces, large or small, in line or island. It presents minimum maintenance and revision costs. It is notable for its ease of erection and dismantling and the resultant lower costs for these services. It exhibits our products consistantly and well. It includes in its design, provision for all of the variations likely at any show as well as the often-overlooked small details. It eliminates the need for custom, special booths. It allows us to concentrate on the booth content without spending valuable time (once developed) on display fixtures.

Van Dyke Associates has sent me a tentative proposal outlining such a system. It is enclosed with this memo. Also enclosed is a schedule and cost breakdown, by Van Dyke Associates, on the five shows which we have discussed as important for introduction of our four new computers and an estimate of the costs for the design, construction and maintenance of a booth for the next three years as contrasted with the three year cost for our present back wall approach.

It takes approximately one month for design and one month for construction of a booth of this kind. Successful completion of this project in time for the Wescon Show requires that we make an early decision. We will meet for this purpose in the next few days.

VAN DYCK ASSOCIATES DIVISION OF VAN DYCK CORPORATION SOUTHPORT, CONN. 06490 AREA CODE 203 259-5253

16 June 1966

Mr. Jim Jordan
Digital Equipment Corporation
Maynard, Mass.

Dear Jim:

Thank you for the opportunity to expose D.E.C. to our capability in exhibition design. As I hope we made clear in our presentation, we feel we can make a significant contribution to your exhibit program. As you have seen, our experience has been primarily with clients whose needs, requirements, and design philosophies are similar to your own.

We believe that the most economical and useful solution for you is to consider the development of a DISPLAY SYSTEM. For an initial expenditure of from three to five thousand dollars this will provide you with a modular system consisting of:

1. Back walls
2. Side walls
3. Flooring
4. Storage capability
5. A lighting system
6. A graphics system
7. A product display system

The entire system will be tailored to your specific product display needs, marketing objectives, demonstration methods and will give you the capability to present yourselves to the exhibit market place in a consistent and effective way. The system will be designed to allow you to exhibit in almost any size and normal configuration of space.

We will consider such basic requirements as

1. The typical types of spaces you exhibit in
2. The type of audience you wish to play to
3. Your marketing objectives in attending trade exhibits
4. Your specific approach to selling at exhibits (hard-soft)
5. The types of products you will display
6. The optimum way to demonstrate your products

7. Your specific storage requirements
8. Literature distribution requirements
9. Conference areas
10. Seating, ashtrays, accessories, etc.

Jim, the above notes are very preliminary, of course. As soon as you feel the time is right, we will prepare a more detailed formal program and budget estimate.

Best regards,

Rodrigo Lopez-Fabrega
Associate

RL-F:ctk
16 June 1966

cc: Kenneth Olsen
Loren Prentice

6/23/66

SCHEDULE AND COST ESTIMATE FOR FIVE SELECTED EXHIBITS

	WORK	PLACE	DATES	ESTIMATED COST
1.	Design & Supervision During Construction	Southport, Connecticut	July 1 - August 12	$ 5,000.00
2.	Construction NOTE: (30' To Be Constructed In Time For Wescon. Remaining 30' To Be Ready For FJCC)	At Display Of Our Choice	August 12	Tentative Cost For 60: 50 Goal For FJCC. 10' As Spare And For Contingencies 12,000.00
3.	Inspection	Maynard	August 12	
4.	Ship	Wescon, Los Angeles	August 12 - 19	1,000.00
5.	Erection		August 20 - 23	500.00
6.	Show		August 23 - 26	
7.	Dismantle		August 27 - 28	500.00
8.	Ship	N E C, Chicago	August 29 - 31	700.00
9.	Erection		October 1 - 3	350.00
10.	Show		October 3 - 5	
11.	Dismantle		October 6 - 7	350.00
12.	Ship to New York	I S A, New York	October 20	200.00
13.	Erection		October 22 - 24	200.00

WORK	PLACE	DATES	ESTIMATED COST
14. Show		October 24 - 27	$
15. Dismantle		October 27 - 28	200.00
16. Ship	NEREM, Boston	October 28 - 29	200.00
17. Refurbish		October 30 - 31	150.00
18. Erection		November 1 - 2	300.00
19. Show		November 2 - 4	
20. Dismantle		November 4	300.00
21. Ship NEREM Section (30') Air Freight	FJCC, San Francisco	November 4 - 6	1,000.00
Ship PDP-11 Section (20') Land		October 31 - November 5	650.00
22. Erection		November 5 - 8	700.00
23. Show		November 8 - 10	
24. Dismantle		November 10 - 11	700.00
25. Ship	Maynard	November 11 - 18	1,000.00
		Total Cost of Five Shows	$ 26,500.00

EXHIBIT BOOTH COSTS FOR THREE YEARS

FISCAL YEAR	NEW BOOTH SYSTEM		PRESENT BOOTH	
1966			Design and Construction	$ 10,000.
1967	Design Construction Maintenance	$ 5,000. 12,000. 3,000.	Maintenance	5,000.
1968	Maintenance	4,200.	Maintenance	5,000.
1969	Maintenance	4,200.	Maintenance	5,000.
1967 - 1969	Total Cost	27,400.	Total Cost	15,000.

Cost Difference Per Year 4,133.

INTEROFFICE MEMORANDUM

DATE June 21, 1966

SUBJECT STANDARDIZATION OF CONTROL PANELS - MEETING - JUNE 17, 1966

TO Ken Olsen FROM Jim Jordan

Friday, June 17, 1966, a group consisting of Ken Olsen, Stan Olsen, Ed DeCastro, Larry Seligman, Mike Ford, Loren Prentice, Ron Cajolet, Bob Savell and Jim Jordan met to discuss standardization of our control panels.

The following subjects were discussed:

1. Switches

   a. All stackpole switches for this application should be the same. This will be a single wipe, detented version.

   b. Different activating levers may be attached, depending on application.

2. Switch Assembly

   The switch assembly is to be the same, that is, switches mounted on P.C. Boards. The PDP-9 may be used as a model. PDP-8/S is a unique approach and should be considered for future applications.

3. Light Bulbs

   Light bulbs will be the same as those presently in use. A new plugable light bulb and clip are now under investigation, but will not be available for evaluation for two or three months. Several other plugging systems have been looked at in the past. None are as inexpensive and reliable as the present method. No complaints about our control panel have been registered and so we must assume that while it is desireable to have plugable bulbs we do not need a new system. Any new system will be judged when it is proposed.

For improved convenience in replacing burned out bulbs, the control panel should be made easily removable.

For improved reliability light, bulbs should be burned or pulsed in at full rated wattage by us or by one of our several suppliers.

4. Plexiglass vs. Glass Panels

Ron Cajolet will have figures by Friday showing comparative costs of the PDP-8, PDP-9 and Eight-Linc Panels. The pros and cons for using one or the other are as follows:

A. Glass

pro: quick delivery; low cost (with present vendor); can screen on back, therefore protecting silk screening; is readily available; has good scratch resistance

con: cannot be machined; is not tinted; cannot give dead front effect; quite often imperfections show up only after screening; is some question if glass can span 32½ inches; edges chip; must have complete trim wrap on edges; only marginal quality

B. Plexiglass

pro: is tin table and therefore allows dead front approach; easily spans 32½ inches; does not chip; does not require additional framing hardware; high quality

con: is relatively expensive to silk screen with our present vendor; must be silk screened on front; is susceptible to scratching; long lead time required for delivery

copies to:

K. Olsen	S. Olsen	E. DeCastro
L. Seligman	M. Ford	L. Prentice
R. Cajolet	R. Savell	J. Jordan

file

digital EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

TO: Ken Olsen, Harry Mann, Ted Johnson
cc: Nick Mazzarese and Win Hindle

FROM: Stan Olsen
DATE: 21 June 1966

RE: Telephone Switchboard/Paging and Reception for Building 12

The system proposed and accepted by the Works Committee is as follows:

1.) Two (2) telephone operators would be located behind the wall without reception duties to allow them to perform the most efficient telephone service.

2.) The full time paging girl would be located adjacent to the telephone operators. She would do all normal paging and when an operator could not reach someone at his extension, the call would be turned over to the paging operator. This would then allow purchasing and personnel to supply receptionists in Bldg. 5 whose only responsibilities would be reception work. They would no longer do paging work which was only a secondary task, and would eliminate the problem of two girls paging at the same time.

3.) The receptionists' functions would be performed by part-time girls from the 2nd and 3rd floors of Building 12. A typewriter can be kept at the reception area so the girls may continue their normal work during the reception work.

Stan(mel)
Stan

SCO/mel

INTEROFFICE MEMORANDUM

DATE June 20, 1966

SUBJECT TRIP REPORT TO AMP CORP., HARRISBURGH, PA. (June 9 & 10)

TO Product Line Managers
Ken Olsen
Harry Mann
cc: Henry Crouse
Dick Best

FROM Loren Prentice

I was accompanied on this trip by Henry Crouse, Purchasing, and by Dick Best. The purpose of the trip was to evaluate the facilities, receive the latest proposals on connectors and view the operation of termi-point machine and termi-point system.

The AMP Corporation spent considerable money to transport the three of us there and missed the significance and purpose of the trip. There was a great deal of the "Madison Avenue" approach to our visit and not much to what our real purpose was. There were no accommodations for allowing us to visit the things and have overnight conferences among ourselves, at which to discuss the things that we wish to see and questions that would be pertinent on the second day.

Some of the highlights of the visit were proposals on connectors. There is no compatibility or attempt of compatibility between wire wrap and termi-point. The termination tails for the two systems require significantly different parameters. They had made up models showing a very close use of 32 x 62 pins with termi-point that showed us possibilities and also its limitations. The drawings provided for their proposal were nebulas in the extreme showing almost nothing of how their proposal is surpose to be and we only had this by word of mouth and only in a vague manner.

We had a very satisfying and informative trip into their laboratory where they measure plating thickness. Their psychology in the use of plated materials was fully explained to us and we were shown the instrumentation used for arriving at their conclusions. They claim they can use 30 millionths of gold over nickel for 500 insertions. A few significant details were missing as to how heavy a load was produced on these terminals and the exact manner of the tests.

We reviewed the termi-point machine on Thursday at approximately 11:00 AM. They were running a single head machine on a panel approximately 15" x 20" and were running two smaller

panels on a double head machine in the same area. They have at the present time, about 16 machines in production for various customers and approximately the same number have been delivered to customers. The machine is now in its fourth generation, and significantly it also has its fourth generation of mechanical engineers assigned to it and I do not believe as yet, with the exception of the production people, that these people have been aboard long enough to really know the problems attendant to this type of operation. The mechanical engineer who described this operation to us had been in charge during the third generation of the machine. The third machine, the presen production model, has an easily replaceable head which can be changed in about 30 minutes to an hour and one half, depending upon the number of changes required.

They have two problems still to be solved which are significant. These have been partically solved but not completely. One is the control of the wire as it is fed into the machine. There is a possibility of loosing control of this wire, at least part of the time, as it is fed down to the termi-point and inserted for the tail. The second is wire dressing on the panel. This is a complex problem and has been attempted to be met by designing a tamper foot for each job. This presents a considerable problem for those persons who want to make short runs of the small number of panels and would have to have a significant number of tamper feet. This is accomplished at the present time and on the machines that we watched, by removal of any tamper foot and by the operator, who has to be in constant attendance to keep the wires pressed down below the height of the tails. Otherwise the machine will follow these wires as it makes the second or third connection.

The two headed machine had to be slowed down to its slowest speed in order for the operator to take care of both of the panels. As this machine had not been in operation for long, it was quite probable that the operator can do a significantly better job after a reasonable learning period. The operator has to be clever and nimble with fingers in order to stay out of the way of the machine and do this dressing. It is an operation which would probably cause a safety man to do some gasping.

The conclusion is that their pricing of their connector is out of the range that we wish to pay; that they do not provide any services that would significantly make up for this difference in price; and the machine presents many difficulties. It is possible to use, but I don't believe it competes very well as opposed to wire wrap at this time.

file

INTEROFFICE MEMORANDUM

DATE June 17, 1966

SUBJECT Bulk Storage Trichlorethylene

TO Ken Olsen ✓

FROM John Trebendis

cc: Henry Crouse
Cy Kendrick
Dick King
Loren Prentice
Dave Widder

We are in the final stages of signing an agreement for Bulk Storage of Trichlorethylene. The agreement is with General Chemical Corporation. General Chemical Corporation has agreed to install all tanks, piping and valves for the proper handling of the solvent. They will maintain (other than our own misuse) all equipment that they install. The entire installation and maintenance of this equipment will be done at no charge to Digital Equipment Corporation, except for any electrical wiring that may be required. The system will consist of five separate tanks.

BOARD PREPARATION AREA

1. 500 gallon storage tank
2. 500 gallon storage tank for contaminated solvent

MODULE PRODUCTION AREA

1. 500 gallon storage tank tapped to degreaser
2. 500 gallon storage tank with piping and drain for small usage

SHEET METAL SHOP

1. 275 gallon storage tank tapped or piped to degreaser

General Chemical guarantees that we will not run out of solvent at any time. It will be on a guarantee delivery schedule. If for one reason or another we require more solvent, they will deliver on one day's notice.

General Chemical will also have our contaminated trichlorethylene reprocessed. We will use this trichlorethylene in the Module Production Area and Sheet Metal Shop. Virgin Trichlorethylene will be used in the Board Production area only.

The savings involved in this set-up is quite substantial. We are going to save $.01 1/4 per pound on all Virgin Trichlorethylene. We also save $.05 per gallon on reprocessed Trichlorethylene.

Additional savings will come from labor normally involved in moving 55 gallon drums to specific areas and also sending back contaminated Trichlorethylene for reprocessing. We use approximately 20 barrels per month. Trichlorethylene averages in weight 660 pounds per 55 gallon drum. With a little bit of figuring, you can estimate the savings involved.

My further recommendations are that some time in the near future we should consider the installation of a Still so that we may reprocess our own contaminated Trichlorethylene. An approximate cost of this unit installation would run around $1,600.00. Going on the basis of what we process now, we would pay for this installation and any labor involved to operate within six months. The unit would offer considerable savings to Digital Equipment Corporation.

John Trebendis

John Trebendis

Ken Olsen

file

INTEROFFICE MEMORANDUM

DATE June 17, 1966

SUBJECT Proposal for Telephone Service

TO Product Line Managers
Works Committee Members

FROM Ted Johnson

Since we haven't had a chance to discuss this so far, I would like to outline certain facts in the basic proposal for handling the telephone system.

FACTS

1. Service now suffers because of the lack of operators for coffee breaks and lunch. As it stands, we have had up to 130 minutes during the working day during which time only one girl is on the switchboard. Plant employees tend to misuse the service the most surrounding the coffee break time, although, I believe, this has improved with the addition of more pay phones.

2. There is a basic capacity problem which is that the Maynard exchange has an inadequate number of lines to surrounding communities, including Boston. The problem is not in our lines to the Maynard exchange. This affects area code dialing to Maynard because all 617 calls are routed through the Boston exchange automatically. This explains, for instance, why calling from Sudbury to the plant might get a busy signal which has nothing to do with our switchboard.

3. Our needs for having some answering service capacity has increased in after-hours and on Saturdays. Field Service needs an efficient system, the company needs to present a good picture to the outside world and we need to be able to call into the plant for people who are working during these extra hours and reach them efficiently.

4. Our domestic phone bills are running close to $20,000 per month. We estimate that one-half of this is in long distance calls and that the breakdown is as follows:

Customer Calls	
Maynard to Customers (including non-WATS calls to branches)	$6,000
Branch to Customers	$2,000
	$8,000

Inter-Company	
Maynard to Branches (Current pseudo WATS line)	$3,000
Branches to Maynard	$1,000
	$4,000

Equipment Costs	$3,500
Boston Area Calls	$1,000
TWX	$2,500

I am excluding foreign communications costs from this report. They have exceeded our budget and we will have to analyze this in detail. We hope to make significant reductions through improvements in Sales Administration and DATEL, which will go into effect in the next few months.

PROPOSAL

1. Nancy Funderburk be made supervisor of the communications area in Building #12, acting as receptionist, travel girl, trainer and help spell the switchboard.

2. Ferne Halley and another girl be full-time switchboard operators.

3. A paging operator be immediately set up next to the switchboard. She will also help to spell the switchboard.

4. Nancy will be responsible for seeing that two girls are on the switchboard at all times.

5. We set up at least one WATS line immediately. In this line, I believe we should investigate additional WATS lines, cut back on unrestricted phones to a minimum for emergency use only; and request all company personnel to make calls to certain areas only on the WATS lines.

A WATS to service the New York and Mid West area is less expensive than the current WATS lines which have full area coverage. I believe one full area coverage line should be made available to the Western Region and be the only way of communicating from the West Coast.

6. The TWX and Telex should be a function of the organization of the people who require the most communication. A possibility is that the TWX and Telex be located near Sales Administration preferably, assuming that the Sales Administration function will be located in the same area. Another possibility is that we locate the TWX and Telex near the switchboard with an internal TWX for re-transmitting TWXes to Sales Administration or Field Service twice daily.

7. We immediately hire a girl to man the switchboard from 5:30 - 7:30 P.M. on weekdays and 9:00 A.M. - 4:00 P.M. on Saturdays. She will be able to both page and call extentions. People in the plant on Saturday should notify her of their whereabouts if they want to be reached.

8. Field Service recommends using an answering service and, on a rotary basis, a Field Servicéman will be assigned to be on duty and will call the answering

service to accept any inputs. This should go into effect as soon as possible.

9. Finally, we need a company education program to make sure that people use the telephones well. I will enforce the system on the branch offices who are currently misusing the WATS capacity from time to time.

TJ/mr

K. Olsen

INTEROFFICE MEMORANDUM

DATE June 14, 1966

SUBJECT Project Schedules

TO Project Managers

FROM Rod Belden

Included in this memo is a selection of the ideas on project scheduling which were presented at the Monday Works Committee Meeting. In addition there are some ideas as to how we might structure a continuing program of reviewing the progress of projects.

Common Format

It was generally agreed that the use of a common format would simplify the review and exchange of ideas. The EXPERT format of plotting a schedule and listing manpower requirements is a compromise between the PERT system of mapping and the GANT system of charting. It incorporates the PERT event-dependency concepts with the GANT bar-schedule methods. Much of the study of the EXPERT system was done for DEC by a summer student two years ago. An abstract of this work is attached.

Schedule Summary

The Schedule Summary should be a single EXPERT chart which shows the time and manpower requirements of all major parts of the project. If the summary is limited to less than 25 items, it will be a useful overview of the project. Generally each item on the summary would be scheduled in greater detail on other charts for use within the project.

The summary should be written on a sepia master so that copies can be made of it each month. As the schedule changes, the sepia can be changed. In this manner, the new schedule can be compared easily with the previous month's schedule.

What to Summarize?

Include items of importance such as some of A + B below (i.e., Central Processor Prototype Running)

"A"	"B"
Central Processor	Specifications Complete
Memory	Design Complete
I/O Control	Drafting Complete
Periphal	Prototype running
Wired Panel	Received from production
Cabinets	First unit shipped
Control Unit	Completed drafting
Mechanical Assembly	
Fortran	
Assembler, etc.	
Manuals	
Special Modules	
Testors	

Check Points

Specific events within a project (i.e., prototype running, completed wire list, mechanical assembly received from production, etc.) are the most meaningful indicators of progress. Furthermore, in a long project they are necessary to reinforce confidence that the project should be continued. Where possible, check points should be noted on the summary schedule.

Review

Informally review the eight largest company projects once a month. Opportunity to report:

1) Progress of project; check points
2) Changes in project scope
3) $ spent to date and % total
4) Problems needing assistance

Reviews scheduled 2 per week for the month. Keep meetings direct and short. Secretary to Chief Engineer schedule meetings each week and give advance notice to managers.

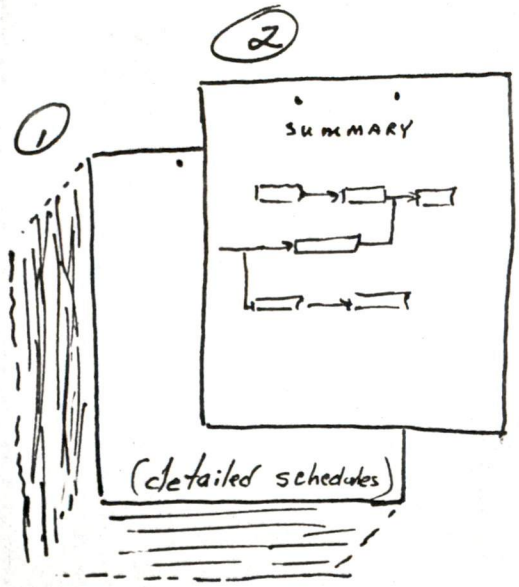
Example:

week of:	July
July 5	PDP-10 and LINC
11	PDP-9 and PMA-8
18	PDP-11 Hardware and Software
25	PMA-8 and Tape Transport

Corporate Project Chart

As each monthly review is complete, the project manager will assist in revising the corporate chart if revision is needed. Although it was suggested that activities such as software, hardware, etc. be color coded alike on all projects to show loading, this will not be necessary with the EXPERT system. Manpower loading is available in detail from the project Summary Schedule and can be totaled for all projects at any point in time.

PROJECT SCHEDULE REVIEW

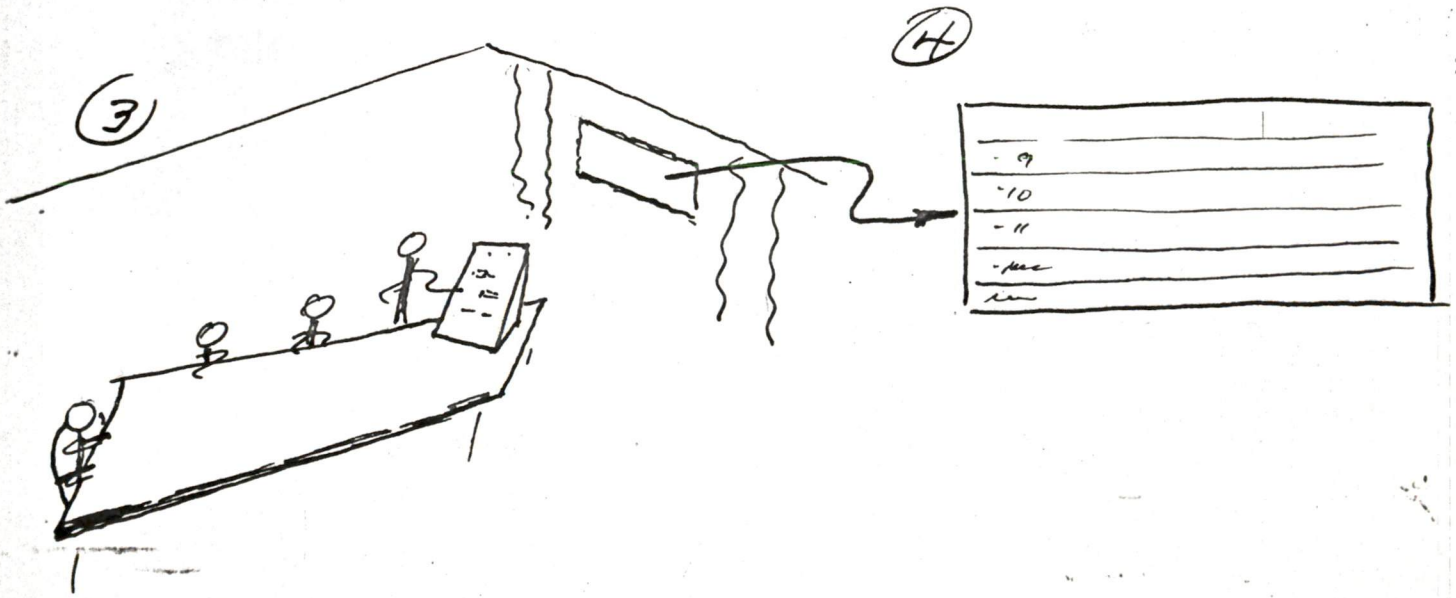


1. Detailed schedules for each major project.

2. "EXPERT" schedule summary on a sepia master. New schedule is compared with copy of old schedule.

3. Brief monthly review of progress, $, problems and changes.

4. Corporate project chart is revised during 3.



ENGINEERING PROJECT SCHEDULING SYSTEM

(Abstracted from a report by R. Vernon Sept. 3, 1964)

The Project Scheduling System is an engineering planning and review aid. The schedule format is similar to that used by the EXPERT system.[1] The project manager is asked to layout on a calendar scale all activities associated with the project, including such non-engineering activities as the preparation of programs and publications. Figure 1 illustrates a hypothetical project schedule. Potential bottlenecks, such as those caused by the failure to order long-lead components at an early date, can often be foreseen and avoided by advance scheduling.

Shown on the schedule are estimates of the manpower required for each phase of the project; included in these estimates are the engineering, technician, drafting, production, and publications requirements. From the estimates, manpower loading forecasts are derived.

These summarized estimates provide the Chief Engineer with information regarding the availability of his technical manpower for work on future projects. The service areas are provided with advance notice of the work load requiremints for each project and of the approximate dates that the work will be expected.

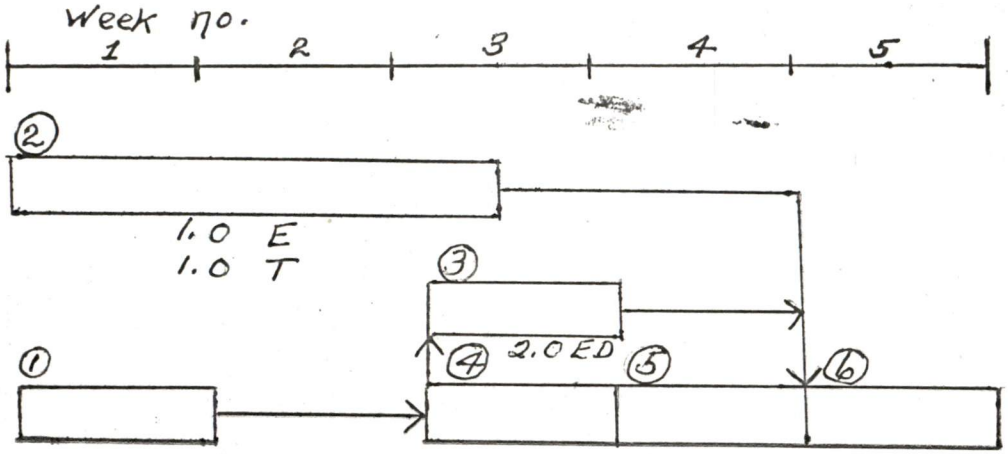
PREPARING THE SCHEDULE - INSTRUCTIONS TO PROJECT ENGINEERS

A basic requirement of the Scheduling System is that the project manager submit a graphical schedule for each project. The usefulness of the system and the accuracy of the manpower load reports depend, in large, upon the thoroughness with which the manager prepares the schedule.

Effort should be made to include all phases of the project on the schedule; in addition to all engineering activities, non-engineering aspects, such as the ordering of long-lead components and the publication of manuals, should be included.

[1] as described in "The EXPERT Approach to Program Control" by Irving C Zacher, Military Systems Design, Volume 7, No. 5, October, 1963, pp. 26, 29.

The manager should adhere to the scheduling format. Project activities are blocked out on a calendar-scaled graph. If a particular activity cannot be started until certain other activities are completed, this is indicated by arrows on the graph. For example, the schedule below indicates that activities 3 and 4 cannot begin until activity 1 is completed. Activity 5 depends upon the completion of 4, and activity 6 depends upon the completion of 2, 3 and 5.



ED - Electrical Draftsman
E - Engineer
T - Technician

Manpower estimates should be made as accurately as possible. Service departments, such as Drafting, should be consulted when making estimates in their areas. Estimates should be included on the schedule, as illustrated above. For example, activity 2 is expected to require one engineer and one technician for the 2-1/2 week duration of that activity. Activity 3 will require an estimated two electrical draftsmen for one week.

Service	Abbreviation
Electrical drafting	ED
Mechanical drafting	MD
Production	P
Engineering	E
Technicians	T

Programming	PR
Wiremen	WM
Technical writing	TW

Manpower estimates for each category relevant to the project should be included on the schedule.

See Figure 1 attached for a more complete example of an EXPERT scheduled project.

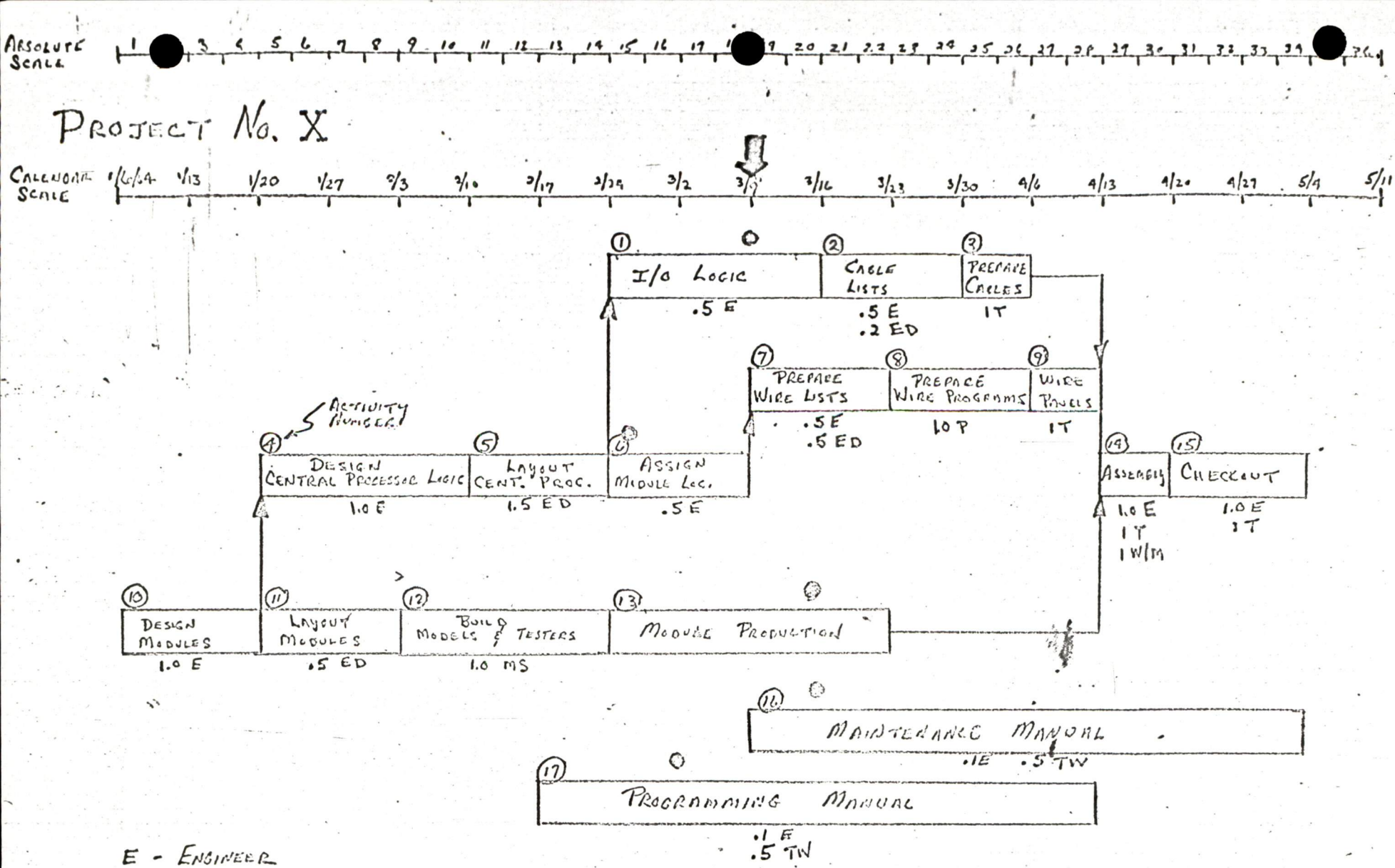

ABSOLUTE SCALE
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
PROJECT No. X
CALENDAR SCALE
1/6/64 1/13 1/20 1/27 2/3 2/10 2/17 2/24 3/2 3/9 3/16 3/23 3/30 4/6 4/13 4/20 4/27 5/4 5/11
1 I/O LOGIC .5 E
2 CABLE LISTS .5 E .2 ED
3 PREPARE CABLES 1T
7 PREPARE WIRE LISTS .5 E .5 ED
8 PREPARE WIRE PROGRAMS 1 P
9 WIRE PANELS 1T
4 DESIGN CENTRAL PROCESSOR LOGIC 1.0 E
5 LAYOUT CENT. PROC. 1.5 ED
6 ASSIGN MODULE LOC. .5 E
14 ASSEMBLY 1.0 E 1T 1 W/M
15 CHECKOUT 1.0 E 1T
10 DESIGN MODULES 1.0 E
11 LAYOUT MODULES .5 ED
12 BUILD MODELS & TESTERS 1.0 MS
13 MODULE PRODUCTION
16 MAINTENANCE MANUAL .1E .5 TW
17 PROGRAMMING MANUAL .1 E .5 TW
ACTIVITY NUMBER
E - ENGINEER
ED - ELECTRICAL DRAFTSMAN
MS - MODEL SHOP
T - TECHNICIAN
TW - TECHNICAL WRITER
P - PROGRAMMER
PRESENT DATE MARKER
ACTIVITY STATUS MARKER

FIGURE 1

INTEROFFICE MEMORANDUM

DATE June 7, 1966

SUBJECT Visit by U.K. Visitors - Tuesday, June 7, 1966 11:00 a.m.

TO Nick Mazzarese
Win Hindle
Ken Olsen
Harry Mann
Stan Olsen

FROM Ted Johnson

People Attending:

Mr. W. S. Elliott - Influential in buying PDP-7 at Cambridge University and either ordering, or has an order for -7 at Imperial College, where he is now going.

Prof. Stanley Gill - Key advisor to Ministry of Technology on computers. Believe he is now at London College - formerly Chief Designer of Atlas while at University of Manchester and Ferranti.

Mr. Laver - Chief computer man at The Ministry of Technology.

Mr. Glennie - Senior Programming Advisor.

These people are visiting in the U.S. presumably with a major reason of finding a large computer system to procure for their University Regional Center, a time-sharing system apparently which will service a number of universities.

Mr. Elliott expressed interest in discussing our plans for manufacturing in the U.K., both following up the visit that we made to Mr. Laver on the PDP-6 and our small computer plans. I believe we could tell them that we approached people like ICT and Plessey and openly discuss our intention of manufacturing in the U.K. Please do not indicate in any way that Mr. Elliott is aware of our discussions with Plessey. The issue of the educational computer mentioned by Mr. Nash might be alluded to if this is information we might reasonably possess.

They are also interested in computer-aided design and possibly we should arrange a half hour walk through the plant from 1:00 - 1:30, or thereabouts, to see the different equipment and possibly have a demonstration on our scope.

OK I WILL GIVE YOU THAT IN A MIN

OK
A.358 6/7/66

Phoned

TO ELSA CARLSON
FROM GERRY MOORE

THE PLASTIC BALLS THAT YOU REFERRED TO ARE QUITE CHEAP. CONSEQUENTLY I AM ORDERING HALF A DOZEN AND WILL SEND THEM TO KEN. I ALSO WILL PASS ON THE LITERATURE AS SOON AS I RECEIVED IT.

These are very senior people and very influential, especially Mr. Laver and Professor Gill in computer activity in the U.K.

This could be an informative visit for all of us.

INTEROFFICE MEMORANDUM

DATE June 3, 1966

SUBJECT FALL JOINT COMPUTER CONFERENCE PLANNING MEETING

TO Ken Olsen
Stan Olsen
Nick Mazzarese
Win Hindle
Joe Nangle
Allan Titcomb
Tim McInerney
Howie Painter
John Jones
Dave Cotton
Paul Rawson
Rod Lopez-Fabriga

FROM Jim Jordan

Van Dyke Associates

The following items were discussed at the Friday, May 27, 1966 planning meeting for the Fall Joint Computer Conference.

1. "The House That Modules Built" theme was discussed. This theme will not be used as we already have several themes which we wish to present. They are:

   We are a single company; we are presenting the family of eight; introducing a PDP-11; and showing a PDP-9.

2. After some discussion it was decided that we wish to introduce the family of eight theme as well as the PDP-9 at the Wescon Show. The following is a list of five shows in which the family of eight will be shown. Some of these shows will also include other sections which are the PDP-9, modules, and the PDP-11.

	SHOW	LOCATION	BOOTH SIZE	DATE	EQUIPMENT
1.	Wescon	San Francisco	40' x 10'	Aug. 23 - 26	PDP-8, PDP-9
2.	NEC	Chicago	20' x 10'	Oct. 3 - 5	PDP-8
3.	ISA	New York	20' x 10'	Oct. 24 - 27	PDP-8
4.	NEREM	Boston	32' x 10'	Nov. 2 - 4	PDP-8, modules
5.	Fall Joint Computer Conference	San Francisco	50' x 10'	Nov. 8 - 10	PDP-8, PDP-9, PDP-11

Because we wnat to present the family of eight idea, new computers as well as displaying modules, it is felt that we want a modular booth that can be shown complete for any given theme (such as the family of eight) in 10' sections. These mdoules, when necessary, may be put together and shown in various lengths with a continuity emphasizing the unity of the company while not loosing the individuality of the separate products. This booth should also provide that we be able to show widely divergent sizes of product such as the 3 Bay PDP-11, the 1 Bay PDP-9, Table Top, PDP-8, PDP-10 and modules. Some ways to achieve this unity are with consistant background color, use of the logo, structure and accessories.

3. There are three or four books to be packaged together in a ring binder or shrink film wrapped. These are the logic, PDP-8, PDP-11, and PDP-9 handbooks. These books will follow the same format as the logic handbook. The idea here is that this will form the nucleus of a "DIGITAL" library of books. Modules will not be shown at the Fall Joint Computer Conference.

4. An overhead sign will be located above the eight foot back wall. It will proclaim that Digital has "Four New Computers".

5. Some method for displaying the action on our scopes is required whether this be a monitor and TV screen or a second scope. This point should be discussed and clarified.

6. The next meeting of the Planning Committee will be held Thursday, June 9, 1966, at 4:00 P.M. . At this meeting I will show sketches of some possibilities for modular booths and we will continue the discussion of the presentation of the family of eight at the Wescon Show.

7. On June 15, 1966, at 1:00 P.M., in Ken's office, Paul Rawson and Rod Lopez-Fabriga of Van Dyke Associates will present some of the outstanding work that they have done in exhibits. Their presentation should be interesting and educational. I urge you all to attend.

dec INTEROFFICE MEMORANDUM

DATE June 2, 1966

SUBJECT Proposed Quantity Discount Policy

TO Win Hindle
Stan Olsen
Ken Olsen
Harry Mann
Ted Johnson
Pat Greene
Mort Ruderman
John Jones
Mike Ford

FROM Nick Mazzarese

Stan Olsen, Win Hindle, and myself have had several meetings to lay ground work for an inter product line quantity discount plan.

The basic structure of this plan has been designed to benefit large purchasers of our equipment whether they are OEM or not. The basic premise is that the customer receives a discount which is a function of the volume of business he has done with us within a given year. Some of the ground rules which were agreed upon are as follows:

1) PDP-7's, 8's, 9's, 10's (and their options) and modules may all be intermixed to determine the volume.

2) The first computer system of any type is never discounted.

3) The following items receive no discount, but add to the customers volume level and determine total discount:

a) Special Systems
b) Field installed peripherals

4) The discount agreement will be signed on a yearly basis and will apply accumulatively to all equipment delivered during that one year period.

5) Blanket orders will be allowed.

Attached is a schedule of discount levels.

I would like to have your evaluation of this plan prior to June 9.

DISCOUNT SCHEDULE

5,000	3%
10,000	5%
20,000	10%
40,000	15%
70,000	18%
100,000	20%
250,000	22%
500,000	25%
1,000,000	26%
2,000,000	27%
3,000,000	28%
4,000,000	29%
5,000,000	30%

file

dec INTEROFFICE MEMORANDUM

DATE 1st June, 1966.

SUBJECT Your memo 4th May concerning power sockets in Europe.

TO Ken Olsen. FROM John Leng.

Please find enclosed a copy of the answer I have received on this.

John.

Encl:

INTEROFFICE MEMORANDUM

DATE May 4, 1966

SUBJECT

TO John Leng

FROM Ken Olsen

9 MAY 1966

Will you send me a proposal as to what socket we should have in the back of the PDP-8 for use in Europe where we normally have 220 volts, 50 cycle. The plug we now use is rated for 250 volts but it is the standard socket we use in this country for 110 volts.

Ken

ecc

Ken Senior
Wally Spittle.

Please get me an answer on this.

John.

Suggest that socket supplied is best solution as there is no standard throughout Europe. Providing a mains lead is supplied with plug to fit socket, the other end can always be fitted with appropiate plug for the country of installation Wally.

Mr. K. Olsen

P R O P O S A L

DECAN

TO ASSEMBLE

CERTAIN PDP-8 MODULES

IN CANADA

June 1966

PREPARED BY: W.C. MacGregor

APPROVED BY:

TABLE OF CONTENTS

I SUMMARY

Figures are presented which indicate that the R210 and R211 modules (with strates) could be assembled in Canada at costs approximately 30% below present DECAN costs.

A substantial saving, but to a lesser degree would be expected for the R212 and R220 modules. DECAN should be given a portion of the R211, R212 and R220 module requirement for the months of July and August, to establish a cost figure.

II PROPOSAL

It is understood that four module types R210, R211, R212 and R220 will be converted to Flip Chips by this Autumn. The proposed models will contain the following Flip Chips.

Module	DGL	DCD	3V	Total/Module
R210	6	15	1	22
R211	7	17	1	25
R212	4	10	1	15
R220	6	9	1	16

DECAN has been manufacturing R210 modules for 3 months now, and comparison figures between discreet components and strates indicate a saving of $2.67/ module over present costs (See Appendix "B"). This cost comes about as a result of a 50% reduction in assembly time, and the elimination of top soldering and inspection, and represents a 30% reduction in DECAN's price to DEC. (See Appendix "C"). Since DEC's assembly costs are assumed to be higher than DECAN's assembly costs, this represents an even higher percentage saving over DEC's prices.

Firm assembly costs are not available for the other three module types, however, if we take the savings as outlined in Appendix "B", we have -

	Type	Qty.	Saving	Total
R211	3V	1	0.0059	0.0059
	DCD	17	0.0159	0.2700
	DGL	7	0.0034	0.0238
			TOTAL SAVING	.2997 hrs. = $1.20
R212	3V	1	0.0059	0.0059
	DCD	10	0.0159	0.1590
	DGL	4	0.0034	0.0136
			TOTAL SAVING	.1795 hrs. = $ .78

	Type	Qty.	Saving	Total
R220	3V	1	0.0059	0.0059
	DCD	9	0.0159	.1430
	DGL	6	0.0034	0.0204

TOTAL SAVING .1693 hrs. = $ .74

The R211 would have savings similar to the R210 as far as top soldering and lead bendings are concerned, and the finished product should have a similar price. The R212 and R220 are not well enough known to predict what additional savings would be effected. For this reason, it is strongly recommended that DECAN be allowed to manufacture a portion of the R211, R212 and R220 module requirements in order to establish cost figures for later comparison.

COMPONENT INSERTION COSTS

The purpose of this exercise is to establish a cost comparison among the following methods:

1) Hand Insertion at DEC
2) Machine Insertion at DEC
3) Template Assembly at DECAN

The calculations will be based on the following assumptions:

a) Labour Cost at DEC 1.65/hr. (U.S.)
b) Labour Cost at DECAN 1.25/hr. (Cdn.)
c) 7 hours of productive labour/8 hr. work day

Certain assumptions made prior to the May 27 Manufacturer's meeting have been corrected, and it is felt that these figures are valid.

METHOD A - Hand Insertion (DEC)

DEC Labour Cost 1.65 per hour
Overhead @ 225% 3.27

Basic Hourly Cost 4.92 x 8/7 = $5.62/hour (U.S.)
at DEC Standard Work rate of 200 components per hour
Assembly cost/Component = $0.0281 (U.S.)

METHOD B - Machine Insertion (DEC)

Personal Observation indicates

a) Machines insert at the rate of about 1/sec.
b) Machines work about ½ time or less (bend leads, board change, etc.)
c) Component waste high (counted 5 rejects out of 33 insertions)

Let us assume the machine inserts 2000/hour successfully and wastes 3½%.

The machine costs $8500. and can be amortized over 5 years. Assume templates, setups adjustment and maintenance at $1200./year. Total machine cost for 5 years = $14,500. or $2700. per year average. At a 7 hour day (35 hour week) this works out to 1820 hours/year or $1.48/hour.

At an insertion rate of 2000/hour and a loss of 3½%, we will damage 70 components/hour at a cost of 6½¢ each = $4.55/hour loss.

Totalling these figures, we get -

Labour'Cost	5.62
Machine Cost	1.48
Lost Components	4.55
Total Hourly Chg.	11.65 (U.S.)

Assembly cost/component @ 2000/hour = $ .0057 U.S.

METHOD C - Template Assembly (DECAN)

Basic Labour Rate	1.25/hour
Manuf. Overhead (200%)	2.50
Total Labour Cost	3.75 x 8/7 = $4.29 Cdn. = $3.97 U.S.

DECAN measured insertion rate 400 components/hour
Assembly cost/component = 0.01 (U.S.)

APPENDIX "B"

FLIP CHIP ECONOMIES ON R210 MODULE

Three types of Flip Chip strates will be available shortly; they are the 3V, the DCD and the DGL.

The 3V replaces the four diodes and resistor required to make the 3V supply, replacing 5 components.

The DCD replaces from 5 to 7 diodes, 1 capacitor and 2 resistors required in a DCD gate, average 9 components.

The DCL replaces two D662 diodes and 3 resistors, making a total replacement of 5 components.

Insertion Tests at DEC indicate a short run, time spread, of 180 to 300 strates/hour. If we assume an insertion rate of 150/hour. This works out to 0.0066 hours or $0.0266 U.S./strate.

We will assume DECAN component insertion rate @ 400/hour or .0025 hours/component.

Insertion Time Saving Using Strates

Strate	Equiv. Comp.	Components	Strate	Saving
3V	5	.0125 hours	.0066 hours	.0059
DGL	4	.01 hours	.0066 hours	.0034
DCD	9	.0225 hours	.0066 hours	.0159

R210L has 218 components. The R210 with strates will have about 163 fewer leaving 55 components for hand insertion. At the no template rate of 300/hour (worst case), this represents 0.18 hours.

22 strates at 150/hour represents	0.15 hours
Total Assembly Time	0.33 hours
Present Assembly Time	.69 hours
Saving on Assembly	.36 hours

APPENDIX "B"

Saving on Lead Bending	.06 hours	
Saving on Top Soldering	.04 hours	
Saving on QC Top Soldering	.04 hours	
Saving on Touch-Up (No Eyelets)	.04 hours	
	.54 hours =	$2.39
+12% reduction in U.S. Customs Duty		.28
TOTAL R210 SAVING		$2.67

APPENDIX "C"

R210 RECORD

In January 1966, I submitted a proposal to make R210 modules in Canada. At that time it was assumed that U.S. duty on returned goods would amount to 9½%. The predicted cost at that time for a complete module tested and ready to use was less than $0.0547/component. This was deemed optimistic in view of Sanders Associates charges of $0.0595 to 0.0639/component for assembly and soldering only.

In March 1966, 900 modules were shipped to DEC at an average cost of $0.0448 and a minimum cost of $0.0379/component. These costs include U.S. customs duty at 12% and are for modules, completely assembled and tested and ready for Finished Goods.

In April, 2 lots of 200 each were shipped, the costs were 0.0426 and 0.0434/component. There was a DEC error here and a DECAN error as well.

In May to date, we have shipped one lot of 200 at a total cost of $0.033/component, and a second 200 of a 400 lot at an expected cost of $0.0325/component.

Assembly time has been reduced to 69.55 hours for 100 boards. At 1.25/hour and 250% overhead, this works out to $0.0128 U.S./component, and is an actual measured quantity. With our overhead reduced to 200%, the figures calculates out to $0.012/component measured.

The techniques applied in the mfg. of R210 modules by DECAN can be applied to the manufacture of other modules and devices as well. Testing and inspection are now the biggest cost, and methods are being investigated to reduce these.