

DEC INTEROFFICE
MEMORANDUM

DATE June 27, 1963

SUBJECT EMPLOYEE HANDBOOK

TO K. H. Olsen
✓ H. E. Anderson
S. Olsen
G. O'Dea
M. Sandler (C. Kendrick, J. Smith)
W. Hindle
R. Mills
R. Best
J. Fadiman
L. Prentice (K. FitzGerald)
J. Atwood
N. Mazzaresse (E. Harwood)
G. Bell
R. Hughes
H. Crouse
R. Melanson
R. Beckman (J. Shields)
R. Savell
A. Blumenthal
G. Gerelds

FROM Personnel Committee

Attached is a preliminary printing of our new employee handbook.

Please review the policies and practices outlined in the booklet and make notes of the items you feel require further explanation and send these comments in writing to the Personnel Office by July 10th.

During the week of July 15th the Personnel Committee will hold a meeting with all people listed above for the purpose of answering questions regarding company policies and practices. Your written comments will be used as a basis for the agenda.

After this meeting, last minute corrections will be made, and the booklet will go immediately to final printing.

A sufficient number of booklets will then be distributed to each of you for distribution to your people. We strongly suggest that each of you meet with your group leaders or your employees to personally review company policies and practices with them when distributing the finished booklets.

HARLAND ANDERSON



INTEROFFICE
MEMORANDUM

COMPANY CONFIDENTIAL

DATE June 27, 1963

SUBJECT Visit to DEC on Tuesday, July 2, 1963 by Don McCoy
and George McGesky, U.S. Steel.

TO

FROM R. L. Lane

- Nick Mazzaresse
- Stan Olsen
- Gordon Bell
- Ken Olsen
- Harland Anderson

Please be advised that Don McCoy and George McGesky of U. S. Steel, Pittsburgh, Pa. will be visiting DEC on Tuesday, July 2, 1963. Their interest will be a PDP-6 with the following equipment:

1. C.P.U.
2. Fast Memory (16 word)
3. Main Memory (32 K)
4. Card Reader-Punch
5. Line Printer
6. Tape Channel (2)
7. Tape Units (8)
8. I-O Typewriter
9. Micro Tape
10. Micro Tape Controller
11. Display

Based upon the above configuration, we gave them an estimate of \$746,000 excluding maintenance. Maintenance for one year was estimated at \$37,000.

Please plan to be available Tuesday to meet with these gentlemen. The exact time will not be determined until late Monday.

INTEROFFICE
MEMORANDUM

DATE June 27, 1962

SUBJECT

TO Ken Olsen

FROM Ken Fitzgerald

Since we have always had many difficulties in the past in getting any type of a special test system or computer system shipped on time or efficiently, I have been doing a bit of research on the problem and have come up with what I feel is a plan that will alleviate many of the short comings of our present methods and insure a more efficient method of handling our shipping problems.

I A packing, crating and shipping area must be established.

- A. This area to contain a minimum of approximately 1600 square feet of floor space, with the minor dimension being no less than 20 feet.
- B. This area should be in close proximity to the final check-out area, and readily accessible to a shipping and receiving dock.
- C. This area will be located adjacent to the carpenter shop.
- D. This area will contain all of the necessary tools, equipment, and materials needed for packing, crating, and preparing for shipment of all systems, computers, in-out gear, etc., or any other products requiring crating.
- E. This area will be the responsibility of the Shipping Department and be staffed while a system is being crated by one carpenter from the Mechanical Engineering Department, one carpenter's helper from the Shipping Department, one mechanical assembler, when needed, from the Mechanical Engineering Department, and one electronic technician supplied by the group responsible for the particular system and familiar with that system.
- F. This area will also be used for the preparation for shipping of all other components and parts (replacement doors, blank panels, special panels, repair parts, etc.)

II Definite rules and responsibilities must be established to insure that all last minute details have been accounted for before the unit is shipped.

- A. The engineer in charge of the unit must request final mechanical assembly from the Mechanical Engineering Department and the detail electrical and mechanical inspection from the Inspection Department prior to the final acceptance test.
- B. The final acceptance test should be performed by the check-out group when the machine is in a completely assembled condition. No haywire, all doors and mechanical components on, all rejects noted by the Inspection Department remedied, etc.
- C. When the machine has passed its final acceptance test the engineer in charge should be certain that the following things are done:
 - 1. Disconnected from power.
 - 2. Completely uncabled, with cables placed in standard Digital cartons.
 - 3. The reader punch typewriter and any other items that must be removed will be removed and placed in their original shipping containers or equivalents.
 - 4. The recording of module serial numbers, securing of the modules (masking tape) tightening up or tying down of any loose items within the cabinets and clean-up of all odds and ends.
 - 5. Final electrical inspection should be conducted before the system is moved to the packing, crating, and shipping area.

III Preparations for packing and crating.

- A. The engineer in charge should request that the Shipping Department move the system to the packing, crating and shipping area. An electronic technician from the group of the engineer in charge should be available to help at this stage.
- B. The engineer in charge should deliver to the shipping people a complete list of the items in the system, and peripheral gear that is to be shipped with it.

- C. All of the small equipment and materials that are to be shipped with the machine should be packed for shipment in standard Digital shipping boxes.
- D. Customer Relations Department should enter the picture at this time and:
 - 1. Deliver all of the accessory gear items packed in standard Digital cartons or original shipping containers to the packing, crating, and shipping area.
 - 2. Deliver a list of these items to the Shipping Department.
- E. The final mechanical inspection and clean-up will be done as soon as the machine reaches the crating, packing, and shipping area.

IV Packing and crating.

- A. All systems, computers, peripheral gear, and special line units, etc., will be packed and crated according to the following specifications:
 - 1. All units will be on a skid designed to be lifted by our pallet trucks.
 - 2. The unit will be bolted to the skid in a minimum of two places.
 - 3. All plenum door shipping bolts will be tightened at this time.
 - 4. The unit will be completely washed down and covered with a plastic shroud.
 - 5. The complete unit will be covered with a minimum of one layer of Kimpack and crated on all four sides and top with half inch Plyscored.
 - 6. Three quarter inch signode steel strapping will be used to hold the crate in position and the machine to the skid(a minimum of nails will be used to hold the crate together preparatory to strapping).

7. No free-hand writing or marking of the crate will be done. All markings necessary for the shipment of the crate will be applied with stencil and stencil ink.
8. The markings will be applied in the following manner:
 - a. Digital Equipment Corporation, silk screen or stencil will be applied to the upper left corner of both the front and back of the crate.
 - b. Immediately below that will be the box number. Located in the central portion of the crate, on both the front and back, will be the name and address of the consignee.
 - c. When there is a definite front or back to a unit, it will be so labeled with a stencil on the lower portion of the crate about ten inches from the floor.

V Shipping.

- A. The Shipping Department will handle all paper work necessary for the actual moving of the equipment from our packing, crating, and shipping area to the movers equipment.
- B. The Shipping Department will supervise the actual loading of the unit.

cc: Harlan Anderson
Stan Olsen
Dick Best
Ben Gurley
Jon Fadiman
Bob Beckman
Nick Mazzaresse
Jim Myers
Loren Prentice



INTEROFFICE MEMORANDUM

DATE June 27, 1963

SUBJECT Lettering Drawings

TO Ken Olsen
Harlan Anderson
Dick Best
Gordon Bell
Tom Stockebrand

FROM Roger Melanson

A time consuming operation in the Drafting Department is lettering drawings. A number of various drawings require many hours of lettering, they are:

1. Block Schematic
2. Module Location
3. Utilization Module List
4. Circuit Schematic
5. Extensive Notes on Drawings

Sometime ago, it became apparent that quality lettering was a necessity to insure adequate intermediate vellums and hard copies from microfilm. Existing freehand lettering drawings showed approx. 20% of all draftsmen could letter adequately. From experiments it was found that template lettering, of prescribed sizes would answer one of our most pressing problems, namely inadequate lettering on drawings. A re-education of lettering drawings was initiated to insure consistent height, form and style with the use of lettering templates. Our problems of this nature soon disappeared. As time went on, I found that draftsmen were taking an extremely long time to finish a drawing. In my research, I found lettering was a contributing factor to time consuming drawings. I then proceeded to have all draftsmen, capable of lettering freehand adequately, not use the template. Unfortunately, the 20% falls in the mechanical section and not in the electrical section where it's needed.

An experiment using a VariTyper has shown very good results and is an answer to reducing time and cost.

A Block Schematic, template lettered by a draftsman consumed 4 hours. A typist using a VariTyper consumes only $1\frac{1}{4}$ hours; a savings of 71% in time.

EXPIREMENT

Draftsman average hourly rate	=	\$ 2.30
Clerk typist average hourly rate	=	1.65
\$2.30 X 4 hrs.	=	9.20
\$1.65 X 1¼ hrs.	=	2.09
<u>Savings</u>	=	<u>7.11</u>

RESEARCH FACTS

1. Average time per dwg., template lettering = 8 hrs.
2. Average time saved per drawing = 5 5/8 hrs.
3. Average cost saved per drawing = \$14.48
4. Approx. amount of drawing per year requiring considerable lettering (excluding dwg. with extensive notes) = 800 - 1000
5. Approx. amount saved per year = \$11,584 - \$14,480
6. Two clerk typist in place of two draftsmen, Savings per year = \$2,000
7. Average time per dwg. freehand lettering = 4 - 5 hrs.

COST OF VARITYPER & ACCESSORIES

1. Model 350 Engineering Lettering Machine = \$1,645.00
2. Type Fonts (each style & size) = 35.50
3. Roll of Tape (1000 feet) = 4.50
4. 90 Days free service and replacement of parts.
5. Delivery: 30 - 45 Days.
6. There is a possibility that a second hand VariTyper can be purchased for \$500 - \$800 from Atwood & Morrill Co., in Salem, Mass.

SPECIFICATIONS OF THE MODEL 350

The VariTyper can write a continuous line 23.1" in length. The variable spacing control has four settings yielding a choice of 10, 12, 14 and 16 characters to the inch. The inter-linear spacing control can be set for 9, 6, 4½, 3 3/5 and 3 lines per inch. The machine operates from either AC or DC current, 110 or 220 volts. Special open-end basket for paper or masters has an extended carriage release and feed-roller lever to accommodate drawings larger than carriage width.

A three day schooling program free of charge is given to a clerk typist to acquaint her in the use of a VariTyper.



Roger Melanson
Chief Draftsman

RM/db

June 26, 1963

Personnel Forecasting--Hourly Technical Personnel

M. Sandler
J. Smith
R. Hughes
G. Gerelds
N. Mazzaresse (E. Harwood)
G. Bell (A. Hall)
R. Best (T. Stockebrand, R. Boisvert)
J. Fadiman
R. Savell
A. Blumenthal
D. White
R. Beckman (J. Shields)

Bob Lassen

cc: K. H. Olsen
H. E. Anderson

In August personnel forecasting will become an integral part of departmental budgeting.

In the meantime, however, it is necessary that we immediately project our hourly technical personnel requirements (Wiremen through Senior Technicians). Several technical openings remain unfilled, and it is quite evident that several more jobs will open up within the next six months. Most of these jobs must be filled by competent trained technicians from within the company. Therefore, unless we project these requirements right now, we will be in a vulnerable position with respect to hiring new trainees and preparing our qualified people to fill these openings.

The Personnel Planning Committee has done a good job of monitoring the selection of qualified employees for new openings, and I have confidence that the committee will successfully map out more effective technical training measures, including accelerated classes when needed. However, this program will not be continuously effective unless we institute responsible forecasting on a regular interval basis.

Attached you will find a forecast sheet which will enable you to report your immediate requirements and your 6-month and 12-month projections.

Please bear in mind that personnel forecasting is a planning measure and does not constitute permission to hire. The procedure for obtaining permission to hire remains unchanged.

Please submit your completed forecasts to the Personnel Office by Monday, 7/1/63.

C

RTL/jfr

O

P

Y

HOURLY (WAGE CLASS 1 AND 2) TECHNICAL PERSONNEL FORECASTS--7/1/63

	Immediate Requirements	6-Month Forecast	12-month Forecast
Wireman level			
Technicians (Module Test level)			
Technicians (Peripheral & Component Checkout level)			
Technicians (Computer Checkout level-- PDP-1, PDP-4)			
Technicians (Senior or Advanced Checkout level)			
Technicians (Project level)			
Other (State specific requirements)			

INTEROFFICE MEMORANDUM

DATE: June 25, 1963

TO: *H. Anderson*

FROM: J. Smith

Attached, you will find a listing of all open construction requisitions for peripheral equipment. It should be noted that there are a number of items not released to date. The 131-510 Controls are moving rather slowly due to modifications. The AEC Princeton 131-510 will not be available for delivery until the second or third week in July. Delivery to Lincoln Labs should be on time.

Completion of the second lot of 555 units by 8/1 will depend on the release of the new model which utilized IBM relays. If the model is released within the next week, there should be no problem meeting the 8/1 target date. Jerry feels the model will be released within the next week.

DEC Los Angeles

Del. Req'd

1 Portable Display Tester EN 2583	Not Released	5/20/63
-----------------------------------	--------------	---------

NSA

3 Additional Memories	In Stock	6/15/63
1 Spare Typewriter	In Stock	

LRL

Data Control 131 (EN 2524)	Released 6/17*	6/30/63
Tape Control 510 (EN 2525)	Released 6/17*	6/30/63

AEC Princeton

Precision CRT (EN2556)	In Process (1)	6/30/63
Magnetic Tape Control 510 (EN 2558)	Released 6/17*	6/30/63
Data control 131 (EN 2559)	Released 6/17*	6/30/63

Customer Relations

Data Control 131 (EN 2586)	Released 6/17*	7/1/63
Tape Control 510 (EN 2587)	Released 6/17*	7/1/63

Information International

Mag. Tape 51 (EN 2605 - EN 2606)	In Process (1) 6/28/63	7/7/63
CRT 30A EN 2607	In Process	7/7/63

BBN

1 Multiply & Divide (EN 2618)	In Stock	7/15/63
1 30H Display (EN 2617)	In Process	7/15/63

AECL

Multiply & Divide 10 (EN 2610)	Del. to CR	8/1/63
16 Sequence Break (EN 2613)	Del. to CR	8/1/63

Lincoln Lab.

2 Data Controls 131 (EN 2579)	Released 6/17*	8/1/63
1 Mag. Tape Control 510 (EN 2580)	Released 6/17*	8/1/63
1 High Speed Channel (EN 2581)	In Stock	8/1/63
1 16K Memory Module (EN 2506)	Not Released	8/1/63

JPL

Del. Req'd.

Arithmetic Element (EN 2631)	In Stock	8/1/63
Data Interrupt Mult. (EN 2632)	Not Released	8/1/63
Mag. Tape Control 57 (EN 2633)	Not Released	8/1/63
Mag. Tape 50 (EN 2634)	In Stock	8/1/63
Additional Memory (EN 2630)	In Stock	8/1/63

JPL

Mag. Tape Control 57 (EN 2627)	Not Released	8/1/63
Buffered Interface (EN 2628)	Released 6/21 (1)	8/1/63

SDC

2 Additional On-line Typewriters EN 2599	Not Released	8/28/63
--	--------------	---------

AECL

2 On-line Teleprinters (EN 2569)	Logic not Rel.	9/1/63
Additional Memory (EN 2567)	In Stock	9/1/63
Arithmetic Unit (EN 2568)	In Stock	9/1/63
Precision Display (EN 2579)	In Process (1)	9/1/63
16K Drum System (EN 2575)	Not Released	9/1/63
Spare Reader (EN 2574)	In Stock	9/1/63
Direct Drum to Display Circuits (EN 2578)	Not Released	9/1/63

*An Engineering Hold has once again been placed on 131-510 controls. Modification generated by the Fort Mead 131-510 system under test are being made on the recently constructed system for LRL. The present Engineering Hold is expected to last until testing of the LRL 131-510 has been completed, which is approximately one week.

(1) will be completed by required date.

Status of Open Construction Requisitions

J. Smith
June 24, 1963

Kie Comp.

Del. Req'd

2 550 Tape Transport Controls (EN 2594)	7/20/63
6 555 Tape Transports (EN 2595)	7/20/63

AECL

1 550 Tape Transport Control (EN 2612)	8/1/63
3 555 Tape Transports (EN 2611)	8/1/63

DEC Sales

1 550 Control	8/1/63
1 555 Transport	8/1/63

Fort Meed

1 550 Tape Transport Control (EN 2604)	8/15/63
1 555 Tape Transport (EN 2609)	8/15/63

The first Production unit has been tested and Engineering Changes noted. Additional units in the lot, eight in number, are being modified and will undergo test this week. A new model is under construction utilizing IBM relays. All subsequent units will be constructed to this model. Jerry Hamilton feels the new model will be released the end of this week.



INTEROFFICE MEMORANDUM

DATE June 26, 1963

SUBJECT Financial Forecasts

TO Harlan Anderson ✓

FROM George T. O'Dea
Richard Mills

Ever since last September we have been issuing Twelve Month Financial Forecasts, updated each month and including schedules to disclose the basic assumptions affecting cash.

Everyone more or less understood that the first three months of the forecast were intended to be definitive but beyond that point, it trailed off into institutional goals.

This monthly forecast has been circulated to the Board of Directors, the National Shawmut Bank, and once to the Morgan Guaranty Trust.

Irrespective of the accuracy of prior forecasts, I think we might ask ourselves what was basically wrong with the documents. I'm sure we'd all agree that their primary flaw lay in the lack of individual responsibility for expenditures.

Dick has now completed a gross roots type of forecast which has as its source the opinions of each cost center manager. The first of these documents was presented to the Works Committee on June 4.

If gross roots is more realistic, it is also very much slower. It is a matter of weeks in preparation and takes up the time of persons who are better used in their managerial specialties.

A quarterly preparation is probably more appropriate here.

At this time, it might be wise to question whether or not we really need a monthly forecast for presentation to the Board and the Bank. (Our Short Term Cash Forecast would continue to be issued monthly for internal purposes).

How do you feel about this?

GTO'D:ncs



INTEROFFICE MEMORANDUM

DATE June 26, 1963

SUBJECT Consolidation of Foreign Subsidiaries - June 30, 1963

TO Kenneth Olsen
Harlan Anderson ✓
George O'Dea

FROM R. Mills

Our subsidiaries have been operating approximately 2 months during the current fiscal year ending June 30, 1963 but even though of short duration, we must consider the need for consolidating or not consolidating in our Statements for the fiscal year ending June 30, 1963. Digital Equipment of Canada, Limited was incorporated May 1, 1963 and Digital Equipment G.m.b.H. was incorporated May 8, 1963, with an estimated budget loss of \$19,499. thru June 30, 1963.

There are basically two alternative ways of handling the operational figures of the foreign subsidiaries in our statements, which are:

- 1) To prepare DEC's figures, as we have in the past, with a footnote as to the net investment in foreign subsidiaries of X number of dollars, with no consolidation of the detailed figures either on the Balance Sheet or the Profit and Loss Statement.
- 2) Is the reverse of #1, in that the detailed figures would be incorporated into DEC's figures, running through the usual elimination of payables, receivables, capital stock and winding up with the net investment in the subsidiaries reflected in the total of the three companies added together.

My own preference here is by way of #1.....being a footnote on the Balance Sheet.

####



INTEROFFICE MEMORANDUM

SUBJECT

Pricing

TO

George O'Dea

DATE

June 25, 1963

FROM

Kenneth H. Olsen

cc: **Jon Fadiman**
Herlan Anderson ✓

There is developing in the Engineering Department the attitude that it is impossible to make money on one-of-a-kind devices. We may not want to do one-of-a-kind devices but let's do it for other reasons. If we don't make money on it, it's because we don't charge enough. I would like to review our pricing techniques so that we can make money on one-of-a-kind if we want to. I would like to see George and Jon review a few engineering projects which we priced on the assumption that we would only sell one and see how our estimates were. I would guess that we underestimated the labor involved. This is simple, let's just be more conservative later on. If we review every project after it is done, the people who make the estimates originally will become more intelligent.

Will you find out from Dick Mills how much we have invested so far in the 555 Microtape units. This should include the price of the literature, the engineering, and how much we have in inventory for production.

Kenneth H. Olsen

KHO/ms



**INTEROFFICE
MEMORANDUM**

DATE **June 25, 1963**

SUBJECT

TO **K. Olsen**
 ✓ H. Anderson

FROM **Roland Boisvert**

With the recent sales to JPL with deliveries in August and September and future sales of the Tape Control 510, I consider it imperative that we order immediately for a 90 day rental a 729 VI transport.



INTEROFFICE MEMORANDUM

DATE June 21, 1963

SUBJECT PRICE ESTIMATES FOR PDP-1D SYSTEM FOR BB&N.

TO EN 1166 File

FROM Gerald T. Moore

The following are the currently estimated prices for the PDP-1D computer system for Bolt, Beranek and Newman:

PDP-1D Computer including:

Perforated Tape Reader	
Perforated Tape Punch	
Automatic Typewriter	
Multiple Channel Sequence Break Type 20	
Automatic Multiply and Divide	
Core Memory Extension Control Type 15A	
Complement I/O Instruction	
Skip on non-zero I/O Instruction	
Jam AC to I/O or jam I/O to AC or swap AC and I/O Instruction	\$153,000
One 16K Memory Module	60,000
Two 4K Memory Modules	60,000
Memory Switch with an installed capacity for 3 memories and 3 processors and with provision for expansion to an ultimate capacity of 4 memories and 4 processors	36,000
Drum System Type 23	73,400
Two 16-line Teletype Interface Modules . .	<u>38,000</u>
TOTAL ESTIMATED PRICE	\$420,400

These prices are within 5% of the final firm quotations that will be submitted to BB&N. The final quotation will be submitted to BB&N within one week.

GTM:vg

dec**INTEROFFICE
MEMORANDUM**

DATE June 21, 1963

SUBJECT Finance Briefing Session - American Management Association, June 18, 1963
Statler Hilton Hotel, New York City

TO Ken Olsen
Harlan Anderson ✓
Stan Olsen
George O'Dea
Win Hindle

FROM Dick Mills

Introduction:

On June 18, I attended a Finance Briefing Session of the AMA, in New York, where the final Internal Revenue Service, Treasury Department Corporate Tax Rules and Guidelines were discussed with an introductory speech made by Mortimer M. Caplin, Commissioner, Internal Revenue Service. The primary subject matter was Travel and Entertainment Expenses, Guidelines for Computing Depreciation Allowances, Investment Tax Credit, Foreign Tax Credit and Self-Employment Retirement Contributions. I attended the Travel and Entertainment Expense Session, Investment Tax Credit and the Foreign Tax Credit Sessions.

Travel and Entertainment Expenses:

The Three panelists were, two from the Internal Revenue Service and one from the U.S. Treasury Department, who stated that the final regulations on Travel and Entertainment Expense will be out this week. The emphasis of their discussion was on the atmosphere attendant to the entertainment being conducive to a business discussion. They state, that if the entertainment were socially motivated, it would not be allowable as an entertainment deduction, however, legal counsel from the U.S, Treasury Department, stated that in some cases, home entertainment would not be socially motivated and thus would be subject to deduction. This conversation went on for seventeen minutes around the point of the atmosphere surrounding the business discussion. The net result of all this was, that it would be a difficult job for a person to differentiate between a social or a business oriented entertainment, where the entertainment was for customers of long standing who are friends. This in effect set

the tone of the entire meeting and was somewhat of a disappointment to me and many others, since we expected more of the philosophy of the Government in their attitude towards business in taking T&E deductions.

Robert F. Hannan of the Internal Revenue Service stated that, what the Internal Revenue Service was really after, were those people who are abusing Travel & Entertainment Expense Regulations. He stated, that the acid test would be to show that the entertainment was directly related to business with the following three hurdles to get over:

1. It must have more than a general business purpose.
The words "general business purpose" were meant to mean a sort of missionary work on the part of a company, versus entertainment directly related to a firm business discussion as regards a contract or an order for business.
2. It must be proven that an actual business discussion took place.
3. The tone of the meeting must be business rather than social.

The next major area of discussion was entertainment facilities, which meeting I passed up, since we have no facilities, such as hunting lodges, yachts, golf courses, rest homes, etc.

I passed up the rest of the Travel & Entertainment Session until the afternoon session at 4 O'clock, where the questions resulting from the groups from the morning session getting together, would be asked of the panel and I hoped that this would be a real meaty session, but it was far from it. The first question to be asked was, "I am down here at this session, which is a business connected meeting, if I went to a night club tonight, would this be an allowable entertainment expense?". This question took eleven minutes to dispose of and it never should have come up at all. The next three questions were oriented toward the types of business discussions necessary to qualify with the emphasis on specific order entertainment rather than general entertainment of a good customer.

Summary:

The net overall effect of this entire session was that entertainment expenses, in order to be deductible, must have a closer relationship to the conduct of the business. With emphasis on a business discussion preceding or following the expenditure and with nightclubs, theaters, sporting events, cocktail parties, hunting or fishing trips and yachts, being considered outside of entertainment expenses, unless the taxpayer can clearly show that this was necessary for him to obtain this business and that it could not be obtained any other way.

Travel Allocation Rules:

A significant item of change is the allocation of the personal portion of travel expense on business trips which are combined with vacations. This expense will be disallowed if, 1) the trip lasts more than a week; 2) the personal portion accounts for 25% or more of the total time on the trip; 3) the traveler had substantial control arranging the business trip; 4) a major consideration in deciding to make the trip was to have a vacation.

Accounting Treatment of Investment Tax Credit:

This discussion was led by Andrew Barr, who is chief Accountant for the Securities and Exchange Commission, and revolved around the Balance Sheet treatment of the Investment Tax Credit. The preferred treatment is to show the Investment Tax Credit. The preferred treatment is to show the Investment Tax Credit as deferred income rather than netting it out against the tax liability, which will facilitate adjustments in the event of sale. The SEC will accept the opinion issued by the Accounting Principles Board of the American Institute of American Certified Public Accountants, which was arrived at after considering the following:

1. Subsidy by way of a contribution to capital
2. Tax reduction

- a) The basis of the property will be reduced for tax purposes by the amount of the Investment Credit
- b) The 48 - 52% method, which in effect means that only 48% of the Investment Credit would be reflected in income, being that portion which would normally reside as an increase in that income and that 52% would be the tax expense to be deferred to subsequent accounting periods, to be written off over the lives of the assets.

3. Cost Reduction:

This involves a direct credit to an expense normally depreciation within the year of the Investment Tax Credit.

The conclusions of the AIA:

1. The allowable Investment Credit should be reflected in net income over the productive life of acquired property.
2. Alternative choices for recording the credit are available with their recommendation of reducing the cost of the asset - thereby reclaiming to income the Investment Credit over a reduced depreciation charge.

Another treatment is to set it up as deferred income with credits being made in each year appropriate to the life of the property. The P&L treatment to reflect the credit against income tax is considered proper, provided that a corresponding charge is made to the provision for depreciation or some similar account of a deferred nature.

Further discussion was made of the reserve ratio test and that the fact that fully depreciated assets must be included. This test is to determine whether or not the lives used in depreciation are reasonable since a rising ratio of reserve to total cost will indicate that the lives used are short, where a declining ratio will show the opposite. Rate of growth figures are also developed in computing this test and this would appear to be the place to make a stand. It will be three years before there are any problems regarding application of the reserve ratio test.

Foreign Tax Credit:

This session was used primarily to work thru the Form - 1118, which is a statement to support the claiming of foreign taxes as a credit against U.S. Taxes. The primary difference between the previous code and the 1962 Code, is that previously, only dividends withdrawn from the foreign corporation and brought to the United States were taxable in the U.S. under the 1962 law, all income of the foreign subsidiary is taken into income of the U.S. Parent Corporation in the year earned, rather than the year withdrawn as dividends.



INTEROFFICE MEMORANDUM

DATE June 20, 1963

SUBJECT #24 Serial Drum Prices

TO ~~K~~ Olsen W Hindle
 ✓ H Anderson R Mills
 S Olsen R Beckman
 N Mazzaresse R Best
 R Maxcy G Bell
 J Atwood E T Johnson
 S Grover

FROM Arthur Hall

Several weeks ago, the Computer Guidance Committee considered serial drum price changes which would make the price relationship between drums more consistent. It was agreed that the prices would be changed and that H Anderson and A Hall would decide upon the exact figures.

H Anderson has approved the following prices which shall be effective July 1st. Unless comment or complaint concerning these prices is received by A Hall by June 26th they may be quoted to all and sundry starting June 27th.

16 K drum	\$36,200
32 K drum	\$38,680
64 K drum	\$43,400

In contrast to the previous situation, all of these drums may be field retrofitted to 64 K without replacing the drum itself.

Cost of field retrofit is the cost of parts (see below) plus labor at \$20 per hour (per any number of men) plus travel and living expenses.

Additional drum heads	\$20/head	64 per 16K
Additional diode boards w/diodes	\$210/board	4 per 16K
Additional modules	\$84/module	2 per 16K

Estimated time for field retrofit

16K to 32K	32 calendar-hrs. 48 man-hrs.
32K to 64K	40 calendar-hrs. 60 man-hrs.

AH:ASJ

6/21/63

A. Anderson
H.S.G.



INTEROFFICE MEMORANDUM

DATE

June 19, 1963

SUBJECT

OBSOLETE STOCK ROOM MODULES

TO

Whom It May Concern

FROM

Bill Farnham

<u>ITEM</u>	<u>QUAN</u>	<u>MODEL</u>	<u>ITEM</u>	<u>QUAN</u>	<u>MODEL</u>
1.	2	601	24.	152	1984
2.	1	602	25.	4	1985
3.	10	775	26.	10	1987
4.	10	1103	27.	15	3112
5.	23	1141	28.	2	3201
6.	59	1151	29.	12	3202
7.	24	1546	30.	9	3406
8.	35	1549	31.	16	3601
9.	30	1553	32.	10	4117
10.	22	1555	33.	12	4128
11.	10	1569	34.	9	4157
12.	8	1606	35.	98	4203
13.	3	1608	36.	14	4217
14.	2	1667	37.	6	4406
15.	35	1673	38.	1	4407
16.	29	1682	39.	35	47G0D
17.	40	1683	40.	1	5401
18.	1	1919	41.	4	6101
19.	11	1950	42.	13	6160
20.	22	1974	43.	1	POWER CORD
21.	12	1975	44.	1	POWER CORD AND
22.	32	1977		20	BATTERIES ENCLOSED
23.	16	1980			IN LEATHER CASING.

The above is a list of modules that are in the Obsolete Stock Room. They will be distributed to anyone who wants them on a first-come, first-served basis. Please contact Bill Farnham, extension 377, when you want to use any of the above obsolete stock.



INTEROFFICE MEMORANDUM

SUBJECT COMPUTER SCHEDULING
TO COMPUTER USERS

DATE June 18, 1963

FROM Sandy Moore

Computer time on the PDP-1C 20, Sales PDP-1, PDP-4 Prototype, and Sales PDP-4 can be scheduled by calling Sandy Moore on Ext. 362. Whenever possible, scheduling should be done by 9 A.M. on Friday of the week preceding the desired time. The computers are usually very busy and it is seldom possible to get time on short notice.

Schedules will be posted for all the above machines on Friday afternoons, covering the following week. Signing your own name on these schedules in no way guarantees your time. If you wish time after the schedules have been posted, call 362. A master schedule is kept, and will be checked to see if there is short notice time available. People listed on the schedules take precedence over anyone on the machines unless special arrangements are made through Bob Beckman.



INTEROFFICE MEMORANDUM

DATE June 18, 1963

SUBJECT COMPUTER SCHEDULING

TO COMPUTER USERS

FROM Sandy Moore

Requests for computer time should be as accurate as possible. The computers are in great demand, and in order to provide time to all those who need it, it is important not to over-schedule.

When you use the computer always sign the log book. This is important for maintenance records, and to determine the needs of different groups of people for computer time. Requests for computer time will be compared with entries in the log books.



INTEROFFICE MEMORANDUM

SUBJECT 30th Meeting of the
Test Equipment Committee
June 11, 1963

DATE June 18, 1963

TO Richard L. Best

FROM Russell Doane

Members of the Committee:

Robert Hughes, Chairman
Russell Doane, Secretary
George Gerelds
Dave Dubay
Dick Tringale
Jim Cudmore
Steve Lambert
Al Falco
Ed Harwood
Jack Shields

1. The nanoampere leakage tester has been tested and will be ready for use as soon as the panel has been labeled.
2. We discovered that we cannot get the quantity discount on any multimeters from Triplet unless we buy 10 of a single type. Since we do not feel that there is a need for as many as ten of the 630 NS high impedance meters or the 630 L low voltage ohmmeters, we will order ten of our standard 630 NA meters. (See last page.)
3. After looking at the Beta checking equipment available, we decided to ask for a demonstration of the Dynatran model 1803 and a demonstration of the Fairchild model 50. The Dynatran is capable of measuring hob, hoe, hrb, hib, hie, hfe, and Ico over wide ranges. The model "A" whose Ico sensitivity exchange extends from 100 nanoamperes to 1 milliampere full scale costs \$795. The "B" model which costs \$845. has Ico scales extending from 10 nanoamperes to 100 microamperes full scale. Fairchild, model 50, offers digital readout for betas from 2 to 999 and is capable of making pulsed measurements over a collector current range from 1 microampere to 1 ampere. It does not measure any other parameters.
4. Our Fluke meters are now labeled according to their rated accuracy. Dave Dubay recently completed the quarterly intercomparison of our high precision Fluke meters and our precision Kintell power supply. All of the errors he observed were somewhat less than the sum of the rated errors of the devices being compared. We will make it a general practice to make this intercomparison on any such comparable devices we own on or about June 1, Sept. 1, Dec. 1 and March 1. Meanwhile the purchase of a standard divider from Julie Research Corporation which will soon be made, will provide us with 15 bit ratio accuracy between 10 volts and zero which probably can be incorporated with one separate divider for standardization at 500 volts and 50 volts to allow checking of linearity and checking of high voltage cardinal points on our Fluke meters and high precision power supply internally without great expense.

We would need a voltage standard approaching the accuracy of the Julie Research Laboratory 3-standard cell temperature enclosure (which costs \$1390 with the cells installed and certified for 3 part per million accuracy for a period of one year).

5. Al Falco and Jack Shields and Ed Harwood will be added as committee members. Al Falco replaces Ken Wakeen for Production engineering. Don White is no longer a member of the committee.

6. Many new requests for oscilloscopes and other equipment were made to the committee at this meeting:

- A. The PDP-6 group requested a Tektronix type 585 oscilloscope for use with the 10 megacycle logic, and this has been ordered. They feel that the 4 nanosecond rise time available with a dual trace plug-in unit in the 585 oscilloscope is necessary and that the 9 nanosecond rise time of the Hewlett Packard 175A dual trace oscilloscope with delaying sweep would not be adequate.
- B. Steve Lambert reports that the oscilloscope he expected to receive was never assigned to him. He needs a dual-beam 555 Tektronix oscilloscope, for viewing 8 traces, on two time bases.
- C. Ed Harwood requested two oscilloscopes without sweep delay and two oscilloscopes with sweep delay--all to have dual trace plug-in units. He wants two 9 foot probes to be included in the order. Two of these may be postponed for delivery at the end of August if necessary.
- D. Larry White reports a need for two sweep delayed oscilloscopes and one scope without delay. Two are for two engineers and one oscilloscope is to be used by any of five technicians, not all of whom work with an engineer to whom a scope is assigned.
- E. Both Guenther Huewe in the Munich office and the Ottawa office are reported to need oscilloscopes. We discussed the possibility of shipping them the two 541 oscilloscopes that we have owned for several years. Before doing this, we will double check the reported three to four month delivery time for oscilloscopes from the European Tektronix office to the DEC office in Munich.
- F. The Model Shop still needs an oscilloscope, since it never was assigned its third scope.

Before ordering scopes to meet the above requirements, we decided to try to pin the local Tektronix representative down on what Tektronix intends to do in the near future to meet the competition of the Hewlett Packard 175A. He has repeatedly implied that Tektronix would announce something this summer to outclass the Hewlett Packard oscilloscope.

A. We received the following hints from him:

1. The principal new development in the offing is something in the 540 series (he refused to reveal the number) with the following improvements:
 - a. Improved triggering, up to the full bandwidth of the vertical channel.
 - b. Distributed-constant delay line (as in the 580 series 'scopes) instead of the present multi-adjustment lumped line.
 - c. No cathode interface problem. He did not deny our speculation that this means the use of transistors throughout.
 - d. Six cm deflection, without the increase in spot size he claims is inherent in their mesh-corrected electron-optic design.
 - e. Bandwidth will be the same as, or greater than, the present 540 series.
 - f. Much increased gain.
2. Improved 580-series instruments will be available beginning in August, and will no longer have gain dependent on vertical position. A modification kit will be available for earlier 'scopes.
3. Announcement will be either at Wescon or Merem.

Meanwhile our service experience to date on the 175A is that the time to calibrate them at present is approximately equal to the time we now require to calibrate the 543 type oscilloscope. In view of the fact that we are just beginning to calibrate the Hewlett Packard scope and that we do not have the specialized test equipment from Hewlett Packard that corresponds to the specialized equipment for the 543 scopes that we have available, the outlook is good for increased efficiency in this area with the Hewlett Packard scopes, if we buy the necessary accessories.

7. Russ Doane proposed that we order for \$40, from Triplett, a zero center 2 1/2 microampere meter to replace the zero center 20 microampere meter now installed with the resistance bridge. The increased sensitivity and more optimum resistance matching of the new meter should allow a much larger proportion of uses of the resistance bridge to be performed without the aid of the sensitive DC VTVM. The committee agreed.

8. Steve Lambert complained about the difficulty of using Tektronix probes in checking out computer wiring. Three concrete proposals were made towards alleviating his problem.

First: Return to the use of a 6" lead extending the tip of the probe with a high quality minigater clip at the

end, so as to make it easier to reach hard-to-get-at spots.

Second: Change to a sampling scope or some other type of oscilloscope input circuit which will allow the use of very low level signals with 50 ohm cable, thus making it possible to home-build special small attenuator probes which consist of nothing more than a 1/4 watt carbon resistor in series with the center conductor of the coaxial cable.

Third: To reduce the problem of stepping on probes by accident and to remove scopes and associated wires from the walking area around a computer under checkout, possibly the oscilloscope to be used could be mounted on top of the computer during the checkout process in a cradle which would allow it to be tipped somewhat downwards. This would provide several advantages: first, the scope would be out of the way; second, probes could be used barely long enough to touch the floor, thereby preventing them ever from lying on the floor and being stepped on and additionally the probes would always hang straight down, which would reduce the force tending to pull the probe off of a point under observation. Third, except for short people or for testing of the bottom mounting panels, the controls might be easier to reach, especially since the technician would only have to look up instead of turning his head completely around from the point of observation. Fourth, the downward-facing display tube would be shielded somewhat from ambient illumination. All of the advantages may well be overshadowed by the expense and difficulty of mounting the oscilloscope above the computer; however, for a machine as large and complex as PDP-6, the labor necessary to make this arrangement might be worthwhile.

9. Jim Cudmore reported that for production test purposes, a Hofstrom Thompson oven costing \$650 has been ordered. This oven is similar in cubic capacity to the small Delta Design oven in the model shop. He noted that Delta Design has gone out of business.

10. Ed Harwood has requested 6 Triplet type 630 NA multimeters, some of which will replace meters he now has on loan from other areas. He also needs four more passive-terminated current probes. Guenther Heuwe, from the German office, needs a current probe with type 131 amplifier. The six meters will be reserved out of the ten to be ordered from Triplet. We will order the 5 passive current probes, but we made no decision about the current probe for the Munich office.

11. Russ Doane proposed that we seriously consider buying a Hewlett Packard type 1782 A display scanner plug-in unit with a Mosely type 2D XY recorder for use with our 175A oscilloscopes. Several members of the committee felt that this would be an extremely useful device. Its advantages are that it provides a permanent record with greatly increased resolution and on paper where notes can easily be written

and also that multiple traces can be recorded with less confusion since the ink line on the paper is so thin and since the 11" x 17" area is so large. This has a special importance to computer check-out people and might also be useful to anyone using a type 175A who wants to get a permanent record of its display since the usual photographs of the tube face suffer from uneven illumination as this oscilloscope is not equipped with edge lighting on the internal graticule. Unfortunately, this system would use the vertical plug-in unit of the Hewlett Packard oscilloscopes, eliminating the possibility of using delayed sweep if the recorder is in use. The cost of this equipment would be \$2675.

12. The attached list of oscilloscopes, oscilloscope plug-in units, and multimeters, along with several other types of equipment which may be considered for purchase in the future, is included for reference.

The next meeting of the Test Equipment Committee will be on Tuesday, July 9, at 1:30 in Bob Hughes' office.

cc: ✓ H. Anderson
B. Beckman
W. Hindle
N. Mazzaresse
R. Mills
J. O'Connell
G. O'Dea
K. Olsen
S. Olsen
H. Painter
G. Rice
M. Sandler
Engineers

OSCILLOSCOPES

Characteristics with dual-trace plug-in and X10 probes	Tek 543A	Tek 541A	H.P. w/o sweep delay	Tek 581	Tek 585	H.P. with sweep delay	Tek 545A
Rise Time, ns	16.5	16.5	9.5	5	5	9.5	16.5
Best Gain, v/cm	0.5	0.5	0.5	0.1	0.1	0.5	0.5
Fastest Sweep, ns/cm (with magnifier)	20	20	10	10	10	10	20
Magnifications	x2, X5 X10, X20 X50, X100	X5	X10	X5	X5	X10	X5
Display Height, cm	4	4	6	4	4	6	4
Spot Size, mils	20	20	25	20	20	25	20
Anti Parallax Tube	no	no	yes	no	no	yes	no
Lighted Graticule	yes	yes	no	yes	yes	no	yes
Main Vertical Plug-ins Available	15	15	4	3	3	4	15
Horizontal Plug-ins	none	none	4	none	none	4	none
Probe Input, pf	14	14	10	7	7	10	14
Rise Time, ns (single trace, no probe)	12	12	7	3.8 with probe	3.8 w/probe	7	12
Sweep Delay, min.	none	none	none	none	2 usec	1 usec	2 usec
Four-trace rise time w/probes, ns	18.5	18.5	9.5	like 543A	like 543A	9.5	18.5
Dual-trace Cost, \$\$	1560	1485	1635	2075	2375	1985	1810

METERS

	Triplet 630-NA	Triplet 630-NS	Triplet 630-L
DC ohms/volt	V - 10,000 ohms/volt $\frac{V}{2}$ - 20,000 ohms/volt	V - 100,000 ohms/volt $\frac{V}{2}$ - 200,000 ohms/volt	20,000 ohms/volt
AC ohms/volt	V - 5000 ohms/volt $\frac{V}{2}$ - 10,000 ohms/volt	V - 10,000 ohms/volt $\frac{V}{2}$ - 20,000 ohms/volt	5,000 ohms/volt
DC full-scale volts	.120 - .240 - .3 - .6 - 1.5 - 3 - 6 - 12 - 30 - 60 - 150 - 300 - 600 - 1200 - 3000 - 6000	.150 - .3 - .6 - 1.5 - 3 - 6 - 12 - 30 - 60 - 150 - 300 - 600 - 1200	2.5 - 10 - 50 - 250 - 1,000 - 5,000
Ac full-scale volts	1.5 - 3 - 6 - 12 - 30 - 60 - 150 - 300 - 600 - 1200 - 3000 - 6000	1.5 - 3 - 6 - 12 - 30 - 60 - 150 - 300 - 600 - 1200	3 - 10 - 50 - 250 - 1000 - 5000
Dc full-scale ma	.060 - .120 - .600 - 1.2 - 6 - 12 - 60 - 120 - 600 - 1200 - 6000 - 12000	.060 - .120 - .600 - 1.2 - 6 - 12 - 60 - 120 - 600 - 1200 - 6000 - 12000	.1 - 10 - 100 - 1000 - 10000
Ohms center - scale ohms	5 - 50 - 500 - 5K - 50K - 500 K	5 - 50 - 500 - 5K 50K - 500K	5 - 50 - 5K 500K
Volts on Low Ohms	1.5	1.5	0.14
DC tolerance	$\pm 1.5\%$	$\pm 1.5\%$	$\pm 3\%$
Mirror scale ?	Yes	Yes	No
\$\$ each, 1 - 9	79.50	99.50	54.50
\$\$ each, 10 or more	52.15	69.65	38.15
Suspension	Spring backed Jewel	Taut spring suspension	Spring backed Jewel

TECHNICAL PUBLICATIONS KEY PROJECT LIST - 6/17/63

Job No. Job Title Review Week Due Week Now Due

Public Relations]

1509	1963 Annual Report	7/1+7/8	8/26	
1511	June ON LINE	6/10	6/17	
1512	July ON LINE	7/1	7/15	

Sales Promotion]

<i>- August</i>				
3329	May-June General Mailing	6/10	6/17	
3335	July General Mailing	6/24	7/22	8/19
3415	WESCON Display	7/1	7/29	
3416	APA Display	7/8	8/15	
3417	ACM Display	7/8	8/15	
3418	INEL Display	7/8	8/15	
3419	ISA Display	7/22	8/19	
3523	MICRO TAPE Bulletin - <i>Option of the computer</i>	6/10	6/24	?
3542	One MC Module Bulletins	6/10	6/24	?
3543	Revised PDP-4 Brochure	7/1	7/15	8/15
3553	Revised PDP-5 Brochure	7/15	8/12	

Technical Information]

3554	PDP-5 Price List	7/8	7/22	
5505	CRT 30C Manual	---	6/17	
5506	CRT 31A Manual	6/17	8/5	
5507	Card Punch 40 Manual	6/17	7/29	LRL
5508	Card Reader 41B Manual	NS		
5509	PDP-1 In-Out Manual	NS		
5510	Memory Tester 1521 Manual	---	7/1	
5513	Mag Tape 50-51-52 Manual	6/17	7/1	7/29
5529	New DECAL Manual	NS		
5530	New MACRO Manual	NS		
5536	Tape Control 57 Short Form Manual	---	6/24	8/5
5538	Core Tester 2115 Manual	NS		
5539	Memory Tester 1516 Manual	---	?	
5541	Core Tester 2110 Manual	6/10	?	
5549	CRT 31 Manual <i>Fort Meade</i>	6/24	8/19	
5559	new A/D/A Manual	6/10	6/24	7/29
5561	New PDP-1 Short Form Manual	6/10	7/1	8/12
5562	Data Channel 123 Description	---	6/24	
5563	Line Printer 64 Manual	---	6/24	7/15
5566	Controls 131/510 Manual	6/17	6/24	7/22
5567	PDP-5 Short Form Manual	7/1	7/15	8/26
5571	Serial Drum 24 Manual	NS		

Graphic Arts Services]

8027	Digital Quotation Form	6/10	7/15	?
------	------------------------	------	------	---

5573	Module Tester Manual	7/29	?	
------	----------------------	------	---	--

5204	PDP-6 Technical Article *	7/29	8/12	
5205	PDP-5 Technical Article	8/12	8/26	

SALES CALL REPORT

FIRM	University of Illinois	DATE	June 18, 1963
DIVISION	Digital Computer Lab.	SALESMAN	Fred Gould
STREET		OFFICE	Maynard
CITY	Urbana	STATE	Illinois
PHONE NUMBER	333-1115	AREA CODE	217
		NATURE OF CALL	Visit to Univ.
		FOLLOW-UP DATE	

CONTACTED

Professor Bruce McCormick

SUBJECT
Scanner 2301

REMARKS (CONTINUE ON BACK OF SHEET)

My intention here was to check on the operation of the Scanner we delivered nearly two years ago. Upon meeting the chap he took me completely over and I spent the next three hours running all over the campus with him while he showed me the complete computer operation at the University, both actual and planned.

To skip a whole mess of details, Professor McCormick has and is developing a scanner - PLPR type computer. Some outstanding features are a 2 μ sec multiply scan conversion in less than one millisecond.

After the sales pitch (he was selling) he asked me if we were interested in the machine from the standpoint of building it for the commercial market (commercial in the sense of profit-making only, as this system would have at the most 10 users at this time, in the Professor's own estimate).

My answer was yes we are interested - just how much I could not tell him, but promised to lay out the details to my superiors and definitely contact him within a month if we are interested. He does not expect a final evaluation by us until he has his complete cost data available (sometime in Oct. or Nov. 1963). The system would probably cost 500-750K

PROMISED in the final analysis.
To discuss with DEC Management, and phone within 4 weeks.

HOW TO LOCATE PLANT

The Lab is actually located in Champaign, Illinois.

SALES CALL REPORT

FIRM	University of Illinois	DATE	June 18, 1963
DIVISION	Electrical Engineering Dept.	SALESMAN	F. Gould
STREET	602 South 6th Street	OFFICE	Maynard
CITY	Champaign	STATE	Illinois
PHONE NUMBER	333-3018	NATURE OF CALL	Visit at Univ.
		AREA CODE	217
		FOLLOW-UP DATE	

CONTACTED

Prof. Robert H. Smith

SUBJECT

PDP-4

REMARKS (CONTINUE ON BACK OF SHEET)

Professor Smith has under his control a PB-250 and a Bendix G-20.

I would say he is sort of committed to a PDP-4 at this point, but cannot decide the best method to sell the idea to his boss. He would like a "loaded" 8K PDP-4 but may play it cool and get a \$65.5K machine.

His desires are: 8K PDP-4 with Printer Keyboard and Punch }
Extended Arithmetic } *\$86,300*
Card Reader
Holly Printer ← *\$15,430*
2 Microtapes.

He states that up to 500 students in one year would have contact with the machine and that its use would be academic. Funding would be with State of Illinois money.

One other possibility is that the board may want a mere minimal machine, in this case he feels the PDP-5 is a shoo-in. I agree.

(over)

PROMISED

To phone him information on probable discount.

HOW TO LOCATE PLANT

Part time work will be done on hybrid computer techniques using whatever machine they purchase with their already owned Pace Analog machine.

The other contact here at the University was Dr. Heinz Von Forester. Professor Smith gave me the scoop on him. He was given a B-205 at the Spring Conference (an outright gift). He really doesn't know much about computers. Professor Smith does not want to work a parley with him.

10% \$ 5,650

20% \$ 11,300

30% \$ 16,950

40% \$ 22,600

50% \$ 28,250



INTEROFFICE MEMORANDUM

DATE June 18, 1963

SUBJECT APPLICATION NOTES

TO Jack Atwood

FROM Howie Painter

cc: >H. Anderson
S. Olsen
N. Mazzaresse
G. Moore

It would be nice to have the following Application Notes for the American Psychological Association Convention (August 29 - Sept. 4):

1. Applications in the biomedical field, particularly based on Dr. Rosner's brain wave work.

Gerry Moore will be working on copy for this one.

2. Use of the PDP-1 in psychological testing and experimentation (similar to the work that OAL at Hanscom Field is doing).

I will be working on the copy for this.

Both Gerry and I hope to provide the copy for these brochures by July 15.

HOP:vg



INTEROFFICE MEMORANDUM

DATE June 17, 1963

SUBJECT

TO Works Committee

FROM J. Smith

A job cost analysis of 555 micro tape units will be completed within the next few days. At that time, inventory investment figures for raw materials and manufactured parts will be available. These figures along with orders received and sales probabilities will be presented for consideration, in order that a realistic production rate may be established.



INTEROFFICE MEMORANDUM

DATE June 14, 1963

SUBJECT

TO *H. Anderson*

FROM J. Smith

Presently there are three open orders for 131-510 data-tape controls; LRL with a delivery of June 30, AEC - Princeton University June 30, and Customer Relations PDP-1C-20 July 1. There continues to be an Engineering Hold on construction of these units pending modifications.

6/12/63

Memo:

To: Computer Guidance Committee

Subject: Use of PDP-4 by Accounting

Introduction

For some months now the Accounting Department has been working toward utilization of our PDP-4 installation on the first floor of building #12. To the present time, six programs have been written but have not been operating on a regular basis, due to the unavailability of the PDP-4. The equipment has had a large amount of down time and this coupled with customer use has given us very little time to use it.

The purpose of this presentation is to show the need for the use of the PDP-4 computer by the Accounting Department in order to satisfy the growing needs of the company, with regard to data handling requirements. The sheets attached are our estimate of current volume and future volume under three assumptions. It will be readily noted that we show an increase in card volume of 115% and by using our PDP-4 installation and increase in cost 72% over our present cost which includes depreciation on the PDP-4 at full list price converted to cost, which is the worst case, due to our prototype writeoffs on several peices of the equipment. Due to the new applications, being readied, and the need for coordinating data gathering for the entire company, the computer appears to show the most promise for accomplishing this. This will greatly facilitate making our reporting more timely and our controls over the company even better.

There are several alternatives^{7.} solving our volume problem, three of which are presented on the attached sheet and one other, being to order an IBM 1440, which for our installation will carry a rental cost per month of \$3,015. I believe we should use the PDP-4 and Bus/Pac for several reasons. The prime one being to create out of our converting to the PDP-4, business packages which can be used in marketing the unit.

One business package, which always seems to intrigue financial men, is a financial forecasting package which we intend to prepare and in which I intend to be deeply involved.

No mention has been made in this presentation of programming assistance, since we intend to rely on Fred Mac Lean, with help in the rough spots from Dit Morse's programming group.

Present Installation - Tab Equipment

Our current installation is running at a card volume at about 79,000 cards per month with seven people, and a total cost of approximately \$6,100. per month. As you can see, from the attached chart the utilization of the equipment is quite high, and the only way we can absorb extra volume is to go into a night shift, with its attendant inefficiencies and heavy demands on the day time manager. Moves have already been made to free Fred Mac Lean for his work on PDP-4 programming.

Future Installation With PDP-4

We are assuming that all of our accounting (current) jobs being done in Tabulating will be converted to the PDP-4 by September 1, on the further assumption that the equipment will be available to us July 1st. Bob Beckman is obtaining a status report on the condition of the equipment for me, in order that he may fairly estimate how much time will be required to tune the equipment for regular day to day operation.

We estimate that we can utilize the PDP-4 equipment 100% of the time for at least four months for programming and regular production work. The total costs with the PDP-4 approximates \$10,500. per month, which is 72% increase over the present cost, but all of this with a 115% increase in volume. The difference will be absorbed in higher utilization of the IBM equipment with other efficiencies being realized by the use of the PDP-4.

Future Installation Without PDP-4

The total cost here is approximately \$8,700. per month and shows a 43% increase over the present cost. We shouldn't be misled by this lower percentage, because included in the future installation with the PDP-4 is a \$3,900. charge per month for depreciation on the PDP-4 equipment which was calculated at full sales value reduced to cost of sales and on a ^{4 year} double declining balance, using the first year which is a 50% of the cost basis. This is indeed the worst case, and if we used the second years depreciation, this would bring both installations to approximately the same cost. It should also be noted that if we follow this course, we will require extra space, even now getting tight, to house the extra equipment and people.

Summary

Recognizing that there is a real need for better reporting and definition of our cost, in order to disseminate more meaningful information to management, project managers, and cost center managers, plus faster, more timely reports, I believe we should move into a computer operation as soon as possible. I don't mean, by mentioning financial forecasting last, that it is of the least importance, because at the present time this is taking considerable time to prepare and the ultimate goal - with the computer - would be to be able to run several different models at different assumptions, in order to see more quickly what cash, personnel and facility requirements are needed.

I believe a major by-product of the use of our own PDP-4, for our business applications, will be the preparation and documentation of business packages which we can use to merchandise our equipment. It should be remembered, that once we go into business applications, the equipment will have to be operational for the time slots required by accounting, and this in turn will restrict the use of the machine for testing modifications to a minor level. We can not afford to be out of action on a payroll day.

Present Equipment:

- 1- 402 Printer
- 1- 403 MLD Printer
- 1- 602 Calculator (+ - x)
- 1- 083 Sorter
- 1- 056 Verifier
- 1- 514 Reproducing Punch
- 1- 085 Collator
- 4- Keypunches 026
- 1- 548 Alphabetic Interpreter
- 1- 082 SORTER

Employees:

- 1- MANAGER - F. MACLEAN
- 1- Supervisor - Operator G. Breen
- 1- Keypunch - mach. operator L. Downey
- 1- Keypunch Verifier G. Konowicz
- 3- Keypunch operators S. Paul, N. Copeland, E. Lambert

Jobs Now Being Done:

- 1. Payroll - From Time Card to Check
- 2. Labor - Distribution
- 3. Material Accounting
- 4. Reconciliations - Bank Accounts
- 5. Cost Center Reporting
- 6. Budgets
- 7. Capital Equipment
- 8. Accounts Payable
- 9. Accounts Receivable
- 10. Sales Analysis
- 11. Trial Balances & Gen Ledger
- 12. Personnel Records
- 13. Purchase Commitments
- 14. Miscellaneous

TOTAL

PRESENT TAB INSTALLATION

UTILIZATION %	COST MONTH
80	#
75	
20	
80	
100	
25	
25	
80	
30	
80	
<hr/>	
	1951

MONTHLY PUNCHING VOLUME (CARDS)

10000	
28000	
14000	e/H 1600
4000	# 6105
2000	
2000	
100	
12000	
500	
2500	
1000	
100	
1000	
2000	
<hr/>	
79200	

FUTURE INSTALLATION WITH PDP-4

EQUIPMENT	COST MONTH
—	#
1-403 MLD PRINTER	470
—	
2-083 SORTERS	220
2-056 VERIFIERS	100
1-514 REPR. PUNCH	85
1-085 COLLATOR	125
6-026 KEYPUNCHES	360
<hr/>	
	1360

PDP-4 DEPR.

3 KEYPUNCH	840
PRESENT	2554
1-OPERATOR-TAB.	350
<hr/>	
	3744

TOTAL EQUIP. + PAYROLL	8164
OVERHEAD @ 6 1/2 %	2340
<hr/>	
	\$ 10504

PRESENT

79200

+ 7 1/2 %
OVER
PRESENT

FUTURE INSTALLATION WITHOUT PDP-4

EQUIPMENT	COST MONTH
1-402 PRINTER	\$ 425
2-403 MLD PRINTER	940
1-602 CALCULATOR	255
2-083 SORTERS	220
2-056 VERIFIERS	100
1-514 REPR. PUNCH	70
1-085 COLLATOR	125
6-026 KEYPUNCHES	360
1-082 SORTER	55
1-548 ALPHA. INTER.	100
<hr/>	
TOTAL EQUIP.	2650

1-OPERATOR	350
PRESENT	2554
3-KEYPUNCH	840
<hr/>	
	3744

TOTAL EQUIP. + PAYROLL	6394
OVERHEAD @ 6 1/2 %	2340
<hr/>	
	\$ 8734

+ 43 %
OVER
PRESENT

6/11/6

New Applications:

1. Job Order Costing (material for T.P.)
2. Wiring Lists
3. Inventory Controls (Inc. Classes)
4. Prepunched Job Tickets
5. Purchase Commitments (All inclusive)
6. Inventory Requisition Pricing
7. *Financial Forecasting*

1 YEAR	47000
	35000
	4000
	4000
	5000
	500
	500
	<hr/>
	170200

INCREASE OVER
PRESENT 115%

dec

INTEROFFICE
MEMORANDUM

136

DATE June 12, 1963

SUBJECT

TO *H. Anderson*

FROM J. Smith

The first production 555 unit is currently undergoing test by Jerry Hamilton. All units should be tested by June 24th, barring any drastic modifications.

A. W. Wakeen



**INTEROFFICE
MEMORANDUM**

62-004

DATE **June 12, 1963**

SUBJECT **Implementation of the Weston Resistor "Automatic Resistor
Temperature Coefficient Tester"**

TO **Computer Guidance Committee** FROM **K. Wakeen**

**A meeting was held to determine how best to handle the subject
job in the event of a sale. Present at the meeting were:**

**Ed DeCastro
Pat Greene
Jon Fadiman
Len Hantman
Ken Wakeen**

**Jon Fadiman indicated that he could provide the construction
and debugging portion of the system, since his engineering is spread
thin at this time.**

**Design, programming, and delivery will be the writers
responsibility.**

**This particular working relationship will hold as an interim
measure and change will be made if required on future jobs.**

TENTATIVE ANNUAL REPORT PRODUCTION SCHEDULE

<u>Start Date</u>	<u>Step</u>	<u>Work Days</u>	<u>Operations</u>	<u>Participating</u>	<u>On Vacation</u>
6/10 24	Outline	5	Prepare subject outline and list of illustrations	Management, writers and illustrators	
6/17 25-26	Text & layout	10	Produce preliminary draft, layout and illustrations	Department heads, writers, illustrators	6/24 Stu
7/1 27-28	Draft review	10	Put text into final form and settle on layout and illustrations	Management, department heads, writers, and illustrators	7/1 Stu, Ted 7/8 Ted
7/15 29-30	Mechanicals	10	Set type, do finished art, take final photos, complete paste-up	Illustrators	7/15 JLA 7/22 JLA
7/29 31	Camerawork	5	Make negatives and proofs	Printer	
8/5 32-33	Proof review	10	Make necessary alterations in text, type, illustrations	Management, department heads, writers, and illustrators	8/5 Jim 8/12 Jim, Bob
8/19 34	Financial Figs.	2	Set type, shoot and insert in proofs	Printer	
8/21 34	Final review	2	Make any final changes	Management and writers	
8/23 34	Printing	5	Print and bind	Printer	
8/30 35	Delivery				

H. Anderson



**INTEROFFICE
MEMORANDUM**

SUBJECT 29th Meeting of the Test Equipment Committee

DATE June 10, 1963

TO Richard L. Best

FROM Russell Doane

Members of the Committee:

- Robert Hughes, Chairman
- Russell Doane, Secretary
- Donald White
- George Gerelds
- Dave Dubay
- Dick Tringale
- Jim Cudmore
- Larry White
- Ken Wakeen
- Steve Lambert

1. Our nanoampere leakage tester has been built but has not yet been tested.
2. Triplet has recently come out with two new meter types, the 630 L and the 630 NS. The 630 L is a low power ohmmeter which puts a maximum of 140 millivolts across any device under test, thereby measuring only leakage current in conventional semiconductors regardless of polarity, and making it possible to check "backward diodes", tunnel diodes, etc., without burning them out. The 630 NS is a 630 NA with terminal resistance an order of magnitude higher, making it possible to use it in places where a 630 NA loads a circuit appreciably. We cannot obtain the low factory discount on quantities of less than ten each of a particular type, so we'll discuss what to order at the next meeting.
3. The Standards subcommittee reported that the standard ladder network for computer controlled digital to analog converter for use in calibrating and testing our analog to digital and digital to analog converters has been designed and submitted to Julie Research for preliminary comment. After several revisions, we can soon place an order. The subcommittee also reported discussing how our Fluke meters and Kintell voltage power supply should be standardized and traced to make a cost comparison between sending the instruments out on a regular basis for calibration by a standardizing lab such as Avco, versus the cost of buying and maintaining standards of our own for the job.
4. Russ Doane was asked to look into the possibilities of buying an instrument to measure low current beta since our present measurement of beta is a cumbersome operation involving setting up the Tektronix curve tracer and interpolating from the curves displayed to calculate the beta. Fairchild was suggested as a possible source for this instrument.

5. A suggestion from Barbera Stephenson, to put a label on our Fluke meters plainly showing their rated accuracy to avoid confusion, was applauded and will soon be done.

6. For our new Hewlett Packard 50 megacycle oscilloscope there is a four-trace plug-in unit available whose rise time is slightly more than half that of the Tektronix Type M four-trace plug-in unit, and at the next meeting we will discuss the possibility of buying one of these.

7. We decided to order a \$30. frequency doubler for our Tektronix 50 megacycle pushbutton frequency reference to make it easier to calibrate the sweep speeds of 50 and 100 megacycle oscilloscopes, each of which has 10 nanosecond per centimeter maximum sweep speed. This device may also facilitate calibration of the much faster sweeps of our sampling scopes.

The next meeting of the Test Equipment Committee will be on Tuesday, June 11, at 1:30 in Bob Hughes' office.

JSC



INTEROFFICE
MEMORANDUM

DATE June 11, 1963

SUBJECT

TO *H. Anderson*

FROM J. Smith

There is presently an Engineering Hold on 131-510
Tape Controls. Revised schedule dates will be issued
on release.



INTEROFFICE MEMORANDUM

DATE June 10, 1963

SUBJECT PDP-4 FOR THE UNIVERSITY OF WASHINGTON

TO K. Olsen

FROM G. Moore

cc: H. Anderson
S. Olsen
N. Mazzaresse

Dr. Allen Scher of the Department of Physiology and Biophysics at the University of Washington in Seattle is going to purchase a small computer. His initial application will be to reduce data for subsequent further processing on the University of Washington's 7090. Eventually he will use it for other applications, including on-line applications. Dr. A. C. Young, also of the Department of Physiology and Biophysics, will possibly be contributing some of his grant funds toward the computer, and will also be using it. Dr. Theodore Kehl, a young post doctorate, will be working with Scher and Young on the computer.

Dr. Scher is presently considering CDC, SDS, 3-C, ASI, and Packard-Bell computers in addition to DEC's PDP-4 for his installation. He thinks PDP-4 is one of the strongest contenders in the area of in-out processing.

The PDP-4 configuration which he would most likely be interested in and the corresponding prices are as follows:

Basic PDP-4	\$56,500
Printer Keyboard	5,000
Perforated Tape Punch	4,000
4096 Word Core Memory Module	14,500
Extended Arithmetic Element	6,300
New Tape Control	24,000 (estimate)
Midwestern Tape Transport	24,000 (estimate)
A-D Converter	5,000 (estimate)
8-Channel Multiplexer	<u>4,450</u>
Total System Price	\$143,750

Scher expects to have his specifications ready for bidding by the end of June.

I believe the discount that is offered Scher will be a large factor in his selection of a supplier. I further believe that it is sufficiently important for us to get a PDP-4 into his department

to justify our offering a sizable discount. My judgment of the importance of selling Scher a PDP-4 is based on two criteria:

- 1) What stature does Scher and his department enjoy?
- 2) How intelligently would Scher use a small computer?

The University of Washington appears to have one of the most highly regarded physiology departments in the country. According to Dr. Kehl, it is the largest department in the country in terms of the number of post doctoral fellows (Ph.D. and M.D.). A majority of the post doctoral fellows both in and out of the department take Dr. Young's course in biomedical instrumentation. Dr. Kehl is teaching a course in digital techniques and will be developing a series of courses to follow it. This particular course is a special training course presented under a research methods training grant from N.I.H. It is required of the participants in the research methods program who are primarily medical school students. However, nearly an equal number of post doctoral fellows and faculty members attend the course. Present policy is to develop the training program into a degree course in five years.

Dr. Young is a Ph.D. in physics. According to Dr. Kehl, Young has worked with all the great names in physiology of the present day, including Bronck, Hartline, and Fenn. Dr. Scher is reputedly internationally known for his work on systems analysis of the cardiovascular system. These two men both contributed to the "Textbook of Medical Physiology and Biophysics", which, according to the publisher, Saunders and Co., is the largest selling and most widely used physiology textbook in the country. The book was edited by Ruch, Chairman of the Department of Physiology and Biophysics at the University of Washington, and by Fulton at Yale. Parts of it were contributed by eminent men in the field from all over the country. As I examined the books, it appeared that the largest number of contributors were from the University of Washington.

Dr. Kehl received his Ph.D. in Zoology from the University of Wisconsin. He has had considerable computer experience. He has programmed the 7090, 650, 704, 1620, 160A, and 1604. He taught a programming course at the University of Wisconsin. Last summer he assisted Ross Adey at UCLA in teaching a course on the use of digital computers in biological research. (Ross Adey is at UCLA's Brain Research Institute and has a CDC 160A of his own.)

I have a suspicion that the University of Washington is slightly prejudiced in favor of a 160A, if only for the reason that Kehl has had more experience with CDC equipment. I expect that their prejudices will show in their specs when they are sent out at the end of June. Therefore, it would be a good idea to bend their prejudices towards a PDP-4 by offering a discount before the specs are completed. I suggest that we offer a 30% discount.

GTM:vg



INTEROFFICE MEMORANDUM

DATE June 10, 1963

SUBJECT

TO H. Anderson ✓ T. Stockebrand FROM Alan Kotok
N. Mazzaresse R. Savell
G. Bell

I had an impromptu conversation with Prof. Minsky at MIT last night, in which he stated a desire for some kind of display maintaining controller. He seems to be interested in running lots of displays on one deflection system with selective unblanking. He would like the controller to be a satellite of a PDP-1. The controller should be able to go through its memory, and interpret the information as being single points, characters, line segments, etc. It should recognize the light pen, but need not track it itself.

I think this is close to what McDonald at BTL wants. Maybe the same solution exists to both their problems.



INTEROFFICE MEMORANDUM

DATE June 7, 1963

SUBJECT PDP-4 Prototype

TO H. Anderson ✓
S. Olsen
B. Beckman
D. Mills
G. Bell

FROM Dit Morse

A crisis has developed. The PDP-4 Prototype was down for four days this week, true to Bob Beckman's impeding disaster. The crisis was magnify by the fact that a potential customer (?) sat cooling his heels while people frantically tried to fix the machine.

In the neat future, Microtape and the 16K Prototype PDP-6 memory will be added to this machine.

To insure maximum up time and proper maintenance, I propose that the machine be turned over exclusively to Bob Beckman's group until they are satisfy with the condition and operation of the machine and a good set of prints exists, so that future additions and modifications may be made.

HM/nbh



INTEROFFICE MEMORANDUM

DATE June 7, 1963

SUBJECT

TO Ed DeCastro

FROM Arthur Hall

✓ Harlan Anderson
Robert Maxcy
Gordon Bell

PDP-3

On 6/7/63 at the request of Foxboro I gave a verbal quotation to Roy Fine, Manager of Operations, for the cost of additional equipment to create a Foxboro Real Time Option. The rough calculation:

5	1685 at 128	640
3	1304 at 130	390
	Engin. Dev. \$50/5 machines	10
	Drafting 40 hrs. \$672/5 machines	134
	Wiring \$14/module	112
	Additional test - negligible	000
		<u>\$1286</u>

My ballpark quote: approx. \$1200

Ed DeCastro's ball park quote for Real Time Clock \$1000.
Definite price for thermostats: \$40/bay
No charge for Power Slave signal

Real Time Option to include:

- 3 time pulses 1.5 μ sec. long
- 6 buffered address lines (gnd a "one")
- 12 buffered data distributor lines (gnd a "one")
- 12 Information lines (to accept pulses)
- 1 Priority interrupt line
- 1 skip input (to accept pulses)

Delivery estimate of 3 months if order arrives not sooner than July 1, 1963.

Presumably a formal request for prices will arrive soon accompanied by R.T.O. specification and a more exact answer will have to be formulated.

AH/II

OVERDUE MODULE LIST, AS OF END OF DAY JUNE 5, 1963

Digital Order Number	Customer	Qty.	Modules	Due Date
04724	STELMA, INC. (655.36 KC)	5	1406	5/10/63
04738	STANFORD UNIVERSITY <i>Scrapplate</i>	4	4221	5/22/63
04752	EDGERTON, GERMESHAUSEN & GRIER INC.	14	4303	5/18/63
04753	EDGERTON, GERMESHAUSEN & GRIER INC.	8	1954	5/18/63
04795	NATIONAL CASH REGISTER	1	4702	5/29/63
04801	UNIVERSITY OF CALIFORNIA, LRL <i>Scrapplate</i>	3	4225	5/24/63
04812	MASS. INSTITUTE OF TECHNOLOGY (1.2288 MC)	1	1406	5/27/63
04842	BELL TELEPHONE LABORATORIES <i>10m.c. pulse amp</i>	1	6603	5/27/63
04852	MASS. INSTITUTE OF TECHNOLOGY <i>not a slicer w.o. barrel</i>	4	1556	5/20/63
04855	BELL TELEPHONE LABORATORIES	1	749	5/28/63
04862	UNIVERSITY OF DENVER <i>BCD Light Driver</i>	17	1671	6/4/63
<hr/>				
04884	WESTERN ELECTRIC COMPANY <i>Level Amp</i>	1	668	6/3/63
04888	BELL TELEPHONE LABORATORIES	4	1616	5/27/63
04889	BELL TELEPHONE LABORATORIES	3	1954	5/27/63
04896	RAYTHEON COMPANY	1	1568	6/3/63
04923	ITEK CORPORATION	1	1559	5/31/63
<p>1990</p> <p># 1562 Replace.</p>				

NEW AND SPECIAL UNITS, AS OF END OF DAY JUNE 5, 1963

Digital Order Number	Customer	Qty	Modules	Due Date
04627	MASS. INSTITUTE OF TECHNOLOGY	114	4221	6/30/63
04724	STELMA, INC. (655.36 KC)	5	1406	5/10/63
04775	MASS. INSTITUTE OF TECHNOLOGY	2	4225	6/7/63
04808	BELL TELEPHONE LABORATORIES	6	4221	6/7/63
		2	4225	6/7/63
04839	MASS. INSTITUTE OF TECHNOLOGY	6	4221	6/21/63
04919	THE BOEING COMPANY	1	4224	6/10/63
		2	4225	6/10/63
		3	4221	6/10/63
04936	MASS. INSTITUTE OF TECHNOLOGY (1.6384 MC)	1	1406	6/25/63



INTEROFFICE
MEMORANDUM

DATE June 5, 1963

SUBJECT

TO Works Committee
H. Anderson

FROM J. Smith

Date of last report: April 24, 1963

PDP-1

Additions:

Probable delivery

Raytheon	July 1963
Beckman #3	Sept 1963
Beckman #4	Oct 1963

Deletion:

BBN	Sept 1963
-----	-----------

During this period, machines were shipped to Stanford University and MIT. The MIT machine being on a loan basis. PDP-1 which was out on loan to Adams was returned. Princeton University will receive their machine this month. In turn, the machine they presently have will be loaned to Rutgers.

It should be noted that the added probabilities leave the available for commitment balance at 0 for August - 1 for September and 0 for October. This would suggest a trend toward a four month delivery of computers starting in the month of August. If it is desired to improve on this situation, additional production starts should be generated this month.

PDP-4

Additions:

Probable delivery

JPL #3	July 1, 1963
JPL #4	July 1, 1963
I.E.C.	August 1963
Beckman	Sept 1963

Deletions:

None

During this period, machines were shipped to JPL, Kie Corporation and DEC (Eng.). Even with added probabilities, the available for commitment balance remains at an adequate level.

H. Anderson

dec

INTEROFFICE
MEMORANDUM

SUBJECT Programming Notes
TO PDP-4, PDP-1 List

DATE June 5, 1963

FROM Dit Morse

There occasionally arise topics concerning programming conventions, etc., which do not require a permanent memorandum or program write-up. Such things may be very nicely covered by a "programming note".

Programming notes will be distributed to the PDP-4 and/or the PDP-1 distribution lists. People wishing to distribute programming notes are requested to do so through the Programming Group. Copies will be available through the program library or Programming Group.

Attached is the first PDP-4 programming note

cc: Sandy Moore

DHM/nbh

PDP-4 PROGRAMMING NOTE 1

SUBJECT: Conventions for library subroutines using the program interrupt

The subroutine should exit by the use of the instruction DISMIS, which will be defined in the main program as a jump to the routine which will dismiss the interrupt.

The subroutine write-up should specify the name of the place to which control should be transferred when the flag for the devices becomes a 'one'. The subroutine should turn off the flag before dismissing the interrupt.

The user of the subroutine must insure that the I/O device flags are clear before execution of the program begins. In addition the user should supply the DISMIS routine and the sequence of instructions to check the I/O device flags.



**INTEROFFICE
MEMORANDUM**

DATE June 5, 1963

SUBJECT Fiscal '63 Annual Report

TO Ken Olsen
Harlan Anderson ✓

FROM George O'Dea

Jack Atwood's memo of 5/28 (Attached) has all of the sounds of a full blown annual report.

If we are going to publish anything at all I would recommend that we limit it to a Balance Sheet and P&L (current and prior year only) with perhaps a cover letter by yourself stating that this is the first time DEC has revealed its financial record. A single sheet folding down into four pages would do it nicely.

The biggest reason for this recommendation is the simple fact that in DEC's case the figures speak far more eloquently than words.

Literally nothing is to be gained by adding conversation to the report.

George O'Dea

GTO'Dacs
Attachment



INTEROFFICE
MEMORANDUM

George O. Dea

DATE May 28, 1963

SUBJECT 1963 ANNUAL REPORT

TO ~~K. H. Olsen~~

FROM J. L. Atwood

If we are going to do an Annual Report this year, we certainly should have it available by September 13th for General Doriot's talk in New York. As a matter of fact, I had in the back of my mind the possibility that the General would still be interested in mailing copies of our Annual Report with his Mid-Year Report in August. That was the information Bill Congleton relayed to us the afternoon we went over the annual report problem immediately prior to the ARD Annual Meeting.

In any case, it would be a very good idea for us to begin early in June outlining and drafting the text for a report. This would give us a good month before the closing of the fiscal year to decide what, if anything, we want to say. Once the text and illustrations are determined, it becomes a relatively simple matter to insert the financial figures and go to press.

INTEROFFICE MEMORANDUM

SUBJECT: JOB ALLOCATION, MECHANICAL DESIGN DATE: June 5, 1963

TO: All Engineers FROM: Loren Prentice

K. Olsen
 S. Olsen
 H. Anderson
 N. Mazzaresse
 M. Sandler
 J. Smith
 R. Maxcy
 R. Maroney
 K. Peirce
 H. Crouse
 W. Brackett
 W. Hindle

To better acquaint all engineers and management with job responsibility within the mechanical design department, a memo will be issued periodically as required.

<u>ENGINEER</u>	<u>JOB NUMBER OR EN NUMBER</u>	<u>DESCRIPTION</u>	<u>% COMPLETE</u>
Ron Cajolet	1169	Display 30 interface	80%
	1199	Type 580 tape transport	5%
	1178	PDP-6 Development	5%
	1177	PDP-5 Development	80%
	1157	PDP-4 Automatic Module Tester	85%
	1064	Display 31	95%
	1016	Core Memory Development	75%
	2523	Reader Spooler	98%
	1023	Special Mounting Panel	-

<u>ENGINEER</u>	<u>JOB NUMBER OR EN NUMBER</u>	<u>DESCRIPTION</u>	<u>% COMPLETE</u>
Cott Miller	1027	30 Display (Cabinet Model)	Started
	1177	PDP-5	85%
	1178	PDP-6	95%
	1189	Tape control 510	98%
	1190	Data Control 131	98%
	1196	Tape Transport 570	90%
	--	Product Identification	Open
Ken FitzGerald	1023	Additional assembly jig for 1914 mounting panels	50%
	1000	Paint adhesion on steel components	30%
	1053	Welding jigs for standard computer cabinets	90%
	1000	Sheet metal, machine, cabinet assembly and carpenter shop supervision and administration	
	1178	PDP-6 console mechanical design and prototype fabrication	35%
	1208	DEC paper tape reader (Stepping motor drive)	1%
	1000	"Plastic" doors and end panel research	0%
Loren Prentice	1136	555 Tape Unit	95%
	1097	Mod. development	75%
	1065	Large display	10%

<u>ENGINEER</u>	<u>JOB NUMBER OR EN NUMBER</u>	<u>DESCRIPTION</u>	<u>% COMPLETE</u>
Loren Prentice (continued)	1177	PDP-3 computer (24-36 bit)	25%
	1184	Variable field light pen First three units	95%
	1179	Display 30 cost reduction survey	95%
	1000	Building layout	60%
	1196	Tape transport type 70	0.5%

JOBS PENDING - UNASSIGNED

ASSIGNED
ELECTRONIC ENG.

1151	Large Tape Storage - Hold	T. Stockebrand
1165	Projection display	R. Savell
1180	Camera equipment for 30 display	R. Savell
1181	Camera equipment for 31 display	R. Savell
1182	Electrostatic display development	R. Savell
1086	Holley printer	R. Savell
1064	Eye-ball unit	R. Savell



INTEROFFICE MEMORANDUM

J.S.A.

DATE June 5, 1963

SUBJECT Pete Ingerman

TO H. Anderson ✓
G. Bell
W. Hindle

FROM Dit Morse

Pete Ingerman will be consulting with us on
PDP-6 the 19, 20, and 21 of June.

DHM/nbh

H. Anderson



INTEROFFICE
MEMORANDUM

DATE June 4, 1963

SUBJECT Pete Ingerman

TO Gordon Bell

FROM Dit Morse

Pete Ingerman would like to consult with DEC about the PDP-6 if we so desired.

Pete is a personal and professional friend of mine, whom I met through standards activities about one and one half (1 1/2) years ago. His background is basically that of a programmer of broad experience, with a degree in Mathematics and a recently acquired masters degree in E.E.

Pete will be starting with Westinghouse (Solomon Computer) on July 1, so any consultating activity must take place before then, to avoid a conflict of interest.

The reason I think it would be valuable to partake of his opinions are three:

First, he probably has a working acquaintance with as many different computers as any person available to us in this capacity.

Second, we generally work in a "limited vacuum" in where all the people directly concerned (including J. McCarthy and the BBN people) come from the same enviroment and cannot always be as usefully critical as people from a different enviroments can be.

Third, Pete is a very talented person with emphasis on the use of computers (as opposed to design). He is joining Westinghouse to and the design, and be in charge of programming the Solomon Computer. He has consulted with them in recent months and is also associated with a consulting group titled "Pennsylvania Research Associates". He thinks (and I agree with him) that his talents could be of service to us.

We can buy Pete Ingerman for a \$ 100.00 a day plus expenses. He would prefer the week of June 10. Two or three days consultation would be satisfactory to both parties.

DRM/nbh

digital MEMO

DATE June 4, 1963

TO Harlan Anderson FROM Geny Moore

Here is a rough draft of a technical description of the teletype data processor which I wrote a few weeks ago. I'm in the process of rewriting it and will include diagrams and timing considerations in the new writeup.

SECTION 7

TELETYPE PROCESSING SYSTEM

The Teletype Processing System permits the transfer of information between PDP-D and 100 teletype printer keyboards. The system can be readily expanded to handle up to 256 teletype printer keyboards with the addition of plug-in circuit modules. Each of the 100 lines is a two-wire line over which information can be received and transmitted (but not both simultaneously). The system is capable of handling both 7.5 unit and 11 unit code at a 100 word per minute rate.

The system consists of a control, a line scanner, buffer registers, and a group of teletype sending-receiving modules. It is a "processor-like device" as defined in Section 2, General Description, in that it includes a memory buffer and a memory address register.[?] The Teletype Processing System communicates directly with one 4096 word core memory module through the memory switch, and a portion of this memory module is used to act as a data buffer between the teletype printer keyboards and PDP-1-D.

The complete Teletype Processing System operates through two channels of the sequence break system.

7.1 Operation

The scanner scans all active channels of one code type (7.5 unit or 11 unit) 8 times during the duration of each transmitted or received bit. The 7.5 unit and 11 unit channels are separately, but not simultaneously, scanned. If, during a scan of, say, the 7.5 unit channels, a clock pulse occurs requesting a scan of the 11 unit channels, the scan does not immediately begin. The scan request line remains active until the 7.5 unit channels have been scanned. Then scanning of the 11 unit channels is started.

When, during scanning, an active channel is encountered, scanning stops and a memory address corresponding to the selected active channel is accessed. A control word is retrieved from memory which indicates:

1. The current count (at 8 counts per bit);
2. the current bit (at 5 bits per 7.5 unit code character and 8 bits per 11 unit code character);
3. The current character (1, 2, or 3); and
4. the information transfer direction (transmit or receive).

Each time the control word for a particular channel is retrieved from memory the current count for that channel is indexed in the memory buffer. An overflow of the current count indexes the current bit, and, similarly, an overflow of the current bit indexes the current character.

When indexing is complete, the control word is deposited back in memory. If the current count did not overflow, scanning continues until another active line is encountered. If the current count did overflow, a second memory cycle occurs immediately. The memory address register is indexed between the two memory cycles so that the location next to the one containing the control word for the channel being scanned is accessed. This location contains a partially received character or one or more (up to three for 7.5 unit code) partially transmitted characters. If the control is in the transmit state (as determined by the transmit-receive bit in the control word just accessed) one bit is shifted out of the memory buffer and transmitted via the selected channel's sending-receiving module. If the control is in the receive state, the selected channel is sampled and the received bit is shifted into the memory buffer. Then scanning continues.

SECTION 7 (continued)

On the next 7 scans of this channel, the control word will be retrieved from memory; the count will be indexed, and the word will be deposited back in memory. No information will be transferred (transmitted or received) on this channel during these 7 scans. On the eighth scan of this channel two memory cycles again occur, the current count register overflows, the current bit number increases by one, and another bit is transferred.

When the current character number for any channel overflows, a sequence break occurs to one of two channels of the sequence break system of PDPI-D, depending upon the direction of information transfer. Under this circumstance, scanning does not continue after a second teletype system memory cycle. If the system is in the transmit state, scanning will continue only after the selected channel number has been read into the AC of PDPI-D by an IOT pulse. If the system is in the receive state, the selected channel number is read into the AC and the received character (or characters) is read into the IO register.

Likewise, when PDPI-D wishes to transmit a character (or characters - up to 18 bits) on a particular channel, the channel *number must be loaded into the AC and the character to be transmitted* ~~number~~ must be loaded into the IO register. The appropriate IO instruction causes this information to be transferred to the Teletype Processing System. At the moment when such a transfer takes place, the scanner will either be idle or will be in a scan cycle, but will not, in general, be scanning the particular channel indicated by the contents of the AC. The transmit instruction causes a Teletype Processor interrupt in which the current memory cycle, if any, is completed and the scanner remains stopped. A buffer in the Teletype Processor which contains the received channel number assumes control of address and channel selection. Two Teletype Processor "interrupt" memory cycles occur. During the first,

SECTION 7 (continued)

the appropriate control word is deposited in memory and during the second the character/s to be transmitted is deposited in the adjacent memory location. At the same time, the "active" bit is set in the sending-receiving module for the selected channel. At the end of the second interrupt cycle, the scanner regains control of channel and address selection and continues from where it left off.

7.2 Instructions

The following instructions control the transfer of information through the Teletype Processor:

Transmit, tmt (5.3 microseconds)

This instruction transfers bits 10-17 of the AC and bits 0-17 of the IO to the Teletype Processor. Bits 7-11 of the instruction code specify the number of characters being transmitted (1, 2, or 3 for 7.5 unit code; 1 or 2 for 11 unit code) and the code type. (Note that the code type is already inferred by the channel number. Each channel is assigned a particular code by the choice of sending-receiving module. The code type specified by the instruction must agree with the code type for the specified channel.)

Transmit Complete, tmc (5.3 microseconds)

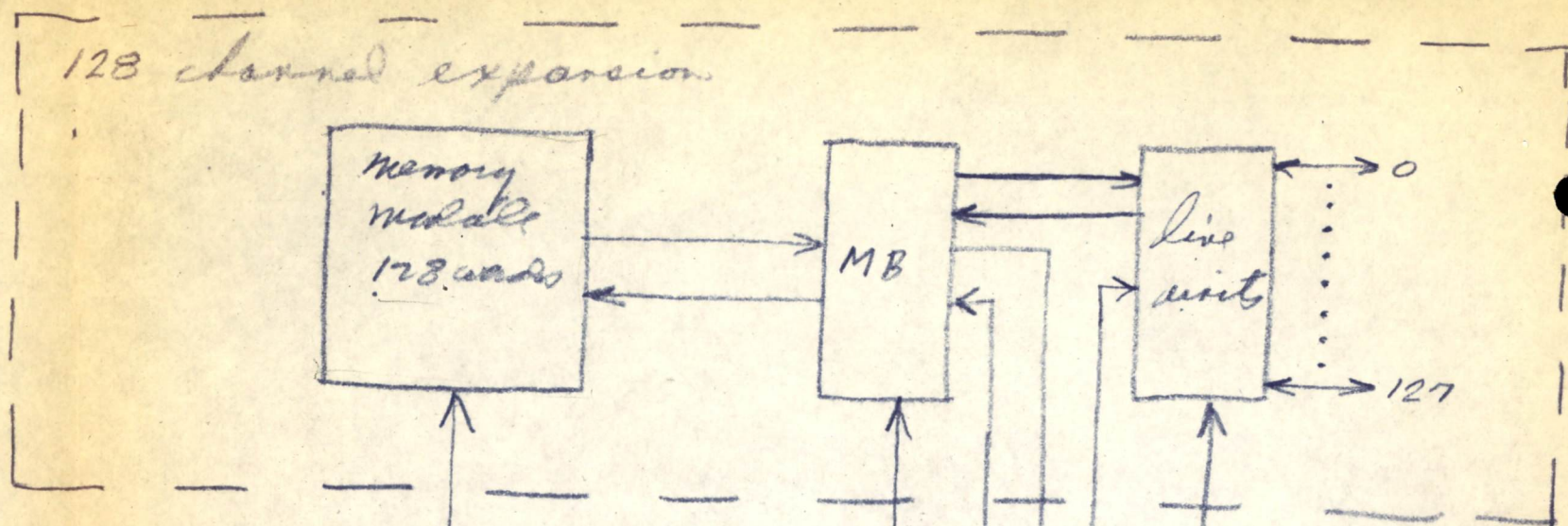
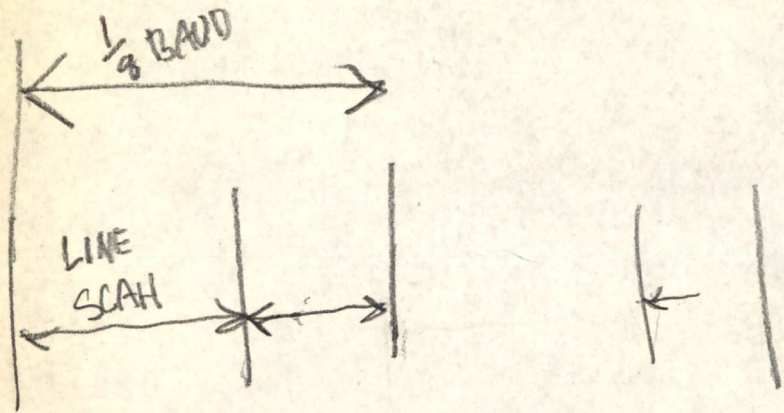
This instruction transfers the channel number of the selected channel into bits 10-17 of the AC.

Receive Complete, rcv (5.3 microseconds)

This instruction transfers the channel number of the selected channel into bits 10-17 of the AC and transfers a single character into bits 13-17 (7.5 unit code) or bits 10-17 (11 unit code) of the IO register.

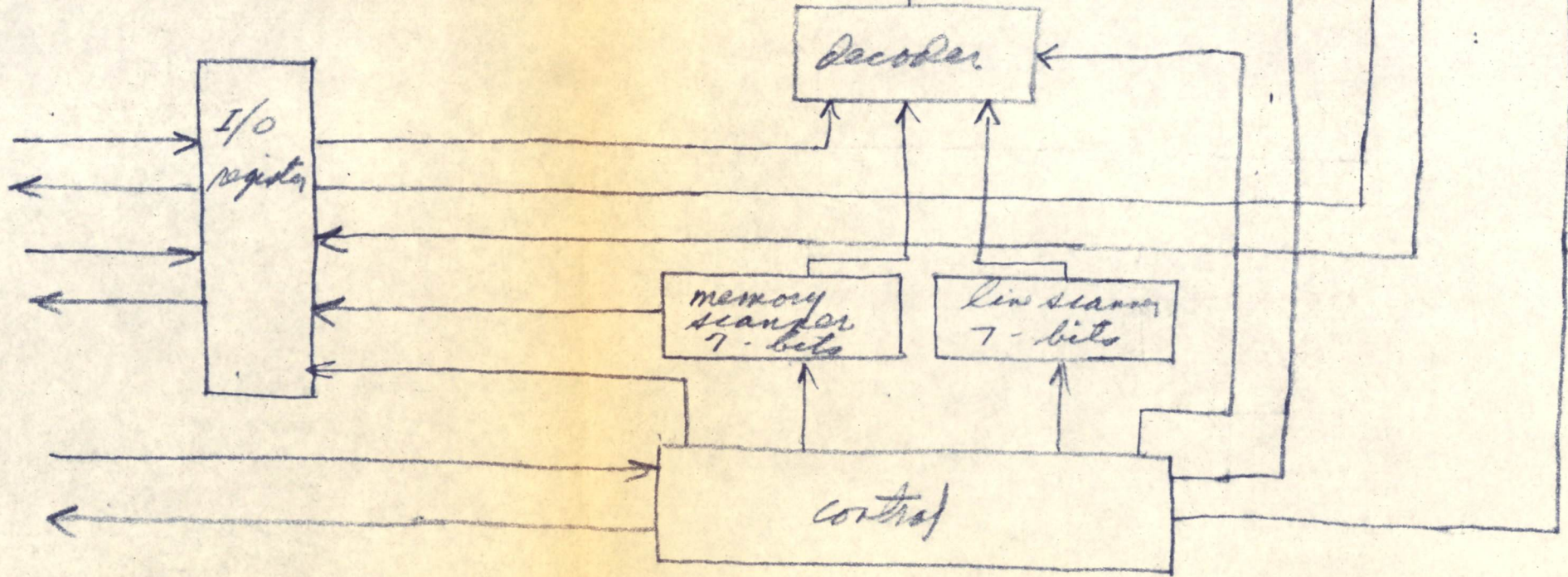
Teletype Data Processor

57M June 10, 1963



channel designation {
teletype characters {

10t pulses, flags, other control



June 1963
-1-

AUTOMATIC MEMORY CORE TESTER SPECIFICATIONS

Pulse Generator

Number of program step	8
Repeat frequency	1 Kc - 1 Mc
Programming mode	Continuous Step repeat (Step pair repeat)
Repeat duration	2 μ sec to 2 msec
Pulse delay	100 nsec to 10 μ sec Continuously variable each channel
Synchronous output	Selectively programmed to occur at start of any one.
Number of driver	2 positive 3 negative
Current amplitude	50 ma to 1000 ma continuously variable each channel
Back E. H. F. capability	50 Volts
Rise time	<u>30 nsec to 1 μsec</u>
Fall time	30 nsec to 1 μ sec
Output source impedance	up to 10,000 ohms
Output shunt capacitance	Below as 100 pF
Out leakage current	2 μ sec max. at 25°C
Amplitude stability	0.1% typical drift over 8 hrs.
Overshoot and droop	0.5% max.
Duty cycle	20% at 1 A, 50 ohms load, and provide with automatic duty cycle controller.

Core handler

Ramsey core handler model GM 70.

Signal loading

Core output signal applied to 100 ohms load.
(As possible as high input resistance are require.)

Core signal analysis

Peak voltage discriminators 3
Strobed voltage discriminators 3
Strobed pulse width 10 nsec effective
Discriminator accuracy *T/140* Below 10.3 mV at medium range.
Amplifier bandwidth 30 megacycles *20mcs*

Accept and reject categories

High voltage grade accept, low voltage grade accept and No Test plus Reject.

Accept - Reject and No Test

Self checking features *Two*

Close tolerance check of standard core by four peak voltage discriminators

Other specifications

Core accounting tally Total Tests, High Accept, Low Accept, Total Accept, Reject plus No Test, and individual totals of each discriminators.

Calibrator with solid state type calibrator.

Line power 115 Volts 60 c/s

Fuji Electrochemical Co., Ltd.

June 1963



INTEROFFICE MEMORANDUM

DATE June 4, 1963

SUBJECT Cost Analysis - PDP-6

TO R. Lane
A. Kotok
R. Mills
A. Hall
Computer Guidance Committee

FROM Gordon Bell

The Computer Guidance Committee has recommended that a study of the market be made for PDP-6 with the aim to plan PDP-6 development.

The data required is:

1. Incremental manufacturing costs of various components.
2. Development cost of various components.
3. Future development costs.
4. Programs required, and the programming development costs.
5. Field service costs/machine.
6. Sales costs/machine.
7. Continuing engineering development support.
8. Sales fixed costs, manuals, shows, advertising, etc.

These should be compared with:

1. Sales prospects.
2. DEC's ability to produce -n machines/year.

Yielding:

1. Sales forecast.
2. Crossover for costs payoff.

For the record, a list of potential customer needs to be compiled, and a sampling of the customers should be visited. It will be necessary to have a sale for the first PDP-6 prior to the prototype development.

GB/II

Computer Delivery Probability

PDP-1

	5/1	6/1	7/1	8/1	9/1	10/1	11/1
Princeton (loan)							
Adams (on loan)		-X returned					
MIT (on loan)	-----X						
Princeton		-----X					
SDC (100%)				-----X			
Stanford (100%)	-----X						
NSA (100%)			-----X				
Yale (100%)		-----X					
AEC #1 (90%)				-----X			
AEC #2 (90%)					-----X		
AEC #3 (90%)						-----X	
BBN (90%)				-----X			
Raytheon (80%)			-----X				
Beck. #1 (90%)					-----X		
Beck. #2 (90%)						-----X	

In Checkout	7	7	6	5	3	2
Shipments	2	2	2	3	2	2
Reserved for* Customer Order	4	3	3	2	2	0
Available for Commitment	+1 #41	#41 +2 #44	+1 #45	0	-1	0
On loan	3	2	2	2	2	2
* SDC NSA Yale Princeton	SDC NSA Ray. (38)	SDC NSA AEC#1 (41) BBN(44)	AEC #2 (45) Beck.#1 (46)	AEC #3 (47) Beck.#2		

Computer Delivery Probability

PDP-4

	5/1	6/1	7/1	8/1	9/1	10/1	11/1
Mass. Gen. (on loan)							
JPL #2 (100%)		-----X					
Harvard (loan)		-----X					
Fox. (U.S.) (100%)		-----X					
Fox. (50%)		-----X	X				
Bell Labs (70%)		-----X	X				
AECL (80%)						-----X	
DEC (Eng.)	-----X						
JPL #3		-----X					
JPL #4		-----X					
IEC				-----X			
Beck.					-----X		
Checkout	9	9	5	4	4		
Shipments	1	5	2	1	1		
Reserved for* Cust. Order	5	2	1	1	1		
Available for Commitment	+3	+2	+2	+2	+2		
On loan	1	2	2	2	2	2	
* JPL #2 Fox. (US) Harvard JPL #3 JPL #4		Fox. Bell Labs	IEC	Beck.	AECL		



INTEROFFICE
MEMORANDUM

DATE June 3, 1963

SUBJECT Progress of New Products

TO K. Olsen
✓H. Anderson
S. Olsen
M. Sandler
N. Mazzaresse

FROM J. Smith

Mag. Tape 57

The first production unit has been completed and is currently undergoing test. There is a major change being made by Steve Lambert for all subsequent units. As soon as prints are released, Production will start once again on 57 Controls.

510-131

The initial unit has been completed and is currently undergoing test. When checked out, this unit will become part of the NSA system. Five additional units are presently being manufactured. The first of these units should be completed by June 14th, with additional units to follow, spaced one week apart.

555 Micro Tape

All purchased parts have been received. Chassis have been fabricated and are currently being wired. To date, four chassis have been completely wired. The additional six will be complete by June 10th. The first production unit will be delivered to Jerry Hamilton for testing the middle of this week. A tester has been built, and a man assigned to assist Jerry in the initial testing. After this man has been checked out on the operation of the tester, testing of Micro units will become part of the Production process. All ten units should be completed by July 1st, the original target date.



INTEROFFICE MEMORANDUM

DATE June 4, 1963

SUBJECT Magnetic Tape Charges April 1963 Statement

TO K.Olsen
H.E. Anderson
G. O'Dea
D. Mills
R. Best

FROM R. Dill

<u>Engineering #</u>	<u>Description</u>	<u>Monthly Charge</u>
1026	Magnetic Tape Equipment	\$ 6,669
1136	Line Tape Unit	10,549
1137	Type 56 Tape Control Development	161
1161	PDP-4 Type 57 Magnetic Tape Control Development	19,867
1162	PDP-4 Type 57 Magnetic Tape Control Prototype	305
1189	Tape Control 510 Development	2,111
1190	Data Control 131 Development	2,337
1196	M 3000 Tape Transport Prototype	1,571
1199	Type 580 Tape Transport	62
	Engineering Variance	<u>(5,580)</u>
		<u>\$ 38,052</u>

June 14th Reminder file

dec

**INTEROFFICE
MEMORANDUM**

DATE June 3, 1963

SUBJECT Australian Representation

TO Stan Olsen

FROM Harlan Anderson ✓

cc: Ken Olsen
Brad Towle

On Monday I was telephoned by a Mr. Ronald Payne of the Ronald Payne PTY, Ltd. whose address is 385 Bridge Road, Richmond, Victoria, Australia. He is making an extended world tour of electronic companies to learn about products that they might sell in Australia. He learned about us from a company in the Boston area called, "Rotek", (I don't know anything about them).

His company is a 14 man company that apparently does engineering work and normally buys the products they sell and stocks them more like a distributor. They do some assembly work of systems of some kind too. The principle company that they represent is Solatron in England who makes analog equipment of one kind or another. I believe he indicated that Solatron has now been bought out by the Schlumberger Company and prior to coming to the United States he visited Schlumberger's affiliated companies in Paris and if we want a reference on his company we could probably get it through Arnaud de Vitry. The correspondent bank that his Australian bank works with is the Shawmut Bank and a man named Mr. Smith had a routine letter of introduction for him. He seemed very nice and very capable and exceedingly interested in our products. I would suggest that we have Brad Towle request a State Department Business Report on his enterprise and wait to see what reaction we get from his people in Australia to the technical literature that I have sent to him. He will not be returning there for another six weeks so this is not an urgent matter. Is this the same man that you had heard about some time ago?

H. Anderson

HEA:mcs