

G. S. Grumman & Associates
Incorporated

PURPOSE

G. S. GRUMMAN & ASSOCIATES, INC., was formed to assist institutional investors in their effort to select and monitor growth investments in science-based industries. This service is an extension of the nine-year-old coverage formerly provided by Sterling Grumman as an independent analyst.

The economic need for such an investment research service stems from the fact that scientific markets are often ill-defined and unmeasured. Under these circumstances, the assessment of management and scientific personnel becomes a crucial investment consideration. Accordingly, it is essential to appraise accurately a company's technological capabilities through contacts with customers, competitors, and technical consultants as well as by direct observations.

It is even more important to adequately evaluate the men who direct new product developments, negotiate acquisitions, and devise new approaches to marketing, tighter financial controls, and improvements in organizational structure. The necessity of doing so is underscored by the prevalence of those who have demonstrated success as scientists or engineers but who have failed badly as managers.

As selectivity and timing become increasingly important for successful investment results in scientific fields, meticulous and thoughtful analyses, coupled with constant surveillance may well prove even more rewarding than in the past. Correspondingly, investors who rely on shallow analyses, based on

inadequate information on the one hand or on preoccupation with details on the other, may find success even more elusive.

The services provided by G. S. Grumman & Associates, Inc. will necessarily vary considerably between customers, because their needs and wants differ so widely. Analysts who are able to spend most or all of their time on technical-based companies tend to be more interested in the details of recent developments and interpretations thereof. On the other hand, customers who have limited research support and little or no contacts with managements, and who are directly under the gun for investment decisions, seek carefully considered recommendations. In meeting the latter demands it is of utmost importance first to clearly identify investment objectives and then to determine the extent to which these objectives have already been attained.

In the case of a very limited number of highly sophisticated institutional investors, these objectives will be implemented by frequent consultations with our analysts through visits, phone calls, and letters. In addition, we will arrange management interviews, field trips and provide the services of technical consultants. For other customers, these objectives may best be served by visits and phone calls from institutional salesmen, and by group discussions and visits with our research analysts.

All customers will receive reports of two varieties. The "service report" appearing on each company once a year will contain a conclusion and a full presentation and analysis of current developments and future prospects, as a supplement to published materials and to our previous memoranda. Here it will be as-

sumed that the reader, as a professional investor, is already reasonably well acquainted with most published information, or would prefer to obtain such details directly from primary sources in his own file. Thus we will strive never to burden our reader with voluminous, redundant and often unimportant facts.

In addition, as dictated by circumstances, we will periodically prepare short notes on the current operations of, or new developments affecting the companies that we cover. In these notes we will not attempt to present a complete analysis, but we will indicate the manner in which our conclusions may have been altered by new circumstances.

The excellent past support given by institutional investors to the work of Sterling Gruman has made possible this substantially enlarged effort to meet their needs. The additional sponsorship that we hope will stem therefrom should permit us to implement a number of new ideas for further extending and improving our service coverage.

As with our research effort, so also with the execution of commission business, we will always strive for excellence. Indeed, primarily for this purpose, and after an extensive and almost unanimous poll of institutional clients, we have selected Hayden, Stone & Co. as our correspondent.

BIOGRAPHIES

G. Sterling Grumman formed the Institutional Department of Schirmer, Atherton & Co. four years ago, and when that firm was acquired by F. I. duPont & Co. in 1962 he founded and managed Burgess & Leith's Institutional Department. He began his career as an investment analyst with J. P. Morgan & Company twelve years ago and previously was an economist with the Federal Reserve Bank of New York.

Mr. Grumman holds a BS in economics from Yale University and a Masters degree from the School of International Affairs of Columbia University where he completed his course requirements for a Ph.D. in economics.

He was a contributing author of Benjamin H. Beckert's book *Comparative Banking Systems* and has written several papers on financing economic growth in underdeveloped countries for presentation at central bank conferences. Last fall he presented a paper on investing in science companies at a conference of bankers and scientists in London.

Bruce W. Everitt was associated for five years with the investment consulting firm of Duff, Anderson & Clark in Chicago as their senior analyst in fields of high technology. Before this he served seven years with Motorola's Communications and Industrial Electronics Division. He was first Assistant to the Divisional Vice President and General Manager, then Assistant Production Manager, and finally Manager of Marketing Control.

Mr. Everitt graduated from the University of Illinois with a BS in electrical engineering in 1950 and from the Harvard Graduate School of Business Administration with an MBA in 1952. He was elected to two engineer-

ing honorary fraternities — Eta Kappa Nu and Sigma Tau, and he received the Westinghouse fellowship for study at the Harvard Business School.

John B. Lynch was formerly a General Partner of Shields & Co. with responsibility for sales management. Prior to joining that firm six years ago, he served briefly on the Acquisition Committee of NAFI Corporation, and for the previous five years he was with Phelps Dodge as their sales engineer in charge of new products for the electronics industry, including nuclear accelerators. Mr. Lynch graduated from Brown University in 1949 with a BS in engineering, and he attended the New York University Graduate School of Business.

Godfrey M. Birckhead was associated with Smith, Barney & Co. for two years in a liaison capacity between that firm's research staff in New York and institutional customers in Boston. Previously for six and a half years he was a member and eventually acting director of the Research Department as well as a stockholder of David L. Babson & Co., Inc. Prior to joining this Boston-based investment counseling firm and upon graduating from Harvard College, Mr. Birckhead was an employee of Minis & Co., investment counselors in Savannah, Georgia.

Alex G. Fedoroff was Assistant Director of the Institutional Research Department of Hemphill, Noyes & Co., which he joined four years ago. He received a BA in economics from Hofstra College in 1954 and an MBA from the Harvard Graduate School of Business Administration in 1956. Mr. Fedoroff authored the widely cited study on the electronic data processing industry that was presented at the 1962 convention of the Investment Bankers Association.

INITIAL SERVICE COVERAGE

Addressograph-Multigraph	Grumman
Ampex	Everitt
Computer Division	Fedoroff
Beckman Instruments	Everitt
Burroughs	Fedoroff
Control Data	Fedoroff & Grumman
Fairchild Camera & Inst.	Everitt
Hewlett-Packard	Everitt
High Voltage Engineering	Everitt
IBM	Fedoroff & Grumman
Litton Industries	Grumman
Magnavox	Grumman
Minn. Mining & Mfg.	Grumman
Motorola	Everitt
NCR	Fedoroff
Perkin-Elmer	Everitt
Pitney-Bowes	Grumman
RCA	Grumman
EDP Division	Fedoroff
Semiconductor Div.	Everitt
Sperry Rand	Fedoroff & Grumman
Texas Instruments	Everitt
Varian Associates	Everitt
Xerox	Grumman
Zenith Radio	Grumman

ADDITIONS TO SERVICE COVERAGE PROJECTED FOR 1964

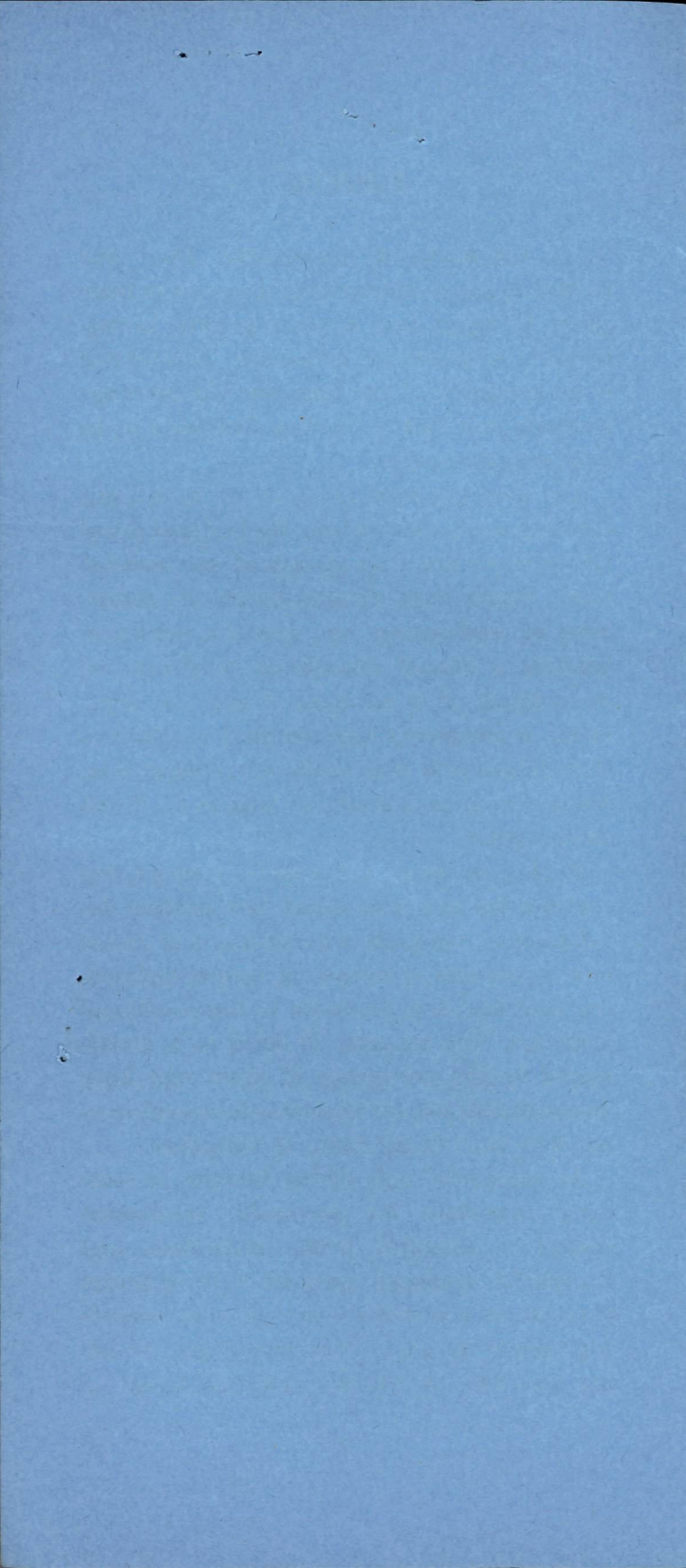
Foxboro	Fedoroff
Leeds and Northrup	Fedoroff
Moore Corporation	Fedoroff
Sanders Associates	Everitt
Taylor Instrument	Fedoroff
Tektronix	Everitt

LIMITED COVERAGE

American Res. & Dev. Digital Equipment	Grumman Fedoroff
ANalex	Fedoroff
Barnes Engineering	Everitt
Computer Control	Fedoroff
Corning Glass Signetics Division	Everitt
Data Products	Fedoroff
Eitel-McCullough	Everitt
Electronic Associates	Fedoroff
General Electric Computer Division Semiconductor Div.	Fedoroff Everitt
Internat. Rectifier	Everitt
Itek	Everitt
Jarrell-Ash	Everitt
Microwave Associates	Everitt
Minneapolis-Honeywell	Fedoroff
Packard-Bell	Grumman
Potter Instrument	Fedoroff
Standard Register	Fedoroff
UARCO	Fedoroff
Raychem	Everitt
Raytheon	Grumman

G. STERLING GRUMMAN, *President*
BRUCE W. EVERITT, *Vice President*
GODFREY M. BIRCKHEAD, *Asst. Vice President*
ALEX G. FEDOROFF, *Senior Security Analyst*
147 Milk Street
Boston, Massachusetts 02109
482-5420 (Area Code 617)

JOHN B. LYNCH, *Vice President*
25 Broad Street
New York, N. Y. 10004
269-3654 (Area Code 212)



Mr. John Karavish
ITT Data and Information Systems Division

July 14, 1964

Cancellation changes for an order or part of an order will be as follows:

- (A) Equipment Cancelled Six Months prior to delivery - Discount Level Adjustment Only.
- (B) Equipment Cancelled Under Six Months - 15% of the net price for the items cancelled plus percent completion times the net price.

DEC wishes to take exception to Paragraph 5 of Enclosure 2, Taxes.

There are presently no taxes applicable to the purchase of PDP-6 systems. However, should a Federal Excise Tax be imposed upon such equipment, this tax will be paid by ITT. DEC agrees to pay all taxes associated with the manufacturing of the PDP-6 in Maynard, Massachusetts.

Respectively yours,

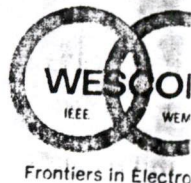
R. L. Lane

Approved _____
Kenneth H. Olsen
President

RLL/pam

1964 WESTERN ELECTRONIC SHOW AND CONVENTION

Business Office: The Travelers Building, 3600 Wilshire Boulevard, Los Angeles, California 90005 / Phone: 381-2871



Harlan Anderson

Stan Olsen

Ted Johnson

Burt Scudney

July 13, 1964

To: All Exhibitors

**EXHIBITORS' MEETING SCHEDULED FOR WEDNESDAY MORNING,
AUG. 26, SPORTS ARENA**

Although we have two exhibit locations this year, we're still just one Show and so we've scheduled just one Exhibitors' meeting for all of us. We hope that this early notice will help you in your planning so that you can be sure to attend.

The Exhibitors' meeting will be held the second day of WESCON, Wednesday, August 26 at 9 o'clock in the morning. Location will be the Television Room adjacent to Booth 2128 on the Concourse level on the east side of the Sports Arena.

At the meeting you'll be brought up-to-the-minute on Show attendance and other statistics, have a chance to air any problems in time for them to be corrected early in the Show, meet members of the WESCON management team and learn about WESCON's plans for the future.

And if the early hour forces you to skip breakfast, coffee and cakes will be available to get you through to lunchtime. The meeting will last about an hour or so and will be well worth your time.

We are looking forward to seeing you there.

Cordially,

Ben Warner, Jr.

Chairman

WESCON Exhibits Committee

BW:ht

- Chairman,
Board of Directors
Edward C. Beitolet
- Chairman,
Executive Committee
S. H. Berne
- Convention Director
Ralph A. Lamm
- Show Director
Hugh P. Moore
- Directors
John A. Chartz
Phillip L. Gundy
Edward W. Herold
John S. McCullough
- Manager
Don Larson
- Assistant Manager
James H. Bolton
- Recording Secretary
Jeanne W. Howard
- Banquet Chairman
John Guarrera
- Vice-Chairman
John O. Hjaloren
- Cocktail Party Chairman
R. E. Darringer
- Vice-Chairman
Jack Beamish
- DMR Conference
Chairman
Herb Becker
- Vice-Chairman
Homer Nielsen
- Exhibits Chairman
Ben Warner
- Vice-Chairmen
Edward W. Watts
Robert Guss
- Facilities Chairman
Einar Ingebretsen
- Chairmen
J. Varian
A. Bejach
- Future Engineers Show
Chairman
Charles Edwards
- Vice-Chairman
E. H. Schreiber
- Hospitality Chairman
William J. Moreland
- Vice-Chairman
Charles Olsetsky
- Industrial Design
Chairman
Phillip J. Quinn
- Vice-Chairman
George Alken
- Public Relations
Chairman
David T. Traitel
- Vice-Chairman
Don Flamm
- Registration Chairman
T. L. Gaimis
- Vice-Chairman
John Barker
- Technical Program
Chairman
Robert R. Bennett
- Vice-Chairman
George F. Smith
- Technical Tours
Chairman
John Ganzhuber
- Vice-Chairman
V. J. Braun
- Visitors Services
Chairman
Robert C. Tetherow
- Vice-Chairman
Charles Fetty
- Women's Activities
Chairman
Mrs. Dana Johnson
- Vice-Chairman
Gurguss Dempster

Los Angeles District and
San Francisco Section,
representing the 6th
Region, Institute of Electrical
and Electronic Engineers,
and the Western Electronic
Manufacturers Association

5 Highwood Road
Manchester, Mass.

July 9, 1964

Digital Equipment Corp.
Main Street
Maynard, Mass.

Attn: Mr. Harlan E. Anderson, Vice. Pres.

Dear Mr. Anderson:

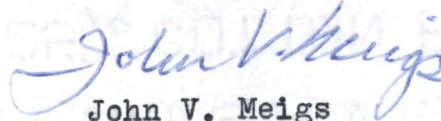
This is just a note to express my appreciation for the time you gave me last Thursday.

Your comments and suggestions were most helpful.

Should there ever be an opportunity in your organization, I would be extremely interested in investigating the possibility.

Thanks again for the assist.

Sincerely yours,



John V. Meigs

July 2, 1964

Mr. Kulicke
Kulicke and Soffa Mfg. Company
135 Commerce Drive
Fort Washington, Pennsylvania

Dear Mr. Kulicke:

We were disappointed you were unable to visit with us Wednesday.

May we set the time for a meeting with you at the earliest possible time?

As you know, it is our intention to purchase an in-house capability to produce semiconductors for our own use. We need equipment which ranges from diffusion furnaces, KMER application, wafer probing to die testing and sorting and your proposal, recommending the equipment to manufacture PNP epitaxial transistors is vital to our future.

Thank you for your consideration.

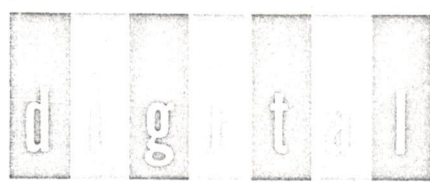
Yours truly,

Henry J. Crouse
Purchasing Agent

HJC/amg

cc: Mr. R. Richardson
Mr. B. Robertson
Mr. H. Anderson

HEA



equipment corporation

MAYNARD, MASSACHUSETTS
TWinoaks 7-8822 TWX MAYN 816

July 14, 1964

Mr. John Karavish
ITT Data and Information Systems Division
Route 17 Garden State Parkway
Paramus, New Jersey

Dear Mr. Karavish:

In response to ITT Data and Information Systems Division's request for proposal dated 10 July 1964 (S-JJK-0544), Digital Equipment Corporation is pleased to submit the following quotation for Programmed Data Processor-6 system components. The system components will be inter-connected to operate as described in DEC document F-65 (PDP-6 Handbook) dated February 1964 and as described in the ITT statement of work dated 10 July 1964 or by subsequent DEC Modifications approved by ITT.

The prices will be in accordance to the following price list which is guaranteed not to be in excess of prices currently being quoted to other customers in like or similar quantities for the same item.

Item	DEC Type No.	Description	Min. Qty.	Max. Qty.	Unit Price	Min. % Disc.	Max. % Disc.
*1	166	Arithmetic Processor	11	21	140,000	32	34
*a		Parity Generator, (166)	11	21	2,500	32	34
*b		Sense Switches (8)	11	21	1,000	32	34
*c		Priority Interrupt Levels 8-14	11	21	15,000	32	34
*2		Real Time Clock	11	21	3,000	32	34

Mr. John Karavish
 ITT Data and Information Systems Division

July 14, 1964

Item	DEC Type No.	Description	Min. Qty.	Max. Qty.	Unit Price	Min. Qty. %	Max. Qty. %
						Disc.	Disc.
*3	626	Printer-Keyboard & Control	11	21	6,100	32	34
*4	162	Fast Memory	11	21	30,000	32	34
*a		Switch & Add'l Interface	10	20	2,700	32	34
*5	163C	Core Memory	24	45	126,000	32	34
*a		Parity Plane & Logic	24	45	3,150	32	34
*b		Add'l Memory Interfaces	72	135	2,700	32	34
6	OMITTED FROM RFQ						
*7	167	Drum I/O Proc- essor	11	21	22,000	32	34
*a		Parity Generator (167)	11	21	2,500	32	34
*8	236	Drum Control	11	21	13,000	32	34
9	237	Drum Unit	14	25	75,000	10	10
*10		Drum Unit Switch	5	10	6,000	32	34
*11	516-521	Tape Control Unit	16	31	18,000	32	34
*12	136	Data Control	16	31	10,000	32	34
13	570	Magnetic Tape Transport	61	130	30,400	24	24
*14		Tape Unit Bus Switch	5	10	2,050	32	34
15	461	Card Reader & Control	6	11	16,500	10	10

Mr. John Karavish
ITT Data and Information Systems Division

July 14, 1964

Item	DEC Type No.	Description	Min. Qty.	Max. Qty.	Unit Price	Min. Qty. % Disc.	Max. Qty. % Disc.
16	460	Card Punch & Control	6	11	29,000	10	10
*17		Switch Control	5	10	10,300	32	34
*18		Tape Control Unit Switch	15	30	4,100	32	34
*19		Drum I/O Processor/Cont. Sw.	10	20	4,100	32	34
*20		Tape Unit Switch (Dual)	55	124	100	32	34
*21		Card Reader & Punch Switch	5	10	4,100	32	34
*22		H.S. Line Printer Switch	10	20	4,100	32	34
23	646B	Line Printer & Control (600)	10	21	37,500	10	10

Discounts listed above are contingent upon a minimum purchase of at least six (6) systems.

*The quantity discount for the asterisk items is as follows:

- (a) One procurement of six (6) systems 32%
- (b) One procurement of 7, 8, 9, 10 or 11 systems 34%
- (c) Additional procurements placed within one year from date of the initial order 32%

DOW JONES & COMPANY, INC.

44 Broad Street - New York 4, N.Y.

July 14th, 1964

Mr. Harlan Anderson
Vice President
Digital Equipment Corporation
Maynard, Massachusetts

Dear Mr. Anderson:

I am very sorry Gean Holden and I were unable to spend more time with you, Stan Olson and Larry Buckland on our visit to Maynard last Friday. From our standpoint, it was a most useful and informative visit, but didn't begin to allow us to explore the many ideas we've been thinking about in recent months. That, in itself, is probably a very good reason for throwing away the schedule from time to time.

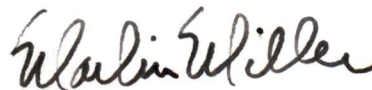
Gean had come back from his previous visit with a most favorable report of your manufacturing facilities and other operations. I certainly share his reaction, for it's difficult to escape the atmosphere of quiet efficiency.

It is my hope that the discussions we've been having with your company will result in something concrete. It's still too early to tell whether that will happen, but I do believe that the area of distribution and process control offer us some great opportunities. The exchanges with Larry Buckland opened even more areas for us to think about.

If you are still interested in seeing our Chicopee plant, I would be happy to make the arrangements for you. Moreover, if your business brings you to New York, we might do some more talking over lunch.

With best wishes,

Sincerely,



Marlin M. Miller
Director of Communications

mc

N. Anderson

July 16, 1964

Ing. Sergio R. Beltran, Director
Centro De Calculo Electronico
Cuidad Univeritaria
Mexico 20, D. F.

Dear Mr. Beltran:

First of all, let me apologize for the long delay in answering your letters. I will try in this letter to answer some of your questions and also provide the information which you asked for in your recent phone conversation with Harlan Anderson. Included with this letter are brochures, programming manual and price list for the PDP-5 computer. I gathered that you have already had experience with this machine and, therefore, I need not explain too much about it. It is a very rugged system and there would be no problem about Van transportation. The computer is ideally suited to training of students in computer theory and practice and is an excellent machine on which to learn programming. We would provide training for some of your people at Maynard, Massachusetts, and after that your engineers should have no difficulties in maintaining the computer.

Enclosed also is a price list for the PDP-6 and some general information. It is certainly possible to tie into the computer by telephone line or Telex and the PDP-6 is designed for a time sharing operation.

Next, I would like to present to you a list of Digital Equipment modules which we recommend for the teaching of electrical engineering. We realize that you have a limit of about \$5,000 and therefore, we have arranged this list to keep the price under that specified amount. Here is the list of recommended modules.

Ing. Sergio R. Beltran

-2-

July 16, 1964

<u>Item</u>	<u>Quantity</u>	<u>Model</u>	<u>Unit Price</u>	<u>Total</u>
1	24	3201 Flip Flops	63.00	1,512.00
2	6	3101 Inverters	47.00	282.00
3	9	3110 Diode Gates	43.00	387.00
4	6	3301 Delays	74.00	444.00
5	3	3401 Pulse Generators	67.00	201.00
6	3	3410 Pulse Generators	41.00	123.00
7	3	3602 Pulse Amplifiers	65.00	195.00
8	3	722 Power Supplies	320.00	960.00
9	6	901 Mounting Panels	100.00	600.00
10	6	750 Module Accessories	3.00	18.00
11	40	911 Assortment	9.00	360.00

SUBTOTAL	\$ 5,082.00
Less 3% Quantity Discount	152.46
TOTAL	\$ 4,929.54

This equipment is all available within two weeks from receipt of purchase order. I hope that the enclosed information is of some help to you. If you have specific questions about our equipment or would like more information, please write to me and I will see that this information is sent to you as soon as possible.

Sincerely yours,

DIGITAL EQUIPMENT CORPORATION

Jonathan Fadiman
Manager, International Marketing

JF:nlz

Encs.

A-715, B-5100, B-55, A-704,
F-01, F-51, F-52, F-55, F-61, F-62

cc: Harlan Anderson, Vice President, DEC
Burt Scudney, Module Sales, DEC

COPY

303

July 17, 1964

Mr. John Karavish
I.T.T. Information Systems Division
P. O. Box 285
Paramus, New Jersey

Dear Mr. Karavish:

The price of the 1024 word, 36 bit, 2 μ second memory as described below is \$20,000 each.

Core memory, 1024 words, 36 bits, 2 μ sec total read-write cycle. Includes power supplies, stack and analog circuits; excludes address & buffer registers. Similar electrically to DEC type 163 memory, except for reduction in number of words and omission of registers.

This item is subject to the following discount table:

1-5	0%
6-10	10%
11-20	20%
21-37	32%

The above item is discounted separately and is not to be calculated in the Module discount schedule.

Yours very truly,

R. L. Lane

RLL/pam

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July 17, 1964

Mr. John Karavish
I.T.T. Information Systems Division
P. O. Box 285
Paramus, New Jersey

Dear Mr. Karavish:

Thank you for your interest in Digital's products. We are pleased to quote the following price, terms and delivery information.

<u>Item</u>	<u>Quantity</u>	<u>Model</u>	<u>Unit Price</u>	<u>Total Price</u>
1	107	Cabinet for 19" Mounting Panels, W/fan in base.	600.00	64,200.00
2	116	Cabinet end-bell.	75.00	8,700.00
3	350	728	240.00	84,000.00
4	22	1905	175.00	3,850.00
5	3	1916	140.00	420.00
6	1173	Special ITT Mounting Panel	180.00	5,760.00
7	31	1113	68.00	2,108.00
8	31	1204	131.00	4,061.00
9	5390	1802	39.00	210,210.00
10	350	4110	43.00	15,050.00
11	1203	4102	55.00	66,165.00
12	111	4106	47.00	5,217.00
13	110	4111	43.00	4,730.00
14	1077	4112	68.00	73,236.00
15	2735	4113	68.00	185,980.00
16	60	4114	54.00	3,240.00
17	242	4115	54.00	13,068.00
18	37	4118	42.00	1,554.00
19	455	4126	68.00	30,940.00
20	629	4139 (replaced by 4141)	52.00	32,708.00
21	59	4209	79.00	4,661.00

Mr. John Karavish

I.T.T.

Page 2

July 17, 1964

<u>Item</u>	<u>Quantity</u>	<u>Model</u>	<u>Unit Price</u>	<u>Total Price</u>
22	121	4213	87.00	10,527.00
23	723	4214	78.00	56,394.00
24	479	4215	90.000	43,110.00
25	87	4218	96.00	8,352.00
26	362	4224	86.00	31,132.00
27	819	4301	80.00	65,520.00
28	764	4410	39.00	29,796.00
29	828	4504	72.00	59,616.00
30	513	4603	62.00	31,806.00
31	47	4604	92.00	4,324.00
32	74	4606	117.00	8,658.00
33	333	4657	53.00	17,649.00
34	1335	4680	68.00	90,780.00
35	644	4681	68.00	43,792.00
36	187	4682	140.00	26,180.00
37	191	4686	51.00	9,741.00
38	22	4689	44.00	968.00
39	851	6102	86.00	73,186.00
40	370	6105	49.00	18,130.00
41	259	6106	59.00	15,281.00
42	1480	6113	68.00	100,640.00
43	74	6114	74.00	5,476.00
44	333	6115	54.00	17,982.00
45	74	6116	60.00	4,440.00
46	37	6117	47.00	1,739.00
47	222	6119	47.00	10,434.00
48	185	6122	91.00	16,835.00
49	444	6123	90.00	39,960.00
50	666	6207	160.00	106,560.00
51	296	6208	140.00	41,440.00
52	111	6227	150.00	16,650.00
53	37	6403	160.00	5,920.00
54	333	6603	109.00	36,297.00
55	37	1k Core Memory	20,000.00	740,000.00
			Total	2,609,173.00

COPY

Mr. John Karavish
I.T.T.
Page 3
July 17, 1964

The discounts extended to I.T.T. for the AUTODIN Proposal are as follows:

(These apply to Modules, Power Supplies, Mounting Panels, etc., but not to computer systems.)

\$	500,000	-	25%
	750,000	-	27%
	1,000,000	-	30%
	2,000,000	-	32%

With best personal regards,

R. L. Lane

RLL/pam

C
O
P
Y



303
equipment corporation

MAYNARD, MASSACHUSETTS
TWinoaks 7-8822 FWX MAYN 816

July 16, 1964

Mr. John Karavish
ITT Data and Information Systems Division
Route 17 Garden State Parkway
Paramus, New Jersey

Dear Mr. Karavish:

In response to ITT Data and Information Systems Division's request for proposal dated 10 July 1964 (S-JJK-0544), Digital Equipment Corporation is pleased to submit the following quotation for Programmed Data Processor-6 System components. The system components will be inter-connected to operate as described in DEC document F-65 (PDP-6 Handbook) dated February 1964 and as described in the ITT statement of work dated 10 July 1964 or by subsequent DEC Modifications approved by ITT.

The prices will be in accordance to the following price list which is guaranteed not to be in excess of prices currently being quoted to other customers in like or similar quantities for the same item.

Item No.	DEC Type No.	Description	Min. Qty.	Max. Qty.	Unit Price	Min. Qty. % Disc.	Max. Qty. % Disc.
1.	166	Arithmetic Processor	11	21	140,000	35 32	40 34 *
a.		Parity Generator (166)	11	21	2,500	35 32	40 34 *
b.		Sense Switches (8)	11	21	1,000	32	34
c.		Priority Interrupt Levels 8-14	11	21	15,000	35 32	40 34 *
2.		Real Time Clock	11	21	3,000	32	34

Mr. John J. Karavish
 ITT Data and Information Systems Division

July 16, 1964

Item No.	DEC Type No.	Description	Min. Qty.	Max. Qty.	Unit Price	Min. Qty. % Disc.	Max. Qty. % Disc.
3.	626	Printer-Keyboard & Control	11	21	6,100	32 35	40 40
4.	162	Fast Memory Switch & Add'l Interface	11	21	30,000	32	34
a.			10	20	2,700	32	34
5.	163C	Core Memory	24	45	126,000	32 35	40 40
a.		Parity Plane & Logic	24	45	3,150	32 35	40 40
b.		Add'l Memory Interfaces	72	135	2,700	32	34
6.	OMITTED FROM RFQ						
7.	167	Drum I/O Processor	11	21	22,000	32	34
a.		Parity Generator (167)	11	21	2,500	32	34
8.	236	Drum Control	11	21	13,000	32	34
9.	237	Drum Unit	14	25	75,000	10	10
10.		Drum Unit Switch	5	10	6,000	32	34
11.	516-521	Tape Control Unit	16	31	18,000	32	34
12.	136	Data Control	16	31	10,000	32	34
13.	570	Magnetic Tape Transport	61	130	30,400	24	24
14.		Tape Unit Bus Switch	5	10	2,050	32	34
15.	461	Card Reader & Control	6	11	16,500	10	10

Mr. John Karavish
ITT Data and Information Systems Division

July 16, 1964

Item No.	DEC Type No.	Description	Min. Qty.	Max. Qty.	Unit Price	Min. Qty. % Disc.	Max. Qty. % Disc.
16.	460	Card Punch & Control	6	11	29,000	10	10
17.		Switch Control	5	10	10,300	32	34
18.		Tape Control Unit Switch	15	30	4,100	32	34
19.		Drum I/O Processor/Control Switch	10	20	4,100	32	34
20.		Tape Unit Switch (Dual)	55	124	100	32	34
21.		Card Reader & Punch Switch	5	10	4,100	32	34
22.		H.S. Line Printer Switch	10	20	4,100	32	34
23.	646B	Line Printer & Control (600)	10	21	37,500	10	10

The above discounts are a type offered to original equipment manufacturers for ultimate customer resale. They imply the full DEC Standard Warranty but do not require maintenance services. Maintenance will be performed by ITT personnel. DEC will provide installation, test and back up emergency maintenance to ITT.

Rules for obtaining the OEM discount are as follows:

- (1) The minimum order is six systems. The minimum discount of 32% (on applicable items) applies.
- (2) A single order of 7, 8, 9, 10 or 11 systems obtains the maximum discount of 34% (on applicable items).

Mr. John Karavish
ITT Data and Information Systems Division

July 16, 1964

- (3) Supplementary orders placed within one year of the initial order will be at a 32% discount.

Cancellation for an order or part of an order is subject to the following charges:

- (1) If cancelled 6 months prior to delivery, no charges but discount level adjustment.
- (2) If cancelled under six months before delivery, 15% cancellation charge plus percent completion times the net price for the items cancelled.


This quotation is in accordance to the general terms and conditions of your RFQ except for Paragraph 5 of Enclosure 2, Taxes.

There are presently no taxes applicable to the purchase of PDP-6 Systems. However, should a Federal Excise Tax be imposed upon such equipment, this tax will be paid by ITT. DEC agrees to pay all taxes associated with the manufacturing of the PDP-6 in Maynard, Massachusetts.

Respectively yours,



R. L. Lane

Approved 

Kenneth H. Olsen
President

RLL/pam

100K

96.4

55.3

71.7

23.1



Massachusetts Institute of Technology
Alfred P. Sloan School of Management
50 Memorial Drive
Cambridge, Massachusetts, 02139

July 21, 1964

Mr. Harlan E. Anderson
Vice President
Digital Equipment Corp.
146 Main Street
Maynard, Massachusetts

Dear Harlan:

Perhaps you would like these
sheets which came from the time sharing
demonstration Sunday evening.

Sincerely,

Jay W. Forrester

JWF:ie
Enc.

Anderson

LOGIN M478 PUGH

W 2121.4
 PASSWORD
 M0478 248 LOGGED IN 07/19 /64 2121.5
 CTSS BEING USED IS CTR 052
 SHIFT MINUTES
 ALLOTTED USED SINCE 07/02/64 1304.9

1	60	12.2
2	60	0.3
3		0.0
4	60	0.6

LAST LOGOUT WAS 07/19/64 1826.4
 TRACK QUOTA= P, 500 Q. 0082 TRACKS USED.
 R 3.900+.800

INPUT
 W 2124.4
 00010 SINE GENERATOR
 00020 RUN JWF
 00030 3L $SIN.K = SIN.J + (DT)(1/F)(-COS.J)$
 00040 6N SIN=0
 00050 3L $COS.K = COS.J + (DT)(1/F)(SIN.J)$
 00060 C F=.1
 00070 PLOT SIN=S,COS=C
 00080
 MAN. FILE SIN55 MADTRN
 W 2129.4
 R .600+1.600

DYNAMO SIN55
 W 2130.0
 SINE GENERATOR
 RUN JWF
 DYN EXPECTED + WHERE FOUND CHAR . INDICATED

3L $SIN.K = SIN.J + (DT)(1/F)(-COS.J)$ 00030
 DYN EXPECTED + WHERE FOUND CHAR . INDICATED

3L $COS.K = COS.J + (DT)(1/F)(SIN.J)$ 00050
 COS REQUIRES INITIAL VALUE
 R .600+.800

EDIT SIN55 MADTRN
 W 2131.9
 00080
 MAN. 30 3L $SIN.K = SIN.J + (DT)(1/F)(-COS.J+0)$
 MAN. 50 3L $COS.K = COS.J + (DT)(1/F)(SIN.J+0)$
 MAN. 51 6N COS=1
 MAN. FILE SIN56 MADTRN
 W 2136.3
 R .800+1.600

PRINTF SIN56 MADTRN
 W 2137.2
 SIN56 MADTRN - M0478 248 - CTR052 - JUL 19, 1964 - 2137.4

00010 SINE GENERATOR
 00020 RUN JWF
 00030 3L $SIN.K = SIN.J + (DT)(1/F)(-COS.J+0)$
 00040 6N SIN=0
 00050 3L $COS.K = COS.J + (DT)(1/F)(SIN.J+0)$
 00051 6N COS=1
 00060 C F=.1
 00070 PLOT SIN=S,COS=C
 R 4.583+1.216

DYNAMO SIN56
 W 2138.2
 SINE GENERATOR
 RUN JWF
 R 2.416+1.200

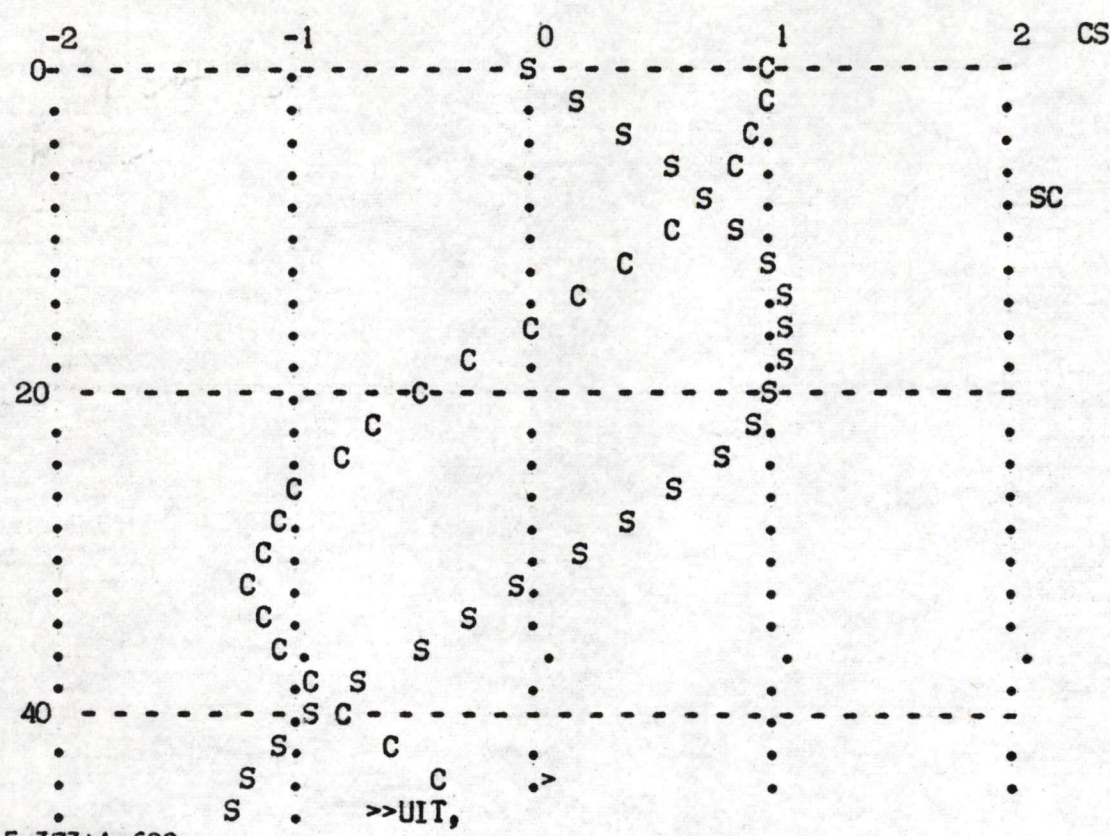
EDIT SIN56 MADTRN
 W 2141.8
 00080 SPEC DT=1/LENGTH=100/PRTPER=0/PLTIPER=2
 00090
 MAN. FILE SIN57 MADTRN
 W 2142.8
 R .916+1.600

DYNAMO SIN57
 W 2142.9
 SINE GENERATOR
 RUN JWF
 NUMBER TOO LARGE - OVERFLOW
 IN EQUATION FOR SIN
 AT TIME = 38.00

0 SIN=S, COS=C
 ERROR FROM /01305
 R 4.816+.800

EDIT SIN57 MADTRN
 W 2148.0
 00090
 MAN. 30 3L $SIN.K = SIN.J + (DT)(1/F)(COS.J+0)$
 MAN. 50 3L $COS.K = COS.J + (DT)(1/F)(SIN.J+0)$
 MAN. 60 C F=10
 MAN. FILE SIN57 MADTRN
 W 2152.6
 R .916+1.616

DYNAMO SIN57
 W 2152.8
 SINE GENERATOR
 RUN JWF



R 5.383+1.600

LISTF

QUIT,
R .000+.000

W 2155.7

LISTF

CTSS NOT IN OPERATION

CTSS IN OPERATION

LISTF

W 2156.8

33 FILES 85 TRACKS USED

DATE	NAME	MODE	NO.	TRACKS
7/19/64	SIN57	MADTRN	P	1
7/19/64	SIN56	MADTRN	P	1
7/19/64	SIN55	MADTRN	P	1
7/17/64	FUTURE	MADTRN	P	7
7/17/64	KEN	BSS	P	1
7/17/64	KEN	MADTAB	P	1

>> QUIT,
R .983+.416

LISTF

W 2159.4

33 FILES 85 TRACKS USED

DATE	NAME	MODE	NO.	TRACKS
7/19/64	SIN57	MADTRN	P	1
7/19/64	SIN56	MADTRN	P	1
7/19/64	SIN55	MADTRN	P	1
7/17/64	FUTURE	MADTRN	P	7
7/17/64	KEN	BSS	P	1
7/17/64	KEN	MADTAB	P	1
7/17/64	KEN	MAD	P	1
7/17/64	FUT13	MADTRN	P	2
7/17/64	T	MADTRN	P	2
7/17/64	FUT11	MADTRN	P	3
7/17/64	FUT9	MADTRN	P	3
7/17/64	KEN	MADTRN	P	1
7/17/64	PRINT	BINARY	RI	2
7/17/64	RERUN	BINARY	P	3
7/17/64	PLOT	BINARY	P	3
7/17/64	SUBR	BINARY	P	2
7/17/64	GEN	BINARY	P	4
7/17/64	FUT3	MADTRN	P	3
7/17/64	FUT5	MADTRN	P	3
7/17/64	FUT7	MADTRN	P	3
7/17/64	FUT1	MADTRN	P	3
7/17/64	DYN	SAVED	P	7
7/13/64	D19	MADTRN	P	2
7/06/64	DYN2	SAVED	P	7
7/06/64	SCC1	MADTRN	P	2
7/06/64	DYNAMO	TSSDC.	P	7
6/25/64	SCC2	MAD->R	QUIT,	

R .000+.200

HELP

HELP IS NOT A COMMAND.

LOGOUT

W 2202.2
MO478 248 LOGGED OUT 07/19 /64 2202.2
TOTAL TIME USED= 01.1 MIN.

LOGIN M478 PUGH
 W 2203.6
 PASSWORD
 M0478 248 LOGGED IN 07/19 /64 2207.3
 CTSS BEING USED IS CTR052
 SHIFT MINUTES
 ALLOTTED USED SINCE 07/02/64 1304.9
 1 60 12.2
 2 60 0.3
 3 60 0.0
 4 60 1.5
 LAST LOGOUT WAS 07/19/64 2202.3
 TRACK QUOTA= P, 500 Q. 0085 TRACKS USED.
 R 3.916+.800

PRINTF T MADTRN
 W 2208.1

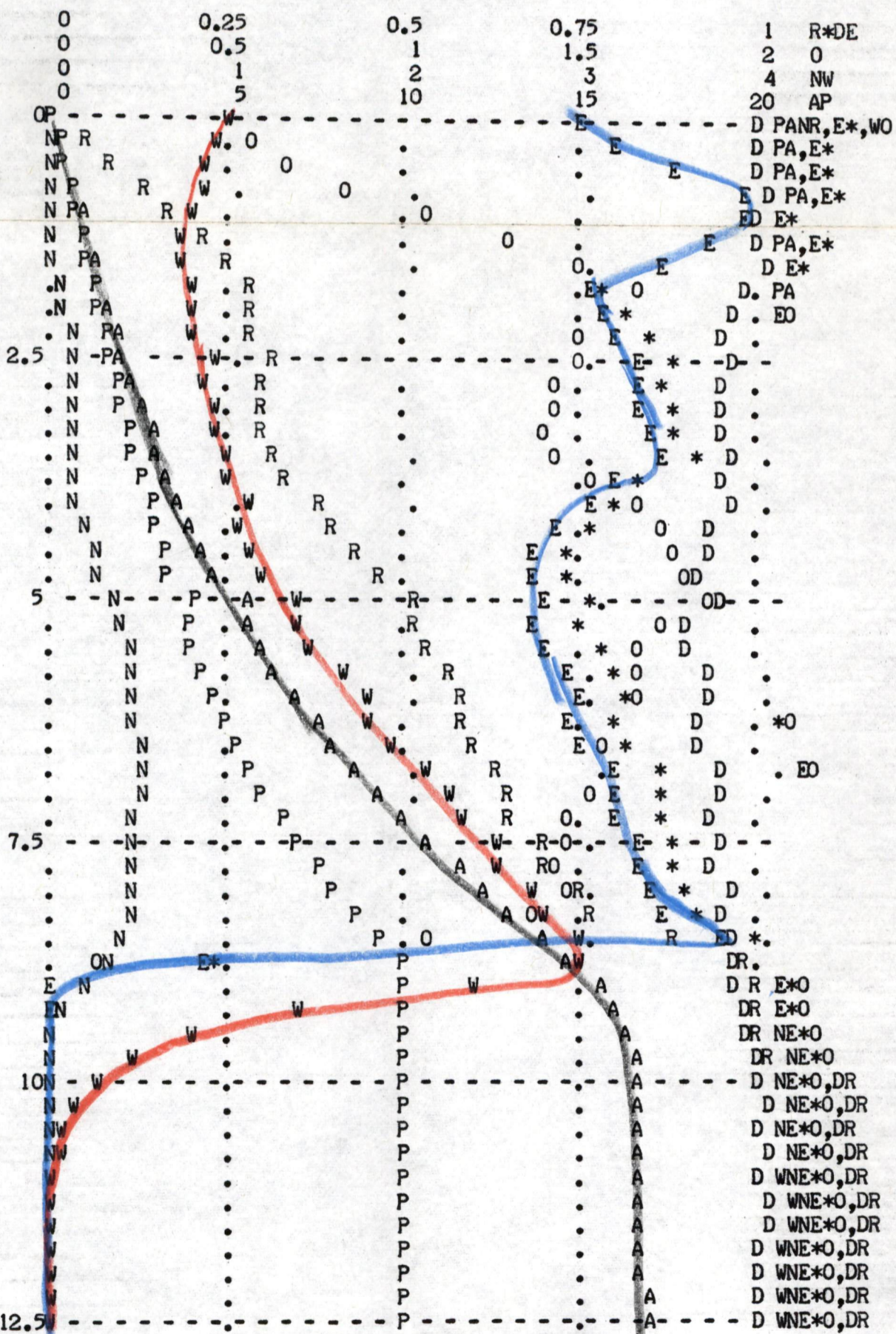
T MADTRN - M0478 248 - CTR052 - JUL 19, 1964 - 2208.2

00001 DEVELOPMENT SECTOR MODEL
 00005 RUN
 00010 1L PDMM.K=PDMM.J+(DT)(PDM.J+0)
 00020 6N PDMM=0-> QUIT,
 R 6.033+1.600

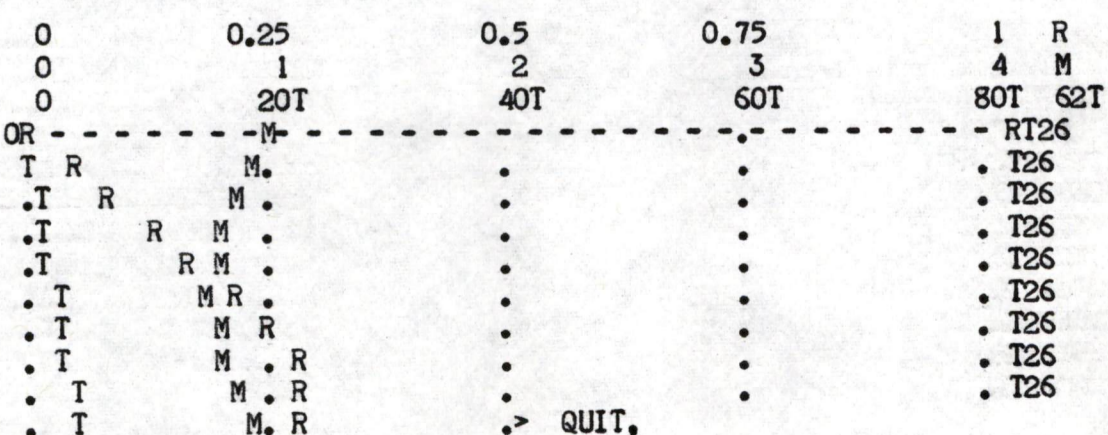
DYNAMO D19
 W 2216.3
 DEVELOPMENT SECTOR MODEL
 RUN

TIME	ADMM	PDMM	DCT	DC2PR	DC6PR
E+00	E+00	E+00	E+03	E+03	E+03
.000	.000	.000	.000	.000	.000
12.500	16.834	10.000	33.667	38.299	49.916

0 PDMM=P, ADMM=A, WDM=W4 NDM=N, ED=E, EWD=D, EEDD=*, DR=R, READM=0



0 ADM=M, DR=R, DCT=T, DC2PR=2, DC6PR=6



R 7.483+4.200

> QUIT,

LOGIN M478 PUGH
W 2232.7
PASSWORD

MO478 248 LOGGED IN 07/19 /64 2232.9
CTSS BEING USED IS CTR 0 52

SHIFT	MINUTES	ALLOTTED	USED SINCE 07/02/64
1	60	12.2	
2	60	0.3	
3	60	0.0	
4	60	5.4	

LAST LOGOUT WAS 07/19/64 2225.5
TRACK QUOTA= P, 500 Q. 0103 TRACKS USED.
R 3.866+.800



Copy to John Long
" "
John

THE SOLARTRON ELECTRONIC GROUP LTD

DIRECTORS:

J. RIBOUD (FRENCH) J. E. BOLTON, D.S.C.
E. R. PONSFORD R. CATHERALL
H. D. BINYON, M.B.E.

FARNBOROUGH · HAMPSHIRE

TELEPHONE:
FARNBOROUGH, HANTS 3000

CABLES:
SOLARTRON, FARNBOROUGH, HANTS

SECRETARY:
G. de VERTEUIL

TELEX:
8545 SOLARTRON F N B R O.
HEA:nCS

Harlan E. Anderson,
Vice President,
Digital Equipment Corporation,
Maynard,
Massachusetts,
U.S.A.

23rd July, 1964

DLD/MWO

Dear Mr. Anderson,

Thank you for your letter dated 10th July which reached me yesterday.

As you might have heard we are in the midst of a strike of Postal workers in the U.K. at the moment, and postal communication is a little difficult.

I am pleased to note that you found our activity an interesting and modern one and from your general comments it is quite apparent that you would be in favour of some working relationship between us. As you know, we are in the midst of discussions both with C.E.C.I.S. in France and S.D.S. in the U.S.A., not forgetting the fact that within the Schlumberger organisation there is already in existence A.S.I. With all these points in mind there is little I can say at this present time with regard to any possible arrangement between us.

With regard to your quantity discount arrangements, I would repeat my verbal comments to you that it would be much more attractive to us if the discount was based on the total amount of equipment purchased by us within a given year, rather than being based on quantities of a given type of equipment. With our type of organisation it is quite likely that we could use a lot of your equipment throughout our activities but it is equally possible that the various systems teams might require different computers, hence, on your arrangement earning no discount. If you could have further thoughts with regard to this topic, I would be interested in hearing them.

Continued.....

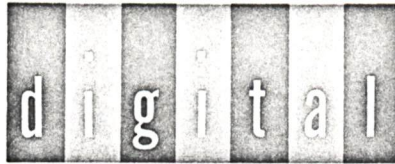


We enjoyed having you here and look forward to our next meeting.

Yours sincerely,

D. Leighton Davies.

D. Leighton Davies
Director, R & D (Systems)



equipment corporation

MAYNARD, MASSACHUSETTS
LOS ANGELES 45, CALIFORNIA*

27 July 1964

Mr. James Tupac
The Rand Corporation
1700 Main Street
Santa Monica, California

Dear Mr. Tupac:

This letter amends the Digital Equipment Corporation Proposal of 6 July 1964 to the Rand Corporation for the New JOSS System. (Rand Request letter L-11225, 27 May 1964.) The system has been re-configured and the prices and configurations are attached. The changes include a reduction in storage capacity of the Type 237 Drum System, reduction in storage capacity and changing the input-output connection of the Data Products DISCFILE Interface to the PDP-6 I/O Bus. Addition of Type 516 - 520 tape control unit and a Type 50 tape transport, and redesign of the PDP-6/4 interface Type 138.

Type 237-A Drum Memory is a Type 237 drum memory with head assemblies and field select circuitry removed to reduce its storage capacity from 1,048,576 36-bit words to 262,144 36-bit words. A field modification will extend the drum to 1,048,576 word capacity.

Data Products DISCFILE is purchased from Data Products, but the reduction of storage capacity of the file is accomplished by the removal of 4 discs at a savings of approximately \$1,500 per disc.

Type 137 DISCFILE Control is required to interface the Data Products Corporation Model 5024 DISCFILE to the PDP-6 I/O Bus System. The above original proposal describes the general connection of the DISCFILE, Section 2C, page 4.

138 PDP-4/6 Data Interchange is an option which allows 2 full duplex (simultaneous transmission on 2 one-way data paths) communication between the PDP-4 and the PDP-6. It consists of two 18-bit registers which are called Data Register 4 to 6 (DR46) and Data Register 6 to 4 (DR64). Two flags are associated with each register

and are called DR46 Full Flag, DR46 Empty Flag, DR64 Full Flag and DR64 Empty Flag.

The Flags and Registers:

1. DR46 is loaded by PDP-4, and read by PDP-6.
2. DR46 Full Flag is set by PDP-4 and interrupt PDP-6.
3. DR46 Empty Flag is set by PDP-6, and interrupts PDP-4.
4. DR64 is loaded by PDP-6 and read by PDP-4.
5. DR64 Full Flag is set by PDP-6 and interrupts PDP-4.
6. DR64 Empty Flag is set by PDP-4 and interrupts PDP-6.

The PDP-4 instructions for PDP-4 to PDP-6 transmission are:

1. Load DR46, set DR46 Full Flag, clear DR46 Empty Flag.
2. Skip on DR46 Empty Flag.
3. Clear DR46 Empty Flag.

The PDP-6 instructions for PDP-4 to PDP-6 transmission are:

1. Read in DR46 (into right half of word), clear DR46 Full Flag, set DR46 Empty Flag (datai, blki)
2. Examine conditions of DR46 flags (coni, consz, or conso)

PDP-6 Instructions for PDP-6 to PDP-4 transmission are:

1. Load DR64, set DR64 Full Flag, clear DR64 Empty Flag (datao, blk0)
2. Examine conditions of DR64 Flags (coni, consz, conso).
3. Clear DR64 Empty Flag (cono)

PDP-4 instructions for PDP-6 to PDP-4 transmission are:

1. Read DR64, clear DR64 Full Flag, set DR64 Empty Flag.
2. Skip on DR64 Full Flag.

The PDP-4 can be delivered in 60 days to permit the generation of console control programs. Much of the PDP-6 programming for The New JOSS System can be done on the PDP-4 utilizing the PDP-6 simulator program and MACRO 6.4 Assembler (assembles MACRO-6 programs with restrictions).

The 630 Data Communications System and JOSS consoles could also be delivered approximately 3 months prior to the delivery date stated in the original proposal.

Included is a price breakdown and a block diagram of the revised configuration.

1 - 166	Arithmetic Processor (with console Teleprinter)	\$146,100
1 - 162	16 Word Fast Memory	30,000
2 - 163C	16,384 Word 2 Microsecond Memories	252,000
1 - 760	Paper Tape Reader	9,000
1 - 761	Paper Tape Punch	5,500
1 - 167	I/O Processor	22,000
1 - 236	Drum Control	13,000
1 - 237A	Drum with 262,144 words (field expandable to Type 237)	59,000
1 - 136	Data Control	10,000
1 - 516 - 520	Tape Control	18,000
1 - 50	Tape Unit	18,000
1 - 137	Data Products DISCFILE Control	9,200
1 - 138	PDP-6/PDP-4 Interface	4,100
1 - PDP-4	with Paper Tape Reader, and 8,192 Word Memory	71,000
1 - 75	Tape Punch (for PDP-4)	4,000
1 - 64	Printer-Keyboard (for PDP-4)	5,000
1 - 630	Data Communications System for 30 Full Duplex Lines	36,984
30 - 628	JOSS Consoles (less Selectric Typewriters)	<u>135,000</u>
	SUBTOTAL	\$847,884
	DISCOUNT for 2 - 163C Memories (See enclosed DEC quantity discount schedule)	<u>-15,120</u>
	PURCHASE PRICE	\$832,764
	System Rental Price/Month	\$ 28,262.80

Mr. J. Tupac

-4-

27 July 1964

System Monthly Maintenance after
6 month warranty period

\$2,120.00

DEC has assembled a prototype of the JOSS console, using an IBM Selectric typewriter and a special control box. We would like to exhibit this prototype to the Rand Corporation for your consideration. The design is preliminary and any suggestions you have are welcome. We look forward to receiving your comments on our amended proposal.

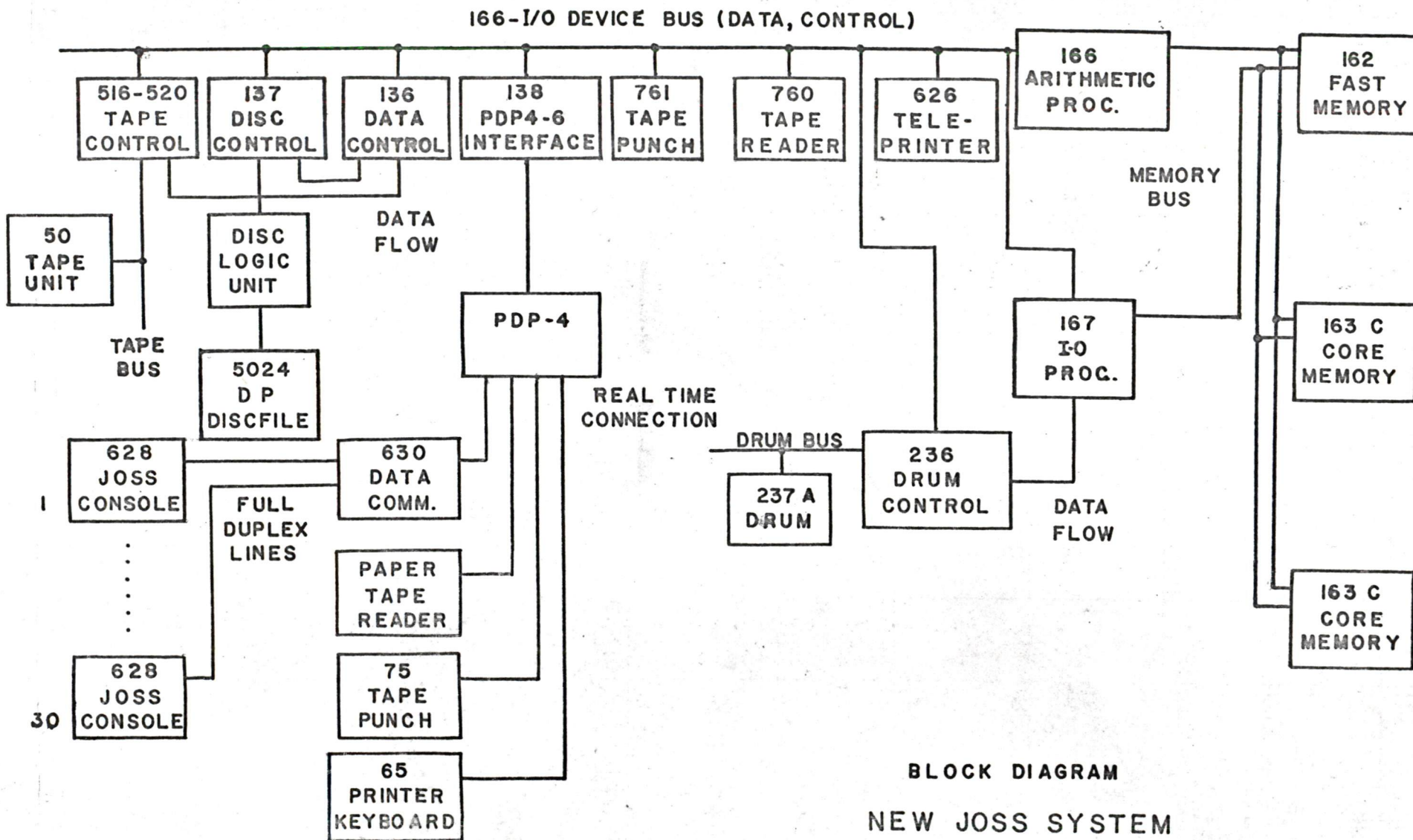
Sincerely,



Robert A. Stiver
Applications Engineer

RAS:jww

Enclosure: Standard Computer Discount Agreement



BLOCK DIAGRAM
NEW JOSS SYSTEM

H. Anderson



30 July 1964

Mr. Gordon Bell
Digital Equipment Corporation
146 Main Street
Mainard, Massachusetts

Dear Mr. Bell:

The prices shown below are those you requested by telephone. Should you need any further information, please call our Eastern Regional Manager, Mr. Cecil Shelton at Area Code 202, 244-7100. He is located at 4429 Wisconsin Avenue, N.W., Washington, D.C.

I trust that you will treat this price schedule as Company Confidential.

Model	Qty. <u>1-2</u>	Qty. <u>3-5</u>	Qty. <u>6</u>
5025-1 (2 Logic)	113,650	106,025	90,900
5025 (No Logic)	78,900	76,600	63,100
5035-1 (2 Logic)	151,050	140,950	120,800
5035 (No Logic)	109,500	102,200	87,600

These prices are good for sixty (60) days and are f.o.b. St. Paul, Minnesota or Culver City, California.

Very truly yours,

William H. Collins
William H. Collins
Western Regional Sales Manager

jl

Enclosures

cc C.F. Shelton

cc. T. Johnson
R. Stover
R. Lane

The RAND Corporation

1700 MAIN ST. • SANTA MONICA • CALIFORNIA 90406

3 August 1964

L-10306

Mr. Harlan Anderson
Vice President
Digital Equipment Corporation
Maynard, Massachusetts

Dear Andy:

Enclosed herewith is a print of the JOSS film. When you have completed your showings of this film, please return it to:

JOSS Film Distribution
The RAND Corporation
1700 Main Street
Santa Monica, California 90406

Please have your mailroom return this as Educational Material-Special Handling and insured for \$50.00.

Sincerely,

Church-

C. L. Baker
Computer Sciences Department

CLB:ew

Enclosure (as noted)

Also enclosed: RM-4162-PR, entitled
JOSS: SCENARIO OF A FILMED REPORT
(under separate cover)

P.S. Many thanks for your hospitality last Friday. I was very impressed by the hardware & by the people I met. I'm sure we'll be back for more before too long.

P.P.S. The console looks pretty good - our comments will take a while, though.



PHOTOGRAPHIC TYPE-COMPOSITION EQUIPMENT

355 Middlesex Avenue, Wilmington, Massachusetts • 933-7000

To our Stockholders:

On a number of occasions I have had the opportunity to report to you concerning the progress of the Company, but at no time have I felt as confident concerning our future as I do now after reviewing the activities and results of the last six months.

Among the goals which we set for this period were the shipment and acceptance of the ZIP machine, the introduction of a low-cost straight matter machine, and last but not least, an acceptable profit from operations.

Since each of these matters is quite important to you and to your investment in the Company, I shall report on each one separately.

1. The ZIP machine, which was shipped to the National Library of Medicine on May 11, 1964, has been performing even better than expected. The type for the August edition of the INDEX MEDICUS, which is to be published on July 30, has been set on the machine, and the personnel associated with the project report most satisfactory and gratifying results. We are advised that the Library of Medicine will be issuing a news release on its operation very shortly, and we suggest that you watch for this most significant event.

Work is already in progress on the first production lot of ZIP machines, with the delivery of the first of these scheduled for December of this year.

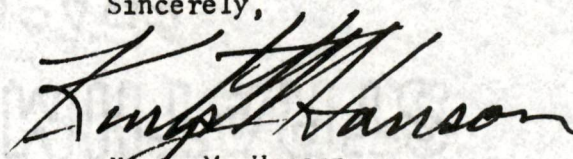
2. After almost two years of development the new straight matter text machine, now formally named the 713 Textmaster, was introduced early in June at the ANPA-RI Westprint Show in Los Angeles. The enthusiasm expressed by the people attending the Show reaffirms the position of leadership which Photon has maintained in the phototypesetting field, and we already have on hand a series of orders which have been placed for this new equipment, with delivery scheduled to commence in December of this year. Our entire display as well as the introduction of this equipment was most successful for the Company.

3. As you remember, the last half of 1963 resulted in profitable operations. We have continued to progress during the first half of 1964, and from sales of \$2,115,851 for the six months ended June 30, the Company has realized a profit of \$158,197 before provision for interest for the 5% Convertible Subordinated Income Debentures. This is the first consecutive twelve-month period in which substantive profits have been earned, and we firmly believe this trend will continue.

We can all take pride in the results of the effort put into the rapid development of our product line during the last two years. Our ZIP and 713 machines are outstanding. They are the two fastest typesetting machines on the market, and coupled with the great versatility of our display composition equipment and computer-generated tape driven equipment provide the most extensive line of phototypesetting equipment offered by any manufacturer in the world today.

In summarizing the general outlook of the Company, I would say that the backlog continues at a very satisfactory level, sales prospects have never looked brighter, and the market for phototypesetting equipment has never been so promising as at the present time. To meet this market, we have provided the extensive product line described above, improved service to our customers, expanded manufacturing resources through our subcontracting program and a Company organization that is well coordinated to meet the increasing demands placed upon it.

Sincerely,



Kurtz M. Hanson
President

July 24, 1964



PHOTOGRAPHIC TYPE-COMPOSITION EQUIPMENT

355 Middlesex Avenue, Wilmington, Massachusetts • 933-7000

August 4, 1964

Mr. Harlan E. Anderson
Digital Equipment Corporation
Maynard
Massachusetts

Dear Mr. Anderson:

Mr. George Rice telephoned today to say that you were not able at this time to give further consideration to the opportunities in High Speed Computer Photo-Typesetting. Mr. Rice indicated that he did not feel that you had the qualified personnel to take on such a venture. Our problem has been that no one has personnel who is qualified in all areas. Quite a few of the computer manufacturers have indicated that they would like to sell their equipment in applications of information, storage and retrieval. We have a number of publishers who have indicated that they would like to purchase a service of typeset printout from computer storage. The only way it appears that such a service might be offered is through the combined efforts of a computer manufacturer, ourselves and some "software" specialist. No single company, it appears, is going to be qualified to supply all the know-how; therefore, we must combine the efforts of several companies.

There is a strong trend toward phototypesetting caused by the following developments:

1. Growth of web fed offset lithography.
2. New Plastic and fast etch metal photo letterpress printing plates.
3. Expanding need for high speed, low cost typesetting.
4. Increased awareness of the greater impact and economy of typeset computer printout by the publishing and data processing industries.

I am enclosing a copy of our letter which our president, Kurtz Hanson recently mailed to our stockholders. We hope, after you have had an opportunity to catch up on your present activities, you will be able to reflect on the opportunities which exist in this area.

Yours very truly,

PHOTON, INC.

Stuart E. Arnett
Stuart E. Arnett, General Manager
Computer Typesetter Division

SEA:dms
Enc.

G. S. GRUMMAN & ASSOCIATES, INC.

MEMBERS OF THE NEW YORK STOCK EXCHANGE

147 MILK STREET • BOSTON, MASS. 02109

TELEPHONE 617 - 482-5420

25 BROAD STREET
NEW YORK, N. Y.
TELEPHONE 212 - 269-3654

August 7, 1964

Mr. Harlan Anderson
Digital Equipment Corporation
Main Street
Maynard, Massachusetts

Dear Mr. Anderson:

As the enclosed brochure indicates, our firm was organized early this year to provide investment research service for institutions on electronic securities. In this respect, you might be familiar with the work Sterling Grumman has done in the past, and the report I did on the computer industry for the Investment Bankers Association, in which your company was kind enough to co-operate.

As you will also note in the booklet, DEC has a limited coverage designation, primarily because it is not a public company. However, we deem it very important to be familiar with your operations not only because of the fact that you might go public in the future, but also because of the important position you occupy in the scientific and real-time areas. A familiarity with your company, of course, is necessary in order to cover such companies as Computer Control and Scientific Data Systems.

In this light, Lou Rusitzky of the Boston Safe Deposit & Trust Company has suggested that I might get in touch with you to arrange for an interview to discuss DEC's operations. If this is convenient for you, I was thinking of Wednesday, August 19 as a possible date. I would like to come out in the morning, say 9:30 a.m., and spend a few hours with you. In addition, I would also appreciate a quick tour of your production facilities.

Looking forward to hearing from you and meeting you, I am,

Very truly yours,

Alex G. Fedoroff

Alex G. Fedoroff

AGF:ca
Enclosure

LYBRAND, ROSS BROS. & MONTGOMERY

COOPERS & LYBRAND
IN AREAS OF THE WORLD
OUTSIDE THE UNITED STATES

80 FEDERAL STREET
BOSTON 10

August 10, 1964

Mr. Harlan E. Anderson, Treasurer
Digital Equipment Corporation
Maynard
Massachusetts

Dear Andy:

I am having sent to you with my compliments,
a copy of the 39th Edition of Montgomery's Federal
Taxes which is just being released by the publisher.

The new edition, like its predecessors,
provides a concise summary of the federal tax law with
emphasis on business and investment problems. All the
important and pertinent new developments since the last
edition are incorporated. This includes the Revenue
Acts of 1962 and 1964 as well as administrative actions
(such as the "depreciation guidelines", Rev. Proc. 62-
21) and court decisions. Planning opportunities related
thereto are also pointed out by the book. The scope and
arrangement are essentially similar to the previous
edition and I hope that you will find this edition of
even greater interest and value.

Please let me know if your copy does not reach
you within a reasonable time.

Sincerely yours,

Roscoe Irving

nancy
Remind me to acknowledge
when it arrives.
Andy

MCW:ECB
REI



equipment corporation

MAYNARD, MASSACHUSETTS

TWinoaks 7-8822 TWX MAYN 816

August 11, 1964

Mr. Harlan E. Anderson, Vice President
Digital Equipment Corporation
Maynard, Massachusetts

Dear Mr. Anderson:

Please consider this notice of a meeting of the Board of Directors of Digital Equipment Corporation, to be held at the offices of the Corporation, 146 Main Street, Maynard, Massachusetts, on Tuesday, September 8, 1964, at 2:00 p.m.

I shall appreciate your indicating on the enclosed copy whether or not you plan to attend the meeting, returning the copy to me.

*sent 8/11/64
ner*

Very truly yours,

Dorothy E. Rowe

Dorothy E. Rowe
Clerk

DER:ah
Enclosure

GORDON S. SLOUGHTER
PRESIDENT

August 3, 1964

Mr. Arnaud de Vitry
Technical Studies, Inc.
730 Fifth Avenue
New York, New York 10019

Dear Arnaud:

It was indeed a pleasure to hear from you and I am happy to forward, under separate cover, some of our more recent literature. It is certainly true that EMR has grown considerably over the past few years.

EMR was renegotiated only for the fiscal year ended March 31, 1957, and most of our profit was realized on proprietary items developed in prior years as self-sponsored R & D. For the year in question, EMR was required to make a significant refund, primarily because of the relatively high profit experience. An additional factor was the disqualification of most of our claim for new durable productive equipment. Although the renegotiation allegedly covered this one year alone, we endeavored to show losses incurred in a subsequent year as an illustration of the inherent risk in EMR's business which deals with self-sponsored engineering that is constantly advancing with the state-of-the-art.

??
5 year
Life

We were informed that product development (which was expensed on the books of EMR) was considered only if incurred during the year of renegotiation. It seemed to us that the Board based their determination on each individual case after considering all of the relevant factors. They did not disclose the formula, if any, by which they arrived at their final determination. The pretax profit finally allowed EMR was about 15% of "adjusted" sales.

Needless to say, we would be very glad to furnish any further information with regard to our unpleasant experience with the Renegotiation Board, and we would be delighted to have you visit us in Sarasota whenever you can make it.

Sincerely,

Gordon

ARNAUD DE VITRY

12. RUE DE LA PAIX
PARIS 2, FRANCE

August 11, 1964

Mr. Harlan Anderson
Vice President
Digital Equipment Corporation
Maynard, Mass.

Dear Andy,

Please find enclosed a photocopy of a letter I received today from the president of Electro-Mechanical Research mentioning his unpleasant experience in 1957 with the Renegotiation Board on proprietary products.

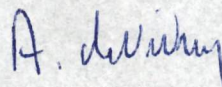
This letter confirms my recollection that you can be renegotiated on proprietary products but I would advise you to get in touch directly with Mr. Gordon Sloughter and ask him any additional questions you care to in order to get a clearer description of EMR's problem with the Renegotiation Board.

Here in Paris I shall see Mr. Varda to reassure him that Bunker Ramo is in no way negotiating the buying of DEC. In September I shall try to visit with John Ackley and begin a pleasant relationship with him. Bob Lane should by now be back in Maynard and has probably brought you up to date on his negotiations with IT&T.

I was very happy to visit with DEC during my trip to the United States and I want to congratulate both Ken and you on the financial results of the fiscal year just ended, which at the last minute are much better than I had expected six months ago. I was also very encouraged by Ken's optimism on the financial forecast presented for next year, which appears to me really due to the quality of the new products coming out of your engineering department.

Hoping to see you in November, I remain

Sincerely yours,



A. de Vitry

Enclosure

AMERICAN RESEARCH AND DEVELOPMENT CORPORATION

THE JOHN HANCOCK BUILDING · BOSTON · MASSACHUSETTS 02116

AREA CODE 617 426-7060

August 11, 1964

Mr. Harlan Anderson, Vice President
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts

Dear Harlan:

I am enclosing all the material we had on Western Union International, which we discussed yesterday. This information contains a letter to stockholders of May 1964 and a prospectus dated September 23, 1963. I think you will find the latter document useful and informative.

*Prospectus
file
name's
etc*

The man to whom I will forward your Digital information is listed in the prospectus. He is Anthony A. Sirna, III, who is a director and secretary of the company. It is my understanding that he will present the Digital material to the technical personnel of Western Union International. Subsequently, the pertinent personnel at Western Union International and Digital can meet at some mutually convenient time and place.

This company would appear to offer considerable potential for your equipment and services.

Please let me know if I can be of any further assistance.

With best wishes to Ken and yourself,

Sincerely,

Bill

William Elfers

WE:dt

Enclosures

August 11, 1964

Mr. Anthony A. Sirna, III
Western Union International, Inc.
60 Hudson Street
New York 13, New York

Dear Mr. Sirna:

It was a pleasure to meet you last week, and to learn of the very interesting participation your office has in Western Union International Limited.

As we discussed, under separate cover I have sent you the pertinent product literature of Digital Equipment Corporation of Maynard, Mass., which the management would very much like to have you bring to the attention of your technical people. We would be very pleased to have representatives of Digital come to New York at your convenience to further discuss their equipment. We at American Research, of course, believe that the Digital management have done an outstanding job in developing extremely efficient data processing equipment and adapting it to the particular requirements of important markets, such as communications.

I look forward to hearing from you and your advice as to how we may proceed with Western Union International.

Sincerely yours,

William Elfers
Vice President

WE:dt

BCY: Mr. Harlan Anderson

H. E. ANDERSON

Bob Lane

Would sales to these
people be in conflict
with I.T.T. in Paris?

Andy
Please return.

DIGITAL EQUIPMENT CORPORATION

Andy:

I assume that this is Western Union, U.K - Europe and
yes it is in conflict with ITT, Provis. But they may
be a better risk. Lets investigate and use it two

ways:

- (1) Possible OEM account - scratch ITT.
- (2) Pressure ITT to move!

Bob.

BOLT BERANEK AND NEWMAN INC
CONSULTING DEVELOPMENT RESEARCH

HEA

50 MOULTON STREET
CAMBRIDGE, MASS. 02138
TELEPHONE (617) 491-1850

13 August 1964

Mr. John J. Shields
Digital Equipment Corporation
Maynard
Massachusetts

Dear Jack:

This letter refers to yours of 6 August to me and our subsequent telephone conversations.

We agree that the warranty on the PDP-1D-45 system should start on 1 September 1964 as an 8-month warranty. If, however, the items on the list attached to your letter of 6 August are not completed by 1 September, warranty is to run from the date of completion of the last of them. The completion of Item #5, wiring diagrams, however is not anticipated by 1 September and will not affect the warranty period. I am accepting your assurance that it will be finished by 1 December 1964.

It is understood that the system referred to in this letter does not include the high-speed swapping drum which is a separate problem.

Very sincerely yours,

BOLT BERANEK AND NEWMAN INC.



John H. Hughes

JHH:hl

P.S. Many many thanks to you and Mr. Andersen for the additional time you have given us on Core 7 on the old machine. It will be a real life saver.

*make more positive
ref: bottom of next
pages*

Through Put Rate:

A through put of 5 KC cannot be obtained with the basic system outlined in the price quotation. The reason is due to program limitations. This situation is when a buffer is filled and the program must reinitialize the loop counter and buffer pointer and start the tape. The preliminary program which is enclosed requires 318 μ seconds to input an analog reading, store it, and reinitialize. This must be done only after every 1024th reading, but, nonetheless, it is the time which determines the maximum continuous throughput rate of 3.2 keps.

The program organization is as follows:

1. Memory is divided into three parts

0000 - 3777	program storage
4000 - 5777	buffer 1
6000 - 7777	buffer 2

2. There are three parts to the program: initialization, main program, and interrupt program. The initialization routine is executed only once immediately following operation of the start key. This routine selects the multiplexer channel; sets up the tape control, core address, and word counter; and initializes the character counter and buffer pointer.

The main routine simply waits for the tape control to finish its operation and then resets the control registers in the tape control and sets up some constants for use by the interrupt routine. The execution of this routine is time interlaced with the interrupt routine so its running time is not significant within fairly large limits.

The interrupt program does most of the work. This routine is initiated by a timing flag which is set by a pulse received from an external

COPY

device. This is the same pulse which switches the sample and hold to Hold mode. During the execution of this portion of the program, the conversion is actually made and the result stored in memory. A typical pass through this routine requires 276 microseconds. However, at the end of a block the buffer pointer and character counter must be reinitialized, and this required 318 microseconds. This is the significant value which limits maximum sampling rate.

Included here is the interrupt program listing. This is more than adequate for most of the input sampling rates, however to obtain the rate of 5 KC would require additional hardware. This hardware can be added at a later date or if the University of Michigan Space Physics Laboratory desires this Data Controller, the estimated system cost is between \$7,000 to \$10,000.

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1	P. C.		48
2	jmp 100		12
100	stf	/skip on timing flag	12
	jmp	/not timing flag	
	adc	/start conversion	12
	dca temp	/store A C for int. return	
	isz chct	/check for last character	
	jmp + 7		
	tad	/reinitialize character count	
	dca chct		132
	tad	/reset buffer area	
	dca Ξ 10		
	ctf	/clear timing flag	
	sadf	/skip on A-D flag	
	jmp - 1		
	radc	/read A-D into AC	12
	dca i Ξ 10		24
	tad temp	/restore AC	18
	ion		12
	jmp i Ξ 1	/return from interrupt	18

300

3 tape interrupts

18

318

PDP-5 System for the University of Michigan

General

The required Analog-to-Digital System will be implemented through the use of the PDP-5 Digital Equipment Corporation Computer. This machine has been specifically designed to replace special purpose, inflexible, wired equipment.

The proposed system will be built almost entirely from Digital's standard line of catalogue items. All of the equipment is operational and prices quoted for each device include complete interfacing to the basic computer. Reliability will be high, since all equipment is field proven and no new engineering will be necessary.

Additional features inherent in production line equipment as opposed to special systems are: quantity discounts, six months free service, periodic maintenance training and programming courses, and applications and engineering support. Since the heart of the system is a Digital PDP-5 computer you will be able to share information and exchange ideas among persons with a variety of applications. This may be done through DECUS, (Digital Equipment Corporation Users Society). The computer method permits one to change the basic concept of the Analog-Digital System at a later date, by simply changing programming. Also, the system can be greatly expanded to include visual displays, a plotter or direct communication with other computers using data phone, teletype or

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PDP-5 System for the University of Michigan

General (continued)

magnetic tape. Little of this is possible with a fixed design, special system.

Perhaps the primary advantage of using a computer is that the system may perform additional tasks besides the analog digital conversion and tape formatting. The computer may be used to perform preliminary calculations on the analog inputs detect high and low alarm or other significant parameters, perform off line processing of the tape information after a data run or supply information to the experimenter to permit real time control over the experiments. Since the user is provided with the facilities of the general purpose computer, there is no reason for the system to sit idle between data gathering runs.

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SOFTWARE

PAL Assembler (DEC-5-1-5)

PAL, a two-pass assembler, produces a machine language version of a program written in PAL symbolic language.

Debugging Program (DEC-5-5-5)

The debugging program accepts programs assembled using PAL and allows complete on-line debugging. Important features of this debugging aid are that memory registers can be examined and their contents modified, and subject program breaks can be inserted at arbitrary points to monitor operation of subsections of the program. The operator communicates with the program on a Tape Teleprinter (ASR-33).

Utility Programs

Various utility programs provide printouts of punchouts of memory contents in octal, decimal, or binary form, as specified by the user. Utility subroutines are provided for octal or decimal data transfer and binary-to-decimal, decimal-to-binary, and Tape Teleprinter conversion.

Software also includes a set of elementary function subroutines such as an exclusive OR, inclusive OR, single or double-precision add, subtract, multiply, and divide, square root, sin-cos, logarithm, and exponential.

A 36-bit word floating-point package will be provided so that programs can be written using floating-point arithmetic. Floating-point arithmetic on the PDP-5

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SOFTWARE

Utility Programs (continued)

will give results only one significant figure less precise than large-scale computing systems.

Maintenance Programs

A complete set of standard diagnostic programs is provided to simplify and expedite system maintenance. Program descriptions and usage manuals permit the user to effectively test the operation of the computer for proper memory functioning and execution of instructions. In addition, diagnostic programs to check performance of standard and optional peripheral devices are provided with the devices.

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PROGRAMMING SYSTEMS AND SUPPORT

The software package delivered with each PDP-5 consists of an assembler, a debugging program, and utility and maintenance programs, all designed to operate with the basic computer (processor, 1024 or 4096-word memory, Tape Teleprinter). This package is designed to provide the operating nucleus for a growing library of programs and routines to be made available to all PDP-5 users. New techniques, routines, and programs are constantly being developed, field tested, and documented in the Digital Program Library for incorporation in user's systems.

SUPPORT

Training and Assistance - Digital offers monthly courses in programming and maintaining each of its computer models as part of the service provided to purchasers. These courses include instruction by experienced Digital personnel, training manuals, and supplies. Classes are small to insure adequate individual attention.

Digital will assist you with specific programming problems before, during, and after installation of your computer and can provide a computer at our home office to let you check out your program under the guidance of Digital programmers until your own computer is on-line.

DECUS Library, Newsletter - In addition to the Digital Program Library, users of Digital equipment have access to the extensive DECUS Library of utility programs,

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DECUS Library, Newsletter (continued)

subroutines and other programming materials. DECUS (for Digital Equipment Computer User's Society) was formed to promote a free and effective interchange of information. A principal channel for the information flow is DECUSCOPE, a monthly technical newsletter to which users contribute their ideas, techniques, routines, and program summaries. The DECUS Library distributes to members program write-ups and the corresponding program tapes and listings. Certification of these materials is under the direction of the user's programming committee, which also guides the operation of the library. DECUS also publishes the proceedings of its annual symposiums.

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Locations of Present Installations in the Ann Arbor Area

1. University of Michigan
Mental Health Research Institute
205 Forest Avenue
Ann Arbor, Michigan

2. Applied Dynamics
2275 Platt Avenue
Ann Arbor, Michigan

List Unit of
Mich. PDP-1 installations.
+ PDP-4 " "



COPY

106-6
PIC
04

identical letter to
Dr. Dohrenwend

August 14, 1964

Dr. Rob J. Roy, Assistant Professor
of Electrical Engineering
Rensselaer Polytechnic Institute
Troy, New York

Dear Dr. Roy:

Rensselaer will shortly be acquiring a new general purpose digital computer system; and you, no doubt, will be involved in the decision as to which computer is chosen. Digital Equipment Corporation has recently introduced PDP-6 (for Programmed Data Processor - 6), one of the most advanced and flexible computing systems now available. Since you will be hearing more about PDP-6 in the near future, I am writing you to provide you with an initial acquaintance with DEC and with PDP-6.

PDP-6 is, by present standards, a medium-to-large scale machine of a somewhat higher level of performance than the IBM 7090, 7094 machines, and with some unique features which very few, if any, other systems can match. It is extremely modular and expandable. A PDP-6 system is composed of a large variety of system components. The concepts of modularity and expandability have been implemented in such a way as to permit graceful system growth. Pluggable additions can be made with a minimum of ~~discrip-~~ ^{disrup-}tion and do not require the replacement of existing system components.

DEC has been a pioneer in the development of time-shared computer systems and the new PDP-6 reflects that experience. It is the first non-experimental, commercially available computer to offer built in time-sharing capability. Briefly, time-sharing permits simultaneous use of the computer by several persons operating at

Dr. Rob J. Roy

Page 2

remote consoles. It results in maximum computer utilization and minimum turn-around time.

DEC has built over 100 general purpose digital computers since 1959. We are presently building computers at a rate of approximately 100 per year. Users include Harvard, M. I. T., University of Michigan, Stanford, University of California, Yale, Princeton, Rutgers and others in the academic category. In addition, a large number are installed with commercial organizations and in government laboratories.

I would be very pleased to hear from you if you desire more information.

Sincerely,

Gerald T. Moore
Computer Applications Engineer

GTM/kge

Harlan Anderson

August 14, 1964

Mr. Joseph R. Welch
The University of Michigan
Office of Assistant Controller
And Business Manager for Sponsored Research
Building 2033, Willow Run Airport
Ypsilanti, Michigan

Dear Mr. Welch:

Thank you for your request for bid 05776-1 involving a Multiplexed Analog to Digital Converter to Magnetic Tape System. Digital Equipment Corporation also appreciates the time extension for answering the request for bid.

Digital Equipment Corporation is pleased to submit this proposal which outlines our concept of an operational system and can be easily expanded. Of course, in a matter such as this, DEC stands ready to assist you in any way and to make any modifications to the proposed system.

I have included additional standard PDP-5 literature and option price list. Also enclosed is Digital Equipment Corporation Standard Terms and Conditions and Quantity Discount Agreement.

All Digital Equipment Corporation Systems are manufactured from our standard line of circuit modules, all of which have been thoroughly tested and field proven.

Please do not hesitate to contact me or Mr. Robert Oakley, 3853 Research Park Drive, Ann Arbor, Michigan (AC 313 -- 663 -- 4163) should you require any additional information.

Sincerely yours,

Morton E. Rudeman

Proposed PDP-5 System Configuration for University of Michigan

1. Standard PDP-5 Computer with:
 - Control Processor
 - Printed-Keyboard
 - Perforated Tape Reader and Punch (ASR-33)
 - Program Interrupt
 - Data Interrupt
 - Input/Output Skip Facility
 - Input/Output Hold Facility
 - Bussed In/Out Facility
 - Device Selection
 - 4096 Word Core Memory \$27,000
2. Analog to Digital Converter, Type 138 \$ 5,000
3. Multiplexer Control, Type 139 \$ 3,600
4. Multiplexer Switches, Type 157B
 - 8 channels -- 4 channels/157B @ 333 \$ 666
5. Time Coding Facility
 - Option to read on command -- BCD time coded information; hours, minutes, seconds and milliseconds -- to be read onto tape on command.
 - Includes mode switching facility \$ 2,000
6. Digitizing Check-Option
 - D/A converter with ability to read back into 138 for checking purposes \$ 2,000
7. Automatic Magnetic Tape Control, Type 57A
 - Controls a maximum of eight type 50 tape transports automatically. Provides information transfer through computer's data interrupt facility. Controls reading or writing of tape at 15,000 cps transfer rate, 200 or 556 bits per inch. Format is IBM compatible \$10,000
 - Total \$50,266

Note: Lease or rental of magnetic tape transport is at the rate of 1/30th per month of list price for a three year lease.
 1/30 \$10,000 = \$600/month

Delivery: Basic System 1 month
 Tape Control and A to D (to be installed at University of Michigan to Basic System) 3 months

**Customer is requested to supply sample and hold at present.

AMERICAN RESEARCH AND DEVELOPMENT CORPORATION

THE JOHN HANCOCK BUILDING · BOSTON · MASSACHUSETTS 02116

AREA CODE 617 426-7060

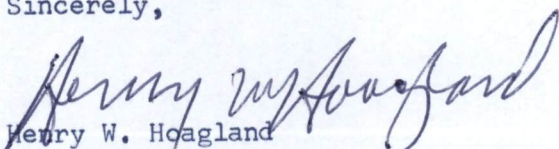
August 17, 1964

Mrs. Nancy Survilas
Secretary to Harlan E. Anderson
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts

Dear Mrs. Survilas:

Thank you for the invitation for luncheon preceding the Board of Directors Meeting on September 8th. I am very pleased to accept, and will plan to be present at 12:30 p.m.

Sincerely,


Henry W. Hoagland
Vice President

HWH:dt



Massachusetts Institute of Technology
Alfred P. Sloan School of Management
50 Memorial Drive
Cambridge, Massachusetts, 02139

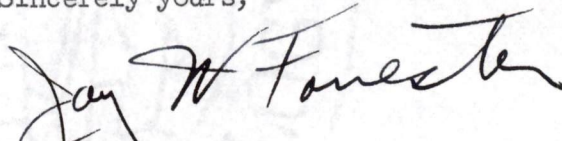
August 17, 1964

Miss N. Survilas, Secretary
to Mr. Harlan E. Anderson
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts

Dear Miss Survilas:

I will plan to attend the 12:30 luncheon preceding the
Board of Directors Meeting on September 8.

Sincerely yours,



Jay W. Forrester
Professor of Industrial Management

JWF:ie

digital MEMO

DATE Aug. 21, 1964

TO Dorothy E. Rowe FROM Nancy Survilas

Dear Miss Rowe,

Would you kindly affix your corporate seal to the enclosed documents per request of Stan Olsen. Please return to me as soon as possible.

Thank you.

Nancy

Enc: MOfidication #2 JPL Contract #950791



JET PROPULSION LABORATORY California Institute of Technology • 4800 Oak Grove Drive, Pasadena, California 91103

18 August 1964

In reply,
refer to: File 3281

DIGITAL EQUIPMENT CORPORATION
Maynard
Massachusetts

Attention Mr. Harlen E. Anderson
Vice-President

Gentlemen:

Subject: JPL Contract No. 950791, Modification No. 2

We are returning two (2) copies of subject document, and ask that corporate seal be affixed as requested in our letter of 10 July 1964, and that each copy be dated; we also will require three (3) copies as specified.

Upon execution and dating by the Institute, a fully executed copy will be returned to you.

Very truly yours,

S. J. Evans
Sr. Contract Negotiator

SJE:js

Enclosures: (2)

H. Anderson

August 19, 1964

Doctor E. H. Schuford
Decisions Science Laboratory
L. G. Hanscom Field
Bedford, Massachusetts

Dear Doctor Schuford:

I am furnishing the following information in reference to our recent telephone conversation about tying a Digital Equipment Corporation PDP-6 computer to your existing PDP-1 installation.

Statement of problem: My understanding of the problem is that excessive time is used currently by the PDP-1 system to perform mathematical computations on test results. Present requirements for operating the CRT display for testing consume nearly 100 per cent of existing computer time.

Proposed Solution: Ideally, the PDP-1 could be used in conjunction with the new type 340 display system as a test monitor; that is, using its memory as a picture storage facility whose parameters are automatically called for by the display, which is in effect a picture processor. Approximately 7 per cent computer time is used in the character generating mode, 35 per cent computer time in increment mode, and 12 per cent in random plot.

One can see from the above figures that most of the time is not used by the displays and available for other uses. Obtaining a new group of picture parameters from the Type 24G Drum does not require excessive time as the automatic interrupt system can be utilized. Primarily, the PDP-1 is waiting as much as 20-30 per cent of its time for light pen interrupts. There is computer time available to initiate single word transfers to an external processor which, in turn, can utilize 100 per cent of its time in mathematical calculations.

COPY

For these reasons, the proposed system is based on the facts that:

- 1) Few words will be processed, as opposed to large blocks, and
- 2) ample time is available in existing PDP-1 programs to allow an IOT command to transfer data rather than a direct memory block dump.

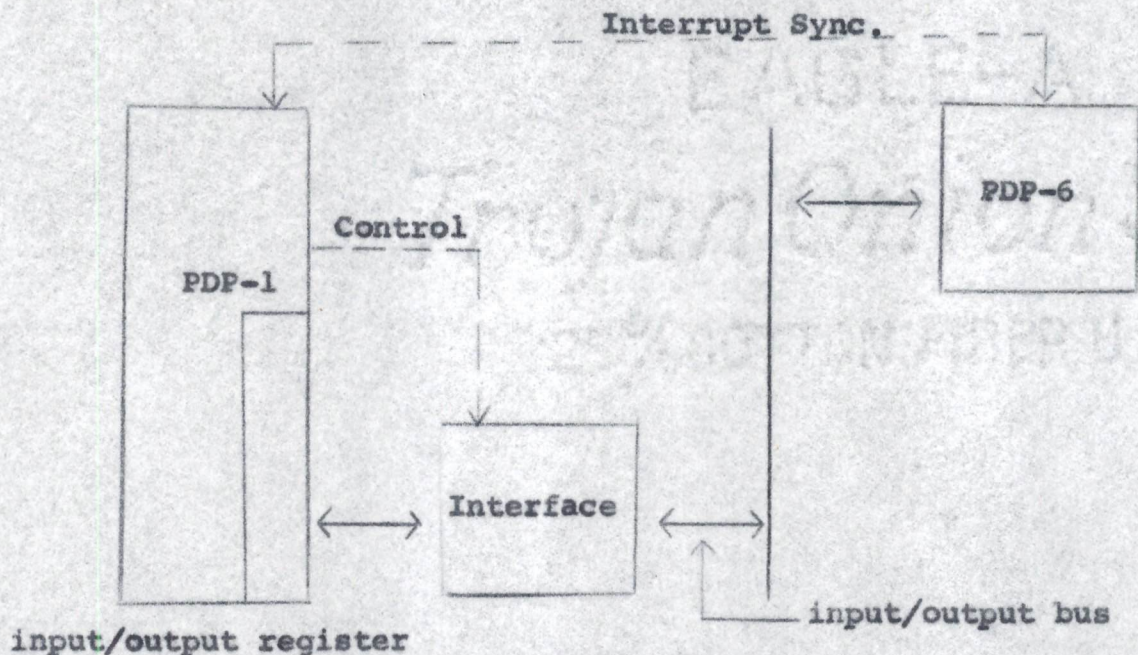


figure 1

Figure 1 illustrates the interface scheme proposed. All transfer is done through the PDP-1 input-output register with control pulses furnished with iot commands. When enough data has been transferred, the PDP-6 can be signalled to compute. After calculating a result, it can cause an interrupt in the PDP-1 and furnish data through the same interface.

The interface consists of an 18-bit data register (1/2 word transmission to the PDP-6 and the necessary buffering to operate bi-directionally.

Figure 2 (enclosed) shows in more detail, the contents of the interface. The interface requires a complete mounting panel and should be mounted in the PDP-1 with standard coaxial ribbon cables into the PDP-6 I/O bus. A reasonable price estimate for this interface is \$3500 (including necessary PDP-1 iot commands).

Figure 3 illustrates a basic PDP-6 configuration which would be suitable for your application. The cost breakdown is as follows:

COPY

Arithmetic Processor Type 166	\$146,100
8K - 2 μ sec Memory Type 163	80,000
Paper Tape Reader Type 760	9,000
Paper Tape Punch Type 761	5,500
Special Interface	approx. <u>3,500</u>
	\$244,100
0.4 μ sec Fast Memory Type 162	<u>30,000</u>
	\$274,100

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The cost of a 0.4 μ sec Fast Memory is separated, as it depends upon program and speed requirements on your part whether or not it is needed.

I might add that most of the existing peripheral equipment presently ordered for your PDP-1 installation can be used directly on the PDP-6 system with just the added cost of interfaces, not basic equipment costs.

I am enclosing our latest PDP-6 price list and literature for your evaluation.

If I can be of any further assistance, please feel free to contact me.

Very truly yours,

Stefan Mikulski
Customer Relations

SM:jam

Enclosures

cc: R. Beckman
R. Lane
H. Anderson

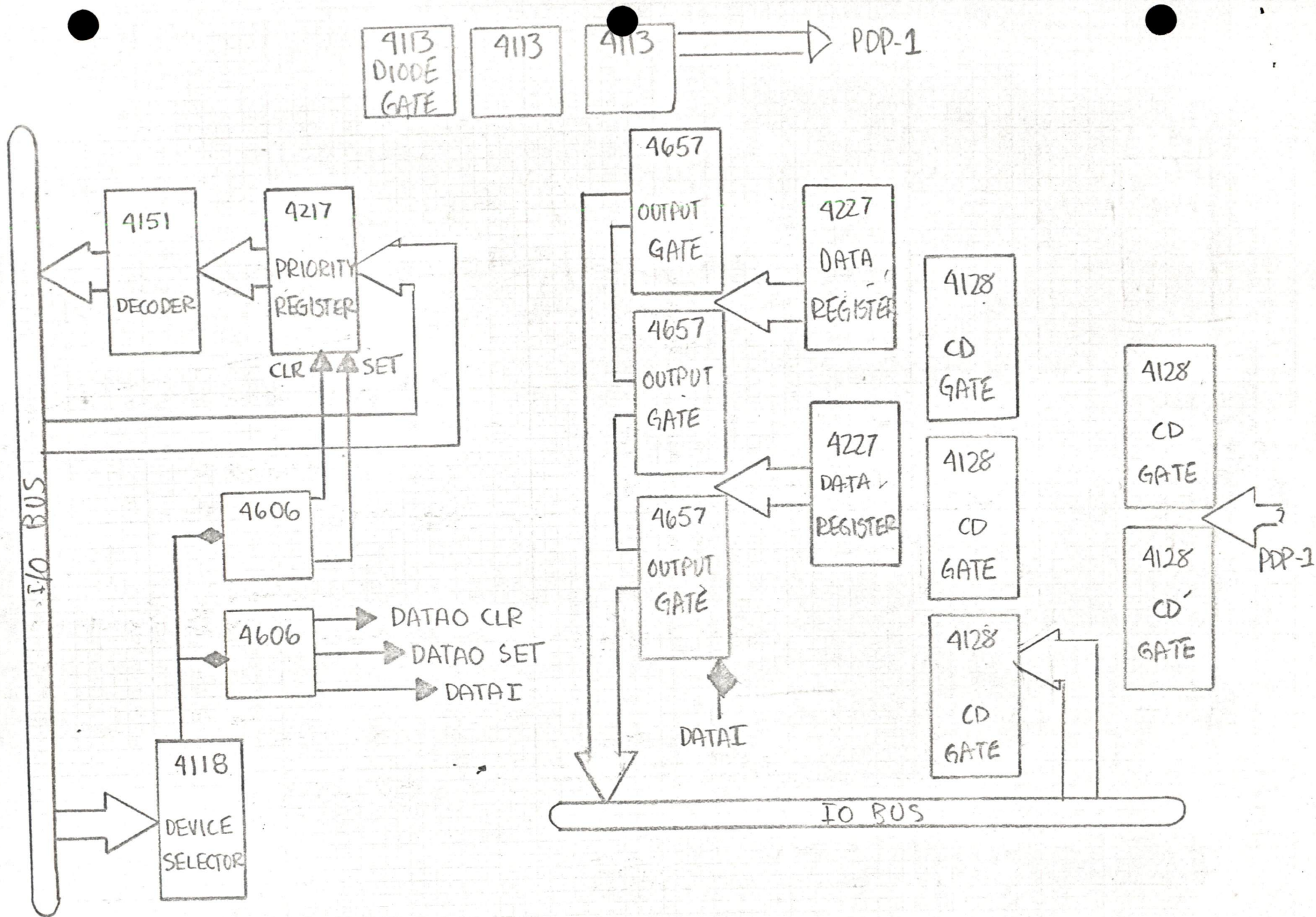


FIGURE - 2

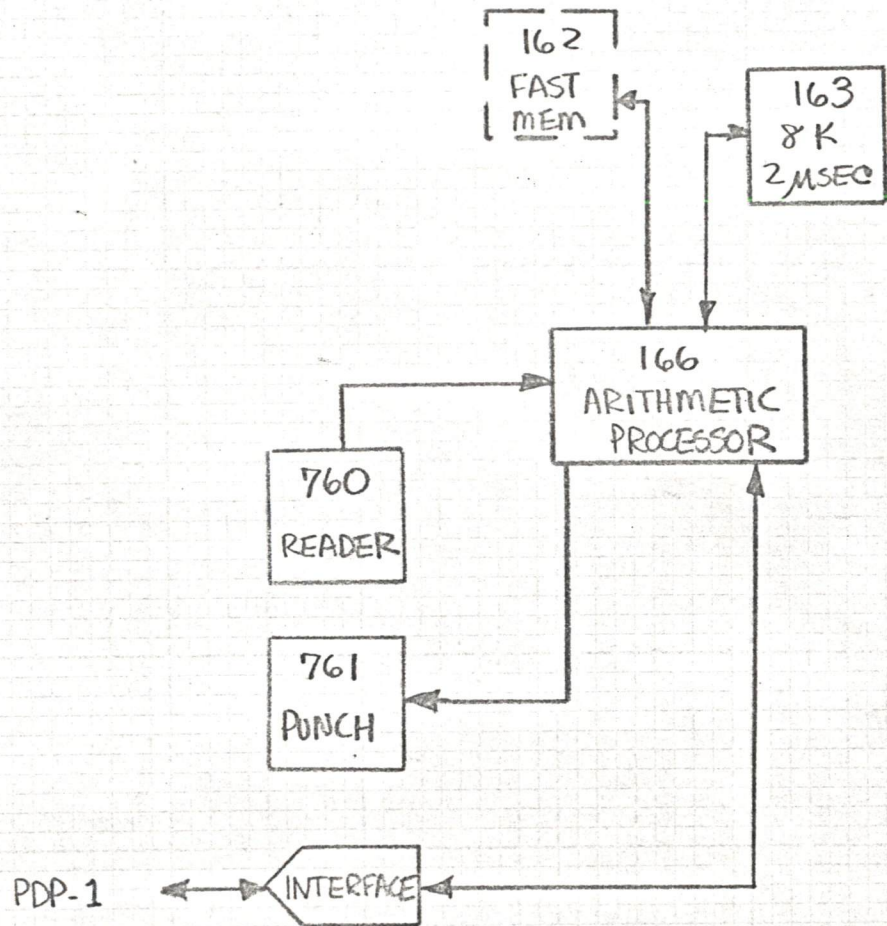


FIGURE-3

UNIVERSITY of PENNSYLVANIA

PHILADELPHIA 19104

THE DEVELOPMENT PROGRAM
201 South Thirty-fourth Street
215 594 8498

August 27, 1964

Mr. Harlan Anderson, Vice President
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts

Dear Mr. Anderson:

At the suggestion of Dr. John F. Lubin, I am happy to forward for your information the enclosed literature about the University of Pennsylvania's Integrated Development Plan.

If I may be of further assistance to you, please do not hesitate to contact me at the above.

With all good wishes.

Sincerely yours,

Bob Hess

Robert K. Hess
Director of Corporate Programs

RKH/rfk

Enclosures

"Not Many Miles from the Town..."

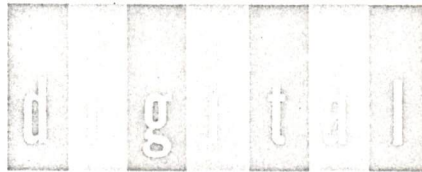
"Kite, Key, and Computer"

"Innovation..."

Faces of the University of Pennsylvania

see file

H. Anderson



equipment corporation

MAYNARD, MASSACHUSETTS
TWinoaks 7-8822 TWX MAYN 816

1 September 1964

Mr. Charles W. Adams
Adams Associates
142 The Great Road
Bedford, Massachusetts

Dear Mr. Adams:

Digital Equipment Corporation is pleased to offer Adams Associates the option of converting their PDP-6 purchase agreement from a straight purchase to a lease arrangement.

This offer is made subject to the following conditions:

1. Written notice of your desire to convert to a lease must be submitted on or before 15 December 1964.
2. The lease shall be governed by Digital's standard policies, terms and conditions of lease in effect at the time conversion is requested.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Robert J. Beckman".

Robert J. Beckman
Manager, Customer Relations

RJB/eb

G. S. GRUMMAN & ASSOCIATES, INC.

MEMBERS OF THE NEW YORK STOCK EXCHANGE

147 MILK STREET • BOSTON, MASS. 02109

TELEPHONE 617 - 482-5420

25 BROAD STREET
NEW YORK, N. Y.
TELEPHONE 212 - 269-3654

September 1, 1964

Mr. Harlan E. Anderson, Vice President
Digital Equipment Corporation
Maynard, Massachusetts

Dear Mr. Anderson:

Just a short note to thank you and Dave Packer for your time and comments during my recent visit to your facility.

As I indicated to you, we would like to keep in touch with you once a quarter, to keep abreast of your progress in the fast-changing EDP field. We would very much like to be put on your mailing list to receive all official mailings, including your upcoming annual report. If possible, we would also like to receive your On Line employees publication.

start
List

Many thanks again and I hope to talk to you soon.

Yours very truly,

Alex G. Fedoroff

Alex G. Fedoroff

AGF:ca



PHOTOGRAPHIC TYPE-COMPOSITION EQUIPMENT

355 Middlesex Avenue, Wilmington, Massachusetts • 933-7000

September 1, 1964

Mr. Harlan E. Anderson, Vice President
DIGITAL EQUIPMENT CORPORATION
Maynard, Massachusetts

Dear Mr. Anderson:

Thank you for your letter of August 24 indicating your continued interest in the opportunities of your computer equipment in applications requiring typesetting printout with our ZIP Model 900.

I strongly believe that there are profit opportunities in our working together in the promotion of our equipments. I believe it would be helpful if you could visit with us at our plant.

Just as soon as your schedule indicates when this might be possible, we would like to hear from you.

Very truly yours,

PHOTON, INC.

Stuart E. Arnett
General Manager
Computer Typesetter Division

SEA:dms

STRATHMORE BOND

ERASEWELL

25% COTTON FIBER USA

September 2, 1964

Mr. Charles Baker
The Rand Corporation
c/o The Colonial Inn
11 Monument Square
Concord, Massachusetts

Dear Mr. Baker:

It gives me great pleasure to extend to you an invitation to attend the Annual Meeting of Digital Equipment Computer Users Society (DECUS) which will take place at Dayton, Ohio on September 24 and 26, 1964.

Enclosed you will find a copy of the program and registration information. I have also included a copy of the 1962 and 1963 DECUS PROCEEDINGS which report papers given at previous DECUS Meetings.

If you cannot plan to attend, please feel free to send a representative from the Rand Corporation.

Sincerely,

Elsa Newman (Mrs.)
DECUS Secretary

ejc

cc: Mr. Harlan Anderson ✓

Enclosures: As indicated above

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ARNAUD DE VITRY

12, RUE DE LA PAIX
PARIS 2, FRANCE

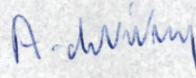
September 4, 1964

Mr. Harlan E. Anderson
Digital Equipment Corporation
Maynard, Mass.

Dear Andy,

Thank you for your invitation to the 12:30 luncheon
prior to the Board of Directors meeting on September
8th. I shall be unable to attend the meeting and will
therefore not be able to attend the luncheon.

Sincerely,



A. de Vitry

H. Anderson

September 8, 1964

Mr. Charles L. Ford
E. I. duPont de Nemours and Company,
Incorporated
Organic Chemical Department
P. O. Box 525
Wilmington, Delaware 19899

Dear Mr. Ford:

Enclosed you will find literature describing our display systems.

Your interest in Digital Equipment Corporation is sincerely appreciated. If we can be of further assistance to you, please do not hesitate to write or call us.

Sincerely yours,

Allan Titcomb
Applications Engineer

AT/kge

Enclosures: F-01, F-13(30), F-13(340)

C
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P
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September 4, 1964

Dr. John McCarthy
Computation Center
Stanford University
Stanford, California

Dear Dr. McCarthy:

Thank you for taking the time to review our new Flip-Chip Module Catalog. Your comments have been discussed here at DEC, resulting in a rewriting of this booklet. Hopefully, the new version will be more complete and easier to understand.

I will be glad to forward a revised edition to you just as soon as it is available.

In the meantime, if you wish, it is possible to arrange a presentation for you and your associates at Stanford, thereby providing complete and up to date information on Flip-Chip Modules.

Also, if there is any other information I can provide concerning any of DEC's products please do not hesitate to call upon me.

Very truly yours,

Burton V. Scudney
Module Sales Manager

BVS:vg

cc: K. Olsen
→ H. Anderson
R. Best
K. Larsen

COPY

charles w. **adams associates** inc.

142 THE GREAT ROAD · BEDFORD · MASSACHUSETTS · 01730 ◊ 617 275-8050

September 9, 1964

Mr. Robert J. Beckman
Digital Equipment Corporation
Maynard, Massachusetts

Beckman

Dear Mr. Beckman:

Our auditors, Lybrand, Ross Bros. & Montgomery are engaged in an audit of our records and have requested confirmation of certain details concerning our purchase and lease agreements for the PDP-6 computer and related equipment. These details have been summarized as follows:

On August 17, 1964, Charles W. Adams Associates, Inc. contracted to purchase a PDP-6 computer for \$814,968 payable before June 24, 1965, unless the purchaser elects before December 15, 1964 to convert to a lease with a minimum term of 12 months and a monthly charge of \$27,167.

Would you kindly indicate your confirmation and/or comments below and return this letter directly to our above-named auditors at 80 Federal Street, Boston, Massachusetts.

Very truly yours,

Vincent F. Raso
Controller

VFR:mk

The above information correctly summarizes the status of our contract with Charles W. Adams Associates at this date.

Date: _____ Signed: _____

143 BAY STATE ROAD • BOSTON • MASS.

CONTRACT DATA PROCESSING, INC. • 536-9715

September 14, 1964

Mr. Harlan Anderson
Digital Equipment Corp.
Maynard, Massachusetts

Dear Harlan:

The advent of the JOSS System as it will exist when implemented on the PDP-6 will afford unprecedented opportunities for DEC in the scientific computer market. Non-IBM equipment manufacturers have always before competed for this market on a "me too" basis with IBM. However, being selected as the hardware manufacturer, DEC will enjoy the advantages of having the JOSS system programmed, debugged, and implemented, as well as continually improved and maintained by the Rand Corporation. All other manufacturers will be at a serious disadvantage in this regard.

The JOSS system is extremely attractive to scientists and to engineers because of its immediacy of use and ease of communication, as well as low cost per user or user group.

When implemented on the PDP-6, a powerful computer is available as well for large volume production work. Production programs can be easily generated from the JOSS system, using the final statements, by a compiler or by an experienced FORTRAN programmer. A typical installation might run, for example, from 9:00AM to 6:00PM using JOSS; and from 6:00PM to 9:00AM doing production work, as discussed in our previous proposal.

DEC is now in a position to offer to individual companies, or the general public, a scientific computing center capable of "me tooing" in almost every way existing installations and, at the same time, offering an entirely new dimension of capability.

To install one or more stations on a utility basis, either in organizations with conventional systems installed or within those using service companies, will be comparatively simple. Selling can commence immediately on this basis and, since hardware will be delivered, contracts can be obtained in advance of actual production of stations.

We would like to propose an arrangement between our organizations on the following basis:

-cont'd-

Mr. Harlan Anderson
Digital Equipment Corp.

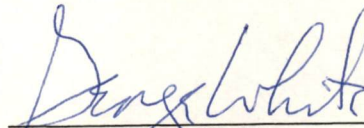
-2-

September 14, 1964

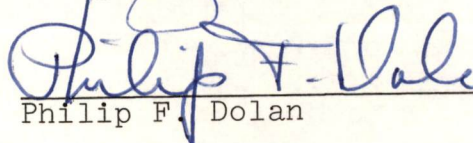
1. CDP would begin to market JOSS consoles immediately on the basis of \$1,000 per month rental each for a period of one year minimum. This would cover the first forty console hours and each additional hour used on a monthly basis will be billed at the rate of \$25.00/hour.
2. DEC would schedule a PDP-6 configuration matching that ordered by Rand Corp. for delivery approximately 30 days after the Rand system.
3. Ninety days prior to delivery, a decision would be made on the basis of the number of JOSS console Rental Agreements obtained by CDP, as to whether or not DEC would produce and deliver the PDP-6 for CDP.
4. If CDP is successful in getting such a computing center into profitable operation, the way is clear for DEC and CDP to open additional centers elsewhere.

We would appreciate the opportunity of discussing this approach further with you at your earliest convenience.

Very truly yours,



George S. White



Philip F. Dolan

/cdl

cc: Mr. Robert Lane
Digital Equipment Corp.

September 17, 1964

Mr. Jack Gilmore
Charles Adams Assoc.
387 Eliot Street
Newton Upper Falls 64, Mass.

Dear Mr. Gilmore:

We would like to have you submit a proposal for the implementation of a Compact Cobol Compiler for our PDP-6. This proposal should specify the language to be implemented (the minimum subset of Compact Cobol), your machine time requirements for checkout, the level of documentation you will provide (both user and maintenance), your responsibility for maintaining the system, etc..

The following are some general conditons to be met:

1. Proposal to be received by us no later than October 16, 1964.
2. The system to be delivered one year or less after the contract.
3. Both the Compiler and object program must be wholly compatible with our time sharing monitor.
4. The basic time sharing configuration is 16K, paper tape reader and punch, one dual DECTAPE transport. In addition, a printer will be considered part of the configuration for COBOL.

September 17, 1964

5. The proposal should specify the necessary configuration for compilation and execution. Since our system requires that the compiler be device-independent, this means that the configuration must be specified in terms of available back up storage not in terms of devices. The compiler should not care if the storage is DECTape, a drum, additional memory, magnetic tape, etc..
6. If possible within the definition of Compact Cobol symbols would be a maximum of 6 characters or if longer that they be unique within the first 6 characters, and that a symbol table be available for our debugging programs.
7. That a symbolic listing of the compiled code be available as well as adequate diagnostics, memory maps, etc..

We have available a full scale assembler, a syntax-directed Fortran compiler and a large number of arithmetic, conversion and utility routines, which you may use as required.

I am enclosing a group of manuals, memos, etc. which you will find necessary for reference. I will send you additional documents describing our Monitor formats, calling sequences, etc. as they become available.

Sincerely,

Lawrence J. Portner

Systems Programming

LJP:tw
Enc.

COPY

122 EAST 42ND STREET
84TH FLOOR
NEW YORK 17, N. Y.
OXFORD 7-2420

RECEIVED

SEP 17 1964

AM. RES. & DEV. CORP.

WE
7/24
24/24
7/24

September 15, 1964

Mr. William Elfers, Vice President
American Research and Development Corporation
The John Hancock Building
Boston, Massachusetts 02116

Dear Mr. Elfers:

Thank you for your letter and the literature on the products of Digital Equipment Corporation which were awaiting me upon my return from vacation on the Cape.

The data has been forwarded to the president of Western Union International who will see that the proper technical people of that company review it. As soon as I hear further I shall get in touch with you.

Sincerely,

Anthony A. Sirna

Anthony A. Sirna

msk

WILLIAM ELFERS

G. Moore

September 16, 1964

Dr. Clayton O. Dohrenwend,
Vice-President and Provost
Rensselaer Polytechnic Institute
Troy, New York

Dear Dr. Dohrenwend:

Thank you for your kind hospitality during our visit to R.P.I. yesterday. We appreciated the opportunity to talk to you and Dr. Hollingsworth. We always enjoy the chance to talk about DEC, its background, its people, and its record in the industry. We are quite proud of our Company and never tire of talking about it.

Harlan Anderson is getting together some additional information for you, which he will send out tomorrow. Meanwhile, I'm sending along some XEROX copies of the article from "Industry", as promised. I'm sorry they are not regular reprints. We expect reprints shortly.

Sincerely,

Gerald T. Moore
Computer Applications
Engineer

GTH/pam
Enclosures: (3)

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H. Anderson

Mark Maggarese

4 copies please
SEP 22 REC'D



UNIVERSITY OF PITTSBURGH
800 CATHEDRAL OF LEARNING
PITTSBURGH, PENNSYLVANIA 15213
COMPUTATION & DATA PROCESSING CENTER

WILLIAM B. KEHL
Director

September 18, 1964

Area Code 412
621-3500 Ext. 7185

Dear Ray:

I thought it would be of help to you if I put down on paper the considerations about computer equipment information needed for the N. I. H. proposal.

1. We must submit the proposal by November 1, 1964, to be reviewed in the spring in order to receive funds by December, 1965, or January, 1966. Further delay is not practical.

2. N. I. H. does not give funds just for equipment. They want to be certain that their grant will lead to specific research accomplishments in the Life Sciences. As such, they want specific detail on how the computer will be used and they expect to support the associated staff programming efforts to help in medical research.

3. Thus we can write a proposal on either of two distinct levels.

A. A minimum proposal. For this we would ask N. I. H. for a modest sum of money to implement a time-sharing system for a single processor. The remote stations would be approximately 16 typewriter-type input stations with perhaps 2 card readers. The use would be primarily for small simulations such as interest biostatisticians and for statistical studies based on large card or magnetic tape files such as those carried out in our pharmacology drug studies. The special programming efforts would be by our own group and would include a Morrissey type Fortran or Joss language operating in an interpretive mode. More complex applications would continue to be processed on the IBM 7090 in batched runs. To make such a proposal to N. I. H., I must have explicit information on the specification of the Compiler language, the Monitor Systems and its communication with the remote stations, the time-sharing capabilities of the hardware and its limitations (relocatability, memory lock-out, etc.). I would not be willing to submit a proposal for which I was responsible to the N. I. H. without such explicit information. We will most certainly have a site visit from them, at which time I will have to answer these questions. In addition to this, we need detailed costs of special features required for such operation and a delivery schedule for those special features. No further systems assistance by D. E. C. would be required for this modest proposal.

B. A major proposal. Because of the unique interdisciplinary relationships developed by the Chancellor within the University, there is an opportunity to take advantage of the potential total institutional capability in the Life Sciences, the Natural Sciences, Social Sciences, and Engineering -- all together with the Computing Center. The close tie between the Schools of the Health Professions and the Computing Center is an important factor in this consideration. The Center is responsible for providing the best computational facilities to the entire university program. Such a situation offers an opportunity to D.E.C. to expand its own potential with the new PDP-6 by developing a hardware system to handle complex medical processing in a concrete situation. It offers a challenge that I feel is of greater significance to the industry than the well known Project MAC System because of the significance of the applications themselves. Such a program would imply an investment of both time and funds by D.E.C. -- of both software developments in applications as well as special hardware, most particularly with respect to special input-output devices for the medical area. It would be a pilot program which would not be unique but could become a model for other institutions. The University hospital, the Medical School, the Graduate School of Public Health, the Schools of Pharmacy and Dentistry, the Biological and Engineering Sciences, and the Behavioral Sciences would all be involved, as each of these areas currently receives N.I.H. support for their research. The kinds of applications here at the University for which this more complex system is required includes the following examples:

Partial List of Applications of a Time-Sharing System

1. A Whole Body Counter 400 Channel Gamma Ray Spectrometer

Requiring access to the machine at 15 minute intervals with 400 binary coded decimal words with 105 capacity. This is to be located approximately 2 miles from the base computer.

2. Automatic Analysis of Human Blood Cell Chromosomes

Approximately 1,000,000 words of 6 bit each must be transmitted for each cell studied. Approximately 600 cells to be studied per day on an around the clock basis. This data is for both counting and matching pairs of chromosomes to detect deviation from normals.

3. Mass Data Reduction and Analysis Using Remote Terminals

Large files of data are to be maintained on mass storage devices for processing with parameters provided in real-time from a remote terminal. Visual display as well as more normal printed output must be provided as a rapid response by the processing system. Many stations with this capability must be able to be serviced without degrading of response time.

4. On-line Data Collection and Monitoring Devices

Testing devices such as rat cages require access to the computer for collecting and preliminary processing of data generated in animal based experiments. This device will be mostly digital but E.E.G. and E.K.G. data must be able to be monitored and recorded for remote stations. A-D converters must be provided as an interface to the machine. Such things as the M.I.T. Owl will probably be necessary, although specific users are not known of as yet. Early users of this capability will be in the school of Pharmacy studying the effects of drugs on the gross behavior of animals.

5. Simple Human Testing Devices

Simple devices for the recording of responses to such things as auditory testing with very slow rates such as one character every two seconds would need to be built as input from remote stations.

6. Blood Bank Monitor and Inventory Control

Central Blood Bank is interested in the possibility of a monitoring inventory system maintaining up-to-date information on the availability and condition of their supply of blood.

7. Analog Collection and Transmission Devices

Some facility such as an analog tape recorder would be necessary to collect data for later processing. This later processing could be either from remote terminals or by means of being carried to the Computation Center. It is preferable that such processing could be done remotely and in real-time.

For such a proposal the hardware requires 1 processor initially with specific plans for a second processor and the capability for further expansion operating under a time-sharing supervisor which considers the multi-processing rather than simple sequential time-sharing problems. In addition to standard typewriter type inputs and card readers there would have to be a development and experimental effort by D. E. C. together with the University in investigating techniques and equipment to handle higher real-time data transmission rates and the modifications to the monitor and compiler needed for such operation.

A much larger number of remote stations, about 150, would eventually be installed because, for example, we hope that the Learning Research and Development Center could use the equipment in their project and the Natural Science areas related to this field, including, for example, our elaborate Crystal Structure Analyses carried out by the Crystallography Laboratory would become an on-line operation taking direct observations.

It is clear that no university would be in a position to tackle such a large commission unless there was a firm joint commitment by D. E. C. Our proposal to N.I.H. could be submitted in either of two ways.

Mr. Lindsay
Page 4
September 18, 1964

1. A joint proposal of the University and D.E.C. to N.I.H.
2. A proposal by the University with a firm statement of commitment by D.E.C. of their role and responsibilities above supplying the rental of standard hardware items. If preferred, this could even take the form of a sub-contract for development as long as it was clear that such a contract would be a real contribution to the state of the art that went beyond the economics involved.

On a project level, both administratively and technically, I would want to be reassured personally of many working details before I would dare submit a proposal to the National Institutes of Health so that I could sincerely and directly answer their questions on a site visit and feel that the system we proposed was able to do the job. I do not feel it would be necessary to specify the details of many of the special input-output devices since these are part of an experimental development program and it is really in the input-output area that we must turn for greatest help to D.E.C. However, it would still be necessary for me to have explicit details and costs on the processors, on standard I/O devices, the monitor system and compiler language, on the communication of the system with the remote stations as before, on the time-sharing capabilities and limitations of the 1 and 2 processor systems. I would hope that such a system might incorporate advances made in the Project MAC System, but in addition we would place more emphasis on special I/O capabilities.

I want to emphasize that we must draft our proposal including a statement for the vendor in time to meet the November 1, deadline. I should also be quite frank, that obviously we prefer the more expanded system and hope that we can develop some sort of cooperative relation with a manufacturer along these lines.

As you can see, close cooperation with a manufacturer is of great importance in such a system. I am most hopeful that you will be able to come up with a solution to our problem. Our staff is ready to discuss more detailed specifications with the D.E.C. Engineering group as soon as you wish and our medical research people are also available.

Yours sincerely,

William B. Kehl

William B. Kehl

Mr. Ray Lindsay
Digital Equipment Corporation
300 Seco Road
Monroeville, Pennsylvania

WBK:jaw

THE UNIVERSITY OF MICHIGAN

ANN ARBOR

MENTAL HEALTH RESEARCH INSTITUTE
JAMES G. MILLER, M.D., DIRECTOR

September 18, 1964

DEPARTMENT OF PSYCHIATRY
RAYMOND W. WAGGONER, M.D., CHAIRMAN

Mr. Gerald Moore
Digital Equipment Corporation
Maynard, Massachusetts

Dear Mr. Moore:

After careful consideration, those of us associated with the real-time computer proposal at The University of Michigan have decided that the best machine to meet our needs would be the PDP-6 manufactured by your company. We would therefore like to indicate to you our intent to have a formal purchase order sent to you contingent upon prior receipt by us of formal notification that we have received the grant from the National Institutes of Health which is now pending council action. Since we have been informed that we will be notified in November, we would expect to send a purchase order to you before November 15, 1964, if the proposal is acted upon favorably. Such a purchase order will also be contingent upon a delivery date which we understand can now be set during April of 1965 and a satisfactory demonstration of the PDP-6 time-sharing monitor and compiling systems which you have indicated will be available at that time. We feel that we will be able to commence negotiations for final acceptance conditions about the same time a purchase order can be submitted.

The purchase order will cover the following configuration::

1. Type 166 Arithmetic Processor
2. Type 162 Fast Memory
3. Type 163C Core Memory, 2 each
4. Memory Bus Interface, 2 each
5. Type 167 I/O Processor
6. Type 236 Magnetic Drum Control Unit
7. Type 237 Magnetic Drum
8. Type 768 Paper Tape Reader and Control
9. Type 761 Paper Tape Punch and Control
10. Type 136 Data Control
11. Type 516-520 Magnetic Tape Control
12. Type 50 Magnetic Tape Transport, 2 each
13. Type 551 Microtape Control Unit
14. Type 555 Dual Micro Tape, 2 each
15. Type 646 Line Printer
16. Type 346 Display Monitor and Control
17. Type 630 Data Communications System with 16 Control Lines
18. Type 635e Remote User Station (ASR33), 16 each
19. Line Power Supply
20. Jack Panel

Mr. Gerald Moore
Page 2

September 18, 1964

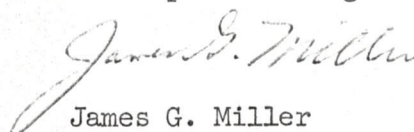
According to your teletype of September 17, 1963, the net price for this configuration will be \$645,352.00 discounted from the total list price of the system which you quote as \$766,740.

This letter in no way commits us or The University of Michigan contractually but is merely a statement of our intent if we should receive the grant.

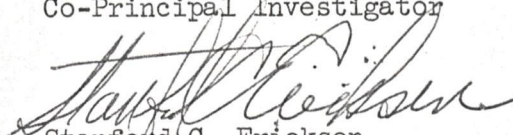
Sincerely,



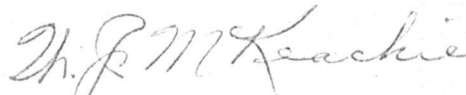
William R. Uttal
Principal Investigator



James G. Miller
Co-Principal Investigator



Stanford C. Ericksen
Co-Principal Investigator



Wilbert J. McKeachie
Co-Principal Investigator

cc: Mr. Fanning
Medical Center Purchasing

WU/nm

23 September 1964

Mr. Armin Miller, President
Data Disc Incorporated
981 Commercial Street
Palo Alto, California

Dear Armin:

I was talking with Mr. Harlan Anderson of the Digital Equipment Corporation. As you know, they manufacture the very interesting and productive line of "PDP" Computers.

I told Harlan about your equipment, "Data Disc". I am sending him a copy of your descriptive literature and suggest you send him any additional materials that you may have.

I am now back in the thick of things here at Pennsylvania -- this job is not easy -- I look back on my year in Palo Alto with a tear in my eye.

Sincerely,

John Francis Lubin
Director of Computing Activities

JFL:dm

CC - Mr. Harlan Anderson, Vice President ✓
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts

*sent to
Purchasing
cost file*

COPY

UNIVERSITY of PENNSYLVANIA

PHILADELPHIA 4

The Computer Center

18 September 1964

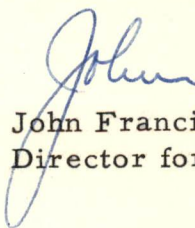
Mr. Harlan Anderson
Vice President
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts

Dear Harlan:

I have been giving much thought to the proposition that you and I discussed some weeks ago. I am very interested in it. I am certain that such an installation here at the University of Pennsylvania could be of great value to the Digital Equipment Corporation (and to Penn, of course).

I understand very well that our talk was but a preliminary one. I await further word from you.

Cordially yours,



John Francis Lubin
Director for Computing Activities

JFL:sk



Rensselaer Polytechnic Institute

TROY, NEW YORK

Office of the Provost and Vice-President

September 24, 1964

Mr. Harlan E. Anderson
Vice President
Digital Equipment Corporation
Maynard, Massachusetts

Dear Mr. Anderson:

Thank you for your letter of September 18, and the information enclosed therewith.

The material that you sent is very helpful in giving us a more complete background of Digital Equipment Corporation.

Thank you for your courtesy.

Sincerely,

Clayton O. Dohrenwend

C. O. Dohrenwend

mb

APPLIED DYNAMICS INTERNATIONAL

JDK #929

MEMO

To: Mr. Verwey (R & H) H. T. Liu (INDENCO)
L. F. Taylor (Philips) O. Judd (Showalter-Judd)
R. Maidanik (Coasin) G. F. Graber (ADI)
B. H. McGregor (McGregor) W. W. Wood (ADI)
B. Pekelman (Pekelman) ~~H. Anderson~~ (DEC - Maynard)
H. Van Landuyt (R & H) R. Oakley (DEC - Ann Arbor)
T. Hirata (TKK)

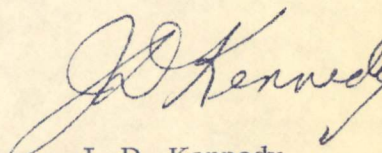
Date: September 28, 1964

Subject: Attached Abbreviated Copy of Digital Program Via TWX

Gentlemen:

To illustrate the capability of sending SPOUSE code programs from Applied Dynamics or Digital Equipment Company to users who have TWX, we transmitted the enclosed program from Digital Equipment Company to Applied Dynamics in Ann Arbor over the TWX system. The TWX at Applied Dynamics is identical with the input-output system provided in the SPOUSE (PDP-5). Thus, it is possible for us to prepare a paper tape at the customer's installation by remote control from Ann Arbor.

You might say that we have a SPOUSE program emitter follower at AD in Ann Arbor!



J. D. Kennedy
President

JDK:cn
Encl:

APPLD DYN A A

DIGITAL ANN

TO CXXX JOHN BRUSSOLO

FROM J.D.KENNEDY

WE ARE GOING TO TRANSMIT A DIGITAL EQUIPMENT CORPORATION DOUBLE
PRECISION MULTIPLY DIGITAL TAPE. PLS FOLLOW THESE INSTRUCTIONS

1. PLS TURN ON THE PUNCH AT THE SOUND OF THE BELL

/DOUBLE PRECISION MULTIPLY ROUTINE, 2'S COMP.

/CALLING SEQUENCE: JMS DMUL

/ ADDRESS OF MULTIPLICAND (HIGH ORDER)

/ ADDRESS OF MULTIPLICAND (HIGH ORDER)

/ RETURN, HIGH ORDER PRODUCT IN AC,

/ NEXT HIGH TO LOW IN B, C, D.

*200

DMUL,0

CLA CLL

TAD REST

DCA SGN

TAD I DMUL

MP1, 0

MP3, 0

THIR, 7764

XMP2, 0

\$

TU WE HAVE RECEIVED YOUR TAPE

APPLD DYN A A

H. Anderson

September 29, 1964

COPY

Dr. Pless
Massachusetts Institute of Technology
Laboratory for Nuclear Science, Rm. 26-505
Cambridge, Massachusetts 02139

Dear Dr. Pless:

During your past visit to DEC, we arrived at a new PDP-6 configuration relative to AEC purchase order No. 63-404-7, Mod. 2. for the PDP-6 system. We have reviewed this configuration and below is our interpretation of that order.

Item	Description	Type No.	Qty.	Unit Price	% Disc.	Total Discounted Price
1.	Arithmetic Processor	166	1	140,000	24	106,400
2.	Data Control	136	1	10,000	24	7,600
3.	Tape Control Unit (IBM-7291)	522B	1	30,000	24	22,800
4.	Display Interface to I/O Bus		1	3,000	24	2,280
5.	Core Memory, 16K, 2μsec	163C	1	126,000	24	95,760
6.	Core Memory, 16K, 5μsec	161C	1	85,000	24	64,600
7.	Data Communication System (1 station)	630	1	9,869	24	7,500

Dr. Pless
Massachusetts Institute of Technology
Laboratory for Nuclear Science

September 29, 1964

(Continued)

Item	Description	Type No.	Qty.	Unit Price	% Disc.	Total Discounted Price
8.	User Station Tele-printer	635C	1	900	0	900
9.	Card Reader	461A	1	16,500	0	<u>16,500</u>
Total Discounted Price						324,340
Less Trade of PDP-1						<u>195,105</u>
New net balance of existing order						129,235
The current AEC purchase order is for (\$110,494)						<u>-110,494</u>
To be purchased by MIT						18,741

Production of this system has commenced and delivery will be on or about March 15, 1965.

Diagnostic programs will be made available on Magnetic Tape with back up on punched cards. If, however, a paper tape reader is desirable to enable more efficient DEC maintenance, it will be installed at no additional charge to MIT.

The non-monitored I/O system will take full advantage of the Magnetic Tapes and suitable routines will be supplied by DEC. The DEC Time Sharing System will not operate from Magnetic Tape but requires DEC tape or Magnetic Drum Storage to enable reading and writing of short files.

Fortran IV is under consideration here at DEC. We request that you forward to us a copy of one of your Fortran programs so we can determine software compatibility.

DEC also requests that you send an IBM 7291 Tape Unit to permit testing the interface prior to shipment of the system.

Thank you for visiting DEC. We are planning to demonstrate for you a complete compilation using DEC Fortran (preferably one of your programs) and to take you on a tour of our manufacturing facility.

With best personal regards.

R. L. Lane

RLL/pam

COPY

H. ANDERSON

THE FOXBORO COMPANY

DIGITAL SYSTEMS DIVISION
21 STRATHMORE ROAD
NATICK, MASS. 01762
TEL. 653-5660

October 1, 1964

Digital Equipment Corporation
Maynard
Massachusetts

Attention: Arthur Hall, III

Reference: Your letter to R. Treiber dated August 7, 1964
and your letter to P. H. Anderson dated August
6, 1964.

Dear Arthur:

The purpose of this letter is to review our needs and require-
ments in regard to the PDP-7 based upon the information we
have to-date.

I. EXTEND MODE

After review of this option with Ron Wilson and our
people, we feel that this design does the job as well
as bank switching and is satisfactory for our purposes.

II. SLOW CYCLE

Your letter of August 6 indicates a method of providing
slow cycle which we feel is highly unsatisfactory be-
cause we may have on one job as many as sixty devices
or requirements for IOT codes, some devices requiring
more than one IOT code. A more satisfactory technique
has been discussed with Ron Wilson on previous occa-
sions at which time we were left with the impression
that DEC would employ this technique (diode decoder) in
order to put us in the slow cycle. This diode decoder
as we discussed consisted of approximately 30 some odd

October 1, 1964

diodes. After your transmittal of August 6th to Paul Anderson, this was again discussed with Ron Wilson at which time he indicated that this technique would be made a special option for Foxboro. Since your last understanding was not in agreement with ours, will you please reconfirm this.

III. PARITY CHECKING

As of our previous telephone conversation, it is our understanding that a parity checking option will be available with the PDP-7 and if elected, will in no way affect the current promised delivery cycle of 5 months. A firm price was to be quoted to us on this option prior to September 16. We have not received it, and in the meantime, we have been using your estimate of \$3-\$4,000 for the first 4K of core and \$600-\$700 additional for each increment of 4K of core over the first 4K. Please provide us firm prices as soon as possible.

IV. DOUBLE PRECISION HARDWARE

Prior to your letter of August 7, discussions with Ron Wilson had led us to believe that an outboard, double precision, arithmetic unit could be built as a special option which would not affect the standard design of the PDP-7 nor in those cases where this option was not elected, affect the compatibility of the PDP-7 with the PDP-4. In those cases where we would elect this double precision hardware option, compatibility with the PDP-4 would not be a requirement since we could not expect the software written for single precision operations to be applicable with double precision arithmetic operations.

V. As you know, we are actively quoting the PDP-7 to our customers. To-date we have been at an extreme disadvantage in quoting this machine because of the lack of adequate specifications, documentation, and sales tools. We are unable to provide our Sales people with literature and effective sales tools because DEC has not made

Digital Equipment Corporation 3.
Attn: Arthur Hall, III

October 1, 1964

certain information and documents available to us. The following is a list of these items:

- 1) Complete Specifications
- 2) Type and Component Count
- 3) Recommended Spare Parts List
- 4) Photographs
- 5) Functional Block Diagrams
- 6) List of available Software, supplementing PDP-4 Software
- 7) List of planned new Software for the PDP-7
- 8) Programmer's Manual

Some detailed questions that we need answers to immediately are as follows:

- 1) What are the physical dimensions and power requirements of the PDP-7?
- 2) What are the multiply and divide times of the machine using a software sub-routine?
- 3) What are the environmental specifications for the machine?
- 4) Will the Assembler and FORTRAN be modified to handle more than 8K of core?

Please provide me with dates as to when the information and answers to these questions will be supplied.

The sooner the above information is made available to us, the sooner we will be able to more effectively sell our systems with your computer.

Thank you for your cooperation.

Very truly yours,

THE FOXBORO COMPANY

Robert Treiber

RT/vn

cc: H. Anderson
R. Maxcy
R. Wilson

digital

EQUIPMENT
CORPORATION

MAYNARD, MASSACHUSETTS

10-6-64

Andy,

The attached copy came with my original.

Except for where we failed to deliver a Parity Checking price on time our performance is not as bad as implied. The writer has a talent for magnifying the negative aspects of DEC - Foxboro relations.

AJ III

1st October, 1964.

Mr. D. Leighton Davies,
Director, R & D (Systems),
The Solartron Electronic Group Ltd.,
FARNBOROUGH,
Hampshire.

Dear Mr. Davies,

I was pleased to have spoken with you on the 'phone today and to hear that the question of which computers you will use is close to a decision.

Further to Mr. Anderson's letter to you of 10th July I would like to emphasize a few important points and add some further ones which I think in total make the choice of our equipment by yourselves by far the most profitable choice. In this regard I think you will agree that the most important criterion is the total profit you will make per annum in the use of our systems.

Let us first of all review our quantity discount arrangement, as although you believe it to be not the best type of arrangement for your requirements I am inclined to think that the quantities of computers used and sold by a large organization such as yours will offset the apparent disadvantages of it not being a blanket agreement.

Basically the discount agreement we offer is one of quantity either on modules or one particular type of computer or another. Now its most probable that the items of most interest to you would be:-

- 1) Flip-Chips Modules.
- 2) PHS-5A Computer.
- 3) PHS-7 Computer.

It is of interest to note the Flip-Chips modules are used in both of these computers so quantities would be purchased for spares. The quantity discount arrangement for Flip-Chips is noted along with their prices at the back of the appropriate catalogue. The level of most interest to you will probably be £36,000 (100,000 dollars) where the discount is 20%. In the case of modules one can either operate under a cumulative discount agreement for one year, whereby the discount increases as the volume increases, or under a blanket discount agreement, whereby a blanket order for which the appropriate discount is granted for delivery of modules over one year.

Computer discounts are slightly different; one machine brings no discount, two machines six per cent on each, up to 24 percent on each for a total of five machines. Here cumulative discount applies and also blanket order discount. The advantage of the blanket discount order in this case is that one has a look-back advantage of one year; that is when placing an order for the coming year those computers purchased in the previous year count towards the total discount purposes.

I assure that your company is not intending to simply market computers but primarily to incorporate them in systems so that the Solartron identity is maintained and so that a fair amount of your own design, programming and manufacturing content goes into the equipment. These systems I understand to be data loggers, process controllers, hybrid analog-digital computers and radar simulators. One of the largest existing markets covering the first two items you will realize of course that Honeywell in this country are already putting a concerted sales effort into. Their systems use the SDS computer, for which they have developed their own software packages etc., and they would therefore be competing directly with you. On the other hand the large users of our equipment, in the U.S.A., for this purpose are not tackling the European market as far as we know. This would mean that if you used our equipment you would have unique data-logging and process-control computer systems which you could sell not only in Britain but in addition the rest of Western Europe. Europe would not be open to you in the same way for SDS machines because of the existence of C.R.C.I.S. in France.

Further to this we can mount our computers in your own cabinets with your name plate attached and a similar thing can be done with the Flip-Chip modules by leaving off our characteristic handle. Indeed if you have a need for special logic in our Flip-Chip packages and of course in quantities, then we can provide this for you.

As our company progresses in the U.K. it is almost certain that we will engage in some form of manufacturing and this again could be a further advantage to you.

It is probably worthwhile considering at this time the progress of our company in this country. As you know we were incorporated in April of this year and to date have a staff of four experienced computer engineers with more being interviewed. The demand for our particular equipment has been very gratifying with two fairly large computer installations to date, one a 11,000 word PDP-1 and the other a 20,000 word PDP-4, in addition to several significant module orders. What is proving even more encouraging is our large number of pending customers in this country which will mean a considerable number of installations for next year. The European picture also looks extremely good with a second installation just taking place in France and a further one due for Holland.

All this means that we are able to give you better all round service both from the programming and maintenance point of view. In addition with an increasing number of users of our equipment in this country and the rest of Europe there will be an increasing amount of program interchange and joint effort. This in turn will lead to more sales.

To emphasize a point made by Mr. Anderson when we visited your factory, you won't have to spend a large sum of money in building up a large programming and maintenance support group; we will give you all the training you need here at Reading and this is included in the price of the equipment. Further our experienced sales engineers will be at your disposal to assist you in selling the equipment to your ultimate customers. This means that you can get off of the ground right now with no expenditures on equipment and with a minimum sales staff. As orders are received you can gradually acquire the people you need for an expanding program. The key point is speed; by using our equipment you can get a good start on the competition whereas by using SDS equipment it could be year before you are in a position to give your customers service. By then, of course, the competition will be in a much stronger position.

A few points on the comparisons between SDS equipment and our own is probably worthwhile. I have recently hired an engineer from my old company who made a detailed study of SDS computers before buying seven of our PDP-5 computers (already had a PDP-1, a PDP-4 and a Honeywell-610).

They are about to place an order for about eight more PDP-5's. His comments are briefly as follows:-

- 1) The I/O is confined to 6-bit characters and in addition the number of channels is limited.
- 2) In order to have direct access to memory, which is very important for hybrid systems and high speed data logging, a very expensive addition is required.
- 3) Data being entered through normal program routines requires three cycles to enter each word in memory. This is slow and inefficient.
- 4) The machines use serial logic. This is slow as in (3), and is very difficult for isolating faults when these occur.
- 5) The noise level is high making interfacing difficult. Honeywell had a great deal of trouble over this point.
- 6) Further to (5) the circuits are of fairly high impedance and do not use clamped output loads.
- 7) The logic diagrams are very difficult to understand making interfacing additionally difficult to achieve.

Since the majority of your applications will involve interfacing of one sort or another all of these points are particularly significant.

In regard to the SDS-92 the addressing scheme is such that it is very difficult to program and in addition tends to force one to use it as a 24-bit machine. SDS advertise their machine as being able to address 32K directly which is definitely not so. In order to do this they require two consecutive locations, one for instruction and one for address and take three cycle time. The maximum number of words they can address in one instruction is 31 as opposed to 128 for page zero of the PDP-5 plus a further 128 in the immediate page. Thus their fast memory cycle time 1.75 us. becomes 5.25 us. for the majority of data processing.

It is interesting to note that three months after SDS' announcement of the 92 we are receiving orders for the PDP-5 at an increased rate with over 70 installations to our credit so far.

What is more our programming systems for the "5" are far more developed and useful than those for the 92 with the added advantage that we have a working FORTRAN system.

A comparison of prices is of note:-

A 4K SDS-92 with	34K dollars
printer - keyboard	
paper tape	1.5K "
program interrupt	1.5K "
data break	7.5K "
TOTAL:	44.5K dollars

The PDP-5 with these features costs 27K dollars.

Furthermore the interface to analog equipment has been quoted as 10K dollars by SDS as opposed to 6K dollars by ourselves.

The PDP-3A is a much faster version of the "5". Memory cycle time is 1.75 us. as opposed to 6 us. and the program counter is active rather than in memory. This in all increases our speed on typical operations, add 3.5 us. versus 18 us. and jump 1.75 us. versus 13 us. This makes it a far superior machine to the 92. The price is about 10% more than the existing PDP-5; deliveries starting at the beginning of next year about one month behind the 92.

The "3A" uses Flip-Chips and will therefore fit in a much smaller package which should be useful to you in your hybrid systems.

That just about concludes my comparisons between the competition and ourselves for the time being. In a nutshell I think our equipment could mean for your company an immediate start on the market, a low outlay in personnel, training and capital equipment, allarge share of the analog-digital market and the largest possible profit.

It just remains for us to get started on your applications; when can we get together?

We look forward to being of service to you in the near future.

Yours sincerely,

JOHN LEEG.
MANAGER.
RECORDED.

C.C. J. Fadiman.
S. Olson.
H. Hassaroco.
H. Anderson. ✓

B/E.

October 2, 1964

C
O
P
Y

Mr. A. J. Saltalamacchia
Massachusetts Institute of Technology
Project MAC - Technology Square
Cambridge, Massachusetts

Dear Mr. Saltalamacchia:

Digital Equipment Corporation is pleased to provide the following price information to M.I.T. for upgrading the Project MAC PDP-1 Computer System to a PDP-6 Processor System.

This will be performed by a total replacement of the presently installed PDP-1 at 100% of its original purchase price.

The PDP-1 system consists of the following equipment:

<u>Description</u>	<u>Qty.</u>	<u>Total Price</u>
1. Processor with 16K Memory	1	160,000
2. CRT Display, Type 30H	1	14,300
a. Symbol Generator 33	1	4,900
b. Intensity Feature	1	250
3. Light Pen, Type 32	1	1,300
4. Data Control, Type 131	1	10,500
5. High Speed Channel Control, Type 19	1	9,000
6. Micro Tape Control Unit, Type 550	1	9,400
7. Micro Tape Unit, Type 555	1	<u>7,400</u>

Total PDP-1 Price 217,050

Mr. A. J. Saltalamacchia
Massachusetts Institute of Technology

October 2, 1964

The PDP-6 system consists of the following components:

<u>Description</u>	<u>Qty.</u>	<u>Total Price</u>
1. Arithmetic Processor, Type 166-626	1	146,100
2. Data Control, Type 136	1	10,000
3. Micro Tape Control Unit	1	14,000
4. Dual Micro Tape Unit	2	14,800
5. Memory, Type 162	1	30,000
6. Memory, Type 163C	1	126,000
7. Display, Type 346	1	40,000
8. Add'l 64 Character Set, Type 342	1	3,900
9. Paper Tape Reader	1	9,000
10. Paper Tape Punch	1	<u>5,500</u>
	Total	399,300

In Mr. H. E. Anderson's original quotation of 3-20-64 he quoted the PDP-6 at \$156,100. This was later corrected to \$146,100. Further, since the Type 30H CRT will be replaced by a Type 346, the special I/O Bus Interface priced at \$3100 is no longer required.

In summary:

Total PDP-6 System Price	399,300
Less Credit for PDP-1 System	<u>217,050</u>
Net Total	182,250

COPY

Mr. A. J. Saltalamacchia
Massachusetts Institute of Technology

October 2, 1964

Since no costs have been incurred by M.I.T. against P.O. #16284, we suggest that it be cancelled in it's entirety and a change order be issued to the current amount of \$182,250.

If I may be of further assistance, please feel free to contact me.

Yours very truly,

R. L. Lane

RLL/pam

CC: H. Anderson ✓
R. Beckman
T. Whalen

C

O

P

Y

Charles W. Adams Associates, Inc.

141 THE GREAT ROAD - BEDFORD - MASSACHUSETTS - 01730 4 617 275-8050

October 9, 1964

Mr. Harlan Anderson
Digital Equipment Corporation
Maynard, Massachusetts

Dear Harlan

Frank Grestorex and I enjoyed our meeting with you, Gordon, and Chuck Stein on Wednesday. I think we are well on our way to a practical approach to the display software problem.

First of all, let me point out that both Frank and I agree with the basic operational philosophy of the 340; it is a display processor with its own instruction repertoire just as the PDP-8 is a logical processor with an instruction repertoire. Thus it can be extremely useful to many users in its minimum configuration, which is not so of other display approaches.

Successors to the 340 will improve in display speed and their instruction repertoires will be more sophisticated, e.g., curve instructions, index registers for display dynamics, etc. Now is the time to develop the software, however, keeping in mind that it must have the capability of being adaptable to future improvements in display hardware.

The display software, we believe, should serve to generate the machine instructions of the 340. What is interesting is that the command to generate a display may come from either a program or a man at the scope console. Both functions must be provided in the basic package. We feel extremely confident that we can produce a package which will provide a general drawing capability for the man at the console and likewise allow other programs to easily utilize the display equipment.

It is our opinion that a display package should be written for both the PDP-6 and the PDP-7, and that both packages should be able to deal with one or more 340 scopes

directly attached to the computer (and sharing its memory) and/or those that are remote from the computer and attached to a PDP-8.

Furthermore, the display packages for both computers should utilize a concise logical description of the overall drawing which is completely independent of the 340 instruction list. This description, which we prefer to call an entity table, would describe not only the entire drawing but also its logical relationship with the various sub-drawings as well as pertinent non-display information. The generation of the 340 instruction list would be based on the portion or view of the overall drawing selected.

The entity table should be oriented about an 18-bit byte to ensure uniformity between the two software packages. In this way a description of a drawing generated on a PDP-6 could be handled by a PDP-7 without alterations. An 18-bit coordinate system is quite satisfactory and 18 bits is more than enough for chain or ring addressing.

The entity table should also be designed so that it can describe three-dimensional as well as two-dimensional drawings. Naturally the two-dimensional capabilities should be developed first. The major problem with 3D will be the human interaction at the scope console, not the way in which the drawing should be described; consequently its development should be postponed until the 2D capability is implemented and further experience is gained.

We believe the next step should be a study jointly conducted by Adams Associates and Digital Equipment Corporation to define in some detail the basic software package, including a description of the entity table and the man-machine interaction at the scope console. Since we have a great deal of experience in display software, it would be the responsibility of Adams Associates to propose a set of specifications which would stimulate thought and discussion between the two groups.

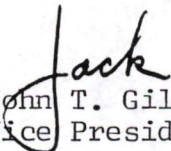
To provide time for sufficient preparation and evaluation and obviate the need for full-time participation on anyone's part, the study should span a two-month period. Frank Greatorex and I would participate in it at a fixed price of \$5,000.

Assuming that agreement is reached on what the basic software package should be, Adams Associates would submit a

report describing the specifications in detail along with a fixed-price proposal to develop simultaneously the packages for both the PDP-6 and the PDP-7. If the study were initiated by mid-October, work on the packages could begin by the first of the year and probably be completed next June at a cost in the vicinity of \$50,000.

As you well know, this is a project dear to my heart. It is my conviction that the display is soon going to play a major role in the use of computers. I feel that Digital Equipment Corporation has an excellent lead in this area and should act now to take advantage of it.

Cordially


John T. Gilmore, Jr.
Vice President

JTG/pf

Harlan Anderson

October 12, 1964

Mr. Henry J. Crouse
Purchasing Agent
Digital Equipment Corporation
Maynard, Massachusetts

Subject: Discrepancy on DEC supplied 570 Cabinets

Dear Henry:

Attached are two copies of a QC discrepancy report, MI Form 293, Vendor Corrective Action Request, covering the first cabinet enclosure received on the release of the second 10 transports on your purchase order 29318.

The problems encountered have been discussed separately between Mr. James Tomblin of Midwestern and Mr. Phil Backholm of Digital, and briefly between myself and Jim McKalip. This submission of a formal report is intended to formally confirm the problems that we encounter in properly assembling transports to meet your requirements without adequate documentation and control of the DEC furnished material.

Item 1 of the formal report covers the existence of extra mounting holes in the new filter assemblies that do not line up with holes in the cabinet. We do not anticipate that this will be a problem to us, but want the responsibility clearly defined.

Items 2 and 3 reference my previous letter to you of March 31, confirming Herb Singleton's letter of March 19. I am enclosing a copy of the March 31 letter for your convenience.

I believe the balance of the report is generally self explanatory. The photo cell clearance (Item 5) and capstan panel flange (Item 9) will present problems in our assembly of the transport and must be resolved; We will require formal authorization to make machining modifications on your parts. The missing parts (Item 11) will also be required.

Generally, we would consider it mutually very desirable to improve the level of reference documentation supplied to Midwestern by

Continued page two.....

Mr. Henry J. Crouse
October 12, 1964
Page 2

Digital to avoid delays and confusion. It was necessary to hold extensive meetings, involving much head scratching, to figure out how to use the DEC material and analyze the missing and non-conforming parts. This is particularly critical in regard to the special DEC hardware (Item 2) and the locations where it is to be used.

We will, of course, make every effort to prevent any delay in delivery as a result of cabinet problems, but request your close co-operation and assistance. I believe Jim Tomblin and Phil Backholm have things generally under control for the first unit, but we should move together quickly to button down the details for subsequent transports.

Very sincerely,

MIDWESTERN INSTRUMENTS, INC.

Bruce M. Brown
Manager - Instrumentation Sales

BMB/gg

Encl: (1) March 31 letter
(2) MI 293

cc: Berle Hall
Phillip Deck
Jim Tomblin
Jim Moon
Howard Cramer
Bill Gillespie
Jim McKalip - DEC
Roland Boisvert - DEC
✓ Harlan Anderson - DEC
Herb Singleton - TII

Andy - I gave copy to Jones

Telephone 92 0919



DIGITAL EQUIPMENT AUSTRALIA PTY. LTD.

Colman House, 89 Berry Street, North Sydney. Cable Address: "DIGITAL," Sydney

A Subsidiary
of DEC
Massachusetts

21st October, 1964.

Mr. Harlan E. Anderson,
Vice President,
Digital Equipment Corporation,
MAYNARD. MASS,
U.S.A.

Dear Andy,

We have just had a fairly strong re-action from Professor John Bennett at Sydney University, who will be extending his KDF-9 installation next year. It seems that for the budgeted cost of some of the peripheral equipment they planned to purchase from English Electric, we will be able to give them suitable substitutes as well as a PDP-8. As a minimum I think they will buy:

PDP-8	\$18,000
Type 451 200 cpm Card Reader	\$14,900
	<hr/>
Total:	\$32,900
	<hr/>

In addition they are very likely to want:

a Type 30 Display	\$14,800
a Type 370 Light Pen	\$ 1,625

and also:

...2/



Mr. Harlan E. Anderson.

21st October, 1964.

a basic control for a 64-channel multi-user system initially consisting of:

Type 633 half-duplex interface	\$7,000
Type 632 send-receive module chassis (for 8 lines)	\$1,500
Type 631 data line chassis (for 8 lines)	\$ 750
635A line power supply (for 32 lines)	\$ 500
	<hr/>
Total:	\$9,750
	<hr/>

There may be a few extra odds and ends, but in future years they are sure to want to implement some of the multi-user stations, probably add an incremental plotter and possibly microtape, etc. etc. Quite apart from being able to establish these people as a long term customer for additional products, their Computing Laboratory is a very good prestige place to have equipment and will do us quite a lot of good. They have, of course, asked me about discounts. Do you think that we might offer them a discount on the Display, Light Pen and Data Communications System of 20%, subject of course to their applying to you in the usual manner.

These people have gone overboard about the idea of having multi-user stations and a display system, and are also very enthusiastic about the idea of connecting a PDP-8 up to their existing equipment. Apart from its "entertainment value", they are seriously bothered about the amount of engineering necessary if they connect various bits of gear to the KDF-9. Their plan instead is to engineer a connection between the KDF-9 and the PDP-8 and then to buy peripherals from us which they can put directly onto the PDP-8 without any development problems.

With the money they have available they must somehow get a magnetic drum or disc store. The only thing we are able to offer at the moment is the type 250G magnetic drum for the PDP-8. This is alright for library program storage and so on, but it is of course rather horrible as a swapping drum. John Bennett may be prepared to put up with slow re-action time since he is not planning to swap very frequently. It would, however, be very much nicer if we were able to offer them something a bit more like the

digital

Mr. Harlan E. Anderson.

21st October, 1964.

PDP-6 drum with an interface to the PDP-8. Depending on how the funds are allocated, they may be able to just about afford the drum and to do their interfacing. They have in fact suggested that perhaps we would give them a discount on the drum if they designed an interface to the PDP-8 which we could then flog to other people wanting a fast drum on the PDP-8. Sorry for all this great long rambling letter, but it comes down to the following questions to which I would appreciate your answers:

1. On which items, if any, of the configuration suggested, might we offer then an educational discount?
2. Is there any plan to provide a much faster drum for the PDP-8 (the problem of the KDF-9 communicating with the drum through the PDP-8 sounds kloogey but looks fairly reasonable to me)?
3. Are we likely to offer any sort of a discount on one of our super drums on the basis that Sydney University do some interfacing design work for us?

I hope I am not wearing you down with my problems! Best wishes,



R. G. SMART,
General Manager.

RGS.JD449

LADENBURG, THALMANN & Co.

MEMBERS OF NEW YORK STOCK EXCHANGE

HANOVER 2-8570

TWENTY-FIVE BROAD STREET
NEW YORK, N. Y. 10004

October 22, 1964

Mr. Harlan E. Anderson
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts

*Not coming!
2 Nov. 1964
H. S.G.*

Dear Mr. Anderson:

In response to your request I am writing to clarify the purpose of my proposed visit to your company. As I mentioned yesterday, I am interested in gaining as much knowledge as possible about that area of electronic data processing now being served primarily by Digital Equipment, Computer Control and Scientific Data Systems. Specifically, I would like to discuss with you or your representative such topics as:

- 1) the estimated size of the market for small to medium-size, high speed digital computers designed for scientific and engineering applications;
- 2) the growth potential of this market;
- 3) technological developments which should affect this market in the near future;
- 4) the meaning and significance of "process computer technology";
- 5) the probability of the giant computer firms exerting a major effort to capture this market, and
- 6) the relative competitive position of the firms now serving this market.

Again, I want to emphasize my appreciation of your willingness to meet with me. I plan to telephone your office on Monday, November 2 and arrange the details of my visit.

Sincerely yours,



Anthony W. Roberts

AWR/jp



NATIONAL SECURITY AGENCY
FORT GEORGE G. MEADE, MARYLAND

KHO

Serial: R55/137

22 October 1964

copy to
Tom Stockbrand
& Ken Olsen

Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts
ATTN: Mr. Harlan Anderson

Gentlemen:

This letter is to confirm our telephone conversation of last week. DEC's development of the flip-chip modules and their use in the forthcoming PDP-8 excited considerable interest here at the National Security Agency. We have also been working with various thin film circuit construction techniques and would be interested in a technical information exchange on this subject. In our case the primary objective has been circuit speed whereas this development has very low cost potential.

Mr. Paul Kretchmar is responsible for our particular project in this area and will contact you directly to arrange a visit to your plant as you suggested over the telephone. This trip will probably occur sometime in November in connection with other trips planned by Mr. Kretchmar and his people.

We appreciate your willingness to discuss your developments.

Sincerely,

Ronald L. Wigington

RONALD L. WIGINGTON
Chief, Systems Evaluation Division

Note:

visit scheduled for Friday Dec. 18

H.E.G.

cc: Harlan Anderson

October 23, 1964

University of Pittsburgh
800 Cathedral of Learning
Computation & Data Processing Center
Pittsburgh, Pennsylvania 15213

Attention: Mr. William B. Kehl, Director

Digital Equipment Corporation would like to submit the following quotation in response to your letter of September 18, 1964, and the several discussions we have had pertaining to a central time-sharing, multi-processor system using our PDP-6 Computer as the nucleus.

The attached prices and basic equipment configuration should adequately cover most aspects of the above mentioned discussions, but should not be considered as the ultimate system. Upon request, DEC would be most happy to submit a more detailed system description, equipment configuration, and spell out the necessary details for the special I/O equipment. DEC is very enthused over the opportunity to present this proposal which will give you a powerful and versatile system for your immediate and future needs.

DEC will support this project in various ways. For instance, we will provide competent programming support when necessary to supplement the initial system's effort advanced by the University of Pittsburgh. The minimum programming support would be a one-man year for a system this size. As is evident, DEC could not assume primary system responsibility because of the need to tailor the system according to the various user's demands and concepts of the University programming staff.

COPY

University of Pittsburgh
Attn: Mr. William B. Kehl

-2-

October 23, 1964

The software package would contain the following programs, write-ups, and necessary print-outs for the University programming staff to add, delete, or modify as it becomes necessary:

ASSEMBLER - MACRO 6
FORTRAN II
EDITOR
DDT-6 - DYNAMIC DEBUGGING PROGRAM
MONITOR

The above programs with the exception of FORTRAN and the MONITOR are completed. FORTRAN will be completed by January, 1965. The MONITOR along with the Executive Program is scheduled in phases. The first phase using micro tape will be completed by January, 1965. The second phase using the drum will be completed by June, 1965. The third phase using the drum and disc will be completed according to customer's request.

There are various methods of planned maintenance for a system this size. The University of Pittsburgh has the option of having their own people trained in Maynard utilizing all of DEC's facilities. DEC also provides trained people for maintenance and up-keep of the above system. For an 8-hour shift per day coverage, the maintenance cost would be 3% of the total purchase price per year. This will make available the necessary men to keep the system running satisfactorily whether it be one, two, etc. men. This figure also includes all spare parts, tools and special maintenance equipment. A 24-hour shift per day figure would be 5% of the total purchase price including the other above mentioned features.

The attached equipment configuration may be changed in many ways to accommodate your individual needs. Also, different units may be deleted, added, or modified at the user's discretion.

A 20% educational discount will be applicable to most equipment. I have broken the units into two groups showing separately the discountable and non-discountable units.

C
O
P
Y

University of Pittsburgh
Attn: Mr. William B. Kehl

-3-

October 23, 1964

As mentioned before, the system configuration could change in many ways. For instance, further details would have to be made available in order to determine which units on the I/O buses would be connected to which processor and possibly some of them having a switch to make them more versatile.

As the configuration is shown, all four of the memory bus lines have been used. The University also has the option of freeing one of the buses for future expansion by running the I/O 167 Processors through a multiplexing unit.

Digital Equipment Corporation is rapidly becoming a leader in the computer medical field. We are attaining this position by having modular equipment suited to most any application, and the appropriate knowledgeable people directing their efforts in the exploration of this relatively new field. We welcome this opportunity to work in conjunction with other people who have the foresight to see what the needs of the future must be.

Sincerely,

RAY LINDSAY
District Manager
Pittsburgh Office

RL;bc

Enclosures: Terms and Conditions
Maintenance Contract

COPY

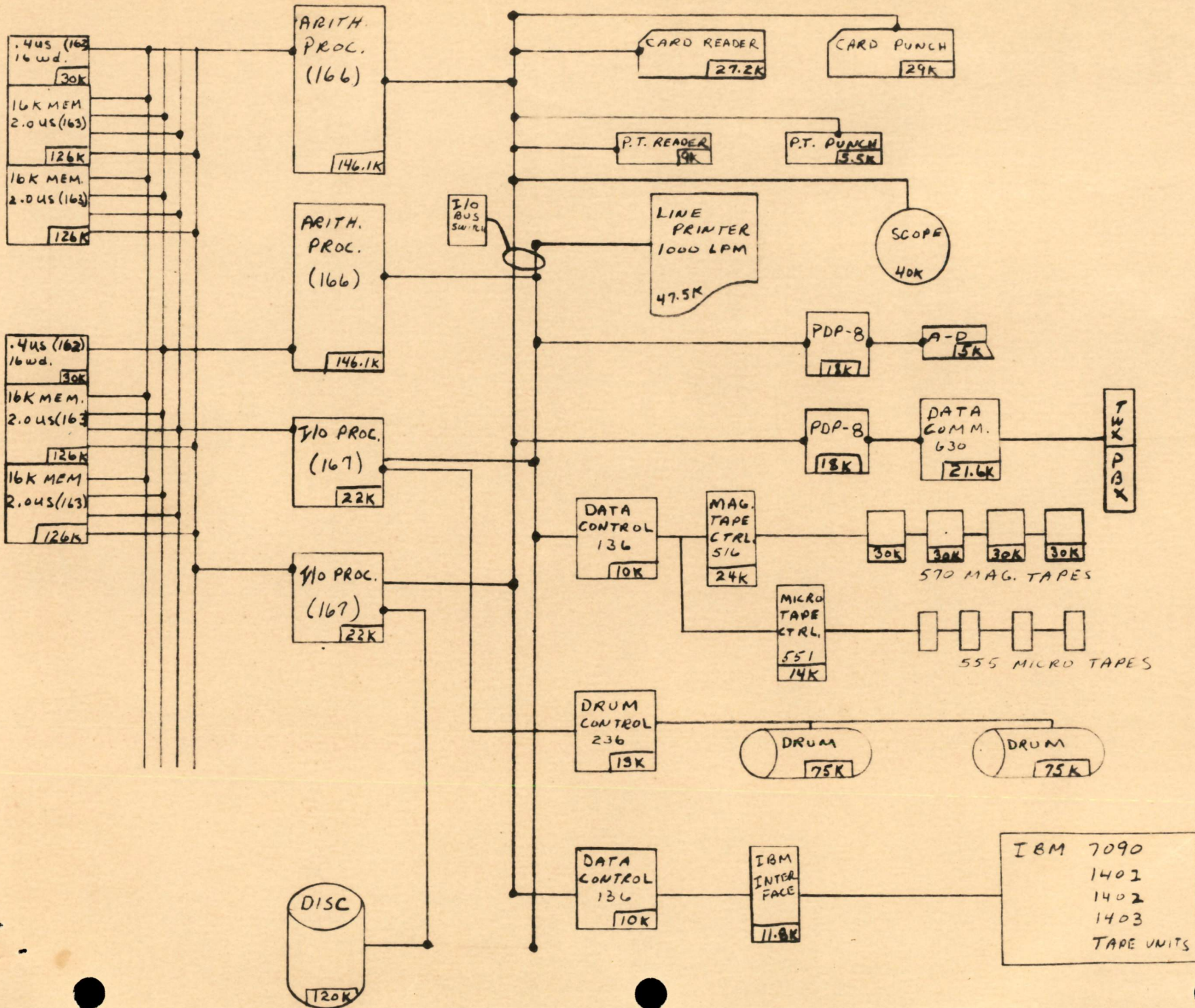
The following units are discountable:

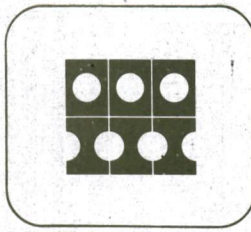
<u>EQUIPMENT</u>	<u>EACH</u>	<u>TOTAL</u>
2-Arith. Processors (166)	\$ 146,000	\$ 292,200
2-Mem. Modules (162)	30,000	60,000
4-Mem. Modules (163)	126,000	504,000
12-Mem. Interfaces	2,700	32,400
2-I/O Processors (167)	22,000	44,000
1-Drum Control (236)	13,000	13,000
1-Tape Control (516-521)	24,000	24,000
1-Micro Tape Control (551)	14,000	14,000
4-Tape Units (555)	7,400 (2)	14,800
1-Paper Tape Reader (760)	9,000	9,000
1-Paper Tape Punch (761)	5,500	5,500
1-Display Monitor & Control (346)	40,000	40,000
2-Data Controls (136)	10,000	20,000
2-PDP-8's	18,000	36,000
1-Analog-Digital Converter	5,000	5,000
1-Data Comm. System (630)	21,642 (16 lines)	21,642
1-IBM 7090 Interface	11,800	11,800
2-PDP-8 (switchable I/O bus interfaces)	6,400	12,800
1-I/O Bus Switch	5,000	5,000
		<hr/>
		\$ 1,165,142

SUB TOTAL INCLUDING 20% DISCOUNT \$ 932,114

The following units are not discountable:

1-Card Reader & Control (461) (800 cards per min.)	\$ 27,200	\$ 27,200
1-Card Punch & Control (460) (100 cards per min.)	29,000	29,000
1-Printer & Control (646) (1000 lines per min.)	47,500	47,500
2-Magnetic Drum Units (237)	75,000	150,000
1-Disc File	120,000	120,000
4-Magnetic Tape Units (570)	30,400	121,600
		<hr/>
	SUB TOTAL	\$ 495,300
	TOTAL	\$ 1,427,414





INFORMATION INTERNATIONAL INC. 200 Sixth Street, Cambridge, Massachusetts, 02142 ■ Tel (617) 868-9810


IF YOU INTEND
TO VISIT THE
FALL JOINT COMPUTER CONFERENCE
AT SAN FRANCISCO
OCTOBER 27-29

We would like to welcome you to our demonstration of fully automatic PROGRAMMABLE FILM READING at booth 111-113.

The PFR-1 PROGRAMMABLE FILM READER automatically reads and digitizes scientific data recorded on 16, 35, or 70 mm. photographic film at the rate of approximately 5000 points per second. The system is operated completely under computer control, and does not require a human operator, as do existing semi-automatic readers.

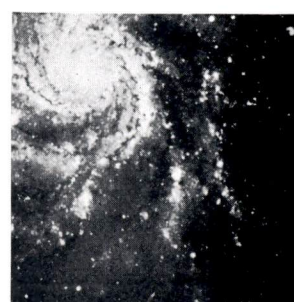
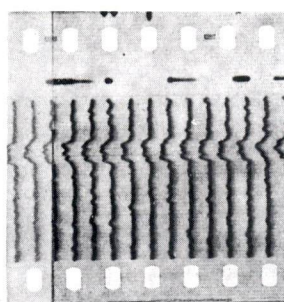
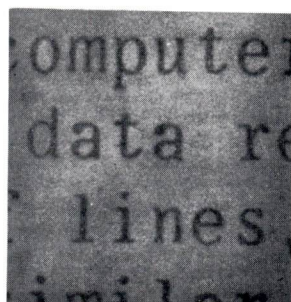
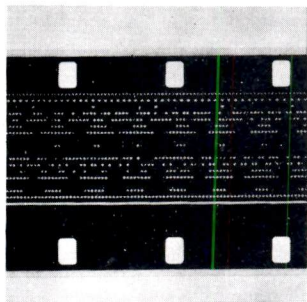
Applications of the PROGRAMMABLE FILM READER include the processing of radar A-scope traces, including missile and aircraft tracking studies; theodolite film; ionosphere and meteorological data on film; oceanographic current meter and bathythermograph film; oil well log data on film; and electrocardiogram and other medical film data.

Looking forward to seeing you there.


Edward Fredkin, President

INFORMATION INTERNATIONAL INC.

5000 POINTS PER SECOND



Information International, Inc., Maynard, Mass., has developed a fully automatic Programmable Film Reader to read scientific or engineering data recorded on photographic film, paper, or similar media. Readout can be had on IBM-compatible magnetic tape, or in the form of numerical printouts, graphs or plots, or visual CRT displays. This article describes the system and its applications.

THE FILM READING SYSTEM Using 16 or 35 mm. film as a medium for recording scientific data has many advantages. Because of the small input power and limited storage space that are required, it is particularly suitable for recording data produced by recording devices in space vehicles or aircraft; by wind and current measuring devices; and by other devices of similar nature.

However, reading or transcribing the data from film once it has been recorded has presented many problems in the past. It has generally been necessary for an analyst or researcher to read the data visually from the film and transcribe it by hand. This has been found to be a time-consuming, laborious and relatively expensive operation. In some cases, semi-automatic film reading devices are available. However, these can read only about 5000 points per day and require a human operator.

Information International, Inc., of Maynard, Mass., has now developed a completely automatic computer film reading system which can read film at the rate of approximately 5000 points per second. Scientific data recorded on 16 or 35 mm film can be read completely automatically and printed out in the form of numerical listings or recorded on magnetic tape for further processing and analysis. The film reading system is based on three major elements: A general purpose digital computer, together with a visual display scope; a film reading device; and computer programs for using the computer and film reader.

THE FILM READING PROCESS The film reading process involves the scanning of film by a rapidly moving light point on the visual display scope. The output of this scanning operation is detected by a photo-sensitive device in the film reader and relayed to the digital computer for further processing and analysis. In addition to translating the data itself into a more desirable format, the film reading system can also furnish additional summaries and analyses of the data as may be required.

EXTREMELY FLEXIBLE SYSTEM The flexibility of the film reading system in two respects should be emphasized. First, almost any format of data on film can be read, with appropriate modifications to the basic computer program. This includes data represented in the form of lines, graphs (e.g., radar pulses), points, and other similar forms of data. Second, almost any type of desired output may be obtained once the basic data is obtained from the film. Forms of output which are available include the following:

- (i) A print-out or listing of data on paper.
- (ii) A record of the data on magnetic tape.
- (iii) Visual representations of data. These may take the form of a continuous graph (using a digital x-y plotting device). Or they may take the form of photographs — still or motion — of scope displays.

In addition to data recorded on film, data recorded on paper can also be read by means of the film reading system.

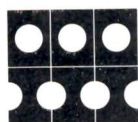
SYSTEM APPLICATIONS

- (i) Analysis of data produced by oscillographs or other types of graphic recorders
- (ii) Tracking and analysis of objects for which motion pictures are available (e.g., missile tracking studies)
- (iii) Reading of astronomical or astrophysical data recorded on film (e.g., analysis of stellar configurations)
- (iv) Reading photographs of cloud chambers, bubble chambers, and spark chambers
- (v) Counting of particles (such as blood cells or bacteria) in photographs
- (vi) Character recognition

To the best of our knowledge, Information International is the only commercial firm supplying fully automatic computer film reading systems. We do essentially two things. We develop and manufacture film reading systems for clients to use at their own facilities (as, for example, in the case of radar film reading systems we have developed for Lincoln Laboratory and the U. S. Air Force). And we furnish services for reading films which are sent to us for processing (as in the case of oceanographic current meter film).

III is able to supply equipment to satisfy a variety of customer needs. Customer options include transmissive or reflective input media, binary density decision, multiple level density measurement, local contrast measurement, and various degrees of system resolution.

We can supply a completely set-up, ready-to-run "turnkey" film reading system (including a medium price, general purpose computer). Or we can provide the basic film reading device, appropriate computer programs, or technical consulting to those planning to develop their own film reading systems. The film reading device itself may be used with specialized film reading computer programs, such as those we have developed, which make use of highly sophisticated filtering techniques to minimize the effect of "noise" (dirt, scratches, general illegibility) on the film. As a result, the film reading system is capable of reading film in relatively poor condition. Or, where the quantity of data on film is not great enough to justify investment in a film reading system, I.I.I. can furnish services for reading film and transcribing data on a production basis. A brochure describing the film reader and film reading systems we have developed is available on request.



**INFORMATION
INTERNATIONAL
INCORPORATED**

P. O. BOX 106 • MAYNARD, MASS.

Circle No. 12 on Readers Service Card

BLAIR AND BUCKLES

PATENT AND TRADEMARK COUNSEL

89 STATE STREET
BOSTON, MASS, 02109
742-3340

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

JOHN C. BLAIR
ROBERT A. BUCKLES
ROBERT A. CESARI
F. EUGENE DAVIS IV
RONALD J. ST. ONGE
W. HUGO LIEPMANN
JOHN F. McKENNA
ROBERT A. CAHILL

October 29, 1964

Mr. Harlan E. Anderson
Digital Equipment Corporation
Maynard, Massachusetts

Dear Andy:

On November 2, 1964, we are moving our
offices to 89 State Street in Boston. Our tele-
phone number will be 742-3340.

Sincerely yours,



Robert A. Cesari

D/d

November 5, 1964

Mr. Shelly Boilen
Bolt, Beranek & Newman, Inc.
50 Moulton Street
Cambridge, Massachusetts

Dear Shelly,

Digital Equipment Corporation (DEC) of Maynard, Massachusetts is pleased to submit the following price quotation to Bolt, Beranek & Newman, Inc. of Cambridge, Massachusetts:

1. Additional feature to the Special Operate Instruction	\$1321.00
5% Installation Fee	56.00
	<u>\$1377.00</u>

The additional Special Operate feature will operate in the following manner:

When a special operate command is given and:

1. Memory Buffer bit 16 is a one the "Exclusive OR" of the IO register and the Accumulator will be formed in the Accumulator.
2. Memory Buffer bits 16 and 17 are ones, the IO will be added to the Accumulator.

Mr. Shelly Boilen

-2-

November 5, 1964

3. Memory Buffer bit 16 is a zero and 17 is a one the "Inclusive OR" or the IO and the AC will be formed in the AC.

Attachment A. "Terms and Conditions of Price Quotations" is enclosed and should be considered part of this quotation. Delivery will be two months from receipt of your purchase order.

Very truly yours,

John Shields, Manager
Field Service Department

JS:ned

Enc.

H. Anderson

12 November 1964

Mr. Paul Slattery
Charles W. Adams Associates, Inc.
142 The Great Road
Bedford, Massachusetts

Dear Paul:

Enclosed you will find preliminary specifications for the Discfile and Control Type 270. I have also included a Data Products brochure that contains additional information about the disc unit itself.

The price of the discfile and control is \$140,000. Up to three additional disc units may be attached to the control. The price for each additional disc unit is \$90,000.

Delivery of a system with one disc unit can be made on or before 1 April 1965 provided we receive a firm order no later than 18 November 1964. Normal delivery of disc units will be six months after receipt of order.

This discfile and control system is offered on a sale basis only and is not available for rental. This quotation is subject to DEC's standard Terms and Conditions, a copy of which is enclosed, and the price quotation is firm for a period of sixty days.

Please contact me if you require any additional information.

Very truly yours,

Robert J. Beckman
Manager, PDP-6 Systems

RJB/elz
Enclosures

C

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P

Y

THE FOXBORO COMPANY

KHO

November 17, 1964

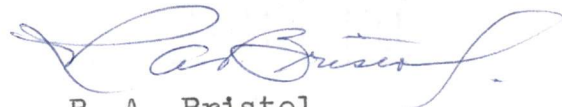
NEPONSET AVENUE
FOXBORO, MASS. 02035

Mr. Harlan T. Anderson, Vice President
Digital Equipment Corporation
Maynard
Massachusetts

Dear Mr. Anderson:

For some time now I have given lip service to visiting your company. Tom Nourse has now taken steps to make sure I do what I have been talking about. I am looking forward to our visit of December 3.

Sincerely



R. A. Bristol
President
THE FOXBORO COMPANY

RAB:MLP

digital EQUIPMENT
OF CANADA LTD.

P.O. BOX 370 CARLETON PLACE, ONT.
TEL. 237-0772 - AREA CODE 613 - (DIRECT OTTAWA LINE)

November 18, 1964

Mr. Harlan Anderson
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts
U.S.A.

Dear Harlan:

Three people from Canadian General Electric in Peterboro, Ontario, would like to visit Maynard on Tuesday, December 1.

These people do a lot of work for Chalk River and have actually constructed the first nuclear power demonstration station just north of Chalk River. They are bidding on at least two others, and we have been talking to them for sometime now about PDP-5's and PDP-8's. The Chalk River people have literally told them that any of the new control systems which are planned for future stations will take the lines of the system that Pat Greene did at Chalk River. The only variation would be that the computer would consist of several PDP-8's instead of a PDP-5 and PDP-4.

The purpose of their visit to Maynard is to see our facilities and talk to people like Pat Greene and make contact with Foxboro as well. The people who are going are as follows:

- 1) Gord Davis
He is the leader of the group
- 2) Bill Cliff
He is an instrumentation man involved in process control
- 3) Mr. G. R. Andrews
He is an engineer who is more concerned with data logging and on-off type of control systems.

Mr. Harlan Anderson

- 2 -

November 18, 1964

It is possible that they will arrive on the afternoon of November 30, but I have given them all of your names and your telephone number and they will likely make contact with you. I have sent them a map showing how to get there.

Sincerely yours,



Denzil J. Doyle
Manager

DJD:EG

cc Arthur Hall, III
Pat Greene

Copy: Mr. Harlan Anderson

November 18, 1964

Mr. George Comstock
Friden, Inc.
2350 Washington Avenue
San Leandro, California

Dear Mr. Comstock:

I have been advised by Mr. Harlan Anderson in our Maynard Office and by Mr. Kenneth Larsen in our Palo Alto Office that you have expressed considerable interest in DEC's new line of moderate cost computers, the PDP-7 and PDP-8.

The enclosed brochures which very briefly describe the characteristics and general specifications of these machines may be of interest.

I would be happy to discuss with you in detail possible applications of the PDP-8 to your Flexowriter and Desk Calculator systems.

Since I have been unsuccessful in repeated attempts to reach you by telephone, please call me as to when it will be convenient to meet for such a discussion.

Sincerely,

Kenneth O. Weir
Applications Engineer

KOW:es
Encls - F71
5166

Copy: Mr. S. Olsen, Maynard, Mass.
Mr. H. Anderson ✓
Mr. T. Johnson

COPY

cc Mr. Harlan E. Anderson ✓

November 18, 1964

Mr. Jim McKalip
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts
U.S.A.

Dear Jim:

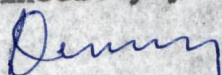
You recall I spoke with you concerning the loan of a microtape system to Computing Devices of Canada for a shake test. Andy's approach was to let me evaluate the situation myself, and he would likely go along with it.

Can you initiate the necessary action to get me a microtape system with a PDP-5 control by January 15 or so? We will do the tests with our PDP-5 at the customer's plant, and we will have the authority to call "Halt."

Enclosed you will find a piece of paper which you have likely never seen before, but it was distributed by Nick on December 27, 1963. It requires Stan Olsen's or Harlan Anderson's signature, before such a loan can be made. I have sent a copy to Andy.

Let me know -- unless I hear otherwise, I will expect a DEC Tape System by January 15.

Sincerely yours,


Denzil J. Doyle

DJDEG
Enclosure

LOAN RECORD

Computing Devices of Canada Limited

CUSTOMER

November 23, 1964

Date

Computers, Systems, and Optional Equipment Being Loaned

Item	Quant.	Name	Qty	Model	Time Loaned	
					From	To
1	1	Type 555 Dual Transport			Jan. 15	Jan. 30
2	1	Type 552 Control Unit			Jan. 15	Jan. 30

REASON FOR LOAN:

For evaluation for use in an airborne application -- tests to be done by Digital Equipment of Canada at customers' plant using PDP-5.

D. Boyle

Transacted by

H. E. G.

Approved by

UNIVERSITY of PENNSYLVANIA

PHILADELPHIA 4

The Computer Center

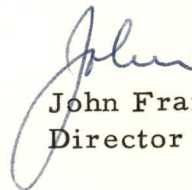
20 November 1964

Mr. Harlan Anderson
Vice President
Digital Equipment Corporation
Maynard, Massachusetts

Dear Harlan:

It was very good to meet with you in San Francisco. I hope that either you come to Philadelphia or I to Maynard to continue our previous discussions.

Cordially,



John Francis Lubin
Director of Computing Activities

JFL:sk

THE UNIVERSITY OF MICHIGAN
ANN ARBOR

R. Anderson

MENTAL HEALTH RESEARCH INSTITUTE
JAMES G. MILLER, M.D., DIRECTOR

DEPARTMENT OF PSYCHIATRY
RAYMOND W. WAGGONER, M.D., CHAIRMAN

November 23, 1964

Mr. Gerald Moore
Digital Equipment Corporation
Maynard, Massachusetts

Dear Mr. Moore:

I am sorry to have to write to tell you that the NIH has not acted favorably on our grant request. We, therefore, must withdraw our letter of intent concerning the PDP-6. This is an unfortunate development but perhaps sometime in the future we will have the opportunity to try again. All of us here at the University of Michigan appreciate very much the assistance and advice given to us by various members of your staff.

Sincerely,

William R. Uttal

William R. Uttal
Associate Professor of Psychology

WRU:lr

CC: Mr. Robert Oakley



FIRST NATIONAL CITY BANK

399 PARK AVENUE, NEW YORK, N.Y. 10022

IN REPLY PLEASE QUOTE

November 24, 1964

Mr. Harlan B. Anderson
Vice President and Treasurer
Digital Equipment Corporation
Maynard, Massachusetts

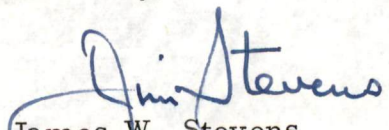
Dear Mr. Anderson:

I appreciated the opportunity to meet with Win Hindle and you last week, and thank you both for your time. I have great respect for the job you and your associates have done at Digital Equipment, and I think you deserve the heartiest congratulations for an excellent 1964.

I would welcome the opportunity to expose you to our Overseas Division either here in New York or abroad. The enclosed booklet will give you an idea of the scope of our activities and the number of Citibankers that are in residence in the various capitals and trading centers of the world. We would like to have the chance to discuss your overseas program here in New York and introduce you to our associates as you travel. We believe that we could earn our way with Digital Equipment, and we only seek to be able to prove this to you.

With best wishes,

Sincerely,


James W. Stevens
Assistant Vice President

Enclosure

annual Report file

MILLERS FALLS
E-Z
COTTAGE

HUGHES AIRCRAFT COMPANY

**AEROSPACE GROUP
GUIDANCE & CONTROLS DIVISION
CULVER CITY, CALIFORNIA**

30 November 1964

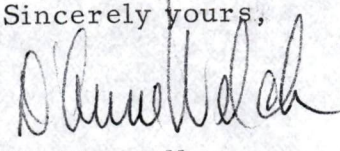
In Reply Refer to:
64H-6880

Mr. Harland Anderson
Vice President
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts

Dear Mr. Anderson:

In response to our telephone conversation of 30 November 1964, I have attached a set of data which may assist you in gaining a better understanding of the system I described on the telephone. I appreciate your candid preliminary response to a possible joint venture, however, if after reviewing this data you should find an area of interest please do not hesitate to contact me.

Sincerely yours,

for 
D. M. Muller
Manager
Products Marketing

DMM:dw
Enclosures:

ADMA Literature

*sent to cut file
Purdum*

THE FOXBORO COMPANY

1. ~~Ken Olsen~~
2. ~~Dick Best~~

DIGITAL SYSTEMS DIVISION
21 STRATHMORE ROAD
NATICK, MASS. 01762
TEL. 653-5660

December 1, 1964

Digital Equipment Corporation
Maynard
Massachusetts

Attention: Robert Maxcy

Dear Bob:

As you requested, the following is a confirmation of the comments made to you over the past few weeks regarding temperature specifications for DEC Computers (PDP-7 and PDP-8):

- 1) A 105°F temperature specification puts your computers in a commercial class to the extent that they are not suited for use in the general purpose industrial-type environment.
- 2) Because of the limited availability of silicon machines in the past, we were forced to contend with the 105°F specification. Today, silicon machines are generally available for industrial applications. Because of this, the users willingness to accept a germanium machine or a silicon machine whose temperature spec. is equivalent to that of a germanium machine is extremely limited.
- 3) Presently, all of our competition is offering silicon machines whose temperature specs. are higher than 105°F. If our new product line were to incorporate a machine whose temperature spec. is 105°F, we believe we would be in an extremely, untenable sales position to the extent that we would expect a drop-off in sales.

Digital Equipment Corporation
Attn: Robert Maxcy

2.

December 1, 1964

My present understanding of why the PDP-7 and PDP-8 temperature specification is 105°F is that the memory driver circuits are the limiting devices and that the flip-chip modules will operate reliably well above 105°F. Based upon this understanding, it is not clear to us why you do not design these driver circuits to take full advantage of the inherent capabilities obtained through the use of silicon.

In conclusion, we consider a 105°F temperature specification a disqualifying factor in the selection of a computer for our applications. At present, we feel that we must have a machine whose temperature specification is at least 120°F and preferably 131°F. If the PDP-7 and PDP-8 do not meet our temperature requirements, this will represent a major problem area in our future planning.

We hope that you and your company will give this matter serious consideration and inform us as soon as possible as to your intentions regarding this temperature specification.

Very truly yours,

THE FOXBORO COMPANY

RT/eg

cc: R. Beldon
H. Anderson

Robert Treiber

H. Anderson

GASTON, SNOW, MOTLEY & HOLT

WARREN MOTLEY
F. T. HAMMOND, JR.
ROY M. ROBINSON
JOSEPH P. ROONEY
FRANCIS R. HINES
ARTHUR P. SCHMIDT
PAUL V. POWER
ANDREW M. WOOD
F. D. HERBERICH
LAWRENCE R. MANNING
JAMES M. STOREY
ROGER M. THOMAS

ROBERT H. HOLT
EARLE W. CARR
ROBERT H. HOPKINS
CHARLES JACKSON, JR.
GARDNER CUSHMAN
RICHARD N. BAIL
CALEB LORING, JR.
JOHN B. PIERCE, JR.
HARRY F. RICE, JR.
N. U. SOMMERFELD
GORDON K. BELL
JOHN W. BELASH

ANSEL B. CHAPLIN
ERNEST V. KLEIN
ROBERT S. PIRIE
RICHARD M. REILLY

STEPHEN A. MOORE
RICHARD J. TESTA
WILLIAM F. KEHOE
DAVID M. ELWOOD

SHAWMUT BANK BUILDING
82 DEVONSHIRE STREET
BOSTON, MASSACHUSETTS 02109

AREA CODE 617 CAPITOL 7-3180
CABLE ADDRESS: GASTOW

December 2, 1964

Frederic A. Rubenstein, Esq.
Guggenheimer & Untermeyer
80 Pine Street
New York 5, New York

Re: Digital Equipment Corporation - Adams Associates

Dear Mr. Rubenstein:

Herewith are first drafts of a security agreement, a form of guarantee, and an escrow agreement for Mr. Adams. An escrow agreement for Mr. Gilmore is also contemplated, but it will have the same form as the Adams' escrow agreement. A revision of the sales agreement is being prepared in Maynard and will be sent to you under separate cover.

Very truly yours,

Richard J. Testa

RJT:mag

Enclosures

cc: Mr. Charles W. Adams
Mr. Robert J. Beckman ✓

H. ANDERSON

December 2, 1964

Dr. William A. Miller
Stanford Linear Accelerator Center
Campus Drive
Stanford University
Stanford, California

Dear Bill,

During your past visit to DEC, I promised you information pertaining to certain DEC product line items. I am enclosing portions of this information along with the configuration of the MIT - PEPR, PDP-6 System. As you are aware, this system is scheduled for delivery in March 1965 with various stages of system upgrading coincident with PEPR progress.

As an experimental system, PEPR can be tested with a slow memory and no fast registers. The number of events per hour/per day will be substantially computer limited at this time. As PEPR becomes a production system, the PDP-6 will be supplemented by faster core memory and the fast registers. This substantially increases the number of events processed to where 1 to 2,000 events per day can be realized by a single PEPR-PDP-6 System.

Your recommendation that DEC consider offering PEPR as a product line item has been seriously considered here at DEC and we have taken the first step.

C
O
P
Y

Dr. William A. Miller
SLAC

December 2, 1964

Mr. Allan Titcomb of DEC has been designated Project Engineer responsible for the development and coordination of the PEPR-PDP-6 System. One of his immediate assignments is the integration of the Measuring Tables. He will also be assigned at MIT-LNS to work on the present PDP-1 PEPR system and to assist in the formulation of PEPR-PDP-6 specifications.

No decisions have been made with respect to the optics. Dr. Pless is currently experimenting with a 7 inch tube and concurrent availability of more than one view, i.e. multi-film transports.

Any manufacturer who agrees to furnish or develop a PEPR product line prior to completion of these early experiments is foolhardy and you can expect that his development costs will be reflected in the selling price of the equipment. Our intention is to pledge our manufacturing capabilities to the early PEPR users and assist them with the total system. If at that time it appears desirable from both the user's viewpoint and DEC's, then and only then can we offer all the system components and help disseminate operational programs.

I hope you find the enclosed information useful and that we may soon arrive at a working relationship beneficial to both our respective groups.

With best personal regards,

R. L. Lane

RLL/pam

Enclosures: Configuration
Notebook - Products

C
O
P
Y

PEPR - PDP-6 CONFIGURATION
As Specified by

Item	Description	Type No.	Qty.	Unit Price	Total Price
1.	Arithmetic Processor	166-626	1	146,100	146,100
2.	Core Memory, 2μsec, 16K	163C	1	126,000	126,000
3.	Core Memory, 5μsec, 16K	161C	1	85,000	85,000
4.	Tape Control Unit	516-520	1	18,000	18,000
5.	Data Control	136	1	10,000	10,000
6.	Tape Units	50	2	18,000	36,000
7.	DEC Tape Control Unit	551	1	14,000	14,000
8.	DEC Dual Tape Units	555	2	7,400	14,800
9.	Card Reader	461	1	16,500	16,500
10.	Display Subsystem	30-348	1	19,400	19,400
11.	Data Communication System	630	4 Stations		11,726
12.	Teleprinters	635C	3	<u>900</u>	<u>2,700</u>
				Total Price	500,226
				AEC Discount Price	385,819

If purchased under the AEC contract, the net price is \$385,819.

COPY

LYBRAND, ROSS BROS. & MONTGOMERY

COOPERS & LYBRAND
IN AREAS OF THE WORLD
OUTSIDE THE UNITED STATES

80 FEDERAL STREET
BOSTON 10

December 4, 1964

TO OUR CLIENTS:

Re: Year-End Tax Planning

Federal income tax rates for both individuals and corporations will be lower in 1965 than in 1964, as the second stage of the reductions granted by the Revenue Act of 1964 takes effect. Much can be done between now and the end of the year to take advantage of these reduced rates. For the most part, the action takes the form of deferring income or accelerating deductions, and we enclose checklists listing the most common items which can be shifted from one year to another. These checklists are set up separately for business organizations and for individual taxpayers.

No decision to defer income or to accelerate deductions ordinarily should be taken without making at least a rough estimate of income for both 1964 and 1965. Because of the graduated individual income tax, too large a switch from 1964 to 1965 could increase total tax liability rather than reduce it. Similarly, for corporations it is generally unwise to reduce 1964 income below \$25,000 (22% tax) if the result is to increase 1965 income in the bracket above \$25,000 (48% tax).

Fiscal-year taxpayers have not been specifically covered in the enclosed checklists. In general, switching income from the 1964-65 to the 1965-66 fiscal year would give them advantages similar to those of calendar-year taxpayers, but smaller in amount.

We shall be glad to discuss any of the items on the enclosed checklists with you if you wish. We may also be able to suggest other methods of shifting income which may be useful in your particular situation.

Very truly yours,

Lybrand, Ross Bros & Montgomery

HSjr:AJO

Enclosure

LYBRAND, ROSS BROS. & MONTGOMERY
1964 YEAR-END TAX PLANNING CHECK LIST
BUSINESS ORGANIZATIONS

I. TIMING of INCOME

1. Income from Sales, Fees, Services, Etc.:

Delay closing contracts, shipment of goods or performance of services, to delay accrual of income. Use of escrow arrangements, option contracts, sales on consignment or approval or with conditional selling price should be considered.

Qualify for and elect instalment method of reporting income on certain real estate and personal property sales. Dealers reporting instalment sales on the accrual basis can adopt the instalment method but must watch treatment of income from prior instalment sales.

2. Delay Receipt of Advance Rentals, Etc.:

Defer receipt of advance rentals, advance royalties or bonuses until 1965.

3. Price Redetermination of Government Contracts:

Upward adjustments to the original contract price are taxed when agreed upon. It may be desirable to defer agreement when upward adjustment is indicated. Downward adjustments affect years of performance.

4. Timing of Dividend Income:

Dividends of subsidiary corporations can be made payable in 1965 to avoid current receipt of income. (All tax on dividends from domestic subsidiaries may be avoided if consolidated return is filed or 100% dividends received deduction is elected. In such a case, it may be well to accelerate dividends into 1964, if a different election for 1965 is a possibility.) In the case of foreign subsidiaries, numerous special considerations exist.

5. Foreign Income:

Taxpayers with foreign income should consider controlling time of receipt or accrual, where practicable, to obtain maximum advantage of foreign tax credits and to avoid possible tax liability on undistributed income under 1962 legislation.

6. Sale or Disposition of Machinery and Equipment:

If ordinary losses under section 1231 are available because losses on dispositions of real estate or depreciable property held for more than six months exceed gains on such dispositions, it may be desirable to realize more such losses in 1964 and defer gains until future years. Where there will be a net gain under section 1231 (after giving effect to depreciation recapture), there is ordinarily no objection to realizing additional such gains, if taxable income before long-term capital gains will exceed \$25,000, the point at which the 25 per cent alternative tax becomes effective. See next item for effect of an operating loss for the taxable year.

7. Capital Gains and Losses:

Capital gains should be avoided or offset by capital losses, if possible, where there is an operating loss for the year which can be carried back with full tax benefit.

The five-year capital loss carryover provisions still apply to corporations. If the five-year period is about to expire, appreciated capital assets may be sold at a gain and shortly thereafter repurchased with a resultant increase in basis. The wash sales rules do not apply to gains.

II. ACCELERATION of DEDUCTIONS

1. Business Expenses:

Cash basis taxpayers should pay all deductible items possible before the end of 1964. Whether on a cash or accrual basis, consideration could be given to accelerating work or making certain purchases prior to December 31. Maintenance and repairs could be made in December rather than on schedule in 1965. Additional advertising expenditures might be incurred. Noninventory supplies could be purchased in extra quantities. All possible accruals should be set up at year end, if on that basis.

2. Depreciation and Investment Credit:

An additional first-year depreciation allowance of 20% of the first \$10,000 of cost can be taken on business tangible personal property having at least a six-year life.

Accelerated methods of depreciation may be elected for tangible assets new in use. Guideline lives under Rev. Proc. 62-21 may be advantageous.

Early acquisition or completion of plant and equipment may give 1964 depreciation deduction and investment credit.

3. Bad Debts:

Bad debts are deductible on the specific debt basis only in the year they become worthless or become partially worthless and are charged off. It is important, therefore, that they be charged off no later than the first year the debt may have become totally worthless. Where it is clear that a debt is only partially worthless, charge-off and deduction can be claimed in 1964. If on the reserve method, a review of accounts receivable should be made to see if the reserve can be increased.

4. Accrual of Vacation Pay:

If the company has a year-end liability for vacation pay, the deduction may be accrued. If accrued liability was not claimed or allowed for prior periods, Treasury approval of a change in accounting method may be required, with benefits of change spread over a ten-year period. If liability did not exist, accelerated deduction may be available by vesting full rights to vacations as at the year end.

5. Accrual of Employee Bonuses:

If the company pays bonuses to employees after the close of the taxable year, it may be able to deduct the bonus in the taxable year, provided the employees as a group have been given a vested interest in a determined dollar amount or in a determined percentage of the profits. If bonuses have usually been paid before year end, it may be desirable to make the award in 1964, but defer payment until 1965 for maximum benefit to the employees. If latter course is followed, employer must guard against possible loss of deduction under section 404(a)(5).

6. Medical Care Payments by Employers:

Employers interested in providing fringe benefits may adopt a plan for reimbursing their employees for actual medical expenses (including medical and hospitalization insurance premiums). Dependents' medical expenses may be handled in the same manner. Amounts paid are generally deductible by the employer and are not includible in the income of the employee. Exemption does not apply to reimbursements for amounts used in a medical expense deduction in any prior year.

7. Charitable Contributions:

1965 charitable contributions can be accelerated into 1964 deductions through prepayment or Board of Directors authorization before end of year with payment on or before March 15, 1965. (Corresponding date applies for fiscal-year corporations.)

8. Organization of a Charitable Foundation:

Such a foundation might permit increased 1964 contributions (within the 5% limitation) with the foundation assuming some of the corporation's charitable responsibilities in the future. Also available to individuals and unincorporated businesses.

9. Qualified Pension or Profit Sharing:

Payments under a qualified pension or profit-sharing plan not later than the due date of the return (including extensions) are considered payment within the taxable year, provided the plan is in existence at the year end.

Thus, if a plan has been considered for 1965, by stepping up the date of its inception to 1964, current deductions may be available.

Payment of maximum deductible amount on account of past service benefits under qualified pension plans should be considered. Where profit-sharing plan does not have a fixed formula, the year's formula should be adopted before end of year in order to safeguard accrual deduction.

10. Exploratory Oil and Gas Ventures:

Drilling programs could be accelerated to 1964 with deduction of intangible drilling and development costs.

11. Abandonment of Mining Properties Where Exploration Has Been Deferred or Capitalized:

Where abandonment is probable in the future it may be desirable to complete steps for abandonment in 1964 to obtain the current deduction.

12. Liquidation of Loss Subsidiary:

Where a subsidiary is insolvent a taxable liquidation might be considered. Such a liquidation may result in a worthless stock loss and a partial bad debt deduction. If the subsidiary is solvent and has loss carryovers, prompt liquidation under section 332 may give parent complete or partial benefit of those losses immediately.

13. Abandonment of Property:

Losses on sale of depreciable property may have to be offset against capital gains from the sale of similar assets, but abandonment and certain demolition losses are fully deductible. Where realizable values are relatively small (less than 33-1/3 per cent of adjusted basis) it may be advantageous to abandon rather than sell obsolete property. If scrapping or sale of plant or equipment is under consideration, it may

be desirable to accelerate the disposition to obtain deduction of loss during current taxable period. Worthless patents, trade-marks, etc., may also be abandoned and written off. However, before abandoning property, consideration should be given to the effect of current abandonment on the transition period reserve ratio test under the new depreciation guideline rules. Abandonment may also result in additional tax through recapture of investment credit.

14. Disputed Liabilities:

Disputed items are not deductible. Can any controversies, including Federal and state income taxes, be settled this year or payments made on account? (Payment permits deduction under 1964 Revenue Act, even if the controversy is continued.) Have credit memos been issued for all sales returns and allowances?

15. Purchase Commitments:

Where firm commitment for purchase next year of inventory items, etc., has been made at a price in excess of current market, a current deduction may be obtained by taking title to goods prior to year end (if inventory valued at lower of cost or market under FIFO) or by buying out of the contract (regardless of inventory method).

16. Inventories Valued under LIFO Method:

If inventory replacement costs (material, labor or both) have increased materially since the beginning of 1964, the adoption of LIFO may result in a substantial reduction of income.

17. Voluntary State Unemployment Tax Contributions:

These may provide increased deductions in 1964.

18. Low Value Assets of Dealers:

Dealers in real property should survey their holdings to determine whether any high basis, low-value property may be sold with resultant ordinary loss.

19. Net Operating Losses:

If net operating losses may be applied against taxable income of a prior year, it may be advisable to accelerate deductions and thus derive immediate tax benefits from the deductions. Gains from sale of capital assets or section 1231 assets should be delayed until a subsequent year in order to obtain the full tax benefits from the losses.

20. Changes in Accounting Practices:

A new Treasury procedure permits applications for changes in accounting "practices" to be filed at any time before the related tax return is filed, whereas applications for changes in accounting "methods" must be filed within 90 days after the beginning of the taxable year. Although certain basic changes remain subject to the old rule, there may be other changes which the Treasury would permit and which would reduce 1964 taxable income at least to the extent of one-tenth of the adjustment resulting from the change.

LYBRAND, ROSS BROS. & MONTGOMERY
1964 YEAR-END TAX PLANNING CHECK LIST
INDIVIDUALS

I. TIMING of INCOME

1. Income from Rentals and Sales of Property:
Delay receipt of rentals and avoid receiving advance rentals.
Qualify for and elect instalment method of reporting income on certain real estate and personal property sales.

2. Timing of Dividends:
Dividends from closely-held corporations can be declared payable in January rather than December to avoid receipt of income. This would result in the loss of the 2% dividends received credit. Such loss may be greater than the benefit from lower tax rates in 1965, but generally not enough greater to offset the value of the use of the tax money for an additional year.

3. Bonuses:
Similarly, bonuses awarded in 1964 or provided for under a fixed formula could be made payable to the employee in 1965. The employer, if on the accrual basis, would generally have a current 1964 deduction (assuming section 404(a)(5) was avoided), but the employee would not have income until 1965.

4. Sale or Disposition of Income-Producing Property:
Sale or disposition of stock prior to receipt of year-end dividends might be considered. Gift of appreciated property to charity (see below) could be advantageous in this connection. Family gifts could satisfy estate planning objectives as well. In addition, the transfer of income-producing securities between spouses may result in greater retirement income credit.

5. Capital Gains and Losses:
Where market conditions dictate a sale of securities, a short sale can be made and recognition of the gain postponed until next year when the long and short positions would be closed out. The date of the short sale would determine the holding period of the long securities.

Where capital assets have depreciated in value, there may be an advantage in selling them prior to 1965, even if the loss is substantially in excess of \$1,000 (the maximum which can be offset against ordinary income). Such excess capital loss will be carried forward indefinitely. Where possible the capital assets should be sold within 6 months since under the new law the capital loss carryovers will retain their character as short-term or long-term losses.

6. Income Averaging:

Where taxable income for either 1964 or 1965 is expected to be large in relation to average income for the preceding four years, the income averaging provisions of the 1964 Revenue Act may be beneficial. "Average base period income" under those provisions should be determined prior to year end, so that approximations of 1964 and 1965 tax liability can be made and it can be determined whether it would be more advantageous to accelerate or defer income. The income averaging rules may also make it desirable to defer long-term capital gains or realize capital losses to offset them.

II. ACCELERATION of DEDUCTIONS

1. Expenses in Connection with Property Held for the Production of Income:

Cash-basis taxpayers should pay all deductible items possible before the end of 1964. In certain cases, advance payment of routine expenses (such as investment advisory fees, subscriptions, etc.) may be appropriate. Maintenance and repairs on rental property could be performed and paid for in December rather than waiting until 1965.

2. Exploratory Oil and Gas Ventures:

Drilling programs could be accelerated to 1964 with deduction of intangible drilling and development costs. Abandonment may accelerate deduction for cost of unproductive properties.

3. Losses on Rental Property:

If the disposition of rental property at a loss is contemplated in the near future, consideration might be given to completing its disposition or abandonment in 1964 if the loss on disposition will qualify as an ordinary loss.

4. Medical and Dental Expenses:

Payment of bills for medical and dental expenses (and for purchases of drugs, if drug expenses can be raised above 1% of adjusted gross income) including, if possible, payment of medical insurance premiums, should be accelerated into 1964 if the 3% of adjusted gross income limitation (if applicable) will be exceeded and the maximum limitations will not be reached. This would include payment of expenses for "medical dependents." Consider having special medical or dental work done and paid for in 1964. If the taxpayer, his spouse or a dependent parent will become 65 in 1965, consider deferring payment of medical cost in their behalf until 1965 when the 1% and 3% limitations will not apply.

5. Charitable Contributions:

Contributions to charities which might normally be made in 1965 could be accelerated to 1964 if within the maximum 20% or 30% limitations, the application of which was changed by the 1964 Revenue Act. Certain excess contributions may be carried over for five subsequent years.

Among other possibilities are the following:

Consider establishment of an irrevocable, nonreversionary trust with income payable to a designated charitable beneficiary for a term of at least two years. The present value of the income right for the term specified would be deductible in the year the trust is established.

Alternatively, a gift could be made of a charitable remainder in securities, reserving income to the settlor for life. The present actuarial value of the charitable remainder would provide a current deduction. Substantial estate tax savings could also result.

A personal charitable foundation might be established. However, contributions to a private foundation may not qualify for the 30% limitation and the five-year carryover.

Contribution could be made of low basis appreciated property or merely of the appreciation, with other substantial tax benefits therefrom.

6. Interest:

Interest on loans might be prepaid before the end of 1964. If taking out a loan is contemplated, the payment of interest in advance will generally qualify for a current interest deduction. Funds can be borrowed, if necessary, to pay such interest.

7. Taxes:

Real estate taxes due in 1965 on 1964 assessments could be paid this year. Fourth quarter instalments of 1964 state income taxes can be paid in December. If the estimate of 1964 state income taxes has been conservative, the last instalment could be increased so that the extra tax due would be paid in 1964 rather than in 1965. Alternatively, arrangement could be made with an employer to increase withholding on final pay checks for the year. Where state law does not provide for estimated tax payments or withholding, it may be possible to file return and pay tax by December 31, 1964.

8. Use of Standard Deduction:

When the taxpayer's itemized deductions normally are approximately equal to the 10% standard deduction or the minimum standard deduction, payments of deductible items can be bunched in alternate years by accelerating or deferring them, and the standard deduction taken in the "lean" years. This results in larger aggregate deductions for the two years.



UNIVERSITY OF SOUTHWESTERN LOUISIANA

Joel L. Fletcher, President

LAFAYETTE, LOUISIANA

December 9, 1964

DR. JAMES R. OLIVER, DIRECTOR
COMPUTING CENTER

Mr. Robert Lane
Computer Applications Department
Digital Equipment Corporation
Maynard, Massachusetts

Dear Bob:

Some time ago I wrote to you concerning the possibility of summer employment for some of my graduate students in computer science. So far I have not heard from you so I am wondering whether perhaps my letter has gone astray. I am, therefore, sending along a copy of the letter which I sent you.

I don't mean to rush and I must apologize if I seem to be trying to do so. However, I know that applications for summer jobs must often be made a long time in advance. These graduate students are quite excellent, and I would like very much to see them have an opportunity of employment with Digital Equipment Corporation. I feel that any of them could give a satisfactory accounting of himself in such employment.

May I thank you for taking time out to handle this correspondence. If you have written to me recently, please overlook this letter. I will appreciate anything you can do concerning summer employment for these students.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Jim", with a long horizontal line extending to the right.

James R. Oliver
Director, Computing Center and
Dean, Graduate School

JRO:mc

Attach.

October 27, 1964

C
Job Inquiries
for Computer
Scientists

Mr. Robert Lane
Digital Equipment Corporation
Maynard, Massachusetts

Dear Bob:

As you probably already know, we have instituted a master's degree program in the area of systems programming here at the University of Southwestern Louisiana. This year I have six outstanding students in the program. It is likely that all of them will be interested in some kind of summer employment. I am, therefore, writing this letter to inquire as to the procedure to follow in having these people apply for such employment.

Although their primary emphasis will be on systems programming, they should also do well in applications programming. All have strong mathematics backgrounds.

I shall be waiting to hear from you at your earliest convenience.

Sincerely yours,

James R. Oliver, Dean
Graduate School and
Director, Computing Center

JRO/vc



UNIVERSITY OF SOUTHWESTERN LOUISIANA

Joel L. Fletcher, President

LAFAYETTE, LOUISIANA

December 11, 1964

DR. JAMES R. OLIVER, DIRECTOR
COMPUTING CENTER

Mr. Harlan Anderson
Vice-President
Digital Equipment Corporation
Maynard, Massachusetts

Dear Andy:

Bob Lane requested that I send you the enclosed information concerning the Computer Conference since he plans to be out of town during the coming week. I am pleased to send the requested information, and should you need additional information, please do not hesitate to communicate with me.

I hope that you and Bob have the opportunity of visiting with us in the not too distant future, and I certainly hope that we will have the opportunity of working together.

As I mentioned to Bob in a telephone conversation Thursday afternoon, I am in the process of preparing a brochure to mail out to prospective participants. If a decision is made in the very near future that Digital Equipment Corporation will furnish a machine to us, I would be happy to include that information in the brochure. However, such information should be sent to me in the very near future.

Sincerely yours,

James R. Oliver

James R. Oliver
Director, Computing Center and
Dean, Graduate School

JRO:mc

Enclosure

cc Mr. Robert Lane

CONFERENCE ON DIGITAL COMPUTERS
For College Teachers of Science, Mathematics and Engineering
University of Southwestern Louisiana
Lafayette, Louisiana
Sponsored by the National Science Foundation

For the third summer the University of Southwestern Louisiana will have on its campus a Conference on Digital Computers for College Teachers of Science, Mathematics and Engineering. A total of 40 college faculty members will participate in the Conference--20 at an elementary level and 20 at an advanced level. The Conference is financed by the National Science Foundation. Director of the Conference will be Dr. James R. Oliver, Director of the Computing Center, Dean of the Graduate School, University of Southwestern Louisiana, Lafayette, Louisiana.

The Conference is aimed particularly at college and university computing center directors and prospective computing center directors. Those at the elementary level will generally be directors of recently formed computing centers who have had little experience in this area as well as faculty members who have been informed they will be appointed to such positions in the not too distant future.

Those faculty members at the advanced level will be persons who have had the elementary level Conference or its equivalent or who have had some experience in the field of computing. Generally speaking, these individuals will be on campuses already having computing centers. Many of the participants at the advanced level will be persons who have attended a previous Conference at the University of Southwestern Louisiana and who are returning for further training and experience. It is likely that a large portion of the computing center directors in the advanced level

program will be thinking seriously about expansion of their computer facilities. In many cases these directors will be seriously considering obtaining a new machine to replace the one they presently have. Since these men are computing center directors, they will play a major role in designating the kind of equipment to obtain.

Geographical distribution in the Conference will include individuals from all parts of the country. While a large portion of the group will probably come from states located within 1,000 miles of the University, past experience has shown that every section of the country will probably be represented.

The formal course offerings to be presented in the Conference have been submitted to the National Science Foundation and have been approved as submitted. Any significant change in these courses would necessitate negotiation with the National Science Foundation. However, an especially attractive feature of the Conference is the holding of seminars, panel discussions and informal training sessions with the participants. It would be quite feasible to arrange these seminars to deal with subjects such as time sharing and others if equipment were available for such instruction and demonstration. In fact, since the participants will be residing in the dormitory about two blocks off campus, it would be informative and interesting to have one or more remote terminals located in the dormitory. In that way, the participants would become familiar with time sharing through its actual use. During various times of the evening they would be able to use the remote console for the solution of their problems.

The machine configuration would be left to Digital Equipment Corporation. The University would accept whichever configuration Digital Equipment Corporation feels would demonstrate their equipment to best advantage.

It might be interesting to note that this Conference at the University of Southwestern Louisiana is the only Conference dealing specifically with the field of computing and slanted toward the computing center director which will be supported by the National Science Foundation during this coming summer. It is felt that the tremendous successes of the past two Conferences has contributed to the decision by National Science Foundation to support still another Conference at U. S. L.

Dr. Oliver, director of the previous Conferences as well as this one, has had occasion to visit a large number of the campuses represented by participants in the former institutes. Most of the persons visited are now directors of a computing center and most of them were responsible for selecting the computer to be used. It probably comes as no surprise that in such instances all such computing centers have machines of the same type as that at the University of Southwestern Louisiana. It is felt that acquaintance with the machine used in the Conference influenced considerably the selection of a computer by these individuals.

Additional information concerning the Computer Conference may be obtained from Dr. James R. Oliver, Director, USL Computer Conference, Box 133, USL Station, Lafayette, Louisiana, 70506.

14 December 1964

Mr. Harlan Anderson
Digital Equipment Corporation
Maynard, Mass.

Dear Harlan:

I would like to express our appreciation for the PDP-1 computer which you placed at our disposal for the demonstration at the recent Boston Architectural Center Conference, "Architecture and the Computer".

As you know, the short demonstration with scope, light pen and typewriter does more than any number of words and slides to illustrate possible applications of the computer to architectural and planning processes. The questions from the roving audience during our brief and hectic demonstration period was evidence of considerable interest. Let's hope that more architects will be intrigued into exploring this new technology.

We would like to thank Jack Kildeff and others who adapted the machine, checked it out and set it up at the hotel for the demonstration, and are grateful to Ted Johnson for suggesting this demonstration and for making the many necessary arrangements.

Sincerely,

Welden E. Clark

WEC:ael

cc: Addressee
Mr. T. Johnson,
Digital Equipment

THE FOXBORO COMPANY

DIGITAL SYSTEMS DIVISION
21 STRATHMORE ROAD
NATICK, MASS. 01762
TEL. 653-5660

December 14, 1964

Mr. Harlan Anderson, Vice-President
Digital Equipment Company
146 Main Street
Maynard, Mass. 01754

Dear Harlan:

We are mailing under separate cover the information promised you by Tom Nourse on his recent visit with Rex Bristol.

If you find that additional information is required, I would appreciate your contacting me directly in this matter.

Very truly yours,

Dick Reut

Dick Reut
Marketing Manager
Digital Systems Division

DR:dk

14 December 1964

Mr. Harlan Anderson
Digital Equipment Corporation
Maynard, Mass.

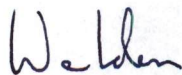
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Sincerely,



Welden E. Clark

WEC:ael

cc: Addressee
Mr. T. Johnson,
Digital Equipment

December 14, 1964

Professor Robert N. Anthony
Harvard University
Graduate School of Business Administration
Soldiers Field Road
Boston, Massachusetts 02163

Dear Professor Anthony:

Thank you very much for your letter of December 9 forwarding to me a copy of the resume of Mr. J. Peter Jaffe. I shall see that it is brought to the attention of Digital Equipment Corporation.

Thanking you again and with kindest regards,

Sincerely yours,

Henry W. Hoagland
Vice President

HWH:ah

ARNAUD DE VITRY

12, RUE DE LA PAIX
PARIS 2, FRANCE

December 15, 1964

Mr. Kenneth H. Olsen
President
Digital Equipment Corporation
Maynard, Mass.

Dear Ken,

A letter from Betsy Dickinson, Assistant Editor of Adams Associates, informs me that DEC will send me a Computer Characteristics Quarterly as a Christmas present. May I thank you for this present, which will be very useful to me here in Europe.

I received the October Monthly Statement, but will not comment on it by mail. Before departing from Boston, I heard from Dorothy Rowe that you were perfectly aware of the potential problems. They appear quite clearly in this report.

May I ask you to be certain to send me, in addition to the monthly reports, the two sheets given to the directors at the Board meeting, i.e., the agenda and the latest financial and cash information. The latter, showing both the backlog and the latest sales volume, as well as the most current borrowing position of DEC, is of great interest to me.

May I wish you and your family a very Merry Christmas.

Yours sincerely,

A. de Vitry
A. de Vitry

*Sent
H.S.G.*

TRANSLATION OF LETTER FROM JEAN LABEL OF C.L.E.S

December 15, 1964

Dear Jonathan:

As I have told you I have arranged for the office which you have rented from Digital to be kept for you until the first of February.

Nevertheless, from this date, it is rented from the Société Meval which occupied up to now the two other offices which you would like. Provided that our business progresses in a satisfactory manner we would probably have need of at least two offices which will be free the first of February within the spring or summer. In the meantime we will occupy them partially. We will nevertheless be happy to welcome you there on a friendly basis.

I wish you a Merry Christmas and a Happy New Year and permit me at this occasion to send to you a new copy of our brochure to which has been added on the last page the activities which we have accomplished during the current year 1964.

Cordially,

Jean Label

cc; Dick Mills
/ Harlan Anderson

HAPPY Holidays -

This is an *informal copy*
signed
else



DIGITAL EQUIPMENT COMPUTER USERS SOCIETY
MAYNARD, MASSACHUSETTS/TWinoaks 7-8822/TWX MAYN 816

December 19, 1964

Dear DECUS Delegate:

This letter will give you a summary of the recent Executive Board Meeting held Dec. 14 from 4 to 6pm at Adams Associates, Inc., Bedford, Mass.

All voting members of the Board were present.

Mr. William Fahle, President, called on each standing committee chairman for old and new business. He introduced Mr. John Ridgeway, Manager of Digital's newly established Applied Programming Department which was described in November DECUSCOPE. Mr. Ridgeway will serve as Digital's ex-officio member of the Executive Board and will be interested in DECUS. He said his department would lend software support and assist with the DECUS Library and DECUSCOPE. Mrs. Angela Cossette accompanied Mr. Ridgeway.

MEETINGS - Mr. John Gilmore, Jr.

A letter from Dr. G. Norman confirming May 20, 21 as the dates for the next DECUS Society Meeting was given to Mrs. Newman with the recommendation that the Board consider approval of one large annual meeting for the Society. The one large annual meeting should take place just before the meeting of the Joint Computer Conference - preferably on the EAST coast near Digital so that users could visit the manufacturer's plant in conjunction with the meeting.

All members of the Board were not agreed as to how much difference in attendance or participation this would make but the Board did agree that comments and opinions of DECUS delegates and members should be solicited. Mr. Fahle asked Mr. Gilmore to prepare an open letter concerning his Committee's recommendations for publication in DECUSCOPE.

It was decided to issue a call for papers - Feb 15 for 100 word abstracts of proposed papers to be mailed to Mr. Gilmore. Mr. Lundy urged submission of final paper by May 15. Mr. Gilmore said his Committee was in favor of insisting that final papers be submitted BEFORE presentation at the annual meeting. He also said his committee was in favor of the old DECUS policy of encouraging many smaller regional meetings and one in the West Coast in particular.

When Mrs. Newman brought up the question of how many "Proceedings" it was agreed that not all meetings need have published proceedings.

PUBLICATIONS: Mr. Joseph Lundy

Mr. Joseph Lundy was appointed Publications Committee Chairman after completing his term as Meetings Chairman- 1963-64- He is working on the 1964 DECUS Proceedings and will work closely with Mr. Gilmore and the Board. He has been very active with DECUSCOPE since Mrs. Newman's resignation as Editor. Because of limited time at Mr. Fahle's disposal questions of DECUS Publications were deferred for the next Board Meeting. An "Introduction to new members" kit with appropriate literature has been in preparation.



DIGITAL EQUIPMENT COMPUTER USERS SOCIETY
MAYNARD, MASSACHUSETTS/TWinoaks 7-8822/TWX MAYN 816

time. How to state DECUS's purpose and goals (stated on a sample brochure) was then questioned by Mr. Brown and an interesting discussion followed. The members of the Board will give further consideration to this.

DECUSCOPE will continue to be the vehicle of communications, all agreed and Mr. Lundy urged contributions to it. Some discussion centered on how to get authors to contribute final papers for publications and more DECUS Delegate participation but no definite conclusions were made.

EQUIPMENT - Mr. John B. Brown

Mr. Brown has been working with DECUS on a questionnaire to be sent to old as well as new members for the purpose of finding out user equipment configurations and options so that users might be referred to other users having similar configurations as problems arise. There was lively discussion as to the "economic" benefits to be derived if users could share information of this kind. DECUS has made several attempts to coordinate this information and with renewed interest something very useful may result.

PROGRAMMING - Mr. Richard McQuillin

Mr. McQuillin has been reviewing recent contributions to the DECUS Library by new members. He has appointed sub-committee chairmen for reviewing and stimulating contributions to the various PDP Libraries.

Mr. Gerald Mahoney (The Foxboro Co.) has been PDP-4 Programs Adviser

Mr. Sypko Andreae, (LRL, Berkely, Cal.) PDP-5 Programming and Meetings.

Mr. McQuillin hopes to announce PDP-6,7 and 8 chairmen in the future. He also made a plea for JUG and hoped that DECUS would participate in its activities.

CONCLUSIONS:

1. Next DECUS TECHNICAL Meeting MAY 20-21 HARVARD UNIVERSITY
Feb 15 deadline for 100 word Abstracts to be sent to Mr. John Gilmore, Jr. Adams Associates, Inc. Bedford, Mass.
2. The DECUS Executive Board will study DECUS GOALS and ways to achieve them. DECUS Delegates should comment and communicate.

I wish to thank you for your support these past three years and send best wishes for a Merry Christmas and Happy New Year.

Sincerely

Elsa Newman
Elsa Newman, DECUS Secretary
R.F.D. 2, Lincoln, Mass. 01773

December 21, 1964

Mr. Ralph Belluardo
Computation Center
United Aircraft Research Labs.
East Hartford, Connecticut

Dear Ralph,

Pursuant to our telephone conversation of Friday, 12-18-64, and your earlier conversations with Harlan Anderson and Nick Mazzaresse, this letter confirms our offer of a free loan of a Memory Extension Control, Type 15, and two 4096 word Memory Modules, Type 12. We have just issued an internal construction requisition on these items and they will be ready for installation in about 6 weeks. Actual installation will require 2-3 days, during which time the PDP-1 will have to be continuously down.

The loan is for a six month period. However, if you wish to keep these units beyond the six month interval, you may purchase them at list price at any time during the interval. Prices are as follows:

Memory Extension Control, Type 15	\$10,000
Two Memory Modules, Type 12, at \$20,000 ea.	<u>\$40,000</u>
Total	\$50,000

C
O
P
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Mr. Ralph Belluardo
United Aircraft Research Labs.

December 21, 1964

If you should decide to purchase the units and should later take delivery of a PDP-6, they may be traded toward the PDP-6 purchase and full list price will be credited toward the '6.

Best wishes for a pleasant holiday season.

Sincerely,

Gerald T. Moore
Computer Applications
Engineer

GTM/pam

C

O

P

Y

December 29, 1964

Mr. Robert Lane
Digital Equipment Corporation
Maynard, Massachusetts

Dear Bob:

I am naturally excited about the news which you gave me in your telephone call yesterday afternoon. Personally I feel that this will be an excellent decision for all concerned, and I am certainly looking forward to working with you and the others at DEC. My main reason for writing today is two-fold.

I would like to get more information on the PDP-6, including systems manuals, manuals on time sharing, and various kinds of operating procedures. I think it would be well for me to have this kind of information so that I can begin right away to become more familiar with the machine. As I suggested to you earlier, I intend to teach this material in considerable detail and feel that I should know it very well.

Along the same line, I would like to suggest that I visit you for about a three-day period; January 27, 28, and 29. I would like to devote this time to becoming familiar with the machine including some actual time with it. What I had in mind is spending some time with a person who will demonstrate the various machine capabilities so that I may adequately plan the Conference. I have already checked with University officials and they have agreed to my visit on those dates. Should you find it impossible to clear those dates for the visit, I am sure that some other arrangements can be made. However, those dates are best for me.

Since it is possible that you will have already left for Europe when this letter arrives, I am sending a carbon copy to Andy. I am thus asking that he provide the answers which I have requested if you are unable to do so. I would also like to obtain information on just what configuration of machine you plan to have here as soon as that information is available. Again, this will make some difference in planning the Conference.

Although I can discuss this with you at a later date, it is quite possible that I can arrange for demonstrations of the machine to various groups. For example, it would be a simple matter to have a computing center directors in our state meet at the University during the summer and provide them with the demonstration of the PDP-6. I think that this would be particularly fascinating if the machine is equipped with remote capabilities, because I am pretty sure nearly all of those persons are not acquainted with remote operation.

I am looking forward to hearing from you at your earliest convenience. If it is more feasible, feel free to call instead of writing. Incidentally, should you ever need to call me at a time the University switchboard is not operating, please call CE 4-7349. My home phone is CE 4-1059.

Sincerely yours,

James R. Oliver, Dean
Graduate School, and
Director, Computing Center

JRO/lef

cc: Mr. Harlan Anderson

information sciences and technology



AUERBACH
corporation
1634 arch st.
philadelphia 3
pennsylvania
locust 3-7737

December 28, 1964

Mr. Harlan Anderson
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts

Dear Andy:

On behalf of AUERBACH and Standard Telephones and Cables Limited, I would like to express our appreciation for the hospitality extended during our visit to your organization on December 18, 1964. We greatly appreciate the effort expended by your organization in adjusting its schedule to set up the program for the Design Automation tour. Our special thanks to you, and those who gave their time and thought in making our visit worthwhile. The technical information conveyed to us will help to provide a good basis for our work in the field of design automation. We wish we had had more time to spend at DEC.

Again, I would like to express our appreciation and if any problems arise in which AUERBACH may be of service to you or your organization, please feel free to call upon us.

The STC people and I send our best personal regards.

Very truly yours,

AUERBACH Corporation



Arthur D. Hughes
Program Manager

ADH/cmd

philadelphia
washington

Las Palmas, December 30, 1964

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

Dear Mr. Olsen:

Following Mr. Anderson's suggestion, I am herewith giving you my impressions of my recent visit with you.

First, let me thank you for your invitation and the very cordial reception I received. For one and one half days, I successively met with all members of your top staff, and had not only their undivided attention but also what I felt was a genuine interest in my exposé of the European market possibilities. I was highly impressed by the executive and engineering competence which I encountered, and reassured of the progress your products have evidently made since I last heard of them back in the U.S. - the PDP-6, 7, 8's are certainly sound, competitive, saleable, and well adapted to the European markets and prices.

So, as a first result of this visit, I now know that I would be proud to represent these products and to belong to the team which produces them.

Yet, analyzing my visit as a sales situation, I must conclude that I got my pitch in, that I failed to close the sale, but that I have not lost it, either. Right?

Specifically, and perhaps as a consequence of my talk with Mr. Hindle, a cold wind seemed to rise at one point which all but blew me out the door ... Mr. Anderson spoke of gaps between my proposed plans of action and what had actually been contemplated, giving the degree of concentration on the European versus the French picture as an example (I had proposed a time division for myself of 30% : 70%). But policies such as rental business and commissions to salesmen had also been mentioned.

In reviewing these possible gaps, I would say this: From the outset, I was told (by Mr. de Vitry as well as in Maynard) that there was no pre-conceived framework set at this time, except for Mr. Fedderman's impending stay/in Paris of upwards of 8 months. So, in what I believe to be the absence of a plan, I made one myself and presented it with some conviction. Based on certain assumptions, my plan was fairly complete and was aimed at avoiding the major pitfalls which Univac, GE (for two wasted years in Paris prior to the Bull agreement), SDS, and a few other U.S. firms have fallen into in the recent past, some in France and some elsewhere ~~into~~ in Europe. They then got stuck with high expenses and low returns, a poor image based on premature advertising and unwise local tie-ins and/or personnel selections, and, worst of all, a lack of mobility.

Of course, this plan, which I may have appeared to be offering more like a consultant than like someone who is considering a job opening, was necessarily rough and failing to take your own policies and established guidelines into account. I now have gained the impression that the latter are in a developmental stage, especially in the marketing area. Under those circumstances, I can see that you have no desire to rush in with changes for the international sector if they may then clash with and disturb your domestic operation. But I must point out that it will be hard to stand up very long against the trend set in France by IBM-France controlling as they do some 70-80% of all French Computer Salesmen - and being deplorably successful at it. Concerning rentals: in the product sector of small and medium scientific machines, I estimate that some 50% of the French market will be open to you on an outright sales basis. This would provide a fair start if you are not ready to work with a leasing company as I had suggested.

What exactly are the big gaps between your and my thinking?

Perhaps personal remuneration is a major factor. What I have asked for is in line with my past earnings, plus an improvement in base salary which I feel is justified in view of the unique market knowledge and specific experience I would bring to your European operation. Attached is a brief summary of the main items I had proposed to Mr. Hindle verbally. Also attached is an article which recently appeared in the Paris edition of the New York Herald Tribune and which sheds some light on the more unfortunate European executive appointments that have been made by U.S. Corporations all too frequently.

After some reflection (in the warm breezes of the Canary Islands...), I have decided that I might as well also attach the main two charts of the rough "2 year French Business Plan" which I presented in Maynard - it included only outright sales, and was based on what I believe to be realistic growth assumptions considering the known size of the market for your products in the next two years. It shows 16 machines sold, 10 of which would be PDP-8's, 4 PDP-7's, and 2 PDP-6's. Under an assumed 6 months delivery, revenue was included from only 9 of the 16 machines installed within the 2 years. A transfer cost of 70% was assumed in producing the gross profit shown. (This percentage is a paper value and designed to keep the product price down for those customers who must pay the 17% import on landed ~~customers~~ transfer cost plus 25% tax on the total). The staff at the end of 2 years would be 15 people excluding myself but including maintenance engineers and clerical personnel. Other factors towards the commercial expenses shown are 30% social charges on the personnel, office rental, and a fairly large amount for sales promotion - mostly shows and direct mailings. (Note that I believe growth can be twice as fast if rental business is accepted).

Thank you again for the time you spent with me, going over a possible joint future - and now again in reading all this. I am looking forward to hearing from you soon. Do not hesitate to criticize and/or knock down any of my proposals!

Sincerely yours,

H.K. Flesch

attach

December 30, 1964

Plan of Action Proposed in Maynard, December '64

1. Start April 1 (or sooner if my company agrees) - initially as employee of DEC Maynard, located in France.

Proposed Title: VP, European Operations

Note: This is customary with similar U.S. ventures, and provides the necessary prestige in dealing with the proper equivalent levels on large sales, on OEM agreements, etc.

As personal remuneration, I am asking a base salary of \$28,000 pa plus 25% over-seas allowance.

As executive incentive, I have requested a stock option and an override percentage (or bonus) arrangement on sales in my territory. (This is independent of any commission plans that might or might not be authorized for salesmen under my jurisdiction). For the over ride, I suggested 1/2% on list.

2. Spend training time in Maynard as required -

I proposed a short period initially so as to get the French operation started first, then to return for several months of thorough training.

3. Set up an "International Digital Equipment Corporation" with Seat in Paris, and with yourself and the German and English DEC Managers on its Board. I would be General Manager of this Corporation, and all initial hirings in France would be into it, with personnel concentrating entirely on getting established in the French market. Out of this staff, a French subsidiary would be formed later, perhaps after one year.

4. Spend 1-2 years primarily building up French sales, but using Germany and England as technical and reference back-up.

Note: The international corporate structure would aid in making all three national staffs working effectively as a team (I know from direct experience that there is a great danger in letting national subsidiaries grow up as independent entities for very long!).

5. After a French subsidiary is formed, I would remain as head of the International Corp., probably with a small HQ staff keeping up and spreading out the European market coverage.

H.K. Flesch

31 December 1964

Mr. Harlan E. Anderson
Vice President and Treasurer
Digital Equipment Corporation
146 Main Street
Maynard, Mass. 01754

Dear Mr. Anderson:

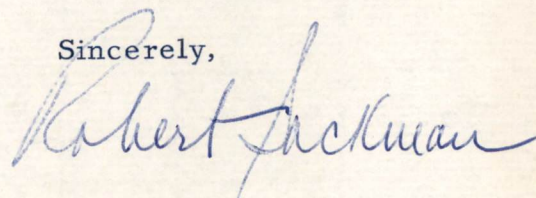
I was very happy to have the opportunity to visit with you, to see at firsthand a company that I had heard about in very favorable terms from many knowledgeable people in the industry. I was most impressed by several things: the feeling of excitement, enthusiasm and unity of purpose that recalled early days at Ampex; the elegance and economy of your technical approach to design and system; and, last but not least, the manufacturing and assembly methods that appear to be those of a company much further along the growth cycle.

Wearing my Ampex hat, I am going to ask our Computer Products group to brief you more thoroughly on some of the technical aspects of our advance planning in the peripheral equipment field. This is with the entirely selfish motive of attempting to place with you in some of your future or current equipment Ampex core memories, tape transports and other gear. I think both you and Mr. Olson, as active engineers, will be interested in some of the thinking we are doing in this peripheral equipment field.

Wearing my other hat as an independent consultant and investor, I would like to have the opportunity to visit with you again when I am in the Boston area, to explore any areas of mutual interest.

Thank you again for the courtesies extended, and a Happy New Year to you and your family.

Sincerely,



RS:hlm