10/31/62

MEMORANDUM

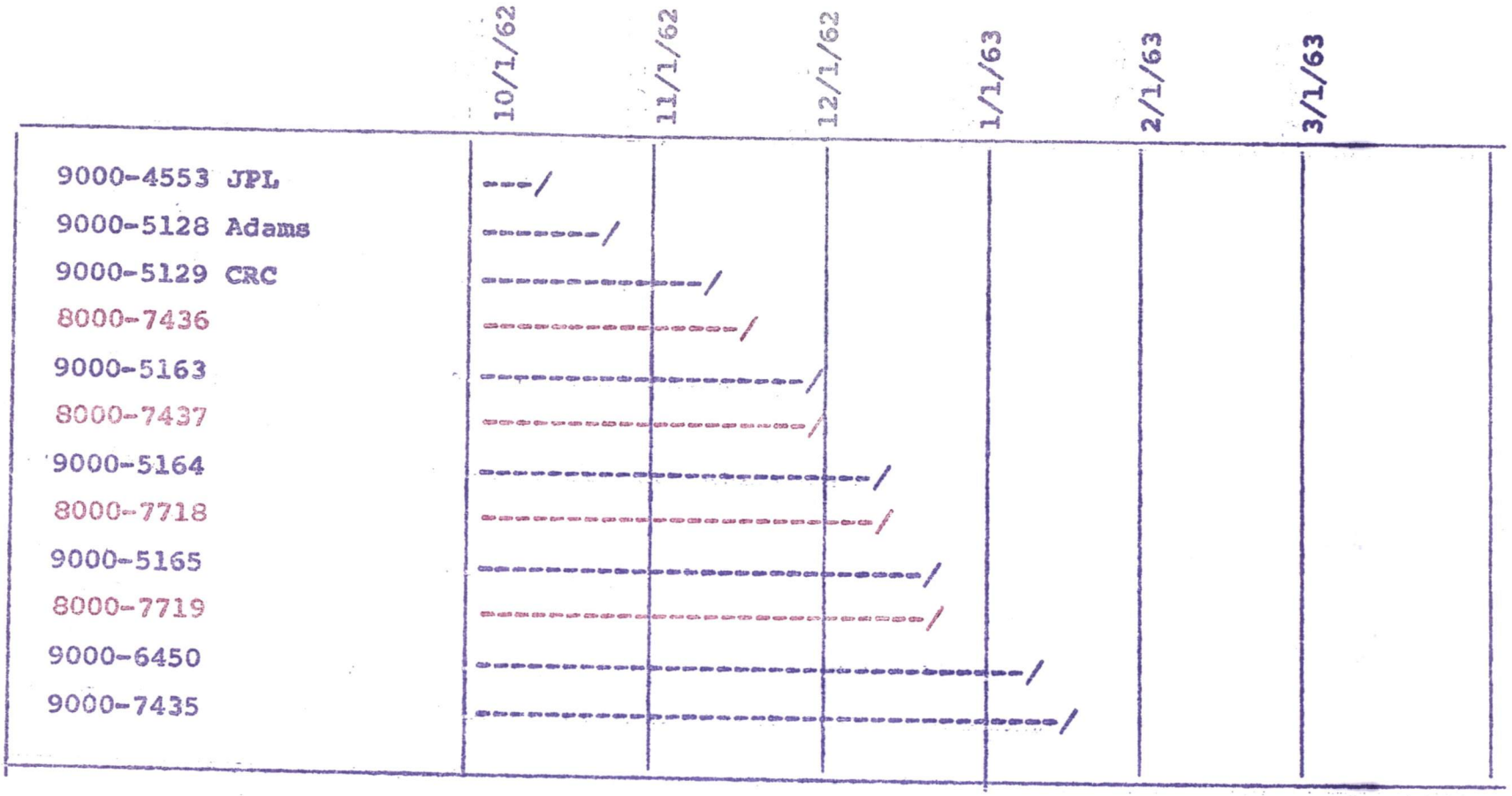
TO: K. Olsen
H. Anderson
S. Olsen
M. Sandler
B. Gurley
G. O'Dea
D. Mills
G. Bell
E. Harwood
A. Hall

FROM: J. Smith

Our program for the construction of two PDP-1 Standard Computers per month is well underway. The present program calls for the delivery of a PDP-1 to Checkout at the beginning and end of each month. Nov. 2 and Nov. 23 are the scheduled dates for the first two computers.

Our program for the construction of two PDP-4 Standard Computers has been slow in starting. This has been due to Engineering Changes, which have had most of the wiring diagrams and cable schedules tied up in Drafting. Wiring diagrams were released this past Friday, Oct. 26 and we are currently wiring 3 sets of sub-assemblies. There are still some cable schedules that have not been released. Even with this delay, I feel quite confident that we will deliver two PDP-4's to Checkout during the month of November. However, it will be rather late in the month. Nov. 19 and Nov. 30 are the present scheduled dates. All scheduled dates are based on a non-overtime work schedule. There should be no problem in delivering a PDP-4 to Checkout at the beginning and end of each month in all subsequent months.

PRODUCTION SCHEDULE COMPUTERS



9000 series numbers - PDP-1

8000 series numbers - PDP-4

OCT 31 1962

dec INTEROFFICE MEMORANDUM

DATE October 31, 1962

SUBJECT Computer Sales Leads

TO Nick Mazzarese

FROM Bob Savell

PDP-1 Systems Research Laboratories, Dayton, Ohio

I contacted Mr. Roy Griffis, who is the only one who I have had anything to do with at Systems Research Lab, in connection with their computer orders. He said that they have included PDP-1 in a proposal to an Air Force group at Wright-Patterson, and at present have a second Tape Unit 50 on order from us. Other than this there were no immediate prospects for more PDP-1's. They are pleased with the present installation. I would suggest that someone in computer sales or Harlan Anderson get in touch with one of the people higher up in the organization whom they have had contact with before to pursue this a bit further.

PDP-1 Lawrence Radiation Laboratory, Livermore, California

In three talks with Ed LaFranchi, who is the head of the Digital Systems Department for the entire laboratory, and with Glenn Strahl, who is the engineer in charge of our installation at PDP, I find that prospects do not look as bright as they once did for another PDP at least in the immediate future. LaFranchi, who is the one who drew up the specification for the original PDP, is quite satisified, however, he relates that Mr. Sid Fernbach, whose title I don't recall right now but is the man who controls all the money, is quite unhappy about the whole system. The points of unhappiness are as follows:

1. The Uptime card reader still does not work very well. Operaters have to try 2 or 3 times to get a deck of cards to run through the reader. LaFranchi feels that part of this is the fault of the operators, however, he says that the Uptime circuitry still contains many problems some of which Uptime is working on, some of which Uptime does not want to believe really exist. LaFranchi feels that as it stands now they will probably keep the Uptime. He feels that further education of the users will cause more satisfaction with the system.

   The Uptime was not supplied by us as part of the system but is being rented by LRL from Uptime. Of course, most of the users don't know anything about the financial arrangements, and so a black eye for Uptime is a black eye for the whole system. I don't believe that there is much we can do about this with the possible exception of trying to tell them all we can about the Burroughs 800 Card-a-Minute Reader and hope that they may decide to get rid of the Uptime one of these days.

2. The Potter 906 II Tape Units: It seems that Fernbach has never liked Potter, and he is not any happier now than he ever was. This again looks as if it is a problem that we cannot do too much about unless we were to replace them with other transports on an exchange price basis. LaFranchi says that electrically things are working nicely. They have had at least one trouble with the tape units since they have been installed but this was cleared

up to the best of my knowledge quite quickly so that they do not have any real complaints electrically. Fernbach's main complaint is that these things just are not as simple to operate as the IBM Transports which appears to be true. LaFranchi gave me the indication that they were going to do something about getting rid of the 906 II's. They do not know as yet exactly what they are going to do though.

LRL is interested in our new tape control for the IBM high density tapes. There is a good possibility we could sell them at least one of these to go on their system.

3. The Ultra-Precision CRT: The main source of trouble here, of course, is the fact that they mysteriously suffered a burned out tube a while back and that during the course of installing a new tube Glenn Strahl make an error which caused another tube to burn out. They admit to their error on the second tube, however, it would be nice if we had a cathode ray tube protection circuit installed to prevent these goofs which result in $1200 catastrophic failures on which there is no salvage. We are at present working on a circuit that will do this. One more point of unhappiness on the precision is the mechanism for adjusting the focus coil which we admitted at the time of installation was not as good as it could be. We are in the middle of designing a new one which I think I mentioned at the EJCC meeting today. We will be testing that one out during this week.

They are very happy with the results they have been getting using the Ultra-Precision CRT, however. The most recent eyeball program they have been experimenting with is used to detect shades of gray. They have been able to detect 25 shades. For a simple single photo-multiplier eyeball arrangement this is pretty darn good.

I told Ed that we wanted to make sure they were satisified with the system and especailly so if their unhappiness was the prime reason for not ordering another PDP at this time. They have been very nice in all our dealings with them, and many times when we have offered to do things for them or come out and help them they have said, no, no don't do that, but I feel that we should discuss the problem further and possibly take the initiative on our own to improve the situation as much as possible even if they don't insist on it. It is certainly worth some investment of time and money if it will result in another system sale.

Mrs. Dorothy Monk, who has also swung quite a bit of weight out there in the past and also has been quite unhappy about the whole system but primarily about the Uptime card reader, is leaving on November 8th. She and Mr. Fernbach are the two people who have swung the most weight as far as the original purchase and purchase of another PDP are concerned.

With regard to the new tape control unit for the high density tape, Ed is concerned because in the proposal for this tape unit that we sent to them we gave them the option of permanently selecting two out of three possible densities. He feels that this is a drawback over the IBM unit which offers programmable selection of two out of three. He says they would gladly pay a few extra dollars for this added selection privilege.

I quizzed them about the possibility of selling them a 16" Display for their 7090. It turns out that in another month they are getting a DD-80 from Data Display to hang on the 7094. The price for this unit Ed tells me is between 50 and 100K. They are also buying a precision display from Data Display (Data Display's first precision) with a Vought camera. He didn't say how much this assemblage was going to cost. They are using a direct data input which is going to cost them 100K for the direct data input alone exclusive of the data channel cost, and will tie up one of their regular data channels full time. However, they will be able to plot points at a 2 microsecond rate and point characters at about a 50KC rate, he said. The 2 microseconds sounds too fast to be correct to me.

He also brought up the interesting information that he had been down to visit Trans-data in San Diego a couple of months ago as they were readying a display to be delivered, he thinks, to MITRE Corporation with a 33KC point-plot rate and a 62 1/2KC character mode. The price for this unit was to be over 100K, so it looks as if I'll have to get on the ball and see what I can find out about both of these units as we are thinking about building something along the same line.

cc: Stan Olsen
Ken Olsen
Harlan Anderson
Ben Gurley
Bob Beckman
Ted Johnson -- West Coast Office

dec INTEROFFICE MEMORANDUM

DATE October 30, 1962

SUBJECT PDP-4 For Our Module Testing

TO Gordon Bell

FROM Kenneth H. Olsen

Will you initiate the red tape necessary to order a PDP-4 for our automatic module testing.

I expect that in a few months we will be overwhelmed with module and computer orders again. We have increased our productivity in many ways and we can turn out units very effectively but module testing is still a severe bottle neck. We have hired a fellow named Ken Wakeen who will join us early in November to do Production Engineering. He is a relatively senior man and supposedly quite capable in this general area. This will be his first task and I would like to have a computer available to him immediately so that he can get all our testing on a computer.

He has no experience with computers and so learning to use it will take a little time, but I think that will be relatively easy. He probably will need some help in programming. The most important thing is I would like to have the computer underway before he gets here.

Kenneth H. Olsen

cc: Jack Smith
Dick Best
Bob Hughes
Harlan Anderson

dec INTEROFFICE MEMORANDUM

Fib

DATE October 30, 1962

SUBJECT Foxboro Sales lead & Medical Computer

TO Nick Mazzarese

FROM Arthur Hall

The status of Foxboro as a past and future customer is as follows:

Foxboro-Nabisco — Computer with printer-keyboard, reader, punch, RTO and A-D has been accepted and remains in-house until Foxboro wants to send it to Nabisco.

Corning — This computer with printer-keyboard, reader, punch, RTO and special I/O interface has been accepted and remains in-house until Corning wants it. This machine has been bought by Corning to be used with Foxboro equipment and with Foxboro engineering assistance.

Foxboro is working on bids to Boston Edison, Monsanto and probably other manufacturers as well. They have been making some kind of a decision about what computer they will use for their control system. While we have not been told, it looks as though DEC has been selected.

If this is the case, we can expect momentarily to receive an order for one computer for Foxboro's own use and up to 4 more for proposed business. They would do this to take advantage of the liberal discount with advantageous cancellation privileges.

If memory serves me correctly, Foxboro's projected sales would mean about 4 computers for 1963 and perhaps 10 for 1964.

Foxboro is interested in the PDP-4 Extended Arithmetic Element and the Drum, both under development. Drums will probably be a part of most future orders from Foxboro. They have to the best of my knowledge displayed no interest in card handling equipment. In reply to my specific question, most of their customers are not interested in line printers although some interest might be generated if we had a printer in the range of $7-15K. (There might be a possibility of making a printer in this price range by using the Kleinschmidt printer)

Pertinent to this subject (although not to Foxboro) is the medical field. Harlan Anderson, Gordon Bell and I met yesterday with Stephen Lorch and Frank Irvin of Massachusetts General Hospital to discuss the computer they will be receiving.

They spoke during the discussion of the increasing interest in computers for medical work that has developed over the last two years. They mentioned computers being used at Johns' Hopkins in Baltimore (maybe as many as 10), at Sloane-Kettering and Einstein Hospitals in N. Y. and at some other locations I don't remember. CDC apparently has a two year

jump on us in this field with perhaps 6 computers in use.

Classes being given by Stephen Lorch at the Harvard Medical School have revealed a great deal of interest in computer use for diagnostic medicine. Some of the students have already done some medical programming during last summer and are eager to do more involved work next summer. With this type of interest and the large amount of money available to medicine from foundations and the government, there may be an explosive expansion of computer-oriented medical research. The National Institute of Health apparently has half a billion dollars to spend on research and is very favorably inclined towards computers for this purpose.

If Dr. Irvin may be taken as representative of the field, then there is a need for fast A-D equipment with 8 bit accuracy as an average (biological-type sensors apparently have no better accuracy) and an accuracy ranging from 4 to 10 bits depending upon the case. Some people are using the very fast Raytheon A-D equipment to tape the information so it can be processed later. Dr. Irvin spoke of having 0 to 1.5v positive outputs from the tape equipment he is using, this necessitating a DC amplifier for each channel of input. Channel requirements may go above 100 in some instances.

Immediate and thorough exploratory work in this field might well put us on the ground floor of a business bonanza of the near future.

cc: Ken Olsen
Harlan Anderson
Gordon Bell

dec INTEROFFICE MEMORANDUM

DATE 30 October 1962

SUBJECT Conference Papers

TO Ken Olsen
Harlan Anderson
Stan Olsen
Dick Best
Ben Gurley
John Fadiman

FROM Stu Grover

Attached is a copy of the technical meetings notice compiled and distributed in the MITRE Corporation each quarter. I thought you might be interested in both its form and substance. Note that it gives abstract deadlines in each month's listing. If we have enough technical development to warrant it, I could

1. Continue to obtain copies of the MITRE compilation and forward them to you and others you might designate (e.g., Russ Doane, Gordon Bell)

2. Compile a list narrowed to DEC's interests and distribute it as above

3. Continue my present practice of sending notes to Dick whenever I see deadlines coming.

I'd appreciate your comments.

OCTOBER -- DECEMBER 1962, TECHNICAL MEETINGS

OCTOBER

MEETINGS	Date	Organization	Place	Sponsor
Monday	1-3	8th Nat'l Communication Symp	Hotel Utica & Municipal Aud, Utica, NY	PGCS, Rome-Utica Section
Monday	1-4	Annual Mtg Air Traffic Control Assn	Flamingo Hotel, Las Vegas, Nev	PGSET
Sunday	7-12	3rd Annual Symp on Switching Circuit Theory & Log Design	Chicago, Ill	AIEE Computing Devices Committee
Monday	8-10	Nat'l Electronics Conf	McCormick Place Chicago, Ill	IRE, AIEE, et al
Friday	12-13	7th Annual Electronic Symp	Greensboro Coliseum Greensboro, NC	North Carolina Section
Monday	15-18	Symp on Space Phenomena and Measurement	Statler-Hilton Detroit, Mich	AEC, PGNS, NASA
Monday	22-24	ECCANE (East Coast Conf on Aerospace & Navigational Electr)	Emerson Hotel Baltimore, Md	PGANE, Balt, Md Section
Wednesday	25-27	1962 Electron Devices Meeting	Sheraton Park Hotel Washington, D.C.	PGED
Tuesday	30-31	Conf on Spaceborne Computer Eng	Disneyland Hotel Anaheim, Cal	PGEC

ABSTRACTS	Due Date	Organization	Mtg Place & Date	Contact
Friday	12	1963 Nat'l Winter Conv on Mil Elec	Ambassador Hotel Los Angeles, Calif Jan 31--Feb 1, 1963	100 word unclass, abstr 500 word summary, sketch of author; Fred P. Adler, Manager, Space Systems Div Hughes Aircraft Co Culver City, Calif
Friday	19	IRE Internat'l Conv	Coliseum & Waldorf-Astoria Hotel, NY Mar 25-28	Dr. D. B. Sinclair, IRE Hdqrs, 1 E 79 St., NY

NOVEMBER

MEETINGS	Date	Organization	Place	Sponsor
Sunday	4-7	15th Annual Conf on Engineering in Bio and Medicine	Conrad Hilton Hotel, Chicago, Ill	PGBME, AIEE, ISA

NOVEMBER (continued)

MEETINGS	Date	Organization	Place	Sponsor
Thursday	1-3	Symp on Continuum Mech	MIT, Cambridge, Mass	SIAM
Monday	5-7	NEREM (Northeast Res and Engineering Mtg)	Commonwealth Armory, Somerset Hotel, Boston	Region 1
Wednesday	7-9	National Mtg, Operations Research Society of America	Sheraton Hotel, Phil	ORS
Monday	12-15	8th Annual Conf on Magnetism and Magnetic Materials	Penn-Sheraton Pittsburgh, Pa	PGMTT, AIEE, AIP
Tuesday	13-15	NEREM (Northeast Res and Engineering Mtg)	Boston, Mass	NEREM
Friday	16-17	2nd Canadian IRE Communications Symp	Queen Eliz Hotel Montreal, P.Q. Can	Montreal Section
Monday	19-20	MAECON (Mid-America Electronics Conf)	Hotel Continental Kansas City, Mo	Kansas City Section
Wednesday	28-30	1962 Ultrasonics Symp	Columbia Univ, New York City	PGUE

ABSTRACTS	Due Date	Organization	Mtg Place & Date	Contact
Thursday	1	Int'l Solid State Circuits Conf	Sheraton Hotel and Univ of Penn, Phil, Pa, Feb 20-22, 1963	S. K. Ghandi, Philco Scientific Lab, Blue Bell, Pa

PAPERS	Due Date	Organization	Mtg Place & Date	Contact
Thursday	15	4 th Joint Aut Cont Conf	Univ of Minn, Minneapolis, Minn June 19-21, 1963	Hdqrs: AIEE, IRE, ASME, OR AIchE

DECEMBER

MEETINGS	Date	Organization	Place	Sponsor
Tuesday	4-6	FJCC (Fall Joint Computer Conf)	Sheraton Hotel, Phil Pa	AFIPS, (PGEC, AIEE, ACM)
Friday	6-7	PGVC (PG on Vehicular Communications) Conf	Disneyland Motel Los Angeles, Calif	PGVC

DECEMBER (continued)

MEETINGS	Date	Organization	Place	Sponsor
Wednesday	26-31	Annual Nat'l Mtg & Exp of Sci & Ind	Amer Assoc for Advancement of Sci, Phila, Pa	AAAS

ABSTRACTS	Due Date	Organization	Mtg Place & Date	Contact
Monday	17	AIEE/IRE Int'l Conf on Nonlinear Magnetics	Shoreham Hotel, Wash, DC, April 17-19, 1963	IRE Hdqrs

SUBJECT: REPAIR OF RETURNED MODULES

DATE: OCTOBER 30, 1962

TO: Harlan Anderson

FROM: JIM CUDMORE

THE FOLLOWING IS A LIST OF MODULES RETURNED FOR REPAIR DURING THE WEEK OF OCTOBER 29.

UNIT	SERIAL NO.	CUSTOMER	DEFECT
62	2874	Q.C.	SI188A - 203 T.I. SHORTED 2N744-221 T.I. SHORTED 2N744 T.I. OPEN 2N744 T.I. HIGH IEBO
1103	40294 E	B.B. & N.	NONE
1103	0056645 D	D.E.C.	NONE
1103	0057633 D	D.E.C.	NONE
1103	0038737 D	D.E.C.	NONE
1105	0036035	D.E.C.	D001 SHORTED
1105	0060656	D.E.C.	MA89 SHORTED
1105	0055186	D.E.C.	NONE
1105	0055192	D.E.C.	NONE
1105	0036122	D.E.C.	NONE
1105	0036139	D.E.C.	NONE
1105	0036125	D.E.C.	NONE
1105	0025638	D.E.C.	NONE
1105	0035312	D.E.C.	NONE
1105	0036158	D.E.C.	NONE
1111	0034697	D.E.C.	NONE
1111	0034683 D	D.E.C.	NONE
1111	0034645 D	D.E.C.	NONE
1111	0034178 D	D.E.C.	NONE
1111	0034700 D	D.E.C.	NONE
1111	0034182 D	D.E.C.	NONE
1111	0035638 D	D.E.C.	NONE

REPAIR OF RETURNED MODULES (CONT.)

UNIT	SERIAL NO.	CUSTOMER	DEFECT
1111	0032818 D	D.E.C.	NONE
1201	0036666 P	D.E.C.	TRANSFORMER LEADS SHORTED
1201	0036667 P	D.E.C.	SAME AS ABOVE
1201	0036511 P	J.P.L.	SAME AS ABOVE
1209	0016248 K	UNKNOWN	NONE
1209	0019133 R	J.P.L.	INTERMITTENT OSCILLATION CAUSED BY Q10 (MA80 6210 PHILCO 2J4)
1209	62632	UNKNOWN	HIGH VCE (2N 1427 IC 3 PHILCO 260)
1209	0016093 K	UNKNOWN	MA80 (2J3 PHILCO 260) OPEN BASE TO EMITTER D001 OPEN
1209	0022341 K	E.A.	MA80 SHORTED
1209	0020672 K	UNKNOWN	NONE
1209	78242 K	ADX-8	MA80 OPEN -- D001 OPEN -- REPLACED MA80 -- VCE TOO HIGH
1209	0020667 K	UNKNOWN	NONE
1209	0020677 K	UNKNOWN	NONE
1209	0030928	UNKNOWN	NONE
1209	0044013 K	I.T.T.	NONE
1209	0016245 K	UNKNOWN	NONE
1209	0043269 K	UNKNOWN	NONE
1209	0016240 K	UNKNOWN	NONE
1311	0016559 E	UNKNOWN	NONE
1311	0016403 E	UNKNOWN	NONE
1311	0016407 E	UNKNOWN	NONE
1311	0016569 E	UNKNOWN	NONE
1311	0016568 E	UNKNOWN	NONE
1311	0016560 E	UNKNOWN	NONE

REPAIR OF RETURNED MODULES (CONT.)

UNIT	SERIAL NO.	CUSTOMER	DEFECT
1410	00431 G	D.E.C.	PULSE WIDTH TOO SMALL - REPLACED T_1 & T_2 WITH (2)T2003'S -- REPLACED R17 WITH 22 OHM RESISTOR.
1410	90028 G	D.E.C.	SAME AS ABOVE
1410	0021594	D.E.C.	NONE
1410	002113 G	D.E.C.	NONE
1540	0026163 D	A.E.	MA90 (SPRAGUE 2-19) SHORTED MD95 (2-08) SHORTED
1684	82286 C	D.E.C.	2N711A T.I. OPEN
1684	0012845 C	D.E.C.	NONE
1685	0020504 B	D.E.C.	VCE TOO HIGH
1972	0008759 B	UNKNOWN	MD114 LEAKY -- REPLACED OBSOLETE 2N599 WITH GA212
1972	0040464 B	UNKNOWN	NONE
1972	00516 B	BECKMAN	EXCESSIVE ICBO 2N1065 G132
1973	0005508 C	D.E.C.	NONE
1973	0032377 C	D.E.C.	NONE
1973	0055807 C	D.E.C.	NONE
1973	0055809 C	D.E.C.	NONE
1978	0020403 C	D.E.C.-W.C.O.	NONE
3302-C		U.S. ARMY	BOARD SLIDES PAST TOP STOP
4204	0043197 B	D.E.C.	MD114 OPEN
4204	0043143 B	D.E.C.	MD114 OPEN
4215	88392 B	VENUS	WRONG DIODE & WRONG WATTAGE RESISTOR IN BOARD
4215	88058 B	D.E.C.	2N1499 A OPEN
4218	04957 B	PROTOTYPE	NONE
4218	0052573 B	PDP-4	NONE
4218	0060236 B	PDP-4	ALL TRANSISTORS MISSING

REPAIR OF RETURNED MODULES (CONT.)

UNIT	SERIAL NO.	CUSTOMER	DEFECT
4301	0042868	PDP-1	REPLACED D3
4301	0019985 E	D.E.C.	NONE
4301	0020909 E	D.E.C.	NONE
4603	71128 C	C.R.C.-O.A.L.	BREAK IN PRINTED CIRCUIT GROUND LINE

OF A TOTAL OF 74 MODULES RETURNED, 48 HAD NO DISCERNIBLE DEFECTS.

dec INTEROFFICE MEMORANDUM

DATE October 30, 1962

SUBJECT

TO Ben Gurley

FROM Kenneth H. Olsen

During the ISA Show Andy received a call from John Mc Carthy at Stanford University saying that he was interested in a PDP-1. I called him back the next day and talked with him about the general problem. He is very interested in a PDP-1 because he has his teaching programs already written with that computer. He didn't have the money initially but he does feel he can get it. I told him I thought we could give him a 10% discount but he was a little disappointed with how small this discount was. I think it would be important for us to get a PDP-1 out there and so I suggest that you follow up on this and feel him out as to how much discount we would have to give him in order to sell the machine there. I think we might go as high as 20 or 25% discount.

His telephone number is Area Code 415, DA 1--2300, Extension 2312.

Kenneth H. Olsen

cc: Harlan Anderson

dec INTEROFFICE MEMORANDUM

File

DATE October 30, 1962

SUBJECT Foxboro

TO ~~Ken Olsen~~ Andy

FROM Stan Olsen

A few weeks ago while interviewing an applicant for a job in the Sales Department, we were discussing our relationship with Foxboro, and I was somewhat amazed at his statement that Foxboro is definitely building their own computer "for process control". It seems this fellow was interviewed by the Natick Foxboro people and this was one of the interesting projects he was to work on.

dec INTEROFFICE MEMORANDUM

File

DATE October 29, 1962

SUBJECT ADVERTISING REVIEW MEETINGS

TO K. H. Olsen
H. E. Anderson
S. C. Olsen

FROM J. L. Atwood

Would it be possible to start the every-other-Thursday advertising review sessions with this Thursday's meeting of the Works Committee?

We have a good-sized backlog of things to discuss, so the sooner we get at it, the more help it will be. In addition, starting this week would put us on a good cycle with respect to trade shows and other distractions. The meetings would then come: November 1, 15 and 29; December 13 and 27; January 10 and 24; February 7 and 21; March 7 and 21; April 4 and 18; May 2, 16 and 30; and June 13 and 27.

This schedule would skip Thanksgiving Day, Fall Joint Computer Conference week, Electrical Engineering Exhibition week, IRE week, and Spring Joint Computer Conference - Design Engineering Show week. If we could meet Tuesday, May 28, instead of Thursday, May 30, it would even get us around the Memorial Day hurdle.

It might also be worthwhile to consider moving this particular meeting upstairs to my room. This would give me a chance to get samples, exhibits and other materials arranged beforehand in order to save time and trouble, and it would mean that any additional materials or any people from my group could be brought into the meeting if needed. This might even prove to be a pleasant change of pace for the Committee members to meet in a different locale.

dec INTEROFFICE MEMORANDUM

DATE October 29, 1962
(dictated 10/26/62)

SUBJECT Raytheon Application for a Computer

TO Stan Olsen
Gordon Bell

FROM Harlan E. Anderson

I was telephoned today by Al Shoolman who used to work at Lincoln Lab and is now at CEIR. He is acting as a consultant to Raytheon in preparing a proposal for a system that would include a computer. He did not tell me the particular application but it would include teletype inputs and probably some type of oscilloscope display. The number of teletypes would be 15 to 20. He intends to have a first draft of the technical part of the proposal ready by Friday, November 2nd.

The computer that did their original study work was the Univac 1216 which is really too large and expensive for this project. The PDP-4 seems great to him over the telephone and I am sending him literature including F-11, F41, F45 and the 10 manual for PDP-1.

Would one of you two call Al Shoolman at Raytheon on Monday afternoon to get together with him Tuesday or Wednesday.

His Raytheon address is Raytheon Equipment Division Headquarters
40 Second Avenue
Waltham, Massachusetts

Telephone: TW 9-8000 Ext. 161

The Raytheon man who is in charge of the proposal project is Dr. Henry Alexander. We are sending the above literature to Al Shoolman's home which is 130 Oliver Road, Waban, Mass. This is a military application which requires 24 hours a day operation and they might consider duplexing the equipment.

Harlan E. Anderson

File

October 29, 1962

PERSONNEL MEETING - 10/3/62 and 10/4/62

K. Olsen
H. Anderson
S. Olsen
M. Sandler
G. O'Dea
R. Best
B. Gurley
J. Fadiman
W. Hindle
R. Mills
B. Charnock

Bob Lassen

The following is a summary of the decisions made at the meeting held on 10/3/62 and 10/4/62 and a report of the status of various personnel projects:

GROUP INSURANCE--Items discussed

a) Establishing an age limit for new employees with respect to group life insurance eligibility.

b) Inclusion of Private Room Coverage under Major Medical to a maximum of $28.00 per day. (This would be subject to the $50.00 deductible and the 80%-20% clause.)

c) Review present method of processing medical claims with particular emphasis on eliminating inconvenience of filling out forms.

I have met this week with the representative of Blue Cross-Shield for the purpose of comparing our plan with theirs.

I will next meet with Mr. DeYorio, John Hancock Group Representative, to further emphasize our intent to establish an age eligibility requirement for new employee life coverage. We will also ask them to consider more carefully possibilities of eliminating some of the undesirable features of processing claims. A proposal made to me earlier on this matter was not satisfactory; however, by using Blue Cross as a wedge, we may be able to come up with something more desirable.

I will also instruct Mr. DeYorio to amend our contract to include Private Room Coverage under Major Medical to a $28.00 per day

maximum--DEC to assume the entire additional cost (approximately $800.00 per year). We have been holding off the printing of new insurance booklets until this coverage was put into effect. We will also issue a notice to all of our employees announcing this as a new company benefit.

WAGE ADMINISTRATION

A formal wage structure was accepted as follows:

Hourly (non-exempt)--Required to record all working time by punching a time card. Eligible for company benefits and privileges for hourly employees including time and one-half pay for all authorized scheduled time worked in excess of 8 hours in a working day or 40 hours in a week, whichever is greater. The Annual Wage Review will be at the time of the company's Annual Review for Hourly Employees. Hourly employees include: Assemblers (female), Wiremen, Technicians, Machinists, Sheet Metal Workers, Mechanics, Maintenance Men, Silk Screeners, Dip Solderers, Photographers, Carpenters, Stock or Tool Crib Attendants, Painters, Shippers, Receivers, Janitors, Production-Clerical, Inspectors, Mail Clerks, etc.

Weekly (non-exempt)--Required to record all working time by filling in (in writing) a time card. Eligible for company benefits and privileges for hourly employees, including time and one-half pay for all authorized scheduled time worked in excess of 8 hours in a working day or 40 hours in a week, whichever is greater. The Annual Wage Review will be at the time of the company's Annual Review for Hourly Employees. Weekly employees include: Clerks, Clerk-typists, Secretaries, Junior Administrative, Librarians, Accounting Clerks. (Weekly people are normally assigned to a clerical or administrative area).

Salaried-Overtime (exempt)--Not required to record time worked during normal working hours. Eligible for company benefits and privileges for salaried employees. Eligible for straight time pay for all authorized scheduled overtime in excess of 40 hours in a week up to a maximum of 48 hours in a week until attainment of a base salary of $120.00 per week. Overtime hours must be recorded and approved. The Annual Wage Review will be at the time of the company's Wage Review for Salaried Employees.

Salaried-Straight (exempt)--Not required to report time worked. Eligible for company benefits and privileges for salaried employees. Not eligible for overtime pay. This category will include all exempt personnel who are receiving a base salary

of over $120.00 per week. The Annual Wage Review will be at the time of the company's Wage Review for Salaried Employees.

It was decided to initiate this program on January 1, 1963. At that time all DEC employees will be classified in one of the above wage classes (by code as suggested by Dick Mills). New employees will be classified in the appropriate wage class when the offer is made. The Personnel Dept. will notify the Accounting Dept. of the new employee's wage class (by code) on the Addition to Payroll notice. I feel this information should be included in our regular IBM salary run sheets.

It was also decided to reclassify the following administrative people from Weekly (non-exempt) to Salaried (exempt) on January 1, 1963, thereby making them eligible for the Salaried Review and other benefits and privileges for salaried personnel:

R. Maroney	J. Rutchman	B. Charnock
W. Farnum	T. Whalen	H. Shebak
F. MacLean	F. Mariani	L. Boucher
F. Kalwell	R. Blackwood	R. King

Their overtime status will, of course, depend upon their salary after the January review.

JOB CLASSIFICATION, MERIT RATING AND WAGE REVIEW PROGRAM FOR ALL HOURLY AND WEEKLY (NON-EXEMPT) PERSONNEL

It was decided to start quarterly merit ratings immediately. This program will be administered by the Personnel Office through the department heads. Merit rating forms and employee listings by departments will be distributed this week with a November 16th deadline. Ratings for all hourly and weekly (non-exempt) employees will eventually be on a regular December, March, June and September basis.

We will continue our regular program of conducting an Annual Job Classification and Wage Review for hourly and weekly (non-exempt) employees. However, I will periodically meet with department heads to keep abreast of individual classification changes during the year.

I am currently outlining a Wage and Benefit survey which we plan to conduct after the first of the year. At that time we will review our current job classification (descriptions) and rate structure and recommend whatever changes are necessary through the department heads and the Personnel Committee.

We agreed that I should set up a planned schedule of meetings with supervisors for the purpose of providing better communication between the company and its people, and vice versa. This program must be designed to be interesting and informative and will require some planning. I am not sure when we'll start; however, I hope to begin around the first of the year after a few of the current projects are cleaned up.

I am working with Dick Mills and Fred MacLean in planning periodic IBM runs pertaining to hourly personnel. The information contained in these runs, together with personal histories of all hourly and weekly (non-exempt) personnel, will be of tremendous help in better evaluating the performance, capabilities, interests, background and training of each employee. (Perhaps something similar should be done with salaried employees.) Many of our present methods rely too much on memory and chance.

Unless there are any questions concerning the activities outlined above, we shall continue proceeding with these projects.

/jfr

CURRENT ENGINEERING DEVELOPMENT AND FIELD SERVICE NUMBERS

FROM: Richard L. Best DATE: October 26, 1962

EN 1000	General Engineering
EN 1010	5 MC System Modules
EN 1011	500 KC System Modules
EN 1012	Non-Compatible Low Speed B. B.
EN 1013	Current Drivers (vacuum tube)
EN 1014	Digital-to-Analog Converter
EN 1015	Typewriter
EN 1016	Core Memory Development
EN 1017	Signal Converters
EN 1018	Memory Tester Development
EN 1019	Modules Sales
EN 1020	PDP-1 Development
EN 1021	Core Handler
EN 1022	Power Supplies
EN 1023	Mounting Panels
EN 1024	Paper Tape Reader
EN 1025	Paper Tape Punch
EN 1026	Magnetic Tape Equipment
EN 1027	Large Tube Display
EN 1029	10 MC System Modules
EN 1030	Educational Building Blocks
EN 1031	Computer Development
EN 1032	Utility Programming, PDP-1
EN 1033	Sales Programming, PDP-1
EN 1034	PDP-1 Sales
EN 1036	Light Pen Development
EN 1037	Core Tester and Memory Tester Sales
EN 1038	Special System Sales
EN 1039	Solid State Current Drivers
EN 1040	Drum Circuit Development
EN 1041	Drum System Development
EN 1042	Current Driver Power Supply 766
EN 1043	VHF Building Blocks
EN 1044	Analog-to-Digital Converter
EN 1045	Digital Average Response Computer
EN 1046	Punched Card Equipment for PDP-1
EN 1048	Test Equipment Headquarters (RH)
EN 1049	Engineering Stockroom
EN 1050	Data Phone

EN 1051	Classroom Modules
EN 1052	Memory Stack Assembly
EN 1053	Computer Cabinet
EN 1055	PDP-1 Production Test Equipment
EN 1057	Core Tester Development
EN 1058	Anelex Development
EN 1062	PDP-4-1 Operation
EN 1064	Display 31 Development
EN 1067	Information International (Ed Fredkin)
EN 1068	Burroughs Card Reader
EN 1069	PDP-1 Computer Administration
EN 1072	Standards
EN 1073	Quality Control
EN 1074	Memory Tester Field Service
EN 1075	Core Tester Field Service
EN 1076	Memory Exerciser Field Service
EN 1077	Misc. Special System Field Service
EN 1078	ITT Prototype Rework
EN 1086	Telex Printer (BS)
EN 1087	Relay and Switch Investigation
EN 1088	Module Packaging for Shipment
EN 1089	Line Unit Tester (GB)
EN 1090	4203 Development
EN 1091	4204 Development
EN 1092	10 MC Laboratory Modules
EN 1093	5 MC Laboratory Modules
EN 1094	500 KC Laboratory Modules
EN 1095	PDP-4 Sales
EN 1096	PDP-4 Programming
EN 1097	Modules Construction Development
EN 1098	M odule Test Development
EN 1099	Field Service, General
EN 1100	Power Controls
EN 1116	Memory Tester Field Modification
EN 1122	3 KC Power System Development
EN 1123	Core Tester 2114 Development
EN 1127	Current Calibrator Development
EN 1128	PDP-1 Checkout Training
EN 1129	Character Generator Development
EN 1130	1521 Development
EN 1131	Anelex Prototype Construction
EN 1132	ADX Systems Administration
EN 1133	PDP-4 Systems Administration
EN 1134	PDP-4 Flexowriter Prototype
EN 1135	Display 30-D Prototype (PDP-4)

	EN 1136	Link Tape Unit
	EN 1137	Type 56 Tape Control Development
*	EN 1138	Prototype A-D for PDP-4-1
*	EN 1139	Serial Drum System Development
*	EN 1140	Serial Drum Prototype
*	EN 1141	Fortran
*	EN 1142	Serial Drum Circuit Development
*	EN 1143	Delay Line Memory Development
*	EN 1144	Quality Control: Test Equipment labor, materials
*	EN 1145	Quality Control: Model Test
*	EN 1146	Quality Control: Module Repair-field failure
*	EN 1147	Quality Control: Module Repair-salvage
*	EN 1148	Teletype line unit modules

Supercedes Memo Dated September 19, 1962

* Indicates New Numbers Added

dec INTEROFFICE MEMORANDUM

File

DATE October 25, 1962

SUBJECT List of DECUS Attendees!

TO Ken Olsen
Stan Olsen
✓Harlan Anderson

FROM Elsa Newman

A list of the attendees at the Annual DECUS Meeting is forwarded for your information. The names were taken from the "Sign-In" register which the Air Force supervised. No doubt there were more Air Force personnel at some of the sessions than the list indicates, making an approximate total of 90 attendees. At no time did the audience number less than approximately 35 and there was certainly a full house for the panel discussions. I have noted the names of the DECUS delegates "D" and "P" if a paper was presented.

The Air Force interest was certainly very great but considering the fact that four different laboratories are concerned the representation of members present is probably average.

As soon as I have received copies of the papers presented I would like to compile a proceedings which I think could be distributed either as a part of DECUSCOPE to delegates or offered on special requests.

Attendees at the Annual DECUS Meeting held October 10 and 11, 1962 at Air Force Cambridge Research Laboratories, Laurence G. Hanscom Field, Bedford, Massachusetts

	NAME	PLACE OF BUSINESS
D	John Gilmore	
	Al Rousseau	Charles W. Adams Associates
	Mary Lanahan	do.
	Paul Rodenhiser	do.
D	J. Quarrington	Atomic Energy of Canada, Limited
	Avery Johnson	Bio-dynamics
D	Thomas Marill	Bolt, Beraneck & Newman, Inc.
	David Park	do.
P	Richard J. McQuillin	do.
	William Mann	do.
	Thomas Evans	do.
	Lucy Darley	do.
	M. Breen	do.
	William Sholey	California Institute of Technology (Jet Propulsion Laboratory)
D	Richard Mills	Data Processing, Inc.
	Harlan Anderson	Digital Equipment Corporation
	Ben Gurley	do.
	Robert Bickman	do.
	George Rice	do.
	John Koudela	do.
	Elsa Newman	do.
	Peter Bonner	do.
	Nancy Lambert	do.
D	Harrison Morse	do.
	Alan Kotok	do.
	Martin Graetz	do.
D	Gerald Clawson	Geotechnical Information, Texas
P	Michael Cappelletti	Information International, Inc.
P, D	Edward Fredkin	do.
	John Wood	do.
D	Lawrence Buckland	Inforonics
	William Nugent	do.
D	H. Gould	International Telephone and Telegraph (Information Systems Division)

Note: D signifies a DECUS Delegate or duly designated representative.

P " presented a paper or served as panelist.

PD " displayed CRT showing special programs not covered in papers

NAME	PLACE OF BUSINESS
Terrence R. Cullen	Itek Corporation
Richard Hagan	do.
Charles Burgess	do.
Earle Pughe	do.
Edward Spignise	do.
H. P. Peterson	do.
Doris Gagnon	do.
Robert Rizzo	do.
William Blotnick	do.
Edward Radkowski	do.
T. R. Stansfield	do.
W. J. Lennon	do.
~~Macey Dickinson~~	Massey Dickenson Company Waltham, Mass ~~do.~~
P D Dorothy T. Monk	Lawrence Radiation Laboratory, Livermore
P Lloyd Mish gave Paper by R. Abbott.	do.
P. Frazer Bonnell	do.
P D Professor Jack B. Dennis	Massachusetts Institute of Technology
Jackson Wright	do.
P Peter Samson	do.
Robert Saunders	do.
Ralph W. Zaorski	Raytheon Manufacturing Company
D W. Fahle	Systems Research Laboratories
D Gerard A. Paquette	United Aircraft Research Laboratories
David Sirota	do.
D Norman Hirst	Wolf Research & Development Corp.
Janet Seltzer	do.
P Carmine Caso	do.
Robert Duncan	USAF - Air Force Cambridge Research Laboratories
John Mott-Smith	do.
Vera Ptess	do.
Stuart Gygi	do.
Richard D. Smallwood	do
D Weiant Wathen-Dunn	do.
Philip Lieberman	do
Eugene Prange	do.
P D Charlton M. Walter	do.
Donald Easterday	do
Frank Balzer, Jr.	do
Eunice C. Cronin	do
Harry Blum	do
Roger E. Bove	do
Edouard LeFebvre	do.
P Theodore Strollo	do
P D. B Bernstein	

NAME	PLACE OF BUSINESS
Paul Wein	USAF - Electronic Systems Division
Ira Goldstein	do.
Robert Westfield	do.
James Duva	do.
P, D John R. Hayes	do.
D Raymond Nickerson	do.
Anne Story	do.
Sylvia Mayer	do.
Major John T. Willis	do.
PD Charles R. Brown	"
PD Donald W. Connolly	"
D Robert W. Coffin	Oregon Primate Research Center

dec INTEROFFICE MEMORANDUM

DATE October 22, 1962

SUBJECT Computer Sales Leads

TO H. E. Anderson

FROM Nick Mazzarese

At our meeting of September 13, regarding PDP-1's and 4's, the following computer sales leads were assigned to you for follow-up:

PDP-1	PDP-4
(r) CRC	U. of Wisconsin
(r) EA	

I would appreciate hearing from you as to the exact status of the above.

NM/ak

Harlan Anderson

dec INTEROFFICE MEMORANDUM

DATE October 22, 1962

SUBJECT Corning Glass

TO Steve Lambert
Gordon Bell
Harlan Anderson ✓
Bill Coburn

FROM George Rice

On Monday, Oct. 29, Arthur Bublitz and one other man, both from Corning will be here. We have offered to assist them in programming their PDP-4 and they will be coming here for this assistance.

The Corning machine should be available and in good shape for their use.

They will be here as long as they feel necessary, probably two or three days.

Bob Smith of Foxboro notified.
K.E.G.

K. Anderson

File

INTEROFFICE MEMORANDUM

DATE October 17, 1962

SUBJECT Food Service at DEC

TO Works Committee

FROM Cafeteria Committee

The Cafeteria Committee proposes the following ground rules for the operation of food services at DEC:

I. General Principles

1. DEC will make food service available for all employees. This service should include coffee before work and at coffee breaks and lunch at the cafeteria during the noon hour. Service in the cafeteria will be limited to sandwiches, soups and desserts; no full meals will be offered.

2. Coffee should be available at separate locations throughout the plant, but lunch should be served in only one location in order to bring employees from different departments together once a day.

3. The cafeteria should have facilities and staff so that all employees who choose to do so may be served during the normal lunch period without excessive waiting.

4. DEC will provide floor space and equipment for proper operation of food service.

II. Scope of Food Service Operations

1. Four areas will be used for food service:

a.	Central cafeteria	-	Building 5, 4th floor
b.	Vending machines	-	Building 12, 2nd floor
c.	Vending machines	-	Building 3, Near tool crib
d.	Tea cart	-	Building 5, Production area.

2. Hours, type, and location of food service:

Hours	Service	Location
7:30 to 8:15	Coffee and pastries	Cafeteria
10:00 to 10:10	Coffee and pastries	All four areas
12:00 to 12:45	Lunch	Cafeteria
3:00 to 3:10	Coffee and pastries	All four areas.

III. Management

1. A contract for food service should be written with a clause allowing either party to terminate on 30 days notice. The contractor will provide personnel, food, vending machinery and supervision.

2. Tobin Vending Service will be the contractor.

3. Financial records must be kept by the contractor and DEC must have the right to audit these records.

4. The food service operation must conform to all public health requirements of the state and town.

5. Henry Crouse will act as DEC contact for Tobin.

IV. Rules of Operation – Cafeteria

1. The menu must be approved in advance by the Cafeteria Committee.

2. Prices must be competitive with all local restaurants and should be posted throughout the plant.

3. Quality of service must be equal to or better than local restaurants.

4. Cafeteria should be arranged physically so that up to 300 employees can be served over a period of 15 minutes.

5. Two service lines should be in operation: one, a line for soups and sandwiches made on request, and the second, an "express" line in which pre-wrapped sandwiches, beverages, and pastries are available.

6. Pre-wrapped sandwiches must be made after 10 a.m. each morning and no pre-wrapped sandwiches may be carried over to a second day. The selection of pre-wrapped sandwiches must be limited to one-half of the kinds of sandwiches available on request. All types of sandwiches available as pre-wrapped selections must also be available on request.

7. Any hot meats available for sandwiches should be prepared in advance of 12 noon. No "cooked-to-order" grille items will be offered.

8. The menu should be standard every day except that two hot sandwiches and one hot soup can be offered each ~~each~~ DAY. On Friday two soups can be offered.

9. All foods must be prepared in the DEC kitchen. All highly perishable foods (i.e., cream pies, cream puffs) will be served one day only.

10. All cafeteria and vending equipment and the dining area will be maintained and kept clean by the contractor.

V. Equipment and Space Recommendations – Total cost - $2,000

1. Racks for paper cups
2. Trays (400-500)
3. Bench type can openers (2)
4. Plexiglass cover for open foods
5. Silverware bins for knives, forks, and spoons
6. Ice cream chest (no cost rental)
7. Rubbish cans
8. Menu board
9. Condiment holders for tables
10. Maintenance supplies – brooms, sponges, buckets, mops, etc.
11. Meat slicer should be equipped with a safety stop – Loren Prentice will advise.
12. Coffee service cart - built by DEC
13. Room adjacent to cafeteria should be made available for storage space.

VI. Items Under Study

1. Contract for Tobin Vending Service – Dick Mills.
2. Cafeteria Layout – Bob Lassen will make recommendations on setting up regular and "express" lines.
3. Health certification and permit – Henry Crouse.
4. Accounting procedures – Dick Mills.

Harlan Anderson

OCTOBER 17, 1962

REPAIR OF RETURNED MODULES

JIM CUDMORE

THE FOLLOWING IS A LIST OF MODULES RETURNED FOR REPAIR DURING THE WEEK OF OCTOBER 8, 1962

UNIT	SERIAL NO.	CUSTOMER	DEFECT
722	3969	DEC	2 CAPS. WERE FLOATING 2 LOOSE CLAMPS NOT SAT.
749	4009	INDIANA GEN. CORP.	FUSE HOLDER BROKEN
1110	0045321E	A.E.C.	MA90 HIGH LEAKAGE
1110	0052213E	ADX-8	MA90 SHORTED EMITTER TO COLLECTOR
1110	0045319E	ADX-8	D-001 HIGH LEAKAGE
1110	0052222E	ADX-8	MA90 SHORTED EMITTER TO COLLECTOR
1111	0030101D	ADX-8	MA90 SHORTED EMITTER TO COLLECTOR D-001 OPEN
1201	0010673 P	DEC	NONE
1201	0013214 P	DEC	T2029 TRANSFORMER LEADS WERE REVERSED
1201	0050622P	ADX-8	REPLACED 2 T2029 TRANSFORMERS
1201	0013215P	DEC	NONE
1201	0009225P	DEC	NONE
1201	0029003P	DEC	NONE
1201	0029184P	DEC	NONE
1201	0032573P	DEC	NONE
1201	0013218P	DEC	NONE
1201	0032583P	DEC	NONE
1204	00335328	ADAMS ASSOC.	NONE
1204	97116 B	ADAMS ASSOC.	NONE
1540	0034739D	PDP-4	NONE

UNIT	SERIAL #	CUSTOMER	REJECT
1540	00207640	PDP-1	NONE
1540	02786 D	PDP-4	OUTPUT PULSES TOO HIGH
1540	29033	EN2290	NONE
1546	327250	DEC	NONE
1546	566800	PROTOTYPE	NONE
1546	28082 C	PROTOTYPE	NONE
1546	28076 C	PROTOTYPE	OLDER TYPE CAPACITORS REPLACED
1546	58676 D	PROTOTYPE	NONE
1669	0012248 C	UNKNOWN	NONE
1669	0012514 C	DEC	NONE
1972	0038103 B	ADX-6	MD114 TOO HIGH ICBO LEAKAGE
1972	00380328	ADX-6	MD114 HIGH ICBO LEAKAGE MD114 OPEN
1972	0037756 B	ADX 6	MD114 HIGH ICBO LEAKAGE
1972	0038522	ADX 6	NONE
1972	0037760	ADX-6	MD114 HIGH ICBO LEAKAGE
1972	0038040 B	ADX 6	MD114 HIGH ICBO LEAKAGE
1972	0037781 B	ADX 6	MD114 HIGH ICBO LEAKAGE
1972	0038034 B	ADX 6	MD114 HIGH ICBO LEAKAGE
1972	0044661 B	ADX 6	NONE
1972	004283 B	ADX 6	MD114 HIGH ICBO LEAKAGE
1972	0025834 B	UNKNOWN	NONE
1972	0044318 B	ADX 8	NONE
1972	0034302 B	A.E.C.	NONE
1972	005012 4 B	MEMORY CHECKOUT	GA212 SHORTED EMITTER TO BASE
1972	00451155 B	ADX 8	NONE

UNIT	SERIAL #	CUSTOMER	REJECT
4111	42863 D	PDP 4	NONE
4111	42852 D	PDP 4	NONE
4111	0017498 D	DEC	NONE
4128	0023709 A	M.I.T.	NONE
4128	23712 A	M.I.T.	NONE
4202	0015953 B	ADX 8	0001 OPEN MD114 AND 2N1305 OPEN
4202	0013428 D	ADX 8	MD114 LEAKAGE

OF 52 MODULES TESTED, 20 HAD NO DISCERNIBLE DEFECTS.

dec INTEROFFICE MEMORANDUM

File

DATE October 17, 1962

SUBJECT Honeywell Visit

TO Ken Olsen
Harlan Anderson
Gordon Bell

FROM Winston Hindle

On Thursday, October 18, the following two men will visit DEC to discuss the PDP-4 for process control applications:

Samuel D. Harper, Manager of Engineering
Robert Moe, General Manager
Special Systems Division
Minneapolis-Honeywell
Pottstown, Pennsylvania

They plan to arrive at 9 a.m. and stay until 3 p.m.

Their division has been using the Honeywell 290 Computer in its systems and Mr. Harper feels that the PDP-4 may be more suitable.

W. R. Hindle

WRH:mcs

dec INTEROFFICE MEMORANDUM

DATE October 16, 1962

SUBJECT DECUS ANNUAL MEETING

TO Ken Olsen

FROM Elsa Newman

The Air Force Cambridge Research Laboratories at Hanscom Field, Bedford, Massachusetts was host to the DECUS delegates. Charlton M. Walter, CRRB, AFCRL, DECUS first President, presided over the meeting the first day (Oct. 10). After welcoming the new officers he turned the meeting over to newly elected president Mr. Edward Fredkin of Information International, Inc., Maynard, Massachusetts on October 11. A lively panel discussion brought keen user participation on the merits of various programming systems. The two-day meeting dealt with polymorphic systems, experimental color and flicker-free displays and man-machine graphic communications. Of special interest to users was the novel use of Digital's PDP as a peripheral computer for Laurence Radiation Laboratory's Stretch, Lark and 7090 computers. There was a free interchange of information among members which resulted in a stimulating atmosphere of challenge and accomplishment.

I am working on a transcription of the procedings which I taped. None of the AFCRL speakers was recorded.

Approximately 85 people were on the attendees register which I will obtain from the Meetings Chairman shortly. Laurence Radiation Lab. made useful suggestions which no doubt you already have heard about.

Should you care to write a message for the new DECUS year to members and officers, I would like to make it a part of the November DECUSCOPE.

I would personally be grateful for your suggestions and a declaration of DEC policy with reference to DEC's supervision and distribution of DECUS Library material.

Copy for H. Anderson

dec INTEROFFICE MEMORANDUM

DATE October 16, 1962

SUBJECT October Report for DECUSCOPE

TO Sandy Moore FROM Elsa Newman

As per our telephone conversation, I am enclosing a complete file of DECUSCOPE issues, (No. 1 thru 7). No. 1 gives a good summary of the goals and accomplishments of the user organization (DECUS) as gathered by me last March when the newsletter was proposed. The function of the newsletter is to implement the goals of the group. To stimulate interest I suggested an Executive Board Meeting on April 4 and worked very closely with the Board Members.

The new DECUS library change came to me as a surprise although Beverly Chloset's frequent remarks in June and July indicated that changes were being made (by DEC) for supervision of the DECUS library. I have been waiting for a clearly defined DEC policy toward DECUS.

I will be very grateful for a report giving information on the progress of the DECUS library since you have had it. I suggest a review of those items mentioned in DECUSCOPE. (You might find it a good place to begin since requests may have been received for quite a number of the mentioned routines). DECUSCOPE should contain a column of all Library activity including requests for old and new tapes, new contributions, etc. You will note that DECUSCOPE spearheaded the action on the Double Precision Package - and the Single Precision package. John Koudela gave the Single Precision Package Tape to Dit Morse yesterday (Oct. 15). Action on this should be included in the report. I go to press about Nov. 1. May I have your report by October 31st?

Good luck and many thanks.

CC: H. Anderson
S. Olsen
J. Koudela
D. Morse
M. Graetz

dec INTEROFFICE MEMORANDUM

DATE October 12, 1962

SUBJECT New Outside Page Lines and Night Answering Procedure

TO All Concerned FROM Brad Towle

New Page Lines

Outside Phone Calls during normal working hours can be answered by dialing 480 or 482 when paged by the switchboard operator. Please begin the conversation after dialing either page line as the calling party will be waiting on the line.

Night Answering Procedure

All telephone calls coming into the plant after normal working hours and on week-ends must be answered in the following manner:

Local Calls (Maynard Line TW7-8821)

Dial 480 to answer incoming call.

To Transfer local calls within the plant Dial 260 from another extension and page the person to dial 481.

Boston Calls (Waltham Line TW9-0510)

Dial 482 to answer incoming call.

To Transfer Boston calls within the plant, Dial 260 from another extension and page the person to Dial 483.

REMEMBER

TO ANSWER LOCAL CALLS ------DIAL 480

TO ANSWER BOSTON CALLS ----DIAL 482

INTEROFFICE MEMORANDUM

DATE October 11, 1962

SUBJECT

TO Harlan Anderson
Jack Atwood

FROM Kenneth H. Olsen

This DECUS Meeting which is now going on is rather impressive. We have important people from many parts of the country and they are presenting papers which in their title appear to rate favorably with those presented at large conferences. We should be sure to exploit this meeting and get publicity in the appropriate places.

I suggest that we consider including copies of the Decuscope where we send out literature on our computers. I am sure that many people don't realise how extensive our users group is.

Kenneth H. Olsen

MEMORANDUM

File

DATE: October 11, 1962

TO: K. Olsen
H. Anderson
S. Olsen
W. Hindle
G. O'Dea
D. Mills
D. Best
B. Gurley

FROM: J. Smith

Before trying to decide on a solution to our problem of the interchanging of customers and EN numbers, we can gain insight into the problem by reviewing our present procedures. In this way I hope the trouble areas will present themselves to us.

While undergoing construction the various machines and associated options are being constructed under either an EN or job number. Outside of this identifying number they have no other identity. Personnel working on these machines do not associate a certain machine with a particular customer. This was set up in this way to enable the interchanging of machines and options with a minimum of confusion. If we should decide to change a magnetic tape unit from one customer to another this does not call for the assignment of a new EN number nor is it necessary. The machine is completed under this number and all charges are made to this number. When complete, the charges to this number can be assigned to any customer. I do not feel that the construction area is a problem area because of the disassociation between customer and number. In this area the machines are being built to a number for stock and not for a particular customer. This attitude of disassociation between number and customer should be carried out throughout the plant. All personnel involved should be made aware of the purpose of an EN number. It is simply an accounting device for the gathering together of material, labor and overhead charges. We should not regard it as an indication of a particular customer.

When the systems move into checkout they do seem to pick up an identity with a particular customer. Checkout personnel hearing there has been a customer change have at times been confused because they do associate a machine with a customer. But I do feel that this problem has been taken care of. They have been instructed to use the EN number posted on the machine and not attempt to look up a particular customer's number. Special option EN numbers are also posted on the machine.

It is my opinion that the two above areas, Construction and Checkout, are not the problem areas. Most of the problems that take place in these areas in relation to changes have been ironed out. I feel that most of the confusion is taking place in accounting and in the area controlled by Jim Myers. The reason for this confusion could be a lack of communication. Many times these two areas are not informed that any customer change has taken place until after the

systems have been shipped. In most cases they learn of this change through informal conversation rather than formal channels. It is my feeling that most of our problems would be eliminated if there was a formal channeling of information to these two areas. I have talked with both Jim and Ed Simeone and they agree that if they were supplied with the necessary information when a change took place, there would be no problem.

I would like to suggest the following procedure for the channeling of change information. Most changes take place at a meeting and there is no official documentation of the change, consequently no distribution of information. Information concerning the change is transferred from one person to another verbally. Here lies the problem area. It would seem that if we appointed one person to be the clearing house for all this information flow we would be well on the way to solving our problem. This person would be supplied with a list of personnel to be notified when a change took place. It would be his responsibility to see that these people received all the necessary information. It is my feeling that Peter Bonner who issues all the original Construction Requisitions is the logical person to handle this channeling of information. The vehicle for this information could be our present amendment form or a new form could be designed. Pete presently has a list of personnel that the original Construction Requisition is sent to. This list could also be used for generating change information. Personnel receiving this information must be made aware that no action is required on their part; this notification is simply to keep them informed. The only person required to actually change any records would be Bob Dill in accounting. It is very important that every one be made aware that the change is a simple accounting function.

Everyone that does have reason to look up EN numbers on the issued EN list should be made aware of our accounting procedure by his supervisor. Supervisors can refresh their memories on the procedures with someone in the accounting department. There are still quite a few people using closed out EN numbers. This shows a lack of understanding of accounting procedures. It would maybe help everyone concerned if a bi-weekly list of closed out EN numbers were issued. But it still is each supervisor's responsibility to see that his people are using the right EN number. This is easily accomplished by reviewing the daily job tickets.

If everyone is in agreement, and I receive no negative replies within the next few days, I will speak to Pete Bonner on information flow procedures. This centralized clearing of information along with a more enlightened personnel on basic accounting procedures will, I hope, eliminate a long time problem.

dec INTEROFFICE MEMORANDUM

File

DATE October 11, 1962

SUBJECT

TO Harlan Anderson
Jon Fadiman

FROM Kenneth H. Olsen

Bill Congleton called to confirm the visit of Mr. Hachette of Cofelec Company.

Mr. Hachette will be staying at the Parker House all week and Bill Congleton offered to drive him out but I said we would take care of it. Jon Fadiman agreed that it might be worth while for him to pick up Mr. Hachette and bring him out here. This way Jon will have a chance to talk with him even though it might not be appropriate during his visit. He is expected out here at 10 o'clock, Thursday, October 18.

Kenneth H. Olsen

dec INTEROFFICE MEMORANDUM

File

DATE October 11, 1962

SUBJECT

TO Bob Beckman

FROM Bob Savell

cc: H. Anderson
B. Gurley
R. Mills

I believe we urgently need a form of this kind or some other formal manner to acknowledge installation and acceptance of systems of all sizes by customers. Copies of it should be sent by the person responsible for the installation to Customer Relations, and Sales and/or accounting.

It is not very businesslike to have accounting call me up and say - "Say, Bob, you remember that job we did for so-and-so a couple of months ago? Well, is it accepted - can we bill it?"

I figured this falls into your bailiwick. If not, holler.

######

SYSTEM INSTALLATION AND ACCEPTANCE REPORT

Customer _____ Date _____

System Name _____

The above system was installed on the above date at the location specified by the customer.

_____ for DEC

_____ for Customer

The above system has passed the acceptance tests agreed upon by the customer and D. E. C. If no tests have been specified, the equipment will be assumed to be acceptable to the customer and will be billed within X days after the installation date.

_____ for DEC

_____ for Customer

INTEROFFICE MEMORANDUM

DATE October 10, 1962

SUBJECT Visit by Bob Lane from ITT - RE: ADX 9, 10, 11 Cancellation Charges

TO H. Anderson ✓
N. Mazzarese

FROM R. Mills

I spoke with Bob Lane today and find that he will be unable to get up here before Friday, October 12. He stated that he would like to discuss the cancellation charges on ADX 9, 10, & 11, and would also like to see how the equipment is coming along on ADX 3, & 8.

In passing, he mentioned that they have a new Executive Vice President by the name of Mr. Mahasky.

# # #

INTEROFFICE MEMORANDUM

File

DATE October 9, 1962

SUBJECT Bi-Weekly Distribution

TO Winston Hindle

FROM Kenneth H. Olsen

When we started our Bi-Weekly Reports we were very concerned about the need for security. We would like people to tell freely in the Bi-Weekly Report what they are doing without any concern for the information leaking out.

Now I am concerned that we are suffering more by the lack of distribution than the danger of information leaking out. I would like to have you check into the possibilities of a wider distribution within the company. We might give it to all engineers, or at least one copy to each office, and to certain of the other administrative type people.

We should still maintain security. We might do this by having the old Bi-Weekly returned each week, or every other week, before a new one is issued.

This cannot help but mean more work. We might use the Library for some of these services. This might justify the inflated size of the Library.

Kenneth H. Olsen

cc: J. Atwood
H. Anderson ✓
S. Olsen
D. Best
B. Gurley

SUBJECT: REPAIR OF RETURNED MODULES

DATE: OCTOBER 8, 1962

TO: Harlan Anderson

FROM: JIM CUDMORE

THE FOLLOWING IS A LIST OF MODULES RETURNED FOR REPAIR DURING THE WEEK OF OCTOBER 1, 1962

UNIT	SERIAL NO.	CUSTOMER	DEFECT
721	2-802	U.S.A. SIGNAL CORPS. FT. MONMOUTH	2-1000 MFD CAPACITORS BLOWN. POOR LEAD DRESS AND POOR INSULATION ON WIRE
1201	0050612 P	A.E.C.	MA80 HIGH LEAKAGE
1209	0031529 K	ADX 7	SOLDER SHORT IN BACK OF BOARD
1209	82464 K	B.B.&N.	NONE
1209	0015521 K	UNKNOWN	NONE
1209	0031537 K	ADX 7	662 DIODE BROKEN
1304	0033753 E	DEC	MA89 SHORTED
1304	97223 E	DEC	NONE
1304	0044076 E	DEC	NONE
1549	0019089	UNKNOWN	(A-C1500 μμF) OBSOLETE CAPACITORS REPLACED
1549	0019085	UNKNOWN	RELAY SHORTED. OBSOLETE CAPACITORS
1549	0019091	UNKNOWN	RELAY SHORTED. OBSOLETE CAPACITORS
1549	0019398	UNKNOWN	OBSOLETE CAPACITORS
1607	0012194 B	UNKNOWN	NONE
1607	0019127 B	UNKNOWN	NONE
1607	0012192 B	UNKNOWN	NONE
1607	29058 A	PROTOTYPE	NONE
1607	0012188 B	UNKNOWN	NONE
1607	0018540 B	UNKNOWN	NONE
1607	0018191 B	UNKNOWN	NONE
1607	0018537 B	UNKNOWN	NONE
1802	0020148 C	I.T.T.	NONE
1802	0020157 C	I.T.T.	NONE

REPAIR OF RETURNED MODULES (CONT.)

UNIT	SERIAL NO.	CUSTOMER	DEFECT
3114	26313	U.S.A. SIGNAL CORPS.(FT. M.)	NONE
3114	25432	U.S.A. SIGNAL CORPS.(FT. M.)	NONE
3114	26978	U.S.A. SIGNAL CORPS.(FT. M.)	NONE
3114 C		U.S.A. SIGNAL CORPS.(FT. M.)	NONE
3302 C		U.S.A. SIGNAL CORPS.(FT. M.)	BROKEN WIRE--LOOSE EYELETS
3302 C		U.S.A. SIGNAL CORPS.(FT. M.)	BROKEN POWER LEADS
4129	0022297 C	ADX 6	001 DIODE BROKEN
4152	97811	U.S.A. SIGNAL CORPS.(FT. M.)	2N1305 SHORTED
4301	0022134 E	DEC	NONE
4301	0022163 E	DEC	NONE
4301	36350 C	DEC	NONE
4301	0046936 E	DEC	MD114 OPEN
4680	0029959 F	I.T.T.	2N1184 SHORTED
4680	0023928 F	I.T.T.	2N1184 SHORTED
4680	0023942 F	I.T.T.	2N1184 SHORTED
4680	0023940 F	I.T.T.	2N1184 SHORTED
4700	05323	UNKNOWN	MD114 HIGH LEAKAGE--D664 SHORTED
4700	05263	UNKNOWN	2N1218 OPEN
4700	0039125	UNKNOWN	NONE
4700	0039112	UNKNOWN	BAD FUSE
4700	0039122	UNKNOWN	NONE
4700	0039115	UNKNOWN	NONE
4700	05390	UNKNOWN	NONE
4700	05236	UNKNOWN	NONE

OF A TOTAL OF 47 MODULES RETURNED, 26 HAD NO DISCERNIBLE DEFECTS.

KRT file

INTEROFFICE MEMORANDUM

DATE 10-8-62

SUBJECT J.P.L. PDP-1

TO Ted Johnson
Western Regional Manager

FROM Bob Oakley

The last three weeks I was with J.P.L. and to the present date a unique problem exists with the J.P.L. PDP-1. This problem is that of time. Since the successful launching of "Mariner-2" the PDP-1 has virtually been in operation continuously. Only short period interruptions of data from the three world wide tracking stations permit maintenance and adjustments to be made without a basic loss of prestige to the PDP-1. Most of the failures encountered could be justified by one means or another. However, they did occur and it is very unfortunate that they happened at this crucial time, because the existence of the PDP-1 being relied upon at J.P.L. for real time data processing is somewhat dependent upon the performance of this machine during the Mariner-2 flight. Therefore, I feel it is extremely important that we convince anyone concerned at J.P.L. that future PDP-1's will not contain the same type of problems because of our having solved these problem areas.

Because of the hardware back-up system at J.P.L., no spacecraft telemetry data was lost due to PDP-1 down time. Actually, the PDP-1 operated at good efficiency at the most critical time; just preceding the mid-course maneuver and the pre-launch period.

The following three items are the problems basically encountered at J.P.L. during the Mariner pre-launch and flight, listed in the order of significance (most significant first).

1. Magnetic tape system

The magnetic tape system was definitely the most detrimental to the whole operation. The people at J.P.L. do not have a good feeling about the tape system and in particular the Potter Instruments tape transports. The feeling is two-fold.
First: the tape transports are extremely difficult to load, which makes frequent tape changes awkward and slows down operations to the extent that if this operation were to continue with these transports, additional units would be required solely for the purpose of speed and ease of changing tapes.
Second: because of numerous failures, particularly with one unit, there is a feeling of unreliability. The replacement of the defective tape transport left a good impression of DEC at J.P.L., but did not improve the feeling about the Potter tape transport's reliability, primarily because so many attempts to repair it were unsuccessful.

Some problems still do exist at J.P.L. with the tape system. It is not understandable to me why other customers have not encountered similar problems. It may very well be that some do and haven't complained, which brings me to believe we should try to correct any possible problems before a situation occurs again that is similar to the J.P.L. situation. The problems that are still presently existent at J.P.L. must by all means be corrected at the earliest possible time. Still, we are virtually handcuffed because of the continuous computer usage. Furthermore, it is my feeling that we will require a maximum amount of effort and time to completely investigate and solve the basic problems.

2. Programming problems

The programming problems encountered at J.P.L. were not in any way a reflection upon us. Actually the ease of PDP-1 programming was brought to a real test and in general it proved PDP-1 programs can be changed or modified simply and easily.

Several modifications were made as difficulties arose with the real-time acquisition program. Most of these changes were made between station transmission and were made to facilitate program manipulations from the sense switches, etc., and to ease the changing of quick-look magnetic tapes. One serious programming problem did exist and was very unique because it appeared almost completely random in nature and gave all the symptoms of an intermittent machine failure. The problem was actually this: in the case where a sequence of a particular subroutine broken by the input at one particular point and reset back by the JMP', if an index was initiated when the address was equal to 7777, a deferred condition caused a program change which in turn clobbered a large area in core. This problem occurred on the average of twice a day and was very difficult to isolate.

3. Computer main frame failures

Four failures have occurred in the computer since the launching of Mariner-2 (five weeks time to date). It is very unfortunate that these failures occurred during the time when continuous reliability is required because only three failures were encountered during previous four months. It is my feeling that fewer failures will occur in the future, particularly the type of failures previously encountered. Furthermore, it is my understanding that PDP-1 computers presently being manufactured do not have the quality control problems that were existent when the J.P.L. serial number 13 computer was being built. The four failures in question are listed below in chronological order.

A. Logical failure -- cycle one and power clear gates

A. (Continued)
   1. Resulting system down time -- two hours
   2. Cause of failure -- short on modules (inverter type 1105)
   3. Symptoms of failure -- no programs would operate including paper tape loader, program counter transferred to memory address during cycle one. Cycle flip-flop operated correctly but the output level at the control points was incorrect due to the short. During the period while trouble-shooting, the short caused the clamp reference voltage to go almost to ground which in turn opened the power clear gate making trouble-shooting even more burdensome at that time.

B. Telemetry Shift Register input
   1. Resulting system down time -- two hours
   2. Cause of failure -- shorted wiring, improper splice which was not correctly sleeved with an exposed area which would intermittently short to ground with vibration.
   3. Symptoms of failure -- the shift register would smear from bit 6 (point of short) intermittently. Removing of a module would eliminate the short because the frame of the module was shorting to the bad splice on the ribbon cable.

C. Core failure
   1. Resulting system down time -- three hours
   2. Cause of failure -- write driver transistor
   3. Symptoms of failure -- intermittent failures of core - particularly during manual manipulations of control. Checker-board would run reliably, but couldn't examine after read-in. Memory appeared to operate only in a continuous mode, any interruption would clobber a program. All signals appeared correct while checker-board was running and sense amp margins good. Trouble-shooting was very frustrating.

D. High speed channel address mixer
   1. Resulting system down time -- thirteen hours
   2. Cause of failure -- no solder connection
   3. Symptoms of failure -- all records written on magnetic tape contained same word with proper record word count. No pulse to HSC. address mixer.

dec INTEROFFICE MEMORANDUM

DATE October 5, 1962

SUBJECT PDP-4

TO Ben Gurley

FROM Bob Hughes

We are concerned about the quality of PDP-4's because many of our procedures which result in quality are being bypassed.

The 4203 and 4204 flip-flops were designed and put into production on the basis of model tests and not on the basis of their first lot tests. Our standard procedure is to have the first lot tested and then make a decision on whether to produce more lots of these units. In this case, the first lot test on both units was bypassed; indeed all testing was bypassed, and these modules were installed in PDP-4's, where it was discovered they were temperature sensitive and had low margins.

I happened to hear about this casually, and on looking into it discovered that we had used 2N1305's as output buffers in these flip-flops, and due to marginal positive bias on the base of these stages, the same transistor manufactured by a different company would not work in the circuit. The checkout crews were removing one manufacturer's transistors and installing another manufacturer's transistors as a solution to the problem. When we became aware of this, we requested engineering to make a change in the circuit and they did.

By now about six lots of flip-flops had been installed in PDP-4's and were untested and were being hand modified on the spot (by selecting transistors) to make them work. Gordon Bell was notified that all units must be modified and tested, so he proceeded to have Jack Smith have them modified, but due to the fact that he was told to get them back to Gordon immediately, these units were not retested. They were installed in the machines and it was found that a large percentage of them were inoperative. He sent the units that would not work back to the test area where they were repaired and tested. To my knowledge, as of this date, all units have not been modified, and I don't know whether the units which were modified and worked were tested or not.

One morning it was discovered that two 4604 pulse amplifiers had been removed from two production burst generator test setups. These were subsequently found in a PDP-4, and it has been determined that a PDP-4 technician had removed these during the night for use in a PDP-4.

In the process of looking for these units, I discovered, on pulling modules at random from PDP-4's, that they were covered with flux. This is an indication that after production assembled the units and installed the transistors, they weren't even ultrasonically cleaned, let alone tested or final inspected.

I believe that some effort should be made to clear up some of the concepts of company operation, and I would be glad to cooperate with you in any way that I can.

cc: Ken Olsen
Harlan Anderson
Stan Olsen
Maynard Sandler
Dick Best
Jack Smith
Jim Cudmore
Klaus Doering
Gordon Bell
Q. C. Manual

INTEROFFICE MEMORANDUM

File

DATE October 3, 1962

SUBJECT Fredkin Rental of PDP-4 and accessory equipment

TO Harlan Anderson FROM George O'Dea

Gordon Bell has provided the following list of equipment which Fredkin may wish to rent:

Item	Price
PDP-4	$85,000
Mag Tape Control	7,000
Line Printer	72,000
Mag Tape at 18,000	36,000
Card Reader	≈ 15,000
Card Punch Control	8,000
Card Punch (IBM-523)	
Scope	14,800

I propose that we take a real hard nosed attitude here and offer him an hourly rental which equals the list price of each piece divided by its normal hours of useful life.

First, I'd like you to agree to this in principle; Second, I'd like you to estimate the hours of normal life for each item; and Third, I think we should refuse to provide the supplies.

George T. O'Dea

GTO'D:ncs

dec INTEROFFICE MEMORANDUM

DATE October 3, 1962

SUBJECT Princeton-Pennsylvania Accelerator
(letter attached)

TO N. Mazzarese

FROM Stan Olsen

This letter is real hot, and I suggest that you follow it up immediately. You should probably check with Ken first to see what action he has taken already and don't hesitate to use his services along with those of Ben Gurley and Dick Best.

The policy is that we are going to pursue as much PEPR business as we can because it looks like there will be at least 50% of it in foreign government which should put us in a good position renegotiation-wise. We should immediately let them know about our letter of intent policy and try to get a letter of intent out ~~to~~ of them right away.

PRINCETON-PENNSYLVANIA ACCELERATOR
PRINCETON UNIVERSITY
JAMES FORRESTAL RESEARCH CENTER
PRINCETON, N.J.

MAIL ADDRESS
ACCELERATOR, P.O. BOX 682
PRINCETON, N.J.

TELEPHONE
PRINCETON, N.J.
WALNUT 1-8000

September 27, 1962

Presidents Office,
Digital Equipment Corporation
Main Street.
Maynard, Massachusetts.

Dear Sir:

We are giving serious consideration to obtaining equipment, now being developed by Professor Pless and your company, for precision encoding and pattern recognition (PEPR). The equipment would be used in conjunction with the Princeton-Pennsylvania Accelerator. I realize that the part being developed by Professor Pless is still in an early stage, and will almost certainly have the usual production difficulties. Nevertheless, I am sufficiently impressed by the long term outlook that I wish to go on record as a very likely purchaser of a complete PEPR system. In the meantime I would like to be kept fully informed on progress, or lack of it.

Since your PDP-1 computer is an integral part of PEPR, and useful for many other problems as well, we may wish to order it early. Therefore I am interested in receiving all available technical data on the PDP-1, its price and availability.

In the event we definitely decide to purchase the PDP-1, and the PEPR equipment, we will want a firm indication of where we will stand in the relative priority list. I would therefore like from you an indication of the steps we should take to insure early delivery. Obviously you would like a firm purchase order, but clearly this will take some time to secure.

Very Truly Yours,

Milton White

Milton White
Professor of Physics
Director, Accelerator Project

MGW:bp
cc: G.T.Reynolds
H.Blumenfeld
I.Seidlitz
R.E.Schultz

dec INTEROFFICE MEMORANDUM

File

DATE October 2, 1962

SUBJECT Introductory Meeting

TO Morgan Guaranty Trust File

FROM George O'Dea

cc: Harlan Anderson

On October 1 Messrs. Norbert LeRoy and David Dyche of the Morgan Guaranty Trust paid us an introductory visit.

Ken and Harlan gave them a brief description of the Company and its Products then a Plant tour.

Mr. LeRoy is with the International Division of Morgan Guaranty and pointed out the areas in which he could be helpful to us. Specifically mentioned were credit references on Companies and Individuals, advice on foreign currencies and their exchange, and advice on free ports. In general, any financial matter with foreign involvement. Mr. LeRoy is an acquaintance of Mr. deVitry.

Mr. Dyche is in the Corporation Research Division of Morgan Guaranty. He had some interesting ideas on leasing (2 yr. commitment) and was asked to ponder the Revolving credit term loan matter as the solution to our cash requirements.

The gentlemen were given our audit report for fiscal '62 and '61 and the results of operations for fiscal '60. We told them of our target of $10,800K for fiscal '63.

It was left that Harlan would contact Mr. Dyche next time he visits New York. Mr. Dyche will return some time thereafter with an associate more directly concerned with our problems to explore the possibility of Morgan Guaranty participating in any future financing through the National Shawmut.

George T. O'Dea

GTO'D:ncs

INTEROFFICE MEMORANDUM

DATE October 3, 1962

SUBJECT Fredkin Rental of PDP-4 and accessory equipment

TO Harlan Anderson FROM George O'Dea

Gordon Bell has provided the following list of equipment which Fredkin may wish to rent:

Item	Price	÷30 = Mo rental	÷173 = hrly rental
PDP-4	$85,000	2,833.33/Mo	16.38/hr
Mag Tape Control	7,000	233.33/Mo	1.35/hr
Line Printer	72,000	2,400.00/Mo	13.87/hr
Mag Tape at 18,000	36,000	1,200.00/Mo	6.94/hr
Card Reader	≈ 15,000	500.00/Mo	2.89/hr
Card Punch Control	8,000	266.67/Mo	1.54/h
Card Punch (IBM-523)			
Scope	14,800	493.33/Mo	2.85/h
	237,800	7,926.66	45.82/hr

I propose that we take a real hard nosed attitude here and offer him an hourly rental which equals the list price of each piece divided by its normal hours of useful life.

First, I'd like you to agree to this in principle; Second, I'd like you to estimate the hours of normal life for each item; and Third, I think we should refuse to provide the supplies.

George T. O'Dea

GTO'D:ncs

digital MEMO

DATE 10/2/62

TO Kenneth H. Olsen

H.E.A.

FROM Dave Denniston

Just for your information, Milton White of the Princeton-Pennsylvania Accelerator at Princeton University is a PhD.

File

To Andy

File

DECUS

PROGRAM

MEETING AT HANSCOM FIELD, Bedford, Mass
in Building called WING B

October 10 (Wednesday)

0900 CHECK-IN (ERD Building)
0930 INTRODUCTORY REMARKS
Charlton M. Walter, DECUS President
0945 THE PDP-4 PROGRAMMING SYSTEM
H. Morse. DEC
1030 READING FILM WITH A COMPUTER
M. Cappelletti. Information International. Inc
1100 MINIMAX DETECTION STATION PLACEMENT
Richard D. Smallwood, AFCRL
1130 ADAPTIVE FILTER PATTERN RECOGNITION
Theodore Strollo, AFCRL
1215 LUNCH
1330 DYNAMIC ATTRIBUTE EXTRACTION
Charlton M Walter, AFCRL
1430 A WORLD OCEANOGRAPHIC DATA DISPLAY SYSTEM
Edward Fredkin, Information International. Inc
1500- DISPLAYS by Steven Bernstein, AFCRL

October 11 (Thursday)

0900 MATRIX PACKAGE FOR DX-1 SYSTEM AFCRL
Carming J. Caso, Wolf R & D Corp.
0920- LAWRENCE RADIATION LABORATORY'S PDP-1:
A PERIPHERAL PROCESSOR FOR LARGE COMPUTERS
Dorothy Monk
1000- A PDP SYSTEMS TAPE
Fraser Bonnell, LRL
1030- Other Papers-
DISCUSSION OF LRL INSTALLATION
1115- BUSINESS, INTRODUCTION OF NEWLY ELECTED OFFICERS
1230- LUNCH
1330 THE BBN SYMBOLIC VERSION OF DECAL
R. J. McQuillin, Bolt, Beranek and Newman, Inc.
1530- DECAL, MACRO and the PDP - Panel Discussion
John Hayes, AFCRL, Moderator
Roland Siler, Mitre Corp.
H. Morse, DEC
Alan Kotok, M.I.T.

To give you an idea before DECUSCOPE is out.
Full abstracts will be in DECUSCOPE + you will have
it at the meeting. It will be in the mail Friday.
Regards - Elsa Oct 3, 1962

DATE: OCTOBER 2, 1962

File

SUBJECT: REPAIR OF RETURNED MODULES

TO: Harlan Anderson

FROM: JIM CUDMORE

THE FOLLOWING IS A LIST OF MODULES RETURNED FOR REPAIR DURING THE WEEK OF SEPT. 24

UNIT	SERIAL NO.	CUSTOMER	DEFECT
52	1933	R.C.A.	NONE
52	1931	R.C.A.	NONE
52	3716	DEC	BROKEN PRINTED CKT (OPEN)
62	2874	DEC	DRIVER DROPPED--KNOBS SMASHED COARSE SLOPE, SWITCH BROKEN,ETC.
62	1940	R.C.A.	NONE
62	NONE	EN 2152	MISSING FUSE
1104	0010780 D	EN 2290	D2-001 OPEN
1104	29304 B	PDP-1 PROTOTYPE	NONE
1105	0033744 E	G.E.	NONE
1110	0011130 E	ADAMS ASSOC.	D001 OPEN, D001 SHORTED
1110	0021450 E	AEC/CANADA	D001 OPEN, D001 SHORTED
1111	0033545 D	EN 2290	NONE
1111	95038 D	DEC	D001 HIGH LEAKAGE
1201	0039901 P	I.T.T.	TRANSFORMER LEADS SHORTED TOGETHER
1201	0032648 P	ADX-3	TRANSFORMER LEADS SHORTED
1201	32634 P	I.T.T.	TRANSFORMER LEADS SHORTED
1201	0024314 P	ADX-6	BROKEN 001 DIODE
1201	44197 M	B.B. & N.	CHANGED COMPLIMENTING DIODES TO 003
1201	40203 L	PROTOTYPE	REPLACED COMPLIMENTING DIODES REPLACED MA45 WITH MA89 REPLACED 2N588 WITH MA90
1201	43650	B.B. & N.	REPLACED COMPLIMENT INPUT DIODES WITH .003
1607	29062 A	PDP-1 PROTOTYPE	NONE
1607	29059 A	PDP-1 PROTOTYPE	NONE

REPAIR OF RETURNED MODULES (CONT.)

UNIT	SERIAL NO.	CUSTOMER	DEFECT
1607	88651 B	CRC # 3	NONE
1669	01763 C	UNKNOWN	NONE
1972	0044824 B	EN 2039	MD114 SHORTED
1979	98599 B	EN 2233	NONE
1979	0025332	UNKNOWN	T1796 OPEN
1982	0040239 B	ADX 7	2N1204 SHORTED--MD114 SHORTED
1982	0023740 B	M.I.T.	MD114 SHORTED--NO OUTPUT ON PIN X
1982	0043316 B	ADAMS ASSOC.	NONE
4105	03714 E	DEC	NONE
4105	0050697 E	I.T.T. #8	NONE
4105	35481 D	DEC	NONE
4105	76264 E	UNKNOWN	NONE
4111	75709 D	TEST EQUIP. HDQS. -- EN1048	NONE
4111	75720 D	T.E.H.--EN1048	NONE
4201	76814 M	T.E.H.--EN1048	NONE
4201	76813 M	T.E.H.--EN1048	NONE
4201	76820	T.E.H.--EN1048	NONE
4201	76817	T.E.H.--EN1048	NONE
4201	77109 M	T.E.H.--EN1048	NONE
4201	77107 M	T.E.H.--EN1048	NONE
4201	76826 M	T.E.H.--EN1048	NONE
4201	76816 M	T.E.H.--EN1048	NONE
4201	77120 M	T.E.H.--EN1048	NONE
4201	77104 M	T.E.H.--EN1048	NONE
4201	76824 M	T.E.H.--EN1048	NONE
4301	79989 E	T.E.H.--EN1048	NONE
4686	0041806 A	UNKNOWN	NONE

REPAIR OF RETURNED MODULES (CONT.)

UNIT	SERIAL NO.	CUSTOMER	DEFECT
4686	0041800 A	UNKNOWN	NONE
4686	0041795 A	UNKNOWN	NONE
4686	0041798 A	UNKNOWN	NONE
4686	0041799 A	UNKNOWN	NONE
4686	0041794 A	UNKNOWN	NONE
4686	0041793 A	UNKNOWN	NONE
4686	0041807 A	UNKNOWN	NONE
4686	0041803 A	UNKNOWN	NONE
4686	0041802 A	UNKNOWN	NONE

UNITS THAT DO NOT HAVE A CUSTOMER NAME BESIDE THEM ARE ONES FROM WHICH THIS INFORMATION WAS MISSING ON THE TAG. PLEASE FILL OUT THE TAGS!!!!

OUT OF A TOTAL OF 59 MODULES RETURNED, 41 HAD NO DISCERNIBLE DEFECTS.

H.B.G.

October 1, 1962

Personnel Meeting - Wednesday 10/3/62 - 4:00 PM

Bob Lassen

K. Olsen
H. Anderson
S. Olsen
G. O'Dea
M. Gandler
W. Hindle
B. Gurley
R. Best
R. Mills

AGENDA

1. Proposed changes in group insurance plan

2. Proposal for establishing a more consistent wage administration program.

3. Proposed Job Classification, Merit Rating and Wage Review program for all non-exempt employees.

4. Establish pay policy for hourly employees travelling to and working at customer locations.

5. Establish a time for the second shift rest period.

6. Discuss establishing monthly meeting of supervisors with Personnel Department for better feed-back of human relations.

7. Discuss company participation in sponsoring employee membership in professional organizations. Play by ear

8. Tuition Refund approvals.

Group Insurance - Proposed Changes

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(a) A complete elimination of coverage at an earlier age than retirement is illegal - both for existing or new employees.

(b) Periodic reduction of face amount of life insurance at certain age levels is permissible for both existing or new employees.

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Although periodic reduction of insurance by age levels has some merit, I feel there are some strong moral arguments against it. Most married men at age 50 or 55 or even 60 still have large life insurance obligations and a life insurance reduction would materially affect family security. There is also the moral obligation to faithful long-term employees who have worked hard to build up a satisfactory estate for their families continued well being.

A survey of the area indicates that only General Radio has incorporated an age reduction provision in their insurance plan. Since we are competing with Sylvania, R.C.A., I.B.M., Honeywell, etc., for top people, an age reduction in our plan would not be a good recruiting measure. Our present life rate has dropped to 39¢ per $1,000 from the initial 43¢ rate when the plan was adopted. Although it is imperative that we watch this rate very carefully, John Hancock feels that we are many years away from a high rate problem. In addition our life claims are charged against the case on a "pooling formula" derived from our annual life premium.

I recommend that we do not incorporate any age limitations at this time. If our life rate starts to increase abnormally, we can then take appropriate measures to limit life coverage by age. I think that limiting coverage to new employees (as described in (c) above) is the fairest way to accomplish this.

2. Private Room Coverage - Major Medical

For some time we have felt that people, who either forced or prefer to be hospitalized in a private room because of the nature of their illness, are penalized because our present plan excludes private room coverage under Major Medical and therefore does not

provide coverage in excess of $20.00 per day. In May, the John Hancock Company presented us with the following rates for extending our major medical plan to include private room coverage:

Additional Monthly Cost Per Employee and Dependent Unit

	$25	$28	$30
Employee	$.17	$.27	$.34
Dependent Unit	$.29	$.46	$.58

At that time, we felt that this coverage should be included under Major Medical at no additional charge. John Hancock feels quite strongly that the extension of such coverage will encourage an increase in the amount of private room claims and therefore will result in some additional cost. Because of this, they are fairly adamant about increasing our premium to compensate for such an inclusion; however they have proposed a lower rate as follows:

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I feel this is fair and that their reasoning is sound. Therefore, I recommend we re-write our plan to include private room coverage under Major Medical at the $30.00 per day charge. I also recommend that the company absorb the entire cost of this increase and that we announce it to our employees as a new benefit.

3. Group Insurance Administration

We have discussed our present methods of administering our group plan with both Bill Duane and Mr. Frank Di Yorio, John Hancock Group Representative. They are well aware of our desire to streamline the paper work involved and they are now working on this. So far the proposal they have presented to me is unsatisfactory and I have asked them to "think a little harder". Both Barbara Charnock and I feel that we should never completely let go of insurance administration. First of all, Barbara is our expert - she knows more about the plan than any one else in the company. Our employees have confidence in her and have been well served by her - especially when most needed. This has been a tremendous morale factor and has allowed her the opportunity of much needed personal contact with many of our employees. It also

lets the employee know that the company is taking a personal interest in them and their insurance plan. For this reason, I strongly feel that overall group insurance administration should remain in the Personnel Office. Workmen's Compensation (Liberty Mutual) claims are not as prevalent and should eventually be handled by the company nurse.

Proposed Wage Structure

Our current wage administration policy particularly for junior administrative people is inconsistent. Some of these people are classed as non-exempt while others are exempt. There are also inconsistencies in the assignment of insurance classes.

I therefore propose the following wage classes:

(a) Hourly - Subject to all non-exempt provisions of the Wage and Hour Act. Required to record working time by punching a time card. Eligible for company benefits and privileges for hourly employees provided all other requirement are met.

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The following non-exempt people meet the necessary requirements under the Wage and Hour Act to be classed as Exempt. I propose we class them as exempt immediately and also determine whether they fall into the Salary-Overtime (c) or Salary-Straight (d) category as outlined above. These people would then be eligible for the January salary review:

R. Maroney	J. Rutschman	B. Charnock
W. Farnum	T. Whalen	H. Shebak
F. Maclean	F. Mariani	L. Boucher
F. Kalwell	R. Blackwood	R. King

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I feel we should establish a policy for conducting semi-annual job classification reviews for all non-exempt employees for the purpose of providing a consistent method of reviewing our hourly wage structure.

I would also like to propose that we establish a policy to provide for formal hourly merit ratings three times a year. Such a program to be administered by the Personnel Department.

The whole hourly Job Classification, Merit Rating and Wage Review program would tie-in together as follows:

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The actual time of the annual wage review will on occasion be determined by results of previous classification reviews and area wage surveys.

Since October is upon us, I feel we should conduct a non-exempt job classification review and merit rating as soon as possible. It would be conducted by the Personnel Office through the appropriate department heads in the same manner as the April review.

I emphatically submit that the October job classification review should not be tied in with wage increases!

To conduct this program effectively, the Personnel Department will need IBM run sheets in October and June containing the names of all non-exempt employees by department and their current rate. Other information may be needed but we can work this out later.

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I would like to have the opportunity to meet with our Supervisors once a month. The prime objective of these meetings would be to discuss employee relations and to provide a more direct line of communication with our employees.

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October 1, 1962

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dec INTEROFFICE MEMORANDUM

File

DATE October 1st, 1962

SUBJECT

TO Gordon Bell

FROM Kenneth H. Olsen

Foxboro has asked us for a brief one page specification on our Fortran which can be included in the PDP-4 manual. I think we should immediately produce this thing. On questions that we are not sure of, we should not mention anything or hedge. It would seem that we could generate a page full of positive statements and leave out all the things we are not sure of.

Kenneth H. Olsen

cc: Harlan Anderson
Arthur Hall

dec INTEROFFICE MEMORANDUM

DATE October 1st, 1962

SUBJECT

TO Jack Atwood

FROM Kenneth H. Olsen

Foxboro wants to use our PDP-4 manual with our name on the cover. We told them this was all right but we want to own the copyright on the document so that we always have the right to its contents. We were talking about how this could be done and I was shocked to realize that we were, during this same meeting, delivering about 20 PDP-4 manuals to them which were not copyrighted. This means that we had already technically lost all the advantage which we were worrying about in the question of copyrighting. Will you be sure that everything we print from now on is copyrighted.

Kenneth H. Olsen

cc: Harlan Anderson
Gordon Bell
Stan Olsen

dec INTEROFFICE MEMORANDUM

DATE September 28, 1962

SUBJECT

TO Harlan Anderson
George O'Dea

FROM Kenneth H. Olsen

On Monday, October 1 at about 11 o'clock, we will be visited by Morgan Guarantee Trust Company of 23 Wall Street, New York 8, New York.

Mr. Norbert G. Leroy who is Assistant Vice President and specialist in European Affairs is our contact at the bank. He is a friend of General Doriot and is working on an American Research like company in Europe. He is a pilot and parachute jumper and may fly his own airplane out.

Mr. Leroy will bring along David Dyche who is with the Corporate Research Department and is probably the one who will take particular interest in our company.

Kenneth H. Olsen

October 1, 1962

Billing Procedures for Computers

K. Olsen
H. Anderson ✓
G. O'Dea
S. Olsen
B. Gurley
W. Hindle

R. Mills

JK

H. S. G.

As part of getting across to the Renegotiation Board our concept of a PDP-1 as a system, Mac Chick has suggested that we bill all of the PDP-1's - Central computers and accessories which can be priced from our established price list on one invoice and that we bill all custom equipment on a separate invoice. The procedure is very straightforward, as it can be done by exception in the Billing Department easily. We would like to start this procedure with the month of October unless there is some objection.

# # #

dec MEMO

DATE 9/28/62

TO H. Anderson & Stan Olsen FROM Ted Johnson

The attached memo by Tom Miller describes the checkout system which will be duplicated at Cape Canaveral. Tom is particularly interested in the extent to which we will go in special systems. This one might be within our realm. Wants to know if we would joint bid it or if we are aware of who would bid our machine. It would appear that Beckman would.

I think we are in quite good shape at JPL and there are good possibilities for PDP-4 sales. We need to educate them and are planning a presentation here at the office.

Current computer areas at JPL are:

1. SFOF System (PDP-1) - Computer used to generate test patterns for systems checkout.
2. Spacecraft Checkout (attached) PDP-1
3. PDP-4's for data translators - Walt Wolin
4. Other PDP-4's

Ted

DAP 984

JET PROPULSION LABORATORY

INTEROFFICE MEMO

September 11, 1962

Ref. No. 372.31/21

TO: Distribution

FROM: T. B. Miller

SUBJECT: Data System for the Support of System and Sub-System Tests at AMR and SAF

PURPOSE:

This memo will describe a general purpose data system to be installed at the Spacecraft Assembly Facility (JPL) and at the JPL Assembly and Checkout Facility at AMR for support of system and sub-system tests. The purpose of this memo is to present a general approach to the data system and to request information on requirements from potential users upon which a detailed design may proceed. A schedule of milestones for completion of the design and delivery of the system is given.

SCOPE:

A. Purpose of the Data System

The present method of systems testing involves the complete dependence on special purpose G.S.E. for all data used in monitoring spacecraft performance. From the standpoint of economy and operational support, it is desirable to standardize the central portion of a system for acquisition, recording, on-line reduction and display of data required for the evaluation of spacecraft performance. This approach provides a facility oriented checked out, data acquisition, recording, reduction, and monitoring system capable of supporting all spacecraft. Changes to accommodate different spacecraft are reduced to spacecraft dependent telemetry conversion equipment and to the central computer program. The specific tasks that the data system would accomplish are:

1. Alarm Processing. The data system would monitor spacecraft measurements whether telemetered or hard line connected for "in tolerance" conditions. Upon getting a measurement which did not meet specifications, an alarm would be given. The specifications on a given measurement would be automatically varied in different steps of the test procedure to accommodate those measurements which have characteristics which normally vary in the test sequence. The internal monitoring sequence of the computer would be

programmed to react to an alarm so that those measurements which are correlated with the non-standard measurement could be examined in greater detail than would be available in a normal scanning sequence.

2. Quick-Look Reduction. The capability would be inherent in the data system to drive a number of display devices in real time. These could be tabulated printouts, plots or decimal window displays of selected measurements. The computer program would allow the Test Director to select any measurement or combination of measurements--up to the capacity of the display devices and the computer--to be displayed. The complete display of all the data accumulated during a test could be generated after the completion of the test. However, volume high-quality hard copy output would not be a capability of this system, and such output should be generated by the Central Computer Facility from the accumulated data.

3. Spacecraft Control. It would be a capability of the data system, although it is not intended that this be an initial use, to automate the test sequence to follow a pre-programmed course. In the event of malfunction or non-standard occurance, the computer program would break away from the standard sequence to exercise those functions which are associated with the failure, and thereby, provide a tool for more rapid and accurate failure diagnosis.

4. Acquisition and Recording. All telemetry and hard line data will be acquired and recorded.

B. Data System Boundaries

This data system as proposed would include the following functional equipment.

1. Interface equipment to connect directly to the spacecraft and to existing Ground Support Equipment, preferably the spacecraft.

2. The necessary telemetry recovery equipment from the output of the receiver.

3. Conversion devices to make the telemetry and hard line data suitable for computer entry.

4. Recording equipment to provide raw records of the test for non-real time reduction.

5. A general purpose computer and controllable scanner-multiplexer system for real time and non-real time reduction of spacecraft measurements.

6. Display devices for displaying data processed by the data system. One display module will probably be available for each spacecraft sub-system and for the systems Test Director.

7. The necessary control devices and spacecraft interfacing to mechanize the control of the spacecraft test sequence.

Preliminary Design Configuration

Figure 1 attached is a block diagram of the preliminary design configuration. The diagram shows how the various data sources and output devices connect to the central part of the data processing system--the computer and the scanner-multiplexer. The spacecraft telemetry receiver output is fed through suitable conversion equipment (discriminators, decommutators, level detectors, etc.) to the scanner-multiplexer. In its raw form, the telemetry is also recorded on an analog tape deck. The hard line data is also entered into the scanner-multiplexer, and in general, these data will require digitizing to make them suitable for computer entry. While the number of hard line measurements will probably preclude the recording of them all in raw form, it would be possible to record those measurements which are most critical during a particular phase of the test; or, it would be possible to automatically start recording any measurement which goes out of tolerance.

The scanner-multiplexer is a device which scans a number of inputs and assembles them for entry into the computer as a serial string of source tagged measurements. Normally the scan rate and sequence of such a device are either fixed or under the control of a plugboard programmer: It is quite feasible, and for this system it is necessary, that the scan rate and sequence be under the control of the computer. This would allow the computer program to modify the frequency at which any measurement is being sampled, based on the phase of the test being conducted or on non-standard performance of any measurement or set of measurements.

The general purpose computer part of the system will be a fast (5 to 7 microsecond cycle) small to medium sized (around 8,000 to 16,000 word core memory) computer with very versatile input-output characteristics. The arithmetic unit will not be complex, though a built-in multiply-divide is desirable to facilitate conversions of the type $y = ax + b$. The command repertoire will include many logical and shifting commands which are necessary to fulfill the prime task of the computer, that of data handling.

The input-output will have two general types of capability. The first is high speed memory interlace capability for block transfers of relatively high rate data--in this system, the input from the scanner-multiplexer and the input from and output to the digital magnetic tapes. This type of high speed channel is the most efficient means of inputting or outputting block data, that is, data which it is possible to accumulate prior to either outputting or prior to processing in the computer.

The second type of input-output capability the computer will have is that of priority interrupt. This type of input-output is useful for handling several asynchronous input or output devices which are either comparatively slow or by their nature are of low priority and should wait for more critical operations to take place--in this system, control data to and from the scanner-multiplexer spacecraft and control console and quick-look data to printers and plotters. The priority interrupt type of input-output is far less expensive than the high speed memory interlace and is efficient for word by word transfer of data.

The digital tape units are used to keep a complete record of all data which enters the data system and to store alternate computer programs or subroutines. The output devices are, of course, not defined very precisely, but in general, will be capable of displaying data in both graphical and tabular form. The control console will perform the following functions: 1) Control which parameters are being monitored on the output devices, 2) Exercise options as to how the data is being processed, and 3) Enter data to the computer such as test phase, etc.

System Capability

It is very difficult to generalize about the capability of a system which has so much versatility and will be required to handle so many varying requirements. The exact speed with which a certain task can be accomplished requires that the task be known in enough detail that an accurate program flow diagram could be constructed. Several examples can be given, however, which will give some indication of the type of capability which can be expected. These examples will be based on the characteristics of the PDP-1 computer as Section 372 has experience in systems applications of this computer in real time data processing applications for Ma-R flight data reduction.

Assuming 50 measurements are to be scanned and handled, and each measurement is assumed to be 6 bits of data:

1. All 50 measurements may be sampled 300 times per second and written onto magnetic tape and compared against an upper and lower limit.

2. All 50 measurements could be scanned 30 times a second, written on magnetic tape, compared against an upper and lower limit, one of each measurement per second converted to engineering units by a $y = ax + b$ conversion, all (50) converted measurements either listed or plotted, and the computer would be idle approximately 900 milliseconds out of each second.

3. The PDP-1 presently installed in Building 125 for support of Mariner and Ranger Flight and Test operations will simultaneously receive data from Ranger and Mariner telemetry, decommutate the Mariner telemetry, record quick-look listings on magnetic tape of the totality of the data, prepare magnetic tape of all the data for 7090 processing and compare all Ranger measurements against pre-set limits

and send alarms via teletype. The computer will be idle approximately 850 milliseconds out of each second when doing this.

The above examples are merely illustrative. There would be no need for all measurements to be sampled at the same rate, and, in fact, this will be completely flexible.

There are obviously other constraints on the system than just computer operating time. The system will be limited by output devices, by the speed with which the scanner-multiplexer can scan and digitize and, perhaps most important, by computer internal storage space. In the example above of the presently installed PDP-1, while the computer is idle about 850 milliseconds out of each second, its 8,000 words of internal storage are virtually exhausted. This means that the data rates could increase significantly without saturating the system, but, if additional programming functions are required, there will be no room for the additional programs in core.

Procedure for Implementation

It is recommended that the implementation of this system proceed in three steps to facilitate the implementation, to allow a more sensible designation of peripheral equipment than might be possible now, and to allow the users to become more familiar with such a system and, thereby, make intelligent decisions as to its expansion. The system will be available for support of Ra-9, Ma-M, Ma-B and all succeeding spacecraft tests.

Step 1 - Implementation of the telemetry and hard line interface for Ranger and Mariner type spacecraft, the scanner-multiplexer and computer with tapes and limited quick-look and control functions. The important part of this design is to insure that the scanner-multiplexer and the computer are adequate to meet requirements for the design life of the system (about 5 years). This will require that the speed, number of channels, and channel characteristics in this scanner-multiplexer are sufficient and that the speed, core memory size and input-output capability of the computer are adequate.

Step 2 - Expansion of the display capability to provide full quick-look displays to all cognizant sub-system groups.

Step 3 - Close the loop to the spacecraft to provide true automated spacecraft checkout. This will provide closely controlled sequencing of the spacecraft through its test sequence.

The ability to look at the correlation between parameters of the whole spacecraft as well as any sub-system.

Required Design Parameters

To implement Steps 1 and 2 above, there are several inputs which must be available to Section 372 design engineers. It is requested that

all technical divisions respond to T. Miller by September 20 with any comments on this memo and with specific comments on the following questions. A meeting will then be held on September 19 at 3:00 p.m. in Building 125, Room 220 at which time a review of the preliminary design will be made. The user divisions are requested to participate in the development of the design. The name of a division representative should be forwarded to T. Miller.

1. How many hard line measurements must the system be capable of accommodating?

2. What type of information is desired from these lines? (i.e., transients with rise times of approximately 10 milliseconds, long term trends, etc.)

3. What reduction functions will be required? (Monitoring against fixed limits, monitoring rate of change, conversion by nth order curve, correlation with n other parameters, etc.)

4. Will it be necessary to do simultaneous testing of more than one spacecraft?

5. What signal levels can be expected over "hard line"? It is quite important, if low level signals are to be used, to include adequate grounding, noise rejection, etc., in the original design. It is also more important to minimize interfaces with the spacecraft if such low level problems are to be encountered.

Schedule

SAF

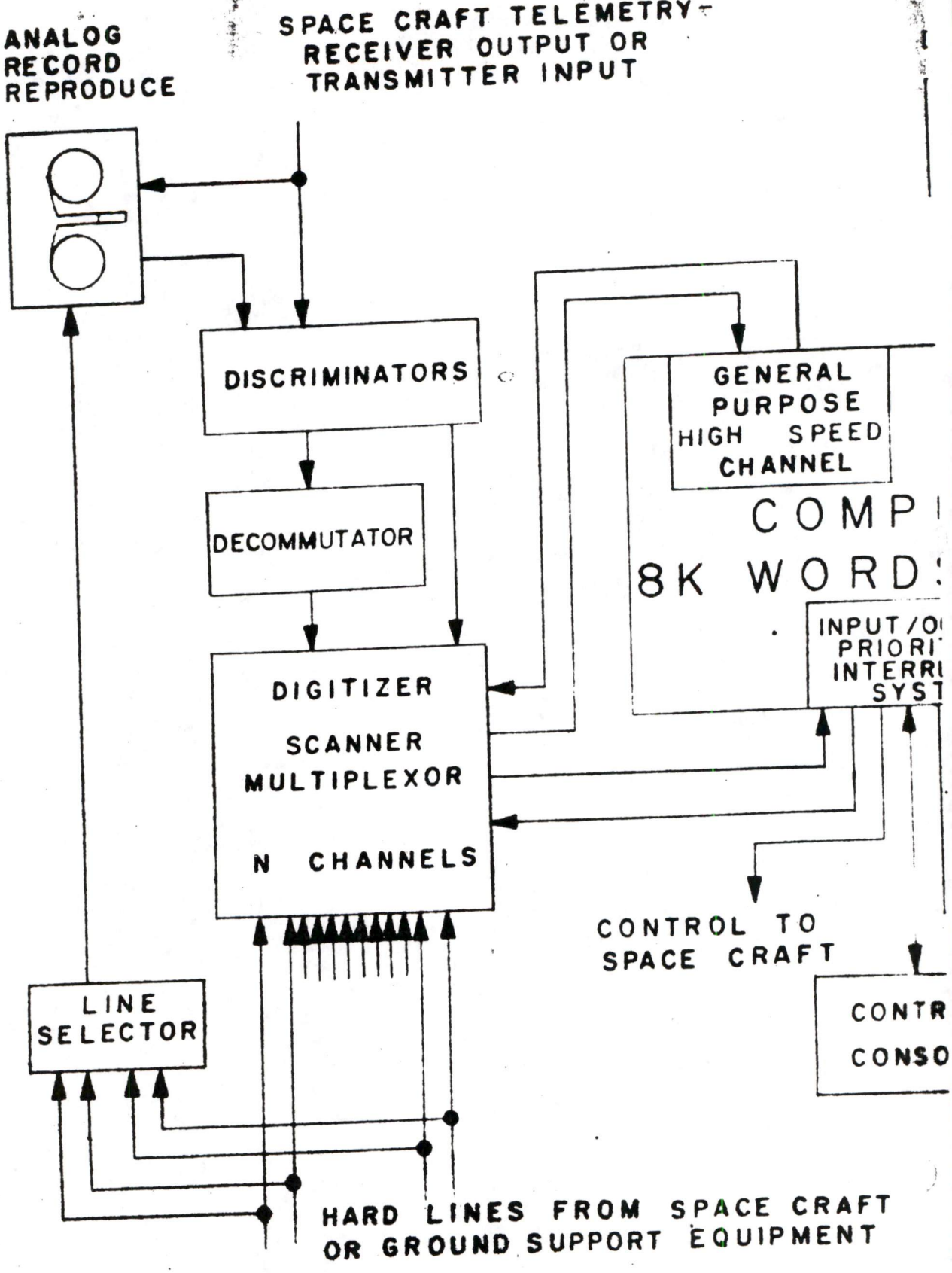
Step 1 Requirements Define	September 25, 1962
Design Specification Complete	October 15, 1962
Procurement	November 20, 1962
Delivery	May 25, 1963
Step 2	4th quarter, 1963
Step 3	When feasible after 1st quarter, 1964

AMR

Delivery	July 1, 1963

TBM/saw

SYSTEM TEST


ANALOG
RECORD
REPRODUCE
SPACE CRAFT TELEMETRY-
RECEIVER OUTPUT OR
TRANSMITTER INPUT
DISCRIMINATORS
DECOMMUTATOR
DIGITIZER
SCANNER
MULTIPLEXOR
N CHANNELS
LINE
SELECTOR
GENERAL
PURPOSE
HIGH SPEED
CHANNEL
COMP
8K WORD
INPUT/O
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CONTROL TO
SPACE CRAFT
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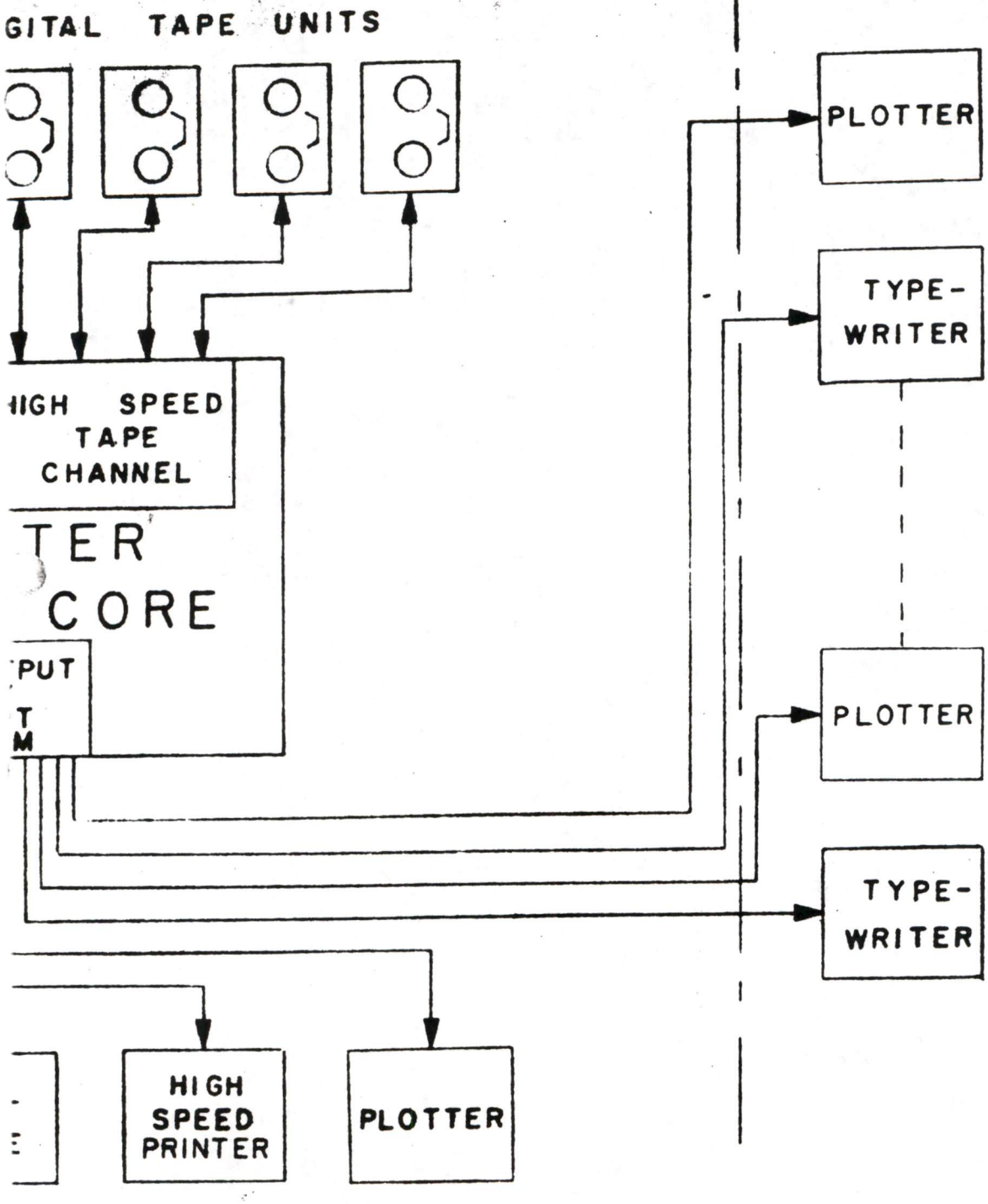
HARD LINES FROM SPACE CRAFT
OR GROUND SUPPORT EQUIPMENT

TA SYSTEM


GITAL TAPE UNITS
PLOTTER
TYPE-
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M
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WRITER
HIGH
SPEED
PRINTER
PLOTTER

dec INTEROFFICE MEMORANDUM

File

DATE September 28, 1962

SUBJECT

TO K. Olsen
H. Anderson
S. Olsen
G. Bell
Sales File

FROM Arthur Hall

On September 27th, K. Olsen, H. Anderson and A. Hall met at Foxboro's Natick plant with R. Sonnenfeldt (General Manager), R. Fine (Operations Manager) and L. Glickman (Manager of Engineering).

The subjects discussed were:

1) Liaison between DEC and Foxboro:

Mr. Fine was quite insistent that all requests for information and action be channeled through Paul Anderson or himself at Foxboro and A. Hall at DEC. H. Anderson suggested later that this routine should not be allowed to interfere with getting our work done if these persons should not be available.

2) Tours of DEC by Foxboro Customers:

The attached Foxboro memo explains this point.

Foxboro will notify DEC about prospective Foxboro customers so that if those customers should contact us, we will not be making conflicting quotes or claims.

3) Supporting PDP-4 literature:

Foxboro would like a written statement from DEC listing the literature we will have available and noting when it will be available. A. Hall will forward this information together with 20 copies of all literature available at present.

Foxboro would like to put their covers on our PDP-4 Manuals. DEC expressed their willingness to do this subject to an agreement on copyright. This should be worked out as soon as possible. They will send DEC copies of our manuals changed as they prefer for our approval before release.

It is not their intention to conceal the origin of the computer, but rather to indicate that their control computer was manufactured expressly for Foxboro by DEC. They plan to assign a Foxboro number to the computer.

4) Financial Statement:

Foxboro would like a statement from DEC concerning their financial status. Their need is for a document which will reassure a customer who has not heard of DEC that we are financially stable and not likely to default on delivery. With this they want a statement of our production capabilities. K. Olsen and H. Anderson have agreed to supply this statement. A. Hall will sent them some copies of the brochure we handed out at the Munich show in case this might be useful to them.

5) PDP-4 Compiler:

Foxboro realizes that a complete description of the PDP-4 compiler will probably not be available until the compiler itself is available. However, they would like to have (now) a one page description of the compiler saying that it is a Fortran II type and catagorizing the instructions in terms a programmer will understand. A. Hall will consult H. Morse about this, and get the description to Foxboro as soon as possible.

6) Reliability:

Foxboro must have enough data from DEC to establish an estimated time between failure for the PDP-4. They will write a statement on the basis of our data, and submit it to us before releasing it. The data must be in their hands by 5:00 PM October 5th.

7) Delivery:

Foxboro wants a statement from DEC quaranteeing a minimum delivery date. It was their expectation that delivery would be required in from 5 to 7 months from date of firm order. H. Anderson said that there was no problem we could see in assuring a 5 month delivery time. A written statement to this effect should be given to Foxboro.

8) Power Failure:

R. Sonnenfeldt stated that if the PDP-4 could continue to run after a line power failure of 2 cycles or longer, it would be a great advantage to them. If the time is less than 2 cycles, they will have to employ a far more expensive protective device. If we were able to add some device costing less than $500 which would be able to guarantee at least 2 cycles, they would be quite please to bear the cost.

DEC has given them the rough figure of 3 1/2 cycles as a possible power outage time. Investigation during the afternoon following the meeting, however, revealed that a power off period of 15 msec. causes the program to stop. The large contactor supplying AC to the memory power supply drops out in this time, and the -35 volts rises 5 volts. Research into causes and cures continues.

Power outage figures and predicted improvement should go to Foxboro as soon as possible, and by October 5th, at the latest, A. Hall will see to this.

9) Durm quote clarification:

A quote from G. Bell to Foxboro concerning drum specifications mentions write protection. They want not only a clarification of the write protection but a way to lock the drum write-inhibit switches or the door which covers them. A. Hall will look into lock-switches and will ask G. Bell to find out from Saul Dinman what additional information is required on the drum. We will send this information to Foxboro as an addition to the previous quote.

10) Spare parts list:

We should send Foxboro a complete spare parts list for the entire computer and peripheral equipment. This is to include only electrical parts (such as relays, fans, power supplies, switches, capacitors etc.) Any part which has a particularly long order cycle should be included. Foxboro stated that their customers were inclined to order a great quantity of spare parts and that the list should be too long rather than too short.

11) PDP-4 Changes:

Foxboro would like to know whenever we plan to make any change in the standard machine which would affect interface signals or programming.

12) ISA Show:

H. Anderson asked if there were any particular PDP-4 features which Foxboro would like us to stree to potential Foxboro customers. They mentioned:

Memory protection on power off.
Lack of susceptability to power failure.
Reliability
Modular construction.
PDP-4 is descendant of PDP-1.

13) Foxboro Colors:

Foxboro would like a statement in writing that we will consider changes in the color of our computers. K. Olsen mentioned that we would prefer to paint the doors, top and side panels and leave the panel above the operators console the same. They will consider this. There seemed to be general agreement that the frames need not be painted. Their stylist will visit as soon as he can (probably not before the ISA show next month) to look at the computer and to suggest the color scheme. DEC agreed that we would use whatever color Formica they wanted on the table tops.

14) DEC Racks:

Foxboro is considering using the DEC racks. They would like to look at our drawings with a view towards making them themselves. We must decide whether or not this will be allowed. Meanwhile we have agreed to quote Foxboro a price for our racks.

15) PDP-4 Tape Units:

We have agreed to quote to Foxboro on both types of Tape Unit for PDP-4.

16) PDP-4 Power Consumption:

Foxboro has heard power consumption figures of 900 and 1400 watts. We must supply them with the correct figure.

17) PDP-4 Discount Schedule:

The most important subject brought up by Foxboro was their discontent with our discount schedule. They pointed out that if they ordered 5 computers at different times during one year, their average discount would amount to about 12%. They stated that they could get a better discount from another computer manufacturer.

It would appear that Foxboro has internally committed themselves fairly strongly to use DEC computers. While they might not change their decision if we maintained our present discount schedule, they would certainly welcome a more favorable schedule, not only for monetary reasons but to better justify their decision to buy DEC equipment.

We have agreed to review our discount schedule and to notify them of our decision by late in the week ending Oct. 5th.

18. Foxboro Computer:

R. Sonnenfeldt said that Foxboro expected to give DEC an order for a PDP-4 within 40 days for delivery sometime early in 1963. This is presumably dependent upon the selection of DEC as computer supplier.

In summary, we must supply Foxboro with:

1. 20 copies of available PDP-4 literature.
2. Availability dates and list of all PDP-4 literature.
3. Permission to adapt & use DEC literature under Foxboro name.
4. Financial & production capability statement.
5. Brochures given out at Munich show.
6. One page description of compiler.
7. PDP-4 reliability data (by Oct. 5)
8. Guaranteed elapsed times for delivery.
9. Computer tolerance to power failure.
10. Drum write protection clarification.
11. Complete PDP-4 spare parts list.
12. Agreement to consider PDP-4 color changes.
13. Agreement (or not) to use DEC rack design.
14. PDP-4 Tape Unit quote.
15. Correct computer power consumption figures.
16. Decision on discount schedule revision (by Oct. 5).
17. DEC Rack Price.

Date: September 18, 1962

To: R. S. Fine

Subject: Digital Equipment Corporation

Our recent effort on the Monsanto bid has taught us a number of lessons with respect to DEC. Please proceed as follows:

1. Liaison Between Foxboro and DEC

Establish a single Foxboro point of contact for all official communications with a single point of contact with DEC. Please advise DEC that all official communications or commitments will go via this route. All other communications with DEC are to be checked with you or your designated alternate either in general or on a per-case basis to make sure that we do not perpetuate the confusion about which DEC has rightly complained.

To enforce this, I have told DEC not to act on any request unless coming from you or designated alternate, and to advise the requestor to work through you. Under this arrangement, we have already set up a channel for purely technical communication between Saul Dinman and Gordon Sell. Anyone else feeling need of such an arrangement should call you to get it set up.

2. Tour of DEC Facility

Roy Fine should contact DEC to make certain that in the future tours of the DEC facility will be conducted by one or more Foxboro representatives with a DEC guide. DEC people should not attempt to "sell" the PDP-4 as a process control computer. During their tour with the Monsanto people, they pulled a number of potential embarrassing bloopers because they neither know nor understand how we use their computer with Foxboro standard system modules. Statements by DEC personnel should be limited to an explanation of their manufacturing methods, the merits of their design of equipment items, but should stay out of the application area entirely.

3. Supporting Literature from DEC

DEC's supporting literature at this time is inadequate. We need from DEC:

a. A statement in writing listing what literature they will have available such as Programmer's Manuals, Equipment Instruction Books, etc., and on what dates these will be available. It is important that you now arrange for sufficient copies to be on hand at Natick so that we do not have to get into a frantic rush each time we make a quotation, nor do we want DEC to know on a per-case basis what we are doing. We need sufficient final copies for the Boston Edison proposal.

b. We need from DEC a statement documenting the capabilities and financial position of their company (an annual statement, if available, plus a general capability or hardware bulletin would be sufficient). We are encountering some difficulties because DEC is not well known. We need to know what is available and when, to be used at our discretion. We also need a modest supply of these items for inclusion in proposals.

3. DEC Software

The Programmer's Manual does not include a description of DEC's compiler. The word "Compiler" is meaningless unless DEC spells out what kind of compiler. We need a description of what they propose to furnish after April 30 as an insert in the Programmer's Manual.

4. PDP-4 Reliability

Although we have investigated the PDP-4 and convinced ourselves that it meets our reliability requirements, we have no documentation for this conclusion in a form suitable for customer distribution. Will you and Les Glickman please determine whether we should go after DEC for such documentation or whether we should write our own. Make sure that this is in finished form in good time for the Boston Edison bid.

5. Delivery

Will you please make a statement in writing of DEC's delivery capabilities based on firm information from DEC.

6. Equipment Marking and Paint

You and Les are to firm up equipment markings to say: Foxboro M7000 computer expressly manufactured for Foxboro by DEC. Equipment colors are to be standard Natick (please check Vin Tivy on latest information regarding type designation M7000).

Will the recipients of this memo please advise Roy Fine before the end of this week (i.e., by September 21) what additional points must be taken up with DEC at this time.

R. W. Sonnenfeldt

R. W. Sonnenfeldt

jh

cc: S. B. Dinman
H. S. Dzinko, 86-8
C. R. Fleming, 86-4
L. M. Gliedman
G. C. Hendrie
D. F. McAvinn
R. W. Smith, 86-8
H. Thistle, 86-4
V. V. Tivy, 86-4

dec MEMO

DATE 9/27/62

TO Harlan Anderson FROM Ted Johnson

We are planning a meeting with people from the newly formed Systems Programming group of Mesa Scientific to discuss a possible PDP-4 application gathering underwater surveying data and calculating amounts and costs of rock fill in construction of the breakwater or pier at the Long Beach Harbor.

Bob Ryle inquired as to whether we might have an interest in a 1401 simulator for the PDP-4. This could be of value --

1. Compatibility with existing 1401 facilities.
2. Phasing into PDP-4 use by people such as the Harbor people.

Ted

INTEROFFICE MEMORANDUM

DATE September 27, 1962

SUBJECT Type 52 Tape Control for CRL

TO Harlan Anderson

FROM Ben Gurley

cc: Stan Olsen
Roland Boisvert

Eunice Cronin of CRL was interested in having a Type 52 Tape Control replace the existing Type 51 Tape Control on their second computer. This is the computer which will be going to ITEK to have the fancy display put in.

I quoted her a price over the phone of $24,000 for a new Type 52 Tape Control in exchange for the Type 51. This price is arrived at as follows: That machine already has a high speed channel control therefore the $38,000 is reduced by $9,000. A return credit of $5,000 will be made on the Type 51 Tape Control leaving a net of $24,000 for the Type 52. These tape controls, the new Type 52 Tape Control and the existing Type 52 Control would not have the facility to connect both of the tape control on either machine under the terms of the discussion with Miss Cronin. We probably would charge extra to put in the additional command pulses, etc. to enable both controls to run simultaneously off either machine.

########## #########

dec INTEROFFICE MEMORANDUM

File

DATE September 27, 1962

SUBJECT Additional Equipment for the CRL Machine

TO Harlan Anderson

FROM Ben Gurley

cc: Stan Olsen

Eunice Cronin called me on September 26th asking for price information for planning purposes on added equipment to their complex of computers. One was additional tape units, an additional corebank, a second colorscope, and the big DEC drum. Also, they had some interest in an IBM 729 Compatible Tape Control Unit, Type 56.

The price on all items except the colorscope are either accurately established or appear to be sufficiently good, for instance, the DEC drum adds $61,800 and the Tape Control Unit 56 adds $67,500. The colorscope I said was a pure estimate, and that I estimated $30,000. We are in a good position to deliver one of those rather quickly.

########## ##########

dec **MEMO**

DATE September 26, 1962

TO K. Olsen, H. Anderson ✓ FROM

The Personnel Committee would like to meet with you for a short time next Wednesday, October 3, 1962, at 4:00 p.m. for discussion of the major topics on their agenda. (They have promised to be brief)

DAP 984

INTEROFFICE MEMORANDUM

DATE September 26, 1962

SUBJECT Renegotiability of FAA

TO H. Anderson ✓
G. O'Dea

FROM R. Mills

I have asked Mac Chick of Lybrands in Washington to send us an up to date list of all government agencies which would be classified as renegotiable business and those that would be classified as non-renegotiable business. I also asked him at the same time what his list showed as a status for the FAA, and he stated that this was a non-renegotiable agency.

(FAA total Invoice - $24,700.)

# # #

R.F. Mills

file

INTEROFFICE MEMORANDUM

DATE September 26, 1961

SUBJECT New Accounting & Cost System General Concepts

TO Ken Olsen
Harlan Anderson
M Sandler
S Olsen
B. Curley
R. Best
J. Fadiman

FROM Richard F. Mills

Memo No. 1

GENERAL CONCEPTS

Organization Form

The following presentation of the General Concepts to be used in approaching our new Accounting and Cost System, are developed from a basic concept of organization for DEC on a functional-line organization basis; versus the conventional line-staff organization. The basic difference between these two is: one, of staff functions being purely of an advisory nature, and two, line functions being processing or operations of a direct manufacturing nature. What seems to me to weigh heavily in favor of the functional-line arrangement is that the organization of the company revolves around functions being grouped under operating heads and with all blocks on the organization chart being centers of decision making of one kind or another, versus the old concept of merely advisory staff functions to management. This in effect, streamlines the organization by way of speeding up necessary decisions by using close integration of former staff operations.

Information Feedback

Feedback of information is not brought in at this time as a basic assumption will be made here that through our project manager concept, a separate specification for information feedback requirements will be made by each project manager. This is quite a different approach to this problem in that conventionally, information is generated in the accounting department and disseminated to projects on a mass regular basis with little interpretation and analysis. The net result of this mass of information flowing to a project is usually a lack of understanding by the project manager of what he is getting and how to use it. It is planned that project manager requirements will be defined very exactly with considerable work being done on the actual report to simplify it and arrange pertinent items in such a way that the report forms a basis for a decision function. We are not naive enough to think that this will not require some orientation, both in the accounting and on the part of the project managers, but the goal is one of easy understanding.

Cost Centers:

Cost Centers will be very easy to add or terminate as required by our operations.

Cost Center Recharges:

A built-in provision is made for recharging services purchased by one cost center from any other cost center in the complex of cost centers. At selling prices or actual cost.

Cost Center Reports:

Profit and loss, and balance sheets will be prepared for every cost center in the company.

Consolidation:

Due to the standard approach to this system, consolidation of all cost center reports into one report for the company is an easy matter.

Cost Center Expenses:

All charges to cost center expenses will be made on the gross incurred basis for simplicity in determining total company expenses by expense element.

Reports:

It is considered that reports will be submitted to each cost center Manager for all items that he can influence.

SYSTEM DEVELOPMENT

Introduction:

The central theme of this new system should fall into place quite readily by giving a short explanation for each of the major items involved as listed below:

1. New chart of accounts
   Balance Sheet
   Profit and Loss
   Inventories
   Expense elements
   Cost centers

2. Cost center coding

3. Standard list of expense elements

4. Recharge method

5. Method of production overhead absorption

6. Cost centers

7. Inventory coding and control

8. Product cost accumulation

9. Allocation of expenses and assessments

10. Project manager reports

1. New Chart of Accounts

The new chart of accounts has been prepared using as a primary consideration individual balance sheet and profit and loss statements for each cost center. This will be accomplished by indicating the department involved by a -1 -2 -3 etc. after the balance sheet or profit and loss account number involved. As an example, assuming silk screening is department number 1, the Accounts Receivable for the silk screening department would be then denoted as 131-1. It becomes obvious then, in order to find out what the total Accounts Receivable Trade are for the company as a whole, we add up the detail sheets behind the 131 in the General Ledger for all departments.

2. Cost center coding

Cost center coding is being handled by using account 64 in the General Ledger under Cost Ledger Control which will be the control figure for all manufacturing, selling, administrative, advertising, research, and engineering and development expense elements involved. An example of an expense being charged to a cost center would be shown as the first number 64 - 65 to denote manufacturing, - 10 for indirect labor. In actual practice, Account 64, the Cost Ledger Control in the General Ledger, will be used very little in detail coding as people will become accustomed to this rapidly.

3. Standard list of expense elements

Our heavy emphasis on preparing a standard list of expense elements will result in significant time savings in all areas of the business, since only one list of expense elements has to be learned and it facilitates consolidation, analysis and interpretation of results, both by the project manager and management. We have tried to include all types of expenses but in the event you should have one for your department which you feel is significant enough to require attention, please let us know about it.

4. Recharge method

Since we must have an easy method of recharging any service purchased by one cost center from another, from any cost center to all cost centers, it is imperative that we have a standard form throughout the company. A first pass form for the monthly cost center bill and a cost center recharge request form has been prepared. Please see Exhibits No. 1 & 2 attached. At the start up of this system, the services sold by one cost center to another will be charged to that cost center at cost with a refinement later of the selling cost center manager charging a price above cost. Simplicity of operation has been the watchword here as has been the case throughout the entire system. As cost center recharge request forms are prepared and forwarded to the selling cost center, the distribution of copies is, one to the originator, one to the receiving cost center, and one to the accounting department; but the distribution to the accounting department will be made only after the completion of the job, which will be the basis for accumulation of all request forms for each cost center in summary form on the monthly cost center bill. The monthly cost center bill will be forwarded to the to-be-charged cost center which will tell him how many services he has purchased outside of his own operation during the month and will also serve as a basis for accounting entries. Overhead rates used will be standard, adjusted once each quarter for any over or under absorbed overhead.

5. Method of production overhead absorption

Each manufacturing cost center will of necessity, have to have overhead absorbed on production during that month. This will require the breakdown of direct labor on each product by cost center in order that that cost center's overhead rate may be applied against their direct labor for absorption to work-in-process inventories. Any over or under absorbed overhead will be handled in the same way (i.e. by a quarterly adjustment to actual,) as above. In effect, this means we must establish a method of summarizing direct labor for each cost centers operation on each one of our products.

6. Cost Centers

We previously mentioned Account 64 which is the Cost Ledger Control. As a back-up to this account, we will have an accounting book known as the Cost Ledger. In this Cost Ledger will be expense element sheets, one for each cost center, broken down with a total sheet for manufacturing and then all manufacturing departments under this; then a total sheet for selling with all selling departments under this, and so on for administrative, advertising, research and engineering in development. Our method for accumulating all the expenses for these cost centers each month will be covered later under the machine methods section. As will be noticed, a provision is made on the expense element sheet, which is in effect the cost center overhead accumulation, for totaling variable and totaling fixed expenses and then deducting recharges to all cost centers and for recharges from all cost centers to arrive at a net figure before earned overhead on production in those cost centers affected to come down to a net over absorbed under absorbed overhead. In order that a close watch may be kept on overhead rates, a provision is made on the very bottom of the sheet for computing total labor, direct labor and in those cost centers with no direct labor to use indirect labor divided into total overhead to arrive at an overhead rate, which would be adjusted quarterly as mentioned previously.

7. Inventory coding and control

Account 17 in the General Ledger is for all inventories, raw material, work and process and finished goods. A sub-ledger will be kept as shown on A/C 17 - Inventories, Appendix I of the Proposed New Chart of Accounts. When any item is purchased for inventories of any kind, the coding will be shown under the code example, Appendix II Inventories. Entries to raw materials will be without the operation and major assembly and sub-assembly code numbers. Finished goods will be controlled by our module numbers. Inventory control sheets will be prepared from product costs lists which will be submitted by project managers. Inventory control will be a production function. As can be seen, this system has the possibility of infinite product variation and expansion.

8. Product cost accumulation

This section is an adjunct to the inventory coding and control above. Our present EN numbering system will be replaced by a product cost sheet which will be an integral part of our inventory control, in effect making up a substantial part of inventory control. Product cost sheets will be broken down into all major assembly and sub-assemblies for which material, labor and overhead will be maintained for each, including outside purchases and outside sub-contract work. By the use of the inventory coding, direct labor and direct material will be charged directly to the product cost sheet which, after the unit is completed, will be totaled and compared against estimates which were prepared at the beginning of the job from a standard bill of materials list.

9. Cost Journals

Since there are some expenses which do not adapt themselves readily to a direct charge for each department but are based upon payroll, square footage, number of employees, etc., the cost journal is a necessity to compute the true amounts to be charged to each cost center for such things as, social security taxes, group insurance, vacations and holidays, workmen's compensation insurance, electricity, fuel, water, rent and amortization of lease hold improvements, local taxes, and several other items. Bases to be used for these distributions are not difficult to compute and no attempt has been made here to assign these values.

10. Project manager reports

Since the ultimate goal of this system is to report to our project managers, the expenses which they are occurring for their operation in order that they may keep their costs in line with present and expected volume, we plan to send to each project manager each month a useable balance sheet, profit and loss, and cost center overhead report. Interest charges to the project from DEC will be shown as will the current total investment in the project todate with computations of return on investment and other meaningful data. It is not my intention to generalize on discussing the value of these reports as I fully expect that they will form the backbone of our budgeting and forecasting.

11. Machine methods

We have investigated the possibility of handling direct labor, raw material and overhead cost through our machine room and find this is entirely feasible but on a restricted basis with our present equipment. We have speeded up our sorter and 402 tabulator very considerably which will give us some strength, but in order to do the full job, more equipment is a must. It is hoped that by using our computer and magnetic tape, that these processes will be significantly speeded up. In particular, I refer to establishing the standard cost at the inception of the order, maintaining raw material and finished goods inventories and processing the raw materials requisitions to production, and production overhead absorption.

We are at the present time handling direct labor reports by product and by operation and will shortly install Payroll Accounting to be followed by Accounts Payable, raw material requisitions and cost center overhead expense reports. Many cash flow requirements will be met from the machine center and we plan to make cash forecasting a regular computer programmed operation.

SUMMARY

I am certain that some of these terms will require explanation but in the whole, this system will provide us with current meaningful reports on an individual cost center basis, a project manager basis, and a management basis. The entire system has been designed from a standpoint of automatic generation of reports requiring very little attention from the mechanics standpoint, thus giving management the necessary time to analyze and interpret the results of operations. In effect, this will put each cost center on a paying basis with management by exception being the rule, making corrective action a much simpler process than at present.

If this concept is accepted, implementation will be started at once and a subsequent first month of dry running will be several months away. It is our intention to prepare a definitive section for each account number on the proposed new chart of accounts which will in turn, require various backups, flow charts, systems diagrams, and additional personnel requirements. Suffice it to say, that the accounting section is ready, willing and able to implement this system.

# # #

TO: GEORGE RICE / DEC

INTEROFFICE MEMORANDUM

DATE September 25, 1962

SUBJECT Your note of FAA & Reneg. Business

TO Dave Denniston FROM Jim Burley

Learned from Renegotiation Board that the following agencies & Departments are renegotiable;

Department of Defense
Department of Army
Department of Navy
Department of Air Force
Maritime Administration and Federal Maritime Comm.
G.S.A.
NASA
Atomic Energy Commission

Therefore, it appears that FAA is not renegotiable. This also leaves State Dept., Health Education & Welfare, Dept. of Labor, Treasury Dept. and some other thin pickins. Will try to confirm above by getting copy of law. Do you want copy?

Regards,

Jim

DATE: SEPTEMBER 24, 1962

SUBJECT: REPAIR OF RETURNED MODULES

TO: FROM: JIM CUDMORE

THE FOLLOWING IS A LIST OF MODULES RETURNED FOR REPAIR DURING THE WEEK OF SEPT. 17

UNIT	SERIAL NO.	CUSTOMER	DEFECT
1103	29255 B	UNKNOWN	2N393 OPEN
1103	0034256 H	UNKNOWN	NONE
1103	0042177 H	UNKNOWN	2N393 TRANSISTOR OPEN
1201	24643 D	R.C.A.	OLD CIRCUIT DID NOT INCLUDE BIAS BATTERY -- MARGINAL OPERATION, REPLACED 001'S WITH 664'S
1201	24297 G	R.C.A.	
1540	02782 D	I.T.T.	NONE
1540	04658 D	I.T.T.	NONE
1540	66389 C	I.T.T.	NONE
1540	02755 D	I.T.T.	NONE
1540	0009601 D	I.T.T.	NONE
1542-A	68233 A	I.T.T.	NONE
1607	0016256 B	UNKNOWN	NONE
1607	0019968 B	ADX 6	OPEN TRANSISTOR MD 95
1607	0034703 B	UNKNOWN	NONE
1607	0017381 B	UNKNOWN	NONE
1669	60173 C	DEC LA	2" ETCH BURNED OFF
1669	35988 A	B.B. & N.	(1) MISSING TRANS.(1)PHILCO 2N224 260-6049 4" ETCH BURNED OFF
1682	51571 A	DEC-CALIF	TRANS. REPLACED-2N1301 REP. BY 2N2099
1684	72848 B	I.T.T.	NONE

REPAIR OF RETURNED MODULES (CONT.)

UNIT	SERIAL NO.	CUSTOMER	DEFECT
1703	96266 A	I.T.T.	(1) MISSING Al ELECT. MISSING CAP. (1)IN270 SHORTED & OPEN DIODES (1)IN276 SHORTED & OPEN DIODES
1703	57127 A	DEC-CALIF	SHORTED CIRCUIT MISSING CAP.
1972	0046519 B	ADX 7	(2)MDII4 TRANSISTORS SHORTED
1972	0045513 B	ADX 7	TRANS. 2NI065 - HIGH ICBO
1972	43889 B	ADAMS ASSOC.	MDII4 - HIGH LEAKAGE
1972	0014635 B	ADX 3	NONE
1972	03445 B	UNKNOWN	NONE
1972	06193 B	UNKNOWN	NONE
1972	92271 B	UNKNOWN	NONE
1972	0014664 B	ADX 6	NONE
1972	0040126 B	ADX 7	MDII4 TRANSISTOR HIGH-LEAKAGE ICBO
1972	0014638 B	ADX 6	NONE
1972	44823 B	ADAMS	MDII4 TRANSISTOR-HIGH ICBO (1)MISSING MDII4 TRANSISTOR
1972	0024696 B	ADX 6	MDII4 TRANSISTOR-HIGH ICBO
1972	0037755 B	UNKNOWN	MDII4 TRANSISTOR-HIGH ICBO
1972	0014642 B	UNKNOWN	MDII4 TRANSISTOR-HIGH ICBO
1972	0014634 B	ADX 6	MDII4 TRANSISTOR-HIGH ICBO
1973	83070 C	DEC-CALIF	NONE
1973	0046384 C	ADAMS	OPEN B-E (2)2NI204 (2)2NI204 HIGH LEAKAGE
1973	0049451 B	ADX 7	(1)2N2099 TRANS. OPEN BASE TO EMITTER (1)2N2099 TRANS. SHORTED
1976	0043819 C	UNKNOWN	OPEN CAPACITOR
1976	54114 B	DEC-CALIF	NO TROUBLE
1978	0020394 C	ADAMS ASSOC.	AMPHENOL PLUG REPLACED - BROKEN LOCATING PIN

REPAIR OF RETURNED MODULES (CONT.)

UNIT	SERIAL NO.	CUSTOMER	DEFECT
4105	85598 E	DEC-CALIF	2N1305 - OPEN TRANSISTOR
4106	63669 F	UNKNOWN	NONE
4203	0029812 D	DEC	CKT. MODIFICATION--(2) TRANS. CHNGD(2N1305 TO 2N1309) (2) RES. CHNGD (1K TO 1.2 K)
4203	0029730	DEC	SAME AS ABOVE
4203	0029729 D	DEC	SAME AS ABOVE
4203	0029712 D	DEC	SAME AS ABOVE
4204	0045017 B	DEC	2N1305 TRANSISTOR SHORTED
4213	63007 D	DEC-CALIF	NONE
4213	55298 D	DEC-CALIF	NONE
4214	76840 B	DEC-CALIF	NONE
4301	0042867 E	DEC	NONE
4410	03562 H	DEC-CALIF	MD114 TRANSISTOR - LEAKY
4410	71176 G	DEC-CALIF	NONE

OF A TOTAL OF 55 MODULES RETURNED, 25 HAD NO DISCERNIBLE DEFECTS. THESE MODULES WERE TESTED AT ROOM TEMP. AND AT 55°C. MANY OF THE DEFECT TAGS WERE INCOMPLETE AND THIS LACK OF INFORMATION WILL GREATLY HAMPER OUR RECORD KEEPING.

dec INTEROFFICE MEMORANDUM

DATE September 24, 1962

SUBJECT DECUS Meeting with Ed Fredkins & Dick Hayes, Sept. 19th.

TO H. Anderson
B. Gurley
B. Beckman
J. Koudela
D. Morse
M. Graetz
E. Newman
S. Moore

FROM Gordon Bell

We discussed the role of DECUS/DEC in program distribution and writing, etc. The feeling was that user programs should go through the following procedures:

1) TAPES and TAPE WRITE-UPS (ON FLEXOTAPE) would be submitted to the DECUS Prog. Committee.

2) The Program Committee might discard them, but would then notify DECUSCOPE of their existence and simultaneously pass the information on to the DECUS library.

3) Any user could request a tape, and would receive it copied from the library tape. Until a tape was certified, a form for certifying the tape would be sent with all new tapes. When the tape was used sufficiently and enough certification forms had been received by the Program Committee, the tape would be certified. The DECUS Library would publish a quarterly list of tapes (both certified and un-certified).

PROCEDURES:

In order to assure uniformity the following manual would have to be written:

1. Description of Process
2. Rules for Tape Write-up
3. Rules for Tape Labeling
4. Certification Process

LIBRARIAN FUNCTIONS:

1. File incoming tapes (and place on master mag tape).
2. Duplicate tape write-ups for user requestes.
3. Duplicate tapes for user requests.
4. Evaluate individual user performance
   a. Number of tapes to library
   b. Number of tapes requested from library.
   c. Activity regarding certification
5. Keep track of modifications to all tapes and write-ups.

DEC'S PARTICIPATION:

1. Provide Space
2. Provide tape duplicating facility.
3. Provide tape write-up duplicating facility.
4. Mail outgoing tapes.
5. Submit DEC Standard Library Tapes.to DECUS Library for comment and certification.
6. Process & route incoming correspondence.
7. Provide programming assistance initially to get tape duplicating facility onto magnetic tape.

The DECUS programming group would like a letter from DEC giving our policy on the above DEC participation.

dec INTEROFFICE MEMORANDUM

File

DATE September 21, 1962

SUBJECT

TO J. Myers
CC H. Anderson ✓

FROM Jack Smith

System Number 9000-5128, which is a basic computer, is currently undergoing construction. Due to a lack of customer order, modules have not been ordered for this system. At a meeting yesterday, Harlan Anderson felt that we should go ahead and insert modules and put the machine into Checkout. The system will be ready to accept modules on October 1, 1962. Will modules be available at this time? Modules should be charged to the above 9000 number.

dec INTEROFFICE MEMORANDUM

DATE September 21, 1962

SUBJECT ESTIMATED COST OF PROPOSAL "PACKAGING"

TO Nick Mazzarese
CC: K. H. Olsen
H. E. Anderson
S. C. Olsen

FROM Jack Atwood

It looks like $200.00 to package 25 copies of a proposal with the specifications listed below. This figure includes the prorated cost for 25 sets of preprinted covers, 25 sets of a five-page preprinted summary of company capabilities and 550 sheets of preprinted proposal paper. We assumed that we would design and preprint 500 sets of covers and write and preprint 500 sets of summary sheets.

Proposal Specifications

Editorial assistance 8 hrs.

Imprint 25 sets of proposal covers.
Type 15 pages of new text material and print 25 copies one side only.
Take four equipment photographs and print as single-page half-tone illustrations.
Draw three diagrams and print as single-page line illustrations.
Collate together with the five-page preprinted summary of capabilities.
Punch and plastic bind.

Covers to be printed in blue and black on a good grade of coated cover stock.
Text and illustrations to be printed in black on a standard proposal form preprinted in blue.

The production time for this type of package should be eight working days, may be five working days, and can be two working days.

7 26

CURRENT ENGINEERING DEVELOPMENT AND FIELD SERVICE NUMBERS

FROM: Richard L. Best

DATE: September 19, 1962

EN 1000	General Engineering
EN 1010	5 MC System Modules
EN 1011	500 KC System Modules
EN 1012	Non-Compatible Low Speed B. B.
EN 1013	Current Drivers (vacuum tube)
EN 1014	Digital-to-Analog Converter
EN 1015	Typewriter
EN 1016	Core Memory Development
EN 1017	Signal Converters
EN 1018	Memory Tester Development
EN 1019	Modules Sales
EN 1020	PDP-1 Development
EN 1021	Core Handler
EN 1022	Power Supplies
EN 1023	Mounting Panels
EN 1024	Paper Tape Reader
EN 1025	Paper Tape Punch
EN 1026	Magnetic Tape Equipment
EN 1027	Large Tube Display
EN 1029	10 MC System Modules
EN 1030	Educational Building Blocks
EN 1031	Computer Development
EN 1032	Utility Programming, PDP-1
EN 1033	Sales Programming, PDP-1
EN 1034	PDP-1 Sales
EN 1036	Light Pen Development
EN 1037	Core Tester and Memory Tester Sales
EN 1038	Special System Sales
EN 1039	Solid State Current Drivers
EN 1040	Drum Circuit Development
EN 1041	Drum System Development
EN 1042	Current Driver Power Supply 766
EN 1043	VHF Building Blocks
EN 1044	Analog-to-Digital Converter
EN 1045	Digital Average Response Computer
EN 1046	Punched Card Equipment for PDP-1
EN 1047	PDP-1 Prototype Operation (BG)
EN 1048	Test Equipment Headquarters (RH)
EN 1049	Engineering Stockroom
EN 1050	Data Phone

EN 1051	Classroom Modules
EN 1052	Memory Stack Assembly
EN 1053	Computer Cabinet
EN 1054	PDP-1B Field Service (BBN) (Replaces EN 2032)
EN 1055	PDP-1 Production Test Equipment
EN 1056	PDP-1C-1 Field Service (ITEK) (AB)
EN 1057	Core Tester Development
EN 1058	Anelex Development
EN 1059	Field Service PDP-1C-2 (ITT)
EN 1060	Field Service PDP-1C-5 (MIT)
EN 1061	Field Service PDP-1C-6 (CRC)
EN 1062	PDP-4-1 Operation
EN 1063	1569 Development
EN 1064	Display 31 Development
EN 1066	Field Service PDP-1C-7 (BBN CAL)
EN 1067	Information International (Ed Fredkin)
EN 1068	Burroughs Card Reader
EN 1069	PDP-1 Computer Administration
EN 1070	Tape Field Service PDP-1C-2 (ITT)
EN 1071	Tape Field Service PDP-1C-7 (BBN CAL)
EN 1072	Standards
EN 1073	Quality Control
EN 1074	Memory Tester Field Service
EN 1075	Core Tester Field Service
EN 1076	Memory Exerciser Field Service
EN 1077	Misc. Special System Field Service
EN 1078	ITT Prototype Rework
EN 1079	Field Service PDP-1C-8 (ITT Prod #1)
EN 1080	Tape Service PDP-1C-8 (ITT Prod #1)
EN 1081	Field Service PDP-1C-9 (Geo Tech)
EN 1082	Tape Service PDP-1C-9 (Geo Tech)
EN 1083	Field Service PDP-1C-9 (JPL)
EN 1084	Tape Field Service PDP-1C-13 (JPL)
EN 1085	Computer Field Service Equipment
EN 1086	Telex Printer (BS)
EN 1087	Relay and Switch Investigation
EN 1088	Module Packaging for Shipment
EN 1089	Line Unit Tester (GB)
EN 1090	4203 Development
EN 1091	4204 Development
EN 1092	10 MC Laboratory Modules
EN 1093	5 MC Laboratory Modules
EN 1094	500 KC Laboratory Modules
EN 1095	PDP-4 Sales
EN 1096	PDP-4 Programming
EN 1097	Modules Construction Development
EN 1098	Module Test Development
EN 1099	Field Service, General
EN 1100	Power Controls

	EN 1102	Field Service PDP-1C-3 (CRC)
	EN 1103	Field Service PDP-1C-3 Mag Tape (CRC)
	EN 1104	Field Service PDP-1C-17 (SRL)
	EN 1105	Field Service PDP-1C-17 Mag Tape (SRL)
	EN 1106	Field Service PDP-1C-4 (CRC)
	EN 1107	Field Service PDP-1C-4 Mag Tape (CRC)
	EN 1108	Field Service PDP-1C-18 ADX-4 (ITT)
	EN 1109	Field Service PDP-1C-18 ADX-4 Mag Tape(ITT)
	EN 1110	Field Service PDP-1C-15 (Beckman)
	EN 1111	Field Service PDP-1C-12 (LRL)
	EN 1112	Field Service PDP-1C-12 Mag Tape (LRL)
	EN 1113	Field Service PDP-1C-16 (Beckman)
	EN 1114	Field Service PDP-1B Mag Tape (BBN)
	EN 1115	Memory Buffer 2009 Repair (FAA)
	EN 1116	Memory Tester Field Module
	EN 1117	Field Service PDP-1C-19 ADX-5 (ITT)
	EN 1118	Field Service PDP-1C-19 ADX-5 Mag Tape (ITT)
	EN 1119	Field Service PDP-4-2 (Foxboro)
	EN 1120	Field Service PDP-1C- 10 ADX-2 (ITT)
	EN 1121	Field Service PDP-1C-10 ADX-2 Mag Tape (ITT)
	EN 1122	3 KC Power System Development
	EN 1123	Core Tester 2114 Development
	EN 1124	Field Service BBN Drum
	EN 1125	Field Service MIT Drum
	EN 1126	Field Service PDP-1C 26 (MIT #2)
	EN 1127	Current Calibrator Development
	EN 1128	PDP-1 Checkout Training
	EN 1129	Character Generator Development
	EN 1130	1521 Development
	EN 1131	Anelex Prototype Construction
	EN 1132	ADX Systems Administration
	EN 1133	PDP-4 Systems Administration
*	EN 1134	PDP-4 Flexowriter Prototype
*	EN 1135	Display 30-D Prototype (PDP-4)
*	EN 1136	Link Tape Unit
*	EN 1137	Type 56 Tape Control Development

Supercedes Memo Dated July 20, 1962

* Indicates New Numbers Added

INTEROFFICE MEMORANDUM

DATE September 19th, 1962

SUBJECT

TO Harlan Anderson
Gordon Bell
Dick Best
Ben Gurley
Dit Morse
Stan Olsen

FROM Kenneth H. Olsen

I received a call from Mr. Glover of Autonetics Industrial Division office in Brookline, his phone number is REgent 4-2610.

Next Monday, September 24th at 9 a.m. until about 4:30 p.m., they are having a session at the Charter House Motel in Chestnut Hill on the Sparks System. This is a program written by the Inertial Guidance Division of Autonetics which uses the Recomp 2 to do circuit design and evaluation. They have been using this for a number of years and now have released it to Recomp users. I suspect that their motivation is to sell Recomp computers to our superiors. The man giving the talk is Mr. C. T. Klinner who is one of the designers of the program.

If anyone wants to go, we should call Mr. Glover immediately because they have limited space and it is going to be on a first come, first serve basis.

Kenneth H. Olsen

MEMO:

DATE: September 19, 1962

TO: Ken Olsen
H. Anderson
S. Olsen
G. O'Dea
B. Beckman
H. Crouse

FROM: R. Mills

COPY

Last night I received a call from Ken Larsen who was proposing that they be issued a block of Purchase Orders to be held in the Los Angeles Office for issuance for emergency parts for maintenance use. His reasons for doing so seemed quite logical in that they are apparently faced with taking money from Petty Cash to purchase parts for emergency service on our equipment to a limit of about $250. for any one service call. We had considered opening charge accounts for them with the various suppliers, but find that the parts which they may require are not always available from all of the suppliers, which necessitates taking money from the Petty Cash and going further.

I would recommend that we issue a block of Purchase Orders to the West Coast Office with a notation on the front " Not Valid Over $250." and that Ted and Ken be authorized to sign. I believe we should check Jack Barnard for any legal implications by restricting the face of the Purchase Order.

Ken also mentioned as a follow up to Ted Johnson's memo of September 10th, regarding putting the company name on local Petty Cash checks which could be signed by either Ted or Ken. This would involve opening a separate account on the West Coast, with proper authorization of the Board, and the filing of the necessary forms with the West Coast Bank. I can see no real objections to this from an accounting point of view.

# # #

INTEROFFICE MEMORANDUM

DATE: September 18, 1962

SUBJECT: Test Equipment Planning

TO: Ken Olsen
H. Anderson
S. Olsen
R. Beckman
G. Bell
R. Best
J. Burley, DCO
D. Denniston, NYO
T. Johnson, WCO
J. Fadiman
B. Gurley
N. Mazzarese
R. Savell

FROM: Test Equipment Committee

The growth of our company makes it increasingly difficult for the test equipment committee to predict needs for test equipment from its own knowledge of the plans of the various departments. We feel it would help us to be sure that test equipment will be available for use in your department if you could make an estimate of your test equipment needs over the coming year. This can be in whatever form the information is closest to you, but naturally it will be easiest for us if you can be specific.

We would like your estimate not only on standard items such as type 543 or 545 oscilloscopes, current probes, and meters, but also on any unusual needs you can predict. It often happens that a special instrument can perform different functions for several different people, and we can only make an intelligent selection if we know the full range of your requirements.

Take the opportunity to tell us anything that's on your mind about the test equipment situation in general, while you are at it. Send your memo to Russ Doane, who would appreciate receiving it before October 9, the date of our next meeting.

INTEROFFICE MEMORANDUM

DATE September 18th, 1962

SUBJECT

TO Ken Olsen
Harlan Anderson
Dick Best
Ben Gurley
Dick Mills
George O'Dea
Stan Olsen
Maynard Sandler

FROM Win Hindle

Because of the confidential nature of Works Committee meeting minutes we shall not distribute copies to all participants. The minutes will be kept in Dick Best's office and my office for your reference.

DEC INTEROFFICE MEMORANDUM

File

SUBJECT: PDP-1 Prototype and PDP-1C Scheduling

DATE: September 18, 1962

TO: PDP-1 Distribution List
Computer Users

FROM: Bob Beckman

The following procedures have been established for the scheduling of the PDP-1 Prototype and the PDP-1C:

1. Until further notice the Prototype and the PDP-1C will be scheduled on a weekly basis. Schedules for the following week will be published on Friday afternoons. A copy of the schedule will be posted on the Computer Room bulletin board. This posted copy is for information only, and "write-in" scheduling must be included on the master schedule to be valid. The master schedule will be retained and updated by Customer Relations.

   It is anticipated that scheduling may eventually be on a daily basis.

2. Requests for computer time must be submitted on the established form. A copy of this form is attached and additional copies are available from Sandy Moore in the Computer Room. It is important that all pertinent information on the form be included. In cases of conflict the information on the form may determine which user has priority. DEC employees requesting time for customers or potential customers should make the requests in their own name with appropriate comments.

   Unless specifically requested, no confirmation of time assigned will be made other than the published schedules. Individual confirmation of time must be justified in the "comments" section of the form. Telephone number (or DEC extension number) should be included even though no specific confirmation is requested.

   Requests for computer time must be submitted to Sandy Moore in the Computer Room by 9:00 A.M. on the Friday preceding the week involved. Requests may be submitted as far in advance as desired, but actual schedules will be established on a week by week basis. A separate request form must be used for each calender week (i.e. a request for time on a Tuesday of one week should not be included on the same form with a request for time on Thursday of the following week).

3. Contact Sandy Moore on Extension 362 for changes or additions to published schedules. Such changes and additions must be kept to a minimum and will be on a "first come, first serve" basis.

4. Computer users are invited and encouraged to make time swaps and other arrangements with other users on an individual basis. Questions that cannot be resolved by the master schedule will be referred to Bob Beckman.

Every effort will be made to satisfy everyone. However, to paraphrase a bit, "You can satisfy some of the people all of the time, etc." The intention is to provide adequate, efficient use of the PDP-1 Prototype and the PDP-1C.

INTEROFFICE MEMORANDUM

DATE SEPTEMBER 17, 1962

SUBJECT REPAIR OF RETURNED MODULES

TO Harlan Anderson FROM JIM CUDMORE

THE FOLLOWING IS A LIST OF MODULES RETURNED FOR REPAIR DURING THE WEEK OF SEPT. 10

UNIT	SERIAL NO.	CUSTOMER	DEFECT
1103	0015852 G	ADX6	Q 1 OPEN, D 1 OPEN
1103	0019232 G	ADX6	Q 6 SHORTED
1103	0018943	ADX6	NONE
1103	0018368 G	ADX6	Q 6 SHORTED
1104	50019 D	I.T.T.	Q 2 LEAKAGE TOO HIGH
1104	62760 B	DEC-CALIF.	NONE
1111	06607 D	I.T.T.	LEAKAGE TOO HIGH
1111	76205 D	I.T.T.	LEAKAGE TOO HIGH
1150	66636 B	I.T.T.	FAILED RISE TTT(TOO SLOW)
1151	41899 C	I.T.T.	NONE
1151	41902 C	I.T.T.	NONE
1201	0032777 P		EXCESSIVE I_{CB}
1201	0032636 P	DEC	EXCESSIVE I_{CBO}
1201	54929 P	BEN FIELD SERVICE	EXCESSIVE I_{CBO}
1204	70347 B	I.T.T.	NONE
1204	79836 B	I.T.T.	NONE
1204	74921 B	I.T.T.	NONE
1204-B	73522 B	I.T.T.	NONE
1209	01697 K	I.T.T.	NONE
1209	0016096 K	I.T.T.	NONE
1209	0019237	ADX6	NONE

REPAIR OF RETURNED MODULES (CONT.)

UNIT	SERIAL NO.	CUSTOMER	DEFECT
1209	94296 K	I.T.T.	HIGH SATURATION VOLTAGE
1310	0008211 E	I.T.T.	NONE
1546	64011 D	DEC	NONE
1546	28198 C	DEC	FAILED RISE TTT
1546	28078 C	DEC	NONE
1546	28092 C	DEC	FAILED RISE TTT
1546	28079 C	DEC	NONE
1546	28203 C	DEC	NONE
1546	28083 C	DEC	Q 6 OPEN EMITTER TO COLLECTOR
1546	28200 C	DEC	Q 4 MISSING
1546	28195 C	DEC	NONE
1607	77417 B	I.T.T.	NONE
1607	77741 B	I.T.T.	NONE
1607	77730 B	DEC-CALIF.	NONE
1972	70822 B	DEC-CALIF.	OPEN
1972	6008745 B	I.T.T.	TRANS. SHORTED
1972	0009994 B	I.T.T.	TRANS. SHORTED
1972	06191 B	I.T.T.	TRANS. SHORTED
1973	31528 A		TRANS. BACKWARD
1973	91905 C	I.T.T.	EXCESSIVE LEAKAGE
1973	0008405 C	I.T.T.	NONE
1976	73863 C	I.T.T.	C 7 OPEN
1976	00891 C	I.T.T.	NONE
1982	0034631 B	DEC-CALIF.	Q 6 SHORTED
1982	0034632 B	DEC-CALIF.	Q 5 & Q 11 SHORTED
4102	0022571 A	I.T.T.	NONE

REPAIR OF RETURNED MODULES (CONT.)

UNIT	SERIAL NO.	CUSTOMER	DEFECT
4106	84467 F	I.T.T.	NONE
4110	78192 E	I.T.T.	Q 1 LEAKAGE TOO HIGH
4112	81317 A	I.T.T.	NONE
4113	0015395 A	I.T.T.	Q 3 & Q 4 SHORTED Q 6 HIGH LEAKAGE
4113	0010576 A	I.T.T.	Q 3 SHORTED
4113	0014857 A	I.T.T.	Q 2 & Q 6 SHORTED
4201	33509 K		OBSOLETE TRANSISTORS REPLACE (2N412)
4213	89247 E	I.T.T.	NONE
4213	95970 E	I.T.T.	NONE
4214	0017702 C	I.T.T.	NONE
4214	93692 B	I.T.T.	NONE
4214	0008723 C	I.T.T.	NONE
4214	93690 B	I.T.T.	NONE
4301	63537 E	I.T.T.	NONE
4603	0010593 D	I.T.T.	NONE
4603	0025124 D	I.T.T.	NONE
4603	80617 C	I.T.T.	BROKEN CIRCUIT

OF A TOTAL OF 64 MODULES RETURNED, 32 HAD NO DISCERNIBLE DEFECTS. THESE MODULES WERE TESTED AT ROOM TEMP. AND AT 55°C. MANY OF THE DEFECT TAGS WERE INCOMPLETE AND THIS LACK OF INFORMATION WILL GREATLY HAMPER OUR RECORD KEEPING.

INTEROFFICE MEMORANDUM

DATE September 14, 1962

SUBJECT General PDP-4 Information

TO Computer Sales Personnel FROM George Rice

Below is a list of the current options for the PDP-4 computer.

Paper Tape Punch and Control	Type 75
Printer-Keyboard and Control	Type 65
Real Time Option	Type 25
Visual 16 in. CRT Display	Type 30D
Magnetic Tape Transport	Type 50
Magnetic Tape Control	Type 54
Line Printer and Control	Type 62
Card Reader and Control	Type 40-200
Card Punch Control	Type 40-523

At present there are two DEC PDP-4's. One is at Maynard and has all of the above options. The second machine is at the DEC office in Los Angeles, and has the Type 75, Type 65, Type 25, Type 30D, and Type 54 options. A third machine, in addition to the two already sold, is being built for stock. This machine will be used at some of the Trade Shows during the month of October and will probably be sent to Massachusetts General Hospital later in November.

In addition to the above options DEC has proposed to build the following for use in Process Control Applications.

The drum system under consideration and proposed to Foxboro Company for Process Control is specified in the memo, Block Transfer Drum System Specifications. This system operates on a serial transfer basis in 256 word blocks, and requires the Real Time Option. The present state of this system is in the proposal form. Computation and drum transfers are concurrent. The prices for this drum are as follows:

16K word capacity	$ 31,600
32K word capacity	36,300
65K word capacity	43,400

Extended Memory - DEC has also proposed an expanded PDP-4 core memory Type 16 described in Permanent Memorandum M-1154. This unit will replace the present physical 4096 word core and 4096 word core memory modules will be placed in additional connected bays of the PDP-4.

Extended Arithmetic Control Unit - The proposed extended arithmetic control unit is in a very general form. The Arithmetic Control Unit (ACU) attaches to the PDP-4 and allows arithmetic operations to be performed faster. The ACU serves as an extension to the Accumulator (AC) and consists of control, a Multiplier-Quotient register (MQ), and a step counting register. The commands which will be available are:

1. Arithmetic Shift - right/left AC and MQ
2. Multiply/Divide - 34 bit variable length
3. Normalize
4. Load Step Counter from AC - specify shifts or length of Multiply/Divide
5. Read Step Counter into AC
6. Load MQ from AC
7. Read MQ into AC

The time required for the above operations will vary. The maximum time required to obtain a signed 36 bit product would be approximately 25 memory cycles or 200 microseconds. The price for the ACU will certainly be less than $15,000 and will more than likely be less than $10,000. At this time an exact specification of the ACU does not exist, although the general method is known. The chief variable in the design is whether or not to provide programmed or hardware sign control.

Following is a variety of information which should be

helpful in the marketing of the PDP-4.

The programs which we currently intend to supply with a computer plus their features are listed below.

1. Macro - 4 Assembly Program - This program is a one pass assembler. It allows mnemonic symbols to be used for addresses and instructions. Constants are automatically assigned. Text statements may be written for printing at run time, and a decimal mode may be specified. Up to 6 character symbols may be used, and the symbol table may be punched on paper tape for use with the DDT program.

2. DDT - 4 DEC Debugging Tape - This program provides communication with a program via the on-line typewriter. Registers may be examined (using nmemonic codes) and modified, communication is entirely in symbolic language. Programs may have break points inserted and then run under DDT control (similar to tracing routine). A program may be searched for particular words.

3. Double Precision Floating Point - This will provide floating point arithmetic with a 36 bit mantissa and exponent. These routines include +, -, $\div$, X, fix-to-float, and float-to-fix, decimal input and output, single and double precision fixed point X and $\div$ are also included in the package.

4. Maintenance Routines - There are five maintenance routines. These tests are also used as DEC's standard acceptance test routines.

a) Interminable Test - Verifies that all machine functions are operating properly. Each instruction is tested, a core checkerboard pattern is run, a message is typed and tape is punched and read. The test will then repeat itself.

b) Instruction Tests - These programs will test all machine instruction under various modes.

c) Checkerboard Program - Provides continuous checkerboard memory testing with four different patterns.

d) Reader and Punch Test - Checks the start time of the reader, and provides check of the reader using different patterns and variable times.

The punch is tested by providing tapes for the reader test.

e) Teleprinter Test - Provides for input and output test to be made on the printer-keyboard teleprinter.

5. Tape Reproducer -

6. Punch Routines - These routines allow for punching tape in either block format or read-in mode format.

7. Octal Debug - Simple debugging routine.

8. Miscellaneous input/output Routines - These routines allow octal, decimal, double precision input and output, also special teletype conversion routines.

9. Demonstration Programs -

a) Display Minskytron

b) Pen Follow

c) Character Display

d) Character Punch

10. Floating Point Functions (not completed) - This program will allow various functions to be computed such as - double precision sine, cosine, tangent, exponents, log base e and square root.

11. Algebraic Compiler (not completed, This compiler is now being specified and should be of the Fortran Type. The expected date of completion is sometime late spring 1963).

Purchase of a PDP-4 will enable customers to become members of the DEC Users Group known as DECUS. DECUS is an active users group whose aim is to facilitate the interchange of information on items of mutual interest to users of PDP-1, PDP-4, and their peripheral equipment. DECUSCOPE is a monthly technical bulletin which attempts to implement the goals and objectives of DECUS, by keeping "in-touch" with members.

The reader-punch cabinet as shown in the recent pictures of the PDP-4 can easily be separated. With the removal of the top part of the cabinet and the installation of rubber

feet then a reader only cabinet is available.

The PDP-4 prototype has about 1000 hours on it without a mainframe failure.

The ambient temperature range of the PDP-4 is between 50°F and 105°F. The computer has been run at temperatures considerably higher than 105, but the long term reliability at higher temperatures is unknown so at this time is not recommended.

There is an eleven instruction loader program which is inserted using the console switches. This program is generally left in memory and is used to read in program tapes.

The delivery time for a PDP-4 depends upon the date of the received purchase order. At the present time we can quote less than 3 months for delivery of a main frame. Most of the standard options can be delivered at the same rate, some of the more sophisticated options require more time.

The standard operating guarantee for a PDP-4 is as follows: The equipment is warranted to be free from design and manufacturing defects for a period of six (6) months following delivery. Parts and service necessary to repair any such defects and to maintain the equipment in proper operating condition during this period will be supplied free of charge. DEC liability under this warranty is limited to these parts and service and does not include any consequential damages. The warranty does not cover damage to the equipment due to service of the equipment by unauthorized personnel or due to unusual physical or electrical stress. This warranty does not cover systems outside continental United States, in this case a special warranty will apply. An "on call" service contract provision from the nearest DEC service area is available after the normal warranty period.

Acceptance procedures for computer systems are generally as follows: Acceptance testing and acceptance of the equipment shall be at Maynard, Mass. Upon satisfactory completion of the acceptance test by both parties the equipment will be shipped to the buyer's sight and again tested for proper operation. This date will be the invoice date and the commencement of the six months guarantee described above. The test shall consist of the standard DEC programs and procedures applicable to the specific equipment. Subject to DEC approval the buyer may include special test procedures and programs. The buyer must bear all cost of preparation and checking of any such special programs, and in no event can the final acceptance of the system be delayed by

nonavailability of such special programs. Final agreement on test procedures and programs must be reached no later than 30 days before scheduled delivery date of the equipment.

There are programming and maintenance manuals available for the PDP-4. There, also, is a one week maintenance course offered at Maynard. This course is usually run the first or second week of each month. A programming course, is also proposed, but no details have been decided upon as yet.

dec INTEROFFICE MEMORANDUM

DATE September 14, 1962

SUBJECT Pricing of Real Time Option, Meeting with Foxboro; Friday, Sept. 14, 1962

TO Kenneth Olsen
Harlan Anderson
Ben Gurley
Richard Mills

FROM Gordon Bell

Today Arthur Hall and I discussed the $8,000 price of the Real Time Option with Foxboro. They felt that its price was too high. Their investigation was started by Les Glickman, and pushed by Saul Dinman.

We initially priced an additional box for their interface at $3,000. This included -6 volt buffers and signal converters, etc. This was too expensive for them so they agreed to do the buffering. We still have to provide a quote to them with the modified interface. The difference between the new and old interface is about + $100, making the cost $8,100 to Foxboro. Their cost analysis at our list prices was as follows:

Modules	3,573
3 mtg panel wiring (75 x 33)	2,500
(3 x 450) mtg. panel price	450
	$6,523

I will quote a new price of $8,100 to Foxboro for their proposed Foxboro Real Time Option.

We discussed the following topics:

1. DEC assisting Foxboro in the problems of signal transmission on long coaxial lines.

2. Give Foxboro overall dimensions of our cabinetry so units in an installation are physically similar.

3. Give Foxboro the specifications and vendor for our coaxial cables. We might also supply them with our coaxial connector or tell them how to cast them.

Foxboro's line of module and systems components are becoming stabalized. Their sub-system select modules are quite similar to ours in that codes for units are within the modules. Their flip-flops now include capacitor-diode gating, and input mixing is done with these gates I believe.

* * * *

INTEROFFICE MEMORANDUM

4.50

DATE September 14, 1962

SUBJECT General PDP-4 Information

TO Computer Sales Personnel FROM George Rice

Below is a list of the current options for the PDP-4 computer.

Paper Tape Punch and Control	Type 75
Printer-Keyboard and Control	Type 65
Real Time Option	Type 25
Visual 16 in. CRT Display	Type 30D
Magnetic Tape Transport	Type 50
Magnetic Tape Control	Type 54
Line Printer and Control	Type 62
Card Reader and Control	Type 40-200
Card Punch Control	Type 40-523

At present there are two DEC PDP-4's. One is at Maynard and has all of the above options. The second machine is at the DEC office in Los Angeles, and has the Type 75, Type 65, Type 25, Type 30D, and Type 54 options. A third machine, in addition to the two already sold, is being built for stock. This machine will be used at some of the Trade Shows during the month of October and will probably be sent to Massachusetts General Hospital later in November.

In addition to the above options DEC has proposed to build the following for use in Process Control Applications.

The drum system under consideration and proposed to Foxboro Company for Process Control is specified in the memo, Block Transfer Drum System Specifications. This system operates on a serial transfer basis in 256 word blocks, and requires the Real Time Option. The present state of this system is in the proposal form. Computation and drum transfers are concurrent. The prices for this drum are as follows:

16K word capacity	$ 31,600
32K word capacity	36,300
65K word capacity	43,400

Extended Memory - DEC has also proposed an expanded PDP-4 core memory Type 16 described in Permanent Memorandum M-1154. This unit will replace the present physical 4096 word core and 4096 word core memory modules will be placed in additional connected bays of the PDP-4.

Extended Arithmetic Control Unit - The proposed extended arithmetic control unit is in a very general form. The Arithmetic Control Unit (ACU) attaches to the PDP-4 and allows arithmetic operations to be performed faster. The ACU serves as an extension to the Accumulator (AC) and consists of control, a Multiplier-Quotient register (MQ), and a step counting register. The commands which will be available are:

1. Arithmetic Shift - right/left AC and MQ
2. Multiply/Divide - 34 bit variable length
3. Normalize
4. Load Step Counter from AC - specify shifts or length of Multiply/Divide
5. Read Step Counter into AC
6. Load MQ from AC
7. Read MQ into AC

The time required for the above operations will vary. The maximum time required to obtain a signed 36 bit product would be approximately 25 memory cycles or 200 microseconds. The price for the ACU will certainly be less than $15,000 and will more than likely be less than $10,000. At this time an exact specification of the ACU does not exist, although the general method is known. The chief variable in the design is whether or not to provide programmed or hardware sign control.

Following is a variety of information which should be

helpful in the marketing of the PDP-4.

The programs which we currently intend to supply with a computer plus their features are listed below.

1. Macro - 4 Assembly Program - This program is a one pass assembler. It allows mnemonic symbols to be used for addresses and instructions. Constants are automatically assigned. Text statements may be written for printing at run time, and a decimal mode may be specified. Up to 6 character symbols may be used, and the symbol table may be punched on paper tape for use with the DDT program.

2. DDT - 4 DEC Debugging Tape - This program provides communication with a program via the on-line typewriter. Registers may be examined (using nmemonic codes) and modified, communication is entirely in symbolic language. Programs may have break points inserted and then run under DDT control (similar to tracing routine). A program may be searched for particular words.

3. Double Precision Floating Point - This will provide floating point arithmetic with a 36 bit mantissa and exponent. These routines include +, -, $\div$, X, fix-to-float, and float-to-fix, decimal input and output, single and double precision fixed point X and $\div$ are also included in the package.

4. Maintenance Routines - There are five maintenance routines. These tests are also used as DEC's standard acceptance test routines.

a) Interminable Test - Verifies that all machine functions are operating properly. Each instruction is tested, a core checkerboard pattern is run, a message is typed and tape is punched and read. The test will then repeat itself.

b) Instruction Tests - These programs will test all machine instruction under various modes.

c) Checkerboard Program - Provides continuous checkerboard memory testing with four different patterns.

d) Reader and Punch Test - Checks the start time of the reader, and provides check of the reader using different patterns and variable times.

The punch is tested by providing tapes for the reader test.

e) Teleprinter Test - Provides for input and output test to be made on the printer-keyboard teleprinter.

5. Tape Reproducer -

6. Punch Routines - These routines allow for punching tape in either block format or read-in mode format.

7. Octal Debug - Simple debugging routine.

8. Miscellaneous input/output Routines - These routines allow octal, decimal, double precision input and output, also special teletype conversion routines.

9. Demonstration Programs -

a) Display Minskytron

b) Pen Follow

c) Character Display

d) Character Punch

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TO: HARLAN ANDERSON

File

SALES MEETING

Maynard, Massachusetts
September 14th, 1962

Stan started the meeting by mentioning that tie clips and pins were in the process of being made and at the cost of 65¢ to 75¢ a piece. At this point drawing templates were brought up again. Jim Burley had obtained a price in quantities on templates, but it was generally agreed that we could have our own die made to produce them much more economically.

Stan told us a little bit about both the WESCON and Munich Shows. WESCON, he said, was somewhat discouraging at one point due to a power failure, but apparently after this was rectified things turned out well. At the Munich Show problems again developed, but the show in general was very good. One point made was that there are cheaper modules available in Europe, but that they are extremely hard for the engineer to work with. The general feeling was the PDP-4 should be quite successful over there. Stan also mentioned that it is quite possible we will have an office in W. Germany, and that he was been talking with a Mr. Hewie there.

Dick Best, Russ Doane and Barbera Stephenson entered and other sales topics were put aside temporarily. Russ gave us some good information on the VHF line, including some applications, and then Barbera gave us a run down on recent thoughts in the

Analog-to-Digital/Digital-to-Analog Conversion line and some of the things being done there. There was also quite a discussion on what other companies were doing, which apparently isn't as spectacular as one might expect, especially after reading their literature. Finally Dick Best talked about some of the new modules and current drivers. Dick also mentioned that we are sending kits to our 52/62 customers to replace the original plastic type dialectric variable capacitors with new air dialectric variables. He also mentioned that the new models of the current drivers will allow a selection of one of three preset levels and there will be a new model of the current calibrator. These will be models 53, 63, and 72 respectively.

The normal sales meeting adgenda resumed after lunch. The first point brought up by Stan was that of the district offices receiving orders and tax problems resulting with respect to these orders. In general, we can eliminate the state of Massachusetts tax on an order by receiving it at the district offices, although it might be wise also to check into the state laws where the district offices are located.

Jim Burley brought up the topic of advertising in general and in particular in EEM. It was pointed out that advertising in magazines has shown to be definitely unprofitable and that we have a large mailing list which we haven't even begun to use. Jack Atwood pointed out the fact that he can, from the master mailing list, line up any number of prospective customers by catagory.

Jack Atwood mentioned that the new catalog would be ready on October 5th. The PDP-4 programming manual will be ready on October 8th and that the PDP-1 maintenance manual will be ready on October 20th.

Our fight with renegotiable business was again brought up and ideas concerning where such business might come from were solicited. It was brought out that the memory-buffers could be one source of non-renegotiable contact if we were to concentrate on the non-government schools. It was pointed out that there is some question as to the advisability of continuing training devices in general, specifically classroom modules. It should be pointed out that some of our people did not even know we made classroom modules in our standard symbology. Stan also mentioned that we have refused to quote on 20 computers to NASA because it is renegotiable, but that we do want to and have to sell computers.

Ken stepped in for a few minutes and brought to light the fact that the drug companies might be a good prospect for computer sales in light of recent events. There are apparently two kinds of drug companies; those that research an item and those that copy. We definitely, and naturally, are interested in the research people. Stan also mentioned the use of a computer as a hotel reservations and service system by using a room telephone dial as an input device and a television set on an unused channel as an output device. It was also brought up that medical research seems to be playing a more and more important part in our lives at DEC and that utility companies

might also be a good prospect. In general, it was said, anyone that has to move something needs a computer.

Harlan Anderson

dec INTEROFFICE MEMORANDUM

DATE September 13, 1962

SUBJECT PDP-4 Drum Delivery

TO Ken Olsen
Harlan Anderson ✓
Dick Best
Ben Gurley
Gordon Bell

FROM George Rice

Today a letter was sent to Foxboro stating a five months delivery from receipt of purchase order for a block transfer drum system. The drum system quoted is the one described in Gordon Bell's letter dated Aug. 16 to Gardner Hendrie and as amended in John Koudela's letter dated Sept. 11 to Roy Fine.

A seven month figure was decided upon at a meeting attended by Dick Best, Ben Gurley, Gordon Bell, and myself. There are three major reasons for the seven month figure:

1) It takes a minimum of three months to receive a drum from Vermont Research.

2) This is the first time for a system of this nature and it will necessitate some new circuit design.

3) At the present time there is a shortage of personnel to be assigned to the project.

Foxboro came back to us requesting a five months figure, so at a meeting attended by the persons to whom this memo is addressed, a five month figure was agreed upon.

dec INTEROFFICE MEMORANDUM

DATE 9/12/62

SUBJECT Boeing RFQ

TO Harlan Anderson

FROM Ted Johnson

Regarding the interest of Les Hong in the PDP-1 in their Flight Simulation Lab., Rush Drake Associates did play a role in encouraging their interest and finding this prospect. At one time, Oliver mentioned the possibility of Rush Drake Associates financing purchase of such a machine. At the time, I disregarded this statement but in view of the importance of leasing the machine for these people, it might prove that this would be a practical way for us to do this. Should Rush Drake Associates be capable of providing a lease to Boeing, this would give us the advantage of receiving cash, they would realize a discount in the form of their finders fee and be able to provide effective liason with Boeing on their PDP-1 installation. In addition, they do have a computer technician who would be able to be trained in the routine maintenance requirements having to do with the input/output equipment and we could provide additional back-up from this office.

I have not approached Oliver Judd on any aspect of this sale since the RFQ and do not intend to involve him in this unless necessary for some information collection, but we might consider all of these possible alternatives for our module benefit. They stand to gain in the module area and prestige as a result of this sale.

Ted Johnson

H. Anderson

dec MEMO

DATE 9/14/62

TO G. O'Dea
D. Mills

FROM J. Smith

SUBJECT: Outside Contract Expenditures (wiring)

During this month I will receive all outstanding orders from wiring vendors, including Power Supplies. This involves a total expenditure of $19,962.00. Our in-house capability should eliminate the need for outside contract help in Oct. and subsequent months.

cc: KHO
HEA ✓

DAP 984

dec INTEROFFICE MEMORANDUM

DATE September 13, 1962

SUBJECT DECUS EXECUTIVE BOARD MEETING
Friday Noon (September 14)

TO FROM Elsa Newman

Ken Olsen
H. Anderson ✓
S. Olsen

The following items will be disposed of:

1. The date of DECUS Annual Organization Meeting is set for 10, 11 October at Hanscom Field - Lawrence Radiation Lab will probably extend invitation for next technical meeting. Mrs. Monk telephoned me for details of host obligations.

2. Article by J. Sexton in August DECUSCOPE stimulated action on DECUS (?) double precision arithmetic routines. Mrs. Monk's letter of May 9 expressed need for them. I repeatedly tried to get Roland Silver, John K., Ed Fredkin, and Ben Gurley to do something. Mr. McQuillan will come to meeting (at my suggestion and with BBN's okay) to proxy for Bill Fletcher. Gordon Bell and Dit Morse have also been invited and will attend.

dec INTEROFFICE MEMORANDUM

DATE September 13th, 1962

SUBJECT

TO Stan Olsen
Harlan Anderson
Jack Atwood
Gordon Bell

FROM Kenneth H. Olsen

October 8th - 12th at the National Institutes of Health, Bethesda, Maryland there is going to be the 12th Annual Instrument Symposium and Research Equipment Exhibit. Because of our new interest in this medical work, it would be very worthwhile if we could work in an exhibit here and have one of our PDP computers. There is a possibility that we might have our Mass General Hospital PDP-4 computer with Analog inputs all set for this time and we could show it off here before we deliver it.

Kenneth H. Olsen

INTEROFFICE MEMORANDUM

DATE September 13, 1962

SUBJECT Potter Instrument Co., Inc. Report

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

FROM H. Crouse

Electronic news had the enclosed report in the September 10, 1962 edition.

To my knowledge we had not given permission to Potter to publish this type of information.

1 Enclosure

Uris.

Digital Pact to Potter

. PLAINVIEW, N. Y.—Potter Instrument Co., Inc., here has received a $131,500 contract from Digital Equipment Corp., Maynard, Mass., for follow-on production of the Model M90611 digital magnetic tape transport, according to a Potter official.

Sept 10, 1962
Elect. News

Uris.

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Sept 10, 1962
Elect. News

dec INTEROFFICE MEMORANDUM

File

DATE September 12, 1962

SUBJECT Pinkerton Guard Service

TO K. Olsen
H. Anderson ✓
G. O'Dea
L. Prentice

FROM R. Mills

Attached you will find a copy of the Confirmation of Order from the Pinkerton people verifying the conference we had with them regarding the guard schedule and pay rates. It is somewhat startling to find that the weekly service totals out to 256 hours which at $2.35 per hour equals $601.60 per week. The total cost on an annual basis is approximately $31,000. plus holiday pay for nine (9) days at $3.90 per hour.

Billing will be made once per month.

A certificate of insurance has been requested from them regarding liability coverage on the guards and the statement was made that all of their guards were bonded. A question was asked regarding union activities and Mr. O'Madigan stated that they had no trouble with their union whatsoever. With one steward and 350 guards placed in so many plants, this seems like a reasonable statement.

We will have to pay for a Detex clock and keys for approximately $200., which is a one shot charge.

# # #

CONFIRMATION OF ORDER
for
GUARD SERVICE

This is NOT a bill

PINKERTON'S NATIONAL DETECTIVE AGENCY, INC.

Address: 136 Federal Street
Boston, Mass.

Telephone: Liberty 2-1751

Date: September 7, 1962

To: Digital Equipment Corporation
146 Main Street - Bldg. 12
Maynard, Mass.

Attn: Mr. Richard Mills

SERVICE AUTHORIZED

Guards as indicated below will proceed with Security Manager, Dennis T. O'Madigan to the Digital Equipment Corporation, Building 12, 146 Main Street, Maynard, Mass. and report to Mr. Richard Mills at 7:00 AM on September 10, 1962.

Monday thru Friday	2 Guards	- 7:00 AM to 3:00 PM
	2 Guards	- 3:00 PM to 11:00 PM
	1 Guard	- 11:00 PM to 7:00 AM
Saturday	2 Guards	- 7:00 AM to 3:00 PM
	1 Guard	- 3:00 PM to 11:00 PM
	1 Guard	- 11:00 PM to 7:00 AM
Sunday	1 Guard	- 7:00 AM to 3:00 PM
	1 Guard	- 3:00 PM to 11:00 PM
	1 Guard	- 11:00 PM to 7:00 AM

Rate for each Guard assigned - $2.35 per hour.
Rate on Holidays for each Guard assigned - $3.90 per hour.

In addition, when indicated below, charges shall be made for:

Expenses, as follows: None

Travel time, as follows: None

Service ordered in addition to the above will be rendered under the same terms and conditions.
Bills payable upon presentation.

PINKERTON'S NATIONAL DETECTIVE AGENCY, INC.
By J. P. McKenna
Manager.

Form 71A - 5M - 10-58 - Ptd. in U.S.A.

dec INTEROFFICE MEMORANDUM

DATE SEPTEMBER 10, 1962

SUBJECT REPAIR OF RETURNED MODULES

TO Harlan Anderson FROM JIM CUDMORE

THE FOLLOWING IS A LIST OF MODULES RETURNED FOR REPAIR DURING THE WEEK OF SEPT. 3,

UNIT	SERIAL NO.	CUSTOMER	DEFECT
1103	79438 F	I.T.T.	SHORTED TRANSISTOR
1103	03593 F	I.T.T.	SHORTED TRANSISTOR AND SHORTED
1103	87991 F	I.T.T.	NONE
1103	81882 F	I.T.T.	NONE
1105	00171 E	I.T.T.	NONE
1105	00166 E	I.T.T.	NONE
1105	76426 E	I.T.T.	NONE
1105	00170 E	I.T.T.	NONE
1105	017864 E	I.T.T.	NONE
4105	03354 E	I.T.T.	NONE
4106	99637 F	I.T.T.	NONE
4106	01144 G	I.T.T.	NONE
4106	74803 F	I.T.T.	NONE
4106	0010953 G	I.T.T.	NONE
4106	70335 F	I.T.T.	NONE
4209	0015306 H	I.T.T.	LEAKY TRANSISTOR(BROKE DOWN UNDER HEAT)
4209	0016780 H	I.T.T.	NONE
4209	0016752 H	I.T.T.	NONE
4209	97488 H	I.T.T.	NONE
4209	75549 H	I.T.T.	NONE
4209	006759 H	I.T.T.	NONE

REPAIR OF RETURNED MODULES(CONT.)

UNIT	SERIAL NO.	CUSTOMER	DEFECT
4216	95736 B	I.T.T.	NONE
4216	0028421 B	I.T.T.	NONE
4216	0028532 B	I.T.T.	NONE
4216	95737 B	I.T.T.	NONE
4216	95769 B	I.T.T.	NONE
4407	0073077 B	I.T.T.	REPLACED ORIGINAL XTAL WHICH WAS KNOWN TO BE OUT OF TOLERANCE
4407	0012906 B	I.T.T.	REPLACED TRANSFORMER FOR PULSE WIDTH(TOO WIDE)
4407	0012907 B	I.T.T.	NONE

OF A TOTAL OF 29 MODULES RETURNED, 23 HAD NO DISCERNABLE DEFECTS. THESE MODULES WERE TESTED AT ROOM TEMP. AND AT 55 C. MANY OF THE DEFECT TAGS WERE INCOMPLETE AND THIS LACK OF INFORMATION WILL GREATLY HAMPER OUR RECORD KEEPING.

September 5, 1962

GROUP INSURANCE

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

Bob Lassen

COPY

This is a report of our findings and recommendations with respect to the following group insurance problems:

1. Cut off or reduction of insurance age eligibility.
2. Inclusion of private room coverage under major medical.
3. More efficient group insurance administration.

1. Age Cut Off Or Reduction - A complete elimination of coverage at an earlier age than retirement would be illegal. There is also a strong possibility that a cut back for existing employees would be considered discrimination by the State Insurance Department.

   At first glance, age reduction seems to make sense however, I feel there are some strong arguments against it. Most married men at age 50, 55 or even 60 still have large life insurance obligations to their families. Many people at this age still face the cost of college educations for their children and there is also the strong possibility of a surviving widow needing support for an additional 15 or 20 years. There is also a moral obligation to faithful long-term employees who have worked hard to build up a satisfactory estate for their families' well being.

   A survey of the area indicates that only General Radio has incorporated an age reduction provision in their insurance plan. Since we are competing with Sylvania, R.C.A., I.B.M., Honeywell, etc., for top people, an age reduction in our plan would not be a good recruiting measure. Our present life rate has dropped to 39¢ per $1,000 from the initial 43¢ rate when the plan was adopted.

Although it is imperative that we watch this rate very carefully, John Hancock feels that we are many years away from a high rate problem. In addition our life claims are charged against the case on a "pooling formula" derived from our annual life premium. I therefore recommend that we do not alter the age provisions of our plan at this time. However, we might want to consider a retirement cut off provision at a later date.

2. Private Room Coverage - Major Medical - For some time we have felt that people, who are either forced or prefer to be hospitalized in a private room because of the nature of their illness, are penalized because our present plan (under Major Medical) does not provide coverage in excess of $20.00 per day. In May, the John Hancock Company presented us with the following rates for extending our major medical plan to include private room coverage:

Additional Monthly Cost Per Employee and Dependent Unit

	$25	$28	$30
Employee	$.17	$.27	$.34
Dependent Unit	$.29	$.46	$.58

At that time, we felt that this coverage should be included under Major Medical at no additional charge. John Hancock feels quite strongly that the extension of such coverage will encourage an increase in the amount of private room claims and therefore will result in some additional cost. Because of this, they are fairly adamant about increasing our premium to compensate for such an inclusion; however they have proposed a lower rate as follows:

Additional Monthly Cost Per Employee and Dependent Unit

	$25	$28	$30
Employee	$.05	$.08	$.10
Dependent Unit	$.15	$.24	$.30

I feel this is fair and that their reasoning is sound. Therefore, I recommend we re-write our plan to include private room coverage under Major Medical at the $28.00 per day charge. I also recommend that the company absorb the entire cost of this increase and that we announce it to our employees as a new benefit.

3. Group Insurance Administration - We have discussed our present methods of administering our group plan with both Bill Duane and Mr. Frank Di Yorio, John Hancock Group Representative. They are well aware of our desire to streamline the paper work involved and they are now working on this. So far the proposal they have presented to me is unsatisfactory and I have asked them to "think a little harder". Both Barbara Charnock and I feel that we should never completely let go of insurance administration. First of all, Barbara is our expert - she knows more about the plan than any one else in the company. Our employees have confidence in her and have been well served by her - especially when most needed. This has been a tremendous morale factor and has allowed her the opportunity of much needed personal contact with many of our employees. It also lets the employee know that the company is taking a personal interest in them and their insurance plan. For this reason, I strongly feel that overall group insurance administration should remain in the Personnel Office. Workmen's Compensation (Liberty Mutual) claims are not as prevalent and should eventually be handled by the company nurse.

I feel we should call a meeting in the near future to discuss these issues and make the necessary decisions.

* * * * *

dec INTEROFFICE MEMORANDUM

DATE September 5, 1962

SUBJECT Request for Proposal A-6026

TO H. Anderson FROM E. Harwood

Ted Johnson called today, Wednesday, September 5th, regarding the proposal to NASA at Ames Research Center Moffit Field, California. Ted would like us to reconsider our refusal to bid on the overall system, and he would like to talk to them on Monday, September 10th about bidding on the whole system.

Ted seems to feel very strongly that it would be a good job for us to handle, and would like to hear from you on this as soon as possible.

Enclosures: Request for Proposal
Proposal

CC: Mr. Anderson's home

dec INTEROFFICE MEMORANDUM

File

DATE September 4, 1962

SUBJECT WORKMANSHIP MANUAL

TO Bob Hughes

FROM Elsa Newman

The third drawer of ny newly reorganized filing cabinet contains several preliminary drafts of the never finished DEC "Workmanship Manual". Because so much effort had been put into it I find it difficult to dispose of. The purpose of the present note is two fold:

1. Do you have a new "Workmanship Manual" I could substitute for these incomplete drafts?

2. If no "Workmanship Manual" has been completed can I help in any way to stimulate new interest in the completion of the interrupted task:

Will you please let me hear from you.

Copy for H. Anderson