INTEROFFICE MEMORANDUM

DATE March 1, 1965

SUBJECT PROPOSED PDP-8 CABINET CONFIGURATIONS

TO Computer Guidance Committee FROM Ken FitzGerald
cc: Loren Prentice
Ron Cajolet

If we offer additional extra bay cabinet configurations for the PDP-8 the same way we have offered them for the PDP-5's in the past, we could have the same number of typical configurations, namely about 15. These configurations are quite expensive since they all involve some parts which are used exclusively on these configurations and therefore, are not economical to make or stock in large quantities and still do not solve the problem of mounting customers special panels. Incidently, most of these 15 configurations evolved from the placement of the punch, reader, oscilliscope and DEC tape options.

Added to the standard extra cabinet option configurations was the proposal of offering three different doors and three different tables for the PDP-8 itself. This gave us six additional different typical configurations. Any deviation from the conbination of above typical configurations would have to be custom engineered. Therefore, I propose that we offer PDP-8's and PDP-8 systems in the following manner.

DEC CABINET MODEL PDP-8

I. CAB-8 (Standard) (Figure 1)

- A. Single DEC blue cabinet
- B. Winged white formica table
- C. Aluminum trimmed rosewood panels

II. Options (Figure 2)

- A. Rectangular white formica table
- B. Aluminum trimmed DEC blue panels

DEC EXTRA CABINETS FOR SYSTEMS

I. CAB-1 (Systems Module Catalog)

- A. Full length blue doors, front & back
- B. Must stand alone if winged table is used
- C. Can be bolted to left side of "8" if rectangular table is used

II. CAB-6 (Systems Module Catalog)

- A. Same as cab-1

III. CAB-5 OR 5D (Systems Module Catalog)

- A. Must stand alone

IV. CAB-3 (?) (Figure 3)

- A. Should be used for punch, reader, scope, DEC tape, etc. options
- B. Short blue doors below table level
- C. Blank panel in table height area
- D. Lift off cover above table blank
- E. Lift off cover can be stocked full size and cut to fit any size at assembly
- F. Can be free standing or stand to any table
- G. Can be bolted to right side of CAB-8, option A
- H. Can be used with any other cabinet configuration except CAB-2 (trimless)

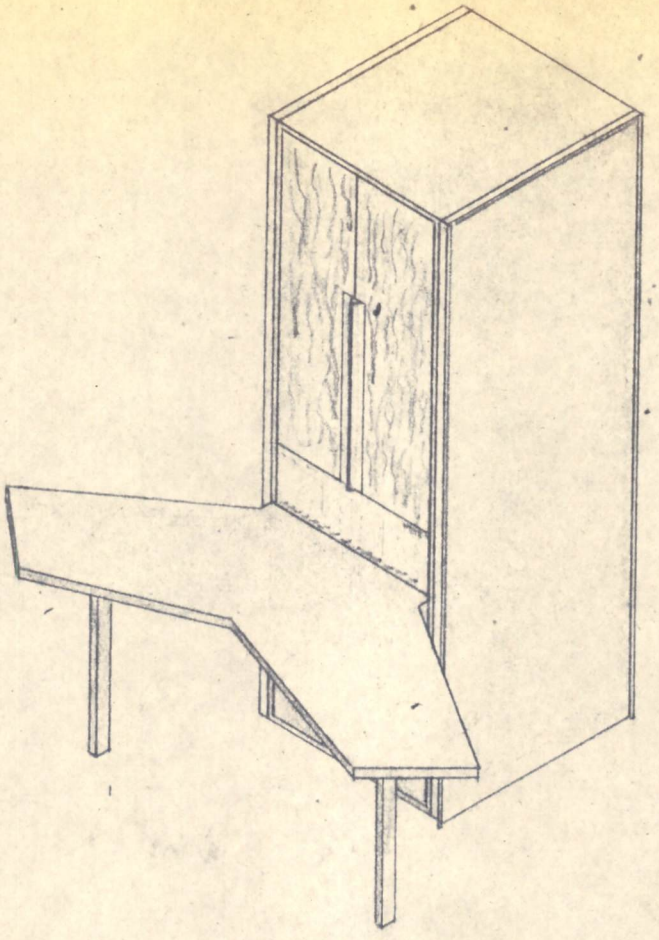

Fig. 1

#1400

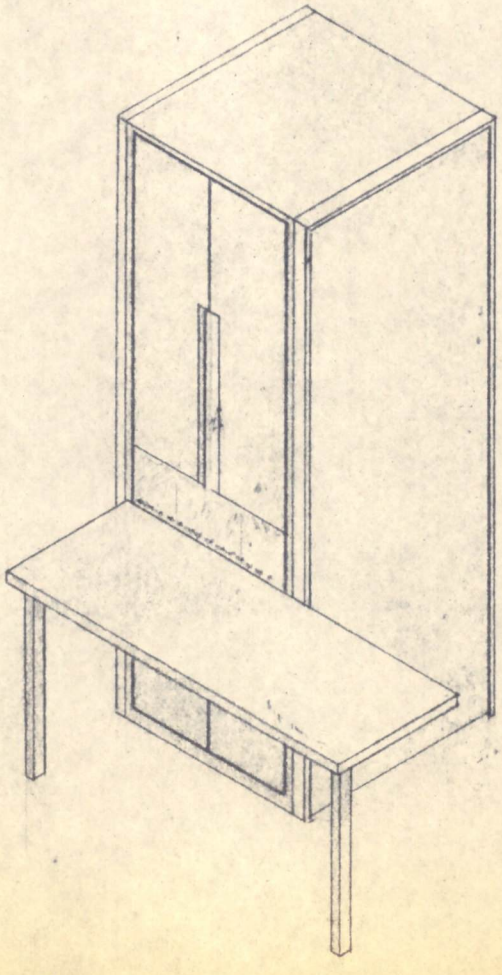

Fig. 2

#1250

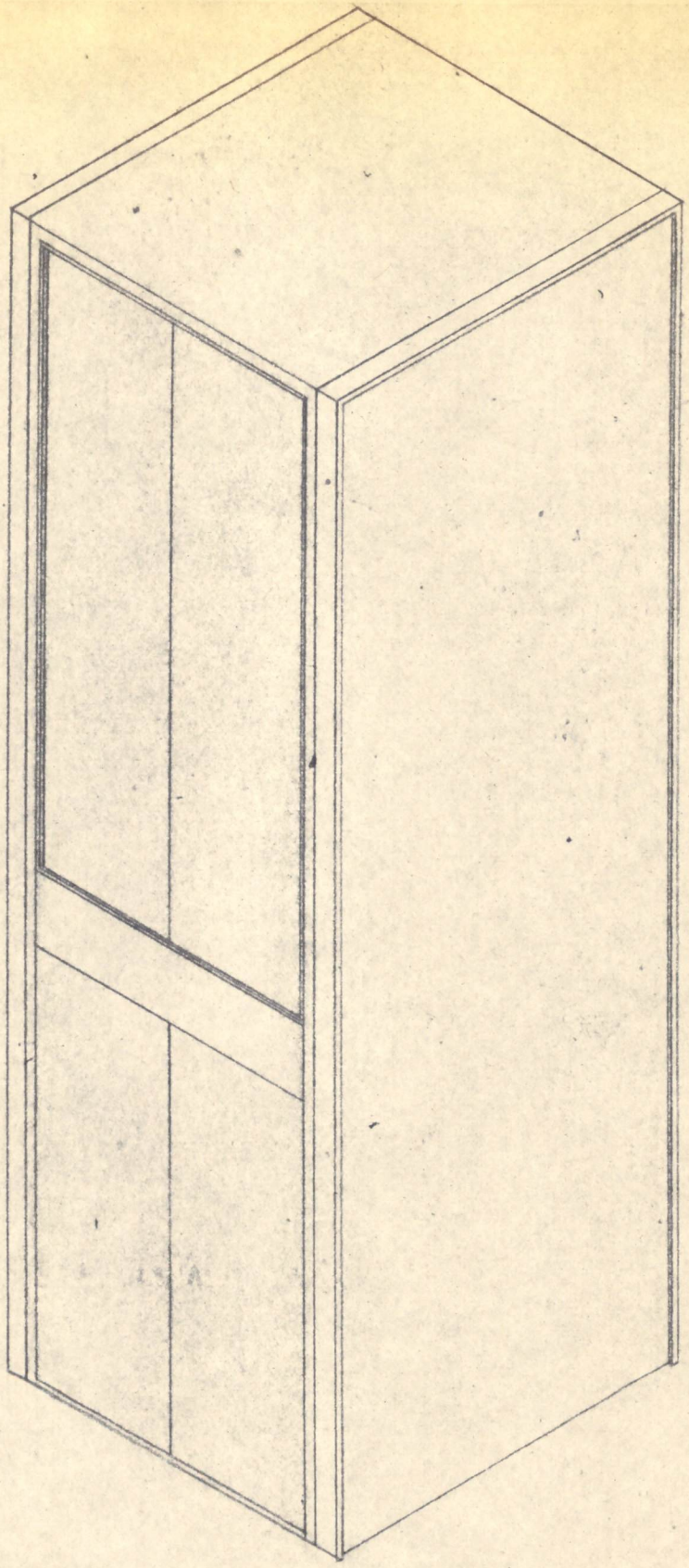

FIG. 3

790 Less End Panels

In the past the PDP-5 required quite a bit of engineering to develop the 15 or so configurations. If the previous proposal is adopted, I feel that the need for additional engineering for the standard option configurations will be non existant and negligible for special customer requirements.

I believe it would be possible to set it up so Ed Harwood could order the PDP-8, additional logic panels, reader, punch, oscilliscope or DEC tape options from the production department and install them in the appropriate cabinets. Once all of the options are physically mounted in the cabinets, it would only be necessary to measure the amount of space remaining above the standard reader punch type options that must be covered and order that size panel from the cabinet assembly shop. They in turn would draw the full size panel from stock, cut it to length and install.

One additional thing that must be done if this proposal is accepted is to redesign our present method of mounting a teletype punch in standard cabinets. There has been objection to the mounting configuration in the PDP-5 and PDP-7. Mostly due to the difficulty of loading tape into the machine. This difficulty should be overcome by placing it on slides and addition of the hardware for securing the blank panel above it to the front panel. This would decrease the apparent physical size of the punch and improve its appearance.

Ken FitzGerald

INTEROFFICE MEMORANDUM

DATE March 1, 1965

SUBJECT

TO Stan Olsen
Harlan Anderson

FROM Kenneth H. Olsen

For the Board Meeting next week, I think it would be a good idea if we had a presentation for the plans of our sales force, both in this country and overseas. I think it would be good to lay out a plan for expansion and what activity we expect to get from each group. Stan will be in school but I think it should be done on paper. It will take very little presentation.

INTEROFFICE MEMORANDUM

DATE March 1, 1965

SUBJECT MAINTENANCE MANUAL CRITERIA

TO H. Anderson
J. Atwood
R. Best
N. Mazzerese
T. Johnson
A. Hall
S. Grover
R. Savell
R. Beckman

FROM Jack Shields

It is evident from past and present performance that our Maintenance Manuals are somewhat lacking. Inconsistancies in format, content, detail and symbology exist.

I feel that one reason for this is because of a lack of standards for the Technical content of these manuals.

The obvious solution is a set of standards for all manuals. I propose that a committee to establish Maintenance Manual Standards be formed. The committee members would be:

A. Hall
R. Savell
R. Beckman
J. Shields
A Respresentative of Tech Pubs.

This committee would meet first for a general session. An outline would be presented by the Tech Pubs Representative at the next meetings for review, etc. I estimate that 3-4 meetings of this type would be all that is required to establish these standards. Once this is accomplished the committee would be dissolved.

Unless I hear to the contrary the first meeting will be held in J. Shields office at 1:30 p.m. on March 8, 1965.

INTEROFFICE MEMORANDUM

DATE March 1, 1965

SUBJECT Paper Tape Reader 760

TO H. Anderson

FROM R. Lane

Paper Tape Reader 760

Serial # 3	(Brookhaven)	2324.
4	(Western Australia)	2717.
5	(LRL)	2388.
6	(Adams)	3178.

Assuming a cost of $2325, the breakdown is as follows. These costs are effective Jan. 23, 1965.

Labor	190
Overhead	285
Material	1850
	2325

The average of the top four is: 2652.

INTEROFFICE MEMORANDUM

DATE March 1, 1965

SUBJECT Data Disc Delivery, March 12, Palo Alto, California

TO K. H. Olsen FROM G. Bell

cc: R. L. Best
H. E. Anderson
N. Mazzarese
J. McKalip
H. Crouse

Today I ordered a Data Disc mechanical assembly for trial on our small computers. DD will sell us:

1. A disc capable of 4 m bits using 1 moving head for $5500 (2 weeks delivery).
2. 1 + Electronics for address seeking, and variable disc to fixed disc transfer electronics, etc. for $5500 + $3400 (70 day delivery). Their president, Armand Miller, does not like this because.
   a. The read amps are not so good, and they are designing better.
   b. The system is clocked, using the fixed disc. This seems to be bad, because of mechanical alignment, and also a self-clocked system would give much higher density (2000 bpi vs. 5000 bpi).
3. A fixed head system yielding 8 m bits, under development for 4 months delivery. - If this works, our PDP-6 drum could be simplified and replaced.

They are also giving us schematics of what circuitry they have, and we can buy cards if we want. I would like us to buy only 1 above and do complete development of Read/Write electronics, etc.

Using a very simple Self-clocked system the format would be:

1. Space neither 1 or 0 output, but 1 polarity flux.
2. Clock Bits to start timing oscillator.
3. Clock Sync Bit (a 1) (usually 10101 pattern)
4. Address.
5. Address Sync Bit.
6. Data, Parity.
7. Space.

Both 1 and 7 above are identical, and are determined by the speed variation of the motor. The computer should have the ability (perhaps an option) to write a complete data track. Let's discuss this now.

GB/mro

INTEROFFICE MEMORANDUM

DATE March 1, 1965

SUBJECT Purchasing Product Development from Bill Wattenberg, of Berkley

TO K. H. Olsen

FROM G. Bell

cc: R. Lane
K. Larsen
H. E. Anderson
W. Hindle
N. Mazzarese
R. L. Best

Introduction

Bill is an Elect. Engineer Professor at Berkley, formerly with LRL (Berkley). He's formed a company with Don Glasier. He feels there is a large supply of engineering design talent in the Berkley area, ideas for products, and he would like to use his company to sell us designs (fixed price or royalty). We would manufacture and market. The company is funded by the president of Clifton Precision (Syndros, etc).

They want to get things arranged in the next month or so. IBM has approached them, and he likes DEC. He has consulted for Lockheed, Douglas, and IBM.

When K. Larsen comes here next week, let's talk about this like crazy, because it might work.

GB/mro

INTEROFFICE MEMORANDUM

DATE March 1, 1965

SUBJECT

TO R. L. Best
M. Sandler
R. Hughes
J. Cudmore
K. Doering
E. Harwood
T. Stockebrand
P. Gadaire
R. Beckman
J. Shields
H. Anderson
N. Mazzarese
R. Lane
J. Burley
R. Belden
E. De Castro
R. Wilson
R. Savell
L. Prentice
K. Fitzgerald
J. McKalip

FROM Arthur Hall

Approval of the attached document will soon be discussed by the Standards Committee. If you have comments or suggestions please forward them to Arthur Hall.

Very few customers, up to now, have required that our equipment meet any well-defined environmental specifications. It is not known what per cent of marginal customers didn't buy because we could not present the proper data or because the specifications were not adequate. The increasing number of requests, however, for these data indicates that we must pay increasing attention to this aspect of our design.

DEC has no firmly established environmental standards and it is not the purpose of this DEC STD, at this time, to establish such standards. It is rather my purpose to present an approximation of the desirable specifications (and, in some cases, the methods of testing for them). After we have a better concensus of customer requrements and with more testing (keeping the noted methods and goals in mind) we will better define the proper environmental specifications and revise this DEC STD. Thus the attached STD represents the necessary first figure for the successive approximations which will follow it.

AH/mro

ENVIRONMENTAL SPECIFICATIONS FOR SYSTEMS

ABSTRACT: A compendium of the environmental specifications evolved at DEC together with a discussion of testing methods.

Number of FIG. which are part of this STD NONE

Original Issue

Revision History:

Written by _____

Approved by _____

ENVIRONMENTAL SPECIFICATIONS FOR SYSTEMS

Unless otherwise specified in the system documentation, it is assumed that the system will operate within its engineering specifications at the worst combination of allowable environmental conditions.

Heat:

Present limits 30°F to 105°F. Top limit of 120°F or more is the goal for PDP-7, 8 and future computers.

PDP-4 and PDP-5 computers have been tested repeatedly at 105°F without trouble. The great variety of system modules used by these computers, the similarity of circuits used in system modules and the heat tests given all module models offer a fair degree of confidence that 105°F is not too high a temperature to expect systems made from system modules to operate properly.

Several PDP-4's have been cycled from room temperature to 105° - 110° every 5-6 hours for 24 hours without failures. Operation of great numbers of computers on the Checkout floor in summer heats of 100°F or so for extended periods of time add to the confidence that systems can probably operate for very extended periods at high temperatures.

Upper limits are difficult to establish in any general way, however experiments with a PDP-4 at elevated temperatures (and high humidity, which was thought to have no effect) revealed that the transistors in a few memory driver modules became marginal and the circuits started to oscillate independently when the temperature of the ambient air reached about 120°F. This was one system only and so it would be dangerous to extrapolate too freely.

Temperature rise in a cabinet full of operating modules has been in the vicinity of 10°F.

The main hot spot in computers has been the current drivers in the memory. The temperature of air exiting from between these modules when mounted at the top of a bay has been measured at 120°F with an ambient inlet air temperature of 105°F.

The Rotron fans (using #2 blades) which are almost universally used in DEC equipment are rated at 350 cubic feet of air per minute without back pressure or filter. With a filter, moderately dirty, and acting against .1 or .2 inches of water static pressure (est.) the air flow is some smaller but unknown quantity, probably about half.

Very little cooling effect comes directly from the air stream from these fans (the strongest part of which exits in a direction about 60° from the vertical). The major part of the cooling occurs because the higher pressure inside the cabinet caused by the pumping effect of the fan causes air to flow between the modules out to the lower pressure outside air.

Components such as power supplies not situated adjacent to exit air flows receive very little cooling except that caused by the convective flow generated by the heat evolved. Dead spots such as this may be cooled by small fans installed as air stirrers.

Gaps in the construction of the unit which allow air to escape along some path which does not cool heat dissipating components seriously compromise the cooling of the unit. Because of the many components mounted on the boards, the resistance to air flow between modules is fairly high. A gap between panels, however has a very low resistance and can lower the interior air pressure markedly.

Only one system has been tested at low temperatures however that one operated perfectly for 4 hours at an air inlet temperature of 24°F. Module models are tested at far lower temperatures and so it is probably fairly safe to guarantee system operation at 30°F.

Virtually no heat is exchanged between the modules and the outside panels by conduction, radiation exchanges heat primarily between modules and so the temperature of the outside panels has little effect on module temperature. Because of the positive pressure maintained inside the cabinet by the fans, no air enters except through these fans. Therefore systems may be heat tested by raising the inlet air to the desired temperature.

The wooden skids on which most systems are mounted have cutouts to allow air to be pulled from below the skid into the computer cabinets. This restricted air path reduces the air flow and, in all probability, changes the patterns of cooling, dead spots, etc. inside the cabinets. At a guess, 2 or 3 cabinets mounted together on a skid manage to draw 75% of the normal amount of air through the area under the skid and may be heat tested in this configuration without departing too seriously from normal conditions of equipment use.

If more than 3 cabinets are mounted together on a skid the air flow is probably reduced so badly that some means must be taken to raise the air pressure at the entrance to the under-skid area to compensate for the air resistance there. One means of doing this is to use the heat cart (usually located in the Checkout area). This unit fits over one end of the equipment skid (all other air inlets are blocked off) and, with a fan, forces heated air under the skid. This will do for up to 4-5 bays but for a larger number, more strenuous measures (not yet devised) will be required.

Equipment not mounted on a skid which fits the heat cart may be tested inside a plastic tent. Care should be taken to seal the tent well, particularly at the floor. Apparently negligible air leaks can reduce the effectiveness of heating efforts by 50% to 75%. Inside the tent any heaters may be used (or perhaps none will be needed because of the heat evolved by the unit under test) because the warmed air is being re-circulated through the heaters.

Heat specifications refer to ambient air temperature and so test temperature readings should be taken just at the air inlet fans with some remote reading instrument. Of course the system must be in its normal configuration, doors and side panels installed, empty mounting panel spaces covered by blank panels, cable doors closed, etc.

There has not been enough experience at this date to generalize about heat specifications of systems using FLIP CHIP modules.

Power Interruption:

It is possible on some present systems to modify them fairly easily so that an interruption of AC voltage (starting at the low tolerance level) for 50 msec. or slightly more can be withstood without adversely affecting logic operation. (The only electromechanical units known at present to withstand this interruption are the Type 24 and 250 drums).

This can be accomplished by buffering the DC voltages where necessary and preventing relays in the AC line from dropping out during this period. The effect of voltage buffering must be watched carefully when the sequence or rate of DC voltage drop is important.

A power interrupter is available at DEC to interrupt 115VAC ± 10VAC at up to 30A.

Circuits are available to warn of power failure by detection of decreasing DC voltage.

Radio Frequency Interference:

The two military specifications which DEC has studied, which deal with RFI are MIL-I-26600 and MIL-I-6181. (These two mil. specs. are closely related). The PDP-4, PDP-1 and PDP-6 tested do not meet the requirements of one of the classifications of these specs. but do meet the less stringent requirements of another classification.

In general, these mil. specs. deal with the output of and susceptibility to conducted and radiated noise of electronic equipment from about 15 kc to about 1 gc.

DEC passed all counts of noise susceptibility. Noise output, conducted (on the AC line) was all right too. Radiated noise varied with program and memory speed and was most severe from memory drivers and electromechanical equipment.

Details of the tests and copies of the specifications may be found in Arthur Hall's files.

Corrosive Atmosphere:

No tests have been made on the effects of a corrosive atmosphere such as salt, sulphur compounds, etc. on DEC equipment and there is no reason to think that DEC systems could withstand such conditions.

Fungus-Proofing:

A fungus-proof and moisture-proof spray has been applied to all the modules of a PDP-4 (which then passed a heat test of 6 hours at 105° F). It was not tested for resistance to fungus or moisture. (It was done to satisfy a statutory requirement of a customer's customer).

The compound used was "Dolphspray" #AC-29-7S made by the John C. Dolph Company (meets performance specs. of MIL-V-173B). The manufacturer states that the fungicidal ingredient in this solution acts by emitting a gas which is effective 1/2 inch from the nearest coating (therefore an integral coating is not required unless moisture-proofing is required). This ingredient exudes gas for about 6 months at which time it must be renewed by an additional coating.

Thickness of the coating should be .00075 ± .00025. A thicker coating when added to regularly (to renew the fungicidal effect) will crack, sag and blister if it gets too thick.

Fungus-proofing of equipment other than modules has not been tried. As spraying of other units, wiring, etc. might make maintenance very difficult, any decision to do so should be carefully considered.

Altitude:

There has been no adverse effect due to a computer having been to those altitudes encountered in shipping by air freight. Operation has not been tried at these altitudes however there is no evident reason why a system should not work at a high altitude.

Attitude:

A PDP-5 computer has operated successfully for extended periods tied down to a deck in a small naval vessel at sea. The only trouble encountered was a reluctance of the Type 33 Teleprinter to complete a carriage return during the high acceleration period of a roll return.

Any rotation of a system should occur in a plane which is at a right angle to the long dimension of the modules (unless the modules are specially secured).

No quantitative information is available.

Acceleration and Shock:

No systematic analysis has been made of the resistance of a DEC system to acceleration or shock. The following observations will, however, serve as a qualitative analysis.

While long distance shipments go by air-ride van, local shipments are made in a relatively small furniture van with no extra provisions for shock absorbing. The system rides on its skid on the bed of the truck. No damage except loose modules have ever come to the attention of the writer. Neither has the vibration and shock of in-plant movement caused trouble.

Relative Humidity:

Present limits: 10% to 90% for equipment operation and 10% to 50% for storage.

The storage figure is an estimate based on the possibility of condensation (inside tubular ferrous members of the mechanical structure) under weather conditions which might reasonably be expected. The main point is to keep the relative humidity at the highest temperature expected, low enough so that the dew point under those conditions is not lower than the lowest temperature expected.

The lower relative humidity limit in both cases is so stated simply because there is no convenient way to drop it lower, nor any expectation that the equipment will ever find itself in such an environment.

Fairly extensive humidity tests have been conducted on two computers, a PDP-4 and a PDP-5. Both computers worked for extended periods at 95% humidity. In the case of the PDP-5 the humidity was measured near the top of the test chamber (where it is likely to be lowest because of the heat). The humidity between the modules was unknown but certainly less because the heat there was greater. The PDP-4 was tested by drawing hot, water-laden air into the air intakes. The humidity was measured on the air-exist side of the modules at 95%.

The only trouble encountered in either case was when a high-value, low dissipation carbon-composition resistor improperly used in an analog circuit of the memory had its resistance shunted by a lower value when the coating absorbed water. These conditions should be considered in design of equipment.

AC Voltage:

115 ± 10VAC There is a proportional tolerance where additional input winding taps allow different line voltages.

The ability of the widely-used #728 Power Supply to operate within engineering specifications over this range of voltages has been checked in great detail (see Engineering files for details).

All systems and attached equipment should operate to this specification.

AC Frequency:

60 ± 1/2 cycle/sec. or 50 ± 1/2 cycle/sec.

The only experiments performed concerning frequency sensitivity are recorded in a report by Acton Laboratories (see Engineering files) on the #728 Power Supply. There is nothing too conclusive in this, but it does look as though our power supplies should meet their specs. with an input frequency variation of one cycle per second or a little more.

As no particular allowance is made for mounting of components or cabling with special attention to vibration, it is probable that there are frequencies of vibration in the vertical axis that would fatigue wires and cables at their attachment points. Vibration in either of the horizontal axes is unlikely to cause trouble if the equipment is free to move on its casters.

A large computer with magnetic tape units and line printer has been delivered mounted on shock absorers on the bed of the truck, however, at publication date not enough experience has been gained with this installation to make a safe generalization.

Magnetic Fields:

Use of a system with or near particle accelerators and other similar equipment involves exposure to strong magnetic fields. No information is available on the effects of these fields on DEC systems.

INTEROFFICE MEMORANDUM

DATE March 2, 1965

SUBJECT

TO K. Olsen
H. Anderson
S. Olsen
T. Johnson
J. Atwood
R. Beckman
J. Fadiman
J. Shields
W. Hindle
D. Packer

FROM N. Mazzarese

gave to Dave Cutler because I check in file

Attached is a copy of a report on the oceanography market. I think this will be of interest to you.

INTEROFFICE MEMORANDUM

DATE March 2, 1965

SUBJECT UNSOLVED PROBLEMS RELATED TO PDP-6 SYSTEMS

TO Ken Olsen
Harlan Anderson
Robert Hughes

FROM Klaus Doering

There are two major problems remaining with the systems:

1. Unspecified 739 Power Supplies.
   Until now these PS did not have:

   a) Engineering specifications (mechanical and electrical)
   b) Test Data Sheets
   c) Any inspection or test (prior to installation into the system)

2. The 50 pin connectors had the Winchester jack screws #JTD801 missing. These screws prevent the coming apart of the plug and receptacle under vibration or similar stresses.

PDP-6	Customer	Unapproved PS	Missing Jack Screws
#2	MIT*	1	28
#3	Brookhaven*	1	0
#4	Australia*	1	28
#5	LRL*	2	56
#6	Adams	3	84
#10	?	?	28
#11	?	?	28
#12	?	?	28

*Already with customer

Note: The Adams system is due to be shipped very soon, and the problems still have not been taken care of.
The systems in the field need these deficiencies to be taken care of, too.

KD/kmk

INTEROFFICE MEMORANDUM

DATE March 2, 1965

SUBJECT

TO Nick Mazzarese
Stan Olsen
cc: Harlan Anderson
Win Hindle

FROM Kenneth H. Olsen

Andy had Chet Gadzinski make up a Sales Plan for the PDP-6. I haven't had a chance to read it yet but it might be a good idea if you get ahold of a copy of this because it might be a good outline for a sales plan to be presented to the Board of Directors. I think it would be a good idea to present a sales plan for each of our marketing groups during the April meeting. Let me know what you think of this because I would like to promise it to the Board of Directors during our March 9th meeting.

Ken

KHO:ecc

INTEROFFICE MEMORANDUM

DATE March 2, 1965

SUBJECT

TO Jim Burley

FROM Ted Johnson

I think your Question and Answer idea for the newsletter is excellent. This is the type of "fact learning" tools we need to do a job in depth on our own equipment. I only hope we see it catch on in general.

TJ/mr

cc: R. Beldon
R. Lane
J. Ridgeway
N. Mazzarese
S. Olsen
H. Anderson ✓

OK

DIGITAL EQLA
MSG. NO. LA-204

TO HARLAN ANDERSON
FROM DICK MUSSON

WOULD YOU CONSIDER LEASE ARRANGEMENTS FOR A 2 YEAR, NON-CANCELLABLE CONTRACT WITH THE UNIVERSITY OF ARIZONA FOR A PDP-6?

THERE POSSIBLE COULD BE TWO UNITS IN THE NEAR FUTURE.

END OR CA

MIN PLS FOR ANOTHER TAPE

INTEROFFICE MEMORANDUM

DATE March 2, 1965

SUBJECT MANUAL STANDARDS

TO J. Shields
H. Anderson
J. Atwood
R. Best
N. Mazzerese
T. Johnson
A. Hall
R. Savell
R. Beckman

FROM Stu Grover

In view of the fact that a group leader for our technical writing effort will be joining us as soon as he can clear up his affairs at his present employer's, I feel that any meeting to establish standards at this time would be premature. I think we owe it to the new man (whose name is Dick Ward) to give him a voice in policies which will become his responsibility to enforce.

We expect him to be here fairly quickly, but don't know the exact date yet.

CSG:ms

DIGITAL MAYN

DIGITAL EQLA
MSG. NO. LA-209
3/2/65

TO HARLAN ANDERSON
FROM DICK MUSSON

NASA, GODDARD SPACE FLIGHT CENTER, IS EITHER ADVERTISING OR IS ISSUING RFQ WITH COMPUTER REQUIREMENT THAT WOULD BY MULTIPLE COMPUTERS IN THE CAPABILITY RANGE OF THE PDP-6.

END OR GA
H@F,

INTEROFFICE MEMORANDUM

DATE March 3, 1965

SUBJECT Cost Estimate for JOSS Console

TO H. Anderson
G. Bell
R. Savell

FROM Alan Kotok

Mfg. Cost Console	$350	
Mfg. Cost Wiring	$100 for machine wiring $ 18 for 50 conductor cable $ 7 for 12 conductor cable $ 5 for wiring control box	
Mfg. Cost Assembly	$ 56 for one day	$2.10/hr. 2.3 O.H.
Mfg. Cost Checkout	$198 for 3 days	$2.50/hr. 2.3 O.H.
List Price Elec. Pts.	$2900	

The following costs were derived at a meeting in K. H. Olsen's office on 3/2/65 for the JOSS Console.

In attendance were:

K.H. Olsen	R. Savell
H. Anderson	D. Nevala
G. Bell	J. Smith
A. Kotok	L. Prentice

AK/mro

INTEROFFICE MEMORANDUM

DATE March 3, 1965

SUBJECT NEW CABINET PRICES

TO All Sales Personnel

FROM Frank Kalwell

Home office
Sales Offices
Sales Representatives

The attached sheets indicate the new lower prices on our line of Cabinets. These prices are effective immediately.

This now enables us to sell these high quality Cabinets with each module order at competitive prices.

		OLD SELLING PRICE	NEW SELLING PRICE
CAB-1	Includes doors, fan housing, fan and fan filter (no table)	$ 940.00	$ 700.00
	Above (CAB-1) without end panels	690.00	500.00
CAB-2	Includes doors, fan housing, fan and fan filter (no table)	822.00	700.00
	Above (CAB-2) without end panels	630.00	500.00
CAB-5	(Single table), includes doors, fan housing, fan, fan filter, table frame, table top, and blank control panel. (Includes end panels).	1378.00	1050.00
CAB-5D	(Double table), same as above (single table), except double table frame and top replaces single table frame and top. Includes two cabinets. Includes end panels.	2395.00	1750.00
CAB-6	Includes doors, fan housing, fan, fan filter, and blank panel (no table). Includes end panels.	1044.00	800.00
	Above (CAB-6) without end panels.	793.00	600.00

The following are new prices on added cabinets which are offered as options with our PDP-8's.

CAB-8	Free standing cabinet, winged table with legs, logic below table covered with short French Doors.	$1100.00
CAB-8B	Free standing cabinet, rectangular table with legs, logic below table covered with short French Doors.	1000.00
CAB-3	Expander cabinet with short French Doors below table level.	650.00

Prints and complete descriptions of the above cabinets are being submitted to all offices by Jim Burley.

Cabinet prices include shipping on wooden skids with any joining hardware necessary.

Please note: Our complete line of cabinets are non-discountable, with or without a discount agreement.

INTEROFFICE MEMORANDUM

DATE March 3, 1965

SUBJECT

TO Nick Mazzarese
Ken Olsen
Win Hindle
Stan Olsen
Harlan Anderson ✓

FROM Ted Johnson

It looks like Sol Zasloff has been given a sizeable mandate to build New York facilities. Note Dave Denniston's SDS comments.

Ted

TJ/mr

MAR 1 1965

dec INTEROFFICE MEMORANDUM

DATE 2.25.65

SUBJECT INFORMATION FOR SALES NEWSLETTER

TO Ted Johnson

FROM Dave Denniston
New York Office

IBM 1130

I hope someone can clear up the question areas on the 1130 fairly quickly. I was recently talking with one of our customers who feels that the 1130 is clearly the machine to get if you are going to rent, but the -8 is the machine to buy. He does have the manual on the 1130 and he claims it has a 6 hierarchy channel priority interrupt and that it does have memory stealing which may be (probably) gotten into if the disc is not used. Also their line printer works through a rather crude data channel according to this particular customer. Also it takes a good deal of programming time setting up a line of print with one cycle for each character in the character set on the line printer. According to the manual that he had, they could not be absolutely positive, but it looked as if input code from the keyboard of the Selectric is Hollerith, but the output to the typewriter is not, which means a rather messy conversion table.

SDS

I was recently talking with Robin White who works in SDS's New York Office. (Iknew him personally before he went to SDS). 92 delivery is scheduled for the end of February--the first machine. He claims they now have 3 working 92's.

Their New York Office is growing in leaps and bounds. They presently have 6 salesmen and a couple of systems analysts and are pushing for prestige sales. They are moving into, as Robin described it, a "plush" suite in Manhattan for sales and maintaining field service in Kew Gardens. They plan to have the full treatment with carpets, a large 930 system, etc.

DBD:BMP

H. Anderson

INTEROFFICE MEMORANDUM

DATE March 3, 1965

SUBJECT NEW CABINET PRICES

TO All Sales Personnel

FROM Frank Kalwell

Home office
Sales Offices
Sales Representatives

The attached sheets indicate the new lower prices on our line of Cabinets. These prices are effective immediately.

This now enables us to sell these high quality Cabinets with each module order at competitive prices.

		OLD SELLING PRICE	NEW SELLING PRICE
CAB-1	Includes doors, fan housing, fan and fan filter (no table)	$ 940.00	$ 700.00
	Above (CAB-1) without end panels	690.00	500.00
CAB-2	Includes doors, fan housing, fan and fan filter (no table)	822.00	700.00
	Above (CAB-2) without end panels	630.00	500.00
CAB-5	(Single table), includes doors, fan housing, fan, fan filter, table frame, table top, and blank control panel. (Includes end panels).	1378.00	1050.00
CAB-5D	(Double table), same as above (single table), except double table frame and top replaces single table frame and top. Includes two cabinets. Includes end panels.	2395.00	1750.00
CAB-6	Includes doors, fan housing, fan, fan filter, and blank panel (no table). Includes end panels.	1044.00	800.00
	Above (CAB-6) without end panels.	793.00	600.00

The following are new prices on added cabinets which are offered as options with our PDP-8's.

CAB-8	Free standing cabinet, winged table with legs, logic below table covered with short French Doors.	$1100.00
CAB-8B	Free standing cabinet, rectangular table with legs, logic below table covered with short French Doors.	1000.00
CAB-3	Expander cabinet with short French Doors below table level.	650.00

Prints and complete descriptions of the above cabinets are being submitted to all offices by Jim Burley.

Cabinet prices include shipping on wooden skids with any joining hardware necessary.

Please note: Our complete line of cabinets are non-discountable, with or without a discount agreement.

INTEROFFICE MEMORANDUM

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3rd March, 1965.

Jon Fadiman

John Leng

Enclosed is a copy of the LOI from Oxford on the PDP-6.

It is an official LOI, just the PO willcome from NIRNS, and they still might agree to Oxford issuing the P.O.

Therefore, contrary to your memo to Bob Lane of 22nd February, I think you should take the same action as you would on any other LOI, apart from advertizing it, that is.

I note also that you have moved the delivery down to October 15th. I'm afraid I've told them September 15th following your telex acknowledging the LOI and quoting delivery. We cannot go back on this now otherwise the whole system of LOI's is of no use to us or to the customer.

c.c. BOb Lane
Harlan Anderson ✓
S. Olsen
N. Mazzarese

INTEROFFICE MEMORANDUM

DATE March 4, 1965

SUBJECT Guidance Committees

TO Harlan Anderson
Stan Olsen
Nick Mazzarese
Win Hindle
cc: Ted Johnson

FROM Kenneth H. Olsen

It has been suggested by a number of people that we set a permanent schedule for our various Guidance Committees so that people can plan their schedules ahead of time. I would also like to suggest that we start a committee meeting that would guide and show interest in the projects which Win Hindle is supervising.

A number of the committee meetings are fixed in their times right now and when you have the times set for your various committee meetings, please tell Elsa and she will generate a memo which we will send out to all employees.

Those committees which now have fixed times are as follows:

Tuesday at 8:30 - Works Committee
Wednesday at 8:30 - Components Meeting
Thursday at 8:30 - Special Module Committee
Thursday at 9:00 - Module Guidance Committee
Friday at 8:30 - Data Processing Committee
Friday at 1:00 - Manufacturing Methods Committee Meeting

Ken Olsen

KHO:ecc

INTEROFFICE MEMORANDUM

DATE March 4, 1965

SUBJECT ASME Show

TO Harlan Anderson
Stan Olsen
Jon Fadiman

FROM Kenneth H. Olsen

At the ASME Show in New York on May 17 - 20, there is a Monday evening session at 7:30 which is a round table discussion on "How to Handle Engineering in Overseas Plants."

Ken

KHO:ecc

INTEROFFICE MEMORANDUM

DATE March 4, 1965

SUBJECT Technician for Dan Wardimon

TO J. Hastings
J. McKalip

FROM R. E. Savell

cc: D. Wardimon
R. L. Best
H. Anderson
G. Bell
J. Stenberg
R. Lassen
R. Beckman

This is to confim our discussion of March 2, 1965 that due to the unavailability of a replacement and due to the immediate added workload of PDP-6 projects that Jan Stenberg will remain working for me.

RES/mro

dec INTEROFFICE MEMORANDUM

DATE March 4, 1965

SUBJECT Configuration for INTER DATA SHOW.

TO Bob Lane

FROM Norm Canning

This is a listing of the configuration that will be used in the INTER DATA SHOW:

SYSTEM COMPONENT	TYPE	NO. OF UNITS
1. Arithmetic Processor A. Paper Tape Reader B. Paper Tape Punch	166-626	1
2. Core Memory	161C	3
3. Data Communications System	630 (KSR-33)	4
4. DECtapes	555	3
5. Control Unit	551	1
6. Data Control	136	1
7. Line Printer (and Control)	646	1
8. Card Reader (and Control)	461	1
9. Display Monitor (and Control)	346	1

CC: K. Anderson ✓
G. Bell
L. Portner
R. Beckman
R. Savell
D. Packer
S. Mikulski

INTEROFFICE MEMORANDUM

DATE March 4, 1965

SUBJECT

TO Stan Olsen
Nick Mazzarese
Ken Olsen
Harlan Anderson

FROM Ted Johnson

You will be interested in the attached questions from the Sales Meeting Questionnaire:

1.) What should our next computer be?

2.) What technical information would help you the most?

TJ/mr

SALES MEETING QUESTIONNAIRE

Question No. 15 Part No.

What should our next computer be?

R. Ockley	32 Bit; 1.5 μsec ; $120K
J. Murphy	32-36 Bit; $150 - 200 K; Hardware Index registers
D. Denniston	32 Bits; PDP-6 type I/O Bus.
R. Stiver	24-32 Bits; $90K - $110K
K. Weir	Smaller PDP-8 with Card Input (Cheap)
D. Barker	32 Bit SDS 930 at 930 Price
R. Lindsay	More Inst. than PDP-7; as much time sharing hardware as possible
H. Painter	24 Bit PDP-7
D. Henderson	Competition for SDS 930 in the simulation and telemetry field
J. O'Connell	32 Bits - between PDP-7 and 6
S. Olsen	36 Bits, $100 K, program compatible with PDP-6
N. Mazzarese	32 Bit, 1μsec, 3 Index Register basic 4K system $99K
T. Johnson	32 Bit; 16K Addressable, 16 word Scratch Pad, Index Registers, HS Channels, auto priority Interrupt
J. Burley	24 Bit PDP-1. $55K-$60K
J. Jones	32 Bit; 1.5 μsec; $140K for 8K memory and fast P.T. I/O
D. Cotton	Variable word length; $100K and up
R. Bocek	Scratchpad
R. Beldon	3 μsec; 32-36 Bit; Multiple Index Register; Data Channel
A. Titcomb	32 Bit; $100K; few cables; strong I/O Interface; Index Register; expandable, fast, easy to learn.
M. Ford	
R. Buiten	Fast 32 Bit; 8-16K Memory; $100 K
G. Rice	Between PDP-7 - 6; No more than $100K; maybe machine compat. with IBM 360
F. Gould	24 - 32 Bit
C. Kotsaftis	
R. Maxcy	Flip Chip PDP-6

SALES MEETING QUESTIONNAIRE

Question No. 14 Part No.

What technical information would help you the most?

R. Oakley	Price on Relay Buffers; Sensing: ADC with Multiple 50 M.V. inputs. General process control Industry Standard for PDP-7, 8.
J. Murphy	Logic problems and answers incurred while building our computers to pass on to module users
D. Denniston	Module Applications
R. Stiver	Specifications
K. Weir	Notebooks of the PDP-8 style
D. Barker	Logic Design, 7, 8 operation and I/O Theory of Interface
R. Lindsay	Computer Application notes and Module Application Notes
H. Painter	Programming, straight forward machine language application notes
D. Henderson	PDP-7, 8 Real time application notes PDP-6 Software literature
J. O'Connell	Good Module Catalog Application notes with module lists.
S. Olsen	
N. Mazzarese	Programming Application Notes
T. Johnson	Programming Concepts and circuit details and technology
J. Burley	Circuit and Software
J. Jones	Good 340 Brochure
D. Cotton	
R. Bocek	Course Workbooks on PDP's
R. Baldan	Computer Interface Information
A. Titcomb	Programming
M. Ford	Clearly defined Interface information for PDP-7, 8
R. Buiten	Everything
G. Rice	Type of logic we use and why
F. Gould	Computer specs. Programming
C. Kotsaftis	Programming for small computers
R. Maxcy	An opportunity to design with modules

digital MEMO

DATE March 4, 1965

TO Ted FROM Margaret

Tom Quinn called while you were interviewing Mr. Hickman - wanted you to know that the Purchase Order from ~~Oregon~~ Argonne on the PDP-8 has come ~~thor~~ through - waiting for the one on the PDP-7.

Marg.

Hurrah! We finally made it!

~~Send "Good news letter."~~

cc: Stan
~~Andy~~
Ken
Nick

DF100-21

5M9/62

INTEROFFICE MEMORANDUM

DATE March 4, 1965

SUBJECT Attached Article

TO Ken Olsen
Harlan Anderson
Stan Olsen
Nick Mazzarese
Ted Johnson

FROM Frank Kalwell

The attached report may be of interest to you on "Computers= Change And Growth".

Please note the report is strictly for informative, rather than speculative purposes.

UNITED INVESTMENT REPORT

February 15, 1965

The *United Opinion* forecasts and advices in these Reports are based on analyses by our own Staff checked against those of other leading Investment Authorities.

Computers = Change And Growth

The Business Equipment Manufacturers Association has made the following estimates and projections:

1. The office equipment industry has an annual growth rate of 15%, but the computer portion is expanding at a 30% rate.

2. The value of computer systems in operation at the end of 1964 was over $6 billion, about $2 billion higher than a year earlier. The value at the end of 1965 should exceed $8 billion.

3. Over 22,000 computer systems were working at the end of 1964 and the figure should rise to 28,500 in 1965.

Other estimates show industry growth in the following terms: installations made in 1965 will total 20,000 machines worth about $1.6 billion, compared with the 16,000 shipped in 1964. The value of installed systems in 1970 is expected to be double that of 1965. While individual estimates vary widely, depending upon what equipment is included, it all adds up to more growth on top of the amazing record of the 10 – 15 years since commercial computers were first sold. However, during 1965 and into 1966, sales progress may slow because of the introduction of new machines.

The first computers were giants (in size) utilizing vacuum tubes and, with the development of transistors and solid state technology, were followed by second generation computers around 1960 – 61. Subsequent developments in microcircuitry are ushering in the third generation. Competitive pressures are mounting as producers fight for orders with new machines. While additional applications for computers are being developed, a very large portion of current sales is for replacement purposes.

The cost of participating in this field is great and profits are hard to come by. IBM dominates the industry, followed — at a considerable distance — by a number of other companies, each trying to enlarge its share of the market. We comment here on the eight largest factors in the field.

	Earnings Per Share E1965	E1964	1963	Recent Price	Dividend	% Yield	*P/E Ratio
◆Burroughs	$1.90	*A* $1.38	*g* $1.04	34	$1.00	2.9	17.9
Control Data	*f* 1.20	*Aj* 0.88	*f* 0.44	57	Nil	Nil	47.5
◆General Electric	*f* 3.60	*f* 3.30	*f* 3.14	96	2.20	2.3	26.7
◆Honeywell, Inc.	3.20	*A* 2.89	2.42	69	1.10	1.6	21.6
◆Int'l Bus. Mach.	13.40	*A* 12.30	10.44	440	6.00	1.4	32.8
National Cash	3.20	2.75	2.42	79	1.20	1.5	24.7
◆Radio Corp.	1.50	1.35	1.09	31	0.60+	1.9	20.7
Sperry Rand	*m* 1.15	*m* 1.00	*m* 0.85	14	Nil	Nil	12.2

◆ Included in our Supervised List. * Recent price divided by estimated 1965 earnings. + Plus stock. *A* Actual. *E* Estimated. *f* Before anti-trust settlements. *g* Excludes 18¢ nonrecurring gain. *j* June year. *m* Fiscal year March of following calendar year.

BURROUGHS reported better-than-anticipated earnings for 1964 and looks for a further rise of 40% this year. The improvement is resulting from success in marketing its products, especially the small E-2100 computer, from extending the life of computer installations through component changeability, and from reduced costs. Though Burroughs has computers covering the range from large to small, emphasis has been on the latter type. Its equipment finds greatest use in banks and similar operations. The company has spent heavily on research and development and is strong technologically. While sales have increased steadily (except in 1963), the earnings record has been erratic. With many other products (including various business machines), increasing commercial sales, and rising rentals, the profit uptrend should be maintained. **Hold.**

CONTROL DATA is a young company which has traveled fast and far. It originally concentrated on big computers for the scientific and engineering market, but its interests and capabilities have grown and it now has a broad range of computers for general use. Where previously it got along with a small sales force and sold most of its machines, the company will now need a larger sales and service force and is finding that the leased equipment ratio is rising. The result is that, while the long term outlook appears bright, interim profits will probably be adversely affected by the costs connected with entering the very competitive mass market. On the other hand, we do not underrate the capabilities of this company. **In spite of its very high p/e ratio, the stock should be held by those willing to accept above-average risks.**

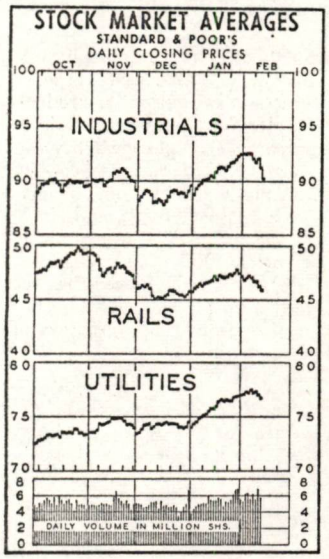
GENERAL ELECTRIC. In relation to GE's total sales of around $5 billion, its current participation in computers is tiny, but is rising rapidly as the result of introduction of a fairly broad line of machines. Shipments last year were worth $60 – $70 million, not including machines used in company installations. GE has been successful in obtaining some well-publicized orders. It presently accounts for 2½% – 3% of the U. S. market but is aiming at 10% and second place by the end of the decade. And it has the money to back up its aim. Abroad, the company has invested $63 million for control of the computer operations of Machines Bull in France and Olivetti in Italy to challenge IBM's dominance there. Although its defense business is lower, other lines such as electrical equipment, appliances, and industrial products are doing well, and the sales and earnings outlook is favorable. **The stock has appeal for long term growth. Buy.**

HONEYWELL has invested heavily in computers and recently has had marked success with its H-200, a third generation small computer. Orders for the 200 have come in well, especially as a replacement for the IBM 1401. Whether this trend will be maintained once IBM's new computers and those of others become available, is uncertain. Last year Honeywell's computer volume jumped to over $100 million from $30 – $35 million in 1963, and is expected to about double this year. Some new systems to expand the line were just announced. Development costs are high, and some financing will probably be required this year. Profit margins will continue to suffer. The remainder of Honeywell's business is in residential and commercial climate controls, industrial process controls, and military and space work. The long term outlook is favorable. **Hold.**

(Please turn to next page)

Viet Nam Causes Setback

Last week's flare-up in the Viet Nam war caused stocks to stumble on several occasions. In such a tense atmosphere nervousness is to be expected. Whenever the cold war warms up, the initial response of the market has generally been to go down, as happened many times in the past 15 – 20 years. But in retrospect such episodes have proved to be buying opportunities. After the initial shock, the market has always resumed its broad uptrend, and chances are that this will be the story again. Aerospace and other war-oriented stocks strengthened last week. But it seems to us hazardous and premature to go head over heels into war stocks at this time.



FRIDAY CLOSINGS	*Feb. 5*	*Feb. 12*
Industrials (S & P)..	92.21	90.99
Rails (S & P).....	47.22	46.36
Utilities (S & P)....	77.60	76.82
S & P "500".....	87.29	86.17
*Industrials (D-J)...	*901.57*	*888.47*

Outlook Basically Sound

Admittedly the news from the Far East is disturbing. The situation is explosive — but we believe it is very unlikely to lead to World War III. The Red Chinese and Soviets have much to lose from a major conflict. Their tactics lie rather in the direction of infiltration, bluff, terror, and intimidation. The best working hypothesis is to assume that they will continue to stir up trouble but stop short of a major conflict. The stock market has flourished in the midst of international tensions and uncertainties for years. Under the surface there is still a solid basis for confidence in the growth of American industry and the securities which represent it. Business is on the upgrade, earnings are rising, and dividends are increasing. Under the circumstances we would expect no more than a limited reaction at this time.

MARKET OUTLOOK—A market that has risen 70% in little over two years is vulnerable to unexpected happenings. It would be advisable to keep some cash in reserve for buying opportunities. The outlook for the economy remains favorable, however, and most stock funds should stay invested.

Computers = Change And Growth

(*Continued from page 67*)

INTERNATIONAL BUSINESS MACHINES, with its new System/360 computers, offers the most complete line of any company. While IBM has regularly introduced new computers, the program for the System/360 was daring and risky, for it obsoletes equipment now in use, requires new programming, and gives competitors a chance to get a foot in the door with IBM customers. Orders have generally come in well and deliveries of the first computers should start soon, but the average customer will have to wait until 1966.

IBM now accounts for about 75% of the U. S. computer market, but the progress being made by competitors indicates gradual erosion of that position. The situation is the same abroad. Nevertheless, in view of the total industry growth in the years ahead, a decline — say to 60% — would still indicate substantial growth for IBM. For 1965, both sales and earnings will rise only moderately, but acceleration should take place in the second half of 1966. Investors should be prepared to see a poor earnings comparison for the first quarter of 1965. In the comparable quarter of 1964 the Government purchased a large number of computers it had previously rented. However, computers are not IBM's only product, and other lines are providing strong sales and earnings support.

Though the stock (440) is up somewhat from its lows, it has not performed as well as the market. **The issue is attractive for the long term and may be bought on that basis.**

NATIONAL CASH REGISTER has made no earnings progress for some years because of development costs of new computers and accounting machines. It now appears that this burden will ease somewhat and permit a good gain in net in 1965. NCR specializes to a large degree in banking and retail installations and is expanding its service center operations. Not only is NCR's computer business growing but, more important, sales of cash registers and accounting machines are also rising. Foreign sales represent over 40% of the total and non-remitted earnings were equal to 28¢ a share in 1963 and 30¢–35¢ last year. **The stock (79) should perform well over the long term. Hold.**

RADIO CORP. introduced a new line of computers, the Spectra 70, in December and thereby demonstrated its determination to remain in the business and greatly strengthened its position. The line runs from small to large, but is not as broad as IBM's. The machines, importantly, are compatible with the System/360 equipment of IBM. Last year RCA broke into the black on its computers with around $100 million in revenues. Development and introduction costs for the Spectra 70, however, may cause the division to operate in the red again. Deliveries will not start until the fall. While computers are adding nothing to RCA's current profits, at least they are not the drag they were earlier. Earnings now come largely from the expanding color TV business. home entertainment products, and broadcasting. **The stock (31) has speculative appeal. Buy.**

SPERRY RAND. Although in second place with around 7% of the computer market, the company has steadily lost position over the years. The poor record appears to stem from management shortcomings and decisions, since its machines are good technologically. Personnel changes have been frequent. However, losses have been sharply reduced and the division may finally be close to breaking even. Sperry has had difficulty with its Remington Rand office equipment division as well, but this situation is improving. The company also manufactures farm equipment, hydraulic products, and shavers, and does a large volume of Government work. **The issue (14) may be held for possible price recovery.**

INTEROFFICE MEMORANDUM

DATE March 4, 1965

SUBJECT MANUAL STANDARDS

TO
H. Anderson
J. Atwood
R. Best
N. Mazzarese
T. Johnson
A. Hall
R. Savell
R. Beckman
S. Grover

FROM Jack Shields

Due to previous commitments of members of the proposed Committee for Maintenance Manual Standards, the first meeting has been deferred until ~~8-15-65, same time, same place~~. a month's time. You will be notified.

H. ANDERSON

dec INTEROFFICE MEMORANDUM

DATE 5 March 1965

SUBJECT PDP-6 sale (?) to University of Rochester

TO Roger Mandy FROM John Allen Jones

As you know we are meeting stiff competition from IBM in trying to capture this order. It is very clear that time sharing capability is important to the prospect.

It is unfortunate that the prospect misunderstood the status of our software for time sharing and the shock of finding out a couple weeks ago that software was not operating has hurt our chances considerably. It is also unfortunate that the people at Brookhaven conveyed the impression that they were going to get time sharing when they get their computer. The best way to counter these major factors is to put on a real time sharing demonstration at the earliest possible date.

This need not be a polished system allowing all functions to all users, in fact, it need be nothing more than permitting one man to compile while another is editing a program.

There is no need to lose this order. IBM is competing with a nonexistent computer. A truly good demonstration of an existing computer running an existing time sharing software, will help us more than anything else at this time.

We probably have less than 30 days in which to make this demonstration, can we do it?

INTEROFFICE MEMORANDUM

DATE March 5, 1965

SUBJECT Work in Process Balances for PDP-5, 6, 7, 8, and LINC

TO K. Olsen
H. Anderson ✓
S. Olsen
N. Mazzarese
J. Burley
M. Ruderman

FROM R. Mills

We took a physical count of central processors on the floor on February 20, 1965 and ran through, as you will see in the attached schedule, what our end of the month balances would be in central processor frames in various stages of completion over the forecast period. As you will see on the current projected production schedule, we will have substantial numbers of machines in process for each product line.

We intend to do a grounds-up forecasting job in June of this year to cover the fiscal year ending June 1966, at which time we can adjust these ending quantities to more nearly reflect our sales picture.

DIGITAL EQUIPMENT CORPORATION

Production Schedule

PDP-5	BOM Balance	Production Entered during Month	Shipments	EOM Balance
2/20/65 - in W.I.P.				12
March 1965	12	6	3	15
April	15	0	1	14
May	14	0	2	12
June	12	0	2	10
July	10	0	0	10
August	10	0	0	10
September	10	0	0	10
October	10	0	0	10
November	10	0	0	10
December	10	0	0	10
January 1966	10	0	0	10
February	10	0	0	10
		6	8	

PDP-6				
2/20/65 - in W.I.P.				19
March 1965	19	1	2	18
April	18	1	1	18
May	18	2	2	18
June	18	2	2	18
July	18	2	1	19
August	19	2	1	20
September	20	2	2	20
October	20	2	2	20
November	20	2	2	20
December	20	2	2	20
January 1966	20	2	2	20
February	20	2	2	20
		22	21	

PDP-7				
2/20/65 - in W.I.P.				17
March 1965	17	4	3	18
April	18	6	5	19
May	19	5	6	18
June	18	5	7	16
July	16	5	5 demos	
			8	8
August	8	5	5	8
September	8	5	5	8

PDP-7 (cont.)

October	8	5	5	8
November	8	5	5	8
December	8	5	2	11
January 1966	11	5	2	14
February	14	5	1	18
		60	59	

PDP-8

2/20/65 - in W.I.P.				0
March 1965	0	10	0	10
April	10	10	2	18
May	18	20	4	34
June	34	20	6	48
July	48	20	18	50
August	50	20	16	54
September	54	16	21	49
October	49	16	20	45
November	45	16	20	41
December	41	16	20	37
January 1966	37	16	25	28
February	28	16	25	19
		196	177	

LINC

2/20/65 - in W.I.P.				8
March 1965	8	1	1	8
April	8	1	1	8
May	8	1	1	8
June	8	1	1	8
July	8	1	1	8
August	8	1	1	8
September	8	1	1	8
October	8	1	1	8
November	8	1	1	8
December	8	1	1	8
January 1966	8	1	1	8
February	8	1	1	8
		12	12	

INTEROFFICE MEMORANDUM

DATE March 5, 1965

SUBJECT Progress Report

TO Works Committee

FROM Data Processing Committee

1. Current Status:

   a. Our PDP-4/7 business compiler (BUS-PAK II) is operational.

   b. Programs for maintaining information on each company project (Engineering, Sales, Manufacturing, etc.) are complete and undergoing tests with real data. This file of information is the basis of the project cost system we are now developing.

   c. Project cost analysis reports are being produced on a trial basis. Regular reporting on engineering projects scheduled for April, 1965.

2. Status Relative to Original Plans:

We originally planned to be routinely producing project cost analysis reports by late Fall. Reasons for the serious slippage are:

   a. Hardware problems. PDP-4 System has been fully operative less than 50% of time; i.e., central processor, card reader, magnetic tapes and line printer all up. Major problem has been peripherals; C.P. has been virtually trouble free. Field service is cooperating in isolating and remedying equipment faults.

   b. Personnel. We have been operating with one full time programmer. An unexpected termination required transferring our second programmer to another job.

3. Plans:

   a. Extend the project cost system to include processing of all cost data and producing all required reports. Phase over existing tabulating operations to the computer system. Planning is complete. If needs (below) are filled, the entire system can be complete by November 1965.

   b. Design and implement inventory control and undertake other data processing projects as resources permit.

4. Needs:

   a. Full time machine operator for night time batch processing services.

   b. Additional experienced data processing programmer.

D. W. Packer

DWP:ncs

H. Anderson

dec INTEROFFICE MEMORANDUM

DATE March 8, 1965

SUBJECT PROJECT MAC PDP-6

TO Bob Lane FROM Jack Shields

In the four (4) month period from October 1964 through January, 1965, the following direct labor hours were dispersed on installation #373 (Project MAC PDP-6-2).

MONTH	TRAINING	WARRANTY	MODIFICATIONS	INSTALLATION
October	____	* 2.75	* 33.50	* 14.00
November	------	* 37.00	* 92.50	* 28.00
December	-----	103.00	19.00	2.00
January	20.25	38.50	35.75	6.00
	20.25	181.25	180.75	50.00

Total Labor Charges for these four months $1448.53

Total Overhead applied for these four months $2717.70

If we allocated these charges according to D.L. hours, we have the following approximate dollar dispersal:

	D.L.	O.H.
Training	68.10	128.05
Warranty	606.93	1138.90
Modifications	605.50	1136.20
Installation	168.00	314.55

The travel expenses for these four (4) months are: $96.00

The material expenses are as follows:

Warranty	316.69
Devel. & Mods.	60.24
Teleprinters	1337.00

*Incurred as a Field Service expense, but not charged against the warranty reserve for that system.

dec INTEROFFICE MEMORANDUM

DATE March 8, 1965

SUBJECT PROJECT MAC PDP-6

TO Bob Lane FROM Jack Shields

The allocation of expenses for these four (4) months should be as follows:

	D.L.	O.H.	Travel	Mat'l	Total
Training	68.10	128.05	-----	------	196.15
Warranty	606.93	1138.90	96.00	*569.69	2411.52
Modifications	605.50	1136.20	-----	60.24	1801.94
Installation	168.00	314.55	-----	------	482.55
				Sub Total	& 4892.16

Total with Teleprinters $ 6076.16

* Including $253 for repair of one (1) Teleprinter. $1184 for two new KSR-33 Units is not listed, but was charged against this warranty reserve. The excess charges were absorbed by Field Service.

The total warranty reserve provided $2308, represents a system worth $184,640. This is the systems value after the PDP-1 trade-in.

The real system value is $371,000 and the warranty reserve provided should have been $4637.50.

Many of the problems of accounting for incorrect warranty reserve charges were due to reporting errors. We will correct these errors so they don't occur in the future.

In order to maintain a reasonable picture of the warranty reserve, however, one of the following two steps must be taken:

1. Charge all future calls during the remaining warranty period to PDP-6 Sales.

2. Recalculate the warranty reserve based on the real value of the system, which is what we are obligated to maintain.

In the future all Field Service charges against this system for the remaining warranty period will be made against PDP-6 Sales.

The inititive for taking the second alternative will be in your hands.

CC: H. Anderson T. Johnson R. Mills L. Fryer

March 8, 1965

PDP-6 System, Delivery Schedule

Bob Beckman

Steve Mikulski

CC: Jim Sullivan
Bob Pate
Harlan Anderson
Record Book

Up until now the philosophy used in constructing PDP-6 Systems was to deliver the processor to the check out floor and phase the options to be checked out on the system processor after the processor has been nearly completely debugged. This system generally calls for the delivery of a memory roughly 2 1/2 months after the delivery of the central processor to the floor, and the delivery of all the options in a staggered manner beginning three months after delivery of the processor and usually extending for the next six weeks.

The problems generating with this method include the following:

1. Near the completion of a system the options being debugged, such as magtape or microtape, are utilizing processor time in a serial manner and any processor instability or failures take an exceedingly long time to repair. It generally takes a few hours to determine that the failure is in the processor rather than the option. After the processor is repaired then the option check out is continued.

This method of checking out options on a system has been shown to be inefficient causing serious delays in the completion of the processor and the options themselves.

2. With a check out processor being used solely to test options, the options can be delivered to the check out floor at the same time the processor is delivered. The revised time of checking out a processor currently stands at 2 1/2 months. This two and one half months period can be used to check out the options and the completion date of the processor can be the completion date of all the options. All these options therefore, can be tested under heat, under margins and have all of the final inspection completed long before they are attached to the system processor. A two-week period at the end of completion of the processor should be of sufficient to tie the system together and run acceptance tests. Prior to this period all inspections will have been completed.

This will be approaching our goal of 90 days on system delivery without having to redesign the check out procedures extensively. It will require, however, a certain amount of "shelving" of options by production in anticipation of sales. The items which should be "shelved" which are being utilized on most systems to date are the following:

516's, 136's, 551's, 161's, 163's 461 card reader and a 646 line printer with the basic time configuration.

A 630 system is also needed, but after talking with Don Smith and the production people I feel that only thing required to stock on 630's and modules and power supplies, the racks themselves such as the scanner does not involve a great deal of time in constructing the checking out.

If the prototype PDP-6 is brought to the check out floor in April 1965 we can initiate this system on PDP-6's and begin with Serial No. 9. In order to meet delivery schedules on PDP-6's this method must be used. I might note that if a check out processor is not available then a scheduled processor willhave to be used for the check out of options from another system thereby delaying delivery of this processor.

dec INTEROFFICE MEMORANDUM

DATE March 8, 1965

SUBJECT PDP-6-6 (Adams)

TO K. Olsen
H. Anderson
R. Hughes
R. Beckman
J. Shields

FROM Klaus Doering

The problems previously mentioned will be taken care of in the field as per R. Best.

Otherwise, the Adams system left for the customer in an excellent condition. Mechanical assembly and solder joints were up to standards and better.

This was primarily possible because of the fine cooperation by the people responsible for this system. They did their best to fix things before these were called out by Q.C. thus making our job easy. It also cut down on the inspection time and overall cost. A lot of credit for this positive approach to quality should go to Steve Mikulski, who really made it work.

We are working on making this a standard procedure on all future systems, and Steve has assured us his further cooperation.

The time we are saving will enable DEC to keep promised delivery dates, ship out a product of better quality and ensure a satisfied customer.

KD/kmk

INTEROFFICE MEMORANDUM

DATE March 8, 1965

SUBJECT 240V 50 cycle Power Wiring

TO J. McKalip

FROM R. E. Savell

cc: H. Anderson
G. Bell

Would you please include a 240V 50 cycle AC power wiring drawing as part of the standard set of 163 drawings.

RES/mro

INTEROFFICE MEMORANDUM

DATE March 8, 1965

SUBJECT

TO Harlan Anderson

FROM Jim McKalip

Bob Savell pointed out in a memo today that we are currently selling twice as many 161 memories as 163C memories. This is not a very good situation, as you are well aware. May I suggest that we re-evaluate our price policies as soon as possible or take some other action to try and correct this situation.

Jim

JMcK:ecc

INTEROFFICE MEMORANDUM

DATE March 8, 1965

SUBJECT Power Failure Protection for 5 microsecond Memory Type 161

TO J. McKalip

FROM R. E. Savell

cc: H. Anderson
G. Bell

Due to the fact that there are almost twice as many 161's on order as there are 163's, would you please incorporate the power failure protection circuitry and logic now being designed for the 163 into the 161 as soon as possible.

RES/mro

NANCY SURVILAS

dec INTEROFFICE MEMORANDUM

DATE March 9, 1965

SUBJECT

TO P. Harris
R. Handy
G. Moore
M. Canning
K. Larsen
R. Mission
D. Denniston

FROM R. Lane

We have scheduled the PDP-6 computer guidance committee to meet every Wednesday at 8:30 a.m. If you propose an agenda item, have it in by Tuesday noon to either Pat Murphy or Nancy Survilas. Plan to be present during discussion of the particular item. (except Field Offices).

From time to time you may be asked to attend meetings so when planning your weekly activities, keep this time in mind.

dec INTEROFFICE MEMORANDUM

DATE March 9, 1965

SUBJECT 46th Meeting of the Test Equipment Committee

TO Richard L. Best

FROM Bill Titelbaum

Members of the Committee:

Robert Hughes, Chairman
Russell Doane, Secretary
Win Hindle
George Gerelds
Jim Cudmore
Steve Lambert
Ed Harwood
Jack Shields
Bill Titelbaum

1. We have received six 547's with the 1A1 Plug-in units for Computer Checkout.

2. Russ Doane will investigate the possibility of renting oscilloscopes on a short-term basis so that we may supply the summer students.

3. We decided to purchase the following test equipment:
   a) four 547 'scopes
   b) four 1A1 plug-ins
   c) three 581A 'scopes
   d) three 82 plug-ins
   e) four 630NA multimeters

Three 581A's and three 547's will go to Production, one 547 will go to Jack Shields and four 630NA multimeters will go to Production Test.

Test Equipment Service will be moving down to the engineering floor within the next two weeks. Modules that are being stored in TEH will be transferred to engineering stock. Also, many items such as power supplies, VTVM's etc. will be stored and signed out by engineering stock.

A subcommittee headed by Klaus Doering and including Bill Titelbaum will decide which equipment will be stored by engineering stock and which equipment will be locked up at night so that the location of all equipment will be known at all times.

Next meeting will be March 29, 1965 at 1:30 p.m. in Bob Hughes' Office.

BT/kmk

H. Anderson

dec INTEROFFICE MEMORANDUM

DATE March 9, 1965

SUBJECT

TO Computer Guidance Committee FROM J. Smith

After yesterday's meeting, R. Belden, E. Harwood and I met to discuss increasing the present PDP-7 schedule to meet increasing commitments. The below listed schedule and customer assignments were agreed upon. The schedule has been increased to six (6) machines in April and eight (8) machines per month starting in May.

Serial Number	Delivery to Checkout	Customer
7 - 10	3/15/65	Rensselear Poly. Institute
7 - 11	3/22/65	Oxford University (Switched)
7 - 12	3/29/65	Ford, Aeroneutronics Div.
7 - 13	4/5/65	Royal Institute
7 - 14	4/12/65	University of Pittsburg
7 - 15	4/16/65	Foxboro
7 - 16	4/19/65	Florida
7 - 17	4/23/65	DEC, Sales (Transition)
7 - 18	4/30/65	MIT, Lincoln Laboratory
7 - 19	5/3/65	Carnegie Institute of Tech.
7 - 20	5/7/65	University of California
7 - 21	5/10/65	Presbyterian Medical Center
7 - 22	5/14/65	University of California (LRL)
7 - 23	5/17/65	Argon
7 - 24	5/21/65	Manchester University
7 - 25	5/24/65	Information International
7 - 26	5/28/65	University of Washington
7 - 27	6/4/65	University of Texas
7 - 28	6/7/65	Jet Propulsion Laboratory
7 - 29	6/11/65	Mass. Institute of Technology
7 - 30	6/14/65	Milgo
7 - 31	6/18/65	Jet Propulsion Laboratory
7 - 32	6/21/65	Foxboro
7 - 33	6/25/65	MIT, Lincoln Laboratory
7 - 34	6/30/65	Boeing Company

CONFERENCE REPORT

PRESENT FOR CLIENT
Mr. J. L. Atwood
Mr. S. Grover
Mr. A. Kutchman
Mr. J. Nangle
Mr. H. Hubbard
Mr. R. Lane

PRESENT FOR AGENCY
Mr. T. P. Howard
Mr. S. T. Ansell

CLIENT DIGITAL EQUIPMENT CORP.

DATE March 9, 1965

PLACE Maynard, Mass.

SUBJECT

ROUTE TO
J. E. Rodwell
W. Mostad
R. V. W. Todd
C. J. Raines
R. Venn
G. M. Papazian
P. S. Monti
N. Lamb
R. Piera

NOTES

1. The primary purpose of this meeting was to review the schedule for March and April insertions and to discuss campaign requirements. In regard to the latter, the agency is in a position to recommend campaign concepts for the following areas:

(1) Modules
  (a) To systems designer
  (b) To OEMs (technical management)
(2) PDP-8
  (a) scientific applications
  (b) education market
(3) PDP-6
  (a) scientific applications and university computation centres
(4) PDP-7
  (a) scientific applications
  (b) process control

TPH to discuss with RVWT

The above areas are listed in order of priority. Concept visuals should serve to illustrate the agency's program recommendations in these areas. It is expected that DEC personnel can visit the agency during the IEEE show (March 22 through 25) to review the agency's proposals -- which also should include recommendations for the company's logotype.

JER & RP note

RP to discuss logo with TPH

2. RC-5. Background information was turned over to the agency for a PDP-6 ad scheduled to appear in the May 7 issue (demographic: education) of TIME. In view of the April 9 closing, the agency will plan to submit copy and layout to JLA by sometime during the week of March 15.

TPH to initiate new job

3. RMC-3. Plans call for a special ad to appear in an IFIP supplement to the Sunday New York Times (sometime in May). This provides an opportunity not only to reach the business community, legislators and educators but also to have some influence on the general public. The agency will prepare its recommendations for an ad, which might discuss computers in relation to the nation's economy, generally, and automation, in particular.

RV to contact TIME for info

TPH to initiate new job

4. RC-7. Copy and layout for LINC ad "This laboratory instrument computer talks back (7288-5-0011)" were returned to the agency, which will revise the layout in time for submittal to DEC on March 10. A picture showing a scientist viewing the instrument's scope will be substituted for one appearing on the original layout. In conjunction with the new main illustration, three (or four, if possible) data-displayed photos will appear in the ad -- which is scheduled to appear in the March 26 issue of SCIENCE and the April issue of AMERICAN JOURNAL OF MEDICAL ELECTRONICS.

AK to provide booth number (FASEB show)

NL to determine extension date

5. RM-5. A module "catalog" type ad is scheduled to appear in the March 15 issue of ELECTRONIC NEWS. It is expected that the plate will be shipped direct from Maynard to the publication. JLA agreed to furnish proofs of the ad and instruct the agency in regard to insertion orders.

JLA to follow up

6. RC-1A. The agency plans to submit a revised layout of ad "The PDP-8 is a powerful (7288-5-0013)" to DEC on March 10. This ad is scheduled to appear in the March 22 issue of ELECTRONIC NEWS. Appearing opposite this full-page ad will be a 5-column by 116-line ad directing the reader's attention to equipment displayed at the IEEE show; this ad is identified by DEC as RMC-2. It will be prepared in Maynard. Also appearing in this same issue will be a recruitment ad prepared in Maynard; this ad is identified by DEC as RR-1. Mechanicals for the latter two ads will be sent to the agency by JLA, who is requested to furnish information relating to size characteristics of the ad before that time.

RV note.

JLA to supply specific space info for 3/22 issue

7. RMC-2. This 5-column by 116-line ad (see item 6, above) will be repeated in the March 24 issue of ELECTRONIC NEWS.

RV & RVWT note

8. RM-2. Originally scheduled to appear in the February 22 issue (and later the March 15 issue) of ELECTRONIC NEWS, this 1-page module ad (7288-5-0008) has been cancelled. Identified by DEC as the "Jones' Application" ad, its final disposition will be discussed by RVWT and JLA on March 12.

RVWT to follow up

9. RC-1. A stat of the mechanical for the 2-page PDP-8 ad (7288-5-0007) was approved by JLA; the agency is authorized to produce a final plate. The ad is scheduled to appear in DATAMATION (April), INDUSTRIAL RESEARCH (April), and COMPUTERS & AUTOMATION (April).

10. RC-3. It is expected that RVWT can submit copy and layout for this PDP-8 ad on oceanography (7288-5-0018) during his March 12 meeting in Maynard. The ad is scheduled to appear in UNDERSEA TECHNOLOGY (May).

RVWT to follow up.

11. RC-6. Additional background information for an ad on DEC's software (7288-5-0012) was turned over to the agency. This ad is scheduled to appear in COMMUNICATIONS OF THE ACM (May).

RVWT to discuss with STA.

12. The agency is requested at this time to investigate media suitable for reaching appropriate audiences in: (1) Canada (2) England (3) France (4) West Germany (5) Australia. No budget restrictions have been established, and no fine definition of audiences has been made. Therefore, the agency should explore the publications available under the following categories:

(1) Computer books (for both computers and modules).
(2) Scientific journals (primarily physics and nuclear).
(3) Control and automation publications (primarily for computers used in process control applications.

TPH to discuss with RV & RVWT

RV: refer to Trade Media International info.

Although space unit size and frequency are undetermined, the agency should include a schedule of probable space costs.

DIGITAL MAYN

DIGITAL EQLA
MSG. NO. LA-237
3/9/65

TO HARLAN ANDERSON
FROM DICK MUSSON

HAVE BEEN INFORMED OF A REQUIREMENT IN BUENAS AIRES, ARGENTINA, FOR GOVERNMENT AGENCY WITH THE FOLLOWING GENERAL SPECS:

LARGE SCALE SYSTEM
MASS STORAGE
MULTIPLE PROCESSING
REMOTE INQUIRY STATIONS

SOUNDS REASONABLE PDP-6 COULD HANDLE THIS TYPE OF JOB. IF YOU ARE INTERESTED, I CAN GET THE RFQ.

ADDITIONALLY, THIS WOULD MEAN SOMEONE WOULD HAVE TO MAKE A TRIP THERE PRIOR TO MARCH 26.

THOUGHT YOU WOULD LIKE TO BE AWARE OF THIS.

END OR GA PLS
!P&P
DIGITAL MAYN
DIGITAL NYO

INTEROFFICE MEMORANDUM

DATE March 10, 1965

SUBJECT

TO Harlan Anderson
cc: Jim McKalip
Dick Best

FROM Kenneth H. Olsen

I would like to suggest that you ask Jim McKalip to prepare a comparison chart for the next PDP-6 Guidance Committee which would lay down the characteristics and prices of the new large, inexpensive memories which people are supplying. Ferroxcube has announced in a magazine that they are selling very large memories at 1 to 2 cents per bit with 10 to 12 microsecond cycle. Ampex is offering one with $2\frac{1}{2}$ microsecond cycles but more cost and Electronics Memory demonstrated one to Dick Best and me last Fall in San Francisco but I don't think the speed and price were fixed at that time.

Ken

KHO:ecc

dec INTEROFFICE MEMORANDUM

PRELIMINARY

DATE March 10, 1965

SUBJECT PDP-6 Organization

TO PDP-6 Guidance Committee

FROM Harlan Anderson

This memo is based on a meeting held Monday, March 8th and attended by Gordon Bell, Dave Packer, Bob Savell, Larry Portner and Harlan Anderson.

This memo should be considered "Preliminary" at this point since no personnel are available for some of the areas that will be listed below and in some cases, reassignments of people are indicated but these have not been discussed with the man involved. The purpose of the memo is to assist us in moving toward a more formal definition of responsibilities.

1. Software Development (Larry Portner)

   a. Prepare design specifications for new software and obtain agreement from all other interested parties in DEC.

   b. Prepare schedules for and implement new software.

   c. Prepare written technical descriptions of software suitable for use by manual writers as source material.

   d. Prepare maintenance programs .

   e. Select and supervise outside contractors doing software development for the PDP-6.

2. Applied Science and Library (Steve Mikulski)

   a. Recruit and train programmers who can help customers use our systems software.

   b. Run training courses in PDP-6 programming.

   c. Provide sales support for bench-mark problems.

   d. Run demonstration programs for plant visitors.

   e. Provide on-sight semi-permanent representatives for customers.

   f. Act as a buffer for software development group from too much customer interference.

3. Front Line Sales (Bob Lane)

   a. Meet with customers.

   b. Prepare sales proposals (using standard sections wherever possible).

   c. Make formal presentations of the hardware.

   d. Provide experienced people to be located at a few of the key field offices permanently.

4. Marketing Support (Perry Harris)

   a. Investigate potential markets for the PDP-6.

   b. Develop sales aids such as new brochures, slide talks, advertising themes, standardized proposals, innovate interesting trade show demonstrations, and etc.

   c. Sales Meetings.

   d. In general, do those things which make the front line sales job easier.

5. Hardware Development (Bob Savell)

   a. Handle all engineering changes to existing PDP-6 hardware.

   b. Provide technical support to Manufacturing and Checkout for problems they cannot handle.

   c. Develop new PDP-6 equipment.

   d. Act as liaison to central Engineering for things like Memories, Magnetic Tapes, DECtapes.

   e. Do Engineering review of new designs for any PDP-6 device.

6. Special Engineering (Alan Titcomb)

   a. Work with front line sales and customers in preparing quotations for special interfaces or options to the PDP-6.

   b. Do detail design of those options ordered.

   c. Supervise construction and checkout of special equipment such as JOSS Console, Physics Digitizers, PEPR, and etc.

7. Contracts and Systems Testing (Bob Beckman)

   a. Negotiate contract terms with customers.

   b. Establish acceptance tests for contract purposes.

   c. Order equipment constructed from manufacturing.

d. Issue construction requisitions.

e. Develop test procedures.

f. Do system testing of standard units and final testing of special options.

g. Obtain approval from Field Service, Quality Control, and Customer for equipment.

8. Training (Ray Bernier)

a. Prepare lesson plans for hardware maintenance personnel.

b. Run formal courses for this purpose.

9. Technical Publications (Bill Segal)

a. Supervise the writing of user oriented software documents.

b. Obtain source material from development personnel.

c. Obtain assistance from central Technical Publications wherever feasible; for example, printing, editorial, and etc.

d. Maintenance manuals are included.

e. Obtain services of outside writers such as Vericon wherever appropriate

10. Administration

a. Coordinate the activities of all the above groups.

b. Recognize the need for new groups.

c. Provide an overall product strategy.

d. Help revise duties when necessary.

e. Provide administrative support such as schedule assistance, financial forecasting and etc.

Harlan E. Anderson

HEA:ncs

DIGITAL EQLA
MSG. NO. LA 240
3/9/65

TO HARLAN ANDERSON
FROM DICK MUSSON

JUST TALKED TO CHUCK BAKER. ANOTHER SIGN OFF HAS BEEN ACCOMPLISHED WHICH GAVE APPROVAL FOR THE PROJECT AND FOR THE HP-6 TO BE USED ON THE PROJECT: BUT NOT FOR THE MONEY.

MY UNDERSTANDING IS THAT IT IS PRESENTLY BEING FORWARDED TO THE SECRETARY OF THE AIR FORCE FOR HIS APPROVAL.

IT SURE DOESN'T LOOK LIKE A MARCH SITUATION. THOUGHT YOU WOULD BE INTERESTED.

END

DEC INTEROFFICE MEMORANDUM

DATE March 10, 1965

SUBJECT

TO Module Guidance Committee FROM M. Sandler

Our current sales forecast and production schedule indicate the need for 8-9,000 SPU Modules and 10-11,000 Flip Chip Modules within two months and a further future monthly requirement of 38-40,000 Flip Chip Modules. It is imperative that we step up our module testing capacity expansion plans.

It has been our plan, and indeed, our hope, that the Automatic Module Tester would bear the burden of capacity expansion. Our present level of attention to this task is far short of need.

Attached are work sheets which list each module type, the test cycle time for each type, the proposed usage for each type and the extension, in hours, of test cycle time by usage quantities.

The extended cycle time plus 25% allowance for trouble and personal time, matched against 200 hours per month per test man indicates the need for 19 manned test stations. We presently have 13-14 test stations and require five additional stations. We are building Burst Generators and Test Equipment Headquarters has ordered Scopes for these stations.

Adding Scope test capacity is only a temporary stop-gap measure - we must add Automatic Module Testing capacity to meet our increasing demands.

We must embark on a full-time, concerted effort to test on the Tester. This requires hardware design, specifications, design, and programming and the engineering man power to accomplish this.

Additionally, we should investigate the present testing procedures in an effort to reduce test cycle times on those modules which are scope tested and demand the greatest load time.

The need for an additional Module Tester should be discussed very shortly.

.007

.02

1/4

4

FINISHED GOODS

FLIP CHIP MODULES

Unit		Cycle	Cycle Hrs	Usage Hrs
10	A100	25 min	— .417 x 10	4.25
10	A101	25 min	— .417	4.25
10	A102	25 min	— .417	4.25
10	A103	25 min	— .417	4.25
10	A201	2 hr	— 2.000	20.00
30	A502			0
65	A601	12½ min	— .208	13.50
80	A604	11 min	— .183	13.75
10	A605			0
10	A702	8 min	— .133	1.50
	…04	45 min	— .750	26.25
80	B104	8 sec (A)	— .004 —	.50
400	B105	8 sec (A)	— .004	1.75
320	B113	8 sec (A)	— .004	1.50
200	B115	8 sec (A)	— .004	1.00
90	B117	8 sec (A)	— .004	.50
10	B124	10 sec (A)	— .005	.25
	B130			
10	B155	15 sec (A)	— .006	.25
80	B171	15 sec (A)	.006	.50
500	B201	35 min	— .583	292.00
90	B204	25 min	— .417	37.75

Unit		Cycle	Cycle Hrs	Usage Hrs
150	B210	40 min	— .667	100.00
10	B301	10 min	— .167	1.75
	B310			
150	B360	15 min	— .250	37.50
	B401			
140	B602	12 min	.200	28.00
130	B620	12 min	— .200	26.00
10	B681	10 sec (A)	.005 —	.25
680	B684	5 min	— .083	56.50
150	G001	30 min	— .500	75.00
20	G002	20 min	— .333	6.75
240	G003	to Beon		0
20	G004			0
	G005			
	G006			
	G080			
	G200			
150	G201	20 min	— .333	50.00
290	G202	15 min	— .250	72.50
320	G203			0
10	G204	10 min	— .167	1.75
120	G205			0

	G205		10 R200	25 min	-.417 4.25
	G207		100 R201	14 sec	(A) -.006 .75
	G270		420 R202	14 sec	(A) -.006 2.75
	G280		280 R203	14 sec	(A) -.006 1.75
	G281		30 R204	15 min	-.250 7.50
	G282		130 R205		
	G600		260 R210		
40	G601		240 R211		
40	G602		120 R212		
160	G603		120 R220		
	G604		70 R284		
	G800		250 R302	20 min	-.333 83.25
	G808		100 R401		
	G809		70 R405		
	G851				
			30 R601	20 min	-.333 10.00
10	R001	5 sec (A) -.003 .25	370 R602	15 min	-.250 92.50
400	R002	5 sec (A) -.003 1.25	420 R603	4.5 min	-.075 31.50
300	R107	10 sec (A) -.005 1.50	260 R650	15 min	-.250 65.00
105	R111	10 sec (A) -.005 5.25			
10	R113	10 sec (A) -.005 .25			
10	R131	15 sec (A) -.006 .25	W002		
350	R141	15 sec (A) -.006 2.25	W005		
50	R151	15 sec (A) -.006 .50	W020		
80	R181	15 sec (A) -.006 .50	W021		

	W022			W992
	W023			W994
	W024			
	W025			
	W026			
	W028			
60	W040	10 min	-.167	10.25
60	W050	10 sec (A)	-.005	.50
	W051			
	W100			
	W101			
	W102			
	W500			
60	W501	25 min	-.417	25.25
30	W510	5 min	-.083	2.50
	W590			
	W600			
20	W601	10 min	-.167	3.50
160	W607	15 min	-.250	40.00
80	W640	20 min	-.333	26.75
	W690			
20	W700	10 min	-.167	3.50
	W800			
	W980			
	W985			
	W990	0		

9000/month

FINISHED GOODS

1 - .0167
2 - .0333
3 - .0500
4 - .0667
5 - .0833
6 - .1000
7 - .1166
8 - .1333
9 - .1500
10 - .1666
11 - .1833
12 - .2000
13 - .2166
14 - .2333
15 - .2500
16 -

	code	Usage X Code	
103	5 min - .05	.25	
110	4 min - .0666	.25	
202	7.5 min - .125	2.50	
302	15 min - .250	3.75	
402	12 min - .200	1.00	
~~410~~			
410	6 min - .100	.50	
501			
602	10 min - .166	1.00	
650			
667	10 min - .166	1.00	
~~1000~~			
~~1001~~			
~~1002~~			
1000	5 sec (A) .003 - ~~600-700~~	.25	
1001	5 sec (A) - .003 - 6-700	.25	
1002	5 sec (A) .003 - 6-700	.25	
1011	1½ min - .025	.50	
1020	2 min - .033	9.00	
1021	2 min - .033	.50	
~~1030~~			
~~1031~~			
~~1032~~			
~~1033~~			
1040	2.5 min - .042	.75	
1103	10 sec (A) - .005 - ~~2-350~~	.50	
1104	10 sec (A) - .005 - ~~2-350~~	.25	
1105	10 sec (A) - .005 - ~~3-350~~	.25	
1110	10 sec (A) .005 - ~~3-350~~	.25	
1111	10 sec (A) .005 - ~~3-350~~	.25	
1113	10 sec (A) - .005 - ~~3-350~~	.50	
1115	10 sec (A) - .005 - ~~3-350~~	.25	
1117	10 sec (A) .005 - ~~3-350~~	.25	
~~1150~~			
1150	18 sec (A) .007 - 150-200	.25	
1151	18 sec (A) .007 - 150-200	.25	
~~1200~~			
1201	7.5 min - .125	13.25	
1204	12 min - .200	4.50	
1209	12 min - .200	4.50	
1213	15 min - .250	5.50	
1250	16.5 min - .275	10.00	
1260	20 min - .333	7.50	
1304	15 min - .250	26.25	
1310	10 min - .166	6.75	
1311	8 min - .133	2.50	
1316	10 min - .166	5.00	
~~1400~~			
1404	12 min - .200	2.50	
1406			
1410	6 min - .100	2.50	
1501	6 min - .100	2.50	
~~1502~~			
1503	30 min - .500	2.75	
1534	5 min - .083	.50	
1535	5 min - .083	1.00	
1536	10 min - .166	1.25	
1537	5 min - .083	.50	
~~1538~~			
1539	15 min - .250	1.50	
1542	10 min - .166	1.00	
1550	10 min - .166	1.00	
1552	6 min - .100	.75	

1554	8 min - .133	.75
1556	20 min -.333	2.00
X		
X		
1561	20 min -.333	4.00
1562	5 min -.083	.25
1563	20 min -.333	2.00
1564	20 min -.333	4.00
X		
1567	30 min -.500	3.00
1568	20 min -.333	2.00
1570	40 min - .667	8.00
1571	15 min - .250	15.00
1573	30 min + Heat + Cold -.75	18.00
1574	30 min + " + " -.75	9.00
1575		
1577	15 min - .250	1.50
1578		
X		
X		
X		
1581		
1582	8 min - .133	.75
1583	16 min - .267	1.50
X		
1607	11 min -.183	15.75
1608	15 min -.250	6.00
1609	10 min -.167	10.25
X		
X		
1664	15 min -.250	3.00
1665	15 min -.250	7.50

1667	6 min - .100	.75
1669	5 min - .083	5.75
1672	8 min - .133	1.00
1675	5 min - .083	.25
1677	12 min - .200	3.75
1678	4 min - .067	.50
1681	10 min - .167	3.00
1682	10 min - .167	X
1684	5 min - .083	4.00
1685	5 min - .083	2.50
1687	10 min - .167	1.00
1689	12 min - .200	1.25
X		
X		
X		
X		
1701	8 min - .133	1.75
1703	7 min - .117	1.50
1704	30 MIN - .500	9.00
1705	15 min - .250	1.50
X		
X		
X		
1751	2 hr. - 2.000	12.00
X		
1783	60 min - 1.000	12.00
1784	20 min - .333	2.00
1802	4 min - .067	1.00
1803	7 min - .117	1.50
X		
X		
X		

807	6 min −.100	1.25
1976	4 min − .067	3.00
1978	4 min −.067	1.75
1982	10 min −.167	5.25
1987	10 min − .167	21.25
1989	15 min −.250	12.00
1990	25 min −.417	10.50
1991	10 min −.167	.75
1992	10 min −.167	2.00
1993	3 min .050	.50
1994	1.5 min −.025	.25
1996	8 min −.133	6.50
1997	8 min −.133	5.00
1998	8 min −.133	9.75
1999	6 min .100	1.25
3101	3 min −.050	1.00
3110	4 min −.067	1.25
3201	7.5 min − .125	7.50
3301	12 min − .200	3.75
3401	12 min −.200	3.75
3410	6 min − .100	1.25
3602	10 min − .167	1.00
4102	10 sec (A) −.003	3-350 .75
4105	10 " (A) −.003	" .25
4106	10 " (A) −.003	" .25
4110	10 " (A) −.003	.25
4111	10 " (A) −.003	.25
4112	10 " (A) −.003	.50
4113	10 " (A) −.003	1.00
4114	10 " (A) −.003	.25
4115	10 " (A) −.003	.50
4116	10 " (A) −.003	.25
4117	10 " (A) −.003	.25
4118	10 " (A) −.003	.25
4119	10 " (A) −.003	.25

4123	10 min -.167	10.00
4125	10 min -.167	3.00
4126	8 min -.133	3.25
4127	8 min -.133	26.75
4128	8 min -.133	3.25
4129	8 min -.133	12.00
4130	8 min -.133	4.00
4141	15 sec (A) -.006	~~200-24~~ .75
4143	15 sec (A) -.006	" "
4150	18 sec (A) -.006	50/200 .25
4151	18 sec (A) -.006	50-200 .25
~~X~~		
~~X~~		
4201	7.5 min -.125	4.50
4202	12 min -.200	1.25
~~X~~		
~~X~~		
4204	15 min -.250	16.50
4205	15 min -.250	13.50
4206	1 1/4 hr. 1.250	75.00
~~X~~		
4209	12 min -.200	12.00
4213	15 min -.250	7.50
4214	12 min -.200	10.00
4215	12 min -.200	29.00
4216	12 min -.200	3.75
4217	12 min -.200	10.00
4218	12 min -.200	12.00
4219	12 min -.200	1.25
4220	20 min -.333	28.00
4221	20 min -.333	24.00
4222	20 min -.333	14.00
4223	20 min -.333	12.00
4224	20 min -.333	2.50
4225	30 min -.500	33.00
4226	15 min -.250	3.00
4227	15 min -.250	3.00
4228	12 min -.200	6.00
42281	10 min -.167	1.00
4230	30 min -.500	9.00
4231	30 min -.500	2.50
4260	15 min -.250	1.75
4261		1.75
4290	30 min -.500	2.50
4301	28 min -.467	42.00
4303	25 min -.417	37.75
4304	15 min -.250	2.75
4305	10 min -.167	1.00
4306	12 min -.200	7.50
4320	10 min -.167	1.00
4321		
4401	12 min -.200	7.75
~~X~~		
4410	6 min -.100	8.50
4504	6 min -.100	.75
4505	6 min -.100	.75
4506	5 min -.083	.50
4507	5 min -.083	.50
4508	10 min -.167	1.00
4509	25 min -.417	2.125
4514	15 min -.250	2.75
4517	20 min -.333	—
4518	8 min -.133	1.50
4519	5 min -.083	—

4521		
4522	8 min — .133	1.00
4523	45 min — .750	13.50
4524	2 min — .033	.25
4525	20 min — .333	4.00
4526	15 min — .250	4.50
4527	10 min — .167	1.00
4528		
4529	45 min — .750	3.75
4530	40 min — .667	3.50
4531	20 min — .333	1.75
4550		
4551	20 min — .333	1.75
4552	6 min — .100	5.50
45521	6 min — .100	8.50
4603	6 min — .100	10.00
4604	9 min — .150	22.50
4605	5 min — .083	10.50
4606	7 min — .117	21.25
4657	6 min — .100	5.50
4658	13 min — .217	2.75
4659	5 min — .083	.50
4660	5 min — .083	.50
4667	6 min — .100	2.00
4669		
4671	10 min — .167	4.25
4676	5 min — .083	.50

4677	15 min — .250	2.75
4678	15 min — .250	6.25
4679	15 min — .250	6.25
4681	4 min — .067	2.50
4686	7 min — .117	1.50
4688	6 min — .100	.50
4689	4 min — .067	1.75
4691		
4702	20 min — .333	2.00
4703	20 min — .333	2.25
4704	20 min — .333	2.00
4705	20 min — .333	2.00
4706	20 min — .333	10.00
4707	20 min — .333	10.00
4800	5 min — .083	.50
4801	3½ min — .058	.50
4802	3 min .050	.50
4900		

4995	8 min −.133	2.50
4996	8 min −.133	1.00
4997	8 min −.133	1.00
4998		
5101	3 min − .050	.75
5202	15 min −.250	1.50
5310	20 min .333	2.00
5401	15 min −.250	1.50
5602	10 min −.167	.75
6102	10 sec (A) −.003	.50
6105	10 " (A) −.003	.25
6106	10 " (A) .003	.50
6109		
6110	10 sec (A) −.003	.25
6111	10 " (A) −.003	.25
6113	10 " (A) −.003	.50
6114	10 " (A) −.003	.25
6115	10 " (A) −.003	.25
6116	10 " (A) −.003	.25
6117	10 " (A) −.003	.25
6118	10 " (A) −.003	.25
6119	10 " (A) −.003	.25
6121	15 " (A) −.006	.25
6123	15 " (A) −.006	.25
6124	15 " (A) −.006	.25
6131	15 min −.250	3.00
6132	15 min −.250	1.50
6150	15 sec (A) −.003	.25
6151	15 sec (A) −.003	.25
6155	15 sec (A) −.003	.25
6202	15 min −.250	6.00
6203	30 min −.500	9.00
6205	45 min −.750	41.25
6206	30 min −.500	18.00
6207	20 min −.333	16.75
6208	20 min −.333	4.00
6227	10 min −.167	7.25
6303		
6304	15 min −.250	6.25
6310	10 min −.167	3.00
6311	8 min −.133	1.00
6401	12 min −.200	2.25
6403		
6509		
6603	8 min −.133	5.00
6609	10 min −.167	2.00
6615	30 min −.500	12.00
6684	15 min −.250	21.00
8104	25 min −.417	5.00
8120	20 min −.333	2.00
8202	30 min −.500	11.00

Total - 131.4 hours

INTEROFFICE MEMORANDUM

DATE March 10, 1965

SUBJECT Clarification of Responsibility for Drum Control Type 236 and Drum Type 237

TO D. Chin
D. Tringale
B. Colburn
P. Scriven

FROM R. E. Savell

CC: R. L. Best
H. Anderson
G. Bell

In the new PDP-6 product line organization, responsibility for the drum and drum control will remain with Derrick Chin since we are using the VRC Drum and the GI Drum has been cancelled. Derrick will be reporting to me on this project. Dick Tringale will be the other member of the engineering team; and technical assistance will be provided by Bill Colburn and Paul Scriven. All three will report to Derrick Chin.

Since Dick Tringale's responsibilities for other drum systems will continue as before, he will be working on the 236 and 237 only 60 per cent of his time.

RES/mro

dec INTEROFFICE MEMORANDUM

DATE March 11, 1965

SUBJECT

TO Dick Mills

FROM Denny Doyle

Your letter of March 8 seems to summarize the Foxboro situation pretty well in so far as Canada is concerned. It is very unfortunate that we will have to pass up opportunities to talk to industries such as the Pulp and Paper Industry until such time as Foxboro decides to take it seriously. It is an industry which spends approximately $200,000,000 per year in new capital equipment. This is rather fantastic when one considers that the entire research budget in the government in Canada is in the neighbourhood of $250,000,000.

Our friends at DCF Systems in Toronto will definitely move into the area of process control, and they will certainly help to sell our computers. However, the working relationship with them would never be so close as it would be with Foxboro since the Foxboro Association would be essentially a copy of the U.S. Association, and I feel that fewer mistakes would be made. Also, DCF really has nothing to offer us since they are not in the business of building hardware, but only in the business of taking on total system responsibility.

D J Doyle

cc Harlan Anderson

INTEROFFICE MEMORANDUM

DATE March 11, 1965

SUBJECT German Sales Office

TO Harlan Anderson

FROM Jonathan Fadiman

In a meeting yesterday with Harlan Anderson, Guenter Huewe and Jon Fadiman, it was decided to set up a second sales office in Germany. The reason for this is that it appears that most of our sales from the German office are to be concentrated in Northern Germany and the Netherlands, and, therefore, Munich is not the most central place for our main office. We are committed to establishing an office in the area of Bonn in any case because of the fact that we have already sold a PDP-6 at the University of Bonn and we are almost sure of selling a PDP-6 to the University of Aachen. Guenter Huewe felt that in light of this and the present and future sales in Germany, the best place for our main office would be in the area just south of Cologne. This area is only about 25 kilometers from Bonn, about 100 kilometers from Aachen, very close to two main autobahns and to two main airports, one at Cologne and the other at Dusseldorf.

The Munich office will be retained as a secondary sales office staffed with one or probably two engineers and one secretary. The total sales force of the German office is being expanded as follows:

1. Guenter Huewe: Manager of both German offices, to be situated eventually in the Cologne area.

2. Juergen Kesper: PDP-6 service to be situated in the Cologne area by May 15.

3. Manfred Jaekel: Service and Sales to be in Munich for some time and then possibly shifted to Cologne.

4. Mr. Klaus D. Kyris: Starting work March 15 in Munich.

5. Fifth engineer:experienced engineer with experience in programming and computer work to start work about July 15. This man will be in charge of the Munich office but under the direction of Guenter Huewe.

Present expenses for the German office are running in the neighborhood of $55,000 per year. It is expected that with expansion the expenses for fiscal year July 1, 1965

through June 30, 1966, will be in the neighborhood of $85,000. It is expected that the sales will be somewhat over $1 million. The area of responsibility for the German office will be Germany, the Netherlands, the northern part of Switzerland. Denmark may also be assigned to the German area.

Guenter Huewe will start looking for the new office in the Cologne area as soon after he returns to Germany on March 15 as possible. We would like to have the office available by May 15.

JF:nlz

cc: Guenter Huewe
John Leng
Dick Mills
Stan Olsen
Ken Olsen

INTEROFFICE MEMORANDUM

DATE March 11, 1965

SUBJECT

TO H. Anderson

FROM D. Kuyamjian

IBM's Ralph Gootner has given me the following information on the new Discpak:

Storage Control Electronics Model 2841: Controls up to eight Model 2311 Disc Drives with Model 1316 Discpaks. Model 2841 - $27,250.00

Additional storage option for tying on a Model 1302 - $8,000.00
File Scan Option for comparison of information selection - $1,400.00
Record Overflow Option - allows overflow to be automatically recorded on next track - $400.00
Two - Channel Switch Option - allows two computors access to discfile under program control - $4,250.00

Disc Drive Model 2311: holds one Discpak Model 1316 - $26,300.00

Discpak Model 1316: can be manually exchanged in one Model 2311. Discpak Model 1316 - $490.00

1) contains six discs, twelve sides, of which ten sides are used for storage of data
2) capacity: each discpak (of six discs) provides storage of 2 million characters or 2.98 million characters with track record feature
3) addresses are pre-recorded
4) average access time is 85 ms

Delivery of the above units: 6-12 months.

I will send you IBM's bulletins on the above as soon as I receive them.

INTEROFFICE MEMORANDUM

DATE March 11, 1965

SUBJECT

TO J. McKalip
S. Lambert
D. Adams

FROM R. E. Savell

CC: H. Anderson
G. Bell
R. L. Best
J. Hastings

I would also like to make sure that everyone understands Dave Adams' status. Dave still works for me and per agreement with Jim Hastings and Dick Best, is on loan to Steve - to work on the Discfile 270 - for the duration of that project.

RES/mro

INTEROFFICE MEMORANDUM

DATE March 11, 1965

SUBJECT

TO H. Anderson

FROM D. Kuyamjian

sent to Every for file

Attached is a copy of the patent held by Technitrol for addressing on magnetic storage equipment.

Bob Cesari has made the following points to me about it:

1) It directly concerns the type of memory drums and disc files which we use with our equipment.
2) Pre-recorded permanent addressing probably wouldn't be an infringement of this patent.
3) The magnetic tape transports we purchase probably wouldn't be an infringement either.
4) Statements by our vendors of drums and files indicating that they will assume liability for any infringements against this patent will completely protect Digital, regardless of the fact that they don't become infringing until used with our equipment. Cesari's basis for this interpretation is that their use with our equipment is the use and application intended by the manufacturer.
5) To date, out-of-court settlements, have been made by Technitrol with Rem Rand, IBM, and G.E. Cesari heard that the IBM settlement was about $400,000.

I have sent letters to our drum and file manufacturers, Vermont Research and Data Products, but as yet have received only the Data Products agreement. I will follow-up on Vermont Research.

b) DEC may cancel this order by written or telegraphic notice if Data Products shall become insolvent or make a general assignment for the benefit of creditors, or if a petition under Chapters X or XI of the Bankruptcy Act is filed by or against Data Products.

Cancellation for Convenience: DEC reserves the right to terminate this order at DEC's convenience at any time. Cancellation charges will be negotiated by DEC and Data Products and will be commensurate with the percentage of work completed on the equipment plus a reasonable profit.

Set-Off: DEC and Data Products shall have the right at anytime to set-off any amount owing from Data Products to DEC or DEC to Data Products, respectively, or any associated or affiliated companies, with respect to this or any subsequent order.

Patents: Data Products shall hold and save DEC, its officers, agents, employees, and customers, harmless from liability and indemnified against loss and expense of any nature or kind, for or on account of the use, sale, or lease of any patented or unpatented design, invention, article, or appliance furnished hereunder, or on account of the use of said equipment or its incorporation into or use with products manufactured by DEC when such connection, incorporation, or use is ordinary and is in accord with and within the general scope of the purpose for which the said Data Products equipment in intended. Data Products shall also hold DEC, its officers, agents, employees and customers harmless from any liability and indemnified loss and expense of any nature or kind connected with United States Patent No. 2611813. Data Products will be exempt from indemnifying DEC against loss and expense resulting from patent infringement only if DEC uses Data Products equipment in an un-common way such as to render it infringing.

Confidential Information and Advertising: Without the prior written consent of DEC, Data Products shall neither disclose to any person outside of its employ, nor use for purposes other than performance of this order, any information pertaining to DEC or DEC's affairs (including all drawings, blueprints, descriptions, specifications and the contents of this order) and upon termination of this order will return to DEC all such items which embody any of such information. Without first obtaining the prior written consent of DEC, Data Products shall not in any manner disclose, advertise or publish the fact that Data Products has furnished, or contracted to furnish DEC, the material and/or services ordered hereunder.

Acknowledgement subject to letter dated 1/20/65.

Signed by Kenneth M. Olsen Date 1-27-65

Data Products Corporation

Signed by Harry J. Crouse Date 1-8-65

Digital Equipment Corporation

ACKNOWLEDGEMENT COPY
TO BE SIGNED AND
RETURNED TO BUYER

Vermont Research Corporation
Contract - P. O. #35422
January 29, 1965

ADDENDUM I

Patents: Seller shall hold and save DEC, its officers, agents employees and customers, harmless from liability and indemnified against loss and expense of any nature or kind, for or on account of the use, sale, or lease of any patented or unpatented design, invention, article, or appliance furnished hereunder, or on account of the use of said equipment or its incorporation into or use with products manufactured by DEC when such connection, incorporation, or use is ordinary and is in accord with and within the general scope of the purpose for which the said Seller's equipment is intended. Seller shall also hold DEC, its officers, agents, employees, and customers harmless from any liability and indemnified against loss and expense or any nature or kind connected with United States patent #2611813.

_____ Date _____

Digital Equipment Corporation

_____ Date _____

Vermont Research Corporation

INTEROFFICE MEMORANDUM

DATE March 11, 1965

SUBJECT

TO Computer Guidance Committee FROM J. Smith

After Monday's meeting, R. Belden, E. Harwood and I met to discuss increasing the present PDP-7 schedule to meet increasing commitments. The attached schedule and customer assignments were agreed upon. The schedule has been increased to six (6) machines in April and eight (8) machines per month starting in May.

This memo supersedes my memo of March 9, 1965.

Distribution:

K. Olsen
H. Anderson
S. Olsen
R. Beckman
R. Beldon
G. Bell
R. Best
W. Brackett
B. Dill
H. Godfrey
J. Hagerty
W. Hindle
C. Kendrick
D. Kicilinski
R. Maroney
N. Mazzarese
H. Morse
D. Packer
G. Porrazzo
M. Sandler

Serial Number	Delivery to Checkout	Shipping Date	Checkout Weeks Allotted	Customer
7-9	---	4/19/65	---	Rensselear Polytechnical Institute
7-10	3/15/65	4/15/65	5 Weeks	Ford, Aeroneutronics Division
7-11	3/22/65	5/3/65	6 Weeks	Oxford University
7-12	3/29/65	5/14/65	7 Weeks	Royal Institute
7-13	*4/5/65	5/17/65	6 Weeks	University of Pittsburg
7-14	4/12/65	5/24/65	6 Weeks	Foxboro
7-15	4/16/65	5/20/65	5 Weeks	Florida
7-16	4/19/65	6/2/65	6 Weeks	DEC, Sales (Transitron)
7-17	4/23/65	6/15/65	7 Weeks	Mass. Institute of Technology, Lincoln Lab.
7-18	4/30/65	6/9/65	6 Weeks	Carnegie Institute of Technology
7-19	**5/3/65	6/14/65	6 Weeks	University of California
7-20	5/7/65	6/21/65	6 Weeks	Presbyterian Medical Center
7-21	5/10/65	6/24/65	7 Weeks	University of California, L.R.L.
7-22	5/14/65	6/30/65	6 Weeks	Argon
7-23	5/17/65	7/5/65	7 Weeks	Manchester University
7-24	5/21/65	7/9/65	7 Weeks	Information International, Inc.
7-25	5/24/65	7/15/65	8 Weeks	University of Washington
7-26	5/28/65	7/25/65	8 Weeks	University of Texas
7-27	6/4/65	7/20/65	6 Weeks	Jet Propulsion Laboratory
7-28	6/7/65	7/20/65	6 Weeks	Mass. Institute of Technology
7-29	6/11/65	8/1/65	7 Weeks	Milgo
7-30	6/14/65	8/5/65	8 Weeks	Jet Propulsion Laboratory
7-31	6/18/65	8/10/65	7 Weeks	Foxboro
7-32	6/21/65	8/15/65	8 Weeks	Mass. Institute of Technology, Lincoln Lab.
7-33	6/25/65	8/20/65	8 Weeks	Boeing Company
7-34	6/30/65	8/25/65	8 Weeks	Stromberg

* Six (6) Machines in April
**Eight (8) Machines Per Month Starting in May

J. Smith
3/11/65

dec INTEROFFICE MEMORANDUM

DATE March 12, 1965

SUBJECT TRANSISTORS FROM THE PDP-6-3 AT BROOKHAVEN

TO Jim Cudmore

FROM Robert Kudera

Five transistors were sent by Bob Clements from Module 6132 of the Brookhaven PDP-6. There were three 2894-1's and two SDA-8's. The SDA-8 was replaced, then the 2894-1's were replaced, and finally the SDA-8 was replaced again before the board would work. The parameters of these transistors were measured and all were found to be within specifications. There was no apparent reason why these transistors would cause the 6132 module from working correctly.

cc: Bob Hughes
Bob Brooks
Jack Shields
Harlan Anderson

RK/kmk

Harlan Anderson

dec INTEROFFICE MEMORANDUM

DATE MARCH 12, 1965

SUBJECT PDP-6 DELIVERY NOTES

TO PDP-6 GUIDANCE COMMITTEE
DICK MILLS
JACK SHIELDS
JOHN FADIMAN

FROM BOB BECKMAN

There has been some confusion in the past as to exactly what is meant by various schedule dates for completion of PDP-6 Systems. In an effort to clarify the situation and to have available the various dates that are of use to different areas of the Company, the attached PDP-6 System Status Report has been generated. This report will be updated and reissued periodically.

Four dates are included on the report covering the period from in-house acceptance to acceptance by the customer. The in-house acceptance date is the date on which we expect to start the in-house acceptance tests. On large systems these tests can take up to five days of actual running time. The in-house acceptance date is the date that normally appears as the required delivery date on a Construction Requisition. The shipping date is the date on which we expect the system to actually be crated and leave the plant. The estimated installation date is the date on which we expect the equipment to arrive at the customer's site and the actual installation and acceptance tests to be started. The final date is the date we expect the system to have completed all acceptance tests and to be accepted formally by the customer.

The dates listed here should be used for planning purposes and we expect to be within a day or two of these dates on all future deliveries. In the event of changes, the people concerned will be notified as soon as possible.

RJB:vc

PDP-6 SYSTEM STATUS

Customer	Serial	in house acc'tnce	ship	est'm'd install.	est'm'd acc'tce
MIT - MAC	2	-	6 Oct.		13 Oct.
BROOKHAVEN	3	-	12 Jan.		
U. of W. AUSTRALIA	4	-	11 Feb.	28 Feb.	
LRL	5	-	20 Jan.		4 Feb.
ADAMS	6	18 Feb.	5 Mar.	5 Mr-1 Ap	1 May.
DEC (Prog)	7		-	-	-
RUTGERS	8	22 Mar.	24 Mar.	26 Mar.	27 Mar.
RAND	9	24 May	1 June	14 June	21 June
BONN	10	3 May	10 May	15 May	29 May
DEC (Sales)	11	17 May	21 May	-	-
AACHEN	12	1 July	7 July	14 July	24 July
MIT - LNS	13	12 July	15 July	15 July	17 July
Univ. of CALIFORNIA (Berkeley)	14	23 Aug.	27 Aug.	8 Sept.	15 Sept.
OXFORD	15	24 Sept.	1 Oct.	5 Oct.	26 Oct.

CONFERENCE REPORT

PRESENT FOR CLIENT		ROUTE TO
J.L. Atwood J. Nangel D. Watson (part time)	CLIENT Digital Equipment Corp. DATE March 12, 1965 PLACE Maynard, Mass. SUBJECT	DIGITAL J. Atwood (12) RUMRILL T. Howard R. Todd D. Moffitt
PRESENT FOR AGENCY F. Bradley Lynch		

NOTES

I. Alignment of agency public relations responsibilities was established as follows:

A. Prime direct contact at Digital on PR work will be Joe Nangle. Jack Atwood is to be kept informed of all activities.

B. Don Moffitt, who is the principal agency contact with Digital, will arrange to spend every other Thursday at Maynard. Exceptions to this will be when inevitable conflicts occur on client or agency schedules and when Joe Nangle comes to the agency in New York.

C. Principal areas of agency PR activity to include:

1. New Products Introductions -- Advice and counsel on methods of handling, contributions to press kits, and the integration of product with the corporate story.

2. Applications Stories -- General interest applications, such as the Woods Hole story, will be the province of the agency in both writing and placement. Highly technical stories will be obtained at Digital from Digital writers, and the agency may be called upon to assist in editing and, in some cases, placement of these.

3. Continued Press Contacts With Key Editors -- The agency will maintain contact with the approximately 20 editors in the electronics and computer fields who are particularly important to Digital. In this way Digital will have an editorial outpost in New York and a group constantly stimulating the editors to interest in the company and its products. The agency's new TWX system, to go in operation shortly, will improve the flow of information back and forth between Maynard and New York so that editorial queries can be handled promptly.

- more -

II. Specific areas of activity covered in this conference include:

A. The IEEE show at the Coliseum in New York.

1. The PDP-8 computer will arrive on Sunday morning, and the agency will see that its arrival in the back of an automobile or station wagon is covered photographically and captioned prints are serviced to the press.

2. The agency this week is making contact with the public relations staff of the IEEE to inform them of the importance of the PDP-8 and of Digital's module story, and to enlist their aid in steering members of the press to the Digital exhibit.

3. The agency will prepare a statement by Ken Olson linking the PDP-8 to the corporate story of Digital.

B. The next significant press introduction will take place in May at the Interdata Show in the New York Hilton, where it may be possible to demonstrate for editors a family of computers - the 6, 7 and 8 - in the hotel suite.

C. The agency will develop a plan for publicizing the use of a PDP-6 computer, which will be lent to the University of Southwestern Louisiana's conference on Digital computers for college teachers of science, mathematics and engineering, to take place August 16 to September 6 under auspices of the National Science Foundation.

D. The agency and Digital will watch closely the development of applications for typesetting in the newspaper field. It's possible that a story in the Worcester Gazette may be leaked from that paper to the trade press once this is installed. Control over what is said, where and how, should be maintained by Digital.

E. To expand on press contacts already made by the agency in Digital's behalf, Joe Nangle and Don Moffitt will make calls on editors together during the IEEE. The agency and Joe will prepare a fact file on Digital Equipment Corp. which, when completed and approved, will be taken by Don to editors and serve as his introduction to them. Items needed for this is are biographies of key Digital people; the agency will obtain these on a coming visit to Maynard.

F. Joe Nangle has requested a copy of IBM's story of several years ago on the Rumrill Company's use of a computer in billing and other operations. This will be sent to Mr. Nangle.

- more -

G. Jim Creager of Chemical and Engineering News, has requested a story on the PDP-8 linked to data logging and instrument control in the chemical industry. The agency will prepare this for approval at the client level.

H. The agency will review the list of PDP-5 installations and send suggestions for stories for different industry markets to Digital. A particularly important area, because of its technical nature, is physics applications. A special effort will be made to obtain stories that are meaningful to the physicists. John Jones, of Digital sales, is a good source for information in this field.

I. Particular areas of application stories which will be valuable to Digital are: aerospace, applied research and engineering (including process control), medicine, oceanography and physics.

J. There is a need for a booklet, 8-1/2 x 11 size, telling application stories of Digital computers in particular fields. The first of these will be dummied and copy prepared by the agency and will cover the field of oceanography. Applications to be covered in this area are the Woods Hole vessel Atlantis, with minor emphasis on other ships - the Evergreen, the Bear, and the Thompson. Information on these was provided to the agency.

K. A talk by Patrick Greene of Digital will be delivered at the IEEE meeting on Monday or Tuesday afternoon, March 22 or 23. The agency is reviewing the content, to ascertain feasibility of preparing a news release on this subject. This talk covers direct Digital control of a nuclear reactor.

L. Technical papers and more speaking engagements by Digital people are important, particularly if they can be translated into magazine articles for general interest publications not now covered by Digital's news program ... of if they can be made front-of-the-book articles in electronics and computer magazines.

M. Of particular value in our program of press contact will be added knowledge of magazines' editorial plans, special subject or theme issues, and a better knowledge of the types of material they want and need from Digital.

N. General interest magazines, such as Fortune, Forbes, Dun's Review, and others, are particularly important. A story on the PDP-8 in Printers' Ink's new products section would be salient, as would articles relating the computer to non-electronic publications such as those of the chemical and book publishing industry. The PDP-8 has wide application and approximately 100 orders have been written. The more we can do to tell readers of general and special interest magazines outside the electronics industry about its manifold uses and

advantages the better. The PDP-8 is being sold more and more to industrial users, whereas the PDP-5 has its heaviest application in universities and other academic research centers.

III. The subject of an external magazine to Digital's list of 20,000 customers, prospects and others who have directly requested information in depth from Digital was discussed. Tentative plans call for a bi-monthly, two-color publication - Time Magazine size.

This magazine should be sophisticated enough to inform and interest the scientific user of Digital computers and still be of such general interest that it will be welcomed by less informed audiences, such as a businessman or educator who knows little about computers but realizes that he should know more.

As contemplated, it will also be sent to Digital employees and opinion molders. Subject matter to be covered includes:

1. New products.
2. Application briefs, mostly pictorial.
3. Information on software.
4. Stories on who is buying what computers and for what use.
5. News about district officers and their technical capabilities.
6. New literature.
7. Company news, including corporate, new production equipment, etc.

Responsibilities may be aligned this way: Digital - copy and photography; Rumrill - editorial consultation, copy, photography, layout and mechanicals.

This magazine is to be the subject of further discussion on Mr. Atwood's next visit to the agency on Thursday, March 25.

#

dec INTEROFFICE MEMORANDUM

DATE March 15, 1965

SUBJECT Rand Corporation

TO R. Beckman

FROM R. Lane

The minimum configuration for the Rand system is as follows:

1 166-626-760 Processor
1 163C Memory, 2μsec, 16K
1 136 Data Control
1 516-520 Tape Control
1 50 Tape Unit
1 551 DEC Tape Control
1 555 DEC Tape Unit
4 628 User Stations
1 761 Paper Tape Punch
1 630 Data Communications System

The 237 Drum, 167-236 Drum Control, and the 270 Disc Control Unit may be delivered later. The additional 163 memory may be retained to test the drum if necessary.

CC: H. Anderson ✓
S. Mikulski

INTEROFFICE MEMORANDUM

DATE 15th March, 1965.

SUBJECT

TO Nancy Zieler

FROM John Leng

U.K. office personnel at present consist of:-

J. Leng	-	Manager
J. Milton	-	Applications Engineer in sales
G. Finch	-	Applications Engineer in sales
W. Spittle	-	Manager, Field Engineering
Hilary Cheeke (formerly Jones)	-	Secretary
Pamela Wyatt	-	Clerk-Typist

As of beginning of April the following staff will be joining us.

Raymond Jones	-	Manager, Applied Programming
Geoffrey Shingles	-	Applications Engineer in field servicing
Alan Pyke	-	Business Assistant

c.c. J. Fadiman
S. Olsen
N. Mazzarese
W. Hindle
R. Lassen
H. Anderson

Harlan Anderson

Memo To: All Concerned

From: Ted Johnson

SUBJECT: IEEE Show

Date: March 15, 1965

1. Dates and Locations — 22 - 25 March 1965
New York Coliseum and New York Hilton Hotel

2. Hotel Accomodations — Rooms have been reserved at the Plaza Hotel. The attached chart gives your room assignments and dates of stay. The Plaza has a copy of this chart and will assign room numbers upon arrival. Please let me know if you desire to make any changes so that best use can be made of these rooms.

3. Suite — A suite has been reserved for the 4 days of the show for interviewing purposes. Please note that Bob Lassen and Jim Hastings have exclusive use of it on Tuesday and Wednesday.

4. Show Registration Cards — Your registration card is attached to this memo. If you are assigned booth duty, make sure you receive your exhibitor's badges when checking into The Coliseum.

5. Booth Assignments — Booth numbers 3927 - 28 - 29 (30 ft.)

6. Trade Show Hours

Monday	-	9:30 a.m. - 9:00 p.m.
Tuesday	-	9:30 a.m. - 6:00 p.m.
Wednesday	-	9:30 a.m. - 6:00 p.m.
Thursday	-	9:30 a.m. - 9:00 p.m.

6. Booth Duty — A team of five men have been assigned booth duty for Module Sales:

Fred Gould
Dave Denniston
John Jorgensen
Dick Kennedy
Stan Olsen

Stan Olsen is the team captain and any time away from the booth during show hours should be arranged with him. It is expected that all five of these men will be on duty between the hours of 11:00 a.m. and 1:00 p.m. each day and at least two men at any other time.

Nick Mazzarese is team captain for Computer Sales. Booth personnel are:

Nick Mazzarese
Jim Burley
Rod Beldon
Howie Painter (two days)
Ray Lindsay (two days)

At least two Computer Sales Personnel must be on duty at any given time.

Mel Arsenault will be travelling with the PDP-8's to the show and will be responsible for installation and maintenance during the show.

Ed de Castro will be on hand Sunday night and Monday.

Dick Best, Ken Olsen and myself will be on hand for support during the show. I plan to spend my time between interviewing and booth duty. Dick has volunteered to spend as much time at booth duty as is required. Please contact me on any questions you might have.

7. Travel Arrangements — It will be up to each individual to make his own travel arrangements for the show.

8. A Reminder — IEEE rules implicitly state that no recruiting shall take place in the booth. This means no job offers, employment offers or discussion, or even the distribution in the booth of employment literature.

TJ/mr

Attachments

IEEE Show. 1965

Room Assignments

Plaza Hotel
5th Ave & 59th St. N.Y.C.
AC 212 – PL-9-3000

All twin rooms have double occupancy. (2 Twin beds)

Date (Night of)	Suite Twin Room #	Suite Twin Room #	Suite Parlor	Twin Room #	Twin Room #	Twin Room #	Twin Room #	Twin Room #	Twin Room #
19 March Friday									M. Arsenault
20 March Saturday									M. Arsenault
21 March Sunday	S. Olsen T. Johnson	N. Mazzarese E. DeCastro		Mr. & Mrs. K. Olsen	D. Denniston J. Jorgenson	F. Gould R. Kennedy	J. Burley H. Painter	R. Belden	M. Arsenault
22 March Monday	S. Olsen T. Johnson	N. Mazzarese R. Best		Mr. & Mrs K. Olsen	R. Lassen J. Hastings	F. Gould R. Kennedy	J. Burley H. Painter	R. Belden	M. Arsenault
23 March Tuesday	S. Olsen T. Johnson	N. Mazzarese R. Best	Reserved for Recruiting	Mr. & Mrs K. Olsen	R. Lassen J. Hastings	F. Gould R. Kennedy	J. Burley R. Lindsay	Ed Harwood	M. Arsenault
24 March Wednesday	S. Olsen T. Johnson	N. Mazzarese R. Best	Reserved for Recruiting	Mr. & Mrs K. Olsen	D. Denniston J. Jorgenson	F. Gould R. Kennedy	J. Burley R. Lindsay		M. Arsenault
25 March Thursday									

H. Anderson

dec INTEROFFICE MEMORANDUM

DATE March 15, 1965

SUBJECT NOTES ON MARCH 9 CONFERENCE REPORT

TO Tom Howard, Rumrill
Rip Todd, Rumrill
CR Distribution List, DEC

FROM Jack Atwood

Your conference report on the March 9 meeting at Maynard was an extremely accurate and helpful record of the key points covered in a day of wide-ranging conversations. It provides an up-to-the-minute situation report on both our current undertakings and our plans for the immediate future. We appreciate the effort you put into it.

I have just a few comments which I would like to record to ensure that we are agreed on certain details.

Your Item 2. We had assumed in making our space schedule revisions that the April 9 mentioned in Rita Venn's listing was the issue date for the April educator's issue of TIME - not the closing date for May. We had hoped to make two issues before the summer hiatus. Is this not possible?

Your Item 3. I believe the New York Times IFIP Supplement ad should not attempt to relate computers and automation to the nation's economy. This is a task for the editorial portion of the supplement, and whatever we might choose to say on the subject would certainly have been said many times before.

Our objective in this ad must be to establish - or start to establish - our identity as an organization which works closely and productively with researchers and educators in developing products to serve their needs. I think the theme should be the one we discussed - that from its very beginning DEC has concerned itself with simplifying man-machine relationships to facilitate scientific research and expand academic frontiers. Our constant objective, from the days of the original modules with graphic front panels to our current efforts in the area of automated design, has been to devise powerful equipment which puts the user in ever easier and more intimate control of ever greater and more versatile computing capability.

Your Item 4. The LINC ad could not be revised in time for the first quarter issue of AMERICAN JOURNAL OF MEDICAL ELECTRONICS. In the second quarter issue, which is published in June, we may decide to use the "full-line" biomedical ad RMC-1.

Your Item 6. We were able to negotiate with ELECTRONIC NEWS for a 5-column by 56-line space for the special IEEE ad RMC-2 instead of a 116-line (half-page) unit. We also arranged for the IEEE recruiting ad RR-1 to be placed directly over RMC-2 in Cols. 1 and 2 opposite the full-page PDP-8 ad RC-1A.

J. L. A.

fd

CONFERENCE REPORT

PRESENT FOR CLIENT

Mr. J. L. Atwood
Mr. S. Grover
Mr. A. Kluchman
Mr. J. Jones

PRESENT FOR AGENCY

Mr. R.V.W. Todd

CLIENT Digital Equipment Corp.

DATE March 15, 1965

PLACE Maynard, Mass.

SUBJECT

ROUTE TO

D.B. Miller
J.E. Rodwell
W. Mostad
C.J. Raines
R. Venn
G.M. Papazian
P.S. Monti
N. Lamb
R. Piera

NOTES

1. RM3, the module ad stressing CEM advantages is scheduled to appear in the May issues of Electro-Technology and Electronic Products. In the tabloid page size it is scheduled to appear in Electronic News, May 17.

   Information for preparing this ad is at the agency.

2. Agency is to prepare a layout of a new ad announcing the fact that "Flip Chip" modules are unconditionally guaranteed for 10 years. Copy was supplied. This ad (RM7) is to appear in the April issue of Computer Design, if possible, and in tabloid page size (as RM7A) in the April 12 issue of Electronic News. Agency is to mail the layout to Mr. Atwood on March 16.

3. Agency is to insert module ad RM1 (7288-5-0001: "Modules like this...") in the April issue of Electromechanical Design.

4. Agency is to send order for insertion of PHA ad RCCO ("On-line multiparameter laboratory systems...") in the April issue of Physics Today. Proof was supplied. Plate - with a patch showing the PDP-8 in place of the computer presently shown in the ad - will be shipped by DEC.

5. Agency is to send order for insertion of a 1/3 pg. bw recruiting ad (RR2) in the April issue of Datamation. This is in addition to the ad already inserted. DEC is sending plate.

6. Agency is to insert recruiting ad RR1 (112 lines on 2 columns) in the March 22nd issue of Electronic News and IEEE ad RMC2 (56 lines on 5 columns) in the March 22nd and 24th issues of Electronic News. Plates are being shipped from Maynard.

7. Ad 7288-5-0007 ("The PDP-8 is a powerful,integrated-circuit computer") in 1-page bw form is scheduled in the April issue of Technology Review.

8. Subjects for the biomedical applications ad (RMC1) scheduled for the May 21 issue of Science are: LINC, PDP-8, PDP-7, and "Flip Chip" modules.

9. Module ad on systems design (RM4) is scheduled for insertion in May issues of Computer Design and Electronics. This is based on the "Jones application" ad (RM2), which has been cancelled. DEC is reworking the ad.

10. DEC is developing material for an ad on the PDP-7 in process control (RC4) for insertion in the April issue of Instruments & Control Systems.

11. Agency is to prepare the special ad to appear in the IFIP (International Federation of Information Processors) Supplement in The New York Times in May. The subject of the ad will be DEC's consistent efforts to simplify man-computer relationships, to put the user into a closer and easier control relationship with the machine.

12. Agency will send copy and layout for the one-page ad on software (RC6) to DEC on March 16.

13. An ad on the PDP-7 computer (ad RC9) is scheduled to appear in the May issue of Computers & Automation. DEC will supply photos of the machine to the agency.

14. Ad RC10, on the PDP-6 computer, is scheduled to run in the May issues of Nucleonics and International Science & Technology.

15. Ad RC3, on oceanographic applications, (7288-5-0018) is scheduled to run in the May issue of Undersea Technology. Copy and layout were left in Maynard for approval.

16. Ad RC5, a general ad on the PDP-6 computer, is scheduled to appear in Datamation, May.

17. Agency is to prepare an ad on the new Digital Laboratory System. This is not yet scheduled.

18. Agency will attempt to place an ad in the April 9 issue of Time magazine (Educators Edition). This may be a one-page bw ad on the PDP-8 (7288-5-0002). Mr. Todd rewrote headline and copy for this "educators' version."

19. Ad RM4, on systems design with Flip Chip modules, is scheduled to run in Computer Design in May. DEC is preparing copy by reworking RM2 (7288-5-0008).

20. Reprints of the Scientific American spread (7288-5-0002) on the PDP-8 are being supplied to DEC by the magazine so no reprints are needed from the agency.

SPACE ADVERTISING STATUS REPORT

March 15, 1965

(R= Rumrill; M= Modules; C= Computers; R= Recruiting)

Ad	Subject	First Insertion	Status
RM-1	Module Prices		Completed
RM-2	Jones' Application		Cancelled
RM-3	OEM Advantages	May Electro-Technology	Rumrill writing
RM-4	Systems Design	May Computer Design	DEC reworking
RM-5	Module Catalog		Completed
RM-6	Digital Lab System		
RM-7	Module Warranty	Apr. Computer Design	Rumrill preparing
RM-7A	Oversize RM-7	Apr. 12 Electronic News	Rumrill preparing
RMC-1	Biomedical Ad	May 21 Science	Rumrill writing
RMC-2	Special IEEE Ad		Completed
RMC-3	Special IFIP Ad	May New York Times	Rumrill writing
RC-0	LINC		Completed
RC-00	Pulse Height Analysis		Completed
RC-1	PDP-8 Specifications		Completed
RC-1A	Oversize Single Page RC-1		Completed
RC-1B	Single Page RC-1	Apr. Technology Review	Rumrill reworking
RC-2	PDP-8 Scientific		Completed
RC-3	Oceanography	May Undersea Technology	Rumrill writing
RC-4	Process Control	Apr. Control Engineering	DEC writing
RC-5	PDP-6 General	Apr. TIME	Rumrill writing
RC-6	Software	Apr. Comms. of ACM	Rumrill writing
RC-7	LINC		Completed
RC-8	Pulse Height Analysis		Rumrill to do
RC-9	PDP-7	May Computers & Automation	Rumrill to do
RC-10	PDP-6 Scientific	May Intl. Science & Tech.	Rumrill to do
RR-1	Staff Positions		Completed
RR-2	Staff Positions	Apr. Datamation	DEC writing

INTEROFFICE MEMORANDUM

DATE March 16, 1965

SUBJECT Review of Salaried Employees

TO Harlan Anderson

FROM Win Hindle

Attached are evaluation forms for salaried employees who should be reviewed now. Most of these men joined DEC between September 1 and December 31, 1964, and consequently were not reviewed for a January salary increase. A few are included who started before September 1, 1964, and we agreed to review them again in the Spring.

To supplement the numerical rating, it is very helpful to have additional remarks in the "Comment" section.

We want to do this review quickly, so I would appreciate your getting the forms back to me by Monday, March 22.

→ [redacted] – 1 June.

~~Chief Finan~~ –

a.) One of patrolman – 6 years.

Kenneth. Hiscoe | patrolman

Concord

Start at bottom.

INTEROFFICE MEMORANDUM

DATE March 16, 1965

SUBJECT MIT-LNS

TO
H. Anderson
G. Bell
L. Portner

FROM R. Lane

I visited MIT-LNS to discuss further the visit by George Michael of LRL. Dr. Pless is inviting Sam Mendiceno to Cambridge (and is paying his transportation out) to draft a specification for a SAMTRAN operating system for the PDP-6. He then hopes DEC will finance the costs of adapting the compiler and preparing the operating system.

He invited us to participate in the preparation of the specifications by sending a programmer type to the working session. (No exact date has been set.)

I have encouraged Dr. Pless in his pursuit of FORTRAN IV via SAMTRAN. I recommend we invite Sam to DEC to negotiate with him if we are interested.

Action to be taken immediately

(1) Are we interested?
(2) If so, we tell Irwin.
(3) Determine who participates in the preparation of the Specifications.
(4) Negotiate with Sam.

CC: R. Beckman
D. Packer
R. Savell

dec INTEROFFICE MEMORANDUM

DATE March 16, 1965

SUBJECT Literature for IEEE Show

TO Stan Olsen
Nick Mazzarese
Harlan Anderson ✓

FROM Ted Johnson

The attached list is Technical Publications' plan for literature (types, quantities) for the IEEE Show. Please check over to see if you agree on the mix.

TJ/mr

Attachment

SEN
3/15/65

IEEE Show material

			qty
Reply handler (tech bulletin)	D-22		2500
Digital Laboratory System ~~Logic Trainer Spec~~	(8½)	NEW	5000
PDP-8 Brochure	(F-81)	NEW	5000
PDP-7 Brochure	(F-71)	(sent 500)	2500
PDP-6 Brochure	(F-61)		1000
PDP-8 Handbook	(F-85)		250
PDP-7 Handbook	(F-75P)	in for reprint	50
PDP-6 Handbook	(F-65)		50
A-D Handbook	(E-5100)		500
CRT 340 Display.	(F-13-340)		100
System Module cat.	(C-100)		250
Flip Chip cat	(C-105)	(will be shipped direct from printers)	25000
Lab Module cat	(B-100)		250

~~Incremental Display~~

INTEROFFICE MEMORANDUM

DATE March 16, 1965

SUBJECT

TO R. Beckman
cc: H. Anderson ✓
R. Savell
D. Chin

FROM D. Kuyamjian

I have entered a verbal order with VRC for the 20" diameter drum (with full capacity) as you requested.

We must give them a formal release within four weeks (April 9). Our liability does not go beyond the terms of the original contract for the basic drums. I have told VRC that this drum must meet performance specifications which will be determined by tests performed on the Adams drum we presently have. We most definitely should write these specs into the release when we commit ourselves to this drum.

Delivery is set twelve weeks from the verbal release - June 4, 1965.

March 16, 1965

ARGONNE NATIONAL LABORATORY

Nick Mazzarese

Tom Quinn

CC: Harlan Anderson
Ted Johnson

The contract for Don Hodge's PDP-7 is now being written. He would like to put a clause in to the effect that should the Applied Mathematics Division order a PDP-6 within 12 months after delivery of the PDP-7, that he could apply some of the purchase price of the PDP-7 as equity toward the PDP-6. As agreed in our conversation, I will allow this clause with the provision that the amount of equity available will be calculated based upon the purchase price of $66,500 less 1/30th ($2200) of $66,500 times the number of months he has had the PDP-7 in operation. The formula then is:

$$\$66{,}500 - \frac{\$66{,}500\ N}{30}$$

Where N= Number of months in service.

TPQ:mb

dec INTEROFFICE MEMORANDUM

DATE March 16, 1965

SUBJECT STATUS REPORT ON TERMI-POINTS

TO H. Anderson
S. Olsen
N. Mazzarese
W. Hindle

FROM Klaus Doering

I. During the past 2-3 weeks we have had difficulties of such magnitude with Termi-Points that they might seriously affect the output of PDP-7's and PDP-8's.

The manufacturer, AMP Inc., specifies that in order to have a reliable, working connection a pull force of min. 3 lbs. must not remove the Termi-Point from its terminal. The PDP-7 for New York University had failures in the order of 50% and up. There are approximately 800 Termi-Points on a PDP-7. In most of the cases it took less than 1 pound to remove the Termi-Point. Another PDP-7 had approximately 25% failures.

An independent experiment using 6 different tools and 4 different operators confirmed these figures: 305 failures out of 605 connections. No operator or tool contributed significantly to the rejects though there were higher rates on some.

The tools, besides producing unreliable and defective connections, though some defects may be operator contributable, are also expensive to maintain. For the 12 tools in our plant we have spent $669.00 on replacement parts, exclusive labor. The original cost per tool is $65.00.

As a short-run solution all Termi-Points on the systems mentioned above have been soldered. We will do likewise on all future systems using Termi-Points until a long-run solution to this problem has been worked out. R. Best has published a note in the Engineering News pertaining to this.

I understand that the Sales Department has distributed 25 Termi-Point tools to customers; 9 more are on order. We do not know at this time, whether these tools produce reliable, working connections, and whether the customer is satisfied with their performance.

We have discussed the problem with the field engineer from AMP Inc. He admitted that the Termi-Point project at AMP has not been fully engineered yet and that they are aware of the problems. His company guarantees only those Termi-Points put onto AMP connectors. He says they make their money on the connectors, not on Termi-Points. This way they also have control over the dimensions of the connector terminals. We pointed out that we would like to continue to use the handy and speedy Termi-Points and asked him to recommend to us the tolerances to be controlled on DEC's connector terminals. We are now awaiting his reply. It was also considered to discontinue the use of Termi-Points and use wire wrapping and in a few instances soldering, instead.

II. A second major problem facing us with Termi-Points is the fact that approximately 20% of all terminals receiving this connection are pushed out of the connector. Our experiment substantiated this as we found 26% of the 605 terminals pushed out.

As pointed out to the Mechanical Engineering Department 6 weeks ago this is because the force holding the connector terminal in place is 10 lbs. minimum (average approximately 13 lbs.) while the force pushing the Termi-Points onto the connector is between 10 and 15 lbs. The natural result is a collapse of a high percentage of terminals. The cost of repair seems substantial and the production rate should be slowed down.

Note: For further reference see section in Don Zereski's Field Service Report of 2-9-65 which reads as follows:

Bell Labs PDP-7-3

"The whole Bell Labs test set was termi-pointed. It seems that the termi-point connectors are really not the best type of connectors for inter-panel wiring. If the termi-point gun is not properly adjusted it will leave enough insulation on the wire to cause an intermittent connection. If the termi-point is cocked on the pin it will shake loose. If one uses an alligator clip to sync on a point the alligator clip might pull the termi-point off. I don't know what type of connector we could use but I don't think termi-point is the ultimate

connector. We are termi-pointing all the PDP-7 Memories."

cc: K. Olsen
R. Hughes
J. Smith
J. Shields
R. Best

KD/kmk

dec INTEROFFICE MEMORANDUM

DATE March 17, 1965

SUBJECT Calcomp Plotter - Interface to PDP-6.

TO
H. Anderson
G. Bell
R. Savell
R. Beckman
D. Smith
Sales Newsletter
A. Hall

FROM
R. Lane

There are two ways to interface the Calcomp plotter to the PDP-6 System - via the I/O Bus or via the 630 DCS.

Option Numbers and prices are as follows:

Via I/O Bus - Type 356-563 -		20,000.
	564 -	22,100.
	565 -	15,500.
	566 -	15,900.
Via DCS - Type 632G-563 -		16,000.
	564 -	18,100.
	565 -	11,500.
	566 -	11,900.

The numbers 563 through 566 describe the respective plotter.

563 - 29½", 12,000 steps/min., step .01"
564 - 29½", 18,000 steps/min., step .005"
565 - 11", 18,000 steps/min., step .01"
566 - 11", 18,000 steps/min., step .005"

INTEROFFICE MEMORANDUM

DATE March 17, 1965

SUBJECT

TO H. Anderson ✓
R. Lane
R. Savell
N. Mazzarese
J. Fadiman

FROM D. Kuyamjian

Attached is the delivery schedule for Anelex line printers. The printer for Washington State has been changed to a 600 lpm for Oxford. This machine will actually be supplied with a 750 rpm drum so that worst case printout will not fall below 600 lines per minute. Please advise if any changes should be made.

CONTRACT	RELEASES	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.
Anelex Corporation Series 5 Line Printer Qty: 10 Contract: 11-64/3-66 Dlvy.Cycle: 5 months	Release #1 - 10 units		#2 300 lpm 120 col 50 220V 15,500 BONN 15th	#3 300 lpm 120 col 50 220V 15,500 AACHEN 14th		#5 600 lpm 120 col 50 240V 17,975 OXFORD 15th	#6	#7	#8	#9	#10		
SPEED, INPUT REQUIREMENTS CHARACTER SET NUMBER OF COLUMNS CANNOT BE CHANGED AFTER THESE DATES WITHOUT CANCELLATION CHARGES AND/OR EXTENSION OF DELIVERY DATES. —— EQUIPMENT MAY BE CANCELLED PRIOR TO THIS DATE WITHOUT INCURRING CANCELLATION CHARGES / EQUIPMENT CANCELLED PRIOR TO THIS DATE MAY INCUR CHARGES FOR PARTS BUT NOT LABOR.				#1 300 lpm 120 col 60 115V 15,500 U. of TEXAS 14th		#4 300 lpm 120 col 60 115V 15,500 SPARE 15th							

15th 28th — 15th 14th 26th — 14th 15th 28th — 15th 15th 27th — 15th 13th 27th — 13th 15th 27th

NOTE: Unit #3 Character Drum to be supplied with ZERO (0) and letter (O) not slashed.

Signed by _____ Date _____
Anelex Corporation

Signed by _____ Date _____
Digital Equipment Corporation

March 17, 1965

PDP-6 System Checkout

R. Beckman
J. Sullivan
L. White
H. Anderson

Steve Mikulski

The following items should be planned on for use during final test.

1. 163C - 2μsec memory - Margins vary with speed. Faster memories not only exercise the circuits at twice the rate but provide shorter program execution times.

2. Line printer - Instruction test requires up to 25 minutes of printout per error. The bulk of time spent during checkout and margins is spent waiting for printouts.

3. 551/136/555 - To store all checkout programs. This provides a neat, quick method of reading in programs for margins and later checkout stages.

The above items, in addition to greatly improving checkout techniques, will also provide a "back-up" computer system available for programming.

The above items represent only 8% of the value of the systems in checkout at any time and only 4% of the equipment checked out in a single year.

SM:af

H. Anderson

dec INTEROFFICE MEMORANDUM

DATE 17 March 1965

SUBJECT 3M's Portable Projector

TO Ted Johnson FROM Dick Musson

Attached is a brochure on 3M's portable overhead projector, which I feel would be an excellent selling tool for presentations.

This approach is far more versatile than slide presentations because:

1) The lights are left on and it is possible to keep control of your audience.

2) Diagrams, additions, changes, etcetera, are extremely simple to make.

3) You can use the projector in the same method that you use a blackboard, as you are able to write, draw, etcetera, on the transparencies.

Probably the only drawback is the expense of having a photographed slide enlarged, but in the types of presentations we generally will make, the bulk of the transparencies will not be photographs but such things as block diagrams, code sheets, command structures, and module diagrams.

I feel that the $250.00 investment is well worthy of the results that could be obtained with this type of projector. Therefore, I am asking permission for the L.A. office to purchase one of these units. I believe that both the PDP-6 and modules could be presented to our prospects in an effective, professional manner.

Additionally, you may wish to investigate this for your own use. Would appreciate hearing from you in regard to this subject, as soon as possible.

Dick

cc: Gordon Bell
Harlan Anderson ✓
Bob Lane

CONFIDNETIAL:

dec INTEROFFICE MEMORANDUM

DATE 17th March, 1965.

SUBJECT

TO Jon Fadiman / Harlan Anderson FROM John Leng

Have read with interest the memo dated 11th March on the new German office. Cologne sounds an excellent place for the head office; in particular being so close to Reading and Paris, communications between us will be much easier.

In regard to the distribution of duties, Jim Milton and I feel that it would not be the best move to put Juergen on PDP-6 maintenance. We feel, based on our experience with him to date, that he is not best suited for this type of work but rather on some of the other jobs which he seems to do quite well.

Since all of our potential customers are going to be looking to the first PDP-6 in Europe, we are rather anxious to ensure that it gets off the ground quickly and gives very reliable service.

One other small comment in regard to Denmark, is that the way things are going at the present time I feel it would be better grouped with the rest of Scandinavia. We are seeing a fair bit of initiative from Telare at the present time and I feel that we should co-operate with them generally throughout Scandinavia as they are planning to extend their company into these other countries. We are looking for a maintenance/sales engineer at the present time, whom we would locate in Stockholm, and he would be best situated to handle Copenhagen. You will realize that in addition to the Stockholm sales, we have two other PDP-8 LOI's from Trondheim in Norway.

If we continue to build up our service organization as a unit in Scandinavia, following the sales, we will be in a better position to set up a company there when this becomes necessary.

I'm wondering how you feel generally about sales in Continental Europe. I haven't had any feedback from Munich directly so I don't have too accurate a picture. In view of the fact that you have been planning to move to Paris for some time I've decided against going over to Munich to encourage Gunther's efforts there. However, even though our expected volume there next year looks promising, I still feel there is something seriously wrong; especially if what I hear is true that we only have two PDP-8's on order on the continent.

Anyway we should be able to talk this over in more detail when you come over in a few weeks.

John

March 17, 1965

Handling of PDP-6 Follow-up

R. Beckman

Steve Mikulski

CC: R. Lane
J. Sullivan
R. Pate
H. Anderson

In my brief contact with PDP-6 Customers I have experienced the lack of follow-up work. This is primarily due to lack of documentation, knowledge of what is needed to build a system, and poor internal communication. The extent of the job requires nearly full time activities of someone to stay in "complete" contact with the customer during the construction phases of his equipment.

Rutgers University was just sent a "skimpy" package of program literature 2 weeks before the system is scheduled for shipment.

Everyone at DEC knows that there is more than one person who is the customer but fails to "go after" the users and purchase people, etc.

I have come up with a system which I feel will do three things:

1. Set up efficient internal communications

2. Contact everyone involved for follow-up

3. Free the salesman to persue prospects.

Briefly, a general information sheet (enclosed) is filled out for each customer (not prospect). Contact information is obtained by myself or someone cognizant of equipment layout, cabling, system limitations, training course content, etc. The initial contact sets up a direct "pipe line" to DEC and obtains vital, accurate information. A standard package will be mailed along with any requested information. Schedules will be generated, people assigned, floor space and power planned. Internal paper work can be initiated. (One of these internal forms is included as a sample.) All this data will be filed in a customer notebook located in R. Beckman's office.

Construction Request forms can be checked from the original sales request form and issued in a suitable form for issuance of a CR.

With the load spread over a few people, contact can be maintained on a regular schedule sending progress reports and news tid-bits of information. Acceptance tests can be agreed on early in the game along with any special shipping arrangements, etc.

To date there is too much work for one person to do and rather than panicing we should work together more efficiently and not overlook many of the small but significant points of getting a system working at the final site.

SM:af
Enc.

PDP-6 GENERAL INFORMATION SHEET

ROUTING

	date	init
SECA		
ADAST		
SECB		
ADAST		
SECB		

Inst. code ☐

Customer _____

Address _____

_____

Purchasing Agent _____ Phone _____

Actual Customer _____ Phone _____

Initial Customer Contact Date _____ by _____

item

1 ☐ Floor Plan

2 ☐ Address Confirmed

3 ☐ Customer requests

_____

Programmer _____

_____

Maint. Man _____

_____

_____

4 ☐ Standard Package mailed to actual cust (checkoff below)

5 ☐ All drawings completed

6 ☐ PERT schedule generated

Additional Information

☐ Manuals

☐ Sales Literature

☐ Class Information

☐ Acceptance Book

☐ Other

_____

_____

8Mar65

inst. code

SYSTEM COVER SHEET

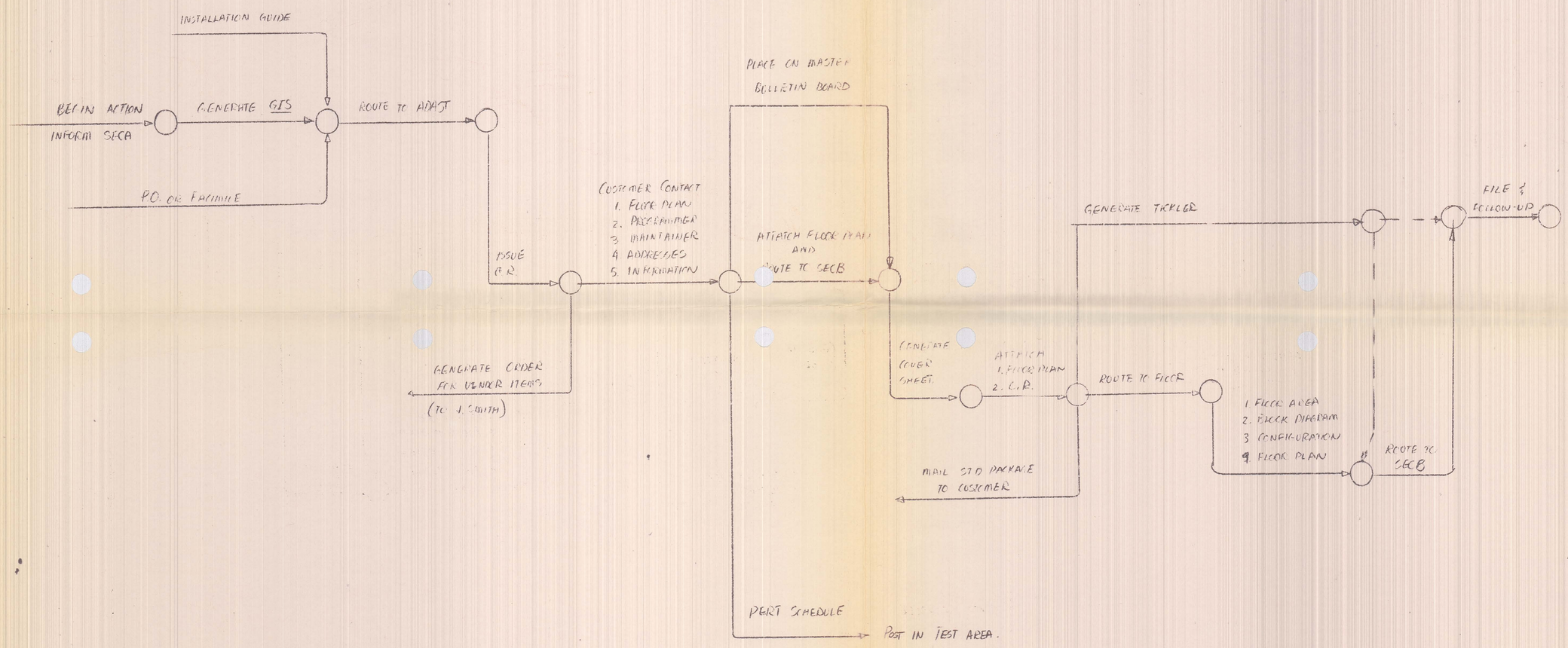
PDP-6

Customer _____

Processor Serial no. _____ System serial no. _____

item		
1	☐	Floor area assigned.
2	☐	System Block Diagram.
3	☐	System Component Configuration.
4	☐	Floor Plan.
		Cables
5	☐	IO Bus
6	☐	Memory Bus
7	☐	Other _____

Attach copies of Items 2,3,4, and route to SECB.



PDP-6
INITIAL ACTION METHOD.
10 MAR 65 SJM

dec INTEROFFICE MEMORANDUM

DATE March 18, 1965

SUBJECT Yale PEPR Controller

TO
Dick Best
John Jones
Alan Titcomb
Bob Savell
Harlan Anderson
Ken Olsen

FROM R. L. Lane

I have received a set of specifications for the Yale PEPR Controller. If you would like to see them, please contact me as I am holding them until Alan Titcomb returns from Germany. He received an informal copy earlier and is preparing the specifications and quote.

We will schedule a review session about April 12 as the due date is April 15, 1965.

INTEROFFICE MEMORANDUM

DATE March 19, 1965

SUBJECT Acceptance Test for Type 270 Disc File

TO S. Lambert

FROM R. E. Savell

CC: J. McKalip
B. Beckman
S. Mikulski
H. Anderson
G. Bell

Please provide me with a detailed write-up of the tests to be performed on the Disc File system by March 26th at the latest. This should not consist of a simple description of what Gossel's test do, but should also indicate what other items will be tested, such as that the write lock-out switches for each disc work, that the data transfer rate is within acceptable limits, that we have tested all the possible error conditions that we can simulate, measured access times, etc. Please also state what procedure will be followed in the event that read errors, write errors, or other malfunctions occur and how many will be allowed.

RES:hf

INTEROFFICE MEMORANDUM

DATE March 19, 1965

SUBJECT

TO K. Olsen, H. Anderson, G. Bell, R. Lane, P. Harris, R. Savell, B. Scudney, N. Hirst, R. Beckman, N. Mazzarese, J. Burley, R. Belden, R. Buyer, E. Harwood, R. L. Best, J. McKalip, R. Melanson, R. Dill, B. Garvin, E. Simeone, L. Boucher FROM Arthur Hall

Because the 3-digit number series is nearly exhausted in one category of option numbers the next issue of the OPTION LIST will have the options grouped differently. Option numbers from that date on will be a 4-character expression with two alphabetic characters followed by two numerals. The first alpha character will denote the category into which the equipment falls. The remaining 3 characters will be assigned serially (the letters G, I, O, Q and Z will be omitted). No present numbers will be changed (except at the request of the person responsible for the designated equipment).

1st Letter	Category	Description
A	Analog-Digital-Analog	
C	Card Equipment	Card readers, punches, their controls and associated equipment.
D	Data Handling Equipment	Data channels, multiplexers, duplexers, data communication systems, IO Processors, etc.
K	Internal Computer Options	Multipliers, clocks, etc.
L	Line Printing Equipment	Line printers, typewriters, Teleprinters.
M	Memories	Static memories; core, flip-flop, etc. and their controls and options.
P	Paper Tape Equipment	Paper tape readers, punches, spoolers, etc. and their controls and accessory equipment.
R	Rotating Memory Files	Drums and discs and their controls and options.
T	Magnetic Tape Equipment	Tape Transports, controls and special interfaces.
V	Visual Readout Equipment	CRT and other displays, light pens, controls and associated auxiliary devices.
X	X-Y Plotters	Plotters and their controls.

AH/mro

INTEROFFICE MEMORANDUM

DATE March 19, 1965

SUBJECT

TO S. Lambert

FROM R. E. Savell

CC: J. McKalip
R. Beckman
H. Anderson
G. Bell
D. Adams

It is extremely important, due to the lateness of the entire Adams PDP-6 system including the Disfile System and due to Adams commitments to their customers, that every effort be made to get the Discfile installed by April 1. Work should continue on a two shift basis on the check-out of the control and the testing of the entire system if it can possibly be arranged.

Since it is quite likely that the disc will be operational before the drum, Adams is slanting their system programs this way. They can get by with the disc and 64K of core if the drum is not available. 48K will be provided to them immediately, with the last 16K to be provided by Bob Beckman on April 15 if the drum is not ready.

RES/mro

Andy

digital MEMO

DATE 3-19-65

TO BOB LANE

FROM KEN LARSEN
PALO ALTO OFFICE

SUBJECT; AEROJET-GENERAL CORPORATION, SACRAMENTO
Ted Winkel's letter of 15 March 1965

What would you think of hiring a consultant to "examine their needs". It might be possible to hire a company called "Trans-Data of Sacramento, on a Fee + Bonus If Sold basis..

KL

✓ Andy: I said we would not be interested unless a 3 year guarantee rental is included thru a 3rd party

GE-17

25-10 / 63

INTEROFFICE MEMORANDUM

DATE March 22, 1965

SUBJECT

TO H. Anderson ✓
R. Savell
B. Scudney
A. Kotok
D. Chin
A. Titcomb
N. Mazzarese
R. Wilson
L. Seligman
R. Sogge
R. L. Best

FROM Arthur Hall

The persons who were in Engineering but who have been transferred into one of the new Product Line groups are presently charging their overhead time and materials to G-24, the Engineering overhead number.

Dick Mills stated today that overhead numbers for Large Computer, Small Computer, Special Projects and Module Product Line groups will be available for the use of these groups on Monday the 29th of March.

From the 29th of this month on, G-24 should be used only by members of the Engineering group.

AH/mro

INTEROFFICE MEMORANDUM

DATE March 22, 1965

SUBJECT

TO H. Anderson

FROM D. Kuyamjian

IBM has quoted six months delivery on their 1311 Disc Files with a good chance of improving delivery. Pricing is:

1311 Mod I	-	$17,610.00	- first drive on a system
1311 Mod II	-	$15,510.00	- additional drives
1311 Mod III	-	$28,760.00	- first drive for use with a 1620 or 1710
1311 Mod IV	-	$41,360.00	- first drive for use with a 1401
1311 Mod V	-	$46,010.00	- first drive for use with a 1410, 7010, or 7740

COMPANY CONFIDENTIAL

dec INTEROFFICE MEMORANDUM

DATE March 23, 1965

SUBJECT Personnel Requirements

TO H. Anderson

FROM R. E. Savell

CC: G. Bell

I have asked Jim Hastings to search for a number of engineers. The reason for my requests are contained further on in the memo.

* One good experienced circuit engineer (as a replacement)
  One good less experienced circuit engineer
* Two peripheral equipment engineers
  One engineer for special engineering
  One good logic and systems engineer
* One of each of these in needed immediately to help relieve the load on A. Kotok and me. I cannot possibly do an adequate job of managing the hardware development without additional help.

CIRCUIT ENGINEERS

I assume that in the future we will have to design all the special modules as well as half of the new product line modules needed for large computers, and that we will have to debug some of the existing product line modules. This assumption was borne out by the Guidance Committee Meeting of March 17. As a minimum then, I believe we need one very good experienced circuit engineer and one very good somewhat less experienced engineer. Since it is quite certain that Burt Scudney will be leaving the company within a short time I have asked Jim Hastings to immediately search for two engineers as described.

PERIPHERAL EQUIPMENT ENGINEERS

Peripheral equipment problems are two:

1. To design some of the new devices that keep cropping up from time to time.
2. To maintain continuing responsibility for those devices designed both within and outside the group for which no one else maintains continuing responsibility. The only devices presently assigned on a continuing basis outside the group are Mag tape, Core Memory, and 630 Systems.

I believe the best way to handle these problems is to obtain people who will both design new devices and will be assigned responsibility for some of the old ones, for I think it would be difficult to get any competent people who would be satisfied for very long with only the job of continuing responsibility for old devices.

Immediate new project possibilities are:

1. The new Fast Memory
2. 1311 Discfile Interface
3. NCR 100 Card Per Minute Card Reader
4. New High Speed Card Reader and Card Punch
5. Modification involved in converting to Solid State DECtape
6. FLIP CHIP IO for present PDP-6 and future 168.

Bob Reed, who has worked on DECtape and the 167, can hold down the continuing responsibility for the present. He would like, however, to go back to work for Ed Harwood and my opinion is that he should be allowed to do so when we can obtain a replacement for him. My recommendation, considering the number of projects listed, is two engineers and I have requested Jim Hastings to search for them.

SPECIAL ENGINEERING

Since Alan Titcomb will apparently be tied up fulltime on physics applications, it seems apparent that we will need one other engineer to handle quotes for special devices for other than physics customers. I have requested Jim Hastings to search for an engineer for this position.

COMPUTER SYSTEMS ENGINEERS

We have at present only one, Alan Kotok, who is potentially available for large periods of time to work on new processors or systems. Certainly if Gordon is going to remain doing more general overall programming and systems work I believe we need at least one more good person in this area. This will certainly be true when we begin to work on the 168, and I feel we should begin to look now for the person we will need.

I have requested Jim Hastings to search for an engineer to fill this position.

TECHNICIAN NEEDS

Technician needs are summarized below:

** Two replacements for J. Stenberg and D. Adams
One replacement for Paul Scriven
Two technicians for peripheral equipment
* Two technicians for computer systems
* One technician to assist me
* One of each needed immediately

PERIPHERAL EQUIPMENT

Replacements for Dave Adams and Jan Stenberg whom I would like to have go to PDP-6 Checkout temporarily. Jan is presently working on the JOSS Console Model and providing we get the JOSS job someone will need to carry through on the problems of building 30.

Dave Adams is presently working on the Discfile on loan to Jim McKalip. We will use the replacement for Dave on some of the new peripheral work.

A replacement is needed for Paul Scriven who is on loan to us from Ed Harwood. After the first drum is delivered to Adams there will still be a number of details remaining to be cleaned up so that the drum will not be a fully acceptable production item until the second one has been produced.

Considering the fact that we will have at least two engineers working on peripheral equipment we will need between one and three technicians in addition to the replacement for Dave Adams.

CIRCUIT DESIGN

In the area of circuit design, I anticipate no technicians at present since the technician work in this area is generally done by George Gerelds' people.

SPECIAL ENGINEERING

The two engineers doing special engineering will certainly need one technician apiece as a starter. This may possibly increase to two apiece depending upon the work load.

COMPUTER SYSTEMS

I am assuming the Bill Colburn will become available some time within the next month or two after the first drum is completed but I estimate we will need one other person in this area as well.

I can use one technician to help me on my numerous loose ends.

RES/mro

CONFERENCE REPORT

PRESENT FOR CLIENT

Mr. J.L. Atwood
Mr. S. Grover
Mr. J. Nangle
Mr. J. Lozouski
Mr. A. Stephens
Mr. D. Watson

PRESENT FOR AGENCY

Mr. S. Ansell
Mr. T. Howard
Mr. B. Godfrey
Mr. D. Moffitt
Mr. R. Piera
Mr. R. Todd

CLIENT Digital Equipment Corp.

DATE March 23, 1965

PLACE New York City

SUBJECT

ROUTE TO

D.B.Miller
T.P.Howard
J.E.Rodwell
W.Mostad
C.J.Raines
R.Venn
G.M.Papazian
P.S.Monti
N.Lamb
R.Piera

NOTES

1. Public Relations Department personnel and Digital Equipment representatives discussed the proposed external house organ. It is anticipated that this would ~~will~~ be similar in approach to ~~Kodak's "International Review" and will be a quarterly~~ DEC's "Pulse" and would be a quarterly.

2. Rough tissue layouts on a proposed module campaign were shown and discussed. The basic campaign idea was to stress the design and production economies, in both time and money, made possible by module and most especially by Digital's "Flip Chip" modules. The advertising will be tied in with a "show me kit" which would consist of relevant literature and the Digital laboratory system which the salesmen can take along to make demonstrations to prospects. It is felt by the agency that this would be a powerful door-opener for Digital salemen, and by virtue of this, supported by the advertising, an excellent salesman's incentive.

3. However, two other approaches were suggested by the client. One campaign approach would attempt to build assurance in the minds of prospects that "Flip Chip" modules can be safely relied upon in all respects. Ad subjects can be as follows:

   The extremely modern and automated production line (which demonstrates Digital's production capability), the fact that Digital stocks and stocks in depth; the fact that Digital offers errorless quality assurance because all Flip Chip are completely and carefully tested by computer, the fact that all Digital sales engineers are fully qualified applications engineers, and the fact that Digital is committed to optimum design not to monolithic circuits or any other type of consideration.

The other approach suggested was competing directly against the current industry fad, monolithic circuits. It was suggested that the basic approach could take the tack of "If you can afford the space occupied by these modules, you get these advantages." The advantages being those of easy desi gn, quality and performance assurance.

The agency will develop a new campaign. Mr. Todd will discuss the marketing value of the different approaches proposed on Monday, March 29 in Maynard.

4. A general ad on the PDP-6 computer (ad #7288-5-0023) was presented. At this time there is some uncertainty as to what specific markets the PDP-6 should be advertised to, particularly in question was the educational and/or educational computing center market for which this ad was in part intended (the Educators Edition of Time Magazine).

   Mr. Todd will discuss this with Harlan Anderson in Maynard on March 29.

5. Digital would like to run a continuing series, one every month, of 1/3p ads on the different peripheral products which they offer. These would include the light pen, racks and other products.

6. Mr. Todd will look into the possibility of "borrowing" Al Wilson from the agency's Rocherster office to spend a day or two in Maynard photographing Digital's facilities and products.

7. It was decided to leave the company's logotype unchanged at this time.

dec INTEROFFICE MEMORANDUM

DATE March 24, 1965

SUBJECT The Brookhaven PDP-6

TO H. Anderson
G. Bell
R. Beckman
R. Savell
L. Portner

FROM Clark Frazier

The central processor of the Brookhaven PDP-6 has not been sufficiently reliable to make a favorable impression on users. There are known module design problems, which could account for many of the machine reliability problems and even a few software reliability problems at Brookhaven. It may be difficult to successfully complete the one-hundred hour software acceptance test until the required design changes have been made.

CF:blk
copy to K. Olsen
J. Shields
R. Clements

INTEROFFICE MEMORANDUM

DATE March 24, 1965

SUBJECT The Brookhaven PDP-6

TO H. Anderson
G. Bell
R. Beckman
R. Savell
L. Portner

FROM Clark Frazier

The central processor of the Brookhaven PDP-6 has not been sufficiently reliable to make a favorable impression on users. There are known module design problems, which could account for many of the machine reliability problems and even a few software reliability problems at Brookhaven. It may be difficult to successfully complete the one-hundred hour software acceptance test until the required design changes have been made.

CF:blk
copy to K. Olsen
J. Shields
R. Clements

dec INTEROFFICE MEMORANDUM

DATE March 24, 1965

SUBJECT Immediate PDP-6 Problems

TO H. Anderson

FROM R. E. Savell

CC: G. Bell

My most immediate pressing problem is, as usual, one of time. On a continuing basis I estimate that my time is spent as follows:

4 hours per week	Meetings, such as Large Computer Guidance Committee.
2 hours per week	Circuit problems on the 166
2 hours per week	General company problems such as drafting standards, personnel problems, etc.
8 hours per week	Supervisory duties on the various PDP-6 projects such as Drum and Discfile. (This should be increased if possible).
8 hours per week	Miscellaneous problems arising on PDP-6 and its various items of peripheral equipment.
24 hours per week --- Total	

Projects that must be done as soon as possible:

Reorganization plans	16 hours
Complete status check on the entire PDP-6 Engineering Program	24 hours
Design review of 167, 236, 237, and 270	120 hours
Design review JOSS	24 hours
Draw up standards for flow diagrams	3 hours
Proposal to redesign the 162	16 hours
Complete formulation of design review procedures and engineering procedures	16 hours
Loose ends on 162 Fast Memory Circuit Boards	8 hours
Review redesigned 163 Logic	16 hours
Complete a solution to speed up the 2 Microsecond Memory access time	16 hours
Read Chapters 2, 3, and 4 of the Maintenance Manual	8 hours
Complete the parity option design and debug	16 hours
Complete power failure detection circuit tests at Adams	16 hours
Analyze cycle time measurement on Arithmetic Processor and attempt to work out solutions for any problems	24 hours

TOTAL --- Approximately 323 hours or about 8 weeks at 40 hours a week.

At the moment I see no one except Alan Kotok and myself available to do these jobs and I feel I will only be able to contribute half time while Alan, I believe, will be able to contribute about 80% of his time. Based on this assumption we have approximately 6 weeks of work, at present, that can be scheduled out ahead of us. Since I am sure that during this 6 week period there will be other items that will come up which we do not now foresee which will occupy significant time in addition to the two trade shows that are planned, I would estimate the actual calendar time to accomplish these jobs is more likely to be at least 9 or 10 weeks rather than 6 weeks.

RES/mro

dec INTEROFFICE MEMORANDUM

DATE March 24, 1965

SUBJECT NASA - Huntsville

TO Don Henderson

FROM R. Lane

I am sending the proposal to Huntsville in response to the first R.F.Q. The final price is about $702,000 and includes:

1 - Processor
2 - 2μsec, 16K core memories
1 - Fast Memory
1 - Tape Control
1 - Data Control
4 - 570 Tape Units
2 - DEC Tape Units
1 - DEC Tape Control
1 - Line Printer (1000 lpm, 132 col.)
1 - Card Reader (800 cpm)
1 - Card Punch (100 cpm)

Total Price $702,000

We will be very high because of the amount of peripheral equipment involved. I could have cut corners by no fast memory and Type 50 Tape Units rather than 570.

I have no feeling one way or the other if this configuration is satisfactory or not. I am lacking certain pre-proposal intelligence data which can only be obtained by a visit or from you. Let's go see them ASAP on the replacement for the ASI 2100. Proposals for those are due 4-5-65. They sure don't give you much time do they!

Please advise me if a suitable meeting can be arranged and when. I am planning to be in New Mexico on Wednesday night, March 31, 1965.

My home phone is: 617 - 443-8089 (for future reference)

CC: G. Bell
H. Anderson

dec INTEROFFICE MEMORANDUM

COMPANY CONFIDENTIAL

DATE March 25, 1965

SUBJECT

TO H Anderson

FROM J McKalip

Attached are the Type 164 Memory Cost Summaries that you requested.

JMCK:ASJ
Att
CC
R L Best
R Lane
G Bell

COMPANY CONFIDENTIAL

March 25, 1965

TYPE 164 MEMORY SYSTEM

36	G005	$ 2770.00	
24	G206	710.00	
36	G207	875.00	
1	G006	13.47	
64	G604	549.00	
16	B204	226.00	
5	W607	67.00	
1	B602	10.75	
3	W300	55.31	
3	B360	76.62	
2	B104	12.54	
8	B105	62.00	
11	B681	61.00	
3	B113	24.24	
1	B155	8.48	
4	W020	11.50	
1	W501	6.14	
1	W021	1.72	
16	B211	330.00	
11	B684	192.00	
10	W102	195.50	
16	W028	61.00	
1	B171	6.02	
		$ 6321.29	Total for Modules
9	1943D	$ 286.00	
1	728	74.60	
1	778	138.22	
1	834	44.24	
1	836	17.38	
1	739	420.00	
		$ 980.44	Total for P.S. & Mounting Panels
1	Bay - CAB-6	$ 278.48	
1	Indicator Panel	25.00	
		$ 303.48	Total

9	Panels Wire Wrap (1943D)	$ 350.00	
	Cover Cost	100.00	
		$ 450.00	Total
36	INH Resistor	$ 85.00	
1	Ferroxcube Stack	$13300.00	
Assembly - 60 hours (Labor & OH)		$ 318.00	
Checkout - 40 hours (Labor & OH)		$ 240.00	

Modules	$6321.29
Power Supplies & Mt Panels	980.44
CAB - 6 & Ind Panel	303.48
Wire Wrapping	450.00
Inh. Resistors	85.00
Stack	13300.00
Ass'y	318.00
Checkout	240.00
	$22000.21

NOTE: Above cost does not include end panels at $88.24 ea.

Harlan Anderson

dec INTEROFFICE MEMORANDUM

DATE MARCH 25, 1965

SUBJECT PDP-6 HEAT TESTING

TO PDP-6 GUIDANCE COMMITTEE
PDP-6 CHECKOUT PERSONNEL
JACK SHIELDS

FROM BOB BECKMAN

The attached memo describes a problem in connection with heat testing of PDP-6's that has become more and more apparent in the last few months.

Steps are being taken to investigate heat problems in PDP-6's. As a temporary measure, until this investigation is complete, final heat margins on PDP-6 equipment will be run with an incoming air temperature of 90° instead of 105°.

Central Processors (166) are presently being "baked in" by applying heat at 105° for at least an eight-hour period before starting checkout. This practice will be continued. The goal of the investigation will be to insure reliable operation over the entire heat range of 50° to 105°.

RJB:vc

MEMO:

FROM: L. White
J. Sullivan

TO: R. Beckman

SUBJECT: PDP-6 Heat Testing

DATE: March 19, 1965

It appears evident from the check-out experience in recent systems, that heat testing the Arithmetic Processor with incoming air at 105 degrees Fahrenheit results in irreversible module failures and/or decreased module life.

Specifically, the Adams Computer had been running with good room temperature margins and without failure for three months previous to heat testing. During the heat test, three 6205 modules failed and had to be repaired. Within a three day period following the heat test, four additional 6205 modules and three 1316 modules failed. The LRL system also had 6205 failures during and following heat testing, although the computer had been running with good margins before the heat test.

Until such time that an arithmetic processor can be evaluated within a high temperature ambient and the heat testing procedure is evaluated, we recommend that the heat test now be performed with incoming air at 90 degrees Fahrenheit.

INTEROFFICE MEMORANDUM

DATE March 25, 1965

SUBJECT Schedules for PDP-6 Projects

TO J. McKalip
S. Lambert
A. Titcomb
D. Smith

FROM R. E. Savell

CC: H. Anderson

So far I have received schedules as requested in my memo of March 15 only from D. Chin and A. Kotok. I would like to have the rest by Monday, March 29, at the latest so that they may be discussed at the next Computer Guidance Committee Meeting.

RES/mro

H. Anderson

INTEROFFICE MEMORANDUM

DATE March 25, 1965

SUBJECT Organizing PDP-6 Field Sales Support

TO H. Hubbard

FROM G. Bell

CC: R. Lane
H. Anderson
P. Harris
T. Johnson
L. Portner
J. Atwood
S. Grover
J. Burley
A. Klutchman
R. Belden

For the next month or so I will be working part time with you on the above. Initially we will work on notebooks to aid Sales people.

The manuals we would construct and support are:

1. Systems Information Manual (general sales)
2. Programming Systems Manual
3. Marketing Information Manual

MANUALS, GENERAL

This notebook will be a 3 hole loose leaf and provide a framework for distributed information. In general, the Sales Newsletter should only be used as a delivery vehicle for attached information which should be placed in the notebooks. A scan of all the newsletters might be a source of some information for the notebooks, too. A monogram or logo should be used to identify this material. Each time information is included with the SNL, notice should be called to it for inclusion in the notebooks. The framework will be simple enough for secretaries to keep notebooks current. The following notebooks and notebook separators should be ordered now for delivery by April 9, 1965, and this is a good deadline for the transmission of the notebooks to field sales offices.

SYSTEMS INFORMATION MANUAL

Identical in size and shape to PDP-6 Programming Systems Manual, with separators for each section. This notebook may be shown to customers. Some of the source information is available, but in many cases needs to be reprinted. The following * items are not available; and need to be originated or re-generated. Some of the documents below will begin as memos, then be combined to form coherent sales documents for customer mailings, etc.

Index

Published periodically to reflect manual's contents.

Option - Prices - Installation

New price list *
Calcomp plotter sheet and specs
Specs on 270 Discfile *
Specs on drum system *
Special quotes for physics applications *
Type 30 Interface quotes and specs *
Other PDP Computer Interface specs *
Parity option
The 338 Display
Installation Manual (to be completed) *
Segmentation options *

DEC

DEC INTRODUCTION brochure (available somewhere)

Talks, Reprints, General

Multiprogramming reprints
General Slide Talk Text *

Multiprogramming T. S. System Slide Talk Test *
Datamation article reprint
Ad reprints

Competitive Data

3200 information *
3600 information *
6400 information *
7040-7094 information *
7090 Functions
7090 fortran II
360 information *
635 information *
9300 information *
IBSYS, FMS, and DEC Time Sharing Monitor comparison *

Warranty, Maintenance, Acceptance

Sample form of contract *
Sample form of letter of intent *
Sample form of purchase order *
Acceptance Testing

Features and Configurations

Fortran II performance *
Fortran Functions performances *
Hardware features *
Program examples *
Example of session at a Console *
Multiprogramming Configuration and Performance *

Quotations

(sample quotations)

MARKET INFORMATION MANUAL

Confidential material, and information not of customer interest. The separators are:

Index

Policy

Customer Support
Educational Discounts
Quality
Software, Hardware Availability and Status
Delivery Status and Rates

DEC Organization

Organization chart and functions
Distribution List

Market General

General *
How to form a prospect list *
Customer list and application
Special Market Identification
1620 Installations
7040-7094 Installations

Market Identification

Physics
Private Industry
Government Labs.
University Research
University Computation Centers
University Research in Computers
Service Center

GB/mro

H. ANderson

LC Dolve

APPLIED LOGIC CORPORATION

Logic, Mathematics, Programming
Time Monitoring Equipment

70 NASSAU STREET
PRINCETON, N. J.

(609) WALNUT 1-2440

March 24, 1965

Mr. Robert L. Lane
Digital Equipment Corporation
Maynard, Massachusetts 01754

Dear Mr. Lane:

I spoke to you earlier concerning a possible modification to the PDP-6 which would allow me to run 32K programs in my 16K machine. I am enclosing several copies of a memorandum describing such a modification.

If possible we would like to have DEC make the modification or else assist us in making it. Perhaps we could discuss this when Dr. Guard and I visit Maynard again. (Will you please pass copies along to Perry Harris and Gordon Bell.)

I have been looking through the system listings that I acquired last week and have noticed a few possible errors. A list of these enclosed; please pass it along to the appropriate party.

I am looking forward to our next visit to DEC in the near future.

Sincerely,

APPLIED LOGIC CORPORATION

William B. Easton

William B. Easton

WBE:pfw

Enclosures

Deck Name

POSSIBLE ERRORS IN PDP-6 SOFTWARE

LOSE 3/23/65.

CDRSER CREOF+5: MOVEI TAC, .

This looks like it would cause an endless loop when end-of-file card is to be skipped. Should it be: MOVEI TAC, .+2 ?

IOCSS (ASSIGN) ASSLOP: MOVE TAC1, DEVNAM(DEVDAT)

Should it be HLLZ to compare only the device name and not the device number?

IOCSS (ASSIGN) ~~ASSLOP: MOVE TAC1, DEVNAM(DEVDAT)~~

ASSASG: LDB TAC, [POINT 9, DEVCHR(DEVDAT), 8]

ASSASG+7: " " " " " "

Here, the first 9 bits of DEVCHR(DEVDAT) are treated as the job number. In the documentation at the beginning of my copy of CDRSER, the ~~device~~ job number is said to be the first 11 bits.

Note: The two identical literals produced two words in the literal table! This shouldn't be. (Remember that it costs me $8/word to buy memory!)

APPLIED LOGIC CORPORATION

MEMORANDUM

From: W. B. Easton March 23, 1965

To: T. F. Droege
J. R. Guard
Gordon Bell
P. Harris
R. Lane ✓

PROPOSED RELOCATION HARDWARE FOR PDP-6

A modification of the memory protection and relocation hardware is proposed below. The purpose of such a modification is to allow the running of two or more non-contiguous segments of a program in core memory. If the modification can be made for $2000 or so, then it should be made, since it would permit us to run programs written for a 32K machine.

The PDP-6 is capable of operating in two modes, executive and user. In user mode, the programmer is allotted a section of core--beginning at a multiple of 1024 and of length a multiple of 1024--which looks to him as if it begins at location zero. Thus, a program can be interrupted, moved to a different part of core (perhaps via the drum), and run some more.

In addition, an initial segment of a program could be placed in core and run, as shown in figure 1. References to the part of the program not in core--i.e., references to addresses above MP[1]--would cause a memory protect trap; the supervisor could then bring in some more of the program and continue running it.

---

[1] By abuse of language, we will use the name of a register to refer to its contents.

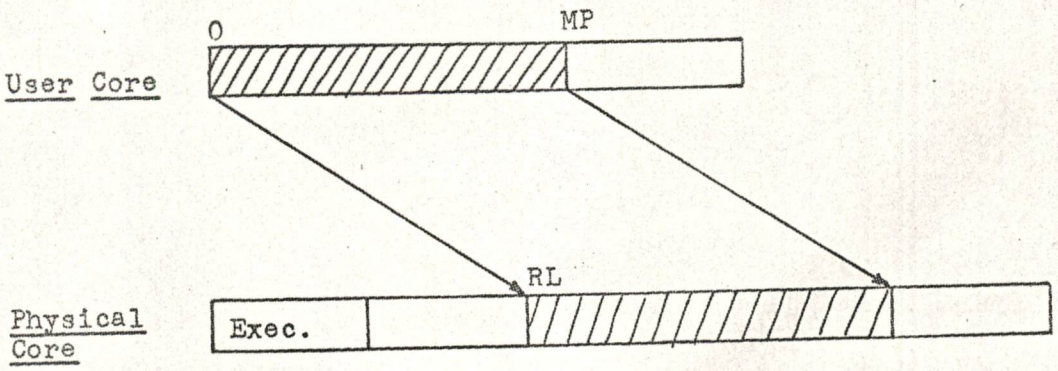


Fig. 1

Memory Layout
With Present Relocation Hardware

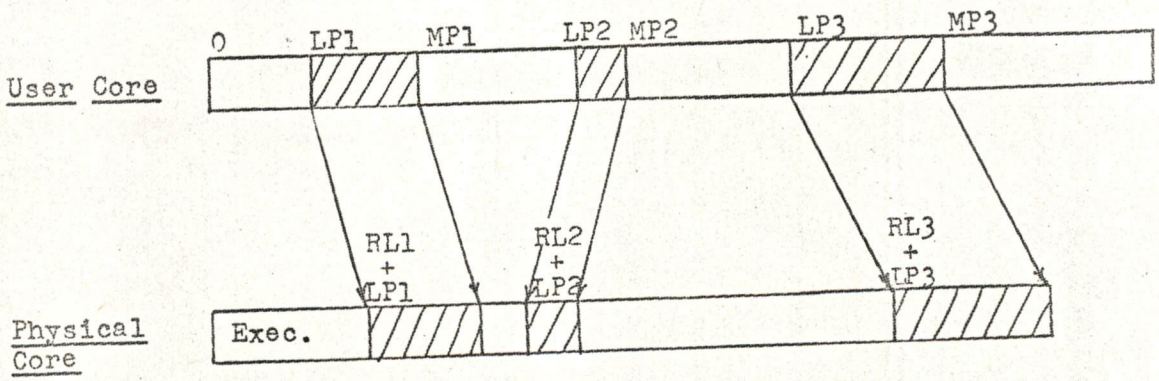


Fig. 2

Memory Layout
With Proposed Relocation Hardware

What is needed in order to run programs which are larger than the machine's core is a method whereby several non-contiguous segments of the program can be given different relocation constants and can refer freely to one another. Such a scheme is illustrated in figure 2 below. (Three segments are shown. At least two are essential; three or four would be nice if the cost isn't too high.)

1. Hardware changes.

The present relocation scheme is illustrated in figure 3 below, and the proposed one is illustrated in figure 4. Please note that we have not attempted to dictate the design of the actual logic circuits, but only to describe the desired effects.

In the present scheme, two registers are used in addition to the memory address (MA) register: the memory protection (MP) register and the relocation (RL) register. Only the first eight bits of the address are considered for relocation, so that the memory may be considered to be divided into blocks of 1024 words.

In the proposed scheme, a memory protection register (MP1, MP2, MP3), a lower protection register (LP1, LP2, LP3), and a relocation register (RL1, RL2, RL3) would be required for each segment of the program to be simultaneously accessible. Addresses between LP1 and MP1 would be relocated using RL1, those between LP2 and MP2 using RL2, and so on.

Notes. (1) What happens when the machine executes the last instruction of the user's allotted memory, and then attempts

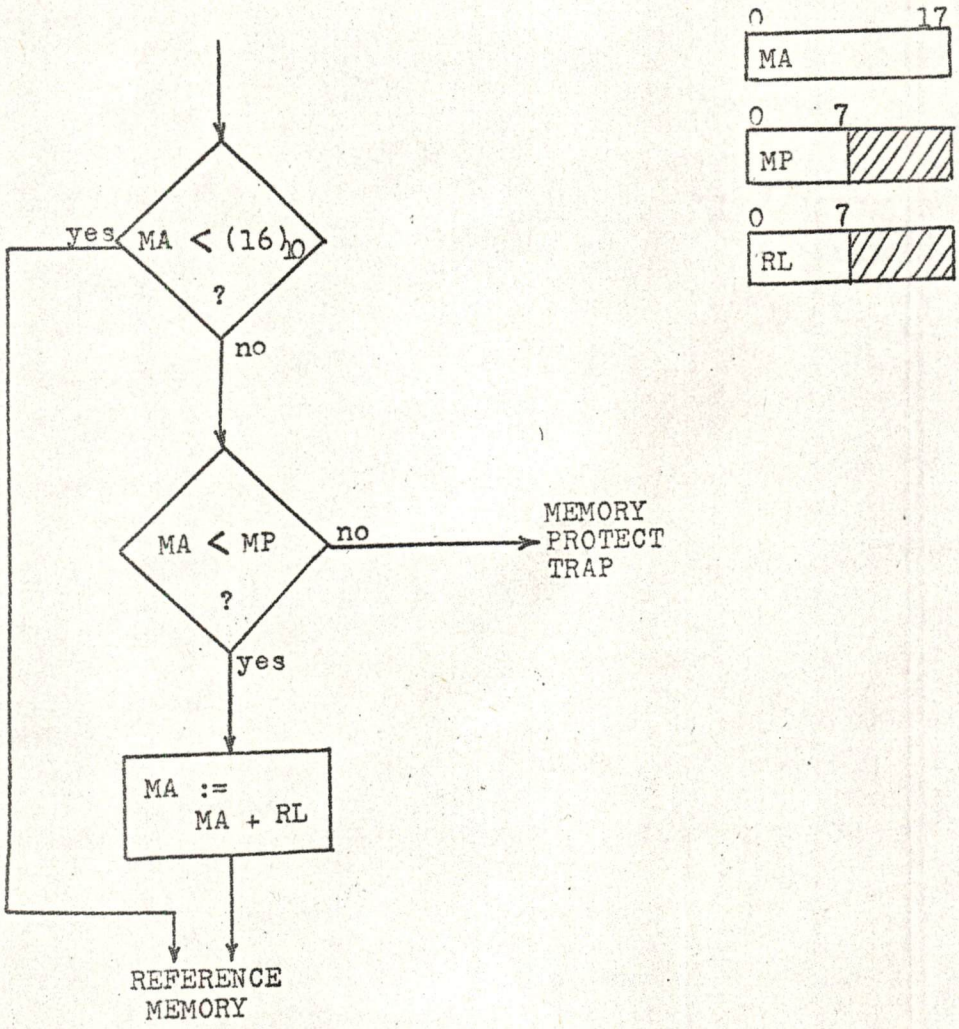


Fig. 3

Present PDP-6 Relocation Scheme

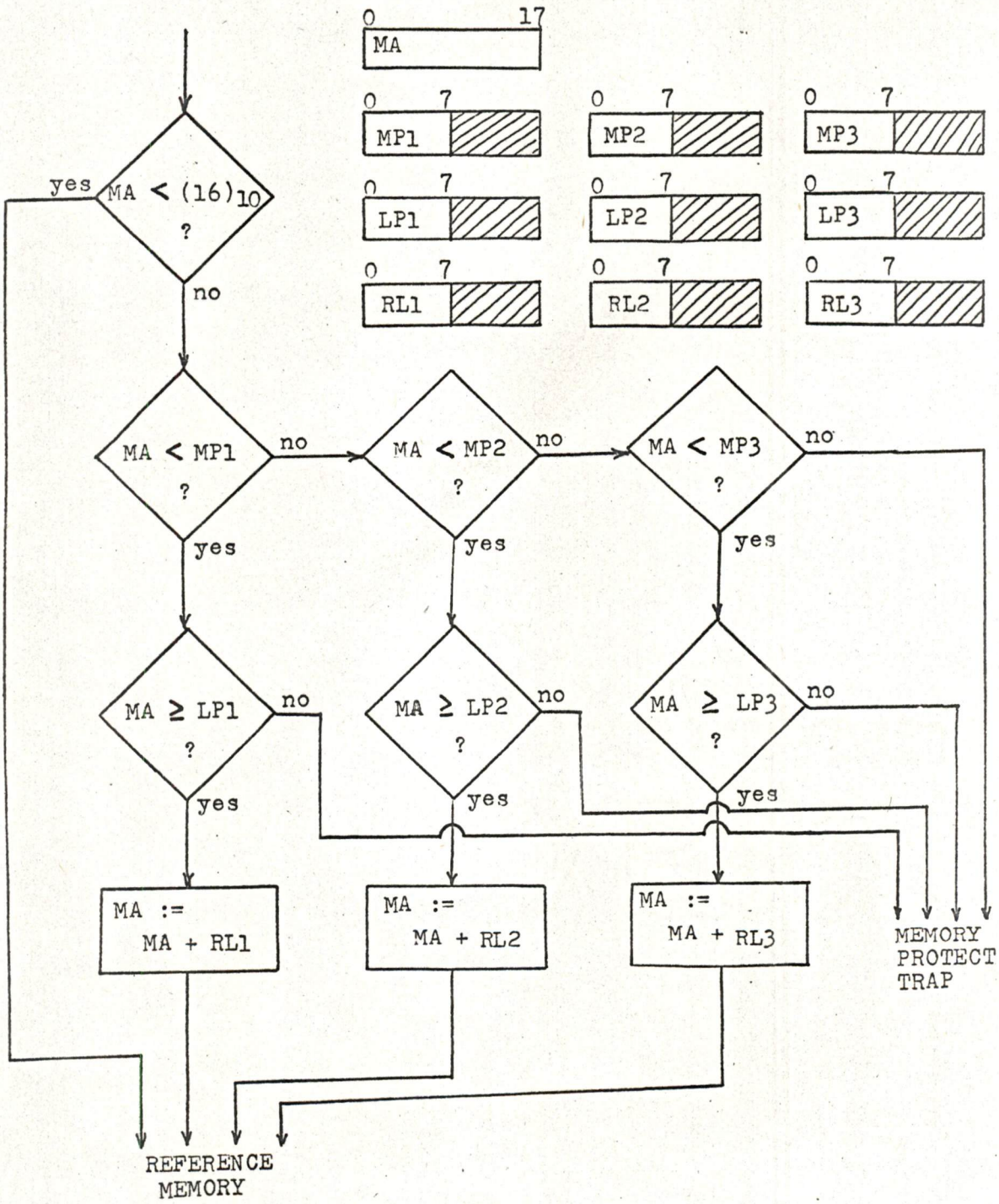


Fig. 4

Proposed Relocation Scheme for Applied Logic PDP-6

to proceed to the next instruction in sequence? This would be a rare occurrence with the standard hardware, but a frequent one with the proposed hardware. It should cause a memory protect trap. (2) It is essential that the program handling the traps be able to determine which instruction caused the trap. (3) We should be able to turn the thing off.

2. Software required.

It is clear that the task of writing software to allow the above hardware to be used while the machine is being time-shared by a number of users could be rather formidable. Therefore, at the outset, I propose that we write a "quick and dirty" package to allow the machine to be used as a large-core machine for batch-processing jobs. I claim that I could produce the required software in a few days; in any case, the job would be simpler than writing I/O routines for the drum--which we have to do anyway.

The required routines are described briefly below:

Trap handler. The largest part of the job would be a routine to handle memory protect traps. This routine would have to decide which segments of the program are in core and which are on the drum, and, of the former, which are in active use. Normally, when a segment is removed from active use, it would be left in core for a while and returned to active use if referred to. Thus, frequently used sections of program would reside in core permanently. I suspect that for the "average"

FORTRAN program, the swapping time would not be too large in comparison to the run time. Of course, we would not try to charge for the swap time. (I realize that SLIP and IPL-V programs could not be run this way.) When the lost time begins to hurt because we are running all night, we can call up and order some more core.

UUO handler. The only change that needs to be made to the basic UUO handler is to replace the current single instruction which picks up the user's UUO (and places it in accumulator UUO) by a dozen or so.

I/O buffering and service routines. As the I/O routines are written now, it is essential that the buffers be all in one piece. I don't think that any changes need be made other than to arrange for the I/O buffer rings to be in the first segment of the program, which would then remain in core at all times. This would require slight modifications to ADVBFE and ADVBFF as well as to the buffer assignment routines (BUFCLC, etc.).

Overflow traps. If floating point overflows are handled by the supervisor, we might have to do the same thing as for the UUO handler.

3. Future use.

After a year or so, when we have two arithmetic processors and infinite memory, I would like to have resident subroutines available to a user program for commonly used functions, etc. Some segmentation scheme, as above, would remove the necessity for "finishing the hardware" by programming. It would be nice to be able to designate a segment as read only; perhaps this could be considered now.

INTEROFFICE MEMORANDUM

DATE March 26, 1965

SUBJECT Martin Thomas

TO Nick Mazzarese
Jack Ridgeway
Stan Olsen
Harlan Anderson
Jim Burley
Ted Johnson
Gordon Bell
Larry Portner
Len Hantman
Bob Lane
Dave Packer
Win Hindle
Jim Hastings

FROM Win Hindle

For his Bachelor's Thesis at MIT, Martin Thomas is doing a case study of the formation of Jack Ridgeway's Applications Programming Group. He is interested in this as a study of the growth process and how a problem is perceived and then solved by a growing company. Since you were involved in considering this, Martin would appreciate a half hour interview with you to ask certain questions. Many of you will remember that Martin worked as a summer employee in Jack Ridgeway's group last summer.

H. Anderson

INTEROFFICE MEMORANDUM

DATE March 25, 1965

SUBJECT Proposal for Completion of the Clean Up of Circuits, Heat, and Problems on PDP-6

TO Large Computer Guidance Committee FROM R. E. Savell

CC: K. Olsen
B. Scudney
L. White
A. Kotok

We have been endeavoring for many months now to cure both circuit problems and timing discrepancies in the Arithmetic Processor and Memory that cause the entire system to run much slower than specified. The circuit problems have been with us since last summer and the timing discrepancies have been evident since November. These efforts have been hampered greatly by the pressures of getting systems delivered and once they are in the field the communication and customer relations problem makes it almost impossible to solve the problems there. If we do not get these problems solved shortly, the task of retrofitting systems in the field will be overwhelming, also one of our customers is liable to become very unhappy that his computer is not what he expected.

The most efficient way to clean up the remaining problems on the PDP-6 Central Processor is to set aside a processor which can be used primarily for this purpose. Jumping back and forth from one processor to another results in unaccessive amount of duplication of effort, may cause some faulty conclusions to be reached, and certainly will delay reaching final solutions to these problems by numbers of months.

I believe that the Central Processor Serial No. 11 which is being built for sales and is scheduled to go to the IFIPS Show can be set aside for this purpose.

I also want time allotted on the programmer's processor until such time as No. 11 is running all instruction tests.

It has been the plan all along to carry out some of this work on No. 11 and some modifications have already been wired in. I firmly believe that we should designate another processor as the one to be sent to the show so that all our efforts on this processor may be concentrated toward one end - solving the circuit and timing problems. Since practically all the programmers will be working at or visiting the IFIPS Show, their processor should be able to be made available for the show. If this will upset the programming or checkout schedule too much, then an alternate proposal is to speed up the Rand Central Processor slightly. This is presently scheduled for in-house acceptance on the 24th of May. If the schedule could be moved up by two weeks, it would correspond to that schedule which has been set for the sales machine. The shipping date for the Rand system is set for June 1, which is after the close of the IFIPS Show so that the entire Rand system could be checked out before the Show, the processor shipped to the show and then shipped to Rand.

digital MEMO

DATE March 26, 1965

TO Harlan Anderson FROM Ted Johnson

What are your current plans for Interdata? We want to nail this down very early and would like to help PDP-6 to be promoted as you see fit.

TJ/mr

Additional experiments which should be performed on this machine are the mapping of temperature around the 6205's and in other portions of the machine.

We have so many variables to contend with in this entire trouble shooting process that the job is difficult enough anyway without the introduction of one more huge set of variables which is the substitution of one processor for another in the middle of an experiment.

I would like to get a decision on this matter on March 26 if at all possible.

RES/mro

dec INTEROFFICE MEMORANDUM

DATE March 26, 1965

SUBJECT Rental Income Value of Leases on Large, Small, and Special Project Computer Equipment

TO Ken Olsen
Harlan Anderson
Stan Olsen
Nick Mazzarese
Ted Johnson
Jon Fadiman
Win Hindle

FROM Dick Mills

Concept

Being able to move in the markets we have pin pointed for our products with greater speed than the competition, has been one of the big strengths of our company. In an effort to strengthen this concept and to minimize the effect of some of the rental agreements which are now in force by our competition, I am exploring a rental basis for DEC which will create the minimum drain on working capital and give us a marketing edge at the same time.

The basic premise of this concept is that, the longer the time that a machine is with the customer, higher grows his investment in programming and staff, and higher grows the probability that he will keep the computer equipment beyond the original lease term of twelve (12) months.

Table of Values

If we can create a firm basis for the above concept, our financial requirements will be minimized and our marketing avenue will be enlarged. The following table reduces this concept to mechanical form with numbers inserted to portray the principle, but I would be the first to say that I have no firm basis for backing up these figures:

(1) Months on Lease	(2) Probability of customer continuing to rent equipment in %	(3) Number of months additional rental beyond 12 month original period	(4) Rental Income Value (Months projected from original plus Col. 3)
1	0	0	12
2	0	0	12
3	10	1	13
4	20	2	14
5	40	5	17
6	50	6	18
7	50	6	18

(1)	(2)	(3)	(4)
8	60	7	19
9	70	9	21
10	80	10	22
11	90	11	23
12	100	12	24

Above is only an example - real figures may be quite different.

If I could receive from each of you what you feel would be a reasonable set of numbers for the line for which you are responsible, to fill in columns 2 and 3, this would then form a good basis for serious discussion by product line.

Bank Interest

Preliminary discussions have been had with our bankers concerning their role, in the event we should want to "pull the plug" on renting our equipment, and the bank's reaction was one of great interest in being the financing medium for our leasing program, and also, one of high interest in the above concept, if the bases of extra rental income beyond the twelve-month certain could be substantiated.

Working Capital Effect

Since on a one-thirtieth basis, we get back 40% of the sales value in twelve months, and on a 50% cost basis, 80% of the cost, this puts DEC in the position of having to put in 20% of the cost for each rental unit, on the further basis that the bank would loan only the certain rents, which they have agreed to do (i.e. 100% of 12 months rent).

I would appreciate your comments and figures soon so that we may proceed to phase 2.

digital

INTEROFFICE MEMORANDUM

SUBJECT: South Africa

DATE: 29th March, 1965.

TO: Harlan E. Anderson
c.c. Jon Fadiman

FROM: Ron Smart

We recently had a visit to Australia from Miss Virginia Marting, who is a very important consultant to the South African CSIRO (Government Research organisation) as well as to various private companies. She was extremely impressed with the PDP-6 in Perth and the idea of time sharing, and asked me to forward literature on our equipment which she could consider when evaluating computing equipment in South Africa. (The yellow copy of our letter to her will be in Nancy Zieler's file).

Before we do any business in South Africa there would no doubt be some basic considerations to be looked at. At this stage, however, I am letting you know that this contact has been made in case somebody else has been in touch with South African organisations and our contact there should be co-ordinated.

I propose to keep in touch with Miss Marting and supply her with additional literature from time to time in the hope that it may lead to the opportunity for some business there. If you would prefer that this matter be handled in some other way, perhaps you could let me know?

Best wishes.

Ron

RGS.JD760

DEC INTEROFFICE MEMORANDUM

DATE March 29, 1965

SUBJECT Design Review Procedures for PDP-6 Engineering Projects

TO Large Computer Guidance Committee FROM R. E. Savell

This memo contains descriptions of the three different types of design review that I feel are necessary and an outline of the points in the design process where I feel these reviews should be made. When we reach agreement as to the definitions and procedures I would like to incorporate then into a permanent memo to be issued under Harlan Anderson's signature and be assured that these procedures will be followed by anyone designing equipment to be used on large computers whether or not they are members of the Large Computer group.

LOGIC DESIGN REVIEW

Does drawing nomenclature and symbology follow the rules set up for PDP-6? When in doubt use the PDP-6 Arithmetic Processor drawings as a guide.

Does the equipment do what the logic description and detailed performance description indicate?

Have modules been used only as specified in the module catalog? If not, all exceptions must be approved by the Chief Engineer.

Is the design the simplest that can be used to achieve the desired result? Can the system get into conditions from which program recovery is impossible?

Are all cable connectors shown on the block schematic and are they clearly labelled?

Does the block schematic agree with the flow diagram and state diagram and do these diagrams truly represent the block schematic? Does the form and symbology used on the flow diagram follow the standards established for these items?

Are sketches neatly laid out? They must be good enough to be understood by someone unfamiliar with the system until such time as finished drawings exist.

CIRCUIT DESIGN REVIEW

All new circuits or circuit modifications must be approved by the Chief Engineer prior to construction.

SYSTEM DESIGN REVIEW

This is a hardware review by a representative of Engineering, Field Service and Computer Checkout.

Is the overall system checkable and maintainable from a hardware point of view? Can you easily get at all modules and all points to be probed or adjusted? Can all modules be put on extenders? Are there enough indicators? Are all switches and cables labelled etc?

DESIGN REVIEW CHECK POINTS IN THE DESIGN PRCESS

Initial Design Review:

Once a device or product has been selected for design the project engineer should prepare a written outline of performance specifications, a description of the physical characteristics of the system, a ballpark price estimate, and an estimate of the engineering time required. This outline should be distributed to a representative of Engineering, Programming, Sales, Field Service, Computer Systems, and to Harlan Anderson. This group will then meet for the Initial Design Review where a decision should be reached as to whether or not to proceed further and where some of the more obvious points to be considered during the next phase of design are brought out.

INTERMEDIATE DESIGN REVIEW

Subsequent to the Initial Design Review the initial system and logic design is performed. This requires the preparation of a detailed description of device operation including all the commands to be implemented, timing, bit assignments, etc. It must be complete enough to allow sample programs to be written. At the same time the price estimate must be improved, prepared on a standard pricing form, and processed through the Accounting Department. A detailed schedule for the project must also be prepared.

The description, estimate, and schedule will be submitted to a representative of Engineering, Programming, Computer Systems, Sales, Field Service, and Harlan Anderson. It will be thoroughly reviewed by these representatives. Engineering will review all parts in detail; Programming will prepare some sample programs and review the system from the programming point of view; Computer Systems will review the system to see how well it integrates into the overall computer system; Sales will review it for price, availability, and specifications; and Field Service from the point of view of maintainability and availability of personnel.

At an Intermediate Design Review meeting these people will once again gather together to thrash out problems and to decide on the course of action to be taken.

INITIAL SYSTEM DESIGN REVIEW AND LOGIC DESIGN REVIEW

Subsequent to intermediate design approval, detailed logical design and system design will be performed. This will result in a complete set of sketches including block schematics, cable lists, flow diagram, state diagram, circuit schematics, system drawings, mechanical drawings, etc. A description of logical operation, a specification for diagnostic program, and an acceptance test specification will be written by the designer at the same time. At the conclusion of this process the designer will check thoroughly for loading rule violations or any other module use violations and will by this time have had any new circuits or circuit modifications approved by the Chief Engineer.

If the logical design has necessitated any changes to the intermediate design review description these changes must be reviewed before the project can continue.

Assuming we have gotten past thetherefore mentioned hurdles a Logic Design Review will be performed by the Engineering Supervisor before any work is begun either on wiring or on any finished drawings. This is, as has been defined, a very thorough review of the logic design to insure that the device really works as the description indicates. It also includes a review of the diagnostic program and acceptance specifications.

At this time an Initial System Design review will be conducted by the Engineering Supervisor, a Field Service representative, and a Computer Checkout representative.

Subsequent to these reviews wiring drawings or wire lists may be prepared from the logic sketches, finished mechanical drawings may be commenced, and finished block schematics and other electrical drawings may be commenced. The price estimate will also be updated at this time.

INTERMEDIATE SYSTEM DESIGN REVIEW

This will take place after the device has been constructed but prior to checkout. This is the time at which obvious physical defects should be pointed out and corrected.

FINAL SYSTEM DESIGN REVIEW

The Final System Design review will be performed just prior to acceptance tests. This is simply a check to make sure that nothing has been changed since the Intermediate System Design review. Anything requiring change at this point must be approved by Harlan Anderson.

FINAL DESIGN REVIEW

This review should be held immediately prior to the acceptance of the system by the Production Department as a production item. At this review the price should be checked again and the mistakes which we should avoid making next time should be listed for posterity. At this same time the Engineering Supervisor will review the test procedures that

have been developed.

MAINTENANCE AND PROGRAMMING MANUAL REVIEW

Maintenance manuals will be reviewed by the Project Engineer, Engineering Supervisor, and Field Service.

Programming manuals will be reviewed by the Project Engineer, Programming Supervisor, and Field Service.

In general, these manuals will conform to standards established by the Large Computer Group Technical Publications Manager.

RES/mro

H Anderson

INTEROFFICE MEMORANDUM

DATE March 30, 1965

SUBJECT System Information Manual
(2", brown, 3-ring loose leaf)

TO J. Atwood, H. Hubbard
cc. R. Lane, H. Anderson

FROM G. Bell

Please order 50 of the above with the following tabs:
INDEX
MANUALS
OPTION, PRICES
INSTALLATION INFO.
SOFTWARE, ABSTRACTS
FEATURES, PERFORMANCE
DEC GENERAL
APPLICATIONS, CUSTOMERS
POLICY, GENERAL INFO. STATUS
TALKS, REPRINTS, ADS, PHOTOS

WARRANTY, MAINTENANCE, ACCEPTANCE
QUOTATIONS, PROPOSALS, CONTRACTS

MISCELLANEOUS
COMPETITIVE DATA
MARKET GENERAL
MARKET IDENTIFICATION
PROSPECTS, SALES CALLS

GB/blk

RCASF 147 1051+
DIGITAL MAYN
+
DIGITAL MAYN

DIGITAL AA92140
DEC PERTH 29-3-65

TO JON FADIMAN/LARRY PORTNER
FROM PETER WATT

PLEASE CALL THEM

DENNIS IS FOZ IN FAVOUR OF GRANTING A FORMAL EXTENSION OF THE CONTRACT DA
DIGNAL E
52:),
AKZ++2+8&85-) .-6,

GA ALL AGAIN

OK MOM

DEC PERTH 29-3-65

TO JON FADIMAN/LARRY PORTNER
FROM PETER WATT

JPLEASE CALL THEM

DENNIS IS NOT IN FAVOUR OF GRANTING A FORMAL EXTENSION OF THE CONTRACT DATE. REASONS FOLLOW:

1. HE WILL NOT REJECT THE PDP-6 BECAUSE THE TS SOFTWARE IS A BIT LATE. IS THE SOFTWARE IS OK IN 2, 4 OR EVEN 6 WEEKS HE WILL BE SATISFIED (JUST?). HE REALISES THE MAGNITUDE OF THE JOB, AND HAS BEEN CONVINCED THAT WE HAVE DONE A COMMENDABLE JOB SO FAR.

2. A FORMAL EXTENSION WOULD INVOLVE A LOT OF RED TAPE WHICH WOULD DO NEITHER DEC OR UNIWEST ANY GOOD.

3. HE IS SATISFIED THAT WE ARE WORKING AS HARD AS IS REASONABLY POSSIBLEM AS LONG (WITHIN LIMITS) AS WE CAN KEEP HIM FEEPING THIS WAY HE WONT REJECT THE SYSTEM.

4. HE CONSIDERS THE FACT THAT DEC WONT BE PAID UNTIL THE SYSTEM IS ACCEPTED SUFFICIENT INCENTIVE TO KEEP US WORKING.

FROM TOMORROW WE ARE SCHEDULING 4 HOURS PER DAY FOR HIS USE. THIS WILL NOT AFFECT OUR DEBUGGING SCHEDULE, AND WILL GO A LONG WAY TO GIVING HIM SOME SATISFACTION FROM THE SYSTEM. HE WILL USE MOSTLY FORTRAN (80 PER CENT OF JOBS HERE ARE FORTRAN).

I SUGGEST WE LEAVE IT AT THAT. IS THIS OK?

INTEROFFICE MEMORANDUM

DATE March 31, 1965

SUBJECT

TO Harlan Anderson

FROM Ted Johnson

R. Musson is working on BBN out there on a PDP-6 and was wondering how far he could go in making an arrangement. He will be visiting next Thursday. He says they sound like BBN here will get a 360. L.A. - BBN will want to trade in a PDP-1 (JPL might buy it) 3 year rental (convert in a year), and possibly have us buy time on their PDP-6.

TJ/mr

INTEROFFICE MEMORANDUM

DATE March 31, 1965

SUBJECT

TO

Gordon Bell
H. Anderson

FROM

Bob Lane

I talked to Don Henderson today again. He did not arrange any visits and does not feel we should propose a system on the ASI-210 replacement.

Based upon his recommendation, I am taking no further action.

dec INTEROFFICE MEMORANDUM

DATE March 31, 1965

SUBJECT Sales Call Report - University of Pittsburgh - March 30, 1965

TO P. Harris
H. Anderson
R. Lindsay
R. Lane

FROM G. Bell

I quoted the following:

1. Interface to a 1301 connected to a dual channel 7909 DISC controller.
$15K + Data Control

2. Interface to a 1401 Serial Input Adapter
$13K + Data Control

3. Mass Memory
$75K/16,384 - 2 microsecond words in quantities of >6 on a system $.03/bit for larger, slow memories

IBM's educational prices: $7250 x 50. for 2 million bytes or about $.025/bit.
$13,500 commercial.

They will call us Thursday regarding our visit.

GB/mro

Individual

DECtape

IBMtape (control with transport)

Drum (control with drum)

Disc

Analog Line

DICK SORENSON WILL REPORT ON MONDAY, APRIL 5th ON:

What is our complete product line for analog equipment?

It should have:

A - D converter

Analog Multiplexer

Operational amplifiers

Sample and Hold

This equipment need not be DEC manufactured, but must be DEC offered.

7X Proposal

8K of memory

0.9 μsec processor cycle time

$35K cost (mark up ~ 2.4X)

Early July - firm logic proposal

Low Cost Card Reader

ED HARWOOD AT MEETING OF APRIL 12, WILL REPORT:

1. Operability of unit
2. Selling Price

31 March 1965

Boundary Register on PDP-7

Will be delivered to LRL 6/24

Price: $1,200

Traps any instruction addressing below the register value

Other options are also being considered

RON WILSON WILL PRESENT ALL OPTIONS AT MEETING OF 4-5-65

ROD BELDEN TO WRITE UP OPTION BULLETINS AND ANNOUNCE THROUGH SALES NEWSLETTER

Proposed PDP-7X memory pricing (1.5 μsec)

8K version

first 8K memory $2860 + memory control (~$300)

stack 3260

next 4K 3350 including stack

next 4K 2210 including stack

16K version

first 8K manufacturing $3350 + memory control (~$300)

stack 3260

next 4K 2260 including stack

next 4K 2260 including stack

Beyond 16K, another complete memory package is needed.

31 March 1965

Boundary Register on PDP-7

Will be delivered to LRL 6/24

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Other options are also being considered

RON WILSON WILL PRESENT ALL OPTIONS AT MEETING OF 4-5-65

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next 4K 2260 including stack

Beyond 16K, another complete memory package is needed.

INTEROFFICE MEMORANDUM

DATE March 31, 1965

SUBJECT

TO Harlan Anderson

FROM Ted Johnson

I'd like to have your thoughts and plans at this point, on two subjects:

1) Field assignments for PDP-6 salesmen

2) Interdata Show

I would like to see Roger Handy assigned in the New England office immediately. Other key assignments are Midwest and New York-Washington.

L.A. also

TJ/mr

INTEROFFICE MEMORANDUM

DATE March 31, 1965

SUBJECT Booth for Interdata

TO K. Olsen
H. Anderson
S. Olsen
N. Mazzarese

FROM T. Johnson

We have a 30 foot booth used at Wescon, Fall Joint and IEEE.

We have a 40 foot space and apparently 20 feet extra for the PDP-6.

I suggest we have a modular booth designed and built which can be used for 40, 30 and 20 feet spaces. At any rate, we need a new booth.

We don't have a good 20 foot booth and I would like to know what those requirements are.

Our Exhibits Manager will be on board on April 12. (Tim McInerney)

Target shipping date is May 17.

TJ/mr