1811 Leadburn Road
Towson, Maryland 21204

May 7, 1975

MR. KENNETH H. OLSEN, President
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts 01754

Dear Mr. Olsen:

I realize your days are very busy, but I wonder if I could impose upon
you for a few minutes of your time.

Western Electric Company conducts computer courses at our Corporate
Education Center at Princeton, New Jersey, and I was fortunate to attend
one a few months ago. I was fascinated by the world of computer terminology,
and was particularly intrigued by Computer Graphics. (Mr. Gordon Anderson,
our instructor, was especially knowledgeable in this area. As a matter of
fact, he will be attending one of your sessions at Marlboro the week of
May 11). I feel that Computer Graphics would make interesting games for
commercial sales market.

However, the main reason for this letter is an idea I had in connection
with deaf people and the sign language. I believe that a computer program
could provide a visual of the hands and face, when necessary, to indicate
signs of communications familiar to the deaf.

Computer Graphics could be used for teaching in schools, industry, and
college. (Presently, Gallaudet in D. C. is the only college for the
deaf in the world!) It would be an excellent visual aid for education.

I, myself, wear a hearing aid and can somewhat relate to the problems of
the deaf. In fact, I have just completed a basic sign language course,
so as to be able to communicate with the deaf people at Western Electric.
I am in salary administration and will be their channel for communication
regarding questions about their job, promotions, salary administration, etc.

Perhaps if you are so inclined, Western Electric may be willing to work
out something with your company, as we have some pretty sharp individuals
at Princeton. (Mr. Gordon Anderson would be an excellent source for ideas.)

Mr. Olsen, there are 25,000 persons in Maryland who are totally deaf and 300,000 who are partially deaf. In the United States, 1,000,000 people are totally deaf and 10 percent of the population are partially deaf.

Please consider these people who could enjoy a whole new world of education and enrichment through your efforts.

Sincerely,

Richard J. Kopro

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Dear Mr. Kopro

I'm sorry to have misplaced your letter to Mr. Olsen. Thanks for sending me the another copy.

I totally agree that there may be a potential use of a computer and CRT as a communications medium to the deaf. Right now we are not able to support doing research that might lead to a tool to help these people. This

~~However, a if you~~
~~This is not I a find a specific for use of our~~
~~However, should there be some~~
~~computers for this purpose,~~

(over)

It is possible that a firm proposal might change this belief, but right now, our research is devoted to building better basic computers (tools) for all applications.

(Computers and displays)

We ~~are very active~~ have machines, at Bell Labs, and

I would think that you might talk directly with them — since they're mainly concerned with communications. Also, I believe, ~~perhaps~~ the best graphics and speech research are done there.

Again please forgive me for not responding rapidly to your idea.

Truly,

cc. Ken Olsen
Jim Bell, Manager of Research
Ed Kramer, Product Line Manager
↑
Laboratory Data Products

digital

INTEROFFICE MEMORANDUM

LOC/MAIL STOP

TO: Lon Abel, Ron Brender, Lloyd Dickman, Len Fehskens, Marty Hurley, Allan Kent, Bob Kusik, Dan Diewiorek

DATE: August 18, 1975
FROM: Gordon Bell
DEPT: Office of Development
EXT: 2236
LOC/MAIL STOP: ML 12-1/A50

SUBJ: MINUTES OF NOTATION MEETING

We agreed to the following, regarding Fehskens August 4, memo:

Len - BNF of description expressions, etc.
BNF of MUD control commands.

Marty - given, BNF of expressions above, check for legality.

BNF of entire assembler input syntax (i.e. directives).

Specification of output formats such that 10/11 interchangeability is permitted.

Eventually the microassembler will get converted to the run on PDP-10 also.

Kusik - Len to check re. signal naming, etc. compatability with standard need BNF of signal names.

Kent - Need BNF of flowchart and signal naming conventions.

Lloyd - Markup - ISP BNF reflecting changes to DEC standard.

Meet in first week of September to check compatability of these.

GB:as

SUBJ: OOD AGENDA/MINUTES   DATE: PAGE   2
                                                     FROM: 09-11-75
                                                                  MJ

9/18	What is resolution of DEC 20		Lens/
	memory strategy	(20 min.)	Lemaire
9/18	OOD space guidelines	(60 min.)	
9/25	Report on in house 2 year PDP-11 usage strategy.		Computer Resource Co.
9/25	QCMS defect reporting system		Smith/Pecore
Sept.	Is there a field integration plan yet?		Smith/Shields/ RC/RP
Sept.	Honoraria Policy		Bell
10/9	Is there a formal action plan that allows follow up on field oriented product safety problems?		Shields/ Minezzi
Oct.	Block mode strategy resolution		Marcus/Portner
?	Is action on ECO control called for at this time?		Marcus
?	What is happening to make systems a reality in the way we do business?		Clayton

Expected attendance at OOD meetings:

	GB	LF	RP	RC	PL	MA	JM	HL
9/04	X	X	X	X	X	X	out	X
9/11	out	out	X	X	X	X	X	X
9/18	X	X	out	X	X	X	X	out
9/25	X	X	X	X	X	X	X	X
10/2	X	X	X	?	?	X	?	X
10/9	X	X	X	X	X	X	X	X
10/16	X	?	X	X	X	X	out	X
10/23	X	X	X	?	X	X	X	X
10/30	X	X	X	X	X	X	X	X

D I G I T A L   INTEROFFICE MEMORANDUM

SUBJ: OOD AGENDA/MINUTES   DATE: 09-11-75
                                                FROM: MJ
                                                  EX: 2237
                                                  MS: ML12

* *
TO: -OOD   ---
* *

SUBJ: OOD Staff Agenda
       ‒‒‒‒‒‒‒‒‒‒‒‒‒‒‒‒‒‒‒‒‒

10:30   Review Minutes

10:35   Review agenda

‒‒‒

                 FUTURE AGENDA ITEMS
                 ‒‒‒‒‒‒‒‒‒‒‒‒‒‒‒‒‒‒‒

When do we want to finalize capital & operating budgets?

Date	Item	Time	Who
9/11	OOD-MKT Committee interface	(40 min.)	
9/11	Sales meetings (especially Spain)	(10 min.)	Clayton
9/11	Status of microprocessor project	(15 min.)	Hughes
9/11	What is our affirmative action status and what problems are key for next 12 months	(30 min.)	Abbett
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9/18	What is the purpose, form, and content of the upcoming MIT lecture series?	(30 min.)	Puffer/ Cronkite
9/18	What is 3 year serial bus strategy?	(20 min.)	Bastiani/ Clayton

SUBJ: MINUTES FOR OOD MEETING OF 9/4/75

Product Manager Dinner Meetings

John Cronkite will come back with a plan for a first, trial
meeting working with Larry and Dick. The subject should be
forecasting and Abbot Weiss and someone for software could
speak to the group.

business Plan Review

Phil's proposal of July 1975 is a reasonable review basis. He
will come back with a flowchart as part of MC/OOD interface
topic.

Product Manager Job Description Update

Mark Abbett will have a pass at this, and will work on the
functions/responsibilities and how they are implemented in
different groups (and using different titles).

OOD Secretary and Best/Noelcke subject deferred.

GB:mjk

RC:mj

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(over)

digital   INTEROFFICE MEMORANDUM

LOC/MAIL STOP

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Allan Kent, Bob Kusik,   DEPT: Office of Development
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D I G I T A L   INTEROFFICE MEMORANDUM

SUBJ: OOD AGENDA/MINUTES

DATE: 09-11-75
FROM: MJ
EX: 2237
MS: ML12

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TO: —OOD   ----
* *

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10:35   Review agenda

FUTURE AGENDA ITEMS

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RC:mj

digital
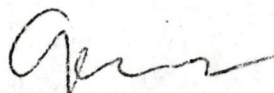
August 6, 1975

E. A. Weiss
Sun Services Corporation
240 Radnor-Chester Road
St. Davids, Pennsylvania 19087

Dear Eric:

I'm sorry I can't respond at this time due to time pressure.
Right now I'm reluctant to delegate this to people who would do a
good job since they are currently under similar pressures. I'm
circulating the request however.

Sincerely,

Gordon Bell
Vice President
Office of Development

GB:mjk

SUNOCO

SUN SERVICES CORPORATION 240 RADNOR-CHESTER ROAD, ST. DAVIDS, PENNSYLVANIA 19087 (215) 985-1600

Robert B. Anderson
President

July 8, 1975

Dr. Gordon Bell
Digital Equipment Corporation
146 Main Street
Maynard, MA   01752

Dear Gordon:

Although the letter soliciting questions for the ACM Self-Assessment Test
is directed to authors of books that deal with programming skills and techniques,
I also sent copies to major figures in the industry who I thought would
be willing to send questions which deal with the fundamentals of computing.
You are in my category of "major figures."

I would like to have several questions which you think illuminate fundamental
and important parts of the subject of computing, but failing that, perhaps
you would be willing to designate a surrogate at DEC to do this for you.

I have now sent out about half the solicitations for questions and do not
know what kind of response I will get. Consequently, I am anxious about
the outcome and would appreciate some encouragement from my friends
in the form of test questions.

Very truly yours,

E. A. Weiss

EAW/mv 1/7

[Handwritten annotations:]

I'm sorry I can't respond at this time

Circulate J Bell, Seborn, Dyer,

Due to time Pressure & etc. I'm reluctant to take this [...] to people [...] on to what I believe a relatively unrequested delegate one [...]

who would do a good job [...]

I [...] for [...] the records.

Dear Eric — I'm sorry I can't respond at this time

You are welcome to respond — but no pressure from me.

                    COMPANY CONFIDENTIAL   01681

SUBJ: MILITARY COMPUTER STRATEGY

The August 11 memo to Operations committee (attached) stands.
Since that time, we have continued with Rolm and Raytheon. My
present belif is that we will have the opportunity to reach
agreement with both Rolm and Raytheon within the next 6-8
weeks. They will be sufficiently willing and we will perceive
adequate market such that there is a sound basis for proceeding
with one (or possibly both) of them.

RC:mjk

Attachment

01681

digital

INTEROFFICE MEMORANDUM

TO: Operations Committee

cc: Military List

LOC/MAIL STOP

DATE: August 11, 1975
FROM: Dick Clayton
DEPT: Computer Systems Development
EXT: 3638
LOC/MAIL STOP: ML5/E71

SUBJ: STATUS OF MILITARIZED PDP-11

Background:

There seems to exist a market for $10 - $20 million per year of relatively standardized, militarized, PDP-11 compatible computers. The existence of one or more militarized PDP-11's would have some positive impact on at least several million dollars of current commercially oriented DEC business.

All this is part of a several hundred million dollars annual military business in Computer Systems and Custom Software dominated by IBM, UNIVAC, CDC, Raytheon, Rolm, Bunker Ramo and others. There seems to exist a significant push toward more standardization of product by the Airforce and Navy (especially mini & micro).

Current Activity:

We have casually invited proposals from several suppliers. We have a proposal from Rolm, a significant interest and apparent internal activity at Raytheon, and an internal proposal being done by Bunker Ramo.

All seem interested in PDQ level products. I believe the present seriousness of the activity is: Rolm, Raytheon, followed a distance by Bunker Ramo, in that order.

Recommendations:

- Do not build *a* product ourselves
- Do not plan on being a significant marketing channel
- Push Raytheon for their proposal
- Work on Rolm to modify their proposal from DG & DEC to DEC only (over 3 yrs.). Soften the exclusivity of Rolm after a given period of time.
- Leave door open for DEC to market limited volumes of the product via an OEM arrangement.
- Leave door open for us to manufacture after 4 years.

Problems:

This is becoming complicated enough that it is no longer a part time
Dick Clayton activity. Assign to Marcus and full time guy or same under
Dick Clayton.

Are we really willing to go through with this assignment of Market Share
to others?

Do we wait for 32 bits? Relative to 32 bits. Do we tell all to a "partner".

digital

INTEROFFICE MEMORANDUM

01686

TO: Gordon Bell
Larry Portner
Dick Clayton
Phil Laut

C-Irene Leary

DATE: August 20, 1975
FROM: Bob Puffer
DEPT: Hardware Development
EXT: 2863
LOC/MAIL STOP: ML1/E38

SUBJ: Increased FY76 Funding

I request $740K in increased funding as follows:

PRINTERS

	Q1	Q2	Q3	Q4	FY76
Approved	441	462	460	467	1830
Proposed	541	542	468	467	2018
Change	100	80	8	0	188

The above $188K is the remainder of the $250K appropriation approved for Q3 and Q4 last year. It could not be fully expended in FY75 because approval came too late in Q3.

The money is to complete the LA36 options and LA180. The alternative is to be over budget in Q1 but catch up in Q2 and Q3 by delaying high volume production for two months on these products.

DISKS

	Q1	Q2	Q3	Q4	FY76
Approved	943	964	990	1059	3956
Proposed	952	1006	1089	1119	4166
Change	9	42	99	60	210

Of the above, $160K funds RK06 Design Maturity Testing of 12 units which was not originally budgeted (a mistake). It also provides for necessary additional RK06 tooling. An additional $150K over plan for tooling will be amortized against product cost.

Alternatives are to keep the RK06 funded by reducing the number of design maturity test units and delay the RK07 project until FY77 or slip the RSL by two months.

The other $50K will allow us to maintain a Q2 FY77 first shipment for the RK06 Massbus interface. Although the project was stopped one month ago, the response to the cancellation suggests we will have to restart it. Without added funding it will be a Q3 ship.

To: Gordon Bell
    Larry Portner
    Dick Clayton
    Phil Laut

August 20, 1975

C1687

Increased FY76 Funding

-2-

FLOPPY DISK and TAPE

	Q1	Q2	Q3	Q4	FY76
Approved	310	330	350	380	1370
Proposed	310	410	455	495	1670
Change	0	80	105	115	300

The above includes $250K more funding for the design of an in-house manufactured RX01 mechanism. This advances the schedule by six months to Q1 FY77 and provides $1.5M in incremental pre-tax profit over the product's life at forecasted volume.

Also included is $50K to move the TU47 (125 IPS ½" tape buy-out) from Q2 FY77 to Q1 FY77 in order to more promptly address the back-up requirement for RP04's and RP05's. This provides $0.5M in incremental profit over the product's life.

POWER and PACKAGING

	Q1	Q2	Q3	Q4	FY76
Approved	115	128	148	148	539
Proposed	123	140	157	161	581
Change	8	12	9	13	42

The above includes $24K to fund the corporate air flow and acoustics lab and provide a minimum level of consulting service to other engineering groups.
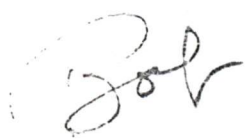
Also included is an additional $18K for corporate RFI testing. Large products requiring substantial effort are funded directly; the above provides for "walk-in", short-duration work on small $1K to $3K jobs.

Backup details on the above requests are available for the asking.

With approval of the above increases my budget would be:

HARDWARE DEVELOPMENT

	Q1	Q2	Q3	Q4	FY76
Approved	2497	2567	2577	2745	10386
Proposed	2614	2781	2798	2933	11126
Change $	117	214	221	188	740
Change %	4.7	8.3	8.6	6.8	7.1

rmj

DIGITAL   INTEROFFICE MEMORANDUM

SUBJ: AGENDA/MINUTES OOD   DATE: PAGE   1
                                              DATE: 08-27-75
                                              FROM: DICK CLAYTON
                                                EX: 3638
                                                MS: ML5-2

* *
TO: FILE
* *

To: OOD

SUBJ: OOD STAFF AGENDA--8/28/75

10:30   Review Minutes   All

10:35   Review Agenda--current/future   All

10:45   Discussion of COMM Strategies   Bastiani et al

         A.   What is COMM strategy?

         B.   Is Corporate Processor really
              understood and funded?

         C.   What is thought/status of serial
              bus?

         D.   What should happen to IOP processor?

         E.   Is there an SDLC chip funding
              problem?

11:40   How do we get a serial bus?   Avery/Bastiani

12:00   Is DEC System 20 group doing the   Lemaire/Leng/
         right thing in changing from core to Faserquist
         MOS

12:30   Military computer status   Clayton

12:40   End

FUTURE AGENDA ITEMS   01689

9/4/75	Product Mgrs. dinner meetings.	Portner et al
9/4/75	Assignment of Best/Noelcke	Puffer/Clayton
9/4/75	Product Mgrs. review (45 min)	
	Job Descriptions	Abbett
	Green Sheet	Portner/Clayton
	Overall organization perception	All

9/4/75	Business Plan Review Procedure	Laut
9/4/75	Review of the role of OOD staff sec.	All
	(and rotation)	
9/4/75	QCMS Defect Reporting system	Smith/Pecore
9/11/75	OOD-Marketing Committee interface	Laut/All
9/11/75	Sales Meeting participation	All
	Who is covering which ones?	
	What message do we have?	
	Is action on new product control	
	necessary?	

9/11/75	What is the status of PDQ	Demmer/Clayton
	project and what have we learned?	
9/18/75	What is the three year serial bus	Clayton/Bastiani
	strategy (15 min.)	
9/18/75	Approval of OOD Space Guidelines	Laut
	(30 min.)	
Sept.	Report on in-house PDP-11 usage.	Computer Resources Committee

Sept.	Is there a field Integration Plan yet?	Smith/Shields/ Clayton/Puffer
Sept.	Honoraria Policy	Bell
10/9	Is there a formal action plan that allows follow up on field oriented product safety problems?	Shields/Minezzi
Oct.	Block Mode Strategy Resolution	Marcus/Portner
?	Is action on ECO control called for at this time.	Marcus
?	What is happening to make systems a reality in the way we do business.	Clayton

---

Expected attendance at next 3 weeks OOD meetings:

GB	LP	BP	DC	PL	MA	JM	HL

INTEROFFICE MEMORANDUM

01691

digital

	LOC/MAIL STOP	
TO: Julius Marcus +	PK3-1/M10	DATE: 9 JUL 75
~~Roger Cady~~	PK3-1/M29	FROM: Vince Bastiani
~~Don Alusic~~	PK3-1/M10	DEPT: DECcomm Eng.
Tony Lauck	PK3-1/M10	EXT: 3292
Nate Teichholtz	ML12-2/A62	LOC/MAIL STOP: ML5-3/E43

CC: ~~Bill Ross~~ PK3-1/F27

Bill Avery; ~~Steve Teicher~~

Fm: G Bell

I'd sure like a different allocation. The LSI-11 came out of the blue. I →

SUBJ: CENTRAL COMM PROJECTS

Listed in the attachment is the schedule for centrally
supported projects in FY76. The projects have been divided
into:

A. Support — Overhead projects needed to support
equipment and propose new projects.

B. Software — Money allocated to provide software
drivers for COMM devices.

C. Current Hardware — Those projects which are on-going.
    Projects

D. Future Hardware — Those projects to be started in
this fiscal year.

The future projects are ranked in order of priority and
represent the product manager's thinking, after discussion
with various product lines (Telco, DECcomm, Business, LDP).
The total priority list is shown in enclosure 2 with the
funding limit line shown. The priority ranking takes into
account the COMM IØP processor approach described in my
10 JUN 75 memo, as this appears to be the most viable approach
to cutting down the number of Comm options and also provides
both cost effective low and high throughput capability.

Note that the serial bus has fallen below the level of funding
line. This is a result of adding in the two interfaces required
for the LSI-11, which will provide a more immediate payoff than
dollars spent on the serial bus. The serial bus, I still believe
to be a longer term necessity and should be pursued by someone
(Industrial or processor people). However, the only way I could
continue this effort would be with additional E20 funds over the
952 allocated.

Money being spent for software drivers has been divided up by
Nate Teichholtz and is part of the overall Network software
budget. This money in part, will provide RSX11-D and RSX11-M

Another plan written in DUST

think you gusing have a plan that comes pursuing from the serial — the — the Panda

I want us to discuss this at OOD Staff. The Serial Bus is dead, by this g Bell.

digital

INTEROFFICE MEMORANDUM

01692

TO: Gordon Bell

CC: OOD
       Vince Bastiani
       Tony Lauck
       Don Alusic

DATE: August 4, 1975
FROM: Julius Marcus
DEPT: Communications Products
EXT: 3191
LOC/MAIL STOP: PK3-1/M10

SUBJ: Communications Engineering Goals

Product

Minimize comm hardware and software investment consistent with

    a)   single machine comm I/O support

    b)   front end and networking capability needs

i.e., exploit

    generality of I/O,

    front end concepts,

    DECnet.

Organizational issues

Get backup to Vince in his group

Get "systems" knowledge applied to comm I/O specifications and planning

Assure better software/hardware planning for the comm functions since clearly both disciplines are involved.

mr

TO: GORDON BELL
DICK CLAYTON
JULIUS MARCUS
VINCE BASTIANI

The budget that Vince has submitted supports the goals outlined here.

As a separate issue, I'm worried that MULTI DROP will drop through the cracks. There is no mention of it here or in Vince's Budget. Vince has suggested that it be picked up by Dick's group or IPG.

I suggest we discuss at staff meeting

Phil Arnt 8/11/75

TO: Vince Bastiani
CC: Bob Puffer
Andy Knowles
Gordon Bell
Don Alusic

SUBJ:

LOC/MAIL STOP

DATE: May 28, 1975   01694
FROM: Julius Marcus
DEPT: Communications Products
EXT: 3191
LOC/MAIL STOP: PK3-1/M10

MAY 31 1975

Cc NAT & Return
for Staff   Dick

Vince, please find out what is going on with Multidrop development for the LA36's and write a broadly dispersed paper on what hardware and software is needed to use this product on DEC systems. I am under the impression that there is a Multidrop option recently priced on the LA36 which was developed by the Central Development Group. I'm also under the suspicion that some work of this type is being done by Logic Products.

Use Tony to make comments on software issues to state the minimal support necessary to support the LA36's in this environment.

I am concerned that we look disconnected within the Corporation (literally).

Bell Staff

mf

digital

INTEROFFICE MEMORANDUM

ood
stff

		LOC/MAIL STOP	
TO:	G. Bell	ML12/A51	DATE: 21 July 1975
	C. Ball	PK3/S20	FROM: Ron Minezzi
	D. Clayton	ML5/E71	DEPT: Product Safety
	J. Cudmore	ML1/E30	EXT: 3122
	G. Mondani	ML1/E30	LOC/MAIL STOP: ML1/E30
	B. Puffer	ML1/E38	
	J. Shields	PK3/A58	

01695

SUBJ: RESOLVING PRODUCT SAFETY PROBLEMS

One area of extreme concern in the resolution of product safety problems is the actual implementation of corrective action. Past experience with such incidents, as the Bell Labs fire, has shown that we need a well formulated program that will allow us to implement field retrofit changes quickly and in such a manner that we would have documented proof of such implementations.

I feel that such a program must start with a plan and time table for procuring parts and materials and any special manufacturing functions that are necessary.

EXAMPLE
Materials

List of parts and materials	Method of Procurement	Person Responsible	Date to be Received

Manufacturing

Functions to be performed	Instructions Required	Person Responsible	Place of Manufacture	QC checks needed	Date of Completion

Consideration should also be given to stockroom requirements. Other considerations of materials is how do we select who handles it? Should it be one group in every case, or should we use who ever is available.

The second part of the problem is how do we notify our own people? (We will have the means of notifying customers thru mail before FY75). Past experience has shown that there is no positive and efficient method of notifying field service that they must take corrective action. Should we develop a special code system for letting everyone know that a problem requires special handling? Could we use the present A.I.D.'s system to communicate directly to field offices with a mandatory answer required by a predetermined time.

The last part of the problem is getting positive documented proof that the action took place. After more than a year on the Bell Labs problem, no one appears able to stand up and say with authority what the status of corrective action is. This holds true for other problems as well.

From the position of product safety, it would seem very desirable to resolve these problems by:

1.   Having identifiable people and organizations that would always be used to procure and manufacture materials.

2.   Have field service develop a plan and systems to quickly implement changes and have documented proof of such action.

PLEASE COMMENT

Mr. G. Bell   JUL 3 1975   7-1-75

    Attached is a copy of the letter
mailed to Mr. Allen.

    I will get in touch with the
proper authority of Western Electric
at Princeton.

                  Sincerely
                  R. J. Kopro

P.S. Thanks for your interest in the deaf.

digital

LOC/MAIL STOP

TO: Dick Clayton   ML5/E71   DATE: July 21, 1975   01697
      Bob Puffer   ML1/E38   FROM: Larry Portner
                                       DEPT:
      cc: Gordon Bell   EXT:
                                       LOC/MAIL STOP:

SUBJ:

Let me once again propose that we create a forum for the interaction of
Product Managers; how about a once-a-month dinner meeting, with informal
discussions on topics of mutual interest at the intersection of the various
groups' responsibilities?

gm

digital

INTEROFFICE MEMORANDUM

LOC/MAIL STOP

TO: OOD

CC: Mark Abbett

DATE: July 29, 1975
FROM: Mary Jane Forbes
DEPT: OOD
EXT: 2237
LOC/MAIL STOP: ML12/A51

SUBJ: <u>JUNGLE MEETING--JULY 30, 31, 1975 (Larry's place*)</u>

<u>July 30</u>

6:00 PM   Dinner - Open discussion for agenda of next day.

<u>July 31</u>   Goals, space, etc.--to be determined night before.

*Note: Bring sleeping bag if possible.

External Goal:

To establish Software Engineering as a significant, visible, contributory growth vehicle for the corporation which permits flexibility of market selection and maximizes hardware and system sales.

Internal Goals:

Because it is through

1. the integrity and contents of the product we provide

2. our ability to implement and efficiently operate the process for better product creation

3. the quality, depth, and efficiency of our human resources that operate the process of Software Development

4. the strength of our reputation

that our goals will be attained; the internal goals are in 4 parts.

1. Product Goal:

To continuously make available products of higher quality and performance which allow the corporation to occupy a dominant position in it's present and future end-user market places.

2. Process Goal:

To ensure the timely completion of product development to the appropriate plan in keeping with the customer and corporate expectation of cost and performance, through a disciplined engineering process.

3. People Goal:

Maximize the performance of our human resource by having the required technical/managerial depth and providing an environment for their personal achievement, advancement, and recognition.

4. Other Goal:

Strengthen total corporate operations through the services provided to both internal and external customers.

OBJECTIVES

1. Product Objectives

    1.1 Gain Market leadership; position

    1.2 Achieve higher product quality image

    1.3 Improve the product contents

    1.4 Establish a product continuum from low end 11 thru high end 10

    1.5 Simplify the product offering.

2. Process Objectives

    2.1 Install a Software Engineering process which operates to plans

    2.2 Improve ability to manage to the plans

    2.3 Upgrade the development technology/methodology

    2.4 Improve the planning process

    2.5 Develop a clear uniform process for maintenance and field support.

3. People/Organization Objectives

    3.1 Improve the organization's depth

    3.2 Increase the emphasis on individual responsibility and accountability

    3.3 Improve recognition and participation.

4. Other Objectives

    4.1 Improve services to our internal and external customers.

1. PRODUCT OBJECTIVES

OBJECTIVE   RESPONSIBILITY

1.1 Gain Market Leadership Position

1.1.1 General

- Product superiority in most of the products most of the time. Development should always occupy a dominent product position in its marketplaces - this doesn't mean we can (or have to) be best in all aspects of every market, but it does mean that we must have at least one leadership product in every major segment of each of our markets. If we can't afford to occupy a leadership position, perhaps we are in the wrong markets.

Specific

- Establish and understand the competitive environment for all software products, and demonstrate this understanding in the Business Plans, "family" plans and in pricing approval presentation.   ✓ M. Woolsey

- Develop semi-annual report on our competitive posture in software and systems.   ✓ M. Woolsey

1.2 Achieve Higher Product Quality Image

1.2.1 General

- Have the highest quality software in the industry - "if you buy it from DEC, it will work!"

Specific

- Installation of a Q.A. policy and procedure for centrally and non-centrally developed software.   ✓ J. Mileski

- Implementation of a field test policy and procedure.   ✓ J. Mileski

- Staffed and operational independent Quality Audit activity.   ✓ J. Mileski

- Higher communication quality in our manuals - test them by having the writers trade manuals with the recipient using the documentation to use the system.   ✓ O. Kostetsky

- Better print quality, particularly of examples.   ✓ O. Kostetsky

OBJECTIVE	RESPONSIBILITY
. 100% accuracy of examples in present and future manuals.	O. Kostetsky
. Zero defects program in the SDC shipped kits.	O. Kostetsky

1.2.2 General

| . Development and implementation of an overall RAS concept for our products. | J. Mileski |

Specific

. Overall RAS program for DEC software (and systems).	J. Mileski
. Useful statement of RAS goals for DEC products and a measurement and feedback system.	J. Mileski
. Documented RAS goals for all diagnostic products and supportive diagnostic plans.	E. Fauvre

1.3 Improve the Product Contents

1.3.1 General

| *. Documented technical strategies available and updated at the component, subsystem and system level. How are we going to make our products? | G. Plowman |

Specific

. Hold quarterly "State of the Technology" presentations for interested audiences.	J. Bell
. Thru Research, bring in at least 2 new products or process technological improvements each year.	J. Bell
. Develop effective Software Product Strategies in support of Central Engineering and DEC-10.	L. Wade/M. Woolsey
. Maintain consistency between the product strategy and the product plans.	M. Woolsey
. NO DEVELOPMENT OF 32-BIT SYSTEM WITHOUT CLEAR, DOCUMENTED OVERALL DIAGNOSTIC STRATEGY.	E. Fauvre

*High Priority

OBJECTIVE	RESPONSIBILITY

. Clear attention in the diagnostic strategy and plans to support the highly leveraged areas, such as Field Service. — E. Fauvre

1.3.2 General

. Achieve a meaningful integration of hardware and software planning and development, so that we can profitably address the tradeoff opportunities between the two disciplines. — L. Wade / M. Woolsey / G. Plowman

. Each new product should specifically address hardware/software tradeoffs. - Should we implement it in ROM? or WCS? Should the error recovery be hardware or software? What are application requirements that have hardware/software implications? Such as context switching, character handling, and memory management? — LW

Specific

. Install scheme for tracking and controlling hardware support commitments. — G. Plowman

1.3.3 General

. Strong applications orientation in all of our products. Each new development should specify several planned applications areas and specifically address the issue of these applications support requirements. — M. Woolsey / G. Plowman / E. Fauvre

Specific

. Establish and maintain a clearing house of all applications development planned or underway in the corporation. — E. Fauvre

. Formal consulting/planning role to provide an "applications requirements" input to new systems software. — E. Fauvre

. Aggressive participation in new "small systems" development. — G. Plowman / E. Fauvre

1.4. Establish a Software Product Continuum from Low End 11 through High End 10

1.4.1 General

. Have absolute upward compatibility through the entire product set.

. Intensify concentration on standards to achieve compatibility goals. — G. Plowman

C1710

OBJECTIVE	RESPONSIBILITY

Specific

. Have totally transportable device drivers.

. Develop Software Product Plans for each Software Product Family, including clear product positioning, time phasing and competitive goals.

. Integrate the Software Product Family Plans for consistency across families.

*. Short term - clarify compatibility goals (10-11, INTRA 11, 11/85, 11/70-32) and develop compatibility plan.

. Management support of standards activity and implementation plan for current and emerging standards.

. Development of uniform standards for applications quality, reliability, documentation, etc.

G. Plowman/
E. Fauvre
M. Woolsey/L. Wade

M. Woolsey/L. Wade

G. Plowman/L. Wade
M. Woolsey

G. Plowman

E. Fauvre

1.5. Simplify the Product Offering

1.5.1 General

. Minimization of product set thru standard interfaces, modular implementation, etc. Guidelines in the foreseeable future - there should not be more than 2 implementations of any language processor or major utility.

. Decreased emphasis on ultra small core systems; core is getting cheaper, software is more complex.

G. Plowman/
M. Woolsey

G. Plowman/
M. Woolsey

Specific

. Phase out old versions/multiple versions of products.

. Better organization of documentation set.

. Share all language and utility manuals; write them once, and change only the cover.

. Fewer pages in the manual set, with higher information content.

. Maximum of 3 distribution mediums.

. Continuous reduction of per system software kit costs.

M. Woolsey

O. Kostetsky

O. Kostetsky

O. Kostetsky

O. Kostetsky

O. Kostetsky

*High Priority

C1711

2. PROCESS OBJECTIVES

OBJECTIVE

2.1 Install Software Engineering Process

2.1.1 General

. Perform no development without a plan.   All ✓✓✓✓✓

Specific

. SYSTEMS - FIRST AND FOREMOST - NO DEVELOPMENT FOR 32 BIT SYSTEM   ✓G. Plowman
  WITHOUT TOTAL LONG TERM DEVELOPMENT PLAN, INCLUDING CONVENTIONS,
  TECHNIQUES, SPECIFIED SOFTWARE SYSTEM ARCHITECTURE TOOLS PLAN,
  SUPPORT, DISTRIBUTION, AND MAINTENANCE PLAN, ETC.

. DIAGNOSTICS - NO DEVELOPMENT OF 32-BIT SYSTEM WITHOUT CLEAR, DOCU-   ✓E. Fauvre
  MENTED OVERALL DIAGNOSTIC STRATEGY.

*. Short term - documented development plans for FY76.   ✓G. Plowman/L. Wade ✓

. Each new product should specifically address hardware/software   ✓G. Plowman/
  tradeoffs. Should we implement it in ROM? or WCS? Should the error   ✓M. Woolsey
  recovery be hardware or software? What are application require-
  ments that have hardware/software implications? Such as context
  switching, character handling, and memory management?

2.2 Improve Ability to Manage to the Plans

2.2.1 General

. Have a clear statement of product goals at the component, sub-   ✓G. Plowman
  system, and system level.

. Install a process for maintaining the development plan, tracking   ✓G. Plowman/
  and controlling changes to the plan, including changes in goals,   ✓E. Fauvre
  scope, content, technique, schedule or budget.

. 80% of the projects must meeting schedule and budget, and do it   ✓G. Plowman/
  without redefining the content, or changing the goals - too many   ✓E. Fauvre
  of our commitments end up being met in the "next release".

*. Completion, installation and maintenance of a useful Software   ✓G. Plowman
  Engineering Policies and Procedures Manual.

*High Priority

OBJECTIVE	RESPONSIBILITY

. Operational new development policies by June. — G. Plowman

. Perform comprehensive review of plans at the detailed technical level for <u>rigid</u> <u>adherence</u> to specification, standards, quality and reliability goals, and spec discipline.
— G. Plowman/
— E. Fauvre/
— J. Mileski

Specific

. Jointly, with Development and Planning Groups, devise and implement a system (the War Room) for tracking and displaying the plans, resources, commitments, and changes to the plan. — M. Woolsey

. Periodically, with the development manager, review development activities for conformance to the plan, and issue a report on the "state of development". — M. Woolsey

2.3 <u>Upgrade the Development Technology/Methodology</u>

2.3.1 <u>General</u>

. Rapidly develop a development methodology, including higher level languages, debugging and design tools and methods, appropriate machine access, with automated bookkeeping and librarian type aids.

. Model and simulate new software.

. Build in performance analysis tools.

Specific

. Thru Research, bring in at least 2 new products or process technological improvements each year. — J. Bell

. Develop and disseminate an applications technology with emphasis on methods and utilization of resources. — E. Fauvre
. Develop and disseminate a 3 year technology for diagnostics. — E. Fauvre
. Aggressively install mechanisms and procedures to aid in the execution and management of programming projects. — G. Plowman

. Better methods for module test program generation; growth in this area (manufacturing support) seems unreasonably high. — E. Fauvre

. A documented philosophy and methodology for setting Quality and Reliability goals, and designing, testing and implementing these goals. — J. Mileski

OBJECTIVE	RESPONSIBILITY

2.3.2 General

. <u>All</u> non-operating system development done in higher level languages.

    E. Fauvre/
    G. Plowman

*. Short term - commitment to and plan for use of BLISS - develop list of criteria for use of BLISS on any specific project.

    G. Plowman

Specific

. 90% of all applications work done in high level language.

    E. Fauvre

. Significant portion of all diagnostics done in high level language. (Manager to supply definition of significance).

    E. Fauvre

. Aggressive support for high level language (BLISS) development facility.

    E. Fauvre

2.4 Improve the Planning Process

2.4.1 General

. Definition and integration of the Systems Architect role.

    L. Wade

Specific

. Develop a Systems Architecture function in order to achieve system-wide product cohesiveness, positioning, compatibility, efficiency and ease of implementation.

    L. Wade

2.4.2 General

. Continuously reduce product support costs on a per-product basis. This includes all aspects of support, such as internal maintenance, field support, SDC costs for updates, etc.

. No new product development without a long-range plan, covering new releases, updates, new versions, etc. Question - can we ever complete a product?

. Clear, effective maintenance and support plans - how will we support our products in the field?

*High Priority

OBJECTIVE	RESPONSIBILITY

2.4.3 <u>General</u>

. Strengthen and formalize the inputs to planning and development.

<u>Specific</u>

. Have all new product starts approved by Products Committee. — ✓ M. Woolsey / L. Wade

. Formalize the PSG process; meet at fixed frequency with clear agenda and intentions; formalize inputs from participating groups, and prepare formal quarterly reports of product requirements to the Planning and Development groups. — ✓ M. Woolsey

2.5 <u>Develop a Clear Uniform Process for Maintenance and Field Support</u>

2.5.1 <u>General</u>

. Clarify our software maintenance process in support of new corporate software warranty. — ✓ M. Woolsey

. Establish an "E.C.O." process for software. — ✓ G. Plowman

<u>Specific</u>

. Short term — analysis and proposal of the "Support Monster" problem. — ✓ J. Mileski

PEOPLE/ORGANIZATION OBJECTIVES

<u>Improve Organizational Depth</u>

3.1.1 <u>Specific</u>

. Implement the Advanced Development function by end of Q1, including at least 2 participants from the development organization. — ✓ J. Bell

. Hire at least 4 technically superior individuals each year. — ✓ J. Bell

. Provide an effective Departmental Planning function to plan and implement the resource (human, financial, hardware, space) and organizational (structure, methodology) requirements in support of Software Engineering goals. — ✓ L. Wade

C1715

OBJECTIVE	RESPONSIBILITY

Specific

. Develop effective Software Product Plans in support of Central Engineering and DEC-10.

L. Wade

. Formalize the PSG process; meet at fixed frequency with clear agenda and intentions; formalize inputs from participating groups, and prepare formal quarterly reports of product requirements to the Planning Group.

M. Woolsey

. Implement aggressive joing planning with the Product Management Group.

G. Plowman

. Clearly document a statement of diagnostic trends in the industry, and long term plans for DEC diagnostics.

E. Fauvre

*. Short term - Develop and establish as a corporate posture a simple, salable and achievable maintenance and support policy for our products (in lieu of "Warranty" statement").

G. Plowman/
H. Spencer/
M. Woolsey

. Establish a competitive analysis activity able to evaluate current competitive products, and predict competitive moves.

M. Woolsey

. Substantial upgrade in the line management structure.

G. Plowman
E. Fauvre

. Availability of skilled applications developers in each of the applications areas of major interest to the corporation.

E. Fauvre

. Staffed and operational high level consulting role in Reliability Engineering applying a documented philosophy and methodology for setting Quality and Reliability goals, and designing, testing and implementing these goals.

J. Mileski

3. Increase Emphasis on Individual Responsibility and Accountability

3.2.1 General

. Products debugged by the developers - neither field test nor Q.A. audit should be able to find more than a few infrequent bugs, and no catastrophic failures.

G. Plowman/
E. Fauvre

*High Priority

01716

Specific

. Clarification of roles and responsibilities of the various management and   ✓ G. Plowman/L. Wade
  technical levels - for example, do we use consulting programmers properly?
  Who develops implementation strategies? Who is responsible for absorption
  of new product technology?

3.3 Improve Recognition and Participation for Key Software Development Personnel

General

                                                              All ✓✓✓✓✓✓

. Build a high level team with increased visibility to the company so they
  be recognized, and who with increased visibility of the company, can operate
  from the broadest possible perspective.

Specific

. Prepare and maintain a menu of likely candidates for both Research and   ✓ J. Bell
  Advanced Development projects.

. Cycle at least 2 superior technical people each year from the research   ✓ J. Bell
  group into the Software Development activity.

. Cycle at least 2 superior technical people each year from the development   ✓ G. Plowman/
  activity into the Research group.   ✓ E. Fauvre

. Participation in the "Advanced Development" activity.   ✓ G. Plowman

. Aggressive joint planning with the Product Management Group.   ✓ G. Plowman

. Development of a competent and visible management and technical staff   ✓ E. Fauvre
  in the applications area.

. Aggressive exposure to the Product Lines, Marketing Committee, OOD, etc.,   ✓ E. Fauvre
  to help bring focus on growing applications activities in the corporation.

01717

4. OTHER OBJECTIVES

OBJECTIVE	RESPONSIBILITY

4.1 Improve Services to our Internal and External Customers

PRODUCT MANAGEMENT

Specific
- Publish overall software business strategy guidelines for use of Product Managers and Product LIne Managers (use output from Ted Johnson's Committee).   — M. Woolsey

- Prepare business plans consistent to the Business Strategy guidelines, but above all with a sensitivity to our marketing requirements.   — M. Woolsey

- Continue to tighten ties with Software Services.   — M. Woolsey

HARDWARE ADMINISTRATION

- Long term plan for supporting needs of software organization.   — E. Fauvre

- Increased service to the software developers, at decreasing cost to the corporation.   — E. Fauvre

- Proposal on development utilization alternatives.   — E. Fauvre

SDC

- Automation of order picking - order processing   — O. Kostetsky

- Maximum of 1 week turnaround to customer orders.   — O. Kostetsky

- Regional SDC's where economically or politically appropriate, or where service required. Maximum of one week turnaround to customers.   — O. Kostetsky

- Priority system for field orders, including an "instan ship" option.   — O. Kostetsky

- Periodic (twice a year) evaluation of kit contents, costs, effectiveness.   — O. Kostetsky

Control (PL)	Peripherals (RP)	Systems /CPU (RC)	Software (LP)	Technical staff (RLB)
• Formulate M/Buy better	• Components work	— Integrate —	— Diagnose + recover	
• Build total eval. system for M/B. (Rank all prod/proj)	• Cabinet/PS strategy →	• multi-Pc —	→ • Software	
	• Strategy in smartT (LA36+)	• virtual Memory in all machines (78)	• TSS11	
• Get EDP strategy/ goals (also Soft.)	**000451**	• g	• Networks	
			• Stds (files, info, lang.)	
• Streamline reports (use our C's)			• PL/1 ?	
	←	• Single K (controller) →•	• Controller support	
	↙ —— →	• Smarter K. —— →		
	• EMI, VDE, UL, etc, process.	→	• Improve t. response	
	.Field integrate, easy configuration.	• build more ideas	• Desc Soft. dept	
			• Move more to applic.	
	• Speed D/A, proto process		• HLL	
			• Struct. prog. + shared code	
	• Mgrs, develop.	(all)	• Quality, reliable, useable	

• Co-ordinate people, #, space, plans.	• Develop / interact to get overall corp. system strategy (Including C in hand, table, desk)			
	• Know position ∀ Products ⊃ More farther (esp. disks)			
• Streamline processes, reports, etc.	• Work together better			
	• Better documentation on □²D, PM, Eng. etc, processes.			
	• Hard C. Sys. Course • more technical education			
	• Grow Mgrs. • Get schools PM, Eng. Mgr.			
• Get contract : KO, □²D;	(GB) • Space process.			
• Eng. Committee operate better				
•				

RP (G)	RC (O)	LP (A)	PL (L)	GB (S)	Marcus/ Lemain
Cab + PS direction →		• Policies: for hang, op. sup, stds, etc.	• Clean up Yellow Bk.	• Increase 1:1 interact.	
Terminal strategy + • Support • low end • →	• Define low end System	Comm. stds + support →	• Help / hold metrics	• Goals ∀	→ Marcus
	Virtual Memory ∀ products →		•	•	→ Serial Bus ?
• ○←		Improve systems for nets, multi-Pc ←		○	→ Marcus
Build strong central product stds wrt. {VDE, VL} {noise, EMI} {design reviews}	• System Mgmt • • Get some planning which collects ∀ products & meshes with Mkt & Software.	• Formulate policies: struct. prog., use of HL, Chief programmer teams. • ↑ reuseable code	• Move Edp into better control, analysis, etc • Build product/mkt analysis to assist rest of OOD	• Move more to a product - # orientation (all) Get Mill Quiet! + less energy. (with MJ)	• Bring in LSI-11 2nd Source
Move to Computers vs dumb K (controllers) →	• →	→	Space →	→	• Get us cust. bipolar / MOS cap.
• ○	•	Take WCS in PDQ to get standard assembler, flowchart, notations, etc • Move to Quantitative metrics on products	• Better understand of roi, funding, mkt, products, etc through consistent metrics and report with history	○ (get standards for ISP, RT, Flowchart, etc. levels) Get VAX arch to stated goals.	
Decrease prototype time in all areas.					
	IIVAX (get)	= →○		=	01720

• Drive to Product - payoff attitude, (all) orientation.
• Educate OOD wrt each group: structure, goals, philosophy, control metrics
• Fix Product Approval process + document. OOD Handbook.
• Team - as needed (use Physnil) • Establish Architectural directions to assist individual groups.
    Placent. • Clean up Staff Mtgs.
• Know Position {∀ products } {∀ phases:
    clear delineation of funds for: study, proposal, design/tool, produce (support), Rejuvinate
• Establish productivity measures ∀ Groups $ activity in each category.
    Policy: Each group must have
    (joint evaluation of direct reports + clean-up engineer levels.)
• Joint mtgs on state-of- engineering, -products, -technology, -People, etc.
• Quality: form metrics, in new design state as # vs tradeoff including lower noise (EMI, d)
• ↑Systems focus: mgmt more direct, fund clearly in 2 dimensions | • Increase interact with MC/PL's
                                                                        Services + Mfg
• Work standards especially to reduce costs, increase interconnectability, ease learning, dec. product
• Generally increase # of prototypes, while moving farther out   gB
• Get PDP-11's in use within OOD. | O2D Possible Goals? 75/76 June 15, 75

digital INTEROFFICE MEMORANDUM

TO: Mark Abbett   ML12-1   DATE: July 25, 1975
         Gordon Bell   ML12/A51
         Dick Clayton   ML5/E71   FROM: Phil Laut
         Henry Lemaire   ML1-2
         Julius Marcus   PK3/M10   DEPT: Engineering
         Larry Portner   ML12/A62
         Bob Puffer   ML1/E38   EXT: 4308   LOC: ML12/A16

CC: Bob Lander   PK3/F33

SUBJ: FY76 Goals for Engineering Finance

The purpose of this note is to lay out my goals for discussion at the
Jungle Meeting next week. It is a minor rewrite of my goals statement
to Gordon and Bob Lander in May (#6 has been added).

Goals of Controller's Organization	Goals of Engineering Finance
1. Improve management decision through financial resources.	
A. Accelerated closing	Meet closing related deadlines
B. Measurements utilization.	Product Accounting (Statements distributed not more than 30 days following the end of the quarter by Nov. 1975.)
C. Utilization of PROFIT System	Continue to work with Finance EDP people to allow implementation of analytical tools designed for Product Accounting into GROMAR/PROFIT.
D. Improved forecasting techniques	Continue to work with Corporate Planning Group to allow pricing and costing of Product Line Forecasts
E. Improve profit planning	
2. Improve financial control system	
A. Accounting procedure manuals	Continue to improve documentation on engineering accounting and budgeting policies as needed
3. Improve corporate asset control/utilization/management	Considerable progress has already been made in controlling employee receivables and rotation inventory. FY76 goal is to understand current use and future needs for DEC-manufactured computers in Engineering.

Goals of Controller's Organization

Goals of Engineering Finance

4. Emphasize functional relationships within:

    A. Decentralized organization

Improve communication with Mfg. Finance

    B. Establish and meet EEO goals

5. Continue to build the Controller's organization

    A. Recruiting, training and development of personnel

Three major thrusts here. Intend to:

1) Increase the amount of reading done by the people in my group (me included)

2) Improve as needed, the clarity of writing done by people in my group.

3) Continue and expand the number of people going to school

6.

Co-ordinate Business Plans. This means encourage and prod product managers to do them, assist in the process, analyze them separately and in the aggregate. Observe, collect data and report on business and technical trends within the Company and in the rest of the industry.

/ale

INDIVIDUAL GOALS

LSI

1. Develop a realistic direction or strategy for LSI in the company. This will be accomplished by bringing together the thoughts of three functions:

   a. the systems user (the customer ex - LSI-11 disks, LA-36, etc.

   b. systems and circuit design (L. Gale)

   c. processing (J. Chenail, Worcester)

2. Define the particular devices which should be designed and LSI'd in the next three years. This is really a more specific definition of the strategy goal. It will demand an intense communication and understanding between the four groups.... systems user, systems designer, circuit designer, and process engineer.

3. Develop Worcester into a "going" processing operation of approximately 300 wafer starts/week by year end using both MOS and bipolar technologies. The processes will have manu-facturing-level controls so as to be a state of readiness to manufacture high-volume, standard devices (ex - 4K RAMS) when the need is evident.

4. Bring the Engineering (Gale) and Manufacturing (Chenail) groups into an effective working team. This is always an important issue but absolutely indispensable in the semi world.

MEMORY

1. Engineering

   - All new memories 16K and under designed with MOS (4K RAM's).

   - Move deeper into total utilization of semi-memories (MOS, bipolar, CCD's).

01724

- Start exploratory work on 16K MOS RAM.

- Use core for large systems - 32K, 64K, 2½D.

2. <u>Product Management</u>

- Develop this function beyond new product strategy, including a plan of developing an effective warning system and action plan to possibly modify product line forecasts. This will be accomplished by pooling data from memory groups, product manager, central planning, and Westminster.

- Phase out core memories and introduce semi memories in a <u>controlled</u> way. We neither want to "fall off the cliff" as cores drop off nor drag out cores when the market dictates that we should be using semi technology.

- Influence memory pricing strategy through Marketing Committee.

3. <u>General</u>

"Let go" of the memory operation so that in fact Cosgrove and Croxon together have 95% control of the business including issues which cut across organizational lines. This includes schedules, inventories, costs, but not systems engineering programs. These are the responsibility of Croxon only.

digital

LOC/MAIL STOP

TO: OOD

cc: Henry Lemaire
    Julius Marcus

DATE: July 25, 1975
FROM: Mark Abbett
DEPT: Central Engineering Personnel
EXT: 2633
LOC/MAIL STOP: ML12/All

SUBJ: CENTRAL ENGINEERING PERSONNEL
         GOALS FOR FY '76

The following is a set of goals for Central Engineering Personnel
to be discussed further at the July 30th Woods Meeting.

MANAGEMENT/EMPLOYEE DEVELOPMENT

Goals for Supervisor Training

o   Core Workshops to continue for next six months with four modules
    including one on problem solving. All Central Engineering
    Supervisors to attend this program.
    Responsibility: John Cronkite   Completion Date: 1/1/76

o   Ken Trend to run two two-day Interviewing Skills Workshop for
    Central Engineering this Fall. Leo will participate in one,
    co-train the second, and be prepared to train future sessions.
    Responsibility: John Cronkite   Completion Date: 11/15/75

o   A one day workshop is to be designed for Supervisors on Techniques
    for Conducting a Performance Appraisal and Plan.
    Responsibility: John Cronkite   Completion Date: 11/75

Goals For Management Training

o   Run Engineering Managers Seminar again for the next level of manage-
    ment.
    Responsibility: John Cronkite and Ed Schein to train
    Completion Date:

o   Have all managers attend a one day workshop on Techniques for Con-
    ducting Performance Appraisals and Plans.
    Responsibility: John Cronkite   Completion Date: 11/75

Goals For Central Engineering Personnel Department Training

o   An experimental Workshop will be run for the staff on Career
    Planning (What are factors that employees should consider in
    choosing a career)
    Responsibility: John Cronkite   Completion Date: 4/76

Goals for Employee Development During FY '76

o   Selling of OOD in support of this effort.
    Responsibility: Mark   Completion Date: 7/1/76

o   Development of a manual summarizing existing training for Central
    Engineering employees. This is to be distributed to managers and
    supervisors as part of our Performance Appraisal Workshop.
    Responsibility: Mark   Completion Date: 10/1/75

o   The formation of a committee of individual contributors with the
    responsibility for administering a program of Employee Develop-
    ment for Central Engineering.
    Responsibility: Mark   Completion Date: 6/76

Agreed Upon Guidelines for Relationship Between Management Development
and Personnel Reps for Workshops

Workshop	Identification of Training Need	Design	Training	Follow Up
Corporate	Mgmt. Dev.	Mgmt. Dev.	Mgmt. Dev.	Reps
Central Eng.	Reps	Mgmt. Dev.	Reps	Reps

John Cronkite's Consulting Goals

A broad guideline for John relative to working consulting issues is
that he designs programs to:

o   Resolve conflicts and problems with Central Engineering and other
    major organizations (i.e., 2 X 2, Engineering Managers)

o   Design programs to address issues and resolve conflicts between
    Vice Presidential organizations within Central Engineering (i.e.,
    Product Management and Systems Management Workshops)

o   Act as consultant to Reps in resolving conflict issues within
    their individual organizations

EMPLOYMENT

o   The development of a comprehensive Manpower Plan for Central Eng-
    ineering in conjunction with the Financial Reps. This plan is to
    include:

    a.   Affirmative Action Plan
    b.   January College Recruiting Plan

  c. Co-op Hires
  d. Minority and Female Training Programs
  e. Plans for promotions and transfers
  Responsibility: Leo   Completion Date: 7/15/75

o Increase in minority and female applicants against committed
 Affirmative Action slots.

  a. A female and minority Employee Referral Program.
  Responsibility: Leo   Completion Date: 2/15/76

  b. Better relationship with Minority Recruiting. This will include
   the invitation to Gas Riley whenever job spec meetings take
   place with managers.
  Responsibility: Leo   Completion Date: 6/30/75

o Work relationship between the Personnel Recruiter and Personnel
 Representative as to further clarification of responsibilities.
 Responsibility: Leo   Start Date: 10/1/75

o Hire a professional Recruiter and define the role of employment
 to include out placement, internal searches, reallocation of
 employees and career counseling when employees desire transfers
 to other organizations.
 Responsibility: Leo   Completion Date: 11/1/75

o Monthly reports to be completed by the last working day of each
 month and sent to the Central Engineering Personnel staff and line
 management are to include:

  1. A Requisition Report of all full time internal and external
   openings for Central Engineering

  2. The top five Central Engineering openings and status of each

  3. An Affirmative Action Report to include how many committed
   openings, offers, and hires.
  Responsibility: Leo   Start Date: 7/1/75

o With key individual searches (Level 11 jobs and above) and
 management openings, whether they be handled by an outside agency
 or Central Engineering Employment, an agreement be written up and
 bi-monthly status reports be sent to the managers, next higher
 level of management and Personnel Representatives.
 Responsibility: Leo   Start Date: 7/1/75

COMPENSATION

o Design and present a training session for managers dealing with Compensation philosophy. This session should include:

    a. The philosophy behind "Pay for Performance"
    b. The concept of frequecy of increases (how and when to use)
    c. The Exemption Questionnaire and a discussion of government requirements for qualifying as an exempt employee
    Responsibility: Jim McCarthy and Reps   Completion Date:

o Design and present a training session for all employees on DEC's Compensation Program. This training should include:

    a. What is a salary range?
    b. How does performance relate to salary range quartiles?
    c. What factor does cost of living play in the adjustment of salary ranges from year to year?
    d. How does job evaluation work and what factors are looked at in deciding the "worth" of a position?
    e. An explanation of the full process of performance and salary reviews at DEC.
    Responsibility: Jim McCarthy and Reps   Completion Date:

o A monthly report on Cost Center Manager's variance between salary plan and actual increases. This report should include a detailed analysis of each Vice Presidential organization and identification of problem areas.
    Responsibility: Jim McCarthy   Start Date: 7/75

To start anticipating problems rather than reacting and fire fighting. This will be accomplished by our imput to compensation proposals through our Rep., Jim McCarthy, support of these proposals to our top management and Compensation's education of us to effectively implement these programs. Specifically:

o During FY '76, Jim McCarthy and his Compensation Group will regularly attend Central Engineering's staff meetings to inform and involve us in all proposals. The goal is that our imputs be considered in these proposals and that we help sell these to our top management.
    Responsibility: Jim McCarthy and Mark   Start Date: 6/27/75

o Before any major compensation programs are implemented within Central Engineering, i.e., Phase I Salary Planning, AAIM Job Slotting, Stock Option Recommendation, etc., an educational program will be presented by Compensation to our Personnel Reps to ensure there is adequate knowledge in implementing the program.
    Responsibility: Jim McCarthy   Start Date: Immediate

AFFIRMATIVE ACTION GOALS

o To have Managers complete an Affirmative Action Plan in conjunction with a manpower plan for each cost center for FY '76. This plan should include committed minority and female slots, training programs, co-op positions, transfers and promotions.
Responsibility: Leo - Coordination   Completion Date: 7/15/75
               Reps - Implementation

o To set up a tracking system where managers quarterly receive a report of where they stand with relation to their Affirmative Action plans and commitments.
Responsibility: Otis Courtney   Start Date: 10/1/75

o To increase the number of minority and female applicants. The implementation and responsibility for this goal is covered under the Employment Section.

o To get a top management commitment and involvement in EEO through specific programs:

1. Through quarterly reports on cost centers status versus their Affirmative Action plan, get Vice Presidents to come down hard on managers who are not obtaining their committed goals. This should be partially reflected in salary reviews and stock option recommendations.

2. To budget a sum of money to be administered by OOD to support EEO programs beneficial to all of Central Engineering.
Responsibility: Mark and OOD   Completion Date: 10/1/75

o To develop two training programs to upgrade the skills of present minority and female DEC employees. A tentative plan would be to run another Tech Training Program and start a program for retraining employees to qualify for entry level Diagnostic Programming positions.
Responsibility: Reps   Completion Date: 3/76

o To complete the Employee Profiles and to use them as a resource for identifying promotable Affirmative Action candidates.
Responsibility: Leo   Completion Date: 2/76

EMPLOYEE RELATIONS GOALS

o Work with Vice Presidents and Managers to educate and prepare them for Personnel's effort in the area of Employee Relations over the next fiscal year.
Responsibility: Reps   Completion Date: 7/75

o   Employee Relations is management's responsibility and not Personnel's. With this perspective, our effort will be to develop specific programs to give managers more tools in order to develop an effective Employee Relations Program. Specific tools are:

1.   Available Technical Training for employees

2.   An awareness workshop on better secretary utilization

3.   A workshop on career counseling and alternative career paths for Central Engineering employees

4.   Other programs?
Responsibility: Reps   Start Date: 7/1/75

o   A program and training for managers on how to conduct Performance Appraisals and plans. Our goal is that every employee in Central Engineering have a performance evaluation every six months.
Responsibility: Reps   Start Date: 10/1/75

o   To develop one and possibly two social events for employees of Central Engineering. One program might be an open house for families of DEC employees and another possibly being a group sports activity such as a Red Sox baseball game.
Responsibility: Theresa   Start Date: 3/76

o   With the completion of the Employee Profile, to set up a mechanism for reviewing Central Engineering employees for all potential promotional and career path opportunities.
Responsibility: Leo   Start Date: 10/75

o   In areas of high hourly employee population (SDC and Engineering Services) to conduct an attitude survey with all employees. This will be an excellent opportunity for new Personnel Representatives to meet with the organization they're supporting.
Responsibility: Reps   Completion Date: Q2

ADMINISTRATION GOALS

o   To set up a policy for paperwork contained in an employee's Personnel File and set up all Central Engineering files accordingly.
Responsibility: Policy: Theresa   Completion Date: 1/76
                Implementation: PSA's

o   To complete a Secretarial Reference Book for use by all secretaries supporting technical organizations in Manufacturing and Engineering.
Responsibility: Theresa   Completion Date: 5/76

o   Training for PSA's and Secretaries. The PSA's should visit John
    Hancock to get better insight into the mechanics of claims pro-
    cessing. With the decentralization of PSA's, Secretaries should
    be cross-trained so that they are qualified to cover the or-
    ganization during times of vacation and absenteeism.
    Responsibility: Theresa   Completion Date: 12/75

o   To improve Central Engineering's New Employee Orientation. Areas
    to be looked at are:

    1.   A film on DEC to give employees a better understanding of the
         products and business we're in.

    2.   Clerical Training - To make new secretaries aware of forms,
         procedures, and DEC organization through a training program
         on their first day.
    Responsibility: Theresa   Start Date: 8/75

clg

digital

LOC/MAIL STOP

TO: Gordon Bell
    Bob Puffer
    Henry Lemaire
    Larry Portner
    Julius Marcus
    Phil Laut

DATE: July 29, 1975
FROM: Dick Clayton
DEPT: Computer Systems Development
EXT: 3638
LOC/MAIL STOP: ML5/E71

SUBJ: For OOD Woods - 7/31/75

Goals (For Major Focus in FY 76)

I Product

- Understand where we build and sell systems vs components and strongly drive market, production, and development*
- Achieve realistic configuration rules
- Do fewer products better (increased risk & payoff)
- Get PDQ to market
- Get LSI to market & build solid successful family
- Successful 32 bit systems

II Process

- Integration of Product Management for Family Plans
- Evolution of System Management and focus* (implications across all development and market)
- Successful implementation of 32 bit management system across OOD*
- Focus on Reliability (Design and Process maturity, MTBF, etc.)
- Clarify Market Services role
- Strengthen PDP-11 & 32 bit Family forces (Platz, etc.)

III People

- Raise level and recognition of Product Managers*
- Bring in more bright college graduates
- Add 3 Product Managers-caliber of Steve, Bruce and Malcolm
- Raise technical training level
- Focus 70% of hardware engineers on minimum software skills (at least serious user)

IV Other

- Establish product specific competitive analysis
- 80% of Engineering Supervisors and above travel at least 3 weeks/year including one week in front of customers
- 70% of principle engineers & above travel 2 weeks/year including 4 days in front of customers
- Raise direct Product Line Eng. to 10% of total at least
- Build team strength and experience
- Execute cross group assignments for at least 10 people of supervisor or principle engineer level or above

*I believe these are also OOD wide goals.

digital

September 3, 1975

Wes Graham, Director
Computer Systems Group
University of Waterloo
Waterloo, Ontario, Canada
N2L 3G1

Dear Wes:

I read the status report of WATFOR and WATBOL.

Can you send me brochures and/or material on them. Are they too
restrictive (200 statements) to be useful? How are sales? How
does WATBOL compare with our COBOL? How can the sales of these
be improved?

Sincerely,

Gordon Bell
Vice President
Office of Development

GB:mjk

cc: Al Brown
     Larry Portner

Div'y
v. g. waterloo, Canada
Waterloo, Ontario, Canada
N2L 3G1

Letter to Wes Graham at Waterloo

AUG 22 1975

Dear Wes:

I read the status report of the Waterloo WATFOR and WATBOL. Can you send me brochures and/or material on them. Are they too small restrictive (200 statements) to be useful? (How are sales? How does WATBOL compare with our Cobol?

August 15, 1975.

Mr. A. Brown
PK 31M12
OEM Group
Digital Equipment Corporation
146 Main Street,
Maynard, Mass 01754.

Dear Al:

It has been some time since we have reported to Digital Equipment Corporation about the status of our compilers for the PDP-11 series of computers.

We thought that you might be interested in the current developments, our plans for distribution and our plans for the next few months.

Attached to this letter are reports on WATFOR-11 and its extension WATFOR-11S and WATBOL-11 our new COBOL compiler.

If you have any questions about any of the details of the compilers or our distribution procedures, please do not hesitate to contact me.

Yours sincerely,

D.D. Cowan

DDC:cd

D.D. Cowan

c.c. Mr. Gordon Bell. ✓

c.c. A Brown
L Portner
D. Hurly

How can the sales of these be improved?

01736

August 15, 1975.
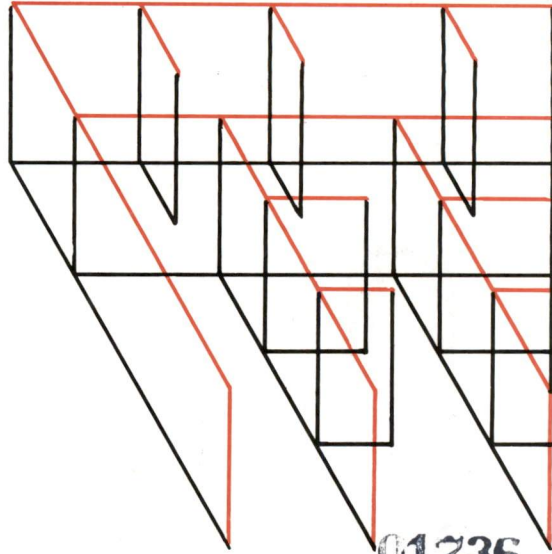
PROGRESS REPORT

WATFOR-11 and WATFOR-11S.

WATFOR-11 has been completed and available for distribution since
January 1, 1975. The compiler implements ANSI standard FORTRAN IV
with format free I/O and other extensions. It compiles at very
high speed with excellent error diagnostics.

WATFOR-11S is a version of WATFOR-11 which includes extra language
features for structured programming. It contains the following
constructs:

IF THEN ELSE,

WHILE DO,

and   DO CASE,

as well as several other similar features. FORTRAN programs which
run under the DEC FORTRAN IV compiler should also run under WATFOR-11
and WATFOR-11S and produce the same results.

Both the WATFOR-11 and WATFOR-11S compilers are available to be run
under the RSX-11D and RSX-11M operating systems and will soon be
available (Fall 1975) under the RT-11 operating system. The
compilers use 24K of memory for the smallest configuration. Using
this size of memory the compiler can accept about a 200 statement
FORTRAN program. Of course the number of statements is highly
dependent on the size of arrays. The compiler can be expanded to
use a larger amount of memory and hence improve its performance
both in terms of speed and size of program handled.

Specific details about these two compilers and the distribution
package are attached to this report.

The distribution of the compiler is being handled in a straight-
forward manner - Upon receipt of a request, a distribution package
is mailed to the potential user. The user completes the various
forms and the contracts and returns them to WATFAC. WATFAC then
copies WATFOR-11 onto DECTAPE or RK05 disk and sends the compiler
to the user. The compiler is distributed as a number of object
decks which can be combined to form a task by the receiving

installation. The object decks include WATFOR-11 compile-time and execution-time routines, additional object decks to create WATFOR-11S (if requested), built-in FORTRAN functions and the run-time support routines for formatted input-output. These last two items are part of the Digital Equipment Corporation FORTRAN Object Time System Version 4. By including the last two object decks our compiler is independent of various versions of the operating systems under which it is implemented.

The WATFOR-11 compiler is leased on an annual basis and at present costs $600 per year. The additional features for WATFOR-11S cost $100 annually.
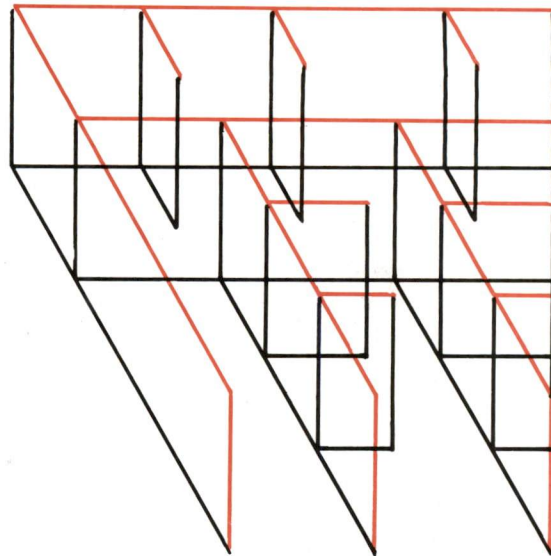
August 15, 1975.

01738

PROGRESS REPORT

WATBOL-11

WATBOL-11 is a load-and-go batch COBOL compiler which is modelled
after WATFOR-11. This compiler is designed for an environment
where large numbers of small file-processing programs (i.e.
educational institutions) are to be processed. WATBOL-11 compiles
and executes batches of COBOL programs at speeds probably
exceeding the speed of a 1000 line-a-minute printer or 1000 card-
a-minute reader. Excellent diagnostic messages are issued to
assist the programmer in detecting errors at both compile and
execution time. The compiler is designed to be a minimum ANSI
standard COBOL compiler with many extra language features. It
appears to accept a richer version of COBOL then DEC's COBOL-11.
Programs which run under DEC COBOL-11 should also run under
WATBOL-11 and produce the same results.

The compiler is not quite complete although it presently will
compile and execute a large number of COBOL test programs which
exercise most of the language features.

We expect the WATBOL-11 compiler to be available for distribution
on or before January 1, 1976. Initially it will be available
under the RSX 11-D and RSX-11M operating system. It is expected
that the compiler will require about 24K of memory for the
smallest configuration and will accept at least a 200 statement
COBOL program. Of course the number of statements is highly
dependent on the size of tables and the number of files used.
The compiler memory requirements can be expanded and as a
consequence improve the performance in terms of both speed and
size of program. A monitor is also being implemented which will
allow a mixed job stream of WATFOR-11 and WATBOL-11 programs to
be executed.

The distribution package for WATBOL-11 is not yet available. It
is planned to distribute WATBOL-11 as a set of object decks on
either DECTAPE or RK05 disk. These decks are then built into a
task by the receiving installation. The object decks will include

WATBOL-11 compile-time and execution-time routines and the
conversion, comparison and arithmetic run-time support routines.
These last three items are from the Digital Equipment Corporation
COBOL object time system. By including them the compiler is
independent of the various versions of the operating systems
under which it is implemented.

The WATBOL-11 compiler will be leased on an annual basis. Although
the lease fee has not yet been decided we expect it will cost
about the same as WATFOR-11.

digital INTEROFFICE MEMORANDUM

TO: Distribution

DATE: September 8, 1975

FROM: Gordon Bell

DEPT: 00D

EXT: 2236   LOC: ML12/A51

SUBJ: ASR CAPABILITY--WHAT IS IT?

I'd like to know how ASR's are used.

Do users keep the tapes? How long? Is the tape just a kludgy
way to do editing? To get more throughput through a line?
To pay less charges?

What I'm driving at is--why can't we build in page editry
with say 4 to 8K bytes of RAM storage to hold the page and
serve 90% of the ASR market? (This would solve the TWX and
internal DEC network problems for example.)

GB:mjk

Distribution

Ed Corell
George Friend
Al Huefner
Andy Knowles
Roy Moffa
Bob Puffer
Mark Sebern
Tom Stockebrand
John Wolaver
Mike Wurster

digital INTEROFFICE MEMORANDUM

TO: Ron Ham
        Pete Van Roekens

CC: Larry Portner

DATE: September 8, 1975

FROM: Gordon Bell

DEPT: OOD

EXT: 2236   LOC: ML12-1

SUBJ: <u>DMS/11</u>

Is DMS/11--a Data Base Management System for the PDP-11 by R.
Hochsprung, as presented at the Fall 1973 DECUS--useful to our
DMS/11 planning?

GB:mjk

digital INTEROFFICE MEMORANDUM

TO: Steve Teicher

CC: Dick Clayton
        Rob Van Naarden

DATE: September 9, 1975

FROM: Gordon Bell

DEPT: OOD

EXT: 2236   LOC: ML12/A51

SUBJ:

What are you thinking vis a vis a WCS and user ROM microprogramming?

GB:mjf

D I G I T A L   INTEROFFICE MEMORANDUM

SUBJ: DATE CHANGE--LARRY ROBERT'S VISIT   DATE: 09-09-75
                                                  FROM: GORDON BELL
                                                  EX: 2236
                                                  MS: ML12-1/A51

* *

TO: FILE

* *

CHANGE IN MEETING NOTICE

To: Distribution

Larry Roberts, President of Telenet, will now visit us on
October 24--many of you were going to be out of
the country on October 1.

        October 24, 1975
        Time: 10:00 AM until 3:00 PM
        My office

Purpose: to convince us that an interface to Telenet is an
           important and profitable product.

There are three areas of interest that I believe are being
attend to already:

1. 10 interface via DAS10.
2. Communications products.
3. Standard networks or other products (e.g. RSTS).

Please arrange to have a spokesman from one of these areas in
attendance (e.g. Pearson, Alusic, Teichholtz).

I will attend:--

I will represent:---

GB:mjf

Distribution

Don Alusic   Stan Olsen
Bob Klein   Stan Pearson
Irwin Jacobs   Nat Teichholtz
John Leng   Larry Wade
Julius Marcus   Stu Wecker

D-I G I T A L   INTEROFFICE MEMORANDUM

SUBJ: MEETING NOTICE--10/2, LASER-SCAN LI   DATE: PAGE   1
                                                         09-09-75
                                               FROM: GORDON BELL
                                                     EX: 2236
                                                   MS: ML12-1/A51

* *

TO: FILE

* *

MEETING NOTICE

To: Distribution

Mr. Street, Laser-Scan Limited, will be visiting us on October 2. The attached letter will explain his visit and more information will be coming.

Pending Mr. Street's confirmation, the meeting will be held:

      Date: October 2, 1975
      Time: 1:00PM
      Place: My office

I will attend:--

I can't make it:--

GB:mjf

Distribution

Leo Bennett
Ed Corell
Len Halio
Bill McBride
Mark Sebern
Tom Stockebrand--host
Phil Tays
Ed Vrablick

LASER-SCAN LIMITED

Registered in England No. 966312
VAT No 213 8605 79

Tel: 0223-69872/4
Telex: 817346

Cambridge Science Park, Milton Road, CAMBRIDGE CB4 4BH, ENGLAND

AUG 28 1975
8-36

13th August 1975.

Professor C.G. Bell,
(V.P. Engineering),
Digital Equipment Corporation,
Maynard,
Mass. 01754, U.S.A.

Dear Professor Bell,

I hope you are well. You may remember that some time ago we
met when you visited the Computer Laboratory in Cambridge, and
saw the HRD-1 as it then was. At the time you were quite
interested in this equipment for your own purposes, but
unfortunately, we were too late for particular provision which
had just been made to obtain micro-film equipment.

As I shall be in your area during late September, I would
very much welcome the opportunity of visiting your establishment
and discussing with you some of the possibilities for our
Company and its equipment as they now stand.

The earliest date on which I could visit you would be Friday,
26th September, but preferably it would be during the following
week, say between October 1st and 6th.   1 & 3 OK

I do hope you can give me two alternative dates at either end
of this period, which would suit you.

Yours sincerely,

Graham Street

G.S.B. Street
Director.

Handwritten margin notes:
I've reserved time on 10/2 1:00 & lunch say 3+ hrs with someone to host him!

Please let me know the arrangements so I can alert some of our people. Also, please send product update information!

OK is P.M.

let's to discuss

Stamp:
G. BELL
PAGE FARM RD.
LINCOLN, MASS. 01773

Handwritten list:
Visitors
Stocky
Bennet   Sebern
Krablin
Halio
McBride
Tays
Correll

O. R. Frisch OBE FRS   C. R. Peter (Managing)

```
            TT
VO⊕            MOT E
LASERSCAN CAMDG
00002 DEC CH
KZ

  PPRR 1321 09-SEP  25371 1319  POASEP
MP30 FORN


ZCZC
817346 - ENGLAND
MSG NO NA31

TO:  G M STREET - DIRECTOR
     LASER-SCAN LTD.
     CAMBRIDGE SCIENCE PARK
     CAMBRIDGE , ENGLAND
     TELEX NO. 817346

I RESERVED TIME ON OCTOBER 2, 1975, AT 1:00 P.M.  PLEASE LET
ME KNOW THE AREAS YOU WOULD LIKE TO DISCUSS SO I CAN ALERT SOME
OF OUR PEOPLE.  ALSO, PLEASE SEND PRODUCT UPDATE INFORMATION.

FROM:  GORDON BELL - DIGITAL EQUIPMENT CORPORATION
       MAYNARD, MASS, U .S.A

REGARDS
J
NNNN
NNNN



     D
LASERSCAN CAMDG
```

SEP 9 I 57 PM '75

digital INTEROFFICE MEMORANDUM

TO: Distribution

CC: OOD

DATE: September 12, 1975

FROM: Gordon Bell

DEPT: OOD

EXT: 2236   LOC: ML12/A51

SUBJ: DDCMP, et al STANDARDS

In talking with Adm. Haak, who buys and installs computers for the Navy, his group strongly suggested we nominate DDCMP and the network protocols as standards to ANSI and CBEMA.

What can we do here? What do you think? Nat, will you come forth with a proposal or statement?

GB:mjf

Distribution

Larry Portner
Nat Teichholtz
Larry Wade
Stu Wecker
Pat White

digital INTEROFFICE MEMORANDUM

TO: Ron Ham
      Larry Portner
      Pete Van Roekens
      Larry Wade

DATE: September 12, 1975

FROM: Gordon Bell

DEPT: OOD

EXT: 2236   LOC: ML12/A51

SUBJ: <u>PROGRAM CONVERSION</u>

In visiting US Navy people, they were concerned about conversions of programs from IBM and Honeywell. There's a major problem when DBMS-type systems are used, since these contribute to incompatibility.

Can we: What's the thinking here?

GB:mjk

digital INTEROFFICE MEMORANDUM

TO: Distribution

DATE: September 12, 1975

FROM: Gordon Bell

DEPT: OOD

EXT: 2236   LOC: ML12/A51

SUBJ: INTERESTING PERSPECTIVE ON OP.SYS.MODS

In talking with people from the Navy, they stated they forced a vendor who had benchmarked a system and given a certain performance, to give free hardware when the Op.Sys. had been enlarged and the performance decreased.

GB:mjk

Distribution

Pete Conklin
Dave Cutler
Roger Gourd
John Levy
Larry Portner
Larry Wade
Pete Van Roekens

digital INTEROFFICE MEMORANDUM

TO: Jim Bell   DATE: September 12, 1975
       Mark Sebern
       Stu Wecker   FROM: Gordon Bell

CC: Andy Knowles   DEPT: OOD

                                       EXT: 2236   LOC:ML12/A51

SUBJ: CONSULTING WITH UMASS VIA HAROLD STONE

Since Harold Stone consults for HP, we should be careful with our own interaction with him. Are we going to, or do we want to build a relationship with him?

GB:mjk

digital INTEROFFICE MEMORANDUM

TO: Distribution

DATE: September 12, 1975

FROM: Gordon Bell

DEPT: OOD

EXT: 2236   LOC: ML12/A51

SUBJ: LASER PRINTERS

HP has taken licenses with Canon and Spectra Physics (?) for their printers. The copies are pretty. IBM is apparently working like crazy too on this.

I believe these all require a dry photographic process. What have we thought about here?

Should we get together to see what is known? Wouldn't Polaroid be the ideal company to work with?

GB:mjk

Distribution
Jim Bell
Ed Corell
Bob Puffer
Ken Olsen
Mark Sebern

D I G I T A L   INTEROFFICE MEMORANDUM

SUBJ: DEC HANDBOOKS	PAGE 1
	DATE: 09-17-75
	FROM: GORDON BELL
	EX: 2236
	MS: ML12/A51

* *
TO: FILE
* *

To: Distribution

SUBJ: PRICES AND STRUCTURE OF OUR HANDBOOKS

I keep getting promises from my friends in academia who teach
the PDP-11 to stop buying it because the manuals are numerous
and expensive.

Dan siewiorek, Professor of CS at CMU, wrote a book to explain
the PDP-11 (and data structures), but recently called me when the
price to students go to be $14 ($4.50 for processor handbook and
$9.50 for CAPS).

If the costs are indeed this high, can we give universities the
plates to reprint them? Are we modular at the wrong level? Will
new language and command standards help make the fabrication, etc.
easier? Aren't we better off being less modular here? Is
microfiche a possibility?

Is this just a problem in our small EDU market? Are there other
quantity users?---
Who's responsible for manual structure planning
and pricing?--------------------------------

I view that this was only solved once in the old PDP-8 handbook
that had everything. Now we've blown it there.

GB:mjf

Distribution

Dick Clayton   Ed Kramer
Dick Eckhouse   Ken Olsen
Bob Gafford   Larry Portner
Win Hindle   Charlie Spector
John Jones   Larry Wade
Oleh Kostetsky   Gerry Witmore

To my knowledge, there's only been 1 study on the subject of   01760
performance for editors. Ken King has a copy of the results,
but it looked roughly:

1. For text input, nothing matters

2. for editing the tube is best by X2--point to the stuff
    rather than describe where it is.

3. for string edits, TECO gets about 30% over others due to
    terseness--etc.

4. The string editors, SOS, QED, the multics editor are all about
    the same for corrections.

Also, there's a problem for doing text typesetting in a coherent,
formatted way.

Where are we going here? Can I see a plan/statement of problem?
Who's driving it?   Given that we're understaffed by 30% in
languages, why are we looking at a new editor?

It would also be nice to have a standard syntax for the editors
we have that are implemented across machines and systems: the
SOS, TECO, VTED, NEW-edit? What's happening on this?

GB:mjf

Distribution

Peter Conklin
Jack Gilmore
Ron Ham
Tom Hastings
Ken King
Larry Portner
Pat White

* *
TO: -OOD   ----
* *

SUBJ: OOD STAFF AGENDA--9/4/75

10:30   Review Minutes

10:35   Review agenda

10:40   Product Line Mgr. Dinner Meeting   Portner

11:00   Business Plan Review Procedure   Laut

11:30   Product Managers Review
            Job description   Abbett
            Green Sheet   Portner/Clayton
            Overall organization perception   All

12:15   Assignment of Best/Noelcke   Puffer/Clayton

12:30   Role of OOD Secretary (rotation)   All

            FUTURE AGENDA ITEMS

When do we want to finalize capital & operating budgets?

9/11   OOD-MKT Committee interface   (40 min.)
9/11   Sales meeting (especially Spain) (10 min.)   Clayton   6453 2
9/11   Status of microprocessor project (15 min.) John Hughes   24682
9/11   What is our affirmative action status   Abbett
            and what problems are key for   out til next week
            next 12 months   (30 min.)   Lega-
9/11   What is PDQ status and what have   Demmer   Bob Hay
            we learned?   (15 min.)

9/18   What is the purpose, form, and content   Puffer/
            of the upcoming MIT lecture   Cronkite
            series?   (30 min.)

9/18   What is 3 year serial bus   Bastiani/
            strategy?   (20 min.)   Clayton

SUBJ: AGENDA/MINUTES OOD   DATE: PAGE   2
                                                                09-04-75
                                               FROM: DICK CLAYTON

9/18   What is resolution of DEC 20   Lens/   *out*
         memory strategy   (20 min.)   Lemaire

9/18   OOD space guidelines   (60 min.)   *↓ 9/25*

9/25   Report on in house 2 year PDP-11 usage   Computer
         strategy.   Resource Co.

9/25   QCMS defect reporting system   Smith/Pecore

Sept.   Is there a field integration plan yet?   Smith/Shields/
                                            RC/RP

Sept.   Honoraria Policy   Bell

10/9   Is there a formal action plan that   Shields/
           allows follow up on field oriented   Minezzi
           product safety problems?

Oct.   Block mode strategy resolution   Marcus/Portner

?   Is action on ECO control called for at this Marcus
           time?

?   What is happening to make systems a reality Clayton
           in the way we do business?

Expected attendance at OOD meetings:

	GB	LP	RP	RC	PL	MA	JM	HL
9/04	X	X	X	X	X	X	out	X
9/11	out	out	X	X	X	X	X	X
9/18	X	X	out	X	X	X	X	out
9/25	X	X	X	X	X	X	X	X
10/2	X	X	X	?	?	X	?	X
10/9	X	X	X	X	X	X	X	X
10/16	X	?	X	X	X	X	out	X
10/23	X	X	X	?	X	X	X	X
10/30	X	X	X	X	X	X	X	X

KEY MANAGEMENT ISSUES

(O.C. Agenda)

Sept 11, 1975

01770

Terminal Strategy **	Knowles/Puffer	Decided, managers needed
Discount Policy	Johnson/Michels	In process
Software Business Strategy	Johnson/Portner	In process
? Memory Strategy	Johnson	Partially decided
Competition with OEM	Hindle/Long	Awaiting write-up
Low Cost Selling Strategy	MC	In process
Transaction Processing	Portner	In process
IAS	Portner	Open
Marketing Function *	MC	Stalled
Mil Spec 11	Clayton/Buckley	Dick owes alternatives
Low end printer	Stockebrand/ Correl)	September 1
Low end CRT **	Gale, Halio, Sebern	Open
Product Line/Field Org. *	OC	October Woods
Red Book Update	Bell	Open
Commercial Product Strategy	S. Olsen	Open
? Combined 11/70, VAX & 2040 Strategy (Mkt. — assigned to Levy / Hindle / Carnes)	OC	Open

9/16

* *

FUTURE AGENDA ITEMS

Catalog GMO Review	Knowles	March 76
Mid & Large Operating System Strategy	Bell	Open
DEC Tablet	Johnson	Open
Industrial OC Concerns	Vachon	Open
Central Vs. PL Software Dev.	Portner	Open
MC/OOD Interface	Laut/Thompson	Open
Company Chaplin/Shrink	Burke	Future Woods Topic
Organization-how to avoid 15 layers	All	Future Woods Topic
Benefits Overview	Bornstein	September
Test of Space Assumptions	Crouse/Thompson	Open
High Potential People & Quarterly Letter Items	Burke	November Woods (with interim discussions)
Info Sent to Field	All	September 22

3/12

digital

INTEROFFICE MEMORANDUM

01771

TO: Gordon Bell

DATE: September 10, 1975
FROM: John Fisher
DEPT: Administration
EXT: 4515
LOC/MAIL STOP: ML 12/1 A-50

SEP 11 1975

SUBJ: MID & LARGE OPERATING SYSTEM STRATEGY

At the Woods Meeting we held at Stan's home you agreed to
return to the OC with a strategy for holding together
Mid and Large Operating Systems Strategy. I continue to
carry this as a future agenda item for the OC and I sense
that there are many people, including Marcus, Portner,
Clayton, etc. who feel it needs to be resolved. Where should
be go from here?

SUBJ: INTERACTION OF OOD AND MARKETING COMMITTEE — Aug 26
(Phil / Bill)

I am still waiting for your writeup of how the OOD and MC should
play together in making Corporate Product/Market decisions. This
was requested by the OC some months ago and I believe it is of
significant importance that we should consider its publication as
a "Green Sheet". Today, I don't think anyone in DEC could explain
clearly and simply how we decide on designing and introducing a
new product.

SUBJ: CHEAP CRT (Stan Bob / Dick) — Aug 26

At the last Woods Meeting there was consensus of the pressing need
for a cheap CRT. Gale, Halio and Sebern were going to set up
a special study group to make this happen. Also, at the 8/25
OC meeting, Puffer explained that he is looking for a new Product
Manager to drive this. Andy is looking for a strong Marketing
Manager to define a winning market strategy. Apparently there
is much confusion about where we are going and the study group
which you promised to set up has never materialized. You will
recall Ken's feeling that genius was necessary to pick a unique
product strategy, and I think everyone was hoping that this might
come out of the Gale/Halio/Sebern team.

Should we continue to push for this?

| TO: | Gordon Bell | ML12-1/A51 |
| | John Fisher | ML12-1/A50 |

DATE: September 4, 1975
FROM: Ken Olsen
DEPT: Administration
EXT: 2300
LOC/MAIL STOP: ML12-1/A50

SUBJ: REVIEW OF 32 BIT MACHINE

In addition to the periodic general reviews of all major projects with the Operations Committee, I think we should spend a half hour or one hour on specific projects.

I think it is time that we spend a half hour on a casual review of the 32 bit computer. Will you schedule a review of this soon?

I think this should be without slides, flip charts, or formal presentation, but should be just a casual review of what has been going on. In general terms, we should know how long it will take, what impact it will make, whether it will wipe out the PDP-10 or will the PDP-10 wipe it out, or whether the two can live compatibly forever. We are particularly interested in how compatible it is with the PDP-11 software.

It seems to me that our original goal was to make this machine, 1) compatible with the 11, and 2) accomplish all the wonderful things that new design makes possible. It will be good to review how we have deviated further from this goal and what we have gained by this deviation.

/ma

digital

September 3, 1975

Professor James Snyder
Computer Science Department
University of Illinois
Urbana, Illinois 61801

Dear Dr. Snyder:

We sadly regret the death of Professor Don Gillies of your department--
a pioneer computer scientist, who has been active throughout the life
of computing. His students (here) remember him as really bright and
inspiring. I enjoyed the interaction with him on his Pascal language
work.

It is therefore with mixed feelings that I enclose a check for five
thousand dollars ($5000) on behalf of Digital Equipment Corporation to
be used for an annual commemorative lecture series. However, we feel
in this small way he can be remembered and computer science learning
can partially continue in his name.

As the details of the series become firm and operates, we would like
to follow it.

Sincerely,

Gordon Bell
Vice President
Office of Development

GB:mjk
cc: David Kuck
Enclosure

PAGE   1
SUBJ: FPLA'S FINALLY   DATE: 09-23-75
                                           FROM: GORDON BELL
                                           EX: 2236
                                           MS: ML12/A51

* *
TO: FILE
* *

To: Distribution   F/U 9/30

It just occurred to me that these devices which are now being
introduced offer an interesting alternative to what would
have been random logic on PCB's. They offer lots of interesting
alternatives to conventional ROM's too.

Is anyone thinking about some of the uses?

Who can carry out an analysis to see if it works as a means of
affecting testability, stocking, PCB area reduction?

Could we get a seminar here to expose and recommend?
Who should do it?

GB:mjk

Distribution

Engineering Managers
Bob Armstrong
Michael Depeyrot

SUBJ: DATA BASE/5100   DATE: PAGE   1
                                                  FROM: 09-25-75
                                                  EX: GORDON BELL
                                                  MS: 2236
                                                              ML12/A51

* *

TO: FILE

* *

Subj: ALL THOSE TINY DATA BASE PROBLEMS CAN BE DONE ON A 5100

To: Distribution

The IBM hardware language, and interface, is ideal to tackle
all those tiny, turnkey data-base applications that there are
millions of:

1.   Pharmacy record control
2.   Doctor's office
3.   Dentist's office
4.   Simple tax form filling out.
5.   Automobile pricing, financing, etc.
6.   DEC field office inventory, computer configuring.

How will they go about doing applications and selling it?
Will distributors spring up? People who sell fixed applications
programs?

GB:mjk

Distribution

Operations Committee
Product Line Managers
Jerry Todd

01777

D I G I T A L   INTEROFFICE MEMORANDUM

SUBJ: ROM MICROCODE   DATE: 10-01-75
                                                FROM: GORDON BELL
                                                EX: 2236
                                                MS: ML12/A51

* *

TO: FILE

* *

Subj: INCREASING SIZE OF ROM MICROCODE ON PDP-11'S VERSUS TIME

To: Distribution   F/U 10/10

It's clear we've really (in retrospect) missed opportunities
to easily mid-life kick all our processors as bipolar ROMS have
gone from 1K to 2K. Now when they go to 4K (1 to 2 years) can we
easily retrofit, to get double the microcode in the same board
space without retooling, etc?

Lloyd Dickman is putting the VAX string stuff in 11/03. Are these
candidates for 45, and 70 (which don't yet have the new 2K ROMS)?

Are there other operations to help these machines now?

Should we conscientiously plan this on new designs...it's only an extra
bit in micro PC?

Please comment.

GB:mjf

Distribution

Bob Armstrong
Jega Arulpragasam
Dick Clayton
Ed Corell
Bill Demmer
Lloyd Dickman
Duane Dickhut
Len Hughes
Chuck Kaman
Bob Kirk
Jim O'Loughlin
Steve Rothman
Al Ryder
Bob Stewart
Tom Stockebrand
Steve Teicher
Mike Tomasic

digital INTEROFFICE MEMORANDUM

TO: OPERATIONS COMMITTEE

DATE: September 22, 1975

FROM: Gordon Bell

DEPT: OOD

EXT: 2236   LOC: ML12/A51

SUBJ: IBM 5100

Attached are the handouts submitted for the Operations Committee meeting today regarding the above subject.

GB:mjk

Wants

0. who's doing compet. Eval. — 5100?   01787

1. Hardware — level

{
  VT5X ———————→ VT5X Repackage $ } Integrated
  +   ↑   } +
  Table top Cab ——→ J.C. integrated tube } new VT5X
  (AK)
}
  └── now ──┘   OR

OR

  ┌── ──┐
  VT5X ————————→ VT5X Repackage (dumb)? } Modular
  Table top ————→ Complete module package. }
  Cab (AK)
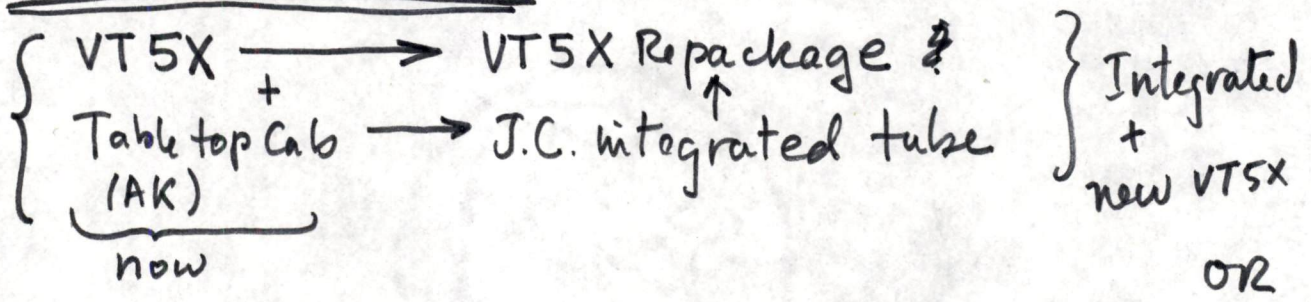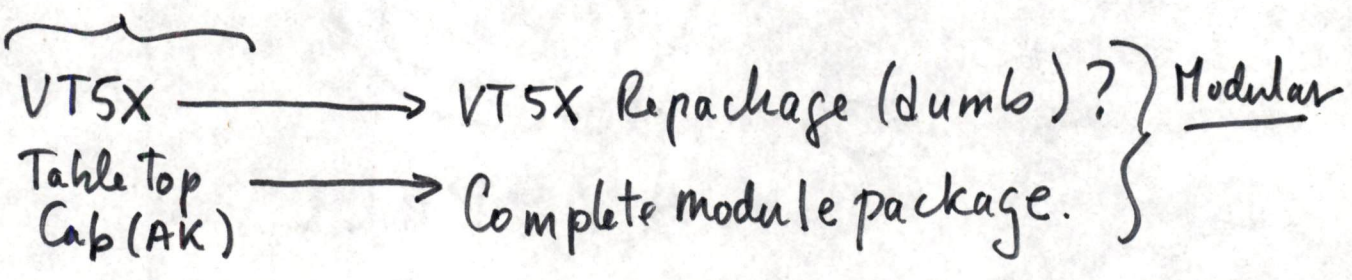
- Tube sizes.
- 1 Floppy vs 2 in basic pkg. gets size down.

2. Software — level.

   - Evaluate 5100
   - Move to clean $up / simply RT interface

3. Applications

   - Concerted / co-ordinated effort.

4. ~~application~~ Specific
      VT61 vs (VT52 + LSI-11)

5. Program MGMT.
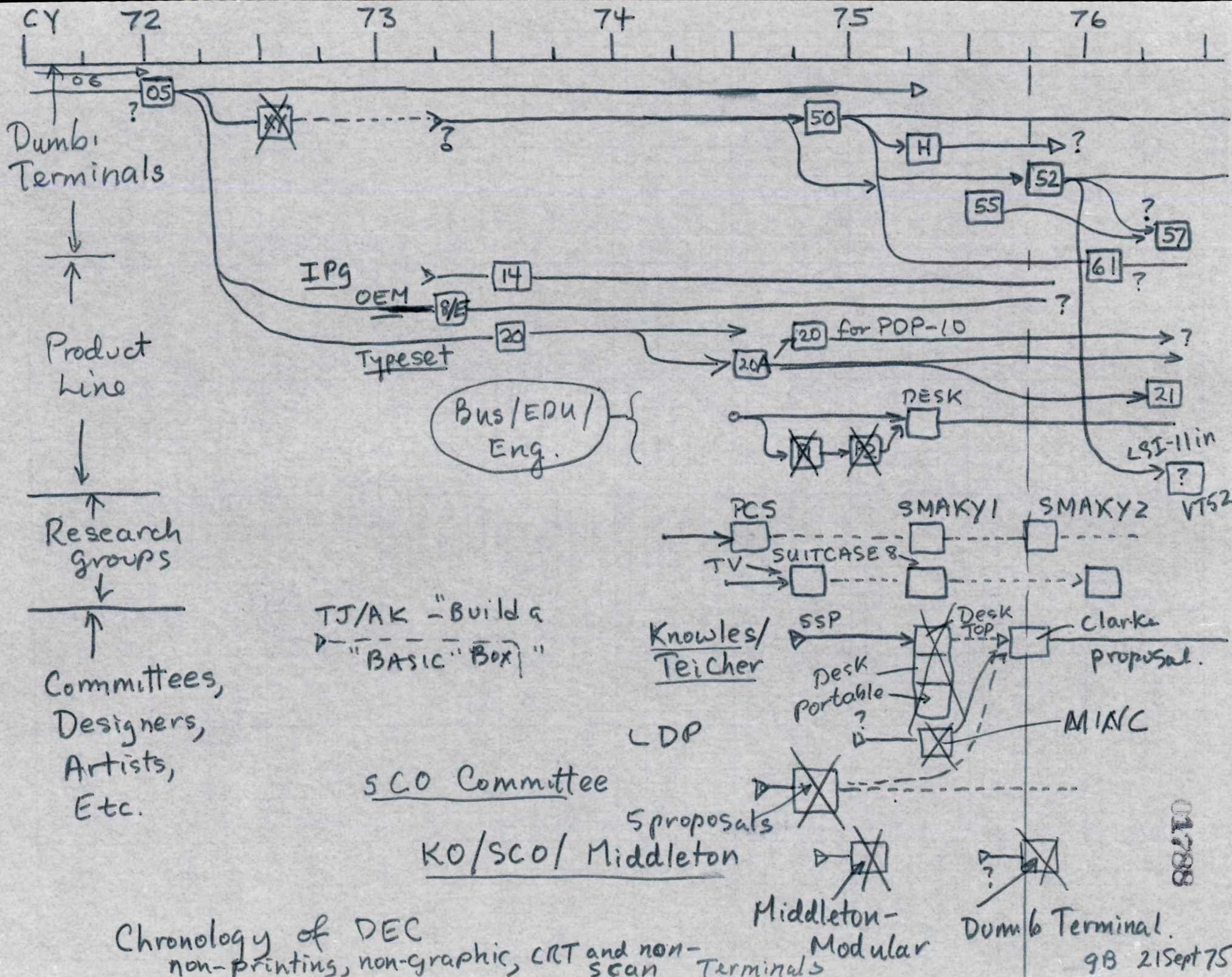
Chronology of DEC non-printing, non-graphic, CRT and non-scan Terminals

GB 21Sept75

Hardware level ↑↓

Basic Software level ↓

Basic use for program. level. ↓

Use.

Package base.

Process-or	Memory Pri. Sec.	Human I/o Keyb.	CRT/ Print	Links comm.	Other

} eg. Clarke

Op. Sys. Base.

Languages L_1 .... L_8	Files	Commands	Other.

} eg RT-11 + languages

Language Library (sub's) (for various uses.	Utilities (eg. Editor)

← Basic tools.

} Current DEC position

Problem Solution Programs

← Market-oriented tools (still requires programming)

← Solution tools

(Use.)

Applications-oriented
Applic.-oriented
Languages
Op.
HDW
Sys.
Library (sub)
Solution tools.
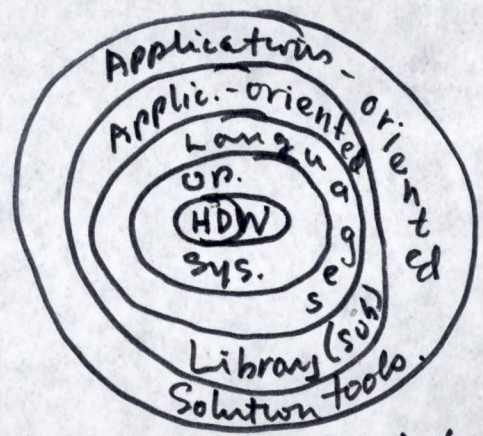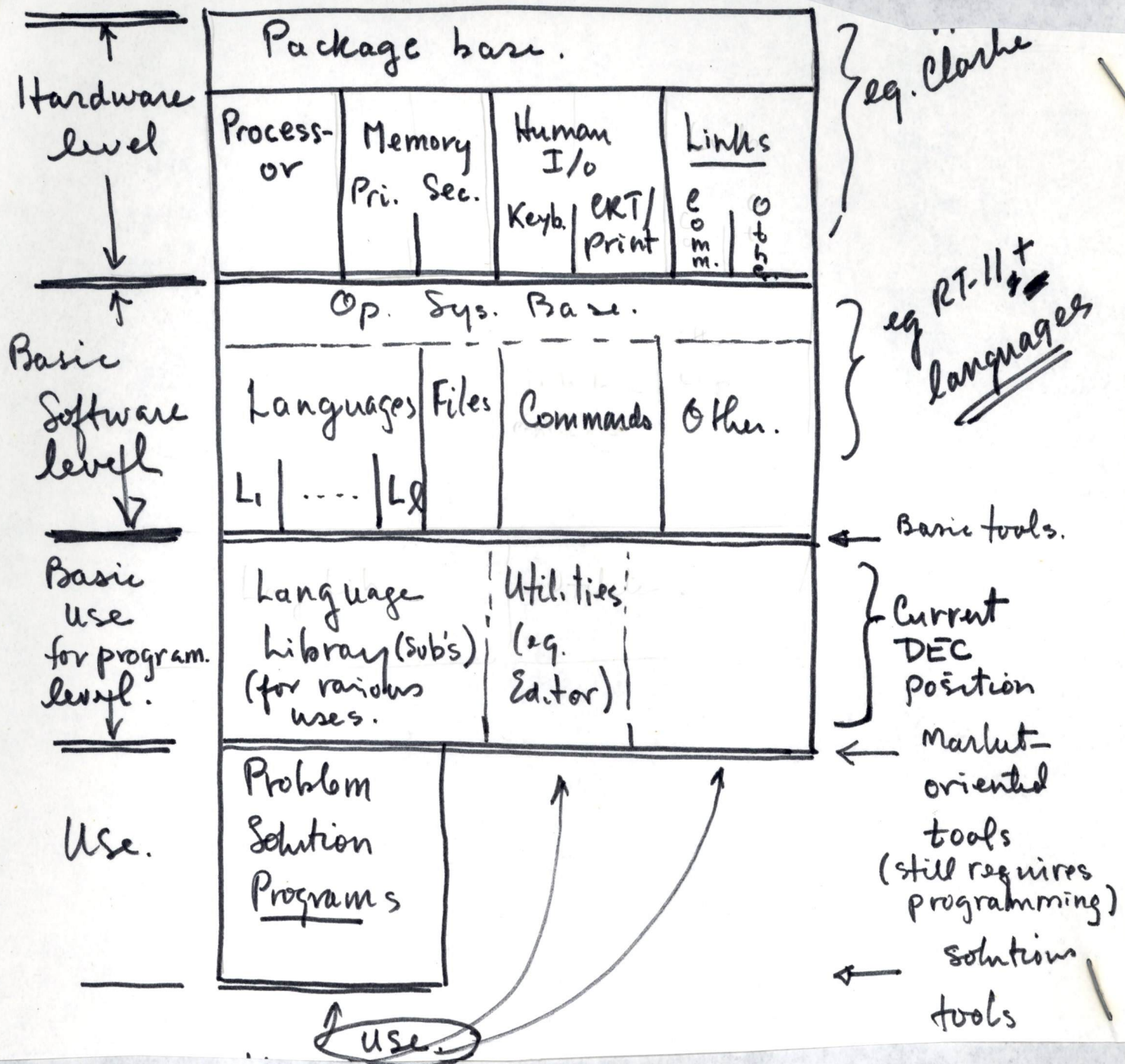
Levels of Machines - Partitioning

g.B 21 Sept 1975

	IBM 5100		DEC
Price		<	Does it matter?
Package	Portable; a bit big to move. Too big to move if programming (i.e. extra tape, printer).	>	Movable in small area. Can't be moved by programmers Small floppy makes ≡ possible in >2 years.
Service	?	>	Possibility exists for "user" replacement of modules.
Desk-top size	Still big.		VT5X is big; LA36 is fine. Modular or smaller CRT would get us a lot.
CRT graphics	Small No upper case?	= <<<	Good sized. Could help us vis a vis word processing. VT57 would give plotting Clarke's is extensive
Hard copy	Printer 60#	< =	Copier + printer Bigger for printer
Keyboard	Overlays may help	=	
Processor + Performance	? (Could be a very fast 16-bitter, i.e. 6 micro-s/16-bits discussed)	=	PDP-11 (enhancements for F.P. + strings would help)
COMM interface	2741 This could give a way to other i/o	<	We have more--not clear about support.
Other i/o	Not announced. Clearly not needed.	<	We have lots.
Processor features	? ?	< <	Interrupts permit real time i/o and; multiprogramming (for multi-terminals)
Primary Mem. RAM ROM	Up to 65K bytes (in 2K chips) >65K bytes?	= >	65K bytes This could give us trouble!
Secondary Mem.	Tape Slow--90 sec. worst case.	< <	Floppy We could get a user throughput of >10∿20% ∴Showing high productivity Enables Virtual Memory (potentially)

APL	YES (CLAIMS 4X SPEED UP OVER COBOL FOR BUS.) >	? AT OMSI
BASIC	YES >	NOT CLEAR HOW OURS STACKS UP? LIBRARY?
COBOL	--	COULD PROBABLY GET
DIBOL	-- <	YES--HOW WELL DO THE 90% OF THE WORLD'S) PROGRAMMER'S (COBOL) TAKE TO IT?
MINI-COBOL	-- >	ARE GETTING. DO WE WANT IT?
EDITOR	?	
FOCAL	<	GOOD APPLICATION LIBRARY
FORTRAN	<	WORLD'S SECOND MOST POPULAR LANGUAGE.
MACRO		YES...BUT FOR WHAT CLASS OF APPLICATIONS
PASCAL		YES--COULD GET
RPG		YES
AS A TERMINAL	2741	WE COULD

GB
9/22/75

HUMAN INTERFACE	SMALL CRT, REGULAR KEYBOARD WITH SPEC. FUNCTIONS	TYPEWRITTEN COMMANDS WILL PROBABLY BEAT IBM APPROACH. FLOPPY HELPS RESPONSE A GREAT DEAL!
MANUALS		> WE HAVE NONE FOR NOVICE.
POTENTIAL APPLICATIONS	GREAT; BUT SOME-WHAT LIMITED BY TAPE AND POSSIBLE LACK OF LOWER CASE. APL WILL RAISE LEVEL OF COMPUTING	> PORTABLE AND APPLICATIONS
	? ? KEYPUNCH REPLACE	< REAL TIME MULTIPROGRAMMING. < MULTI-TERMINAL ≈

IBM 5100 RESPONSE

Re: Operating System (i.e. RT-11),
Languages and
Human Interface

1. System Startup

   A. Operation

      ● Thumbwheel selection of language or root system or application program on media, i.e.,

note extensive languages

BASIC
APL — — FORTRAN
SYSTEM — — FOCAL (?)
APPL — — DIBOL (?)
PGM /OTHERS(?)

Editing (ie word processing)
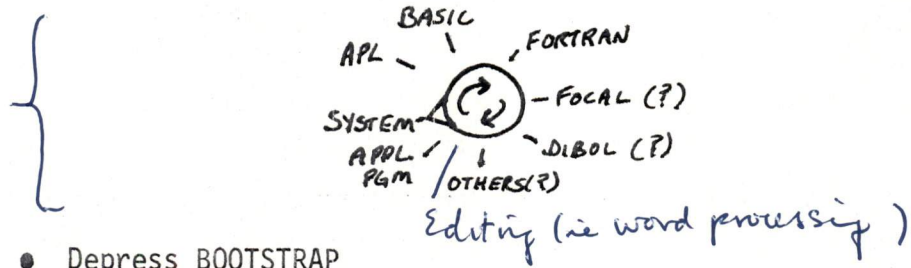
      ● Depress BOOTSTRAP

      ● Selection sets bits on bus accessible to bootstrap which loads requested module (or error halt)

      ● Machine now set to environment selected

      ● ? Allow chaining to another environment, or require re-boot? may allow some options depending on floppy space and/or other configuration parameters.

      ● ? Automatic setting of keyboard interpreter to language/system selected? (i.e., APL keyboard, function keys?)

   B. Cost/Schedule

      ● Should be fairly trivial, straightforward modifications (S/W guess on H/W); 1 month

2. User Command Language

   A. Description

      ● Current RT-11 unacceptable
      ● Need English language, straightforward set
      ● Could be function keys, or keyboard entry
      ● Might permit access to RT-11 if user-selected at bootstrap
      ● Key point - no new knowledge required to understand commands
      ● Proposed set:

COPY { A to B
       Floppy 1 to Floppy 2 }

CATALOG   floppy
INITIALIZE floppy
LIST   file ON { screen
                      printer }

MAKE   file
RUN   file
DELETE file

- Editing performed within language processor and/or separate editor program (thumbwheel select?)

B. Cost/Schedule

- Currently planned RT-11 development (44K) to support ICLS subset targeted for summer 1976 release; could bootstrap off that effort; 3-6 months.

3. File Structure

A. Description

- RT-11: contiguous, for fast access; other organizations not necessary due to lack of large on-line storage capacity.

- File allocation mechanisms might be altered slightly to lessen load on novice user; system overrides provided for more sophisticated type.

B. Cost/Schedule

- Trivial; 1 month.

4. Error Diagnosis/Reporting

A. Description

- Must be English language messages (possible message + number to look up).

- Fixed reaction to H/W - system errors anticipated (e.g., power fail, memory parity, unreadable block on floppy).

- Possible "on-line diagnostics" as part of system floppy - automatically loaded and run at bootstrap (or optional), or loaded and run in response to error.

B. Cost/Schedule

- Small ──▶ significant depending on capability selected; may have payoff in support cost control; 1-6 months.

5. Root Operating System

A. Description

- RT-11 Single Job with additional interfaces to avoid user access to system capabilities (or perhaps available on direct request).

- More/different system functions resident (depending on memory available) to provide correct performance mix (see below).

- Prefer rewritten, new root O/S with "zero-defect" goal-achievable due to reduced complexity/functionality.

- Eventual goal of ROM-ing, and optioning subset functionality.

- Integrated communications? with RT-11 F/B?

B. Cost/Schedule

- Trivial ——▶ 1 man year for new product; 1-12 months

6. Languages

A. BASIC

- Use BASIC/RT-11 (or "common kernel" with O/S interface) need to specialize to configuration, revise error messages.

- BASIC/RT-11 - incremental compiler with "desk calculator" mode; has optional string capability (need 16K); supports CALL, overlays, chaining, sequential and virtual memory files; supports display processor (16K).

unique

- Proposed "ROM BASIC" would provide table-driven interpreter with extendability via
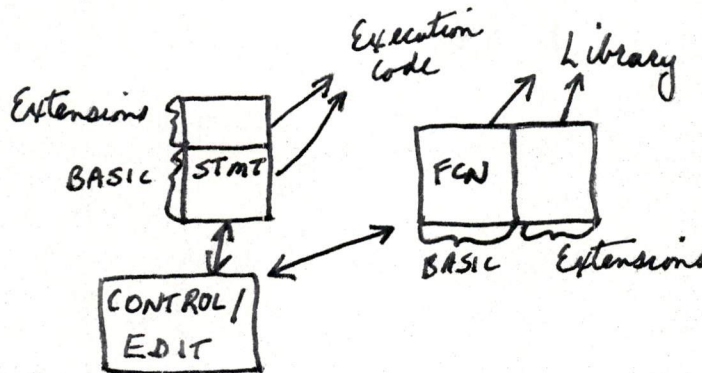
- Used for "immediate mode" and program development.

- Cost/Schedule: Small ——▶ 1-2 man years; 2-16 months.

B. FORTRAN

- Use F4/RT-11.

- F4/RT-11: runs on 8K (16K for string handling subroutines); produces object code directly (threaded - going to in-line integer summer 1976); supports display processor (16K); math and statistical library of functions available.

Basis for quick application programs.

- Need to specialize to configuration and revise error messages.

- Cost/Schedule: Small; 1-2 months

- Used for program development.

C. FOCAL   *(extensive user base / library)*

- Use FOCAL/RT-11.

- FOCAL/RT-11: based on FOCAL/PTS with support of RT-11 file structure; double precision (16K).

- Need to specialize to configuration and revise error messages.

- Used for: "immediate mode" and some program development.

- Cost/Schedule: Small; 1-2 months

D. DIBOL *(How well it known? How easy to pick-up if a COBOL programmer?)*

- From COS-350 system.

- Need to separate language processor from system, and review COS-350 text editor, sort/merge, linker, PIP, librarian, and FILEX in context of alternative O/S functions; may want to lift entire system and review user interface for possible modification at this level; also restrict F/B capability, multi-user capability?

- Used for program development.

- Cost/Schedule: Small ⟶?; 2-? months.

E. APL

- From OMSI (OEM/LDP/ECP/EPG buy-out).

- OMSI/RT-11: will support APL as well as standard keyboard; DECsystem-10 compatible; double precision; memory overhead and implementation techniques unknown; EIS/FIS might be good ⟶ very desirable ⟶ required (?).

- Used for: primarily interactive (due to power of language) with some limited program development.

- Cost/Schedule: probably small (runs under RT-11); 1/1/76 RT-11 version available to DEC.

F. Mini-COBOL

- Not needed if DIBOL?
- Necessary for Federal Government?

G. RPG

- Desirable due to large user community of experience.

- Parameterized execution of fixed program cycle fits system concept nicely.

- Would provide super competitor to very small System/3 and 360/20 systems.

- Why didn't IBM provide? Too much impact on installed base? Will it be coming soon?

- Used for: program execution ($\approx$ program development)

- Cost/Schedule: unknown

H. PASCAL, PL1, ALGOL, etc.

- Too limited to justify investment? Handle via DECUS?

7. Utilities

   A. SORT/MERGE

   - Useful in commercial environment, but RT-11 file structure and lack of large capacity on-line storage minimizes.

   B. Editor

   - BASIC, APL, FOCAL, RPG - no (part of language processor); other languages require one; might separate system products around this sort of function.

   C. FILEX/PIP

   - May need some capability for floppy media interchange among systems from other vendors (and other-than RT-11 DEC systems)

   D. Linker

   - Only for versions of this product sold to computer-familiar customers; too much new knowledge for new users.

   E. Librarian

   - Not for this product.

   F. On-line Debugging

   - May need some capability in selected products (i.e., only for certain languages).

   G. System Patching

   - Not for end user, only by DEC persons (on service call)? tied to support questions.

   H. Prompting/"Help" Files

   - Desirable⟶necessary; also depends on documentation available.

8. Documentation

   A. Description

   note this should material should be substantially "System + paper posed for programmed learning

   - System tutorials, example-oriented.
   - Language tutorials and/or reference? language-specific; potential costly investment.
   - System Managers Guide: high level, for multi-purpose system; also for product promotion.
   - System internals for software support and sophisticated users.
   - Self-study, Programmed Instruction Text.
   - TV tape

   B. Cost/Schedule: varies.

9. Performance Parameters

A. APL, BASIC, FOCAL - must "feel" fast; perhaps micro-code extensions or EIS/FIS to achieve (or offer 2 versions - one normal, one speed-up).

B. Program development - lengthened compile times acceptable (not frequent operation); lengthened link times acceptable; editing should "feel" responsive and quick for sections of program displayed, but longer access times to source segments OK.

C. Program loading - lengthened load times OK; run-time execution is the measure.

D. File access - floppy access times acceptable for the anticipated file sizes.

E. System startup - from system integrity point-of-view, would prefer mini-diagnostic test before finishing boot, but time to load system and initiate activity may be important (IBM probably "instantaneous").

F. Memory usage - will vary with language used, but probably aim for larger system overheads to increase responsiveness; user programs may displace much, if not all of basic system, retaining only sequencing, chaining, and re-start type functions; memory context will probably change more completely than in typical RT-11 single job systems; ROM-potential needs looking at (fixed-purpose machines?).

Subj: IBM 5100 Response Applications Package   01799

Motivation:

This study is motivated by the IBM introduction of the Model
5100 desktop computer. The primary motivation for this product
may be marketplace penetration -- making sure that the first
computer in a shop is an IBM computer, thus making further
selling much easier. This would indicate that IBM recognizes
substantial growth in the low to mid range computer markets in
the future. Whereas the 5100 does not seem to represent
dangerous competition per se, if the marketing strategy of "first
entry" is correct, IBM could be seriously impacting our future
selling situations, which is a real problem.

If we are to meet this challenge head on we need primarily
to develop reasonable packaged Problem Solver products -- the
major thrust of this section -- and to develop marketing and
selling techniques suitable to this marketplace. Our hardware
components are competitive (e.g. RX01--11/03--VT52). Any minor
differences in the human usability of the RT-based system versus
the 5100 are not highly significant because the vast majority of
the use of such a product will be problem solution and not
program generation. A product based on floppy disk rather than
tape will permit verbose CRT dialogue during problem solution,
and this is perhaps the optimal human interface.

Problem Solving versus Process Implementation

In terms of understanding a response to the 5100 it is
useful to think of the 5100 and System/32 as representing entries
into two areas of low-end computing with very different
requirements. The System /32 represents competition directly
against the traditional minicomputer. The /32 is used to support
business activity and is programmed to conform to the particular
needs of the customer. Digital has chosen to stay out of the
real end-user market here, since this market is characterized by
an extensive service relationship which we are not yet ready to
address. IBM has chosen to support the end-user market and does
this by producing generic application packages for very specific
market areas. The applications represent extensive planning and
research into the given market.

The 5100 represents an entry into a quite different market
characterized by problem solving. This market is certainly
better established than the /32 market, and is characterized by
less expensive solution of the traditional computational problems
-- engineering calculations, numerical analysis, etc. The
markets are very different because the end user in the Problem
Solver market is quite familiar with calculation and knows the
problem area in detail, whereas the /32 customer may be terrified
by computers and actually quite ignorant of the problem area

01800

having left much of it to an accountant traditionally.
Therefore, whereas the end-user /32 market is necessarily
characterized by a service relationship, the 5100 type of market
can be sold on a low sales cost, low service basis by providing
complete solutions to the traditional Problem Solving areas.
This kind of product is what this discussion addresses, not the
/32 type of product.

Complete Product Offerings:

Having a complete product offering may be a critical part of
selling computer systems into this low-end market. By a complete
product offering we mean to suggest a complex
calculator/minicomputer and an application package suitable for a
given market segment -- BioStat, Statistics, Electrical
Engineering, Fiscal, Mathematical, etc.

A complete product would include the machine, very easy to
use complete application programs, documentation of program
operation and basic introduction to the problem area including
cross-reference to standard texts and presentations. The
marketplace significance of complete product offerings is the
ability of a general salesman being able to sell into, for
example, an engineering firm either by a brochure detailing the
programs available, or at least by a demonstration period during
which the prospect is given access to the machine and standard
application materials. The key point is not requiring detailed
understanding of customer operations or extensive customer
education as part of the selling effort. The product should sell
itself and the customer should be able to teach himself the use
of the product with essentially no sales time or cost.

Product Relationships and Customer Migration:

This is a facinating problem. It is reasonable to consider
this a dead-end kind of product in many ways. The greatest
customer "migration" will be due to the Digital sales and service
contact and the natural desire for the customer to continue on
this friendly and fruitful relationship when he wants to expand
his use of computers. The fact that the average entry-level
customer will want to increase his use of computers can be taken
for granted, since computer technology clearly has substantial
price/performance improvement left for the next decade. But
beginning from a 5100 type of product, it is likely that the
growth in computing will not be a simple, continuous process.

The 5100 type of product has substantial bounds of
usability. For example, if such a product is being used for
statistics the pain and agony of entering mountains of data will
be a very real limitation. If we assume that many of these
machines will be sold into offices or labs or organizations that
have bigger computers, then the calculator solution must be more
convenient than the big machine solution. The orientation should

01801

be on suitably small problems for which large scale data entry is
not a major problem. In the case of statistical analysis this
would include problems with a reasonably small sample space for
which the problem was functional interpolation, but not the
formation of statistics on large data sets. Ideal examples of
suitable problems are reasonably complex functional calculation
for which basic parameters are input and the result calculated
(filter design in electronics is a good example).

A Plan of Attack:
- ---- -- -------

Competing in this arena has two major components, assuming
for the moment that our hardware offering suffices: (1) creating
a suitable product (2) understanding and implementing the
marketing and selling of the product. The remainder of this
discussion addesses only the first component.

The Product Concept:

The product consists of four parts:

1. The Hardware System

2. An Operating System/High-Level Language
    Software-supported Execution Environment

3. "Problem Solver" Application Packages (written in the
    HLL of the execution environment)

4. Documentation (product, marketing and sales support)

The execution environment could be very like the user-environment
of todays RT systems.

Step One: Target a Half-Dozen Product Packages
---- ---- ------ - ----------- ------- --------

Since all of the major advanced calculator products have
chosen packages with a great deal of commonality, the easiest
method is to take the obvious intersection of these offerings.
This would include:

1. Elementary Statistics

2. BioStatistics

3. Elementary Mathematics

4. Advanced Mathematics

5. Business and Financial

The detailed composition of these packages could be easily
determined from sales literature for the IBM 5100, HP9830, HP-65

01802

and Wang calculators.

Step Two: Develop the Product Packages
==== ====   ======= === ======= ========

Each package has two components:

1. The subject programs

2. The documentation

The programs should be easy to construct since all of the
algorithms are well known, documented and understood. Although
it might be possible to utilize existing library versions of
these programs, it is unlikely that these would be adequate basic
prducts. It will be important that the functioning and
construction of each basic product be carefully verified by
Digital specialists before we present it to the customer, and it
is important that the human interface to the programs be both
made uniform and made professional (for example, existing
programs tend to have cryptic, nasty or obscene diagnostic
messages).

The programs should be constructed such that the actual
computation is partitioned from the interactive control of the
Problem Solver. That is, to many customers the product would be
used as a Digital provided Problem Solver: the computer would be
powered on, the customer would enter RUN GAUSS, and the
Digital-provided Guassian Statistics Problem Solver program would
lead the customer thru a specification dialogue and then solve
the given problem.

However, if the calculation subroutines are neatly
partitioned from the interactive control segment, and if the
subroutines are written such that addition of code to utilize the
subroutines is a well-defined problem (some BASIC implementations
pose serious naming problems among shared subroutines) then some
customers will use the provided subroutines and add customized
calculations or interactions.

The documentation for each Problem Solver product would
consist of the following portions:

1. Introduction and Cross-Reference

2. Explanation of Use

3. Brief Description of Calculation Used

4. Listing of Program

The introduction and cross-reference would introduce the problem area briefly (one page) and would reference standard text material giving further discussion of the subject matter.

The explanation of use would relate the standard terminology in the problem area to the terminology and use of the Problem Solver program, and note any major limitations or exceptions to the operation of the program.

The brief description of the calcuation used would be a concise summary of the numerical techniques used, with an emphasis on known limitations or optimizations of the method (for example, consider integration methods).

The listing of the program would be for the customer who intended to modify the program, or was just curious. With a printer option the program could be listed by the computer in the OS facilities. In the manual it could either be presented in a highly reduced format (like the CACM algorithms perhaps) or be included as a microfiche presentation in an end-pocket of the manual.

The Existing DECUS Libraries:
--- -------- ----- ----------

The existing libraries should be a marketable item. The HP-65 user's library is a simple example. HP offers a library subscription (for a fee) which buys an updated catalog of offerings, and then for a further fee HP sells copies of the library item. The documentation method is straight reproduction of documentation on an HP created standard form. Supposedly HP requires that library offerings conform to some degree of documentation standization. In any case, our experience with DECUS should be convertible to a very attractive adjunct to the basic product.

Marketing the Product:
--------- --- --------

Although the subject is not addressed here, it is clear that the marketing of such products is an integral part of the problem. It is an area for which there is not an obvious model of success within Digital. If one can extrapolate from the HP experience, it would seem that techniques like directed mass mailings may be an important part of product success. A detailed marketing plan should certainly be in place at the time that serious product development is begun.

	IBM	CLASSIC	ANDY	STOCKY	CLARKE
● DEFINITION	PORTABLE	DESK	2 BOXES	2 BOXES	PORTABLE
	SINGLE USER	SINGLE USER	(1)VT52	(1)-LSI11	SINGLE USER
			(2)1103 + FLOPPY	(2) FLOPPY	COMPUTER
● SIZE	8X17.5 X24	30 X 48 X 30	(1)14 X21 X 28	(1)14 X 21 X 28	16 X 22 X 21
			(2)14 X 19 X 17	(2)26 X 12 X 19	
● WEIGHT	50 LBS.	350 LBS.	(1)50 LBS.	(1)50 LBS.	60 LBS.
			(2)75 LBS.	(2)75 LBS.	
● DISPLAY					
SIZE	5"	12"	12"	12"	12"
CHARACTERS	64/32	80	80	80	80
LINES	16	12	24	24	24
INV. VIDEO	YES	NO	NO	NO	YES
MONITOR JACK	YES	NO	NO	NO	YES
GRAPHICS	NO	NO	NO	NO	OPTIONAL
● KEYBOARD					
TYPEWRITER	YES	YES	YES	YES	YES
OTHER	NUM/APL	NUMERIC	NUMERIC	NUMERIC	NUMERIC
CURSOR CTRL	YES	YES	YES	YES	YES
FUNCTIONS	CMND. MODE	NO	NO	NO	OPTIONAL
					REMOTABLE
● BULK STORAGE					
TYPE	CARTRIDGE	FLOPPY	FLOPPY	FLOPPY	FLOPPY
BYTES	204K	512K	512K	512K	512K
SPEED	40 IPS	400 MS ACCESS	400 MS ACCESS	400 MS ACCESS	400 MS ACCESS
READ/WRITE	2850/950 CPS	1250/1250	1250/1250	1250/1250	1250/1250
● I/O	HARD COPY	6 OMNIBUS	3 Q BUS	3 Q BUS	3 Q BUS
	CARTRIDGE	OPTIONS	DOUBLES	DOUBLES	QUADS
● PROCESSOR	INVISIBLE	8A	LSI-11	LSI-11	LSI-11
● MEMORY					
BYTES					
RAM	16 TO 64K		8 TO 56K	8 TO 56K	8 TO 56K
ROM	YES		YES	YES	YES
CORE		32K WORDS	YES	NO	YES
● PROGRAMMING					
MACHINE CODE	NO	YES	YES	YES	YES
HIGHER LEVEL	BASIC/APL	8 SOFTWARE	11 SOFTWARE	11 SOFTWARE	11 SOFTWARE
● INSTALLATION	USER	USER	USER	USER	USER
● MFG. COST	$1800 EST.		(1)$700	(1)$1511	
			(2)$1716	(2)$785	
FY'77		$3200	$2416	$2296	$2100
● DELIVERY	NOW	5/75	2/76	6/76	12/76
● DEVELOPMENT COST		DONE	(2)80K	(1)180K	FY'76 750K
				(2)130K	FY'77 450K

ASSUMPTIONS FOR MFG. COST FY'77 :- 12K BOARD, IN HOUSE FLOPPY, 16K BASE SYSTEM   JOHN CLARKE 9-19-75

DEFINITION	VT61	VT52+LSI11
	SMART TREMINAL	INTELLIGENT
	EDITING FEATURES	USER PROGRAMMABLE
	PORTABLE	PORTABLE
SIZE	14 X 21 X 28	14 X 21 X 28
WEIGHT	50 LBS	50 LBS
DISPLAY		
SIZE	12 "	12 "
CHARACTERS	80	80
LINES	24	24
UPPER/LOWER	YES	YES
INVERTED VIDEO	YES	NO
DATA	ONE SCREEN	FIVE SCREENS
FIELDS	PROTECTED	PROTECTED
KEYBOARD		
TYPEWRITER	YES	YES
NUMERIC PAD	YES	YES
CURSOR CONTROL	YES	YES
EXTRA FUNCTIONS	YES	YES
MEMORY	2 K	56 K
PROGRAMMING	UNIQUE	11 SOFTQARE
	MICROCODE	
MFG. COST	$850	$1200
		8 K BYTES
DELIVERY	2/76	6/76
DEVELOPMENT COST	200K/QTR.	FY'76 $180 K
	IN BUDGET	
PROTOCOL		
HOST MOD. NEEDED	YES	NO
ARPA NET. COMPATIBLE	NO	YES
USER PROGRAMMABLE	NO	YES
DDCMP COMPATIBLE	YES	YES
SPLIT SCREEN	NO	YES

J. CLARKE
9/19/75

D I G I T A L   INTEROFFICE MEMORANDUM

SUBJ: FIBER OPTICS

PAGE   1
DATE: 10-01-75
FROM: GORDON BELL
EX: 2236
MS: ML12-1/A51

* *

TO: FILE

* *

Subj: FIBER OPTICS, OPTICAL ISOLATORS AND US

To: Distribution

There were at least 4 mentions of Fiber Optics, etc. in Electronics, September 18, 1975; and it was not a special issue on the subject. My view is that if Electronics, or another of the popular trade press knows about something, then it's not very long till we see a rash of products (e.g. IBM and HP). Even the low risk components cause a problem (e.g. low power Schottky TTL).

although we seem to have a strong unwritten policy to wait for competitors to produce with a new technology before we look at it, this may be worth bending the policy.

I'd like your comment on the following:

Do you believe this is our development policy?--------------

Should it be?--

Is this an idea worth looking at for our computers?--------
How does it rank with some of the work done in your own group in importance?---

Who's responsible to watch, recommend and/or initiate work in this area?

        Eng. Committee--, Eng. Mgrs.--, Engineers--,
        Operations Committee--, Office of Development--,
        VP of Engineering--, Consulting Engineers--,
        individual groups that might use it--, Research Group--,
        component suppliers--, components engineering--,
        Chief Engineer--, other--.

Should we have a group who does nothing other than look at new technology such that it can be applied when mature?

Transfer ratios, data rates are improving; low prices lure designers

P98

by Lucinda Mattera, *Components Editor*

☐ Although the technology of optically coupled isolators is only four or five years old, these devices have captured a major segment of the semiconductor optoelectronics market. This year, despite the general business slowdown, worldwide coupler sales are expected to continue their increase and reach $20 million to $25 million. In 1976, manufacturers are anticipating a boom to top off at $30 million to $35 million, despite continuing reductions in unit prices. What's more, total coupler sales should continue to grow at a healthy rate of 20% to 30% a year for the next two to three years.

Couplers are only beginning to penetrate high-volume markets such as data processing, telecommunications, industrial process control, and solid-state relays. They are being used as interface devices on data lines between logic circuitry and peripheral equipment, as switching devices on telephone lines, as ground-loop isolators in power supplies, as level-shifting devices between different types of logic, as transmitting devices in data communications, and as sensing devices in telephone circuitry. A relatively new and potentially large market for couplers is analog signal isolation for applications like medical electronics and other types of analog signal-processing and measurement.

purpose operational amplifier, the CA3130 C-MOS/bipolar op amp is especially suited for this application because of its field-effect-transistor input, full voltage output swing, and low cost.

Programable current ranges are obtained by inserting one or more CD4051 C-MOS analog multiplexers in series with resistors of selected values, as shown in Fig. 2. The CD4051 multiplexer has internal level-shift circuitry to accommodate different logic families.

For the higher current ranges (R_{OUT} less than 10 kilohms), it may be necessary to take the on resistance of the switches into account by adjusting the combined resistance of the switch and resistor to yield accurate currents. If V_{IN} is less than ±0.5 v, the op-amp input-offset voltages should be nulled. □

Graphic symbols clarified

A number of readers were apparently confused by the gates section of two-state logic devices in the ''Graphic Symbols for Electronics Diagrams,'' April 3, 1975. To clear up this confusion, the gates section has been modified and reproduced here. It can be clipped out and placed over the origi-
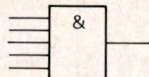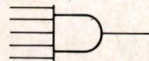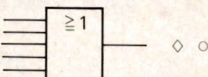

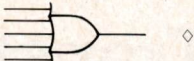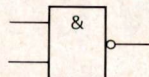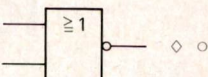AND gate, dual input   OR gate, dual input
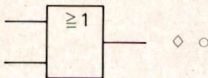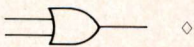
AND gate, multiple input   OR gate, multiple input

NAND gate, dual input   NOR gate, dual input

AND inverter gate, negated inputs   OR inverter gate, negated inputs

	IBM	CLASSIC	ANDY	STOCKY	CLARKE
● DEFINITION	PORTABLE SINGLE USER	DESK SINGLE USER	2 BOXES (1)VT52 (2)1103 + FLOPPY	2 BOXES (1)-LSI11 (2) FLOPPY	PORTABLE SINGLE USER COMPUTER
● SIZE	8X17.5 X24	30 X 48 X 30	(1)14 X21 X 28 (2)14 X 19 X 17	(1)14 X 21 X 28 (2)26 X 12 X 19	16 X 22 X 21
● WEIGHT	50 LBS.	350 LBS.	(1)50 LBS. (2)75 LBS.	(1)50 LBS. (2)75 LBS.	60 LBS.
● DISPLAY					
SIZE	5"	12"	12"	12"	12"
CHARACTERS	64/32	80	80	80	80
LINES	16	12	24	24	24
INV. VIDEO	YES	NO	NO	NO	YES
MONITOR JACK	YES	NO	NO	NO	YES
GRAPHICS	NO	NO	NO	NO	OPTIONAL
● KEYBOARD					
TYPEWRITER	YES	YES	YES	YES	YES
OTHER	NUM/APL	NUMERIC	NUMERIC	NUMERIC	NUMERIC
CURSOR CTRL	YES	YES	YES	YES	YES
FUNCTIONS	CMND. MODE	NO	NO	NO	OPTIONAL REMOTABLE
● BULK STORAGE					
TYPE	CARTRIDGE	FLOPPY	FLOPPY	FLOPPY	FLOPPY
BYTES	204K	512K	512K	512K	512K
SPEED	40 IPS	400 MS ACCESS	400 MS ACCESS	400 MS ACCESS	400 MS ACCESS
READ/WRITE	2850/950 CPS	1250/1250	1250/1250	1250/1250	1250/1250
● I/O	HARD COPY CARTRIDGE	6 OMNIBUS OPTIONS	3 Q BUS DOUBLES	3 Q BUS DOUBLES	3 Q BUS QUADS
● PROCESSOR	INVISIBLE	8A	LSI-11	LSI-11	LSI-11
● MEMORY					
BYTES					
RAM	16 TO 64K		8 TO 56K	8 TO 56K	8 TO 56K
ROM	YES		YES	YES	YES
CORE		32K WORDS	YES	NO	YES
● PROGRAMMING					
MACHINE CODE	NO	YES	YES	YES	YES
HIGHER LEVEL	BASIC/APL	8 SOFTWARE	11 SOFTWARE	11 SOFTWARE	11 SOFTWARE
● INSTALLATION	USER	USER	USER	USER	USER
● MFG. COST	$1800 EST.		(1)$700 (2)$1716	(1)$1511 (2)$785	
FY'77		$3200	$2416	$2296	$2100
● DELIVERY	NOW	5/75	2/76	6/76	12/76
● DEVELOPMENT COST		DONE	(2)80K	(1)180K (2)130K	FY'76 750K FY'77 450K

ASSUMPTIONS FOR MFG. COST FY'77 :- 12K BOARD, IN HOUSE FLOPPY, 16K BASE SYSTEM

JOHN CLARKE 9-19-75

	VT61	VT52+LSI11
DEFINITION	SMART TREMINAL	INTELLIGENT
	EDITING FEATURES	USER PROGRAMMABLE
	PORTABLE	PORTABLE
SIZE	14 X 21 X 28	14 X 21 X 28
WEIGHT	50 LBS	50 LBS
DISPLAY		
SIZE	12 "	12 "
CHARACTERS	80	80
LINES	24	24
UPPER/LOWER	YES	YES
INVERTED VIDEO	YES	NO
DATA	ONE SCREEN	FIVE SCREENS
FIELDS	PROTECTED	PROTECTED
KEYBOARD		
TYPEWRITER	YES	YES
NUMERIC PAD	YES	YES
CURSOR CONTROL	YES	YES
EXTRA FUNCTIONS	YES	YES
MEMORY	2 K	56 K
PROGRAMMING	UNIQUE	11 SOFTWARE
	MICROCODE	
MFG. COST	$850	$1200
		8 K BYTES
DELIVERY	2/76	6/76
DEVELOPMENT COST	200K/QTR.	FY'76 $180 K
	IN BUDGET	
PROTOCOL		
HOST MOD. NEEDED	YES	NO
ARPA NET. COMPATIBLE	NO	YES
USER PROGRAMMABLE	NO	YES
DDCMP COMPATIBLE	YES	YES
SPLIT SCREEN	NO	YES

J. CLARKE
9/19/75

digital

October 2, 1975

D. J. Horton
Trans-Canada Telephone System
P.O. Box 365
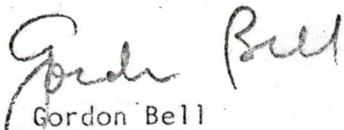Station A
Ottawa, Canada K1n 8v3

Dear Mr. Horton:

Thank you for the invitation to Ken Olsen to submit a paper to ICCC-76.
We have several activities in computer communications: DECNET--methods
for interconnecting our computers; and the Communication Product Line,
which markets computers for communication.

I have sent a copy of the call to Nat Teichholtz, heading the network
activity, and to Julius Marcus, Vice President of the Data Communication
Product Line. I'm sure if they have any new results to report, they'll
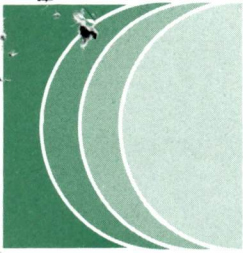respond.

Clearly people from here will attend, if you get the kind of papers
you're soliciting. Good luck on the conference.

Sincerely,

Gordon Bell
Vice President, Engineering

GB:mjf

To: Gordon Bell

ADVANCEMENT THROUGH RESOURCE SHARING

*letter
20pt
page*

SEP 1 6 1975   01807

third international conference on computer communication

p.o. box 365
station a
ottawa, canada
k1n 8v3

Conference Governor
D. J. Horton
Trans-Canada
Telephone System

Conference Chairman
Kenneth B. Harris
Trans-Canada
Telephone System

Program
Dr. Pramode K. Verma
Trans-Canada
Telephone System

Local Arrangements
G. J. Allen
Sperry-Univac

Publications
Robert M. Elliot
Alphatext Limited

Finance
Claude Lemieux
Trans-Canada
Telephone System

Social Activities
Ruth Anne Murphy

Publicity
Charles H. Rust
IBM Canada Limited

September 10, 1975

Mr. K. Olsen,
President,
Digital Equipment Corp.,
146 Main St.,
Maynard, Mass. 01754

Dear Mr. Olsen:

As Conference Governor of ICCC-76, to be held in Toronto
August 3-6, 1976, it is my pleasure to enclose a copy of
the first publicity action on this conference, namely the
Call for Papers.

The document covers the intent of the conference, but there
are a couple of points I would like to emphasize.

1) A major objective of ICCC-76 is to have a truly
    international conference, which is one reason it is being
    held in the week following the Olympic Games. We hope
    that many people will take the opportunity to visit Canada
    for the Games and will travel to Toronto (one hour by
    plane, five hours by train from Montreal) for the conference.

2) We hope to have a relatively senior representation at this
    conference. We are aiming at an attendance of about
    1000 delegates and we believe that the most important
    objective is that the conference should be an opportunity
    for people at the decision making level in all facets of
    computer communications to get together.

    As you are aware, there is now a proliferation of such
    conferences, and, since it is impossible to attend them
    all, many have become less successful in recent years.

    We would like to ensure that ICCC-76, and future ICCC
    conferences, will become a biennial opportunity for reunion.

*Copy of what
mm to
NAT + Gordon*

TO BE HELD IN TORONTO 3-6 AUGUST 1976 AT THE ROYAL YORK HOTEL

3) A major objective for this conference is that it should
    be multi-disciplinary. Much attention has been given
    over the last few years to technical aspects of computer
    communications. Conferences on the social aspects
    have tended to be held quite separately. We want to see
    some of the social effects of computer communications
    highlighted at ICCC-76. While we will be particularly
    focussing on the fields of medicine and law, the social
    implications of electronic fund transfer is another area
    that will undoubtedly gain much attention.

As a senior official of an important organization in the Computer
Communications field, your help would be valuable to us in
ensuring that we have the best possible conference and I would
particularly welcome any thoughts or ideas you or your people
might have.

I look forward to hearing from you.

Yours very sincerely,

D. L. Hartley

Encl.

Dear.
    Thank you for the invitation, to Ken Olsen to submit a paper
to ICCC-76. We have several activities in
Computer Communications, DECNET — a method methods
for interconnecting our computers; and a the Communications Product Line
which markets computers in the for communications. I have
sent a copy of the call to Nate Teichholz who heads the
network activity and to Julius Marcus, head of the
Vice President of the Data Communications product line. I'm
sure if they have any new results to report, they'll
respond. Clearly people from here will attend —

Good luck on the
Conference. Smith.

if you get the kind of papers you're soliciting.

Around the world

BPO to test fiber-optic telephone transmission   P53

Field trials begin soon for two types of fiber-optic telephone links the British Post Office has developed and successfully tested in the laboratory. However, much development and engineering work is still needed to ensure the links' reliability and maintainability before they become part of the telephone network. The fiber-optics must also prove to be more economical than conventional coaxial cable.

A system intended for medium-length hops operates at 8.48 megabits per second, and a system for long-distance trunks operates at 139.264 Mb/s, which, for convenience, is rounded off to 140 Mb/s. Both systems are composed of the light source, coupler, optical fiber, another coupler, the photodiode to convert the light to electrical signals, and the associated amplifier and processing circuitry. To minimize transmission losses at the critical connecting points, the BPO researchers have designed a screwable coupler using aspheric optical plastic lenses to cut down distortion. The coupler actually is two half-couplers, each with lenses 5 and 7 millimeters in diameter that screw together for a precise fit.

Where fiber optics can be used

Sure, fiber optics is a coming technology, offering low-loss wideband optical transmission in small spaces, but is it here yet? See for yourself—the National Technical Information Service has compiled **a bibliography of Government-sponsored work on fiber-optic materials and applications through May 1975.** The 147 abstracts include studies on display systems, communications and TV equipment, transmission lines, imaging devices, recording systems, measuring instruments, and integrated optical circuits. The report, entitled "Fiber Optics," is available in either hard copy or microfiche for $25 from National Technical Information Service, 5285 Port Royal Rd., Springfield, Va. 22161. Ask for NTIS/PS-75/420.
        —Laurence Altman

114

Bell plans test of fiber-optic phone system . . .

Fiber-optic telephone transmission will move closer to reality at the end of the year when Bell Laboratories starts a field trial of a system near Atlanta. **Significantly, production-type equipment will be used in a real operating environment.**

The transmission medium will be cables containing a large number of fibers, from both Bell and Corning, with a single fiber per channel of information. Also significant will be the repeater spacing: five to six miles rather than the easily attainable two or three, meaning repeaters could be taken out of manholes and placed in central offices. And though Bell won't comment, it is believed to have ready for production an advanced repeater with a "quick-connect" design.

. . . as GTE sets field trials of optical trunks

At about the same time that Bell conducts its tests, GTE Corp., the nation's No. 2 telephone company, will start a field trial of its own "practical" fiber-optic system. The test will take place, using existing links, at an operating GTE facility, probably on the West Coast. Thus, the system, which will use an electronic/optical interface, appears to be the first big step **toward replacing T-carrier interoffice trunking with the much higher capacity fiber-optic system.**

According to E. Bryan Carne, director of electronic technology at GTE Labs, the fibers used in the trial will have a loss of 5 decibels per kilometer so that runs of 15,000 feet between repeaters are possible. By comparison, repeaters for twisted-wire pairs are spaced every 6,000 ft.

D I G I T A L   INTEROFFICE MEMORANDUM

	PAGE 1
SUBJ: SOFTWARE PRODUCT MODELS	DATE: 10-02-75
	FROM: GORDON BELL
	EX: 2236
	MS: ML12/A51

* *
TO: SOFTWARE DEVELOPMENT MANAGERS --
* *

SUBJ: PROPER NAMES FOR SOFTWARE PRODUCT MODELS AND REVISIONS
       TO THEM

To: Distribution   F/U 10/10

In listening to several PM's and the field hassle we create
through revisions to software products, and changes in policy,
it became clear to me why this occurs:

1. We build what are fundamentally different software product
    models by adding new user features and do not give them
    different names that are apparent to us and our users.

2. We do not clearly distinguish between ECO's and new
    features revisions. All are versions, and through these
    can be deduced, they are not advertised as such.

This leads to:

1. A feeling that a product will go on, be added to, and last
    forever without any bound.

2. No way to clearly talk about which version various systems
    will run on.

3. No way to ever change a policy, since our literature is
    not time (death) dated. As a result, our customers really
    don't know what's going on, can't distinguish among models
    and ECO's, etc.

4. Potentially explosive situation contractually when we do
    benchmarks on an early system, deliver a later version with
    more features (and larger size), and end up with less
    performance than initially promised. (Note, the Navy has
    actually gotten new hardware from a vendor who did this.)

PROPOSED SOLUTION
----
1. A system is never called without a model number. For
    example, like processor hardware, RT-11 is actually a
    series of operating systems and should always be identified

PAGE   2

as such, i.e. no RT-11, only the RT-11 series...just like
the PDP-11.

2. Each specific version (not an ECO) which has new features
    is identified by name in its literature title, or purhcase
    order name, and order number by its name and Model #. I
    would propose it could be either:

    A. Roman numeral mark #'s, e.g. RT-11/I, ..., RT-11/IV.

    B. Strict model # e.g. RT-11/1, ..., RT-11/4.

3. New versions would breed new literature and policies, prices,
    phase out, etc. plans could be managed. ECO's to models
    would be used as we do them now and have order #'s, e.g. RT-11/1,2.
    Normally, the ECO version would not be important, but it would
    be used to manage our warranty policy (whatever it might be).

Can we start this now and stop the confusion of giving a single
name to what is basically a set of entities? What you think?

GB:mjf

Distribution

Software Product Managers
OOD
PLM
Software Managers
Dave Stone
Dick Best

D I G I T A L   INTEROFFICE MEMORANDUM

SUBJ: OUTSIDE DESIGNED COMPUTER   - DATE: PAGE   1
                                                FROM: 10-06-75
                                                  EX: GORDON BELL
                                                  MS: 2236
                                                           ML12/A51

* *
TO: OPERATIONS COMMITTEE   XX
* *

Subj: DECISION OF AN OUTSIDE DESIGNED COMPUTER FOR OUR PRODUCTS

                     CONFIDENTIAL

Engineering is recommending that it use the Motorola 6800
as the base of terminals, floppy controllers, etc. It's
selection as a poor, second technical choice is due
entirely to our perception of Intel as our dominant competitor.

The Winner

Motorla (AMI-second source)--small MOS division ($30M),
technology not under control and weak technologists, poor past
management structure, high investment in microprocessor could
jeopardize future. This is almost a lose/lose situation: as
a weakling, we'll have poorer products because of them; if
they get strong--they'll be our competitor.

Why the alternatives were rejected:
----

1. Signetics--late with poor product; we have good working
    relationship with them; no interest in components to use
    part in low end microcomputer market.

2. Fairchild--product too small for future applications.
    Poor working relationship.

3. Intel--clear technology, programming, product and market
    leader by 2+ years. We would learn much, and if a close
    relationship, we would teach them more about systems,
    although it looks like they don't have much to learn. A
    competitor at systems and board level.

Concerns for LSI-11 Product Management and Microcomputer Marketing
----

1. Although we see Intel as our significant competitor at
    the board level now, this appears unrealistic: we lose
    money selling at this level; Intel (and others) have much

room to reduce prices in what is a seller's market

2.   The board level may require memory chip manufacture, and   01815
     already requires new parts, options, etc.

3.   We face little deliverable competition now except Intel...
     Motorola, et al will be inevitably. I don't see us as
     competitive at this level.

4.   The LSI-11 is beginning to absorb significant resources
     in engineering for LSI chips, communications options,
     peripherals, cabinets to give us a cost reduction in the
     conventional systems business. This may just take
     away from other sales with lower NOR and high
     engineering costs. Alternatives, I hope we can make products
     heretofor unavailable (i.e. smaller).

5.   We have no ROI/PC model of this investment. It's significant,
     and the Product Management/Marketing has effectively sold it
     internally as a great product. I think (hope) it is too. We
     all want to believe but a bigger picture, with some depth,
     would help.

GB:mjf

cc: Steve Teicher, Rob VanNaarden

MICROPROCESSOR SELECTION ALTERNATIVES AND CRITERIA

	INTEL	SIGNETICS	MOTOROLA	FAIRCHILD
Mgmt.	Best managed.	Not clear about Philips commitment. Team is new.	Real problems; groups are spread out geographically. Team is new. MOS is only $30M	N o joint trust; too egocentric; top dog fight (rumored).
Inter-face	We interface well there; and will learn from their 2-year lead. They'll learn boxes from us.	Best technical interface.	Can probably work. We'll teach them programming, testing, etc.	Poor
Tech-nology	Best and improving technology.	Process looks good-- Philips could help them.	Not clear whether they have it.	Not clear--should be OK.
Cost	Lowest cost by $10.	Next lowest cost (maybe phony)	OK	Low chip count--should be cheap.
Pro-ducts	Best product array. We will need their new, high and low end for new products.	Marginal--taking some chance.	OK for now, though there are some problems.	OK--not really powerful enough for other applications.
Support	Very good.	We'd have to do it.	Programming poor--we'll redo.	OK
Other (Market)	#1 competitor--their costs are low enough to support lower prices. Our volume is small; won't affect things. Will use our order to compete against us--to the naive customer.	We could do parts, tell them what to build, do support software; and enter main microprocessor market. This could help even out the sides: Intel #1, Motorola trying for #2.	Our order is relatively small to their plan. It will give them more credibility...and they will eventually compete. They're doing BASIC to compile at systems.	
Eng. negatives	LSI-11 + Comp. Eng. don't want them.	Component group believes they're backward.	GB negative.	

D I G I T A L   INTEROFFICE MEMORANDUM

                                                    PAGE   1
SUBJ: AADS - WHO'S GOING TO INTERFACE WIT   DATE: 10-06-75
                                                FROM: GORDON BELL
                                                  EX: 2236
                                                  MS: ML12-1/A51

* *
TO: FILE
* *

Subject: AADS - WHO's GOING TO INTERFACE WITH THE SELECTION
          COMMITTEE?

To: Distribution

As I hope you're aware, a group from DOD, especially NRL
(W. R. Smith and Y.S. Wu 202-767-2518) is in the process of selecting a
commercial computer for all the services. Supposedly they will
then ask to license it.

The 11,360 DG Eclipse, Interdata, and Burroughs B6700 are the
architectures being evaluated. The 11 is fairing poorly. The
pivotal issues: 16 vs 32 and addressing; spare opcode
space; software; and military versions.

Prof. Dan Sieworiek, CMU (412-621-2600)) is head of
the sub-committee studying and proposing the 11. They need
help from us in answering some of the above questions.

Their schedule:

        Report from sub-committees   Nov 15
        Meet   Dec 1
        Selection criteria ready   Jan 1
        2 or 3 machines selected   Feb/March
        Recommendations   July

The results of a call to Smith:

    1. W. S. Wu and W. R. Smith want to meet with us about
        the patents and software licensing. They will come here
        for a 2+hr. meeting. They'll describe the program
        and time table. It should be scheduled by either
        Bob or Roy in the Washington office.

    2. We need tomake a general statement about 11 evolution
        in the future vis a bis above problem. This
        can now be done in a letter to Sieworiek which I can

write.

3.   Someone has to be the interface there and here. I
     want out.

4.   They're trying to sort out how they handle
     proprietary data, given we want to say more about our
     plans.

GB/lp

Distribution: John Buckley, Dick Clayton, Bob Huberfield,
                Malcom Johnston, Julius Marcus, Ed Schwartz,
                Roy Van Dusen.

digital INTEROFFICE MEMORANDUM

TO: V. Bastiani, G. Saviers, and
S. Wecker

DATE: October 2, 1975

FROM: Gordon Bell

DEPT: OOD

EXT: 2236   LOC: ML12-1/A51

SUBJ: WECKER ALGORITHM

Rather than building a CRC chip, would we be better to

implement the Wecker Algorithm in ROM?

digital INTEROFFICE MEMORANDUM

TO: John Chromletn

cc: Bob Poffin
Mark Abbott

SUBJ: Attendance of R+D Mgmt Seminars by K. Olsen

DATE:
FROM: gBell
DEPT:
EXT: LOC:

I've got a tentative commitut from Ken to attend. Will you contact Peggy to schedule him at first meeting and send a copy of the ~~than~~ Schedule / topics?

Systems. $
Boxes 6K   25%

— Systems
— Boards
— Chips
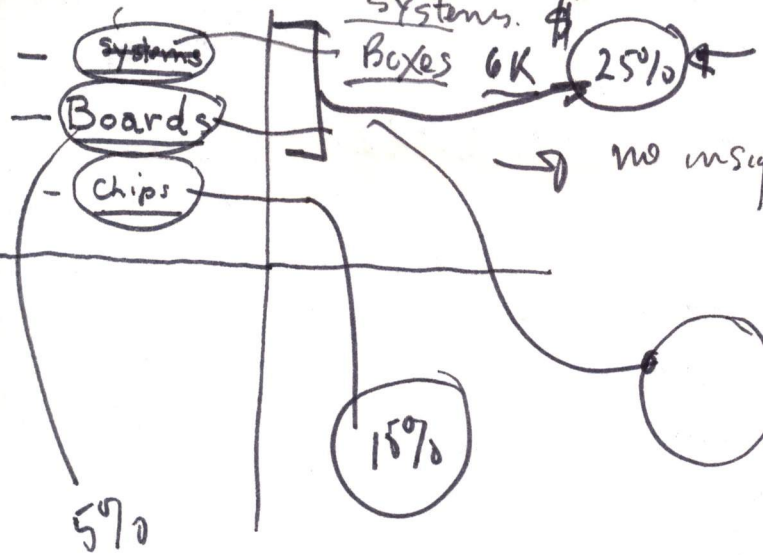
no insight to sell to End user.

15%

5%

D I G I T A L   INTEROFFICE MEMORANDUM

SUBJ: C. EXPERIMENTER MARKET

PAGE   1
DATE: 10-02-75
FROM: GORDON BELL
EX: 2236
MS: ML12/A51

* *

TO: FILE

* *

Subj: THE COMPUTER EXPERIMENTER MARKET...A BEGINNING OF THE
COMPUTER-IN-A-HOME (see attached interchange)

To: Distribution

Mark Sebern has been corresponding with a number of these
people, and there is now a club, Byte, which interchanges
information.

Since we subsidized another L.I. high school student, there
has been more than the usual set of requests. This previous
sale was OK, but there is still a problem with maintenance--the
board mailer would solve most problems for them.

Clearly, no single PL can handle this now, although Logic
Products looks close. Now, if DEC goes with Heathkit, this
might be the right approach. The novice and experimenter (and
many others--I suspect) seem to want:

1. Manuals to understand (they'll pay for these alone).

2. Low prices via catalog...no salespersons!

3. Modules where they can do as much as they have money for.

4. Ability to trade-off make-vs-buy (ala Heathkit).

5. Some mechanism to exchange programs and communicate with
other users.

6. Ability to get mailer service. Currently ALTAIR is optimum
for them. My "party line" is given in the letter.

GB:mjf

Attachment

Distribution

Bill Hogan

October 1, 1975

George A. Caciopro, Jr.
238 Martha Avenue
East Patchogue, New York 11772

Dear George:

It was good to talk with you about the problem of getting
your own computer. As I see it, we may not have computers
at the price you want to pay, since our prices
are predicated on certain market, sales, service
and software support prices and policies.

I'm enclosing a catalog of our Logic Products product line,
which has the MPS (8008) and the PDP-8/A modules. Both
of these schemes might allow you to build at the rate you
want. There is also a problem of service which you clearly
have to address. I'd hope the MPS service arrangements and policy
would work the way you want it to. I'd be interested in your
reaction to this scheme versus the ALTAIR. Also, I'd like you
to write just what you'd expect from a company that sells you
a computer. I.e., do you want salespeople to call,
software service, maintenance, software interchange, etc.
Also, how much would you pay for this?

As I indicated on the phone, I hope you will move immediately
(at least by the second semester), to a university with a
strong Electrical Engineering/Computer Engineering department
(Carnegie-Mellon is my preference, but some of the NY State
universities are clearly fine). With your background and
understanding of computers, your strong academic background,
and Regent's Scholarship, the incremental approach you're
taking to your education will be time-consuming and
produce a poor product. The university should provide your
machines to teach you for now, and I don't believe you should
have enough spare time to do the building.

Sorry we can't help you for now, but I'll keep my eye open
for a machine that we might sell you in a non-subsidizing,
business basis.

                    Sincerely,

                    DIGITAL EQUIPMENT CORPORATION

                    Gordon Bell

                    Gordon Bell   (mjf)
                    Vice President, Engineering
                    Professor, Computer Science
                    Carnegie-Mellon University (on leave)

GB:mjf

9/19

Gordon

I've turned him down — gently, I hope. You should have received copy of my letter already. Original returned for your file—

Alicia Peters

01827

George A. Cacioppo, Jr.
238 Martha Avenue
East Patchogue, N.Y. 11772

September 16, 1975

Gordon Bell
Vice-President
Digital Equipment Corp.
146 Maynard Street
Maynard, Mass.   01754

Dear Sir:

Perhaps Alice Peters did not understand my letter regarding
my obtaining a PDP/8 computer. My application is not strictly
software development.

I am a student of computer science and electrical technology
my first priority is to obtain a PDP/8 for my work. I want it
to be proggrammed by DIGITAL in Basic, and hopefully, Macro.
I am not out to develop new software.

What I request is a helping hand from the company that I
"plug" all of the time. I have worked in a timesharing environment
for four years. If I do say so myself I have learned as much
as possible at a remote site. Now having graduated from Long
Island's high school system, I have been cut off from all the
facilities their PDP-10 offers. I need to continue with what
I have been doing.

I would like to obtain a desk top machine with a teletype
which would be enough to suit my purposes for now. This would
finally give me a hands on environment where I could learn
even more about DEC machines. I hope someday to share my
knowledge with others who would not be so fortunate as to
have their own computer. I must admit that at this time my
purposes are purely in my own interest. So that I may work
further.

I can only emphasize that I have been cut off simply
because I have graduated. I am willing to pay for the
machine if I have to. I will even revert to buying a used
machine if I must. I ask your help, whatever the case.
If there is any way you can help me to obtain a PDP-8 so
I won't be left hanging with knowledge I can't use, please
contact me. I need someone's help, that is why I write to
you. In the hope that you may be able to help me.

Yours Sincerely,

George A. Cacioppo, Jr.

P.S. I am sorry to take up your time, but I hope you will
understand how devoted I am to my work. Thank You.

8-30

F/U

151-3800-
0074

George A. Cacioppo, Jr.
238 Martha Avenue
East Patchogue, N.Y.
11772
(516) 286-2091

Alice Peters
Can you pls handle?
Gordon.

Gordon Bell
Vice-President
Digital Equipment Corp.
146 Main street
Maynard, Mass.
01754

Dear Sir;

I am writing to you for some help. I have been
a computer student for four years at Bellport Senior High
School. I learned most of my programming abilities on
the computer of LIRICS timesharing located in Dix Hills.
The computer was a dec-system PDP-10. I was the president
of their student user group for the 1973-1974 school year.
You can find my name on your mailing list, or last years
as having requested all the PDP-8 manuals Decsystem could
supply me with, which they did.

My purpose in writing to you is that I would like to
obtain a PDP-8/e (or if neccesary PDP-8/m). for my pesonal
use in designing software for a timesharing system for a
PDP-8. I am currently enrolled at SUNY of N.Y. at Farmingdale
for Electrical Technology. At the completion of this
course I hope to have completed the neccesary software
and hardware work to begin opening a general timesharing
and/or Data Processing company hereon the Island.

My problem is the availability of funds for my work.
I cannot possibly afford to buy a PDP-8 out of my own funds.
Is there an program that Dec has whereby a cost reduction
can be made in return for my research efforts? I can
assure that Dec would at least receive advertising from
this venture as several of my teachers and a group of
students from my PDP-10 work will be helping me to design
the system.

Could there perhaps be grants from the government that
would defer my cost of buying a PDP-8? After leaving
college I hope to buy the additional hardware neccesary
to support a multi-user environment. This means that
the original computer will become a base for the system.

I have been interested in computers since a very young
age, I am very well versed in assembly language(Macro) for
the PDP-10. I find that I cannot give you any more reasons
for helping me except that I have been working for years
hoping to end up working with computers as a profession.
I can assure that Dec will have all rights to the work that
I(we) produce.

If there is some way in which you can help us we would
probably need:

> PDP-8 processor (8/e prefferred because of
>   expandability, or 8/m
>
> 4 to 8 k of memory
>
> one teletype w/interface
>
> Macro-8 assembler (for ease in programming, examples)
>
> Basic-8 (for simple programming,for demonstrations,
>   instructing beginners, and perhaps usable
>   for a source of income e.g. teaching students
>   BASIC)
>
> And any other equipment you deem neccesary (the
> Macro-8 assembler is optional, but would ease our
> effort because of out prior experience.)

Thank You for reading my inquiry, I hope to have
supplied with all the information neccesary. I am not
just anyone who wants to get a computer inexpensively, I
am somone who loves DEC-system computers and would like
to make his lifes work of operating one. Please feel free
to call at any time of the day or night if you need more
information.

                              Yours Sincerely,

                              George A. Cacioppo,Jr.

                              George A. Cacioppo, Jr

* *

TO: FILE

* *

Subject: RE ASR CAPABILITY - WHAT IS IT AND HUEFNER/WOLAVER
           RESPONSES

To: Distribution

It looks like we're somewhat on the track to get some of the
ASR capability:

    1. LA36 with buffering (which I hope gets
        simulated now on Mark Sebern's machine before wiring
        down).

    2. LA36 with Moffa - ASR Unit

    3. VT5X with Moffa - ASR Unit

It's just occurred to me that we already have a nifty product
which solves all the applications which are like DECNET. IT IS:

        The VT61 with Copier!!

It has:

    1. Editing capability

    2. A buffer to store reasonable sized messages for
        computation

    3. Ability to be pulled and transmit

    4. Hard copy

Why can't we replace some of the TTY ASR's internally
(i.e. all of George Friend's DECNET)?

How to test it??

GB/lp

Distribution:

        Bill Chalmers
        Ed Corell
        Alan Dziejma
        Ken Fine
        George Friend
        Al Huefner
        Andy Knowles
        Roy Moffa
        Bob Puffer
        Mark Sebern
        Tom Stockebrand
        John Wolaver
        Mike Wurster

SUBJ: JAPANESE COMPUTER MARKETING STRATEG   DATE: PAGE   1
                                                             10-07-75
                                                FROM: GORDON BELL
                                                EX: 2236
                                                MS: ML12-1/A51
* *
TO: FILE
* *

                         CONFIDENTIAL

To: Distribution

Subject: THE JAPANESE COMPUTER MARKETING STRATEGY:
          \THE OLD ORIENTAL INTERCHANGEABLE AMMUNITION TRICK

Since the Japanese re-designed the Chinese Abacus for
cheaper producibility and easier use, calling it the Soroban;
they have been improving other devices. Now with computers
there is a clear continuation of the trend. Some examples:

    1.   IBM ECL technology
          Amdahl (and Motorola) => Fujitsu

    2.   (Amdahl 470 = Fujitsu M-series) is an upward program
          compatible with the 360/370.

    3.   Intel 8080 is a subset of new Nippon part being
          marketed now.

    4.   Motorola 6800 is a subset of new Futitsu parts
          just being built.

The strategy is clear: Remember the Chinese (?) 7.6 mm guns that
were upward compatible with the 8 mm guns? Computers are the
same...once a user buys into the "improvents" he is locked in.

GB/lp

Distribution: OC, PLM, Ron Smart, OOD

SUBJ: MICROPROCESSOR DESIGN   DATE: PAGE   1
                                             DATE: 10-07-75
                                             FROM: GORDON BELL
                                              EX: 2236
                                              MS: ML12-1/A51

* *
TO: FILE
* *

To: Demitrios Lignus/Duane Dickhut

Subject: ANOTHER MICROPROCESSOR DESIGN ALTERNATIVE FOR RK06/RSL

Larry Hodges is sending me a proposal for the design of a small
(37 standard dips), fast (80ns), 4-bit-slice oriented
microprocessor that he believes will interpret 11 ISP competitively
(at 11/40 speed). It includes ROM, but not Unibus interface.

Steve is permitting Duane to interact with them to consult on
the Unibus design and the ISP. In turn, we get their basic
logical design...on a non-proprietary basis.
I don't believe it's what we want or need for a processor, but
I hope it can be used to start to get us into a positive
position wrt disks and their controllers. Duane, in
turn, will interact with the disk group which I would hope
now has at least one experienced processor designer. Someone
in the disk group (or any other group that might take the
design responsibility of the controller) must work with
Duane for the evaluation. The purpose of this:

     1.   Get a disk control based on a microprocessor we
          wouldn't have designed.

     2.   Get additional, real live thinking on the controller
          design problem, instead of the mass of content-free
          design specs and minutes meetings that currently
          eminate.

Since he consults with Varian, CA, and GA it is imperative
that he really not visit here and have much interaction with
us. I especially don't want to tell them that it is a disk
controller! (I don't believe the Tayler/Hodges group (6 of them)
are particularly deep, but they are very clever
logicians).

I will send the proposal when it arrives.

GB/lp

CC: Bob Kirk, OOD, Grant Saviers, Steve Teicher, Bob Armstrong

PAGE   1
SUBJ: RE MEMO ON 2K ROMS   DATE: 10-07-75
                                               FROM: GORDON BELL
                                               EX: 2236
                                               MS: ML12-1/A51

* *
TO: FILE
* *

To: Distribution

Subject: RE MEMO OF 10-1-75 on 2K ROMs

What's the story? Fairchild delivered their first 8K Bipolar
ROMS in June and I have 4K Proms. Why are we fooling around
with 2K ROMS in new products?

I believe we should get on the stick and start a strategy to enhance
the 11 vis a vis more complex instructions: string,
i/o, loop control. These instructions could be in the same
format as VAX, permitting a convergence to VAX in 2 years.

They clearly give us a big mid-life kicker boost!

Who's going to pull this together? Lloyd, what's the list?

Let's discuss in Dick's staff meeting in a week or so!

GB/lp

Attachment

Distribution
·············
Bob Armstrong
Jega Arulpragasam   Jim O'Loughlin
Dick Clayton   Steve Rothman
Ed Corell   Al Ryder
Bill Demmer   Bob Stewart
Lloyd Dickman   Tom Stockebrand
Duane Dickhut   Steve Teicher
Len Hughes   Mike Tomasic
Malcolm Johnston
Chuck Kaman   Attachment
Bob Kirk

D I G I T A L   INTEROFFICE MEMORANDUM

                                                              PAGE   1
SUBJ: ROM MICROCODE   DATE: 10-01-75
                                                  FROM: GORDON BELL
                                                    EX: 2236
                                                    MS: ML12/A51

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TO: FILE
* *

Subj: INCREASING SIZE OF ROM MICROCODE ON PDP-11'S VERSUS TIME

To: Distribution   F/U 10/10

It's clear we've really (in retrospect) missed opportunities
to easily mid-life kick all our processors as bipolar ROMS have
gone from 1K to 2K. Now when they go to 4K (1 to 2 years) can we
easily retrofit, to get double the microcode in the same board
space without retooling, etc?

Lloyd Dickman is putting the VAX string stuff in 11/03. Are these
candidates for 45, and 70 (which don't yet have the new 2K ROMS)?

Are there other operations to help these machines now?

Should we conscientiously plan this on new designs...it's only an extra
bit in micro PC?

Please comment,

GB:mjf

Distribution

Bob Armstrong
Jega Arulpragasam
Dick Clayton
Ed Corell
Bill Demmer
Lloyd Dickman
Duane Dickhut
Len Hughes
Chuck Kaman
Bob Kirk
Jim O'Loughlin
Steve Rothman
Al Ryder
Bob Stewart
Tom Stockebrand
Steve Teicher
Mike Tomasic

digital INTEROFFICE MEMORANDUM

TO: Ron Kanne   PK3-2/F34   DATE: October 10, 1975
     Herb McCauley   PK3-2/F34   FROM: Gordon Bell

                                           DEPT: OOD

                                           EXT: 2236   LOC: ML12/1-A51

SUBJ: OFFICE AUTOMATION

     Where's the minutes of our meeting re word processing/office
automation with the numbers, etc?

     What's the chance of getting the software prep people decent
terminals with UC/LC (e.g. LA36 or VT52)? How can they prepare
documents efficiently, cheaply, etc. on ASR33's?

digital

October 13, 1975

M. J. Sullivan
Spec. Comm. Programs
IBM
Arkmont, New York   10504

Dear Mr. Sullivan:

It was nice talking with you last week regarding the equipment which we
need for our company technology exhibits. We intend to use the parts now
with various technology exhibits, and eventually to have a museum, where
they might be on permanent display. The parts will not be connected; hence,
need not be functional.

The parts I would like:

Memory technology: read-only memory assemblies from 360/30 (capacitor),
        and other 1 or 2 models (e.g. 360/50 inductor)..
        IC read-write memory from a 370 model. MOS ROM IC (48K bits) from
        IBM 5100.

Disks: large platter (only) from original RAMAC, IBM 1311 (basis of
        current series), and flexible (floppy) mechanism with a floppy.

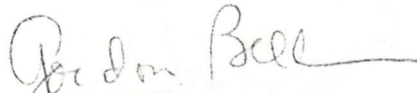Logic technology:
        CPC or 60X relay assembly plus plug-board
        704 flip-flop assembly.
        360-SLT on a card (several cards) with a mother board and cable to
            show interconnects on gate.
        370 IC package to compare with SLT (2 cards)

Typewriter I/O: 1050 and/or 2741.

Complete early relay calculator (e.g. CPC)

I appreciate your help.

                        Sincerely,

                        Gordon Bell
                        Vice President
                        Office of Development

GB:mjf

D I G I T A L   INTEROFFICE MEMORANDUM

SUBJ: COPIER-BASED PRODUCT	PAGE 1
	DATE: 10-14-75
	FROM: GORDON BELL
	EX: 2236
	MS: ML12/A51

* *

TO: FILE

* *

SUBJ: COPIER-BASED PRODUCT WITH VIDEO INPUT

To: Distribution   F/U 10/24

Is there a use for our copier which takes standard video
input, and converts this to a picture?

It is low cost...and I hope good.

1. Since the IBM 5100 has video output, it could connect to it
    directly.

2. Also, we could "add-on" to all the terminals which have
    video output. (E.g. Beehive, HP2640, Tektronix graphics,
    Conrace, Monitors whatever their use.)

3. This may also be the right way to connect the copier to the
    new packaged systems.

4. For the new VT52, it is a clean way to get the copier.

Is it unique?---

Would anyone want one?---

Should we make up such a self-contained gadget?----------------

How much?--------

How long?--------

GB:mjf

Distribution

Jim Bell	Rick Merrill
Ed Corell	Ken Olsen
Ken Fine	Bob Puffer
Len Halio	Mark Sebern
Al Huefner	Tom Stockebrand
Andy Knowles	Al Wallack
Bill McBride	John Wolaver

D I G I T A L   INTEROFFICE MEMORANDUM

SUBJ: LSI-11

PAGE   1
DATE: 10-14-75
FROM: GORDON BELL
EX: 2236
MS: ML12/A51

* *
TO: FILE
* *

SUBJ; DEBUGGING LSI-11 PROGRAMS

To: Distribution

Sam Fuller at CMU has a very nice multi-user interactive
program for controlling a cadre of LSI-11's via multiple high
speed lines (9600 baud). They use a particular monitor, but
I'd believe RSTS or RT11 and BASIC would be a reasonable
environment.

Conventional terminals control, etc., info to the LSI-11's. In
this way, we end up with a better programming environment.

I'll send the manual for their system when it arrives.

This came out of their research in LSI-11 computer modules and
the problem of coordinating and controlling them. Such a system
would be ideal for a lab-teaching environment involving multiple
machines.

GB:mjf

Distribution

Bob Bean   Charlie Spector
Duane Dickhut   Steve Teicher
Andy Knowles   Nat Teichholtz
Ed Kramer   Rob Vannaarden
Roy Moffa   Stu Wecker
                      Al Wallack

`DIGITAL`   INTEROFFICE MEMORANDUM

SUBJ: PM STAFF MEETINGS   DATE: 10-14-75
                                          FROM: GORDON BELL
                                          EX: 2236
                                          MS: ML12/A51

* *

TO: FILE

* *

SUBJ: RE YOUR PM STAFF MEETINGS

To: Malcom Johnston

The several issues which feel hot to me (and I'd like to attend):

Z.   Why are there no software PM's in these meetings?

A.   5100 - Sebern/Christy. Halio should probably be the person
     asked to report on this. Also, he should NOT come alone. I
     believe we want segmentation of problems into the hierarchy of
     levels in my memo, i.e.:

     1.   Packaging/hardware--Clarke (& Teicher)
     2.   Operating System + file RT-11--Munson
     3.   Languages--Ham (+Thissell for APL)
     4.   Applications subprogram--actually Fauvre to pull it
                    together; but also each P/L.
     5.   Customer pre-programmed packages--particular P/L's.
     6.   Sales interface/Service/Software support

We have a 5100 in house (my office now). Halio is coordinating
its evaluation vis a vis: documentation, human interface, APL
and BASIC performance (I want #'s before we talk about it).

Rumour from Al Perlis, Professor at CMU-now Yale (who
says it's the greatest invention yet): two teams were sent
to do the design. The winner used the 370/145 package (about
40K bytes(with emulator-assist and the gadget also interprets
the 370. The loser started from scratch. If this is true,
watch out. A mini 370 in a small box...which according to our
proposal to ARPA for a PDP-10 like it, is perfectly reasonable
and natural. From our analysis so far it ain't true; it's merely
an 8080-type design.

B. How can we use new larger ROMS, PROMS to enhance 11's?

This may be a can of worms. My view is that many features of
VAX can be put into 11's now such that we see a gradual
merging of VAX and 11/PDQ-45-70 -> VAX. The possible primitives:

1. Strings.

2. Fast context switching (e.g. take stuff in M and wire it in).

3. VAX loop control is really good.

4. Possibly field/bit/32-bit operations.

These are quite well defined ala VAX, and must be identical!

C. Address extension of 11. Note, the 2 attached memos with
    time estimates. Neal/Hassett are going off to explore what we
    could do here by getting a few people to explore how.
    My hunch:

    0. Stay away from I/D.

    1. Extend M/D-based primitives ala Cutler's suggestion;
        not clear we have to extend program-size space. Extend
        RT ala Bruce Leavitt.

    2. Wire-in (microprogram) these into PDQ-45-70 to get
        reasonable times (i.e. 2 microseconds). Youse may recall
        this scheme in the original segmentation proposal. Note,
        this would permit competition with the rumoured DG machine.
        Also, it would probably defuse the large VA problem by
        providing access to large arrays. It would run very
        respectably.

D. General architecture control problem.

Who looks out for the 11? (Note, a group went off April 1 and
got vaxcinated with a new machine...while I think they succeeded
in defining an architecture which is by far the best I've ever
seen, truly love, and intend to see that we build, we do have a
transition time where competitors can come at us pretty hard.)

GB:mjf

Attachment

cc: Dick Clayton   Clay Neal
        Bruce Delagi   Larry Portner
        Bill Demmer   Al Ryder
        Bruce Leavitt

digital INTEROFFICE MEMORANDUM

TO: Gordon Bell

DATE: October 6, 1975

FROM: Dave Cutler D.H.C.

DEPT: Advanced 11 Engineering

EXT: 5670   LOC: ML3-5/E35

SUBJ: EXTENDING VA SIZE

RE: Your memo of 1-October-1975

OCT 07 1975

There is a way to modify both RSX-11M/D (without impairing memory protection) so that users could change the address space and thereby get access to large arrays. The technique was suggested by Cutler in October, 1971, by Christy in the spring of 1975, by Lev in the summer of 1975, and implemented by XDS on the 940 timesharing system about seven years ago! I do not know why it was never accepted, perhaps because it required explicit management by the user.

The technique is very simple. The operating system basically implements three primitives:

   1. Create segment (name, length).

   2. Delete segment (name).

   3. Remap segment (name, virtual address, access).

As a user executes, he creates segments (which may be of variable length and require more than one KT register to map) and remaps to them at will. He thus can effectively have a very large address space. The remap time would be on the order of 300 to 400 µs; and therefore, the assumption, that once remapped to a segment, a user program will execute considerably longer before again remapping.

The implementation time? A mere six man months (a SWAG, of course).

/s

cc: Ron Brender
     Janice Carnes
     Dick Clayton
     Peter Christy
     Bill Demmer
     Ron Ham
     John Levy
     Al Ryder
     Pete van Roekens

Gordon Bell
ML 12-1/A51

digital

INTEROFFICE MEMORANDUM

TO: OOD Staff

cc: Stan Olsen
     Bill Demmer

DATE: September 26, 1975
FROM: Larry Portner
DEPT: Software Development
EXT: 2471
LOC/MAIL STOP: ML12/A62

SUBJ: OOD Agenda – October 2, 1975
Larry Portner, Chairman/Secretary

10:30	Review Minutes Review Agenda		
10:35	Budget Review	All	(60 mins.)
11:35	OOD/Marketing Committee Interface	All	(40 mins.)
12:15	OOD Space Guidelines	P. Laut	(15 mins.)

- -

FUTURE AGENDA ITEMS

- Management Development. (J. Cronkite/M. Abbett) 10/9
- Sales Meetings. (D. Clayton) 10/9
- Low Power Schottky help. (V. Bastiani/OOD) 10/9
- Honoraria Policy. (G. Bell) 10/9
- What is Resolution of DEC-20 Memory Strategy? (J. Leng/H. Lemaire) 10/16
- Commercial/OOD Interface. (S. Olsen) 10/23
- GM. (T. Johnson)
- Report on In-House 2-Year PDP-11 Usage Strategy. (Computer Resource Co.)
- QCMS Defect Reporting System. (J. Smith/M. Pecore)
- Is There a Field Integration Plan Yet? (J. Smith/J. Shields/D. Clayton/B. Puffer)
- Is There a Formal Action Plan that Allows Follow-up on Field Oriented Product Safety Problems? (J. Shields/R. Minezzi)
- Block Model Strategy Resolution. (J. Marcus/L. Portner)
- Is Action on ECO Control Called for at This Time? (J. Marcus)
- What is Happening to Make Systems a Reality in the Way we do Business? (D. Clayton)
- What is 3 Year Serial Bus Strategy? (V. Bastiani/D. Clayton)
- Bubble Memories

Expected attendance at OOD Meetings:

	GB	LP	RP	RC	PL	MA	JM	HL
10/2	X	X	X	out	X	X	out	X
10/9	X	X	X	X	X	X	X	X
10/16	X	X	X	X	X	X	out	X
10/23	X	X	X	?	X	X	X	X
10/30	X	X	X	X	X	X	X	X

digital INTEROFFICE MEMORANDUM

TO: Gordon Bell ✓

CC: Ron Brender   Ron Ham
     Janice Carnes   John Levy
     Dick Clayton   Al Ryder
     Dave Cutler   Bill Demmer
     Pete van Roekens

DATE: October 8, 1975

FROM: Bruce Leavitt

DEPT: 8/11 Software Development

EXT: 5465   LOC: ML5-5/E40

OCT 1 0 1975

SUBJ: Extending VA Size

RE: Your memo of October 1, 1975, same subject

FORTRAN IV version 2 will support large virtual arrays (32,767 elements), as planned.

Time frame: about 9-12 months

Systems: Direct access I/O VAs on all
     FORTRAN IV systems (RSX/IAS, RSTS/E, RT-11);

     KT-11 VAs on RT-11 only.

If RSX-11M/D can provide <u>fast</u> (.3ms) remap facilities for non-privileged tasks, we <u>will</u> plan support.

*FORTRAN IV KT-11 VAs have been implemented under RT-11; we are currently debugging and testing performance.

/nw