CONFIDENTIAL

OPERATIONS COMMITTEE MEETING

July 28, 1969

AGENDA

1. Additions and Corrections to Minutes of the July 22 Meeting

2. Increase in Shipping Volume - (John Jones)
   (See attached report)

3. Corporate Graphics - (Gabe d'Annunzio)
   (See attached report)

4. Computer Lab Trade Shows - (Bob Pouliot)
   (See attached report)

5. PDP-11 Announcement Plan - (Nick Mazzarese)
   (See attached report)

6. PDP-11 Project Evaluation - (Nick Mazzarese)
   (See attached report)

7. Overdue Order Report - (Nick Mazzarese/Stan Olsen)
   (See attached report)

8. Application vs. Hardware Cost Comparison - (Joe McHugh)
   (See attached report)

9. Biomedical Brochure - (Mort Ruderman)
   (See attached report)

10. Display Product Group - (Bob Collings)
    (Previously distributed)

11. Small Computer in the Chemical Laboratory - (Mark Nigberg)

CONFIDENTIAL

OPERATIONS COMMITTEE MINUTES

July 28, 1969

Present: K. Olsen, T. Johnson, B. Kopp, S. Olsen (Secy)

1. Minutes

   Minutes from the meeting of July 21, 1969 were read and accepted.

2. Disk Status - Joe StAmour

   Due to the corrosion between head and disk surface, we requested that the vendor change from 8 millionths of rhodium to 16 millionths. Joe suggested Manufacturing hold for 4 - 6 weeks until he can find a substitute for the rhodium (gold, aluminum, cadmium, tin). Joe will check with the Univ. of New Hampshire, and work on all possibilities concurrently. Also, Grant Saviers is in touch with the Metallurgical Department at MIT.

3. Film - Mark Niberg/Steve Kallis

   We contributed $2,000 towards a film, made by Virginia Polytech, on the use of computers in the analytical chemistry laboratory. We viewed about one-half of the film.

4. Increased Shipping Volume - John Jones

   Manufacturing is not up to this level. John to bring total budget, including expenses, next week.

5. Woods Meeting Topic

   How to maintain entrepreneurial spirit with over 4,000 people.

6. Corporate Graphics - Gabe D'Annunzio

   The new typeface is now the preferred type.

7. Budgets

We will sacredly adhere to budgets. Brewster will set up system for easily changing budgets when approved by the Operations Committee.

8. Overdue Orders - Nick, Stan

These reports were quickly discussed.

The following people will come to the Operations Committee to review their FY69 and First Quarter FY70 budgets:

Nick LoRusso
Dave Packer
Bob Lassen
J.C. Peterschmitt
Gabe D'Annunzio

Product Line Managers will analyze Q4 budget against Q4 actual, then look at the First Quarter FY70 Budget with Operations Committee.

Budget changes are not official until Ed Savage has a complete budget, including expenses and inventory changes. This includes PDP-15 and recent actions on PDP-8 and PDP-12.

We also talked about a newsletter version of the minutes for the Product Line Managers.

cag

digital INTEROFFICE MEMORANDUM

DATE: July 21, 1969

SUBJECT: Computer Lab Trade Show Participation

TO: Operations Committee FROM: Bob Pouliot

This is a request for Digital Equipment Corporation to participate in the following Educational Shows:

1. American Vocational Association (AVA)
   December 8-12, 1969 Boston, Mass.
   265 booths (4500 attendance)

2. National Association of Curriculum Development (NACD)
   March 15-19, 1970 San Francisco, California
   325 booths, (6500 attendance)

The AVA meeting in Boston is attended by Supervisors and directors of vocational Education in the United States. The impact of training materials and electronic equipment as well as computers has started to generate a tremendous need to update Vocational Training. This is an important marketing area for Computer Lab and also represents potential for the PDP-8-L. The budget and financial decisions of what equipment to buy result in many cases from what is seen at this show.

Since the convention is being held in Boston it certainly would be beneficial for DEC to participate.

The request is for a 10' booth area.

The NACD is an organization involved in promoting curriculum changes in' all areas of Elementary, Secondary and Post secondary education. People attending are curriculum directors, educational consultants and educators who make present and future recommendations for schools. They are interested in Computers as well as training equipment such as Computer Lab to promote Computer education. A 10' booth is requested. This is also an opportunity to generate Computer Lab sales as well as getting schools to use the PDP-8=L for program instruction.

The above 2 shows represent sales opportunity for Computer Lab Marketing to promote and sell to interested people in areas that would be practically impossible to contact individually.

In the past year many sales of Computer Labs have resulted due to physical contact and demonstration of the unit at trade shows.

TRADE SHOWS

July 21,1969

The planning and logistics of the above shows do not in anyway involve the trade show department since it requires no equipment to be shipped.

COST OF SHOWS:

1. AVA-Boston, Dec. 8-12,1969 $500.00

2. ASCD-San Francisco March 15-19, 1969 $500.00

Above includes cost of booth, shipping literature and booth accessories.

It does not include sales time, per diem and transportation for one person.

Ken

digital INTEROFFICE MEMORANDUM

DATE: 24 July 1969

SUBJECT: BI-MONTHLY REPORT

TO: Pete Kaufmann

FROM: Joe St. Amour

cc: Operations Committee
Marketing Committee

Large disk production has dropped to zero because of disk surface problems. The vendor ran out of control in his rhodium plating operation, and we have rejected approximately 120 surfaces. Disks received since 7 July have improved rhodium plating but now give indications that the corrosion problem still occurs when the disk is down for a period of time during hot, humid weather. We have increased the rhodium thickness from 8 millionths to 14 millionths and expect this should give us enough margin to continue while we come up with a better long-term solution. We will have a plan available Monday that indicates the fastest way to get up to a production of 100 units per month. Included in this plan will be an outline of the various risks involved and an estimate of dollar value at each risk level.

The Paper Tape Punch and Reader is presently in production, and the PDP-8 and PDP-15 Product Lines have agreed to use this machine. PDP-12 indicates they will use it, and a production model is presently in the hands of the PDP-10 group. This unit was redesigned to eliminate a significant number of Field Service and Manufacturing problems and,as a secondary goal, to reduce cost. Feedback indicates that we have met our objectives and that we will save approximately $150 per unit.

The DECtape prototype has been debugged. We have received over eighty percent of the parts required to start building pilot production and expect to have ten dual units or twenty DECtapes complete between August 15th and August 30th. This shows us approximately two to four weeks behind schedule. The pilot production units will be distributed to the various Product Lines for their evaluation and acceptance. We have met our objectives, and this unit will have a manufacturing cost in the neighborhood of $600 which means we will save $300 per unit or approximately three quarters of a million dollars per year.

A prototype of the TU-10 Tape Transport will be completely assembled by 1 August, and we expect that it will be debugged by 7 August. The short debugging time occurs because we have developed a fully debugged breadboard. A second prototype will be complete 15 August. We propose to give this second prototype to one of the Product Lines so that they can start their testing and hopefully so that we get an early acceptance of this unit. The first units which we will build will be a 45-inches per second tape transport instead of the 25-inches per second machine which we proposed. The cost of this machine will be within the cost objectives of the 25-ips tape transport.

We are continuing to look at internal needs for a 75-ips transport and expect to have a proposal sometime in August.

The head concept for a thermal printer has been scrapped because of its inability to perform at the required speeds. We are presently evaluating a wire matrix head made by Phillips which looks very promising. We have been running life tests on this head, and after fifteen million cycles (twenty hours of continuous operation), we have run into a failure on one of the wires. The failure is weird in that this wire actually split longitudinally from the impact point back one to one½ inches. It indicates that there could have been either a defect in the wire or that something slipped during the testing and we contributed to the error. After investigation, additional testing will continue on the remaining six wires.

Drafting has been able to hire a number of permanent people, and during the past three months, we have gotten rid of twelve contract workers. There remains eight contract workers in the Drafting group which we are trying to replace with permanent workers.

We are taking a good hard look at the Automatic Drafting System, and around the middle of August we will come up with an evaluation that outlines the benefits of this system, what it saves, if anything, and effectively justify whether or not it should continue to exist. At the same time, we will evaluate the potential of this system, what it will cost us to get there and what it will save us as we arrive at various levels. We

will then justify any future growths for this system.

Present work on the new PDP-10 includes an evaluation of old versus new cabinets. Present indications are that the use of the new style cabinets could result in savings in excess of $200,000 per year. A mock-up demonstrating alternatives with the new cabinet system will be available during the week of 28 July, and hopefully we will be able to reach a conclusion with the PDP-10 group at that time.

/gp

digital INTEROFFICE MEMORANDUM

DATE: July 23, 1969

SUBJECT: PDP-11 ANNOUNCEMENT PLAN

TO: Operations Committee FROM: Nick Mazzarese

Our current plan is to announce the PDP-11 on September 15. This is five months later than our original schedule. The causes for this delay are covered in a separate memo.

Prior to this date, the following events will have occurred.

1. On August 11, the breadboard, including memory and Teletype, will operate with instruction diagnostics.

2. On September 8, we will propose a firm price and delivery schedule to the Operations Committee.

3. Documentation (for customer evaluation of the PDP-11) will be available by September 15 in xerox copy form.

PDP-11

DATE: July 23, 1969

SUBJECT: PDP-11 Project Evaluation

TO: Operations Committee FROM: Nick Mazzarese

1. Purpose of this memo

To help the PDP-11 produce line evaluate it's successes and failures in achieving it's goals during FY 69, and to set new goals for FY 70.

2. History

On 10/22/68, the DCM project was formally proposed to the operations committee for approval. Prior to this time about 4 months of effort has been expended on an informal basis. In chart 1 attached to this memo, I have composed our current estimates of manufacturing cost, delivery schedule, etc. against this initial plan.

Without making excuses, I can only say that the problems of designing a new architecture for a small computer with inexperienced people were greatly underestimated by myself. In particular the goals for the project shifted as we had more customer/user feedback. On this latter point I feel that the tradeoffs have been worthwhile in that we do have an extremely capable machine, which will give us a strong competitive edge in the market-place.

3. Failures

A) Approximately 6 month slip in announcement and delivery schedule resulting in lost business and revenue but no decrease in engineering costs.

B) Cost objective of 11/20 system missed seriously. However, original estimate subject to question. Cost of upper (fast 16 bit) approximately the same.

C) Staffing of marketing group and support functions proceeding at too slow a rate.

D) Customer Documentation schedule also slow, causing announcement delays.

E) Projected Engineering development costs for FY 1970 double original estimate (but more accurate).

4. Contributions beyond original plan

A) Cross product line modular memory which will be used in 11, 10, 15, 8, possibly 12.

B) Power supply and packaging applicable to lower cost 8/I or 8/L.

C) Increasing company knowledge and confidence in lay-out, production, and testing of complex modules.

D) Positive logic higher density small disk research.

E) Wider range of processor power (covering entire 9/15 line) in family. Upwards source compatibility and peripheral hardware compatibility resulting in lower engineering development costs for future machines.

5. Goals

1. Develop a small-medium size general purpose 16 bit machine which will have outstanding architectural features enabling it to out-perform all present competition, and enabling DEC to pursue it and expand upon it for 4-7 years.

2. Smallest version should be price competitive with the 8 market area, and offer considerably improved performance.

3. The machine must have features which set it apart from "run of the mill" 16 bit systems. The architecture adopted by DEC must have adequate power, flexibility and life to warrant the expenditure on the project.

4. Basic architecture should have upwards growth possibility. This allows DEC to expand the line and add processing power, not just cut price or add frills. Expansion of line should allow simple growth of customer into larger and more sophisticated systems.

5. As new processors are added to the family, users should expect some order of upwards compatibility. Such compatibility must occur in areas of peripherals and interfacing. Program compatibility at source language level would be an objective.

6. There must be developed a complete line of peripherals to enable systems to be competetive.

7. The system must be relatively easy to use. It should not in itself be overly complex for the user, and every attempt should be made to provide convenient and powerful software for both program development and operation.

8. Machine must be extremely adaptable into the OEM market: i.e. modular, reliable, easily and inexpensively interfaced. Must have ROM, power fail, and other desireable features of this type.

9. Interfacing must provide the easiest and best I/O structure possible.

10. Initial market areas will be OEM and computernik's. Additional sales will be in general purpose application areas, concentrating early on communications hardware for OEM's. Prime emphasis will then be placed on development in applications areas where 1) The present PDP-8, -9 do not adequately fill requirements 2) New applications where it is felt that software development would be better invested on PDP-11 than 8 or 9.

11. Approximate cost goals:

11/20	Dedicated controller	2,092
11/30	Basic System	3,452

12. Approximate target dates:

11/30	Breadboard operating	August 10
11/30	Announcement	September 15
11/30	Demo	November 15
11/30	First Delivery	February 1970

CHART 1

	Manufacturing Cost 11/20	11/30	Announce	First Shipment
10/22/68 plan	1250	3450	4/69	8/69
current plan	2092	3452	9/69	2/70

	FY 69	FY 70
Development* cost		
10/22/68	452 (Budget)	811 K
current plan	414.8 (Actual)	1,538 K **

* includes hardware & software & all services.

** includes development of 11/40 (EAE processor)

digital INTEROFFICE MEMORANDUM

DATE: July 23, 1969

SUBJECT: OVERDUE ORDER REPORT

TO: Operations Committee

FROM: Nick Mazzarese

Attached are the Overdue Order Reports for June and July.

We have included our June report for comparison.

NJM/bb

Enclosures 2

NJM 7/17/69

OVERDUE BACKLOG SUMMARY - JULY

PDP-8/I's		
No. of orders > 30 days overdue =	11	$ 223,141.00
No. of orders < 30 days overdue =	19	704,352.12
Totals	30	927,493.12
PDP-8/L's		
No. of orders > 30 days overdue =	32	271,106.40
No. of orders < 30 days overdue =	53	523,391.25
Totals	85	794,497.65
OPTIONS		
No. of orders > 30 days overdue =	15	44,788.02
No. of orders < 30 days overdue =	43	258,389.55
	58	303,177.57
GRAND TOTALS	173	2,025,168.34

MAJOR PROBLEMS

DF/DS-32	18	Not enough forecasted (but corrected in new forecast).
RF/RS08	16	Vendor problems.
DW08	14	Not enough forecasted (but corrected in new forecast).
DC08	5	Design problems.

NJM 6/12/69

- OVERDUE BACKLOG SUMMARY - JUNE

PDP-8/I's		
No. of orders > 30 days overdue =	44	$ 1,178,873.87
No. of orders < 30 days overdue =	26	730,986.08
Totals	70	1,909,859.95
PDP-8/L's		
No. of orders > 30 days overdue =	59	546,506.50
No. of orders < 30 days overdue =	28	263,814.75
Totals	87	810,321.25
OPTIONS		
No. of orders > 30 days overdue =	45	280,161.17
No. of orders < 30 days overdue =	68	373,089.60
Totals	113	653,250.77
GRAND TOTALS	270	3,373,431.97

MAJOR PROBLEMS (approx. nos.)		
DF/DS-32	29	Not enough were forecasted.
DW08	25	" "
RF/RS08	19	Design problems.
DC08	14	Design problems.

digital INTEROFFICE MEMORANDUM

DATE: July 23, 1969

SUBJECT: Application vs Hardware Cost Comparison

TO: Operations Committee FROM: Joe McHugh

The attached chart is a two-dimensional array relating four different application areas against DEC Hardware now and an estimate of 1.5 years from now and three competitive vendors.

Each competitive configuration is compared against DEC price capabilities at the bottom of each block. The left percentage is DEC $ now/competitor $; the right percentage is DEC $ + 1.5 years/ competitor $.

Applic.	DEC Now	DEC + 1.5 yrs.	IBM	NCR	Friden
Brokerage Pkg.	8/I 4 DEC tapes KSR 34K	PDP/11 (4K) 4 DEC tapes KSR 25K	1130 Paper Tape Disk Console PTR 51K	500 69K	6010 4K Console Paper Tape I/O 45,000
			67% 49%	49% 36%	
Bill of Mat'ls 1. Prod. Structure File 2. Retreival	8/I 4 DEC KSR PTR LPT 56K	PDP/11 (8K) Disk LPT 45K	360/20 2 Disks MFCM LPT 1278	Cent 100 16K 2 Disc Card Read 400 LPM Print 112,500	6010 4K Console Paper Tape I/O 45,000
			44% 35%	50% 36%	124% 100%
Route Acctng 1. Load Reqmts 2. Route Reconcillation 3. Prod. Planning	8/L KSR 1 DEc tape 22K	PDP/11 (4K) 1 DEC tape 18K	1130 4K Card Read/Panel 1 Disk Console 70K	Cent 100 16K 2 Disk Card Read 400 LPM $112,500	6010 4K Console Paper Tape I/O 45,000
			31% 26%	20% 16%	49% 40%
Mini-Inventory When & How Much to Order	8/I w/8K MEM KSR Paper Tape Reader Line Printer 56K	PDP/11 (8K) Disk LPT 45K	360/20 Impact 2 Disks MFCM Line Print 127.8K	Cent 100 16K 2 Disks Card Read 400 LPM 112,500	6010 4K Console Paper Tape I/O 45,000
			43% 35%	50% 36%	124% 100%

digital INTEROFFICE MEMORANDUM

DATE: July 23, 1969

SUBJECT: BIOMEDICAL BROCHURE

TO: Operations Committee
cc: Gabe D'Annunzio

FROM: Mort Ruderman

Attached is a proposed outline and rough copy for the biomedical brochure. This format is intended to place our biomedical products first and foremost, and to rely on user efforts in applied medicine to emphasize our concern in these areas.

Thank you.

Mort

Att.

BIOMEDICAL BROCHURE

I. Introduction (1 page)

II. Biomedical Products (4 pages)

- CLINILAB-12
- RADIATION TREATMENT PLANNING
- LAB-8
- LAB-K

III. Research in Applied Medicine (2 pages)

IV. DEC - History and Services (1 page)

Total = 8 pages

I. INTRODUCTION

Several years ago, scientists began using DEC computers and modules in their research laboratories. They needed the power of a computer right in their laboratory, and direct connection to their experiments. DEC computers gave them these capabilities. Computers in biomedicine were new then...and DEC was new to the biomedical applications of computers. But while we were servicing these researchers, we were learning from them. The LAB-8 and the LAB-K, developed specifically for research laboratory applications, are the results of some of this learning.

More recently, physicians have begun to look for ways to utilize computers in the hospital to aid in patient care. Some computers are now operating in the hospital environment and doing just that. DEC's CLINILAB-12 and RADIATION TREATMENT PLANNING Systems, for example. But most of these endeavors in applied medicine are at the research level, and efficient and reliable systems have not yet been perfected.

The pioneers of computers in the laboratory sciences provided a strong foundation of experience for research in applied medicine, and in turn for the development of hospital systems. With these researchers, DEC was also a pioneer, and has established the same foundation. This is why DEC is the leading supplier of computers in biomedicine today. And why DEC will continue to be.

II. Biomedical Products

CLINILAB-12

DEC's CLINILAB-12 was developed for the Hospital Clinical Chemistry Laboratory. Many problems exist in the clinical laboratories which can be done most efficiently by a remote, dedicated computer. The initial steps and feasibility of automating clinical laboratory procedures has already been proven by research centers, where various types of equipment have been running for several years in a production-like environment.

The CLINILAB-12 has been designed as a small time-shared system, in order to service the clinical laboratory needs most effectively. There are two equipment systems available, depending on the laboratory requirements. These systems can be easily modified and/or expanded, either by adding user programs or additional equipment as the situation dictates.

All of the equipment and programs described in both the Basic and Advanced Systems are fully supported and maintained by DEC. And a maintenance contract for field service is required to insure our customers the best possible operation.

Basic System

The Basic Laboratory System includes:

DEC's PDP-12 computer, with:
- 4,096 words of core memory
- Real Time Clock
- 2 LINC Tape Units
- 24 Analog-to-Digital Channels

Laboratory Interface Connection, developed specifically for the Clinical Laboratory.

The Basic System provides the user with more stringent quality controls, reduces the number of manual errors introduced into the system by present methods, relieves technicians from tedious tasks which a computer can more easily handle, and offers the laboratory personnel more and varied methods for doing their routine analysis. This system can print out on any one of six Teletypes, one at a time.

Advanced System

The Advanced Laboratory System, in addition to the Basic System equipment, includes:

-Additional 4,096 word memory
-Fort Random Access Disk (minimum of 512K words)
-Medium Speed Printer (300 LPM)
-Up to 6 Teletype Stations

Additional peripheral equipment, such as card readers, data phones, manual entry consoles, and digital inputs from various laboratory equipment are available, depending on the individual hospital application.

The main objectives of the Advanced Laboratory System (in addition to those already mentioned in the Basic System) are to provide clinical reports for a patient file, summary reports, laboratory worksheets, and to integrate under one system all possible equipment and procedures in the Clinical Laboratory environment.

RADIATION TREATMENT PLANNING

DEC's RADIATION TREATMENT PLANNING System, based on the PDP-8/I computer, is an on-line system for external beam radiotherapy treatment planning. Developed and tested in conjunction with a London Hospital, it provides the radiotherapist with a tool that will perform calculations necessary to obtain an optimum plan for each patient with both speed and accuracy. And by relieving the radiotherapist from these time-consuming tasks, it enables him to put his skill and experience to the greatest possible use.

With this system, the radiotherapist may store representations of X or γ ray beams on DECtape - up to 400 representations may be stored on one tape. Also on DECtape is a representation of each patient outline, with a summary of the last four treatments for that patient. Up to 125 outlines may be stored on one tape. A drawing of the patient outline, indicating internal structure and tumor area, is obtained from a Rho-Theta Transducer, and the computer converts this input to suitable digital form.

The radiotherapist can request the display of a patient outline on the storage oscilloscope, as well as the display of one to six beams. The angle, radius, and relative weighting of each beam can be adjusted, and upon request isodose curves are displayed. After an optimal treatment plan is determined, the radiotherapist can store these on DECtape, immediately following the appropriate patient

outline file. A summary of the plan is then printed out on the Teletype.

Several plans can be examined in rapid succession, until the radiotherapist finally chooses the most suitable one. The production of one dose distribution can be done in approximately four minutes, while manually it may take up to two hours. And with the increased speed and accuracy which this system can provide, the patient, the radiotherapist, and the hospital may all benefit.

Specifications:

DEC's PDP-8/I computer
- 8K core memory
- Dual DECtape
- Storage Oscilloscope
- KV 8/I Interface
- Rho-Theta Transducer
- EAE (optional)

LAB-8

In laboratory research, there is often a need to isolate certain signals in experimental data, and eliminate background noise. Signal averaging is one of the methods for accomplishing this.

The LAB-8 is the first commercially available signal averager to be built, incorporating a general purpose computer. It is any PDP-8/I or lower priced PDP-8/L with an AX08 peripheral. The peripheral adds to the computer all of the electronic accessories required to assemble a compact, inexpensive yet versatile system tailored to the laboratory and especially signal averaging. Along with this hardware package, two complete averaging packages are provided, making the LAB-8 a most sophisticated signal averager.

This combination of computer and signal averager is really very logical. They both need memory and logic. Analog-to-digital conversion, display, and timing clocks are part of a signal averager, and they are part of the LAB-8, because it is a complete laboratory computer system.

Experimental situations exist where more than just an average of a number of signals is required. There may be a need to average at a special height rate, to blow up areas of the signal of special interest, to sort data dependent upon some external event, average signals which occur prior to the sync pulse, or calculate the standard deviation and trend of the signals during the experiment.

And this is where the LAB-8 is most efficient. There are more than 80 LAB-8's now being implemented in biomedical research by neurologists, cardiologists, and other scientists who are making use of these capabilities.

The LAB-8 never stops being a general purpose computer. It retains the flexibility and versatility of a computer, and when it is not doing signal averaging it can be a sophisticated desk calculator or a real laboratory computer.

LAB-K

LAB-K is a development of the research experimental psychology laboratory, where it was conceived. Research psychologists have for several years been using solid state modules to control laboratory experiments. LAB-K has been produced at DEC to meet the needs of these life scientists. Specifically, the LAB-K can aid experimental psychologists, psychophysiologists, and psychopharmacologists.

The LAB-K is a Logic Controller Kit. Basically, it is a group of K Series Modules connected in a building block format, designed for use in the life science research field. The Kit uses Boolean type logic modules which are wired together to control time and events in research experiments. The basic module kit is sold in expandable form.

An investment in LAB-K can eliminate the researcher's need to take a big jump in instrumentation sophistication, and therefore lose valuable time when producing a research experiment. Before LAB-K, the obvious jump in sophistication for the researcher was a computer, but this change required a slow-down in ongoing experiments until software could be developed. LAB-K can control, independent of a computer, a research experiment. That means research can continue with a minimum of interruption of the ongoing experiments. Modification of experiments is accomplished by changing experiments through a patchboard programmer. Parameters are changed through inexpensive thumbwheel switches for controlling time and events.

LAB-K manually controls experiments. With LAB-K, you can also reserve the option for parallel control with a DEC computer like the PDP-8/L, PDP-8/I, PDP-12, or PDP-15. This allows the shaping of subjects and the establishment of baseline behavior. It also allows the development of a new experiment with manual controls before turning the control of multiple LAB-K units over to the computer.

LAB-K provides a low cost logic interface between the test environment and a computer. This is due to the logic level voltage compatability between the K Series Modules of LAB-K and the M Series Modules used in DEC's computers. You can buy the LAB-K now for control of current experiments; later, if the need arises, you can easily interface the LAB-K to a DEC computer. At that point in time, LAB-K becomes the back-up to the computer for ongoing research.

Features:

-K Series high noise immunity solid state modules
-A hybrid module of discrete and IC circuits
-A maximum speed of 100 KHz
  Slow down feature to 5 KHz (maximum noise immunity)
-Signal levels: 0 volts = logic "0"
  +5 volts = logic "1"
-Fan out: 15 ma. available from all outputs;
  Typical inputs 1-3 ma.
-Manual Controls
-Logic independent of a computer, offering convenience and low cost
-Programmable patchboard kit - easily changes experiments and eliminates back wiring by customer
-Complete logic documentation and installation instructions
-Automatic worewrap service
-Prewired option to the maximum logic configuration, allowing ease for expanding

III. RESEARCH IN APPLIED MEDICINE - Introduction

More than 700 DEC computers are being used in Biomedicine, and at least 85% are in the research laboratory environment. In many cases, DEC's small and medium-sized general purpose computers have revolutionized study methods. Computer capabilities - for data acquisition, data reduction and statistical computation, and storage and retrieval of results - have allowed the researcher to attain a level of complexity, speed, and flexibility in his experiments which was once thought impossible.

This extensive and successful implementation of computers in the research environment has led to another level of biomedical research in Applied Medicine. Now physicians in medical centers and hospitals throughout the world are experimenting with methods for utilizing computer capabilities in the process of actual patient care.

This development is taking place in virtually every area of the hospital, and in many instances, DEC computers are involved. There is no doubt that this developmental stage will be a long one. But already, as a result of such efforts in research in Applied Medicine, DEC has produced two complete packages for the hospital. The CLINILAB-12 and the RADIATION TREATMENT PLANNING systems are the results of research and testing in the actual hospital environment. And as the research efforts in Applied Medicine with DEC computers continue, the potential for future hospital systems based on small dedicated computers is being developed.

Patient Monitoring

One northeastern engineering college, in conjunction with a Boston hospital, is developing an automatic monitoring system for ectopic beat detection. EKG's of patients in the coronary care unit of the hospital are transmitted via private telephone line to a DEC PDP-7 computer at the college, some 60 miles distant. The computer detects the ectopic beats through time interval analysis and waveshape analysis, and alerts the physician to his patient's susceptibility to heart electrical failure.

At another university medical school, a LINC-8 computer is monitoring four myocardial infarction patients in a coronary care unit. Eight variables are monitored, and parameters for the four beds are displayed at the computer station and nurse's station. The LINC-8 is capable of monitoring up to ten patients.

In an effort to detect rapidly developing respiratory problems following surgery, a prominent midwestern medical school is monitoring postoperative patients with a PDP-9 based system. One patient is now monitored continuously, and in the future, the system will monitor four, and then up to eight patients. EKG and respiratory rate are monitored constantly, and blood pressure and body temperature at given intervals.

A postoperative monitoring system is also being developed with a LAB-8 by researchers at a southwestern university. The LAB-8 monitors two patients continuously for EKG and blood pressure, while cardiac output is measured periodically. Blood gas readings are manually

Patient Monitoring (continued)

entered into the computer, and respiratory data are also available upon request. Eventually, the LAB-8 will monitor up to ten patients, and the cost of monitoring a patient per day will be significantly reduced.

In the department of surgery of another hospital location, a satellite computer system for patient monitoring is being developed. Here, physicians are implementing a large computer with smaller machines interfaced to it. The small computer is a 4K PDP-8/I, having bi-directional communication with the large machine, and having access to the peripherals of the large computer. The PDP-8/I may be used as a communications link, or as a stand-alone machine for smaller programs.

In the Department of Obstetrics and Gynecology at a university hospital, a PDP-8/I computer (originally done on a LINC-8) is monitoring expectant mothers in cases where complications are expected. Numerous variables are displayed on the computer's scope, and sent via closed circuit television to the patient's room, allowing the obstetrician to interpret any deviations from normal labor at the earliest possible moment.

Patient Interviewing

One medical group at a midwestern university pioneered this field several years ago, when they developed a patient interviewing program on the LINC (Laboratory Instrument Computer). This program presents a series of questions to the patient on a television screen,

and he answers via the computer's Teletype. The "branching" technique of questioning allows the patient several alternatives in responding, and the sequence of the questions presented is based on the individual's answers. A healthy individual may have to answe as few as 15 questions for his examination, while a patient with many health problems may have to answer hundreds. After the intervi a Teletype print-out is forwarded to the physician. A general medical history program, and two specialty interviewing programs will be incorporated into everyday use by this medical center within a year, now operating on a LINC-8 computer with four television screens.

A neurosurgeon in private practice is solving his interviewing and record keeping problems with a DEC PDP-8/I computer. A program containing hundreds of commonly used phrases and paragraphs is being developed, and will be stored on magnetic tape. Once completed, it will be possible to request a series of paragraphs from this program, and they will automatically be printed out by typewriters connected to the computer. This program will be used for correspondence as well as record keeping, and will greatly reduce the enormous amount of paperwork processed daily by this physician and his staff.

A northeastern corporation utilizes a DEC PDP-8/I computer as the basis for its multiphasic screening system. The interview, self-administered by the patient on a history taker console, consists of a 320 item questionnaire based on the "branching"

technique. Once completed, the computer generates a narrative report from 180 possible sentences. Additional physical examination information is entered manually into the computer, and included with the final print-out, which is available simultaneously with the patient's departure.

Pulmonary Function

A southern medical college has been developing a LINC-8 based system for possible use in screening large segments of the population for respiratory diseases, such as asthma, chronic bronchitis, and pulmonary emphysema. Given the patient's age, sex, height, and weight, the computer can establish normal values for that individual, prior to the actual test. The subject then takes a breathing test and answers a questionnaire. The computer expresses the actual test results in terms of the percentage of the normal values obtained for that individual. This system may, in the future, be included as part of a hospital admission procedure, or in business concerns where annual check-ups are required for all employees.

Nuclear Medicine

One european institute has developed a LINC-8 based whole body scanning system. In operation for almost one year, the system consists of the LINC-8, a scanner, a digital counter, and a color television set. The computer controls the scanner and obtains data such as isotopic counts and energy levels from it. After performing calculations with this data, results are displayed on the television

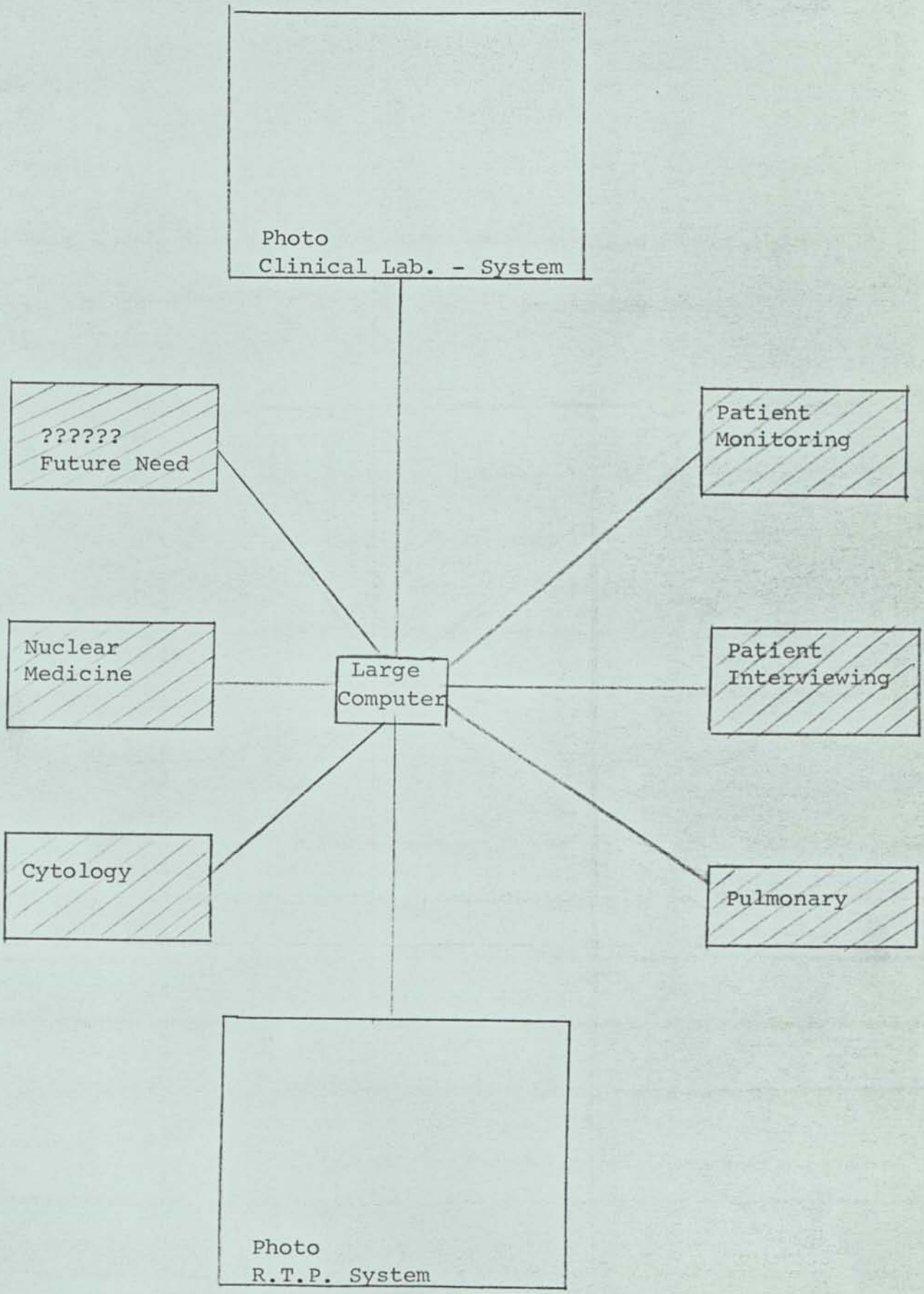
screen, with each isotopic intensity represented by a different color. The physician can immediately determine the areas of greatest radiation density by viewing the display. This system can act as a valuable tool in locating cancerous tissue, and also minimize patient exposure to radiation by precisely determining the effects of previous treatments.

Whole body scanning is also being conducted with a PDP-8/S computer by a nuclear corporation. In this case, the computer is mounted on a trailer for on sight counting at the nuclear facilities. Data obtained from a sensitive detector is processed through the PDP-8/S, and output is received via Teletype.

A PDP-8/S is also being implemented in brain scanning in a London Hospital. By analyzing radioactive brain scans, it is used as a tool for tumor localization. At another location a LINC-8 is used for evaluation of data coming from scintillation localizing equipment in brain scanning, with similar objectives.

Another area of nuclear medicine which has been explored using a DEC computer is Bone Densitometry. A midwestern university location has developed a LINC-8 based system for on-line densitometry, where the mineral content of bone can be measured from an x-ray film image.

Small Dedicated Computers in the Hospital



//// - Research in Applied Medicine

IV. ABOUT DEC

During the last decade, Digital has grown from a small supplier of electronic logic modules into the world's fourth largest computer manufacturer, with over 4,000 installations.

Starting with the PDP-1 in 1959, Digital has pioneered the development of real-time systems for science and industry. Since then, each new system has increased in versatility, yet has consistently decreased the cost of computation. The PDP-1 was the first powerful real-time computer for under $150,000. The PDP-8 showed that an effective computer could sell for less than $20,000, and newer models in the PDP-8 family have lowered the cost to less than $10,000. The PDP-6 was the first time-sharing computer to be delivered with manufacturer-supplied hardware and software, and its successor, the PDP-10 provides the best cost/performance ratio today. In the medium sized computer field, DEC's PDP-15 reflects programming and design experience gained from its predecessors, the PDP-4, 7, 9, and 9/L. The LINC (Laboratory Instrument Computer), and its successors the LINC-8 and PDP-12 are important factors in the development of DEC's biomedical capabilities. They are ideally suited for biomedical applications, allowing the researcher both power and flexibility in his experiments.

DEC CUSTOMER SUPPORT

DECUS

The Digital Equipment Computer Users Society (DECUS) was established in 1961 to advance the effective use of Digital Equipment

Corporation's computers and peripheral equipment. It is a voluntary non-profit users group supported by DEC, and whose objectives are to advance the art of computation through mutual education and interchange of ideas and information; establish standards and provide channels to facilitate free exchange of computer programs among its members; and provide feedback to the manufacturer on equipment and programming needs.

The society sponsors technical symposia twice each year (spring and fall) in the United States, as well as an annual European users meeting. Sessions specific to the biomedical fields are held at these symposia, and in 1967 a separate biomedical seminar was conducted. DECUS publishes proceedings of its symposia, and a newsletter, DECUSCOPE, every two months. DECUS also maintains a program library, which contains programs contributed by DEC computer users.

Service

The DEC Service Organization backs every computer sold. It is constantly growing with over 60 service centers throughout the world, and over 500 trained service engineers. Every Digital service specialist spends 75% of his first year in training and returns to the main plant each year for refresher courses and retraining. Senior field service engineers - about half of the total force - have an average of more than six years of computer experience and a total of nine years in the electronics field. And this Service Organization is ready to provide maintenance services tailored to each customer's needs.

Software Support

As the number of DEC computer installations increases, DEC's software support facilities are also growing. There are more than 30 software specialists located at our field offices, and product line and marketing groups are staffed with experts who can answer specific questions. In addition, a Computer Special Systems Group in Maynard provides both hardware and software support for special applications.

Training

Digital Equipment Corporation offers the DEC training program to every organization purchasing a computer, to prepare future users to program and maintain their DEC equipment. A trained full-time staff periodically conducts courses at Digital's main plant in Maynard. Class size is limited, allowing all students to operate the computers as an integral part of their training.

Reply Card to include the following:

* Applications Literature

Reprints of Computer Applications in Applied Medicine:

-Computers in Biomedicine, Volume II

-Computers in Patient Monitoring

-Computers in the Clinical Laboratory

-Computers for Patient Interviewing

Reprints of Computer Applications in Laboratory Research:

-Computers in Psychology, Volume 1

-Computers in Biomedicine, Volume 1

-Neurophysiology and Psychophysiology Applications with LINC-type Computers

-Simulation of Biological Systems

Product Line Information Requests

* Most of the applications literature consists of DECUS papers, which are to be printed for biomedical promotion, as separate short booklets

digital INTEROFFICE MEMORANDUM

DATE: July 17, 1969

SUBJECT: Display Product Group

TO: Operations Committee FROM: Bob Collings

I would like to repropose the establishment of a Display Product Group. This group will assume full responsibility for the marketing, engineering, and profitability of the following display products:

KV Graphic Systems including the VT01 Storage Tube, the H306 Joystick, the Vto2 Stand-Alone Terminal, and the associated PDP-8 family computer systems, options, and interfaces.

VR-12, Controller, and associated PDP-8/I and 8/L systems. Also "add-on" display options for PDP-8 family computers in the field.

338, 338/I, 339 and 340 Programmed Buffered Display.

Alphamumeric terminals including the VT03 on all products with the exception of the PDP-10.

Special Terminals developed for large volume customers.

It is expected that this reorganization together with the proposed program will more than triple display product sales and profitability during 1970 over what they would be without the establishment of this group. Gross sales are expected to be $4,496,000. Shipments will total $4,000,000 with a net product contribution of $1,092,000. Engineering and Development Expenses are $200,550.

During 1971, we can reasonably expect Display Product Sales to double and profit margins to increase futher.

The reason for expecting dramatic results is that we are only realizing a small portion of the substantial potential of our Display Products. Historically 16% of all PDP-5 systems included displays, 22% of all PDP-6 systems, 37% of all PDP-7 systems and 27% of all PDP-9 systems. The percentage of displays on our more recent computer systems (i.e. PDP-8/I, 9/L, and 10) is estimated to be less than 2%.

There are three distinct factors contributing to this decline. First, our markets are changing and a greater percentage of our systems are now going to OEM and Industrial customers rather than laboratory oriented customers who typically use displays for the real-time monitoring of experiments. Secondly, until recently, our display products have received virtually no sales effort nor marketing support. Many of our display products are older but still competitive, and they can be sold providing there is adequate push and support.

Present results confirm that this is true. During the past three months more 338 and 339 sales have been realized than the past 18 months. In fact, although these products are three to four years old approximately

25% of all systems sold have been sold in the past three months

Several of our newer products are the finest available, and they warrant a fullfledged marketing effort Third, the majority of our display products are available on only a few of our computer systems. This is true of our KV Graphics System, the VR 12 and VT 15.

Of these three factors, the latter two are readily rectified. I am proposing that the major thrust of the Display Product Group's effort be towards making available existing display products across all of our computer lines together with the development of the marketing support (demonstrations, product brochures, advertising, etc.) necessary to sell these products.

I would also like to propose the following projects be funded from the Shared Project fund:

Completion of VR-12

The VR-12 has several "bugs" which must be resolved before the project is completed. There also remains a substantial effort to complete the production release. It is estimated that three months will be required to complete this project and $25,000. The VR-12 will be entered again in Schedule Review with a detailed schedule of all remaining items to be completed. Bernard Nolen will report on the project. This project was originally funded as a shared project.

Completion of 374 Light Pen

The 374 light pen is both on schedule and on budget. To date, $7,500 of the $15,000 budgeted has been spent. The 374 light pen was approved as a shared project and we request the necessary $7,500 to complete the project.

Alphanumeric Terminal

A project presently in the proposal stage is the development of an A/N Terminal (ANT). Klaus Pichler & myself will present to the Operations Committee a proposal to do a feasibility/ bread-board study. The objective of this study is to prove the technical concepts of an ANT before spending large sums on a

full-scale development effort. At this time we only wish to inform you that this proposal is under way and the funds anticipated are $50,000. We would request that the Shared Project Fund not get fully allocated before this proposal is considered.

DISPLAY PRODUCT LINE

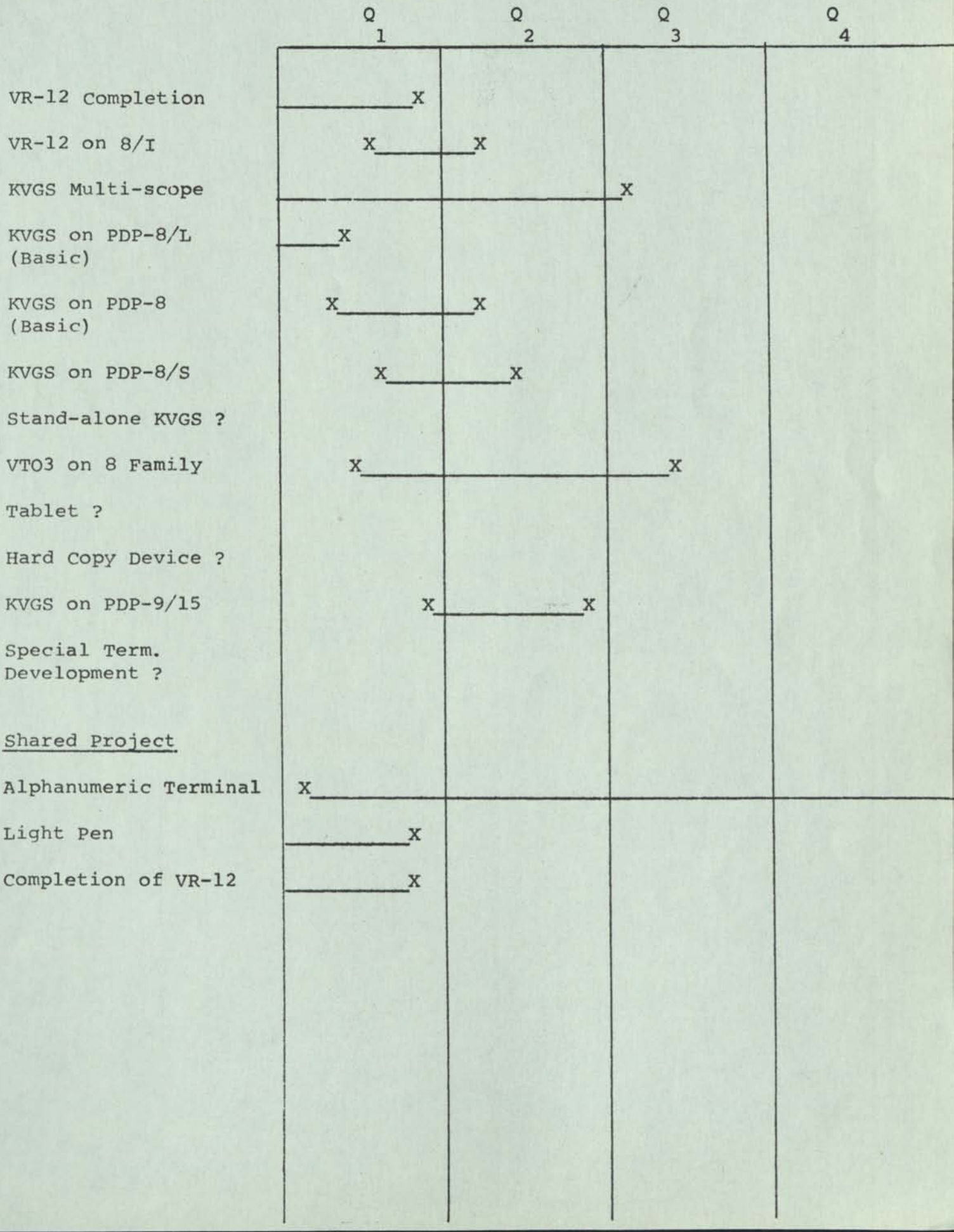
	1970					
	FIRST	SECOND	THIRD	FOURTH	TOTAL	
BOOKINGS	800	1,010	1,300	1,359	4,469	
1 Maynard Shipments	667	800	1133	1,400	4,000	
2 Contributions						
3 Allowances						
4 Discounts (Customer)	(67)	(80)	(113)	(140)	(400)	
5 NET EQUIPMENT	600	720	1020	1260	3,600	
6 Maintenance Income	10	14	24	32	80	
7 NET OPERATING REV.						
8 Manufacturing Cost	307	368	520	645	1840	
9 Allowances						
10 Warranty & Install.	40	48	67	81	236	
11 Maintenance Expense	7	10	17	22	56	
12 COST OF NET OPER. REV.	354	426	604	748	2,132	
13. GROSS MARGIN	256	308	440	544	1,548	
14 Product Engineering	38	43	44	41	166	
15 Product Marketing						
16 Product Selling	50	63	80	87	280	
17 Product Adv. & Prom.	2	3	2	3	10	
18 TOTAL PERIOD EXPENSES						
19 Other (Income) & Exp						
20 PRODUCT CONTRIBUTION	166	199	314	413	1,092	28.5
	27.2%	27.0%	30.0%	32.0%	28.5%	

DISPLAY PRODUCT LINE
1970 SALES MIX

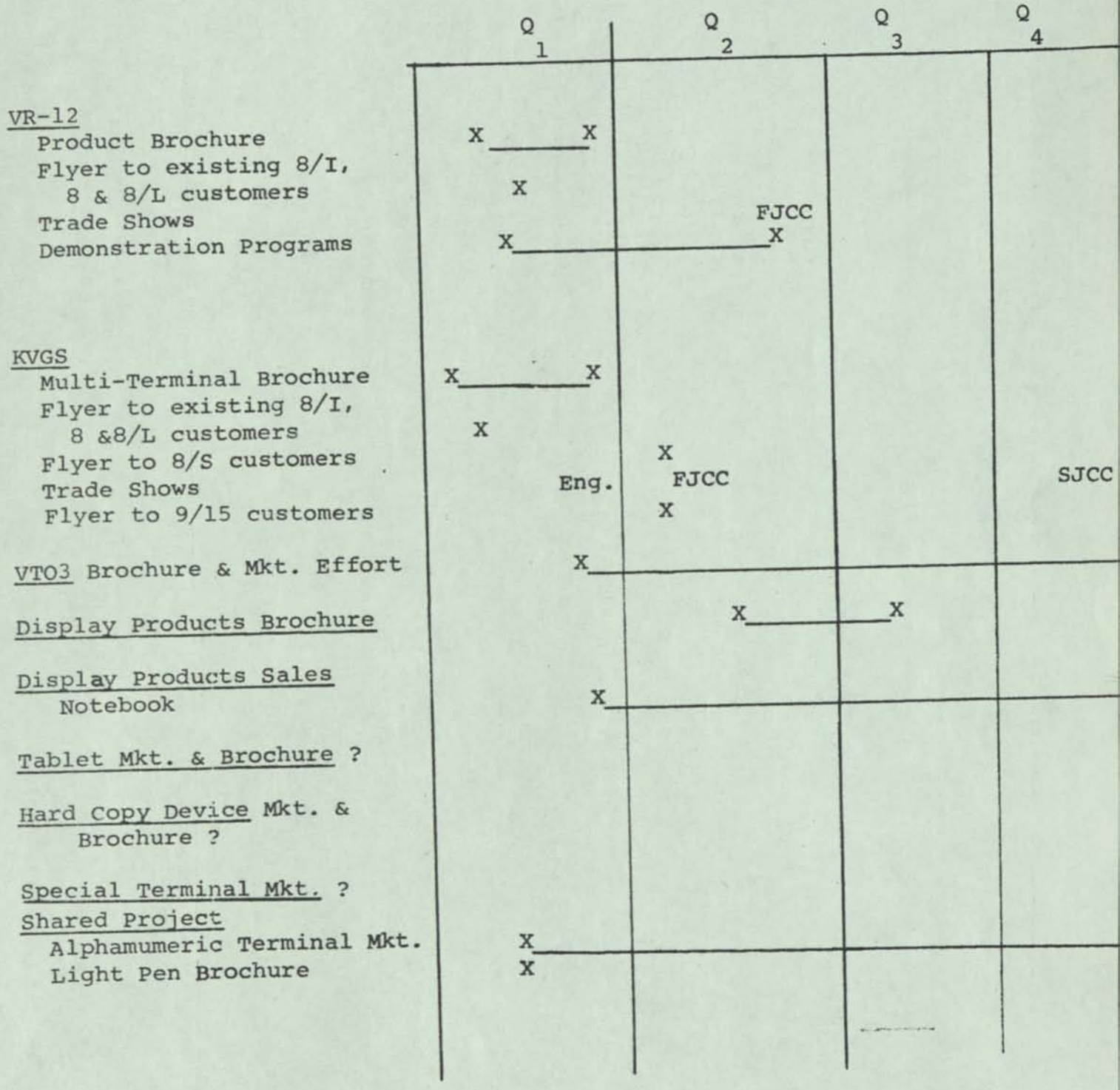
KVGS	
KVGS on 8/I & 8/L (excluding PDP-10 associated systems)	$2,028,000
KVGS on 8 & 8/S (20 systems add-on)	130,000
KVGS on 8/I & 8/L (PDP-10 associated systems only)	450,000
KVGS "add-Ons" to PDP-9/15 (10 systems)	65,000
338, 338/I, 339 & 340	
Includes value of complete system for 338, 338/I & 339 and display portion of 340.	$ 590,000
VR-12	
VR-12 on 8/I & 8/L (40 complete systems)	$ 946,000
VR-12 "add-ons" to 8/I, 8/L & 8 systems (30 add-ons)	144,000
VTO3	
VTO3 displays on all systems except PDP-10 (display value only)	$ 316,000
	$4,469,000 *

* Neither the Sales Revenue nor associated costs of developing a Special Terminal for particular customers has been included in this proposal.

DISPLAY PRODUCT LINE
Product Development



DISPLAY PRODUCT LINE
Market Development



DIGITAL EQUIPMENT CORPORATION
BUDGET WORKSHEET FOR COST CENTER NO. 375

Prepared by Bob Collings Approved by _____ Date _____

Acount Number	Activity Code	R.S.	Acount Name	Fiscal Year First Quarter	Second Quarter	Third Quarter	Fiscal Year Fourth Quarter
7?81		1	Project Material Direct	3,370	3,370	3,370	3,370
7?88		1	Mfg. Transfer - Direct	100	100	100	100
7?89		1	Material Requisitioned Dir.	2,280	2,280	2,280	2,280
7?84		1	Project Labor Direct	2,050	2,050	2,050	2,050
7?01		2	Base Labor (A)	12,000	13,000	13,000	14,000
7?01		2					
7?01		2					
7?02		3	Overhead Labor (B)	8,400	13,400	8,500	8,600
7?11			Holiday and Vacation (Budgeted for in A & B above)				
7?53		3	Agency Personnel	250	250	250	250
7?03		4	Overtime Premium	425	425	425	425
7?04		4	Personal Allowance	100	100	100	100
7?05		4	Sick Pay	100	100	100	100
7?15		4	Fringe Benefits (10% A & B)	2,040	2,100	2,150	2,260
7?25		5	Occupancy Charge (27¢ Sq. Ft./Mo.)	2,390	2,390	2,390	2,390
7?26		6	Stationery Misc.	1,160	1,160	1,160	1,160
7?28		6	Production Materials	4,530	4,530	4,530	4,530
7?29		6	Materials Requisitioned	915	915	915	915
7?40		7	Airlines	3,000	3,000	3,200	3,200
7?41		7	Auto Rentals	200	200	200	200
7?42		7	Lodging	2,000	2,000	2,200	2,200
7?27		8	Equipment Leased				
7?31		8	Repairs & Maintenance				
7?33		8	Depreciation	1,200	1,200	1,200	1,200
7?52		8	Dues & Subscriptions	100	100	100	100
7?58		8	Tel & Tel	1,500	1,500	1,700	1,900
7?59		8	Tuition Assistance	300	300	300	300
Total				48,410	49,470	49,830	51,640
Cost							
Center							200,550 *

* assumes the following project are funded through "shared projects" : 1) Completion of VR-12 ($25K)
2) Light Pen ($1.5K)
3) A/N Terminal Study ($50

CONFIDENTIAL

OPERATIONS COMMITTEE MEETING

July 21, 1969

AGENDA

1. Additions and Corrections to Minutes of the July 14th Meeting
2. Marketing Review Committee Summary - (Ted Johnson)
   (See attached minutes of the July 14th meeting)
3. Annual Report - (Gabe d'Annunzio)
   (See attached Product Summary Brochure portion)
4. Proposed Annual Summer Outing - (Dimitri Dimancesco)
   (See attached report)
5. Proposed Supervisory Training Program for FY 1970 - (Graydon Thayer)
   (See attached report)
6. Display Product Group - (Bob Collings)
   (See attached report)
7. Overdue Orders - (Stan Olsen/Nick Mazzarese)
8. Engineering and Marketing Plans - (Bob Lane)
9. Proposed Expansion and Refurbishing of Cafeteria - (John Murphy)
   (See attached report)
10. Property Removal Authorization and Procedure Policy - (John Kulik)
    (See attached report)

CONFIDENTIAL

COMPANY CONFIDENTIAL

digital INTEROFFICE MEMORANDUM

DATE: July 22, 1969

SUBJECT: OPERATIONS COMMITTEE MINUTES OF JULY 22, 1969

TO: Operations Committee

FROM: Nick Mazzarese

1. Additions and Corrections to Minutes of the July 14th Meeting

   The minutes were approved as submitted.

2. Marketing Review Committee Summary (Ted Johnson)

   This summary was submitted with no comments made.

3. Annual Report (Gabe d'Annunzio)

   In general, it was suggested that we add more facts and brag a little more. We will move ahead with production of this product summary.

4. Proposed Annual Summer Outing (Dimitri Dimancesco)

   This proposal was approved.

5. Proposed Supervisory Training Program for FY 1970 (G. Thayer)

   This proposal was approved.

6. Display Product Group (Bob Collings)

   This proposal was deferred until our next meeting.

7. Overdue Orders (Stan Olsen/Nick Mazzarese)

   This report was deferred until our next meeting.

8. Engineering and Marketing Plans (Bob Lane)

   This report was deferred until our next meeting.

9. Proposed Expansion and Refurbishing of Cafeteria (J. Murphy)

   Air-conditioning of the cafeteria was approved. It was agreed that John should talk to Ted and Brewster to propose a more pleasant cafeteria environment. It was felt that limiting improvement to just painting wouldn't be sufficient. A new proposal should be submitted to the Operations Committee.

10. Property Removal Authorization and Procedure Policy
(John Kulik)

This proposal was approved as submitted.

NJM/bb

digital INTEROFFICE MEMORANDUM

DATE: July 16, 1969

SUBJECT: PROPOSED EXPANSION AND REFURBISHING OF CAFETERIA

TO: Operations Committee

FROM: Personnel Committee
(John Murphy)

	Cost
PHASE I - EXPANSION	
Expand the existing cafeteria approximately 2000 sq. ft. and increase seating capacity from 350 to 425	$3,000
PHASE II - REFURBISHING	
A. Paint Cafeteria (walls and ceiling)	1,300
B. Seal floor (seating area only)	500
C. Room Divider (urgently needed to enable half of cafeteria to be used for meetings, orientations, etc.)	1,500
D. Completely air condition the cafeteria (31 tons of air conditioning)	9,300
TOTAL COST	$15,600

This was suggested to be done all resty

JDM/jfr

digital INTEROFFICE MEMORANDUM

DATE: July 16, 1969

SUBJECT: ANNUAL OUTING

TO: Operations Committee

FROM: Personnel Committee/Dimitri Dimancesco

Attached is the proposal for the Annual Summer Outing as approved by the Personnel Committee on July 9.

Based on our experience in previous years, we estimate total attendence of 6,000 people and total cost of $22,000.

DD:pm
Attachment

Will others be there

Ken

ANNUAL SUMMER
OUTING
PROPOSAL

Canobie Lake Park - Salem, N.H.

Saturday - September 13

(Alternate Date in case of rain - Saturday, September 28)

10:00 A.M. to 5:00 P.M.

Entire Park will be reserved for the Digital outing. Rides and attractions will be free with unlimited access.

Charge is $1.50 per person. We must guarantee 4,000.

SPECIAL ACTIVITIES

- Maynard Community Players Band (will march around park)		$250
- Teenage Dance 2:00 to 5:00 P.M.	Band	$100
- Girls Softball All-Stars vs. League Team		
- Outing souvenirs for young children - Indian Hats		$320
- Treasure Chest - Each person will receive a key to a treasure chest. 25 keys will unlock the chest. There'll be a prize for each winner.		$250
- Attendance prizes. Badges will be numbered and numbers will be drawn at random. Winners will be announced over PA system. List of winners will be posted next to exit. 200 prizes will be given out. Approximate value of each prize $1.		$250

FOOD

Caterer - John Tobin

Charge - $2 per person

- Hamburgers
- Hot Dogs
-Corn
- Pickles/Olives
- Potato Chips
- Watermelon

Ice Cream/Popsicles/Fudgicles
Coffee
Lemonade
Soda

Unlimited service except for ice cream.

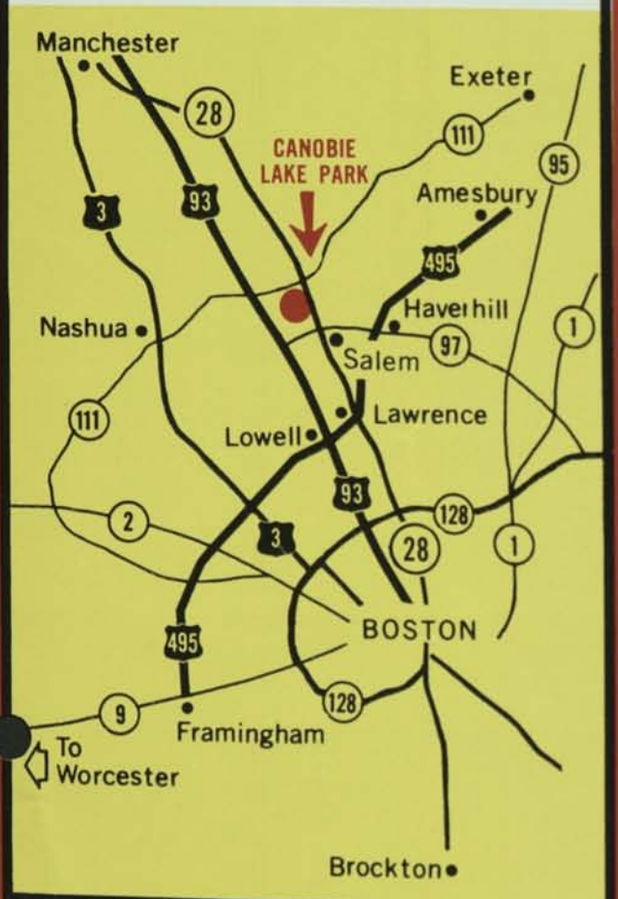
Several serving lines - Ice cream/Popsicles to be served separately after main food serving is completed.

Food hours	11:00 to 3:00
Ice Cream/Soda	1:00 to 4:00

Estimated attendance 6,000

It's Easy to get to . . .

Canobie Lake Park



Route 93 or 28 • Salem, N. H.

Canobie Lake Park is conveniently located and only a short traffic-free drive from Boston. Approximately 35 miles.

The Ideal Place for Outings in the Cool Pine Groves

Canobie Lake Park has something for everyone! Whether you enjoy a day of exhilarating fun, or a shady, restful spot for a picnic, a summer wonderland awaits you at Canobie Lake Park. Plan now to spend a day and evening you'll never forget! It leaves just one thing to be desired-a return trip!

Special rates for group outings of all sizes upon request. For full information about the park and all its facilities, write; or phone (603) 893-3506.

PARK OPEN

Daily June through Labor Day • Week ends April, May and September

PLENTY OF CONVENIENT FREE PARKING

Canobie Lake Park, Salem, N. H. 03079



fun

Seven Days and Seven Nights a Week



Canobie Lake Park

Route 93 or 28 • Salem, New Hampshire

Free Parking for Thousands of Cars

free!

Parking
Picnic Groves
Fireplaces
Baseball Field
Circus Acts
Fireworks

great!

Amusements

New Rides for All Ages

New Games

Outdoor Swimming Pool (with lifeguards)

Roller Skating

Cruises on the Lake

Boating and Fishing

Dancing . . . Nationally Famous Musical Groups and Personalities

Acres of Cool Pine Groves

Restaurant and Refreshment Booths

Fun House *Penny Arcade*

The Fun Capitol of New England!

CANOBIE LAKE PARK

Only 40 minutes from Boston

























digital INTEROFFICE MEMORANDUM

DATE: July 15, 1969

SUBJECT: Supervisory Training Program FY 70

TO: Operations Committee

FROM: Graydon Thayer

Attached is a letter from Art Gerstenfeld outlining our plans for supervisory/management training during FY 70. Under this proposal, it would permit us to double the number of supervisors trained from 30 to 60 per year, which I feel is sorely needed.

I am requesting Operations Committee's review and approval and would point out that the plan would require individuals to be absent from their jobs for a two hour period each day the course is scheduled.

GAT/lw

BOSTON UNIVERSITY
COLLEGE OF BUSINESS ADMINISTRATION
685 Commonwealth Avenue, BOSTON, MASSACHUSETTS 02215
CHARLES RIVER CAMPUS

June 30, 1969

PERSONNEL
JUL 3 1969
G. A. THAYER

Mr. Graydon Thayer
Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts 01754

Dear Graydon:

In accordance with our recent discussion, I am pleased to submit an outline for the training programs that we discussed for the second half of 1969 and the first half of 1970. The outline for these coming programs has, of course, been strongly influenced by feedback that I received from the previous supervisory training courses:

I. The following outline is the tentative plan for the two supervisory training courses:

(The plan would be to have two classes each to be held on consecutive Tuesdays, for a period of 12 weeks, starting September 9th. One of the courses would be conducted from 10 o'clock in the morning until 12 noon. The second course would run from 2 o'clock in the afternoon until 4:00 p.m.)

The meetings will include case discussions, films, articles, research findings, and text material. The goal is for the participants to gain insights into the supervisors' role and responsibilities in the organization. The supervisors will hopefully be stimulated to do further thinking and reading that will enhance their individual growth as well as the growth of the organization.

II. There was an expressed desire at the previous senior management training course that some form of continuing program be enacted. With agreement on that issue, the obvious stumbling block is the serious time constraints on all the members of the senior level management program. The plan that evolved that I now present to you is that a Saturday and Sunday in late November be put aside so that all the participants of the previous senior level management program meet with me for two all-day sessions. We would divide the time among case discussions, research findings, articles, and appropriate text material. It would be our goal to

increase the perspective of the individuals so that decision making in the following months would be based on a larger spectrum of alternatives.

For budgeting purposes I submit the following:

Supervisor Training	Sept. 9, 16, 23, 30 Oct. 7, 14, 21, 28 Nov. 4, 11, 18, 25	
10 a.m. - 12 a.m.; 2 p.m. - 4 p.m.		$200 per day = $2,400
Senior Level Management	2 days - Saturday & Sunday Nov. 29 & 30	
		$250 per day = 500
		Total $2,900

I'd suggest a review of the courses, goals, and accomplishments about January 1st. If the same pattern is followed for the second half of the fiscal year, then specific dates can be set at that time. If the first portion of the year indicates a desire for a similar program for the second portion of the year, the above budgeted figures should be doubled.

I am open to comments and suggestions and will look forward to hearing from you. Please accept my kindest personal regards.

Very truly yours,

Arthur Gerstenfeld

Arthur Gerstenfeld, Ph.D.
Associate Professor
Operations Management

bc

digital INTEROFFICE MEMORANDUM

DATE: July 16, 1969

SUBJECT: PRODUCT SUMMARY BROCHURE

TO: Operations Committee FROM: Gabe d'Annunzio

Attached is the revised copy for the Product Summary Brochure to be included in the Annual Report. Please give me your comments on it as soon as possible as we would like to go ahead setting type during the week of July 21.

GD:meb

DEC PRODUCTS AND SERVICES

INTRODUCTION

Digital Equipment Corporation's growth in a little over ten years can be measured in a number of ways. Production space has increased from a modest eight thousand square feet to over one million square feet. The original nucleus of three employees has grown to a staff of 3,500.

The diversity of markets which DEC now penetrates is probably a more significant gauge. Physics, biomedicine, computerized typesetting, industrial process control, and education are only a few points on the scale. The total picture reveals that DEC is a dominant force in most medium and small computer markets, while at the same time it is one of the world's largest manufacturing supplier of electronic circuit modules.

DEC's success comes from its aggressive development of products which answer specific applications needs in a variety of industrial and scientific environments. The company backs up this product mix with a number of services to make its equipment even more effective.

The following pages will give you an overview of Digital Equipment Corporation: Products and Services.

PDP-8/I and PDP-8/L

PDP-8/I and PDP-8/L -- small, low cost, full scale computers -- are built around the same 4,096-word, 12-bit core memory and fully parallel central processor. The PDP-8/I is designed for those who need plug-in expansion, and the 8/L is designed for those who do not.

The PDP-8's not only handle general purpose tasks, but by means of Computerpacks do special purpose jobs as well.

COMPUTERPACKS

Computerpacks are integrated, computer-based systems, with built-in spftware, interfacing, and special peripherals. The following are only some of the Computerpacks currently available.

The LAB-8 Signal Averaging System enables any PDP-8 to signal, calculate, and display the trend and variance of data, display blow-ups of areas of interest, and control the experiment.

GLC-8 will service 20 or more gas chromatographs simultaneously. It automatically reduces and analyzes data, and types a complete analysis report.

Typeset-8, the PDP-8 computerized typesetting system, takes unjustified and unhyphenated paper tape and converts it to justified, hyphenated tape for use with hot metal and photocomposition machines.

PHA-8 is a complete computer system for nuclear pulse height analysis. It can gather, store, display, and analyze energy or time-of-flight spectra, and record the results on a variety of output devices.

Quickpoint-8 prepares tapes for numerically controlled, point-to-point machine tools.

INDAC-8 is a computerized, real-time system for acquiring and monitoring data. The SNAP feature allows the user to get a "snapshot" of his entire system or any part of it at any specific point in time.

Timeshared-8 is a multi-language local time-sharing system offering simultaneous use to as many as 32 users. Along with the equipment comes a software language package that includes FORTRAN, BASIC, and FOCAL. Machine languages can also be used.

PDP-12

The PDP-12 is the first small laboratory-oriented computer with built-in graphics capability. Performance characteristics have been optimized around a complete 12-bit hardware/software system, and the cathode ray tube display allows interaction between operator and computer.

The PDP-12 can be used to acquire and analyze data from one or more instruments typically used in chemical or physical analysis, such as mass spectrometers, gas chromatographs, chemical analyzers, NMR spectro-

meters, and various particle size counters.

In signal processing, the PDP-12 manipulates data through averaging, time interval measurements, frequency analysis, and correlation.

The hands-on, interactive concept of the PDP-12 make it well suited for computer extended instruction in universities, junior colleges, and high schools.

In psychological and physiological research, the PDP-12 can control experiments, record events, and analyze results.

The PDP-12 can interpret and process data simultaneously from up to 15 analytical instruments. The turn-key system provides efficient patient monitoring and patient interviewing.

PDP-15

Since certain types of data handling tasks require specific hardware and software configurations, Digital has developed four medium-scale 18-bit PDP-15 systems.

The PDP-15/10 is a basic system designed to let beginning users with limited budgets plan for later expansion.

PDP-15/20 is designed for research and engineering environments where real-time data acquisition and control tasks are combined with program development and testing.

PDP-15/30 is oriented towards research, engineering, and industrial environments where one or more real-time tasks typically require continuous responsiveness from the computer but do not use 100% of its capacity.

PDP-15/40 is designed for industrial and engineering environments where the need for a background/foreground mode of operation is compounded by the necessity of large random-access files.

PDP-10

The PDP-10 is DEC's large-scale, 36-bit computer system designed to perform conversational timesharing, batch processing, and real-time operations equally well and simultaneously.

In conversational timesharing, up to 63 users at local or remote locations can simultaneously share a broad range of system capabilities. For programs that do not require immediate processing, a user may initiate batch processing, and let the system software control a queue of card or tape jobs. Real-time operations would include data acquisition and control.

APPLICATIONS

University computer centers use the PDP-10 to solve student and faculty computing problems, develop new programs, process administrative data, and to provide computer-aided instruction.

In hybrid systems, the PDP-10 is combined with analog equipment to simulate the operation and/or control of complex systems. The PDP-10 interfaces easily with analog computers of all the major manufacturers.

In chemical laboratories, the PDP-10 collects data from analytical equipment, makes component identifications and analyses, and builds chemical models.

High energy and nuclear physics laboratories use the PDP-10 for both on-line and off-line analysis of real-time applications.

In biomedical research, the PDP-10 is useful for mathematical modeling and pattern recognition. In applied medicine, it has found uses in clinical chemistry, multiphasic screening centers, hospital information systems, and intensive care units.

MODULES

DEC's logic modules -- solid state, electronic circuit boards -- are used extensively by manufacturers of other equipment, from machine tools to scientific instruments. DEC computers and associated equipment are also constructed from them.

DEC makes 324 different types of modules in three basic families:

K-Series -- for control applications in industrial environments requiring immunity to noise

M-Series -- for high-speed computer interfacing and instrumentation

A-Series -- analog-to-digital and digital-to-analog converters

The modules are used for interfacing other equipment to DEC computing systems, and for constructing a wide variety of laboratory equipment that need not be associated with the computing systems.

PDP-14

DEC's 12-bit PDP-14 is a small, solid state replacement for electrical relays used in control of mass production machinery.

The PDP-14 will directly control machines such as automotive transfer lines, complex material handling systems, steel rolling mills and elevator systems. The PDP-14 can also lead to a machine monitoring system where each 14 controls its own bank of machine tools and keeps a computer informed of its progress.

COMPUTER LAB

DEC's Computer Lab is a complete classroom laboratory for teaching digital logic and computer fundamentals. The course provides a set of ten experiments illustrating the full range of digital logic principles. The student can follow each step of the Computer Lab instructions by wiring the unit with easily inserted and removed Patchcords and then test his final design.

DEC provides a complete line of peripherals and special interfacing to adapt its computers to specific customer requirements for increased input/output capability, processing, and information storage.

ARITHMETIC PROCESSORS	Up to 366 Instructions Up to 16 General Purpose Registers Multi-programming Hardware Priority Interrupt System Console Teletype Paper Tape Reader and Punch Operator Console
DISK SYSTEMS	High-Speed Swapping Disks (to 2,000,000 Words) Disk Packs (to 40,000,000 Words) High-Capacity Storage Disk (to 100,000,000 Words) Disk File 13-Bit Words (to 131,072 Words) Rotating File 13-Bit Words (to 1,024,000 Words)
STORAGE DRUMS	18-Bit Words (to 524,288 Words) 36-Bit Words (to 345,600 Words)
MAGNETIC TAPE UNITS	Seven and Nine Channels 45 and 75 Inches per Second 200, 556, and 800 Bits per Inch Industry Compatible Seven and Nine Channels 25 IPS 200, 556, and 800 BPI Industry Compatible Incremental Write, 700 Steps/Sec. 200, 556, and 800 BPI Industry Compatible
DECTAPE SYSTEMS	Compact 4-inch Diameter Reels Fixed Address Recording 73,984 Words per Reel File-Oriented with Directories 5 Track Redundent Recording
LINE PRINTERS	64 Character, 300 and 1000 lines/minute 96 Character, 600 lines/minute 128 Character, 500 lines/minute

CARD READERS/PUNCHES	1000 cpm Reader (833 cpm for 50 Hertz) 200-365 cpm Punch Card Reader (GDI--Model 100) 200 cpm 50/60 hz. 110V. Card Reader (Burroughs--B122) 200 cpm 50/60 hz. 110V.
PAPER TAPE EQUIPMENT	Readers, optical, 300 cps (characters per second) Punches, 50 cps Typesetting readers, 6 or 8 level, 110 cps Typesetting punches, 6 or 8 level, 110 cps
COMMUNICATIONS EQUIPMENT	Data Line Scanner Computer-Based Communication System Local Terminals (Teletypes and Display) Data Phones Telegraph Lines Automatic Data Set Control Automatic Dialing Capability
TELETYPE EQUIPMENT	ASR-33, 35, 37 KSR-33, 35, 37 100 or 150 wpm
CRT DISPLAY SYSTEMS	Alphanumeric Keyboard Terminals Point Plotting Display Vector Display Fully Buffered Graphic Display Satellite Computer Display Systems Storage Tube Graphic System 20 usec. Character Generator (Hardware) Software Character Generator
PLOTTERS	Width--12 or 18 Inch Step Size--.01 or .005 Inches .1 or .05 Millimeters
REAL-TIME INTERFACE EQUIPMENT	A/D and D/A Converters Digital Input and Output Subsystems Special Systems Gas Chromatography Systems Signal Averaging Systems

DEC SUPPLIES

DEC has a complete line of operating supplies which include DECtape, LINCtape, and standard magnetic tape; paper tape; tape storage racks and accessories; printer paper and ribbons; and miscellaneous items.

COMPUTER SPECIAL SYSTEMS

The Computer Special Systems group is comprised of applications engineers, sales support personnel, project engineers, programmers, and manufacturing specialists. They interface DEC equipment to that of other manufacturers, design new logic to apply the computer to a particular problem or process, and make required modifications to any of DEC's existing products.

For many special applications, DEC has an experienced staff of systems programmers to develop custom software. In some cases, DEC programmers may be able to adapt parts of its standard system software into custom designs.

FIELD SERVICE

A world-wide field service staff insures the proper maintenance of DEC machines. One of the company's over 500 field service engineers can be at any location within a few hours if a problem develops, or a resident engineer can be located at a site full time.

For small computer users, DEC also offers depot repair stations. Located at strategic Digital service centers, each station is a complete service lab manned with full time engineers and fully equipped with test equipment.

DECUS

Digital Equipment Computer Users Society (DECUS) is a volumtary, non-profit users group supported by DEC.

The Society publishes a newsletter, DECUSCOPE, every two months, sponsors technical symposia twice a year (Spring and Fall), maintains a program library, and publishes proceedings of its symposia.

DECUS encourages subgrouping of users with common interests. Special interest groups include European users; module users; the education sub-group; users in the biomedical field; PDP-6/10 users, and local user groups.

The DECUS Program Library contains programs contributed by the users. All DECUS programs are available to members without charge.

THE DEC TRAINING PROGRAM

The company offers the DEC Training Program to every organization purchasing a computer. A trained full-time staff periodically conducts courses at DEC's main plant in Maynard, Massachusetts.

With the exception of the Basic Programming Course, all courses are designed to teach experienced computer personnel how to program or maintain their computer. The courses assume prior knowledge of basic programming or basic electronics, and computer technology.

digital INTEROFFICE MEMORANDUM

DATE: July 15, 1969

SUBJECT: PROPERTY REMOVAL AUTHORIZATION AND PROCEDURE **POLICY**

TO: Operations Committee FROM: John Kulik, Security Officer

Attached please find a copy of the Property Removal Authorization and Procedure which has been approved by the Security Committee.

This procedure is forwarded to you for final approval.

JK/clw

Attachment

POLICY

PROPERTY REMOVAL AUTHORIZATION AND PROCEDURE

AUGUST 1, 1969

A. To establish an accountability of Company property and material to be removed from Company premises on loan or as scrap material, the following procedure will be in effect:

1. No Company property or material shall be removed, or authorized to be removed from the premises without a Property Removal Authorization Pass issued by the Department Cost Center Manager and/or employee designated in writing by Cost Center Manager to Security Officer.

   a. A product on shipping consignment for which billing is required upon being removed in person from DEC will be presented to a security guard along with the Shipping Billing Authorization. A copy of the Shipping Billing Authorization will be retained by the security guard prior to removal of any such property.

2. The Property Removal Authorization Pass will be made up in two (2) parts, each part bearing a corresponding number. The first, or top part, shall consist of an original and a hard carbon copy. The hard carbon copy will be known as the file copy. The second, or bottom part, will be known as the receipt.

3. The Property Removal Authorization Pass will contain the following:

   a. Date

   b. Badge number, Name, and Cost Center of employee to whom Pass is issued

   c. Description of property or material to be removed on loan including serial number, if any. If the property is scrap material, the issuing authority will note same along with the description.

   d. Signature of employee to whom Pass is issued

   e. Signature of issuing authority (Cost Center Manager)

B. Processing

1. Employee to whom Pass has been issued shall, prior to leaving the Company premises, submit the property or material along with the Pass in its entirety to a security guard.

2. The security guard will check the Pass to ascertain if it contains the required information and signatures, that the description noted thereon conforms to the property or material being removed, and will verify or confirm the issuing authorization signature if in doubt.

B. Processing (Cont'd.)

3. Upon clearance by security guard for property or material to be removed on loan, the employee will be given the original copy of the first, or top part, of the Pass and permitted to leave with the material or property. The remaining hard carbon copy with attached receipt will be dated and signed by the guard on the reverse side and placed in an "Out-Property" file.

4. Upon clearance by security guard for property or material authorized to be removed as scrap material, the employee will submit the Pass in its entirety to the security guard. The Pass must note, along with description, that the material or property is scrap. The security guard will date and sign the file copy of the Pass and forward to Security Office.

C. Property Return

1. Property or material which has been out on loan when returned must be presented to the security guard for clearance with the original Authorization Pass. The security guard will check the property and Pass with the copy on file. If no discrepancies are discovered, the security guard will fill out and date the receipt (bottom portion of file copy), detach and give to employee as his record of receipt. Date returned and signature will be noted by security guard on back of file copy. File copy and employee original copy will then be forwarded to Security Office.

2. Should property or material out on loan be returned by mail, it must be sent to the Cost Center Manager with the original Authorization Pass. The Cost Center Manager will submit the Pass to the security guard for clearance. If no discrepancies are found, the security guard will fill out and date the receipt and return to Cost Center Manager. Signature will be noted by the security guard on back of file copy and Pass will be forwarded to Security Office.

D. Liability

Employee to whom Company property or material is issued on loan shall be responsible and liable for:

1. Its return to the issuing authority

2. Restitution in event said property or material is damaged, lost or stolen during such loan period.

E. Cost Center Managers should keep for their own information a record or log of property or material issued to employees. At termination of employment of an employee, the issuing authority shall ascertain and check with Security Office that the terminating employee has no Company property or material out on authorized Pass.

Property Removal Authorization Pass forms will be audited by the Security Office and issued to Cost Centers upon request.

John Kulik/clw
7/15/69

digital

CONFIDENTIAL

OPERATIONS COMMITTEE MEETING

July 14, 1969

AGENDA

1. Additions and Corrections to Minutes of the July 7th Meeting
2. Engineering and Marketing Plans - (Al Devault)
   (See attached report)
3. Engineering and Marketing Plans - (Dick Clayton)
4. Proposal to Establish a Programming Product Line - (Larry Portner)
   (Report distributed for last week's meeting)
5. Salary Administration for Wage Class 4 Employees - (Graydon Thayer/Bob Lassen)
   (Report distributed for last week's meeting)
6. Salary Review - (Ted Johnson)
   (Sales people not discussed at Salary Review Committee on July 8th)
7. Status Report on Plant Engineering Activities - (Al Hanson)
   (Originally scheduled for Schedule Review meeting on July 11th)
8. Proposed Transfer of Timeshared-8 from Nick Mazzarese to Win Hindle
9. Proposed Transfer of Display Products from Nick Mazzarese to Joe St. Amour
10. Monthly Report on Status of Responsibilities - (Dick Best)
    (See attached report)
11. Proposed Administrative Procedures Manual - (Nick LoRusso)
    (See attached report)
12. Annual Report - (Gabe d'Annunzio)
    (See attached Introduction section)
13. Proposed Capital Equipment Plan for Fiscal 1970 - (Ed Savage)
    (See attached report)
14. Fiscal Year 1970 Budget and Budgeting Process - (Bob Savell)
    (Report distributed for last week's meeting)
15. Proposal for Shared Development of Data Acquisition Products
    (Attached report from Ron Noonan as information only)
16. Marketing Review Committee Summary - (Ted Johnson)
    (See attached minutes of the July 3rd meeting)

digital INTEROFFICE MEMORANDUM

DATE: July 15, 1969

SUBJECT: MINUTES OF THE OPERATIONS COMMITTEE MEETING OF JULY 14, 1969

TO: Operations Committee FROM: Nick Mazzarese, Secretary

Present: Ken Olsen, Stan Olsen, Win Hindle, Brewster Kopp, Ted Johnson, and Nick Mazzarese

1. Minutes of the July 7th meeting were approved, but with the following corrections. Under item 1. a., it should read that we buy over "two" million dollars worth of Teletypes a year, not one, and 1. d. should read, In addition to "Digital," "DEC" will be put . . . . . .

Ken asked when the PDP-11 manufacturing cost would be available. Nick proposed that next week he would present a PDP-11 project summary for Fiscal Year 1969 and a plan for its announcement.

2. Discussion of Activities With DEC - (Dick Testa

A. Options for Officers

Our position with regard to the SEC and options for Officers of DEC is that there is no restriction on granting or exercising options for affiliated companies of investment companies.

B. Restricted Options

It is likely that during the next 6 - 30 months there will be less favorable tax treatment for Restricted Options. Dick also guessed that the effective date of this tax treatment will probably slip in time. His proposal was that we continue to offer our Restricted Plan as we have in the past. Should the tax laws change, we could rescind the agreements with employees if they desired.

C. Lobby Groups in Washington

Win has received a request to support the Associated Industries of Massachusetts. We couldn't find reasons why we should support them. Ken suggested we tell them we didn't recognize any benefit, and have them visit us to sell their services.

3. Engineering and Marketing Plans - (Al Devault)

Comments on budget: 1) the PDP-14 budget is conservative, and 2) the module budget, in general, is realistic and can be achieved.

Ken suggested that there was an opportunity in stand-alone A-D converters because no one is doing a good job in this area now.

4. Engineering and Marketing Plans - (Dick Clayton)

Dick would like to propose an increase in his budgeted N.O.R., based on his current backlog. He will propose this next week.

5. Proposal to Establish a Programming Product Line

Larry Portner's proposal was accepted as submitted.

6. Monthly Report on Status of Responsibilities

Dick Best's report was accepted as information.

7. Administrative Procedures Manual

Nick LoRusso's proposed manual was accepted.

8. Annual Report - (Gabe d'Annunzio)

Two documents were proposed; one a financial report, and the other a product summary brochure. The product summary brochure will have 100,000 copies printed, and 50 - 60,000 copies of the financial report would be printed. This approach was approved. Gabe will bring back a new copy for the product summary portion, which will have less flair and more fact, for discussion at next week's meeting.

9. Proposed Capital Equipment Plan for FY 1970

It was suggested that Brewster lay out some general guidelines for the size of the FY 1970 capital equipment budget and a procedure for approving capital expenditures.

10. Fiscal Year 1970 Budget and Budgeting Process

Bob Savell's report was discussed at last week's meeting, so was not necessary to be on the agenda again. Ted will discuss Field Service budget with Bob Savell.

11. Proposed Shared Development of Data Acquisition Products

Comments on Ron Noonan's proposal were not available from the product lines. This item was deferred until they are available.

- - - - - - - - - - - - -

Items 8 and 9 were deferred to the next "Woods" meeting:

Proposed Transfer of Timeshared-8 from Nick Mazzarese to Win Hindle

Proposed Transfer of Display Products from Nick Mazzarese to Joe St. Amour

Items 5, 6, and 7 deferred.

Nick Mazzarese

ecc

digital INTEROFFICE MEMORANDUM

DATE: July 3, 1969

SUBJECT: Budget and Engineering Plans

TO: Operations Committee FROM: Al Devault

In general, I am satified with the final budget. The process by which we arrived at it was, however, extremely confusing. In the future, it would be much more helpful if Product Line Managers met with the Operations Committee on a frequent basis during the budgeting cycle. In that way the reasoning behind any budget cutting or change in emphasis would be much more easily understood.

I am certain that the Module budget is attainable and slightly on the conservative side. The PDP-14 will have a short term negative effect on K Series sales initially, but this will change by mid-year and K Series will be helped by the PDP-14. The PDP-14 budget is conservative and will be rebudgetted in December if the present trend continues.

Engineering developments for the coming year are:

Modules:

1. Communications hardware, such as an acoustic coupler, etc.
2. Simple, versatile interfaces for positive bus computers.
3. Value analysis of existing K and M Series for cost reduction.
4. K Series Logic Lab.

PDP-14:

1. Customer based tester.
2. PDP-8 based supervisory software (monitor).
3. Accessory boxes.
4. Low cost DRO memory.
5. Cost reduction effort on Central Processor and Memory.

CNC Product Development:

1. Real time direct control software.
2. Stepping Motor Interfaces.
3. Enclosure and packaging design.

njb

digital INTEROFFICE MEMORANDUM

DATE: July 14, 1969

SUBJECT: PDP-12 Budget Review and Projects for July 14, 1969 Meeting

TO: Operations Committee

FROM: Richard Clayton

I. Notes on Approved Budget:

Because of the imposed volume constraints, the budget is somewhat unrealistic in both income and expenses. The scheduled production and booked business for Q1 and Q2 (present delivery January) yield higher numbers. I feel it was necessary to approach this round of budgeting in much the way it was done. Now the PDP-12 has proven its market acceptance and production has started, it is time to review the numbers and operate with a realistic plan. We are presently working this budget with Win and it will be ready by July 17, 1969. The outcome is a 15.5 million NOR budget with an identical profit percentage.

The present budget allows enough money to pursue only one of the following projects in addition to LABCOM:

a) Signal Processing Program Package
b) Face lift and cost reduction of PDP-12
c) Full implication of MONO-DISK software
d) Editing Package for typesetting
e) TSS-12 (Time-share 8 on the PDP-12)

We are presently evaluating these projects and expect to start at least three over the next year. The implication for FY 1971 and FY 1972 sales is very great.

II. Comments on the Sequence:

This year was a particularly trying one because of the pressure to come back under control. I feel this was probably over done and caused us some real losses in the areas of Field Service, Sales, and Cross Product Market Development. For the PDP-12 it was a bit early in the Product to be sure of the numbers but an ideal time to bring serious evaluation to the product budget.

III. Projects:

There are only two significant engineering projects over the past two years, these are LABCOM and the PDP-12. We feel both are successful although we would have liked the pay-off somewhat earlier.

000,000 omitted.

	FY68	FY69	FY70	FY71
PDP-12				
Engineering	0.1	0.3	0.4	0.3
Billings	---	0.3	15	15
LABCOM				
Engineering	0.08	0.15	0.2	0.3
Billings	0.3	0.7	3.5	7.0

The plan for upcoming marketing and engineering projects for FY70 is closely tied to a budget revision and includes the projects outlined in Section I above.

RJC/reb

digital INTEROFFICE MEMORANDUM

DATE: July 9, 1969

SUBJECT: ACTIVITIES MARCH 24 - JULY 9, 1969

TO: Operations Committee FROM: Dick Best

Memories

The cross product line memory to be used both on the 10 and the 11 is an example of good cooperation among several vendors and two product lines. We will have our lowest cost stack yet, with RCA being the surprising price leader at 6 mils per bit, and the vendors will have printed circuit patterns that are very easy to work with. The line widths and spacing are much larger than on the G610 through G614, the diode boards on which 8/I, 8/L, and 15 memories are mounted.

My original circuit design for the MTI ROM is now cleaned up and running. It is unfortunate that it took so many months. It would have happened long ago if a competent memory engineer had been assigned to the task. It has been a part-time job of many people. Meanwhile MTI has redesigned it, and their latest sample does indeed work, but it is a little more expensive.

We are still watching plated wire memories. Flexible Products makes the stacks at 3¢ per bit, which is a relatively good price. Toko will demonstrate a system at FJCC for 6¢ per bit including electronics.

Disks

The Memorex Disk is self clocked with jitter in the clock pulses caused by pulse crowding. This requires a logical flywheel, taking the form of a variable frequency oscillator that can be phase locked to the average of the clock pulses. After many false starts we now have an operating servo that does this.

My latest effort relative to Burroughs was to review their proposed amplifier changes to make a minor improvement in data reliability. The DF32 has been having photo cell problems. Bob Hughes observed that the zener diodes that regulate the lamp voltage were way over dissipated, and together we observed that the thermistor in the amplifier made its temperature characterics worse than they would have been with an ordinary resistor. After the obvious changes were made production is still unhappy with the photo cell. We solved the problem early in the big disk development by replacing the cell with an integrating one shot which looks for the gap in the timing track. That solution will be applied here also.

Semiconductors

We re-examined the spec on the DEC7453, an IC that had been misapplied (at TI's verbal advice) in the 8/I and 12. We added a test (that was already in the spec) that we hadn't been making, and Signetics flunked. Signetics hadn't been checking it either, and are now redesigning their masks. An etch change and an additional spec make the application solid. TI visited us and outlined future IC plans for "interfacing" circuits. A memory drive package contains 8 transistors with 2 emitter, 4 base, and 8 collector leads. 2 such packages drive 64 lines. They are also bringing out balanced line drivers and receivers, although they are still expensive. National Semiconductor also visited- they claim to be the largest shipper of MOS devices, and are going to expand into the TTL and become a major vendor there also.

Miscellaneous

A visit to TI to see their printer showed us how far they have come in MOS technology. It would be interesting to figure the cost of an 8/S/I made with MOS and our new 6 mil/bit memory.

The option list has been re-edited twice, corrected numberless times, and finally published, being 2 months old as it comes off the press. The only good thing about punched cards is that, once they're right, they stay right. I'd like to get the list on a machine that would allow on-line editing. Then a list would only be as old as the printing delay.

I helped on the circuit design for the PDP15 I/O bus switch which will allow more than one processor to talk to a periferal device. I have also recently reviewed the analog circuits for the TU10 tape transport, and found some "engineering oversights." They are easy to fix when found early.

Owens-Illinois visited again with their plasma flat display. Its performance is analogous to a very bright, flat, transparent storage tube that can be selectively erased as well as intensified. They forcast a price of $100-300 in a year for a 526X526 array less than 10 inches square. A part time investigation of a sample by a circuit engineer might put us ahead of the field in a future fascinating product.

Modules made by limited release cause us some embarrassment in the field, as they all have an "A" revision, but may be different, and generally have no schematics available. A new method will be used in the future that will enable us to keep track of revisions and

insure schematics, even if only sketches, of each revision. Following is the sequence of names on a typical module:

1.	MS123	P1	Original layout
2.	MS123	P2	Revised
3.	MS123	K456P3	Works well enough for limited release
4.	MS123	K456P4	A second limited release, different from P3
5.		K456A	Released to production

There will be schematics of all versions that have had limited releases in drafting: CS-K456-0-1-P3, CS-K456-0-1-P4, and the released drawing: CS-K456-0-1.

RB:dsw

digital INTEROFFICE MEMORANDUM

DATE: July 10, 1969

SUBJECT: ADMINISTRATIVE PROCEDURES MANUAL

TO: Operations Committee FROM: Nick LoRusso

Purpose:

To request approval for the issuance of an Administrative Procedures Manual.

Reason:

The Company is presently operating without a procedures manual that states guidelines to be followed when requesting services, furniture, telephones, forms, expense accounts, etc. With the continued growth of the Company, both in Maynard and in the field, such a manual is a must to insure proper communications and informed employees. We are suggesting that all administrative functions participate in providing written procedures. Such a manual should be particularly helpful to field personnel.

Benefits:

1. New secretaries and managers will be more effective if properly informed of how things are done at DEC.

2. Improve communications between the administrative groups, product lines, and field personnel.

3. Standardization of all Company procedures.

Cost:

We estimate a requirement of 300 binders at $1.00 each. Printing expense will be about $0.01 per page.

Maintenance and Responsibility:

1. Procedures will be written by Office Services personnel.

2. Procedures will be approved by the proper department head and then submitted to the Senior Secretaries Committee for comments and recommendations.

3. Office Services will maintain records of who has been issued the manuals for updating purposes.

4. All manuals will be surrendered to Office Services upon termination of employee.

5. The Office Services group will not issue procedures which may be considered controversial or have a debatable effect on the employees without prior approval of the Operations Committee.

Your consideration of this recommendation will be greatly appreciated.

Nick LoRusso

ecc

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digital

ADMINISTRATIVE SERVICES PROCEDURE MANUAL

ORIGINAL DATE	REVISION DATE	REVISION NO.	CHAPTER	SECTION	SUBJECT
				05	01

CHAPTER	SECTION	SUBJECT
Office Services	Letter Writing	Company Letterhead

I. Purpose

To inform all departments of the standard format to be followed in typing correspondence on Company letterhead.

II. Scope

This procedure applies to all domestic and international offices.

III. Procedure

A. Inside Address

1. The inside address is always single-spaced. Always use titles:

Mr.	(Messrs.)
Mrs.	(Mmes.)
Miss	(Misses)

2. Do not abbreviate. Spell out Street, Road, the State, etc. Do not abbreviate Company, Corporation, or Incorporated, unless the abbreviated form is the style used by the addressee, in which instance the following are correct:

John Jones Co.
John Jones Corp.
John Jones, Inc.

Use the company's letterhead as a guide for the correct style. If a letterhead is not available, write the name in full.

3. Addresses should be typed in three lines:

Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts 01754

Even if no street address is given, addresses should be typed in three lines:

Digital Equipment Corporation
Maynard
Massachusetts 01754

B. Zip Code

1. The zip code should be typed two spaces after the state:

Maynard, Massachusetts 01754

C. Attention Line

1. When using an attention line, type it two spaces below the address, followed by the salutation, "Gentlemen:" two spaces below. No punctuation is required after the word "Attention."

Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts 01754

Attention Mr. Kenneth H. Olsen, President

Gentlemen:

D. Subject (or Reference) Line

1. When using a subject (or reference) line, center it two spaces below the salutation:

Digital Equipment Corporation
146 Main Street
Maynard, Massachusetts 01754

Gentlemen:

Subject: Use of Subject Line

2. Do not abbreviate the word "Subject"; however, when using a reference line, the word "Reference" may be abbreviated, "Re:"

E. Salutation

1. When the salutation is not dictated, use:

Dear Mr. Jones:) Dear Mrs. Jones:) Dear Miss Jones:)	To an individual
Gentlemen:	(To a company (To a company with an attention line (To two or more men
Mesdames: or Ladies:	(To two or more women (To a company where management is known to be women

2. When the marital status of a woman is not known, address her as "Ms."

F. Body of Letter

1. Modified Block style with blocked paragraphs and mixed punctuation.

2. Date line and closing lines typed ten spaces to the right of the center on IBM Executive typewriters, and five spaces to the right of the center on all standard typewriters.

G. Second Page Heading and Body

1. If the length of the letter warrants a second page, it should be on paper with Digital Equipment Corporation printed in the lower righthand corner, with a heading including the name of the addressee (at left margin), the page number (centered), and the date (at right margin). Maintain the same margins used on the first page.

Mr. John Jones - 2 - July 8, 19__

2. For the heading, begin approximately six spaces below the top edge of the paper.

3. The body should start three spaces below the heading. Do not begin with the last part of a divided word. Include at least two lines of a paragraph.

H. Complimentary Close

1. If the letter is just general, "Very truly yours," should be used. If the letter is to a customer, "Sincerely," or "Sincerely yours," is appropriate.

2. The final sentence before the complimentary close should not end with a comma, such as "I remain," etc.

I. Signature

1. Do not use DIGITAL EQUIPMENT CORPORATION after the complimentary close, since it appears on the letterhead.

2. If the letterhead is plain, type the dictator's name with his title four spaces below and directly under the first letter of the closing:

Very truly yours,

John J. Doe
President

If the letterhead is printed with the dictator's name and title, type just his name four spaces below the closing:

Very truly yours,

John J. Doe

3. When you sign the dictator's name to a letter, place your initials immediately below it.

Very truly yours,

John J. Doe
e.e.
John J. Doe
President

J. Dictator and Stenographic Reference

1. Place the dictator's initials in all capital letters at the left margin, two spaces below the dictator's title; or, if a title is not used, two spaces below the dictator's name, separated by a colan, followed by the stenographer's initials in small letters:

JJD:ecc

K. Enclosures

1. The full word "Enclosure" should be typed at the left margin, one space below the dictator and stenographic reference:

JJD:ecc
Enclosure

or

JJD:ecc
Enclosures (2)

Or, if you want to identify the enclosures:

JJD:ecc
Enclosures: Annual Report
PDP-8 Brochure

L. Carbon Copy Notation

1. Carbon file copies must be made of all correspondence written on Company letterhead. A copy of all customer correspondence should be sent to the Customer File in the Sales Department, and a copy of all general correspondence to the Office Services Department.

2. All carbon copies should be made on the onionskin paper marked "COPY."

3. If a carbon copy is being sent to a second person and the addressee is to know that this copy is being sent, before the letter is removed from the typewriter, two spaces below the stenographic reference note, type "carbon copy" to:

   JJD:ecc

   cc: Mr. John Jones
   Address (if desired)

   If the addressee is not to know a copy is being sent to a second person, remove only the letter from your typewriter and, on all carbon copies, note that it is being sent "blind carbon copy":

   bcc: Mr. John Jones
   Address (if desired)

M. Postscript

1. The postscript should be typed a double space below the reference notation or the last typed line, and in the same format as the letter:

   JJD:ecc

   P. S.

2. When typing a postscript, the initials of the writer may be typed below the postscript in place of a second signature, in line with the typewritten signature.

3. For a second postscript, the abbreviation P. P. S. is used.

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ADMINISTRATIVE SERVICES PROCEDURE MANUAL

ORIGINAL DATE	REVISION DATE	REVISION NO.	CHAPTER	SECTION	SUBJECT
				14	02

CHAPTER	SECTION	SUBJECT
Office Services	Lobby	Authorization List

I. Purpose

To inform employees of the procedure to be followed for adding names to the list of personnel authorized to admit visitors.

II. Scope

This procedure applies to home office and field personnel.

III. Procedure

Those who have justifiable reasons for being authorized to admit visitors into the plant should prepare a memo requesting authorization for area vice-presidential approval. Copies of the memo should be sent to the Plant Engineer's office and the Office Services Department.

Field Sales and Service personnel visiting the plant with customers should, upon entering the building, present their business card to the receptionist, and this will automatically authorize him to enter the building with his visitor.

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ADMINISTRATIVE SERVICES PROCEDURE MANUAL

ORIGINAL DATE	REVISION DATE	REVISION NO.	CHAPTER	SECTION	SUBJECT
				15	02

CHAPTER	SECTION	SUBJECT
Office Services	Telephone & Telegraph	Transfer of Telephone Calls

I. Purpose

To inform all employees of the correct procedure for transferring telephone calls to avoid disconnects.

II. Scope

This procedure applies to home office telephones only.

III. Procedure

This procedure applies to local and long distance calls received through our switchboard. It does not apply to outgoing calls.

A. Depress the receiver hook fully and slowly in order to break the connection. Do this only once. Both you and the caller will hear a ringing sound signaling the operator (by a light indication and audible sound on the switchboard) that she is wanted on the line.

B. When the operator answers, announce the transfer by saying, "Please transfer this call to Mr. Jones in the Personnel Department" (or give her the correct extension number rather than the department).

C. After the operator has acknowledged your request, hang up your receiver.

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ADMINISTRATIVE SERVICES PROCEDURE MANUAL

ORIGINAL DATE	REVISION DATE	REVISION NO.	CHAPTER	SECTION	SUBJECT
				15	04
CHAPTER		SECTION		SUBJECT	
Office Services		Telephone & Telegraph		Problem Calls	

I. Purpose

To establish an acceptable method of handling customer calls that are considered problem calls.

II. Scope

This procedure applies to Maynard Sales Offices and, particularly, Branch Offices.

III. Procedure

A. Absence of Person Being Called

1. When the person being called is absent, never say you "don't know where he is" or "he can't be reached." Offer assistance or pass the call on to a qualified person who is available.

B. Crisis-Type Calls

1. When a call of this type is received and a qualified man is not in the office, take a message and pass the information on to the Regional level. The responding time is important in this type of call. Never refer the customer to the next level of management - do it yourself.

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ADMINISTRATIVE SERVICES PROCEDURE MANUAL

ORIGINAL DATE	REVISION DATE	REVISION NO.	CHAPTER	SECTION	SUBJECT
				16	01
CHAPTER		SECTION		SUBJECT	
Office Services		Office Conduct		The Successful Secretarial Attutude	

I. Purpose

To establish some guidelines for office attitudes, as accepted by most professional societies.

II. Scope

This procedure applies to all offices of Digital Equipment Corporation.

III. Procedure

It is always gratifying to be known as a "nice person to work with," and you'd be surprised to learn how much weight such a reputation carries when promotions are considered and job vacancies filled. The girl who does more than she is expected to -- who uses her head in an unusual situation, pitches in to help when there is a rush job, etc. -- usually gets preference when a better job comes along.

Learn all you can about your Company and its operations; this will not only make your present work more interesting, but will help you to equip yourself for a better job. Ask questions about things that are new to you -- no one criticizes a person who is willing and anxious to learn. Supervisors agree that employees should be encouraged to ask questions which will help them to do a better job. On the other hand, don't ask a question when, with a little effort, you can find the answer yourself.

As a secretary, your value to your boss will depend largely upon how much time and effort you can save him, and the kind of impression you give other employees -- and outsiders -- of his office and the Company.

It doesn't usually take long for a secretary to learn to what extent her boss expects to be reminded of appointments, to be kept informed, protected from possible awkward situations, and how much he depends on her to suggest improvements.

In addition to being kept informed on activities which concern them within the department, many supervisors appreciate having their secretaries remind them of service anniversaries in other departments, successes and honors which have come to employees, and problems such as illness or loss. Calling to his attention news concerning friends and acquaintances outside the Company is often welcome, too.

In the boss's absence, you have an even greater responsibility for keeping things running smoothly and efficiently. Coming back to his office after a trip and finding everything in apple pie order (correspondence sorted and arranged in folders, in order of importance, and personal and telephone calls listed with all necessary information) makes any boss realize that his secretary is a good teammate.

Informality in the office? Within the limits of good taste and accepted business practice, informality adds to the friendly atmosphere in which DEC takes pride. Call your boss by his first name if he indicates you should (although he may use your given name without your permission), and always make a conscious effort to refrain from any conduct which might cause criticism.

Be as quiet as possible in your work and speech (this includes telephone conversations) and encourage your visitors to do likewise. Personal telephone calls? No one objects to your making or receiving an occasional personal call, but keep it brief.

On the subject of personal matters, airing your troubles in the office, or over the office telephone, is never good policy. Naturally, when a supervisor or fellow employee can be of help in solving a problem, you will find them sympathetic and willing to help, but personal feuds and "griping" have no place in an office, and may make an employee's job harder -- and promotions slower -- than she expects.

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ADMINISTRATIVE SERVICES PROCEDURE MANUAL

ORIGINAL DATE	REVISION DATE	REVISION NO.	CHAPTER	SECTION	SUBJECT
				16	02

CHAPTER	SECTION	SUBJECT
Office Services	Office Conduct	Dress

I. Purpose

It is the intent of this procedure to establish preferred guidelines to follow concerning office dress, without restricting or regimenting dress and appearance.

II. Scope

This procedure applies to all offices of Digital Equipment Corporation.

III. Procedure

Good taste varies so much and so often from one individual to another that it requires areas of guidance for employees.

1. All employees are expected to have good personal habits and to be well-groomed. Care should be taken never to offend fellow workers through personal carelessness.

2. Good judgment in selection of clothing should be shown at all times. For office attire, we suggest you wear neat, attractive clothes. Extreme, tight-fitting dresses, for instance, are not in good taste.

3. Men office workers are not to wear sport shirts at any time. In warm weather, short-sleeved shirts may be worn, but with a necktie. Jackets need not be worn. Bermuda shorts shall not be worn.

ORIGINAL DATE	REVISION DATE	REVISION NO.	CHAPTER	SECTION	SUBJECT
				16	02

CHAPTER	SECTION	SUBJECT
Office Services	Office Conduct	Dress

4. All employees should be dressed neatly and modestly. Women may not wear slacks, pedal pushers, shorts (or similar clothing) at any time. Shirts should be long enough and loose enough that you can work in comfort.

digital INTEROFFICE MEMORANDUM

DATE: July 10, 1969

SUBJECT:

TO: Operations Committee FROM: Gabe d'Annunzio

Attached is the Introduction to the product summary manuscript which was submitted three weeks ago.

/meb

INTRODUCTION

COMPANY HISTORY

In a little over a decade, Digital Equipment Corporation has grown from three employees and eight thousand square feet of production floor space to an international corporation employing almost 3,500 people with more than one million square feet of production floor space.

The Company's sales and service organization includes more than 600 sales engineers, field service personnel, and software specialists. Each stands ready to help a customer find solutions to any job he might want to tackle.

MODULES

DEC's rise as a leader in the computer industry began in 1957 with the introduction of the Company's line of electronic circuit modules. These solid state logic devices initially were used to build and test other manufacturers' computers. In 1965, DEC introduced its FLIP CHIP™ module line. These highly reliable modules include circuit cards for internal computer logic, interfacing, and control applications. In 1967, DEC unveiled integrated circuit versions of its FLIP CHIP line of modules.

DEC is one of the world's largest manufacturing suppliers of electronic circuit modules, producing more than two million modules a year.

COMPUTERS

DEC began its rise as a computer manufacturer in 1959, when it introduced the PDP-1. The PDP-1 offered a new concept in the industry -- the small, on-line system. The PDP-1 sold for $120,000 at a time when competitive machines were priced at over $1 million. It was more than a data processor; more than a tool to manipulate data. It was a system that could be connected to all types of instrumentation and equipment and with which people could interact.

DEC has been a leading force in the on-line, real-time computer field. For example, one of the first time-sharing systems was built around a PDP-1 computer, and DEC introduced the first large-scale, commercially-available time-sharing system in 1965 -- the PDP-6. Today, its successor, the PDP-10, is the price/performance leader in its field.

DEC's PDP-8 family of small computers is one of the best known lines in the computer industry -- more than 3,500 are installed around the world. In sciences, they have had a tremendous impact in reducing experiment time and providing the researcher with direct, on-line data reduction. PDP-8 computers control and monitor powerful nuclear reactors, control X-ray diffractometers, and analyze nuclear spectroscopy data. They monitor medical data, automatically analyze electrocardiograms, and study the effects of drugs on the nervous system.

APPLICATIONS

All of DEC's computer lines are making major contributions in advancing the use of on-line, real-time-systems in all types of application areas. They provide engineers with a powerful control and testing tool. They monitor blast furnaces and open hearths, control slab mills and finishing mills in steel plants. The chemical industry uses DEC computers for complete process control systems, while power utilities use them for computer-based systems to control plant start-up, power generation, and power network distribution.

DEC computers are also used in education, providing a classroom computer to teach students about computer programming and hardware design. Many students use DEC computers for homework problems and research projects.

NEW PRODUCTS

Since the beginning of the year, DEC has introduced a number of important new products. The PDP-12 is a new, general-purpose, laboratory/industry-oriented computer. The PDP-14 is a new, special-purpose controller that fills the gap between modules and the general-purpose computer for machine control. INDAC-8 is a new system for industrial process control. The PDP-15 is the newest medium-scale computer with background/foreground capability. There is also a new KV graphics system, which could open up a wide new market for those needing the advantages of a display system.

MANUFACTURING

During this year, the Company started a growth program of substantial increases in manufacturing activities to be continued over the next several years. Several new plant facilities were announced at a May 23, 1969 press conference. These included:

The signing of an agreement to lease a 60,000 square-foot building, now under construction and scheduled for completion in October, in the Leominster Industrial Park.

The signing of an agreement to purchase a 240-acre site on Route 202 in Westfield, Mass., for the contruction of a 150,000 square-foot plant.

The signing of an option to purchase a 137-acre site near Route 2 and Harvard Street in Leominster for a 250,000 square-foot plant.

At the time of these announcements, several of the Company's foreign operations were already expanding.

INTERNATIONAL

In Europe, new subsidiaries have been established in Geneva, Switzerland, and Milan, Italy. New offices have been opened or are being planned in London and Birmingham, England, and Frankfurt, Germany. The Company presently operates a manufacturing facility in Reading, England.

Digital Equipment of Canada, Ltd. based in Carleton Place, Ontario, has installed computers at a faster rate than any other supplier. DEC now enjoys the position of being second in the Canadian computer industry, in terms of the number of machines installed.

At present, more than 100 persons are employed at Carleton Place, which is the sole producer of Computer Labs, computer subassemblies and components. DEC recently acquired a second building there, expanding the capacity of the manufacturing facility by 14,000 square feet, and the Company holds an option for another 11,000 square feet of space in the same building.

The field organization in Canada now includes personnel stationed in every major Canadian city from Halifax to Vancouver. Support for these personnel is provided from five strategically-located field offices, each of which is equipped with field service and software-support facilities.

At San German, Puerto Rico, DEC occupies over 200,000 square feet for module manufacturing. Construction of a 58,000 square foot-building, scheduled for completion in January, has begun. By the time the new building is occupied, it is expected that the work force in San German will total 350 persons.

PRODUCT STRATEGY

Digital Equipment Corporation has built its product mix so that the company can offer a comprehensive line of computing equipment. From its building block modules to its large time-sharing systems, the DEC product line is designed to provide a spectrum of alternatives from which a customer can choose to solve his particular computer-oriented problem.

The DEC product mix did not emerge overnight, but has emerged after more than a decade of careful planning and development. A decade in which DEC learned that no single size computer, nor no single word length, offers a universal solution. A decade in which DEC has learned that a computer manufacturer must provide a customer with more than a basic computer mainframe; it must offer a range of interfacing and peripheral equipment, easy-to-use and efficient software packages, and reliable, worldwide service and support.

DEC has also learned to view its markets in two ways. It has learned that one segment of its markets is concerned with the specific computer specifications of its comprehensive line of equipment. Another segment seeks packaged solutions. They do not ask about mainframe price/performance, memory size, bytes, or bits. They ask about price/performance of their particular problem/solution, and they want the answers in a language they understand. The DEC product line reflects this two-pronged approach.

digital INTEROFFICE MEMORANDUM

DATE: July 10, 1969

SUBJECT: Proposed Plan of Capital Expenditure - Fiscal 1970

TO: Operations Committee FROM: Ed Savage

The current plan which is before you for approval covers a one year period of time. This information serves the planning needs of the corporation in the short-term but future planning endeavors must encompass a greater span of time (i.e. two to five years). In order to achieve for our company the most profitable results in terms of the market and the state of business and to achieve the lowest financing costs this longer range planning is essential.

In order to enhance the earnings of our company, I propose, where practical, that all future investments of $10,000 or more be subjected to an economic evaluation in order to make available to the decision-makers involved, a tool with which to determine whether the resources of our company are being properly utilized.

A capital project can be defined as a plan for acquiring or altering specific facilities and equipment for a designated purpose. Research and development expenditures should also be identified as projects for purposes of this plan even though all costs may be expensed.

Capital projects can normally be justified for one of the following reasons:

1. Profit Improvement
   (a) Cost reduction - improved methods
   (b) Increased capacity
   (c) New Product
   (d) Quality improvement
2. Necessary replacement and major overhauling of buildings and equipment
3. Contractual obligations (other than above)
4. Health and safety considerations

The projects which are justified on the above basis are the ones I propose that the economic evaluation be applied to. The Financial Analysis Group will shortly make available a simple format with which any individual required to make an economic justification can work with.

Proposed Rules in Managing Capital Plan:

1. The over-all capital plan approval by the operations committee should not serve as a green light for individual projects; the projects should be resubmitted during the budget year, with supplementory information for justification purposes.

2. Once the capital plan has been approved, specific authorization (Operations Committee or its designated representative) during the year will be required for significant changes (more than $2000) in an approved project or for the addition of any new project. The Capital Project Authorization form should be used for all such proposed charges and must be approved by an Operations Committee member.

3. Clarification of policy relative to the accountibility of DEC produced products.

I propose the following policy be adhered to during Fiscal 1970.

(a) Computers utilized in the production process for periods in excess of the normal rotation period be capitalized.

(b) Computers to be used by Training & Programming in Maynard for a period in excess of the normal rotation period be capitalized.

(c) All other computers being used for Field Demo's loans, trade shows, etc. be subjected to the 90 day rotation rule unless an exemption is granted by the Product Line Manager whose product is involved. In no case should the rotation period extend beyond 180 days.

4. The use of our products for internal purposes should be subjected to the same economic evaluation justification that the requestor of capital funds would be required to make in the situations spelled out above.

COMMENTS

The schedule shown recpas the proposed capital requirements by Vice Presidential area of responsibility.

	Q 1	Q 2	Q 3	Q 4	Total
Manufacturing (P.K)	$1,387,200	$1,053,600	$ 615,800	$ 594,300	$3,650,900
Sales & Service (T. J.)	304,828	196,750	124,325	104,005	729,908
PDP-10, 12, Training, Personnel, Programming (W.H.) etc.	288,850	343,825	113,935	257,000	1,003,610
PDP-8 Family, 11, Adv. & Prom., etc. (N.M.)	64,380	33,100	45,390	22,000	164,870
Legal, Acctg. EDP (B.K.)	21,200	5,050	4,450	2,650	33,350
PDP-9, 15, Modules, Trad. Bldg. Maint, Printing etc. (S.O.)	3,871,940	291,625	718,600	5,008,400	9,890,565
TOTAL	5,938,398	1,923,950	1,622,500	5,988,355	15,473,203

Included above are items which represent a change in conditions in FY 69	Q 1 $	Q 2 $	Q 3 $	Q 4 $	Total $
1. DEC- constructed products	341,000	188,000	38,000	37,000	604,000
2. New Buildings:					
Westfield	3,000,000				3,000,000
Training Center				380,000	380,000
Leominster				4,280,000	4,280,000
Leominster (Rented Facility)	60,000				60,000
3. Capital investment - equip. New Plant - Westfield	40,000	555,000	74,000	180,000	849,000
Total	3,441,000	743,000	112,000	4,877,000	9,173,000
Planned expenditures exclusive of capitalized computers and new plant expansion	2,497,398	1,180,950	1,510,500	1,111,355	6,300,203

The significant increase over the rate of expenditure experienced in Fiscal 1969 occurs generally in the manufacturing area and in Stan Olsen's area of responsibility. However, there are other areas which questions should be answered to the satisfaction of the Operation Committee. I have singled out items which I fee should be reviewed by the committee before the plan is approved.

1. Planned activities of Building Maintenance - Maynard
2. Leasehold Improvements - Puerto Rico
3. Rented Training Facility Maynard
4. Planned rentals to customers (PDP-15)
5. Rapid expansion of transportation equipment
6. Review of the manufacturing requirements with particular emphasis on the Fabrication Shop, Purchasing, Canada and United Kingdom.
7. PDP-10 Engineering requirements
8. Planned rentals to customers (PDP-10)
9. Questionable items in sales & service area. (See memo under sales section).

If the capital plan as it is currently shown is approved in its entirety, it would add $6,200,000 to the external financing requirements. Of the $6,200,000, the major portion can be attributed to the timing of the Leominster site. ($4,280,000). Another factor is the proposed capitalization of the in-house computers which account for an additional $1,300,000.

In my opinion the Committee should also review the timing of many of the proposed expenditures to coincide when possible with the expansion of the company during the coming year.

ELS/ba
Attachments

DIGITAL EQUIPMENT CORPORATION

Proposed Capital Budgets

Fiscal 1970

K. H. Olsen President

DIGITAL EQUIPMENT CORPORATION

PROPOSED CAPITAL EQUIPMENT PLAN - FISCAL 1970

Submitted
By: Pete Kaufmann

Description	Investment Classifications	Quantity	Fiscal Quarters Q. 1 $	Q. 2 $	Q. 3 $	Q. 4 $	Total $
Manufacturing							
New Plants:							
Westfield	Expansion		40,000	544,500	74,000	179,500	838,000
Board Fabrication	Expansion		162,000	13,000	26,000		201,000
Major Assembly Test	Expansion		20,300	13,600	88,100	9,600	131,600
Module Production	Cost Saving		78,500	42,000	31,000	36,500	188,000
Computer Production	Expansion		99,100	60,500	39,900	15,900	215,400
Fabrication Shop	Expansion		236,500	193,500	72,000	248,000	750,000
Quality Control	Expansion		29,300	2,600	300		32,200
Purchasing	Expansion		108,800	71,300	129,900	27,800	337,800
Central Planning	Expansion		1,500	1,500	1,500	1,500	6,000
Materials	Expansion		3,500	3,500	3,500	3,500	14,000
Manufacturing Administration	Office Equipment		1,500				1,500
Puerto Rico	Expansion		82,400	25,300	41,300	42,500	191,500
Canada Manufacturing	Expansion		459,900	80,000	80,000		619,900
U.K. Production	Expansion		58,300	300	27,500	27,500	113,600
Analog Systems	Expansion		5,600	2,000	800	2,000	10,400
GRAND TOTAL			$1,387,200	$1,053,600	$615,800	$594,300	$3,650,900

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

NEW PLANT - WESTFIELD

Equipment	Fiscal Quarters 1	2	3	4	Total
Leasehold Improvements		60,000			60,000
Drills (5-26k)		26,000	26,000	78,000	130,000
DueS et (1)		20,000			20,000
Wet Hove		18,000			18,000
Photo Room		20,000			20,000
Strike Tanks (3 - 11K)		11,000	11,000	11,000	33,000
Roller Coater (2-5.5K)		5,500		5,500	11,000
Expose Mach. (2 - 8K)		8,000		8,000	16,000
Oven (1)		8,000			8,000
Sanders (2 - 4k)		4,000		4,000	8,000
Copper Tanks (8)		22,000	22,000	46,000	90,000
Solder Tanks (3)		9,000	9,000	9,000	27,000
Etchers (2)		13,000		12,000	25,000
Gold Tanks (3)		6,000	6,000	6,000	18,000
Process Tanks (1)		15,000			15,000
Beveler - Shear & Misc. Mechanical		25,000			25,000
Waste Treatment		50,000			50,000
Air Makeup		8,000			8,000
(1)		10,000			10,000
Other		30,000			30,000
Shear		20,000			20,000
Stacker		7,000			7,000
150 Ton Straight Side		25,000			25,000
90 Ton Brake		15,000			15,000
Power Notches (2)		2,000			2,000
Spot Welders (2)		6,000			6,000
Stud Welders (2)		6,000			6,000
Time Saver		5,000			5,000
Welding Stations (2)		20,000			20,000
Paint System	40,000				40,000
Assembly Equipment		10,000			10,000
Miscellaneous Equipment		20,000			20,000
225 Ton Brake					Transfer
Material Handling Eq.		40,000			40,000
TOTAL	40,000	544,500	74,000	179,500	838,000

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

BOARD FABRICATION

Equipment	Fiscal Quarters 1	2	3	4	Total
Process Improvement & Steady 50K cap.					
Air Dryer (2)	4,000				4,000
Solder Reflow	10,000				10,000
Resist Developer	5,000				5,000
Mechanized Taping		3,000			3,000
Dust Cleaner	1,000				1,000
Air Conditioners	2,000				2,000
Resist Stripper			8,000		8,000
Driu (Large table)	38,000				38,000
Scrubber (SS)			4,000		4,000
Router (SS)			4,000		4,000
Misc (SS & PTH)		10,000	10,000		20,000
Photo Processor	11,000				₱1,000
Leasehold (Move Silverman)	8,000				8,000
50 - 100K Equipment					
Copper Tanks	35,000				35,000
Etcher	13,000				13,000
Gold Tank	6,000				6,000
Drill (small table)	26,000				26,000
Punch Press	3,000				3,000
TOTAL	162,000	13,000	26,000		201,000

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

MAJOR ASSEMBLY TEST

Equipment	Fiscal Quarters 1	2	3	4	Total
1 - Fluke Meter	1,000				1,000
3 - 453 scopes	1,600	1,600		1,600	4,800
2 - 630 NA Meters	100		100		200
1 - PDP-8/I	5,600				5,600
1 - CMT Stations			30,000		30,000
- Hand Test Stations	12,000	12,000	8,000	8,000	40,000
1 - 581 Scope					
1 - 82 PU					
1 - Burst Gen.					
2 - Power Sup.					
1 - Bench, Chair					
1 - 630 RM Meter					
Total - 4.0K					
1 - PDP-11 Checkout Line			50,000		50,000
TOTAL	20,300	13,600	88,100	9,600	131,600

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

MODULE PRODUCTION

Equipment	Fiscal Quarters 1	2	3	4	Total
45 Ton Press	4,000				4,000
I.C. Insertion				15,000	15,000
Computer System	12,000	12,000	12,000		36,000
Separation Die	12,000				12,000
Cable Mfg. Center	16,000				16,000
C. I. Machines	9,500			9,500	19,000
Degreaser		10,000			10,000
Method Improvement	22,000	18,000	18,000	10,000	58,000
Miscellaneous	1,000	1,000	1,000	1,000	4,000
Office Equipment	2,000	1,000		1,000	4,000
TOTAL	78,500	42,000	31,000	36,500	188,000

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

COMPUTER PRODUCTION

Equipment	Fiscal Quarters 1	2	3	4	Total -
59 - 453 Scopes	60,000	24,000	24,000	10,000	118,000
12 - 454 Scopes	18,000	18,000			36,000
4 - EDC Voltage Stds.	2,000	2,000			4,000
1 - Digital Voltmeter	2,000				2,000
3 - Lift Trucks	1,200	600			1,800
3 - Environ Chambers	10,000	10,000	10,000		30,000
4 - Adding Machines	400	400	400	400	1,600
4 - Typewriters	500	500	500	500	2,000
New Products	5,000	5,000	5,000	5,000	20,000
TOTAL	99,100	60,500	39,900	15,900	215,500

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

FABRICATION SHOP

Equipment	Fiscal Quarters 1	2	3	4	Total
Machine Shop Equip.		53,000	50,000		103,000
Sheet Metal Equip.		50,000		50,000	100,000
Auto Lathe 3" Cap.	30,000				30,000
Auto Lathe 1" Cap.	15,000				15,000
Hardening Furnace		5,000			5,000
Punch Press	15,000				15,000
Punch Press	25,000				25,000
Heavy Duty Miller		8,000			8,000
Drill Press	12,000				12,000
Measuring Machine		30,000			30,000
Q. C. Equipment		15,000			15,000
Surface Grinder	15,000				15,000
Cylindrical Grind.	25,000				25,000
Vertical Grinder	25,000				25,000
Vertical Millers (12)	15,000	15,000			30,000
Tapping Head	3,000				3,000
Material Handling Equipment	7,500	7,500			15,000
Office Equipment			2,000		2,000
Drilling Equipment	9,000				9,000
Disc Turning				38,000	38,000
Turret Punch				60,000	60,000
3-Axis Tool Changer				90,000	90,000
Spot Welder	40,000				40,000
Miscellaneous Equipment			20,000		20,000
Computers (2)		10,000		10,000	20,000
TOTAL	236,500	193,500	72,000	248,000	750,000

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

QUALITY CONTROL

Equipment	Fiscal Quarters 1	2	3	4	Total
1- Test Chamber	19,000				19,000
3- 453 Scopes	3,200	1,600			4,800
1 -184 TMG	700				700
1- 106 SWG	600				600
1- HP 333 DVM	400				400
1- Tek Cal.	500				500
1- Tek. Pulser	300				300
3- 630 NA Meters	200		100		300
1- GR Variac	100				100
8- Small GR Variacs	200	300			500
1- Weston #433 AC Meter	100				100
1- Weston #432 Watt Meter	300				300
1- Fischer #11-662 Humidigraph	100				100
1- Rustrax #144 Recorder	200				200
8 -Temp. Control Systems Fenwal	300	300	200		800
1- Mech. Cal. Equip. (See List)	1,800				1,800
1- 88 pc Gauge block set	400				400
1- Hardness Tester	500				500
2- Hunter Pull Testers	300	200			500
2- Microscopes	100	200			300
TOTAL	29,300	2,600	300		32,200

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

PURCHASING

Equipment	Fiscal Quarters 1	2	3	4	Total
1 - Order Process	25,000				25,000
4 - Typewriters	1,000	500	500		2,000
Mat'l. Handling					
1 Rack	1,200				1,200
2 Hand Trucks	500				500
1 Elec. Truck		2,900			2,900
1 - Adding Machine		200			200
Miscellaneous		500		500	1,000
2 - Transistor Testers	34,000	35,000			70,000
1 - Diode Tester	16,000				16,000
1 - Polar Scope		5,000			5,000
6 - Oscilloscopes	4,000	2,000	4,000	2,000	12,000
Microscope	600				600
I.C. Tester			100,000		100,000
Misc. Elec. Mach.	25,000	25,000	25,000	25,000	100,000
TOTAL	108,300	71,100	129,500	27,500	336,400

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

CENTRAL PLANNING

	Fiscal Quarters				
Equipment	1	2	3	4	Total
Miscellaneous	1,500	1,500	1,500	1,500	6,000
TOTAL	1,500	1,500	1,500	1,500	6,000

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

MATERIALS

	Fiscal Quarters				
Equipment	1	2	3	4	Total
Miscellaneous	3,500	3,500	3,500	3,500	14,000
TOTAL	3,500	3,500	3,500	3,500	14,000

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

MANUFACTURING ADMIN.

Equipment	Fiscal Quarters 1	2	3	4	Total
Typewriters (2)	1,000				1,000
Miscellaneous	500				500
TOTAL	1,500				1,500

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

CANADA

Equipment	Fiscal Quarters 1	2	3	4	Total
Degreaser	1,900				1,900
Leasehold Improvements 2nd floor	15,000				15,000
49 N,C. W.W. Machines	232,000	80,000	80,000		392,000
Hydraulics System for 60 Machines	32,400				32,400
Eubanks (3)	11,100				11,100
2 Computer System	100,000				100,000
Air Conditioner	1,400				1,400
1 Awt. Computer	60,500				60,500
1 Air Compressor & Piping Inst.	5,600				5,600
TOTAL	459,900	80,000	80,000		619,900

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

PUERTO RICO

Equipment	Fiscal Quarters 1	2	3	4	Total
10" Solder Wave	10,000				10,000
C I Machines	9,500	19,000	9,500		38,000
22 Tom Punch Press	7,400				7,400
Separation Dies	8,000		4,000		12,000
I C Instertion Mac.	15,000				15,000
Lugging Machine		1,300			1,300
Office Equipment	500	500	500	500	2,000
7" Solder System			2,000		2,000
Degreaser				10,000	10,000
Handle Stamper		500			500
Computer System	12,000		12,000	12,000	36,000
Double Eyelet Mach.			1,300		1,300
Board Scrub. Mach.				4,000	4,000
Computer (Acct.)	20,000				20,000
Methods Improvement		4,000	12,000	16,000	32,000
TOTAL	82,400	25,300	41,300	42,500	191,500

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

UK PRODUCTION

Equipment	Fiscal Quarters 1	2	3	4	Total
WW Machines (Basic 4 Stations)	58,000				58,000
3 Stations			27,500		27,500
3 Stations				27,500	27,500
Office Equipment	300	300			600
TOTAL	58,300	300	27,500	27,500	113,600

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGET

ANALOG SYSTEMS

Equipment	Fiscal Quarters 1	2	3	4	Total
Oscilloscope	4,000	2,000		2,000	8,000
EDC Voltage Source	1,600		800		2,400
TOTAL	5,600	2,000	800	2,000	10,400

CAPITAL EQUIPMENT BUDGETS

SALES and FIELD SERVICE

Attached is the summary and detail support by office for the 1970 Sales and Field Service Capital Equipment Budgets. For 1970 these two groups are requesting an appropriation of $675,000 for capital expenditures, this amount representing an increase of $250,000 over the actual expenditures in 1969.

The Field Service Organization is requesting $455,000 in support of their 1970 effort when they will hire an additional 260 technicians and salaried employees. To support them, they have requested 130 new oscilloscopes ($236,000) and $195,000 in test equipment. A substantial amount ($87,000) of this test equipment is for the addition and distribution to the field of the Memorex Disc Tester. They have also requested 20 new typewriters in support of approximately the same number of new clerical hires, $6,600 of office equipment and $7,500 in leasehold improvements, $5,000 of these improvements are requested by Europe.

The sales organization has requested $221,000 for capital expenditures in 1970. The major portion of this amount is in requests for office furniture ($124,000). In total, 70 new typewriters have been requested as opposed to the addition of approximately only 25 new secretaries and clerks. Also, 46 new dictating machines have been requested versus the addition of 60 new salesmen. In the "other furnishings" amount of $36,000 there is $22,700 for test equipment as requested by Special Systems in Europe. Other office equipment ($28,000) is principally made up of $14,000 for 8 acoustic couplers and $11,000 in combined requests from Europe.

Leasehold improvements also makes up a large share of the budget ($72,000). The major items are $8,000 for a sign in Los Angeles, $10,000 for a new training building in England, $9,000 for the programming group in England, $5,000 for the U.K. sales organization and $9,000 for Canada.

Requests for training aids amount to $25,000 which is divided among the sales group as follows: Domestic, $5,600, Canada, $8,300 and Europe, $10,200.

DIGITAL EQUIPMENT CORPORATION

PROPOSED CAPITAL EQUIPMENT PLAN - FISCAL 1970

Submitted
by: Ted Johnson

Description	Investment Classification	Quantity	Fiscal Quarters Q. 1	Q. 2	Q. 3	Q. 4	Total
			$	$	$	$	$
Sales and Field Service (See attached)	Expansion & Cost Saving		250,553	196,750	124,325	104,005	675,633
Technical Docuementation:							
Office Equipment:							
Flat Files	Expansion	4	1,063				1,063
Drafting Tables	"	2	664				664
Computer Typesetting System consisting of: (1) 8 K PDP8I (2) Transports (Dectape) (1) Disk (1) Interface	Expansion & Cost Saving		21,000				21,000
Adhesive Waxer & Accessors	Expansion	1	398				398
IBM Stand Alone Composers	Expansion	2	9,500				9,500
Total			32,625				32,625
Photo Lab:							
Hasselblad Camera System	Expansion	1	3,200				3,200
Sinar Camera System	&	1	4,800				4,800
Oscilloscope Camera	Cost	1	650				650
Various Laboratory Equipment	Saving		11,500				11,500
Various Lighting Equipment			1,500				1,500
Total			21,650				21,650
GRAND TOTAL			$304,828	$196,750	$124,325	$104,005	$729,908

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

TOTAL

	Quarter				
	1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	12,320	11,125	7,800	3,800	35,045
Dictating	10,360	4,950	1,650	250	17,210
Adding Machines	4,125	955	1,100	730	6,910
Other Furnishings	20,700	7,200	7,650	850	36,400
Other Office Equipment	9,813	9,425	4,100	4,700	28,038
Total	57,318	33,655	22,300	10,330	123,603
Leasehold Improvements	34,200	21,250	13,200	3,900	72,550
Training Aids	9,820	7,915	4,075	2,725	24,535
TOTAL SALES	101,338	62,820	39,575	16,955	220,688
FIELD SERVICE:					
Office Equipment:					
Typewriters	5,000	2,000	2,000	1,000	10,000
Other Office Equipment	2,450	1,940	2,000	200	6,590
Total	7,450	3,940	4,000	1,200	16,590
Scopes	51,900	64,800	55,800	63,200	235,700
Test Equipment	86,565	63,490	22,950	22,150	195,155
Leasehold Improvements	3,300	1,700	2,000	500	7,500
TOTAL FIELD SERVICE	149,215	133,930	84,750	87,050	454,945

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

NORTHEAST REGION

	Quarter 1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	500	1,000	1,000		2,500
Dictating	1,350	1,350			2,700
Adding Machines	435			150	585
Other Furnishings	2,000		500		2,500
Other Office Equipment		1,975			1,975
Total	4,285	4,325	1,500	150	10,260
Leasehold Improvements	1,000	500		500	2,000
Training Aids	400	250	200		850
TOTAL SALES	5,685	5,075	1,700	650	13,110
FIELD SERVICE:					
Office Equipment:					
Typewriters	1,000	500	500	500	2,500
Other Office Equipment					
Total	1,000	500	500	500	2,500
Scopes	9,000	5,400	3,600	1,800	19,800
Test Equipment	6,400	1,300	300		8,000
Leasehold Improvements	700	200		500	1,400
TOTAL FIELD SERVICE	17,100	7,400	4,400	2,800	31,700

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

MID-ATLANTIC REGION:

	Quarter 1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	2,025	1,550		500	4,075
Dictating	1,350	900	450		2,700
Adding Machines	450	150			600
Other Furnishings	500	500			1,000
Other Office Equipment	2,150				2,150
Total	6,475	3,100	450	500	10,525
Leasehold Improvements	2,500		200		2,700
Training Aids	1,150	200	875	225	2,450
TOTAL SALES	10,125	3,300	1,525	725	15,675
FIELD SERVICE:					
Office Equipment:					
Typewriters	500	500	500		1,500
Other Office Equipment		120			120
Total	500	620	500		1,620
Scopes	9,000	9,000	7,200	9,000	34,200
Test Equipment	4,300	2,100	1,900	900	9,200
Leasehold Improvements					
TOTAL FIELD SERVICE	13,800	11,720	9,600	9,900	45,020

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

WESTERN REGION

	Quarter 1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	2,095	3,575	500		6,170
Dictating	3,150	2,700	450		6,300
Adding Machines		555		150	705
Other Furnishings	600	1,400			2,000
Other Office Equipment	4,513	2,500	3,600	1,800	12,413
Total	10,358	10,730	4,550	1,950	27,588
Leasehold Improvements	8,800	6,850	3,000	2,400	21,050
Training Aids	550	525		200	1,275
TOTAL SALES	19,708	18,105	7,550	4,550	49,913
FIELD SERVICE:					
Office Equipment:					
Typewriters	2,000	500			2,500
Other Office Equipment	950	200		200	1,350
Total	2,950	700		200	3,850
Scopes	3,600	9,000	10,800	9,000	32,400
Test Equipment	2,600	4,000			6,600
Leasehold Improvements	1,100				1,100
TOTAL FIELD SERVICE	10,250	13,700	10,800	9,200	43,950

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

CENTRAL REGION

	Quarter				
	1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	2,500		1,500	1,000	5,000
Dictating	2,700		450		3,150
Adding Machines	510		150	180	840
Other Furnishings	300	350			650
Other Office Equipment	700	2,500			3,200
Total	6,710	2,850	2,100	1,180	12,840
Leasehold Improvements					
Training Aids	450	100	500		1,050
TOTAL SALES	7,160	2,950	2,600	1,180	13,890
FIELD SERVICE:					
Office Equipment:					
Typewriters	1,500	500		500	2,500
Other Office Equipment		620			620
Total	1,500	1,120		500	3,120
Scopes	8,700	10,800	10,800	14,600	44,900
Test Equipment	3,850	6,500	3,000	2,500	15,850
Leasehold Improvements					
TOTAL FIELD SERVICE	14,050	18,420	13,800	17,600	63,870

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

IN HOUSE FIELD SERVICE

	Quarter 1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters					
Dictating					
Adding Machines					
Other Furnishings					
Other Office Equipment					
Total					
Leasehold Improvements					
Training Aids					
TOTAL SALES					
FIELD SERVICE:					
Office Equipment:					
Typewriters			1,000		1,000
Other Office Equipment					
Total			1,000		1,000
Scopes		3,600	3,600	1,800	9,000
Test Equipment	61,665	41,640	14,800	14,200	132,305
Leasehold Improvements					
TOTAL FIELD SERVICE	61,665	45,240	19,400	16,000	142,305

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

CANADA - SALES

	Quarter				
	1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters			1,000	600	1,600
Dictating					
Adding Machines					
Other Furnishings	500	750	250	750	2,250
Other Office Equipment	150	150	150	150	600
Total	650	900	1,400	1,500	4,450
Leasehold Improvements	1,750	6,000	500	500	8,750
Training Aids	2,300	2,000	2,000	2,000	8,300
TOTAL SALES	4,700	8,900	3,900	4,000	21,500
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes	3,600	7,200		5,400	16,200
Test Equipment	5,200	2,400	1,200		8,800
Leasehold Improvements					
TOTAL FIELD SERVICE	8,800	9,600	1,200	5,400	25,000

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

CANADA - ADMINISTRATIVE

	Quarter 1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters		600			600
Dictating					
Adding Machines	600		600		1,200
Other Furnishings					
Other Office Equipment					
Total	600	600	600		1,800
Leasehold Improvements					
Training Aids					
TOTAL SALES	600	600	600		1,800
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes					
Test Equipment					
Leasehold Improvements					
TOTAL FIELD SERVICE					

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

JAPAN and AUSTRALIA

	Quarter				
	1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters		500		500	1,000
Dictating	250			250	500
Adding Machines	100		100		200
Other Furnishings					
Other Office Equipment					
Total	350	500	100	750	1,700
Leasehold Improvements	750		750		1,500
Training Aids	200		200		400
TOTAL SALES	1,300	500	1,050	750	3,600
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes	3,600		3,600		7,200
Test Equipment	800	2,800		2,800	6,400
Leasehold Improvements					
TOTAL FIELD SERVICE	4,400	2,800	3,600	2,800	13,600

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

TOTAL EUROPE:

	Quarter 1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	5,200	3,900	3,800	1,200	14,100
Dictating	1,560		300		1,860
Adding Machines	2,030	250	250	250	2,780
Other Furnishings	16,800	4,200	6,900	100	28,000
Other Office Equipment	2,300	2,300	350	2,750	7,700
Total	27,890	10,650	11,600	4,300	54,440
Leasehold Improvements	19,400	7,900	8,750	500	36,550
Training Aids	4,770	4,840	300	300	10,210
TOTAL SALES	52,060	23,390	20,650	5,100	101,200
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment	1,500	1,000	2,000		4,500
Total	1,500	1,000	2,000		4,500
Scopes	14,400	19,800	16,200	21,600	72,000
Test Equipment	1,750	2,750	1,750	1,750	8,000
Leasehold Improvements	1,500	1,500	2,000		5,000
TOTAL FIELD SERVICE	19,150	25,050	21,950	23,350	89,500

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

ENGLAND

	Quarter				
	1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters			500		500
Dictating	250				250
Adding Machines					
Other Furnishings					
Other Office Equipment	300	350	350	350	1,350
Total	550	350	850	350	2,100
Leasehold Improvements		5,000			5,000
Training Aids	130				130
TOTAL SALES	680	5,350	850	350	7,230
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes		5,400	7,200	7,200	19,800
Test Equipment	500	750	750	500	2,500
Leasehold Improvements		500			500
TOTAL FIELD SERVICE	500	6,650	7,950	7,700	22,800

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

SWEDEN

	Quarter				
	1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	500	1,000	500	500	2,500
Dictating					
Adding Machines					
Other Furnishings					
Other Office Equipment	300	250			550
Total	800	1,250	500	500	3,050
Leasehold Improvements	300	400	250		950
Training Aids			300	300	600
TOTAL SALES	1,100	1,650	1,050	800	4,600
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes	1,800	7,200			9,000
Test Equipment	250	250	250	250	1,000
Leasehold Improvements					
TOTAL FIELD SERVICE	2,050	7,450	250	250	10,000

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

BENELUX

	Quarter				
	1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	600	600			1,200
Dictating					
Adding Machines					
Other Furnishings					
Other Office Equipment	900				900
Total	1,500	600			2,100
Leasehold Improvements					
Training Aids					
TOTAL SALES	1,500	600			2,100
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes	5,400		1,800	1,800	9,000
Test Equipment	250	500		250	1,000
Leasehold Improvements					
TOTAL FIELD SERVICE	5,650	500	1,800	2,050	10,000

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

ITALY

	Quarter 1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	500				500
Dictating					
Adding Machines	580				580
Other Furnishings					
Other Office Equipment					
Total	1,080				1,080
Leasehold Improvements					
Training Aids					
TOTAL SALES	1,080				1,080
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes	1,800	1,800		1,800	5,400
Test Equipment	250		250		500
Leasehold Improvements					
TOTAL FIELD SERVICE	2,050	1,800	250	1,800	5,900

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

SWITZERLAND

	Quarter				
	1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	600		600		1,200
Dictating	280				280
Adding Machines	400				400
Other Furnishings					
Other Office Equipment		700			700
Total	1,280	700	600		2,580
Leasehold Improvements	1,000	500			1,500
Training Aids					
TOTAL SALES	2,280	1,200	600		4,080
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes	1,800	1,800		1,800	5,400
Test Equipment		250		250	500
Leasehold Improvements					
TOTAL FIELD SERVICE	1,800	2,050		2,050	5,900

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

GERMANY

	Quarter 1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	300				300
Dictating					
Adding Machines					
Other Furnishings					
Other Office Equipment					
Total	300				300
Leasehold Improvements	800				800
Training Aids					
TOTAL SALES	1,100				1,100
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment	1,500	1,000	500		3,000
Total	1,500	1,000	500		3,000
Scopes	1,800	3,600	3,600	7,200	16,200
Test Equipment	250	500	250	250	1,250
Leasehold Improvements	1,500	1,000	1,000		3,500
TOTAL FIELD SERVICE	5,050	6,100	5,350	7,450	23,950

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

EUROPE - ADMINISTRATION

	Quarter 1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	1,500	1,000	500		3,000
Dictating Machines	200				200
Other Furnishings					
Other Office Equipment					
Total	1,700	1,000	500		3,200
Leasehold Improvements		500	500	500	1,500
Training Aids	200				200
TOTAL SALES	1,900	1,500	1,000	500	4,900
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment			1,500		1,500
Total			1,500		1,500
Scopes					
Test Equipment					
Leasehold Improvements			1,000		1,000
TOTAL FIELD SERVICE			2,500		2,500

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

TRAINING - EUROPE

	Quarter 1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters			500		500
Dictating					
Adding Machines					
Other Furnishings					
Other Office Equipment					
Total			500		500
Leasehold Improvements	10,000				10,000
Training Aids	4,040	4,040			8,080
TOTAL SALES	14,040	4,040	500		18,580
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes					
Test Equipment					
Leasehold Improvements					
TOTAL FIELD SERVICE					

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

PROGRAMMING - EUROPE

	Quarter				
	1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	500		500		1,000
Dictating	80				80
Adding Machines					
Other Furnishings			300		300
Other Office Equipment				2,400	2,400
Total	580		800	2,400	3,780
Leasehold Improvements	3,000	1,500	5,000		9,500
Training Aids					
TOTAL SALES	3,580	1,500	5,800	2,400	13,280
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes					
Test Equipment					
Leasehold Improvements					
TOTAL FIELD SERVICE					

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

SPECIAL SYSTEMS - EUROPE

	Quarter 1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters					
Dictating	250				250
Adding Machines					
Other Furnishings					
Other Office Equipment					
Total	250				250
Leasehold Improvements					
Test Equipment	14,300	4,200	4,100	100	22,700
Training Aids					
TOTAL SALES	14,550	4,200	4,100	100	22,950
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes					
Test Equipment					
Leasehold Improvements					
TOTAL FIELD SERVICE					

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

ADVERTISING - EUROPE

	Quarter 1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters	700				700
Dictating					
Adding Machines					
Other Furnishings	1,000		1,000		2,000
Other Office Equipment					
Total	1,700		1,000		2,700
Leasehold Improvements	2,500		1,000		3,500
Training Aids		800			800
TOTAL SALES	4,200	800	2,000		7,000
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes					
Test Equipment					
Leasehold Improvements					
TOTAL FIELD SERVICE					

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

ACCOUNTING - EUROPE

	Quarter				
	1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters		600			600
Dictating					
Adding Machines	250	250	250	250	1,000
Other Furnishings	300		1,500		1,800
Other Office Equipment	800				800
Total	1,350	850	1,750		4,200
Leasehold Improvements	1,800		1,000		2,800
Training Aids					
TOTAL SALES	3,150	850	2,750	250	7,000
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes					
Test Equipment					
Leasehold Improvements					
TOTAL FIELD SERVICE					

DIGITAL EQUIPMENT CORPORATION

1970 CAPITAL BUDGETS

SALES and FIELD SERVICE

PERSONNEL - EUROPE

	Quarter				
	1	2	3	4	Total
SALES:					
Office Equipment:					
Typewriters			700		700
Dictating	400				400
Adding Machines					
Other Furnishings					
Other Office Equipment					
Total	400		700		1,100
Leasehold Improvements					
Training Aids					
TOTAL SALES	400		700		1,100
FIELD SERVICE:					
Office Equipment:					
Typewriters					
Other Office Equipment					
Total					
Scopes					
Test Equipment					
Leasehold Improvements					
TOTAL FIELD SERVICE					

Submitted
BY: Win Hindle

DIGITAL EQUIPMENT CORPORATION

PROPOSED CAPITAL EQUIPMENT PLAN - FISCAL YEAR 1970

Description	Investment Classification	Quantity	Fiscal Quarters Q. 1 $	Q. 2 $	Q. 3 $	Q. 4 $	Total $
Office Equipment:							
Typewriters	Expansion	21	5,565	1,225	1,735	1,000	9,525
Dictating Units	Expansion	10	700	600	800	500	2,600
Adding Machines	Expansion	2	137	500			637
Cardex Fireproof Record Cabinet	Expansion	1	1,287				1,287
			7,689	2,325	2,535	1,500	14,049
Marketing Equipment:							
Bristol Recorder		1	800				800
Keyboard Terminals		1	1,000				1,000
Patient Monitoring Equip.					2,500		2,500
Miscellaneous			500	500		500	1,500
Portable Teletype		1		1,700			1,700
			2,300	2,200	2,500	500	7,500
Leased Equipment:							
PDP-10 Computers	Expansion	2		225,000		225,000	450,000
Product Development:							
Scopes - Type 453		2	2,000				2,000
Teletype		3		4,700			4,700
PDP-15		1	30,000				30,000
PDP-10 # 2 (Additions to)			45,000				45,000
PDP-10 #40 (Existing Machines)			61,000				61,000
PDP-8 (Tape Prep)	Expansion	1		12,000			12,000
TSS/8		1		46,000			46,000
Linc-8		1	36,000				36,000
PDP-8		1	15,000				15,000
Tape Punches	Expansion	4		1,600	1,600		3,200
Other - See Attached List			37,422	50,000	107,300	30,000	224,722
			226,422	114,300	108,900	30,000	479,622
Training Equipment:							
PDP-9 #60		1	21,761				21,761
PDP-8 #1118		1	15,972				15,972
PDP-8 #1292		1	7,136				7,136
PDP-8/S #116		1	3,364				3,364
PDP-8/S #226		1	4,206				4,206
			52,439				52,439

DIGITAL EQUIPMENT CORPORATION

PROPOSED CAPITAL EQUIPMENT PLAN - FISCAL 1970

PDP-10 Engineering:

Qty.	Item	Q. 1 $	Q. 2 $	Q. 3 $	Q. 4 $	Total $
1	DF 10 #11	2,026				2,026
1	RC 10 #11	5,966				5,966
1	164 #31	21,730				21,730
1	Sampling Scope	3,100				3,100
1	Fluke Voltmeter	1,100				1,100
1	1L5 Plug in	1,000				1,000
1	Drum		40,000			40,000
1	Data Set Tester		10,000			10,000
1	KI 10			35,000		35,000
1	680 I			14,000		14,000
1	PC 04			1,000		1,000
1	TD 10			4,300		4,300
3	TU 55			3,000		3,000
1	MA 10			20,000		20,000
1	Remote Batch Terminal			20,000		20,000
1	VT 15			10,000		10,000
1	Terminal				5,000	5,000
2	90 KC Mag Tape				25,000	25,000
1	KSR 35 SN 127178 Base SN 313268 Printer	2,500				2,500
		$37,422	$50,000	$107,300	$30,000	$224,722

Submitted
BY: W. Brewster Kopp

DIGITAL EQUIPMENT CORPORATION

PROPOSED CAPITAL EQUIPMENT PLAN - FISCAL 1970

Description	Investment Classification	Quantity	Fiscal Quarters Q. 1 $	Q. 2 $	Q. 3 $	Q. 4 $	Total $
Office Equipment:							
Typewriters	Expansion	7	2,400	1,200	600		4,200
Dictating Equipment	Expansion	1	250				250
Calculators	Expansion	3	2,400		1,200		3,600
Adding Machines	Expansion	19	2,400	1,400	1,400	1,400	6,600
Filing System	Cost Reduction	1	5,000				5,000
Stuffing Machine	Cost Reduction	1	7,000				7,000
Other	Expansion		1,250	1,250	1,250	1,250	5,000
Filing Equipment (Cards & Tapes)	Expansion			700			700
Miscellaneous	Expansion		500	500			1,000
GRAND TOTAL			$21,200	$5,050	$4,450	$2,650	$33,350

DIGITAL EQUIPMENT CORPORATION

PROPOSED CAPITAL EQUIPMENT PLAN - FISCAL 1970

Submitted
BY: Stan Olsen

Description	Investment Classification	Quantity	Fiscal Quarters Q. 1 $	Q. 2 $	Q.3 $	Q. 4 $	Total $
Office Equipment:							
Adding Machines	Expansion	4	1,150				1,150
Typewriters	Expansion	3		1,000	250		1,250
Dictaphone	Expansion	1	210				210
Calculator	Expansion	1	720				720
Miscellaneous			400	400	400	400	1,600
Varityper	Expansion	1	4,000				4,000
Telephone Recording Device	Expansion (Dial Dictation)	2	1,100	1,100			2,200
			7,580	2,500	650	400	11,130
Traffic & Material Handling:							
Hydrälic Order Picker	Cost Reduction	1	3,750				3,750
Hydralic Fork Lift Trucks	Expansion	2	800				800
Tape Machine	Expansion	3	300		300	300	900
Micro Film Reader	Micro film of records	1	4,000				4,000
Computer 8L	Inventory Control Cost Reduction	1	5,000				5,000
Power Conveyors	Cost Reduction		4,000	4,000			8,000
White Revolving Storage Conveyors	Cost Reduction			12,000		5,000	17,000
Ho' Trailer (Canada † New Plants)	Cost Reduction		5,500			6,500	12,000
Scales	Expansion	4	250		250	500	1,000
Pallet Trucks	Expansion	3	350	350		300	1,000
Pneumatic Tube device (Enter-Bldg)	Cost Reduction	1	400				400
20' Staight Truck (Westfield-Leominister)	Expansion	1		8,000			8,000
40' Tractor-Trailer (Westfield-Leominster)	Expansion	1				24,000	24,000
Tow Motor-truck (electric)	Expansion	1			6,000		6,000
Scissor type platform for loading low bed trucks	Expansion Cost Reduction	1			2,000		2,000
			24,350	24,350	8,550	36,600	93,850
Demostration Equipment:							
IEEE Show Disply System					1,500		1,500
Wescon Show Display System				1,500			1,500
				1,500	1,500		3,000
Leased Equipment:							
PDP-15/30	Rentals	8	50,000	63,000	50,000	50,000	213,000

Digital Equipment Corporation

Proposed Capital Equipment Plan - Fiscal 1970 Continued

Submitted by: Stan Olsen

Description	Investment Classification	Quantity	Fiscal Quarters Q. 1	Q. 2	Q. 3	Q. 4	Total
Printing Equipment:							
Addressograph Multigraph #2675	Expansion/Cost Reduction	1	14,000				
Addressograph-Uulti Collator	" "	1	9,600				23,600
Ordina Collator	Expansion	1		8,000			
Address/Multigraph 1250 lw with change sticker	Expansion	1		5,500			13,500
A & M Plate Malser	Cost Reduction	1			8,000		8,000
			23,600	13,500	8,000		45,100
Product Development:							
Scopes	Expansion	14	20,175	5,275	2,000	2,000	30,050
Voltage Controlled Generator W.	Expansion	1	545				545
Power Squaring Shear	Expansion	1	3,000				3,000
N.C Controlled Universal Inserting Machine	Expansion/ Cost Reduction	1	"	9,000			9,000
Dry Edge Film Dryer	Expansion	1	425				425
Audio Asocillator	EXpansion	1	255				255
Burst Generator	Expansion	2	800	800			1,600
A C Voltmeter	Expansion	1	310				310
Misc. Test Equipment	Expansion		1,700	1,700	1,700	1,700	6,800
Environmental Test Facilities		1	15,000				15,000
Pulse Generator	Expansion	1	1,300				1,300
BA 08	Expansion	2	1,000				1,000
MC 8/L A	Expansion	2	3,000				3,000
PC 8/L	Expansion	2	2,700				2,700
PDP 8/L	Expansion	1	6,600		3,500		10,100
Production Test Station	Expansion	1				7,000	7,000
ASR - 33	Expansion	2			700	700	1,400
PDP 8S	Expansion	1	4,000				4,000
			61,410	16,775	7,900	11,400	97,485
Plant Expansion and Necessary Replacement and Major overhauling of buildings and equipment	(see attached schedule)		7,985,000	170,000	642,000	630,000	9,427,000
GRAND TOTAL			$8,151,940	$291,625	$718,600	$728,400	$9,890,565

DIGITAL EQUIPMENT CORPORATION

PROPOSED CAPITAL EQUIPMENT PLAN - FISCAL 1970

Submitted By:

V. P.	Description	Fiscal Quarters Q .1	Q. 2	Q. 3	Q. 4	Total
	Planned Activities of Building Maintenance	$	$	$	$	$
S. Olsen	Central Computer System to Centralize Security System				100,000	100,000
S. Olsen	Air Condition 1/3 of Maynard Plant	60,000	65,000	60,000	65,000	250,000
S. Olsen	High Voltage oval switch gear for Maynard			25,000		25,000
S. Olsen	Phase III - Primary Metering for Maynard		50,000			50,000
S. Olsen	Maintenance Equipment			75,000		75,000
S. Olsen	Additional Parking lots - 500 spaces	140,000				140,000
S. Olsen	Parking Lot Lighting	35,000				35,000
S. Olsen	Two 50 cycle Alternators			24,000		24,000
S. Olsen	Two Air Compressors				30,000	30,000
S. Olsen	Leasehold Improvements - Maynard*	55,000	55,000	55,000	55,000	220,000
S. Olsen	Stairs near Thompson Street Ramp			3,000		3,000
W. Hindle	Training Center					
	Land - 40 acre parcel				80,000	80,000
	Building - 30,000 sq.ft.				300,000	300,000
P. Kaufmann	Leasehold Improvements - Temporary Rented Plant Leominster - 60,000 sq.ft.	60,000				60,000
P. Kaufmann	New Plant - Computer Production - Leominster					
	Land - 140 acres				280,000	280,000
	Shell 500,000 sq.ft. with 250,000 sq.ft. Module				4,000,000	4,000,000
P. Kaufmann	New Plant - Sheetmetal & PTH - Westfield					
	Land - 250 acres	450,000				450,000
	Building - 250,000 sq.ft. at 10 aq.ft.	2,500,000				2,500,000
P. Kaufmann	Sprinkler System - Plant #3 Puerto Rico - Phase I	30,000				30,000
P. Kaufmann	Leasehold Improvements - Puerto Rico					
	Plant #3 - 60,000 sq.ft.	300,000				300,000
	Plant #4 - 60,000 sq.ft.			300,000		300,000
	Footwear Building - Olo Site	10,000				10,000
S. Olsen	Additional Sprinkler Work - Maynard			100,000		100,000
S. Olsen	Three Guard Houses - Security	15,000				15,000
W. Hindle	Rented Training Facility Improvement (20,000 sq.ft.)	50,000				50,000
		$3,705,000	$170,000	$642,000	$4,910,000	$9,427,000

*Improvements to following buildings:

1-1, 1-2, 6A-1, 6A-2, 6A-3
6B-1, 6B-2, 6C-1, 6C-2, 8A-1,
11-4, 8-4, 8A-4

digital INTEROFFICE MEMORANDUM

DATE: July 3, 1969

SUBJECT: Shared Development of Data Acquisition Products

TO: Operating Committee FROM: Ron Noonan

The following summarizes the proposal dated June 26, 1969, previously made to the Operating Committee:

I. What is Proposed

The use of $202,000 of shared funds for the following projects:

1. New 12 bit plus sign A/D subsystem with single ended and differential multiplexers.
2. Digital I/O subsystems with several module options.
3. Cabinets with needed termination and grounding facilities.
4. Production of needed customer/sales documentation.

II. What Are Our Current Problems

1. No Digital input/output products currently exist in the computer product lines.
2. Special system approaches to Digital input/output and industrial packaging are generally not competitive.
3. Costs and performance of our basic A/D subsystem (AF01 series) are becoming less competitive.
4. Meaningful technical sales documentation for proposals and evaluation is lacking resulting in loss of sales effectiveness.

III. Why Should We Do It

1. Will enable 8, 9/15, and 11 product lines to increase penetration of markets requiring data acquisition and control functions. These markets were over $160 million in 1969.
2. Projects will be completed in F70 and will payback development costs in the fourth month of F71 yielding less than one year payback.
3. Bookings of $1.6 million in these options per se and $15 million in associated computer systems will occur in F71.
4. Will permit us to maintain and improve our data acquisition hardware development capability. Such a capability is essential in allowing our computer products to be interfaced to real time devices, instruments, and machines.
5. Provides an optimum solution for the problems outlined in paragraph II above.

RPN/

digital INTEROFFICE MEMORANDUM

DATE: July 8, 1969

SUBJECT: Proposal for Shared Development; request for Product Line Approval.

TO: Product Line Managers

FROM: Ronald P. Noonan

Attached is a proposal for shared development funding of Data Acquisition I/O hardware which has been made to the Operations Committee.

As discussed at our peripheral product planning meeting last month, this proposal has been made in lieu of the DSI system. It represents an optimum solution in terms of providing needed products and documentation this fiscal year, reasonably quick payout, development costs, and utilization of our present development capability. This proposal will provide needed improvements primarily for the 8, 9/15, and 11 Product Lines. Some useful modules could fall out of this project for the module group and secondary benefits would accrue to the PDP-12 and TPL. There is no direct benefit here for the 10 family except that this project would strengthen our data acquisition capability in smaller computers for satellite configurations.

It is requested that each of you submit a brief memo to me with a copy to the Operations Committee which states your position on the use of shared development funds for this project. Please indicate your:

1. Approval or disapproval of the project as proposed
2. Brief comments on the reason for your position
3. Suggestions, if any, for modifying the goals presented

I would appreciate receiving your reply by Friday, July 11.

Regards,

BJC
cc: Operations Committee

CONFIDENTIAL

OPERATIONS COMMITTEE MEETING

July 7, 1969

AGENDA

1. Legal/Patent Matters - (Bob Cesari)
2. Additions and Corrections to Minutes of the June 30th Meeting
3. Information System Projects - (Dave Packer)
   (Proposal distributed for last week's meeting)
4. Schedule Review Product Status - (Steve Sobel)
   (Report distributed for last week's meeting)
5. Shared Development of Data Acquisition Products Proposal - (Ron Noonan)
   (See attached report)
6. Proposed Visitors Dining Room - (Al Hanson)
   (Report distributed for last week's meeting)
7. Proposed Air-Conditioning for 3rd and 4th Floors of Building 21 - (Al Hanson)
   (See attached report)
8. Fiscal Year 1970 Budget and Budgeting Process - (Bob Savell)
   (See attached report)
9. Proposal to Establish a Programming Product Line - (Larry Portner)
   (See attached report)
10. Engineering and Marketing Plans - (Al Devault)
11. Proposal to Reduce Sheets in Financial Statement to Size 8 1/2 x 11 - (Brewster Kopp)
    (See attached report from Bob Dill)
12. Salary Administration for Wage Class 4 Employees - (Graydon Thayer)
    (Report distributed for last week's meeting)

COMPANY CONFIDENTIAL

digital INTEROFFICE MEMORANDUM

DATE: July 8, 1969

SUBJECT: MINUTES OF OPERATIONS COMMITTEE OF JULY 7, 1969

TO: Operations Committee FROM: Nick Mazzarese, Secretary

Present: K. Olsen, S. Olsen, W. Hindle, P. Kaufmann, B. Kopp, N. Mazzarese

1. Legal/Patent Matters - (Bob Cesari)

   a. We buy over two million dollars a year in teletypes. Why aren't we developing a unit we can manufacture ourselves?

   b. There is currently memory technology we can license in rod memories and magnetic wire memories. Ken suggested Bob talk to R. Best and R. Hamel about it.

   c. There is a need for a very low cost computer that can compete with NOVA and perhaps, even be priced lower. The question was raised as to whether the PDP-11 was meeting its cost goals.

   d. In addition to "Digital," "DEC" will be put on all packaging materials from now on. Bob feels quite certain that we will be able to get the trademark "Digital" (blocked version as appears on our stationery) registered.

   e. We may not be able to trademark module handles because we sell them separately.

   f. RCA has patents on 2-1/2D and 3D memories that we may be infringing. RCA is also infringing our patents (PDP-10 bus memories). We may be able to negotiate on this.

   g. There is a potential patent problem on disk and drum storage media. Other companies are pursuing this. We will take no action now and see what develops.

   h. Our position on MIT patent (core memory) is that we will not make any further payments because we feel our initial settlement was for too high an amount.

2. Additions and Corrections to Minutes of the June 30th Meeting

The minutes were approved as submitted.

3. Information System Projects - (Dave Packer)

Dave reviewed his projects for the next 6 to 10 months.

4. Schedule Review Product Status - (Steve Sobel)

Steve's proposal was approved.

5. Shared Development of Data Acquisition Products Proposal - (Ron Noonan)

Proposal was approved and written comments from Product Managers will be sent to Operations Committee with summary sheet and comments from Ron Noonan.

6. Proposed Visitors Dining Room - (Al Hanson)

Proposal was rejected. It was suggested that we reserve a room at a local restaurant (Russo's). Another suggestion was a buffet set up away from the main cafeteria area.

Air-conditioning was approved for the cafeteria.

7. Proposed Air-Conditioning for 3rd and 4th Floors of Building 21 - (Al Hanson)

Air-conditioning will not be installed until FY '70. Only office space will be air-conditioned. Equipment areas will be cooled by fans. Final approval will be made after floor layouts are made.

8. Fiscal Year 1970 Budget and Budgeting Process - (Bob Savell)

Bob commented that sales and service departments do not start budgeting process early enough and consequently run behind. We will review this when Ted Johnson is present.

9. Proposal to Establish a Programming Product Line - (Larry Portner)

Proposal was approved. Larry will come before Operations Committee to get our comments next week.

10. Engineering and Marketing Plans - (Al Devault)

Deferred to next week's agenda. Should be first item.

11. Proposal to Reduce Sheets in Financial Statement to Size 8-1/2 x 11 - (Brewster Kopp)

Proposal was approved. It was suggested that we typeset form trying to leave more space for numbers.

12. Salary Administration for Wage Class 4 Employees - (Graydon Thayer)

Deferred to next week's agenda.

Note: Jack Shields should be invited to Operations Committee more often.

NJM/bb

digital INTEROFFICE MEMORANDUM

DATE: June 18, 1969

SUBJECT: Information System Projects

TO: Operations Committee

FROM: David W. Packer

Dave

Below are very brief abstracts of our information systems design and development projects for the coming 6-10 months. They show the main thrust of our systems and programming efforts. Projects are organized by major area, consistent with the department's structure. Rough estimates of man-months also appear, as an indication of scope.

In general, these projects plus maintenance of existing systems and other internal activities leave virtually no resources available for additional major projects for the next 6-8 months. I want to be sure that these areas are the most critical to attack now.

Information System Projects June 18, 1969

MANUFACTURING/COST ACCOUNTING

1. Material Control: 12 Man-months

Expand material planning system, now in operation for module production and module components, to

-Subassembly production

-Fabricated parts

-Circuit board production.

Incorporate computer work-in-process in planning system. Design integration of backlog data

2. Cost Control: 12 Man-months

Establish meaningful variance reporting for production departments on standard cost system. Improve cost reporting on actual cost items. Report variances by part, operation, and department.

3. Purchasing: 8 Man-months

Improve flow of receiving information. Improve open purchase order system. Analyze and improve clerical procedures in purchasing area. Establish "received but not invoiced" system to maintain records of items physically received but not yet vouchered.

4. Order Scheduling: 4 Man-months

Define and develop solutions to problems that affect customer committments, involving the interface between computer administration, production control, and product lines.

Information System Projects June 18, 1969

MARKETING/ACCOUNTS RECEIVABLE

1. Foreign Bookings/Backlog/Sales — 4 Man-months

   Expand information system to contain data on subsidiary bookings through sales. Incorporate status coding on each item so that system can provide:

   a. Total corporate backlog
   b. Maynard and subsidiary accounting backlog
   c. Maynard production backlog -- including internal requirements.

2. Bookings vs. Budget — 3 Man-months

   Establish a system to accumulate and report bookings versus budget by product line and branch office. Possibly integrate with selling expense information to produce meaningful "figure of merit" data.

3. On-line Order Entry — 12 Man-months

   Design and evaluate on-line system for entering and updating order information.

4. Order Entry Improvements — 3 Man-months

   Automate change order entry process, also preparation of multiple OEM orders.

FINANCIAL/ADMINISTRATIVE

1. Payroll — 6 Man-months

   A major revision of the payroll system; designed to reduce clerical effort and expedite payroll information.

2. Personnel — 2 Man-months

   A review of personnel department procedures, clerical organization, and paperwork flows.

Information System Projects June 18, 1969

FIELD SERVICE/MISCELLANEOUS

1. Customer Contact System — 5 Man-months

Maintains name, address, and other data about software contacts, engineering contacts, etc. for each customer installation. Used for software distribution, selective mailings, and other purposes. Integrated with installation file to enable identification of customers with specific configurations.

2. Installation File Revision — 2 Man-months

Reformat installation file; add capability for special software requirements consistent with software distribution system.

DWP:tw

digital INTEROFFICE MEMORANDUM

DATE: June 19, 1969

SUBJECT: SCHEDULE REVIEW PRODUCT STATUS

TO: Operations Committee

FROM: Steve Sobel

After a herculean distillatory effort, the attached checklist emerges as a substitute for the Proposed Supplement to DEC STD 008 (the latter presented to the Operations Committee May 5th and the Engineering Committee May 8th).

It is proposed that copies of the checklist be brought to Schedule Review Meetings and made available to Committee members. The purpose is to offer a summary of product status and current plans.

I am indebted to Jerry Butler who showed me a similar checklist that his product line has been using. I made some minor adaptations. The Operations Committee may in turn wish to suggest some changes.

The checklist does not cover many areas identified in the original supplement proposal, e.g. development cost to-date, revised manufacturing costs and specifications, system software status, backlog of order commitments, competition, etc. Nevertheless, it is my understanding that the product lines and the Operations Committee already have ample means to review such areas.

lm
Attachment

COMPANY CONFIDENTIAL

DATE _____

Project Engineer _____
Chrm., Dsn. Rvw. Comm. _____
Production Engineer _____

NEW HARDWARE RELEASE MILESTONES

PRODUCT NAME & NUMBERS: _____

DESCRIPTION: _____

MILESTONE	INIT. SCHED.	DONE	CURRENT SCHED.	COMMENTS
1ST DESIGN REVIEW				
SPEC'S FIRM				
BREADBOARD WORKING				
2ND DESIGN REVIEW				
3RD DESIGN REVIEW				
PROTOTYPE RUNNING				
RTB				
FIRST UNITS IN F. S. CKOUT				
REL. TO SHIP & 1ST. SHPMT.				
DIAG. & ACCPT. TESTS DONE				
MANUALS AVAILABLE				
SALES PIECES AVAILABLE				
PUBLIC RELEASE				
RELEASE TO SALES				
PURCHASE ORDERS ACCPTD.				
1ST TRAINING CLASS				
RTP				

BUILD-UP OF FIRST UNITS

MONTH					
QUANTITY					
SOURCE					

DISPOSITION OF FIRST UNITS

QUANTITY	TO	DATE	SOURCE	COMMENTS

NOTES

PRODUCT NAMES & NUMBERS

Include option numbers for all equipment associated with product name (interfaces, controller, drives, alternative configurations, etc.). Also indicate discrete project number if one charged to.

DESCRIPTION

Indicate what it is, why being developed, and some idea of target specifications. If characterized by particular technology, mention (e.g. "IC" DECtape , "pinch roller" MAGtape, and "single capstan" MAGtape). If purchased outside, state source.

digital INTEROFFICE MEMORANDUM

DATE: June 26, 1969

SUBJECT: Proposal for Shared Development of needed Data Acquisition Hardware

TO: Operating Committee

FROM: Ron Noonan

I Summary

This memo proposes the use of corporate shared funds for the development of basic data acquisition hardware for our small and medium computer product lines. The cost of such development is $182,000 occuring within fiscal year 1970. Additionally, funding of $20,000 is requested to provide much needed technical sales literature for both existing and proposed equipment which is offered accross our various computer product lines. The execution of this proposal will allow DEC to:

1. Maintain a competitive position in basic analog to Digital conversion capabilities.
2. Offer, badly needed, Digital input/output capability and user oriented packaging to the data acquisition markets for increasing penetration by the PDP-8 and 15 lines.
3. Book $1.6 million in the purposed options themselves during fiscal 1971 (the systems containing these options will provide total bookings of approximately $15 million that year)
4. Achieve bookings in fiscal 1970 and payback at the start of the second quarter of fiscal 1971 on the basis of the options alone.

II Background

This proposal is being submitted in lieu of the DSI (Data Acquisition Systems Interface) project which was brought to the Operations Committee's attention by Nick Mazzarese in May. The DSI project (Appendix 2) while providing an excellent technical solution to the problem of providing standardized, CPU independent, and highly modular data acquisition hardware, did not look attractive in terms of DEC's customary expectations of one year or less as the period for achieving payback on development investment. On analysis of the pro-forma P+L statements (Appendix 1) for the DSI, it was decided by the Data Acquisition and Control Group that we would not make a formal proposal for its funding even though considerable effort was expended in preparation. The more significant financial problems with the DSI project were:

1. Long development and test cycle--18 months
2. Relatively high development costs--$360 K
3. First shipments in quarter three of second year
4. Break-even on basis of cumulative net before tax at end of quarter two of third year.

Additionally there was little short-term help for the PDP-15 and 8 lines, and perhaps the danger of making too large a step change or "leap frog" for which the company as a whole (sales, field service, software development, etc.) was not yet ready.

The present proposal overcomes most of the financial timing problems above by taking a limited but pragmatic approach to Digital I/O and packaging on PDP-8 systems and adding PDP-15 interface facilities.

III Product Line vs Shared Funding of Project

Table 1 indicates the development costs and funding for F70's Data Acquisition hardware development for cc 363 (Analog Development). For support and discrete projects by various product lines, $102 K have been provided; and $85 K is proposed for shared project funding. The shared development project will require $97 K from other engineering services making a total of $182 K to provide the development requisted herein.

Planning, development, and funding of data acquisition products or options has proven to be somewhat of a problem within the product line structure because of:

1. Marketing and technology for these markets do not usually exist in the individual product lines.

2. Development requests are normally on a random request basis which does not lend itself to the development of an integrated, well-planned product capability.

3. Product lines in budget squeeze situations find it easy to cut off or defer funding for service groups. This impacts the stability and effectiveness of the special technology required to sustain and improve our competitive posture in the many markets requiring data acquisition functions.

Shared funding appears in part to solve some of the more immediate problems and provides the basic equipment to improve our competitive capabilities.

IV Project Justification

Table 2 indicates the development schedule for cc363 including the shared projects. Tables 3 and 4 contain a brief description of the discrete and shared projects respectively. Essentially, the shared projects break into three pieces:

1. New 12 bit plus sign A/D with single ended and differential MUX for PDP-8, 15, and 11.

2. Digital I/O for the 8 and 15.

3. Industrial packaging for data acquisition I/O for the 8 and 15.

New A/D and MUX Control

This project is essentially a competitive replacement for our current AF01 series with optional differential capability. This unit will reduce our current factory costs by about 50%,ie,$1,800 to $900. We are currently shipping 10 units per month this year. Refer to table 7--Data Acquisition Option Shipments. Therefore, 120 units times $900 factory cost savings would yield $108,000 direct-cost savings in one year neglecting the higher margins and increased performance and sales of this unit. Also, this unit provides the foundation for more sophisticated front end configurations.

Digital I/O

Currently, there are no standard Digital I/O options available in the PDP-8 family. The 9/15 family offers a limited one-word contact sense which is generally not useable in data acquisition applications. These options allow our systems to be interfaced with external machines, controls and devices that provide or require Digital signals e.g., limit switches, pushbuttons, solenoids, relays, pulse generators, etc. The lack of such capability results in a lack of sales effectiveness--all requirements require special system quotes--approximately 30/month, low proposal capture rate, and no basis on which to generate sales and application literature. Since the basic design for this equipment is being done on a special systems basis for INDAC-8, we will be able to bring this to a product status quickly for shipments in quarters three and four of F70 with payback by quarter one of F70. See tables 5 and 5A.

Industrial Packaging

This is needed to meet the needs of customers for terminating large numbers of input/output wires in a reasonable fashion-wiring troughs, modules screw terminal facilities, signal conditioner mounting, and controlled grounding. This modest project will take an expedient approach with existing cabinets to solve these problems. See tables 5 and 5A for booking and return data.

Table 5 shows projected bookings for these new options for the various product lines. Table 5A is an abbreviated operating P+L on these options. These indicate payment of the $202 K request from shared funds in the fourth month of F71.

Operating expenses of 22% were assumed for simplicity on the bases of the following expense allocation from gross sales:

Shared Engineering	2%
Field Sales	8%
Marketing	4%
G and A	6%
Reserves	2%
Total	22%

Development cost and specific sales literature costs are shown as actuals.

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VI The Market

The current market for computer based data acquisition and control system is shown on table 6--approximately $168 million in 1969. Currently, most of our activity in this area is with OEM's-- Terradyne, Picker, Foxboro, etc. A long-term strategy for profitable penetration and growth in these important markets is to develop a balance between our OEM and end user channels. The current proposal provides some basic front-end capabilities to attack a small portion of the user and system contractor portions of these markets. A cross-product strategy for doing this will be provided in a subsequent Data Acquisition Market Plan.

VII Sales Literature

Included in this proposal is a request for $20 K to produce much needed technical sales literature for our current and proposed data acquisition options. There is presently a serious back of good material for salesmen and customers as well as backups for written proposals. Product lines, in my experience, do not desire to fund cross-product line literature. They would rather use such funds on promotion specific to their products. Since they do not generally possess the technical marketing background to generate meaningful data acquisition literature, the job has not gotten done. The funds would be used as follows in F70:

	Items	Cost	When
1.	Editing, graphics, and printing of Data Acquisition and Control Systems Notebook (currently in draft form)	$3.5 K	QTR 1
2.	Editing and publishing costs for approximately 35 pages in 1970 Controls Handbook	3.0 K	QTR 1
3.	Creation and publication of an organized set of user oriented Spec Sheets for all data acquisition options on cross-product basis	13.5 K	QTR 2,3,4,

VIII Conclusion

Examination of table 7, Data Acquisition Option Shipments, indicates that our shipments of this equipment in F69 will be approximately $1.4 million after adding June shipments and items that did not get posted to the source data for the report. With the impact of INDAC, other programs aimed at this market; and, hopefully, the requested projects, the revenue from these options should increase significantly over the next few years. Current projections look like $2.4 million in F70 and $3.2 million in F71. Assuming that 10% of sales is a reasonable annual expense guideline for continuing development of high technology hardware, this would indicate a development budget of 240 K and 320 K in F70 and F71. The current budget of $280 K (see table 1) plus another $40 K in other development costs for funded discrete projects would indicate a 13% level in F70 and 11% in F71. Therefore, it would seem reasonable in view of the importance of data acquisition capabilities to support our computer product lines that the subject proposal has merit.

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This will conserve our current technical resources and provide much needed competitive capability.

As a longer term consideration, I would be willing to consider and propose a profit center means of managing and evaluating our efforts in Data Acquisition related markets if the Operations Committee feels that this would be worthwhile.

BJC

BJC

ATTACHMENTS

Tables

Table 1 Data Acquisition Development Projects Funding/Costs
Table 2 Fiscal Year 1970 - 363 Development Schedule
Table 3 363 Projects Currently Funded by Product Lines
Table 4 363 Projects Proposed to be Funded by Shared Funds
Table 5 Volume Forecast
Table 5A Abbreviated Financial Analysis of Shared Projects
Table 6 Data Acquisition and Control Markets
Table 7 Data Acquisition Options (11 Month Shipment Report)

Appendicies

Appendix 1 DSI P & L Statements
Appendix 2 Comments by Bev Hallman on DSI Proposal
Appendix 3 DSI Project Plan

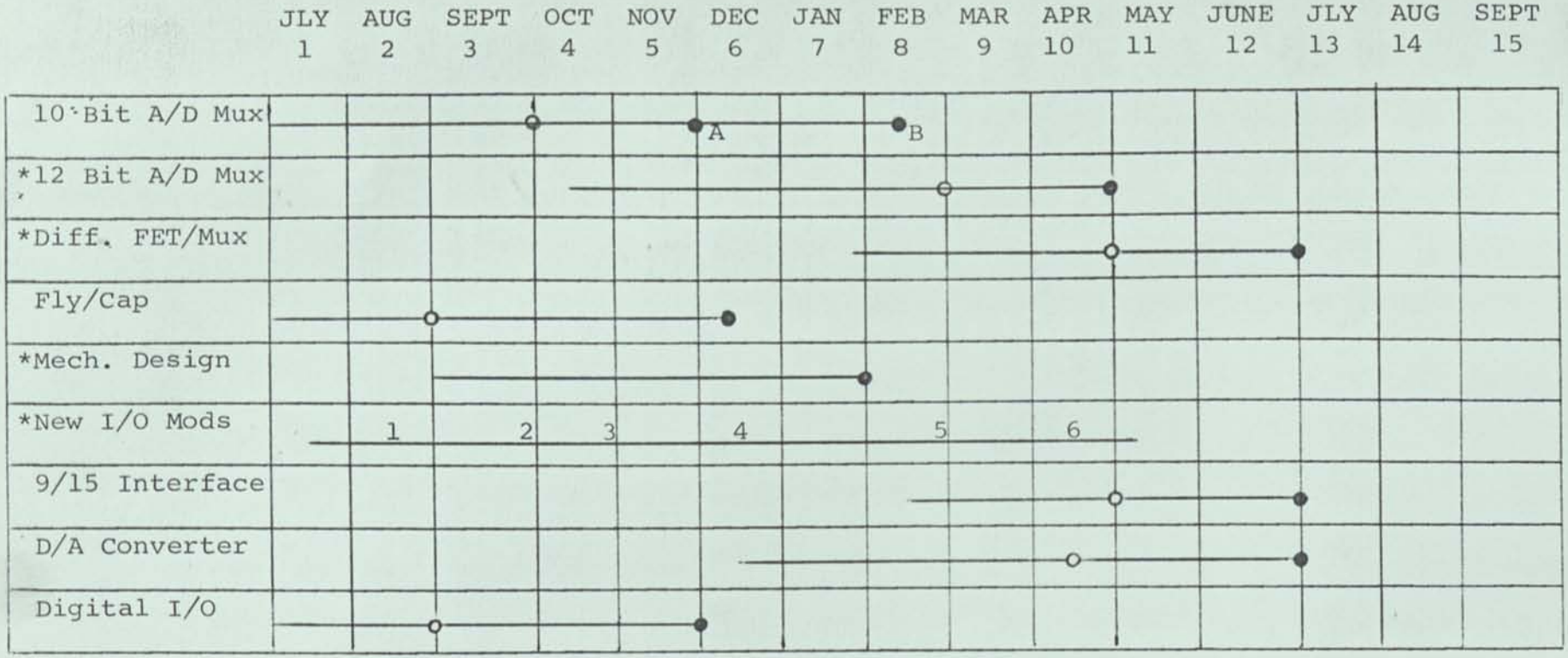
6/24/69

Data Acquisition Development Projects Funding/Costs

Table 1

	TOTAL BUDGET FOR CC363	CURRENT PRODUCT LINE FUNDING						PROPOSED PROJECTS FROM SHARED FUNDS	
		8	9/15	10	11	12	M	363	TOTAL
10 Bit A/D	15	10			5				
12 Bit A/D	25							25	47
Differential FET & MUX	20							20	40
Flying Capacitor	15	15							
Mechanical Design	10							10	30
New I/O & Sig. Cond. Mods.	10							10	20
9-15 Interface	6		6						
Production Support	7	4	1		2				
Sales Support	6	4	1		1				
GLC-8	10	10							
INDAC	11	11							
PDP-12	4					4			
A/D Techniques	12	10			2				
D/A Converter	10				10				
Digital I/O	20							20	45
Modules	6						6		
TOTAL	187	64	8		20	4	6	85	182

Fiscal Year 1970 - 363 Development Schedule



o Release to Build
● Release to Production

A = PDP8/L
B = PDP-11

* Proposed Shared Projects

(TABLE 2)

(TABLE 3)

363 Projects Currently Funded by Product Lines

10 Bit A/D	Positive (or negative) bus A/D converter multiplexer. Included are provisions for 32 channels of single ended FET multiplexer switches. A new gain-changing facility providing 4 gains selected by computer control is included. Special circuits are utilized to isolate the A/D converter from noise coming from the computer through the I/O bus.
Flying Capacitor Scanner	This Flying Capacitor Multiplexer is an improved method of obtaining isolation when switching low level signals. In addition to increased performance, its advantages are, lower wiring and installation costs to the customer, less demanding amplifier requirements, inherent normal mode noise rejection and lower per channel cost.
9/15 Interface	Interface for the new Flying Capacitor mux and Digital I/O controllers.
Production Support	Support to production, ECO activity.
Sales Support	Field support, training, engineering support to Field Service.
GLC-8 Support	Development of lower cost differential amplifier filter and production support.
INDAC Support	System level assistance, development of additional peripherals and operator's console.
PDP-12 Support	Possible low level interface for Gas Chromatagraphy.
Module Support	Support to the module product line.
A/D Techniques	Evaluating new components, amplifiers and trying new approaches and techniques.

Continued:-

D/A Converter	New D/A for PDP-11. Expandable to 8 or 16 12 bit channels. Provides for scaling, inverting and offsetting amplifiers. Includes reference power supply. Interfaced to PDP-11.

(TABLE 4)

363 Projects Proposed to be Funded by Shared Funds

12 Bit Plus Sign ADC	This unit is to replace the ADC in the present AF01 series. It will cost 30 to 50% less to build, will be 2 to 3 times the speed and software problems will be eased by virtue of a 2's complement extended sign output. Will provide for a 13th bit sign option for bi-polar inputs. Conversion time should be about 12-16 micro-seconds.
Differential FET and MUX for 12 Bit Plus Sign ADC	This is required to handle low level signals where scanning requirements are greater than 200 pts/sec. Also to replace single ended high level switches in sticky situations when moderate common mode is present. An option for high speed single ended switches will be provided, interfaced to 8, 15, and 11. Will replace our current AF01 series.
Mechanical Design	New approach to cabinets and mounting panel assemblies for analog and digital input/output signals. It will provide options for conveniently mounted customer terminal connections, cooling air flow on a sub-assembly basis rather than a cabinet basis and facilities for digital and analog grounding on a system basis. Also to provide access to customer's cables from top or bottom of the cabinets. This mechanical configuration should provide more acceptable packaging for the industrial market.
New I/O Modules	For industrial data acquisition and control applications: overflow and presettable counter input modules, stepping motor drivers, a 10 to 12 bit D/A, and signal conditioning modules for current and thermo-couple inputs. The counters, stepping motor driver, and D/A will all be pin compatible and be plug-in options for the new digital output controller.

Continued:-

Digital I/O Controller and Discrete I/O Modules	The project will bring the Digital I/O facilities currently being done for INDAC-8 in DACS Systems Engineering to a product status. Input/output controllers including 6 new input modules and 3 new output modules are included. Input facilities provide individually isolated, differential input from 6, 24, or 48 volt customer contacts or levels. Both contact sense and contact interrupt modules are included. Digital output includes power flip flops and single shots (K series) and sustained and momentary contact output facilities all of which are pin compatible. This will be interfaced to the PDP-8 and 15.

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VOLUME FORECAST

(Bookings in K$)

System Option	Factory Cost as % of Gross Sales	Approximate Selling Price	Product Line	Fiscal Year 70	71	72	73	Total
12 bit plus sign A/D and MUX Subsystem	25 to 30%	$4,000	PDP-8	100	400	300	100	900
			PDP-15	35	200	150	50	435
			PDP-11	15	150	450	850	1,465
			Sub Total	150	750	900	1,000	2,800
Dititial I/O Subsystem	35%	$3 OK to 25 K Range $6,000 Average	PDP-8	450	600	420	180	1,650
			PDP-15	30	150	100	30	310
			Sub Total	480	750	520	210	1,960
* Industrial Cabinet and Packaging	40%	$800 Average	PDP-8	36	92	64	28	220
			PDP-15	4	20	16	4	44
			Sub Total	40	112	80	32	264
			Total	670	1,612	1,500	1,242	5,024

* Note: This packaging is required to meet functional and competitive needs of data acquisition systems; indicated price is for cabinet and screw terminal options only; will be supplied in lieu of standard cabinet.

Table 5

(TABLE 5A)

Abbreviated Financial Analysis of Shared Projects

	1970				1971			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Bookings	20	100	200	350	400	408	408	400
Gross Sales	0	0	160	230	280	380	410	410
Discounts (6%)	0	0	9	14	17	23	25	25
Factory Cost (35%)	0	0	56	80	98	133	143	143
Warantees (6%)	0	0	9	14	17	23	25	25
Gross Margin	0	0	86	122	148	201	217	217
Operating Exp.*	0	0	35	53	62	84	90	90
Actual Shared Eng.	40	46	47	50	5	5	5	5
Special Literature	10	5	3	2	4	2	2	2
Net before taxes	(50)	(51)	1	17	77	110**	120	120

* Operating Expense consists of:

Engineering	2%
Marketing	4%
Sales	8%
Reserves	2%
	22%

** Break even point occurs at beginning of 2nd quarter.

4/20/69

Table 6

Data Acquisition and Control Markets

Notes
1. 1969 total market size--domestic and foreign.
2. End user and system contractor customers only; excludes OEM's.
3. Computer based systems with peripherals and interfaces; excludes instrumentation, system installation, and systems programming.
4. Data is based largely on control engineering, magazine's computer census, and close association with the market.

	Market Area	$M in 1969	Major Competitors
I	Process Control Chem/Petrolium/Pipeline Metals and Ceramics Electric Utilities Paper and Textile	$80	IBM General Electric Control Data Honeywell CCD
II	Manufacturing Control Production Monitoring QC and Product Testing Materials Handling Machine Monitoring/Control	$25	IBM General Electric SEL H. P. DEC
III	Research/Aerospace Materials, System, and Enviormental Testing Telemetry and Tracking Trainer/Simulators	$35	SDS SEL Honeywell CCD H. P.
IV	Analytical Instrumentation Petro-chemical Drugs and tabacco Metals Research	$12	DEC H. P. Varian IBM
V	Miscellaneous (Includes chemical data acquisition functions in atomic energy, biomedical, and other areas)	$15	IBM DEC SDS

Total Market 1969 is $167 million. Current Market Growth is 15 to 20 percent per year.

6/26/67

Data Acqusition options
11 Month Shipment Report

(July 1968 to May 1969)

1. DAC's	
AA01	$137,200
AA05	$ 63,700
A600 series modules	$ 85,175
2. 10 Bit ADC's	
AD08's	$105,500
A801's	$ 55,400
3. 12 Bit ADC's	
ADC-1	$ 60,900
AF01	$354,600
4. Differential MUX--A/D Subsystem	
AF03	$ 43,200
5. IDVM Subsystem	
AF04	$ 88,200
6. Amplifiers	
AG01	$ 8,000
AG02	$ 4,500
AH02	$ 17,500
AH03	$ 24,000
7. Multiplexer Switches	
A121/A122	$ 62,595
A111	$ 31,590
TOTAL	$1,142,060

Table 7

DIGITAL EQUIPMENT CORPORATION AND SUBSIDIARIES
BUDGET STATEMENT OF OPERATIONS

PRODUCT LINE DSI
DATE 4/24/69

APPENDIX 1

	SUMMARY	Fiscal Years 1970 First	1971 Second	1972 Third	1973 Fourth	
	Backlog		1390	1520	1800	
	BOOKINGS		1840	3100	4180	
1	Equipment Sales of Parent		450	2970	3900	
2	Equipment Sales of Subsidiaries					
3	Contributions					
4	Allowances					
5	Discounts		4.5	31	40	
6	INCOME FROM SALES OF EQUIP		445.5	2939	3860	
7	Rental Income					
8	Maintenance & Service Income					
9	NET OPERATING REVENUE		445.5	2939	3860	
10	Domestic Job and Standard Costs		180	1170	1560	
11	Subsidiary Job and Standard Cos					
12	Manufacturing Overhead Varianc					
13	Variances From Standard					
14	Allowances					
15	Warranty & Installation Expense		27	176	233	
	Royalty Expense		3.5	28	39	
17	COST OF SALES - EQUIPMENT		210.5	1374	1832	
18	Depreciation of Leased Equipmer					
19	Maintenance & Service Expense					
20	COST OF NET OPERATING REVENUE		210.5	1374	1832	
21	Margin on Equipment Sales (6-17)			1565	2028	
22	Margin on Rentals (7-18)					
23	Margin on Maintenance & Servic					
30	TOTAL GROSS MARGIN (21 + 22 +		235	1565	2028	
40	Product Line Engineering	308.8	161.9	200	50	
41*	Shared Product Engineering		7	58	77	
42*	Manufacturing Projects		1	15	20	
43	TOTAL ENGINEERING EXPENSE		169.9	273	147	
50	Product Line Marketing		31.5	60	82	
51	Domestic & Foreign Selling		147	248	315	
52	Advertising & Promotion		27.5	48	63	
53	Cross Product Expenses		6	8	12	
	TOTAL SELLING EXPENSE		212	358	470	
61*	ADMINISTRATIVE EXPENSE			176	232	
62*	OTHER (INCOME) & EXPENSE					
70	PROFIT BEFORE FEDERAL TAXES	(308.8)	(108)	883	1179	

*To be completed by accounting

DIGITAL EQUIPMENT CORPORATION AND SUBSIDIARIES
BUDGET STATEMENT OF OPERATIONS

PRODUCT LINE DSI
DATE 6/26/69

		Fiscal Quarters 1970				Total Fiscal Year 1970
		First	Second	Third	Fourth	
	BOOKINGS					
1	Equipment Sales of Parent					
2	Equipment Sales of Subsidiaries					
3	Contributions					
4	Allowances					
5	Discounts					
6	INCOME FROM SALES OF EQUIP					
7	Rental Income					
8	Maintenance & Service Income					
9	NET OPERATING REVENUE					
10	Domestic Job and Standard Costs					
11	Subsidiary Job and Standard Cos					
12	Manufacturing Overhead Varianc					
13	Variances From Standard					
14	Allowances					
15	Warranty & Installation Expense					
	Royalty Expense					
17	COST OF SALES - EQUIPMENT					
18	Depreciation of Leased Equipmer					
19	Maintenance & Service Expense					
20	COST OF NET OPERATING REVENUE					
21	Margin on Equipment Sales (6-17					
22	Margin on Rentals (7-18)					
23	Margin on Maintenance & Servic					
30	TOTAL GROSS MARGIN (21 + 22 +					
40	Product Line Engineering	32.5	113.3	95	68	308.8
41*	Shared Product Engineering					
42*	Manufacturing Projects					
43	TOTAL ENGINEERING EXPENSE					
50	Product Line Marketing					
51	Domestic & Foreign Selling					
52	Advertising & Promotion					
53	Cross Product Expenses					
	TOTAL SELLING EXPENSE					
61*	ADMINISTRATIVE EXPENSE					
62*	OTHER (INCOME) & EXPENSE					
70	PROFIT BEFORE FEDERAL TAXES	(32.5)	(113.3)	(95)	(68)	(308.8)

*To be completed by accounting

DIGITAL EQUIPMENT CORPORATION AND SUBSIDIARIES
BUDGET STATEMENT OF OPERATIONS

PRODUCT LINE
DATE 4/29/69

		Fiscal Quarters 1971				Total Fiscal Year 1971
		First	Second	Third	Fourth	
	Backlog		450	1000	1390	1390
	BOOKINGS		450	510	840	1840
1	Equipment Sales of Parent				450	450
2	Equipment Sales of Subsidiaries					
3	Contributions					
4	Allowances					
5	Discounts				4.5	4.5
6	INCOME FROM SALES OF EQUIP				445.5	445.5
7	Rental Income					
8	Maintenance & Service Income					
9	NET OPERATING REVENUE				445.5	445.5
10	Domestic Job and Standard Cost				180	180
11	Subsidiary Job and Standard Cos					
12	Manufacturing Overhead Varianc					
13	Variances From Standard					
14	Allowances					
15	Warranty & Installation Expense				27	27
	Royalty Expense				3.5	3.5
17	COST OF SALES - EQUIPMENT				210.5	210.5
18	Depreciation of Leased Equipmer					
19	Maintenance & Service Expense					
20	COST OF NET OPERATING REVENUE				210.5	210.5
21	Margin on Equipment Sales (6-17					
22	Margin on Rentals (7-18)					
23	Margin on Maintenance & Servic					
30	TOTAL GROSS MARGIN (21 + 22 +				235	235
40	Product Line Engineering	36.9	25	12	13	161.9
41*	Shared Product Engineering				7	7
42*	Manufacturing Projects				1	1
43	TOTAL ENGINEERING EXPENSE	36.9	25	12	21	169.9
50	Product Line Marketing	7.5	7.5	10	14	31.5
51	Domestic & Foreign Selling		36	44	67	147
52	Advertising & Promotion		7	8	12.5	27.5
	Cross Product Expenses		2	2	2	6
	TOTAL SELLING EXPENSE		52.5	64	95.5	212
61*	ADMINISTRATIVE EXPENSE				27	
62*	OTHER (INCOME) & EXPENSE					
70	PROFIT BEFORE FEDERAL TAXES	(43.4)	(77.5)	(78)	91	(108)

*To be completed by accounting

DIGITAL EQUIPMENT CORPORATION AND SUBSIDIARIES
BUDGET STATEMENT OF OPERATIONS

PRODUCT LINE
DATE 6/24/69

		Fiscal Quarters 1972				Total Fiscal Year 1972
		First	Second	Third	Fourth	
	Backlog	1570	1480	1420	1520	1520
	BOOKINGS	690	770	800	840	3100
1	Equipment Sales of Parent	510	860	860	740	2970
2	Equipment Sales of Subsidiaries					
3	Contributions					
4	Allowances					
5	Discounts	5	9	9	8	31
6	INCOME FROM SALES OF EQUIP	505	851	851	732	2939
7	Rental Income					
8	Maintenance & Service Income					
9	NET OPERATING REVENUE	505	851	851	732	2939
10	Domestic Job and Standard Cost	200	340	340	290	1170
11	Subsidiary Job and Standard Cos					
12	Manufacturing Overhead Varianc					
13	Variances From Standard					
14	Allowances					
15	Warranty & Installation Expense	30	51	51	44	176
	Royalty Expense	5	8	8	7	28
17	COST OF SALES - EQUIPMENT	235	399	399	341	1374
18	Depreciation of Leased Equipmer					
19	Maintenance & Service Expense					
20	COST OF NET OPERATING REVENUE	235	399	399	341	1374
21	Margin on Equipment Sales (6-17	270	452	452	391	1565
22	Margin on Rentals (7-18)					
23	Margin on Maintenance & Servic					
30	TOTAL GROSS MARGIN (21+22+	270	452	452	391	1565
40	Product Line Engineering	12	13	12	13	200
41*	Shared Product Engineering	11	16	16	15	58
42*	Manufacturing Projects	3	4	4	4	15
43	TOTAL ENGINEERING EXPENSE	36	33	33	32	273
50	Product Line Marketing	14	15	15	16	60
51	Domestic & Foreign Selling	55	62	64	67	248
52	Advertising & Promotion	10	12	13	13	48
53	Cross Product Expenses	2	2	2	2	8
59	TOTAL SELLING EXPENSE	81	91	94	92	358
61*	ADMINISTRATIVE EXPENSE	30	51	51	44	176
62*	OTHER (INCOME) & EXPENSE					
70	PROFIT BEFORE FEDERAL TAXES	124	268	268	223	883

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DIGITAL EQUIPMENT CORPORATION AND SUBSIDIARIES
BUDGET STATEMENT OF OPERATIONS

PRODUCT LINE
DATE 4/24/69

		Fiscal Quarters 1973				Total Fiscal Year 1973
		First	Second	Third	Fourth	
	Backlog	1500	1630	1760	1800	
	BOOKINGS	830	1000	11000	1250	4180
1	Equipment Sales of Parent	850	870	970	1210	3900
2	Equipment Sales of Subsidiaries					
3	Contributions					
4	Allowances					
5	Discounts	9	9	10	12	40
6	INCOME FROM SALES OF EQUIP	841	861	960	1198	3860
7	Rental Income					
8	Maintenance & Service Income					
9	NET OPERATING REVENUE	841	861	960	1198	3860
10	Domestic Job and Standard Costs	340	350	390	480	1560
11	Subsidiary Job and Standard Cos					
12	Manufacturing Overhead Varianc					
13	Variances From Standard					
14	Allowances					
15	Warranty & Installation Expense	51	52	58	72	233
16	Royalty Expense	8	9	10	12	39
17	COST OF SALES - EQUIPMENT	399	411	458	564	1832
18	Depreciation of Leased Equipmer					
19	Maintenance & Service Expense					
20	COST OF NET OPERATING REVENUE	399	411	458	564	1832
21	Margin on Equipment Sales (6-17	442	450	502	634	2028
22	Margin on Rentals (7-18)					
23	Margin on Maintenance & Servic					
30	TOTAL GROSS MARGIN (21 + 22 +	442	450	502	634	2028
40	Product Line Engineering	12	13	12	13	50
41*	Shared Product Engineering	17	17	19	24	77
42*	Manufacturing Projects	4	5	5	6	20
43	TOTAL ENGINEERING EXPENSE	33	35	36	43	147
50	Product Line Marketing	20	20	21	21	82
51	Domestic & Foreign Selling	67	70	78	100	315
52	Advertising & Promotion	13	15	16	19	63
53	Cross Product Expenses	3	3	3	3	12
60	TOTAL SELLING EXPENSE	103	108	117	142	470
61*	ADMINISTRATIVE EXPENSE	50	52	58	72	232
62*	OTHER (INCOME) & EXPENSE					
70	PROFIT BEFORE FEDERAL TAXES	256	255	291	377	1179

*To be completed by accounting

INTEROFFICE MEMORANDUM

JUN 10 RECD

DATE 30th May, 1969

SUBJECT DSI Proposal

TO Ron Noonan

c.c. Brad Vachon

FROM Bev Hallman

During the week of April 14th I had the opportunity to sit in on your presentation of your DSI system. This presentation was made to Nick Mazzarese, Bill Long, Brad Vachon and myself. Even though I am very late with this response I feel I should still make my feelings and thoughts known.

Market Areas

After reading your description of the DSI system, I have tried to figure out which countries are the countries that would benefit most from your proposed system.

I think at this time I would have to say that Germany and Holland are the two countries that would certainly welcome the equipment you are proposing. I feel that if we were able to offer that equipment right now, we would have sold approximately an additional million dollars in computer systems in the first six months of 1969. These systems would have sold in Germany alone. I personally have visited a number of customers interested in systems involving DSI type of equipment; generally I have found that money is the least of their problems. In Germany a big problem for Digital is convincing the customer that we as a company are capable of doing what they already know Honeywell is capable of doing. In other words we are faced with the basic DEC image in Germany, which at this moment is very poor, although it is improving.

Tomorrow (30th May) I am going to visit a customer in Holland who is interested in a DSI type of system. The dollar value of this system is $300,000, the computer they are interested in is the PDP-15.

At present I feel that Britain is not yet interested in such equipment. Britain seems to be a country where someone has to make the first move before a market area is opened up. By this I mean once enough companies take the plunge into acquisition systems in industry, then I feel the market in Britain will be tremendous. In the last six months I have only encountered two systems that I could say are DSI type of systems, again the dollar value of these two systems was near $500,000.

Effect on Special Systems

I think it is important to note just what I expect will happen if you actually achieve what you intend to achieve with this DSI project.

At the moment I feel that if we can offer the DSI equipment as you suggest in at least 70% of its completed form, the special system business in the European countries would drop drastically, possibly by as much as 50-60%. In Germany if the salesmen were able to sell DSI equipment, Special System business would be almost negligible. This trend, of course, may be due to the selling habits of our salesmen in Germany.

The introduction of DSI equipment would have a similar effect on the market in Holland.

In the UK the introduction of DSI equipment at present would only mean a reduction of approximately 20% of Special System sales.

The Special Systems sales in other countries is quite small already and it would be hard to predict just what would happen if we had your equipment to offer.

General Comments

1) I am amazed by the requested budget that you have brought forward! I feel that to achieve what you are trying to do with the amount of money you are asking for indicates extraordinary planning. I would have expected the budget to be considerably larger.

2) The time scale that you have stated also seems to be very short. I realise that the project does not have to be completed all at once, yet to get to a meaningful level within one year would indicate very good process.

3) I do agree very strongly that this equipment would certainly have to be supported by software.

4) The documentation for the sales force would certainly need to be very excellent. At present the sales force is being stressed very hard with keeping up with the standard easily sold devices and they do not spend much time learning peripherals, especially analog equipment.

I think you are right in pushing for the "total" approach rather than the "let's help the little guy get started"! I have constantly been confronted by customers wanting "screw terminals" and "industrial packaging."

YES. packaging is very important! Let's do it right this time!

I hope these comments are of some value to you. I am sorry that they are coming so late.

Best regards.

B Hallman

digital INTEROFFICE MEMORANDUM

#2

DATE: July 1, 1969

SUBJECT: Proposed Air-conditioning for 21-3 and 21-4

TO: Members of the Operations Committee

FROM: Al Hanson

At the request of Ted Johnson and Nick Mazzarese, I am submitting to you the following two alternates for air-conditioning the third and fourth floors of Building 21 with 50 tons of air-conditioning per floor.

ALTERNATE 1

Install 5-ton window units with duct work and diffusers

10 units per floor; total of 20 units

COST.....$40,000

ALTERNATE 2

Install 10 fan coil units, ducted with diffusers, suspended from ceiling, with ten 10-ton air-cooled condenser units mounted on roof

5 units per floor; total of 10 units

COST.....$46,000

Until further study, I cannot guarantee that this work will be completed during the 1969 summer season. Nevertheless, the scheduled moves must take place as they were originally planned; otherwise, my Approved Facilities Planning Priority Schedule No. 5 will have to be completely revised.

digital INTEROFFICE MEMORANDUM

DATE: June 25, 1969

SUBJECT: Attached Proposal to Establish a Programming Product Line

TO: Operations Committee

FROM: L. Portner

SUMMARY

Last year 4.5 billion dollars was spent in the United States on programming of all types. The bulk of this money was spent by users developing software for their own applications. As the threshold price of new computer systems continues to drop, more and more unique applications will appear.

During the past three months we have pursued a low-key investigation of the software-for-profit market. By announcing our intentions at a North East Sales Meeting and through a memo to District Sales Managers, a significant number of contracts and potential contracts have appeared (Appendix A). I propose to tap the profit potential in this market place by establishing a programming product line. I feel establishment of a product line is necessary in order to ensure proper accounting, allow identification of profit, provide the profit incentive, gain corporate leverage, and ensure individual motivation.

ORGANIZATION

The organization would initially consist of Roger Pyle as Product Line Manager, a secretary and four experienced programmers. Subsequent growth would be determined by profitability. For accounting purposes, the organization would look like any other Product Line, investing in inventory (programmers' salaries) with the intent to sell for a profit.

BUSINESS PLAN

In order to minimize the start-up costs and achieve rapid profitability, the initial jobs would fit the following criteria:

1. The jobs would be the result of a normal hardware sales contact. (We would not fund software-only sales effort.)
2. The job must be $\leq$6 calendar months to completion.
3. The job must be based preponderantly upon standard DEC hardware.
4. The hardware and software contracts must be separate.
5. The job must be bid upon the basis of value to the end user, where competitive pricing is less important than DEC expertise and the advantage to the customer of dealing with one supplier. (Our markup would be 50% above our anticipated costs of $7.5K/man qtr.)
6. The job must be within easy travelling distance of DEC Maynard.
7. The customer must agree to an absolute limit of liability on the part of DEC.
8. Customer acceptance would be based upon performance to a specification agreed upon prior to contract finalization.

We would adhere to the following milestones to determine success or failure of the enterprise: (see Appendix B)

1. Recovery of investment within 9 months.

2. Maximum indebtedness of $60,000.

3. Operating at a before-tax profit of 30% at the end of 4th quarter of operations.

SUBSIDIARY BENEFITS

There are several additional benefits likely to be realized:

1. Enhanced hardware sales - customers unable to do their own programming and unwilling to deal with multiple vendors, would find a single source for hardware and software attractive.

2. Development of new products. It seems quite likely that many of these applications will develop into new products for DEC with the development funded by the customer. We would relinquish sole rights only on demand and only after legal opinion that we were not limiting future DEC markets.

3. Project discipline. This endeavor would allow us to apply the yardstick of profitability to programming projects. Project control techniques would inevitably carry over into normal Programming Department activity.

4. Enhanced DEC image as a full service supplier.

LONG RANGE PLANS

We anticipate that after a sustained period of profitability, expansion would occur as rapidly as we could staff up; the supply of jobs appears to be a function of DEC unit sales volume. Ultimately, sales activity can be pursued using the regional Software Specialists in conjunction with the regular sales force, in somewhat the same manner as Special Systems is using regional applications engineers.

Appendix A Summary of Software Contracts

The following are random inputs from the field received in the last 6 months which reflect the flavor of the jobs in the market place.

1. Automatic liquid loading system to monitor a full oil distribution point. This involves a PDP-8 and special systems hardware.

   Price quoted - $25,000.00

2. Billing system for document readers for Allied Computer Systems. The customer will buy 150 PDP-8's with Special Systems, and Applications Engineering interface. We will monitor usage of the readers and record use data.

   Price quoted - $12,000.00

3. Micro-Systems, the people who we worked with on Tom Stockebrand's semi-automcatic wire-wrap system, wanted some additional PDP-8 programming to support their sales of this product.

   Price quoted - $26,000.00

4. Customer in Connecticut wants a PDP-8 program to weigh dry cement, control flow and record loading data.

   Price quoted - $12,000.00

5. Data Technology has contracted with us to write a demonstration and diagnostic program for a table digitizer using a PDP-8.

   Price quoted - $3,000.00

6. The PDP-14 Product Line wants a PDP-8 control and monitoring system for their customers. We are specifying the task and will make a quote.

7. Friden asked us to bid on a communications terminal to handle preprinted forms and data forwarding to master computer.

   Price quoted - $88,000.00

8. PDP-10 Product Line wants a Gas Liquid Chromatograph system for standard product sale.

   Cost - $40,000.00

9. Computer Industries (UCC) wants two man years of DEC programmers to support their programming effort to develop a PDP-10 front end to a CDC 6600, UNIVAC 494 and IBM 369/50. PDP-10 input is COPE 45 terminals.

   Price quoted - $100,000.00

Appendix A Summary of Software Contracts con't

10. A PDP-9 Product Line customer wants a DISK PAK system for the PDP-9 and PDP-15.

Price quoted - $16,000.00

11. N.I.H. wants a PDP-10 with both DA10 and DC10 connected to be able to handle communications and file access from a PDP-15 thru DA10 to PDP-10 DISK. DC10 will provide normal TSS operation.

Price quoted - $26,000.00

12. Union Carbide wants a PDP-10/50 connected to a PDP-8/I connected to 3 remote PDP-15/VT15 0 and 1 local PDP-15/VT15 as well as a 360/75, SEL 810B, and IBM 2780 Data Terminal. Scope of task as far as DEC is concerned is not defined. Customer can only pay $25,000.00 and will take whatever part of the above task we will agree to provide.

Price quoted $25,000.00

13. Kurtland Air Force Base wants a 4 remote display system and 1 8/L, driving a card reader, plotter and line printer. The 8/L connects to the PDP-10 thru a Data phone interface. Price includes only PDP-8 programming and PDP-10 service for card reader and plotter.

Price quoted - $26,000.00

14. Dictaphone Corp. wants a multi-user PDP-8 editor with DEC Tapes to give them an entry into the computerized editor market. They want 4 selectri s, 4 DEC tapes and an 8/L per system.

Price quoted - $40,000.00

15. Monsanto Research wants to use 10-16 PDP-8's each with DF32 talking to a PDP-8/L with 1 million word RF08 and PT0 8 interface to the 10-16 PDP-8's to be used in a multi-machine INDAC System.

Price quoted - $25,000.00

Appendix B

CASH FLOW

	Q1	Q2	Q3	Q4
EXPENSES	$30,000	$30,000	$30,000	$45,000
INCOME	ø	$25,000	$65,000	$60,000
NET (cumulative)	($30,000)	($35,000)	$ø	$15,000

digital INTEROFFICE MEMORANDUM

DATE: July 2, 1969

SUBJECT: Proposal that all sheets and financial packages be reduced to 8½x11

TO: Operations Committee FROM: R. F. Dill

It is proposed to the Operations Committee that all sheets in the financial package than can possibly be reduced to an 8½x11 size be done for the first statement to be published for fiscal year 1970, namely the financial statement for July.

Attached to the back of this memorandum is a specimen of how we feel it will look. We would like to get your approval at this meeting so that we may get this to the printer with the necessary drafts for July.

egs

reflected in thousands

Weeks Ending Actual Amount	%	Current Budget Amount	%	Gain + Loss -	Backlog Total $	Domestic $	Foreign $	Weeks Ending Actual Amount	%	Original Budget Amount	%	Gain+ Loss -
					BOOKINGS							
					1. Equipment Sales of Parent							
					2. Equipment Sales of Subsidiaries							
					3. Contributions							
					4. Allowances							
					5. Discounts							
					6. INCOME FROM SALES OF EQUIPMENT							
					7. Rental Income							
					8. Maintenance & Service Income							
					9. NET OPERATING REVENUE							
					10. Domestic Job & Standard Costs							
					11. Subsidiary Job & Standard Costs							
					12. Manufacturing Overhead Variance							
					13. Variances from Standard							
					14. Allowances							
					15. Warranty & Installation Expense							
					16. Royalty Expense							
					17. COST OF SALES - EQUIPMENT							
					18. Depreciation of Leased Equipment							
					19. Maintenance & Service Expense							
					20. COST OF NET OPERATING REVENUE							
					21. Margin on Equipment Sales (6-17)							
					22. Margin on Rentals (7-18)							
					23. Margin on Maintenance & Serv. (8-19)							
					30. TOTAL GROSS MARGIN (21+22+23)							
					40. Product Line Engineering							
					41. Shared Product Engineering							
					42. Manufacturing Projects							
					43. Cross Product Engineering							
					43. TOTAL ENGINEERING EXPENSE							
					50. Product Line Marketing							
					51. Domestic & Foreign Selling							
					52. Advertising & Promotion							
					53. Cross Product Marketing							
					59. TOTAL SELLING EXPENSE							
					61. ADMINISTRATIVE EXPENSE							
					62. OTHER (INCOME) & EXPENSE							
					70. PROFIT BEFORE FEDERAL TAXES							