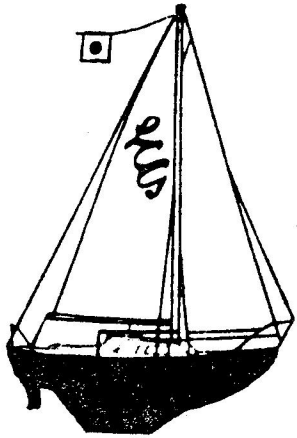


DIGITAL EQUIPMENT COMPUTER USERS SOCIETY

April 1985



TWENTIETH ANNIVERSARY EDITION

AT LARGE

The Newsletter of the Large Systems SIG



IN THIS ISSUE

	<u>Page</u>
Introduction	2
LCG Booth	3
War Stories	6
Trivia Bowl	8
Pioneer's Roundtable	45
Gala Anniversary Party	54
LCG Poster	56
Ode to Vax-Clusters	58
The Soul of an Old Machine	60

)

)

)

INTRODUCTION

A very special event took place from December 10 through 14, 1984 at the Fall Decus Symposium held in Anaheim, California. The Large Systems SIG held the Twentieth Anniversary celebration of 36-bit systems. The PDP-6 was announced in 1964 and twenty years later the 36-bit architecture is still here serving a strongly loyal client base. The Large Systems SIG booth was open all week long in the exhibit hall. It contained memorabilia spanning the entire twenty years. The major celebration occurred on Wednesday when original designers and managers from DEC joined us along with clients from the early 1960's. That day's special events were:

1:30 - 3:00 36-bit Magic and War Stories
3:00 - 4:30 36-bit Trivia Bowl
4:30 - 6:00 36-bit Pioneers Roundtable
7:30 - 11:30 Gala Anniversary Party.

The following pages provide an in-depth look at those special events.

Michael D. Joy
Michael D. Joy
Newsletter Editor

LCG BOOTH

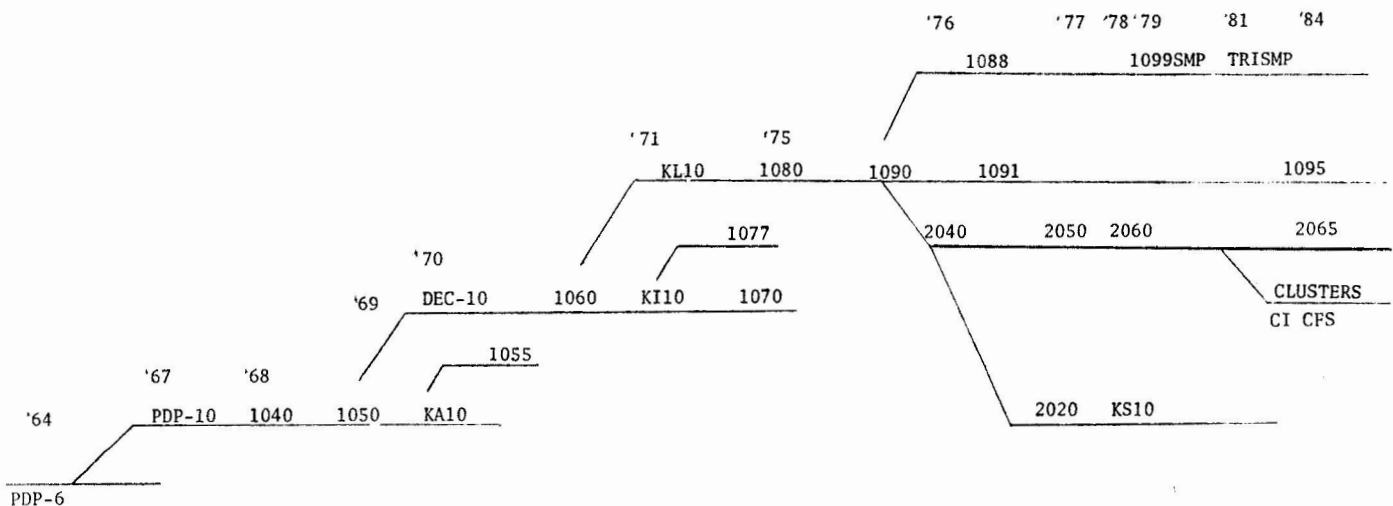
During the entire week long symposium, 36-bit enthusiasts manned the LCG Booth in the exhibit hall. The booth contained memorabilia dating back to the early days of 1964--items such as manuals on the PDP-6, panels and circuit boards from everything in the entire 36-bit line including some prototypes that never made it (such as the minnow).

The largest attraction was probably the working (or almost working) PDP-6 donated by Stanford University. Everyone held their breath as they attempted to resurrect the sleeping giant. Indeed it came to life as they began to laboriously load the machine instructions into the registers and boot it up. Everything checked out except one accumulator in the six foot tall cabinet that houses nothing except sixteen accumulators! Apparently that accumulator had "checked out" long ago. Getting around the one bad accumulator and a second one that occasionally "went to lunch" (we think due to a slightly warm room) they began to get productive work out of "old faithful". And you ask what kind of productive work? -- well here is an actual example of the souvenir message that it spent its last palpatating moments printing on its ancient TTY:

WELCOME TO THE PDP-6 DEMONSTRATION!

HAPPY 20TH ANNIVERSARY, 36 BITS !! DECUS, FALL 1984.

On the back wall of the booth there was a large time line showing the evolution of the entire 36-bit line of computers. Here is what it looked like:





The case in the foreground contains manuals going back as far as the PDP-6. On the bottom shelf are panels from 36-bit legends. In the larger case behind are additional manuals and panels and some prototype boards from machines that never made it to production.



The PDP-6 donated by Stanford University

There were a total of 23 PDP-6's sold by Digital in those early years at an approximate cost of \$300,000 each. And we had living proof that at least one of them was still running twenty years later. Twenty years later, believe it or not, DEC is still selling 36-bit machines. Yes, in DEC's current fiscal year they have thus far sold about 34 KL's to clients and anticipate selling a few more by the end of the year. So although DEC had announced the end of new 36-bit machine development two years ago they are still selling them! That is quite a tribute to an architecture that has survived more than twenty years in an industry that is now superseding new designs every few years.

WAR STORIES

There was "standing room only" for all three Wednesday afternoon sessions in a room intended for about 600 people. The enthusiasm was high and there seemed to be no end to the war stories that people had to tell. This session could have probably gone on at least another hour or more had there been sufficient time. Presented here are summaries of a few of the stories we heard that afternoon. Members of the audience were invited to come to the microphone and tell their favorite war story about "what happened the day their computer room flooded" or "the stupid thing an operator once did or someone did to an operator". They were also interested in hearing about the most bizarre SPR's ever received by DEC or the most bizarre response from DEC.

The first story was about the perils of George the operator. One day he was given the responsibility to copy some current TOPS-20 WATCH data from disk to the end of a WATCH history tape. Without thinking he mounted the history tape with a write-ring and began to write the current data to the beginning of the tape thus wiping out a portion of the history already on the tape. Flustered, he came and reported his mistake and was told that was okay because at least he had the most recent two months of data and the initial history data was of less importance. But George wants to right his mistake and goes off on his own. Now the tape is still sitting at the end of the current data and at the beginning of what is left of the garbaged data on tape. He now writes the garbaged data to disk using the same file name as the two month's current data thus wiping it out with the garbage. But wait, he's not finished yet. Now he rewinds the tape and writes the now garbaged disk file back to the beginning of the tape and has successfully wiped out all possibility of recovering any of the history new or old. Nice going George!

Someone else related the story of another unusual operator. This operator had been fairly lax in logging in messages on the shift log. He had been told that disciplinary action may have to be taken if he continued to overlook entering major events on the shift. One night, soon after, he smelled smoke apparently coming from a printer. He logged it but failed to do anything else. The smell started getting worse so he sent a message to the users telling them that most likely the printer would be coming down soon as it appeared to be burning. He didn't do anything else at this time -- except to log it, of course. One user on the system who didn't seem to be any sharper than the operator sent back a message. But first let me give you an idea of what she was like. She marveled when discussing guns with a friend how puzzled she was about the way the hammer hits the round so hard that it sends the bullet out of the gun at such high speeds. Well back to her response. She explained she had an important report to print and it was short. Could she please have it before the fire got too bad? The operator couldn't comply -- but he did log it!

Then there was the story of the staff who played a practical joke on the recent rookie operator. They added an instruction to the shutdown procedure which stated: "Empty the bit bucket". The joke backfired however. After opening every piece of equipment and looking for a bucket containing little spurious bits he finally gave up and called the DP manager at 2a.m.

One person told us about their computer room disaster. Late one afternoon someone lost control of his car and hit the natural gas line where it entered the building. The gas began filling the computer room and it was necessary to evacuate. The operator sent a message to all users including those at more than 20 remote sites: "We need to evacuate the building due to a natural gas leak. Please log off immediately". This wording sent panic in all the remote sites since "the building" was not more specifically defined. Back at the main computer site they had completed the evacuation. Fire trucks and other emergency vehicles were everywhere. Everyone was preparing for the possibility that any spark might potentially level the building. Then someone noticed that their next door neighbors had not been informed of the pending danger. They were busily working away using their welding equipment. At that point, of course, someone suggested it would be best for them to stop. And now for the security mistake. Everyone was in the rear parking lot waiting for whatever was going to happen. In the meantime someone paraded through the front door which had been propped open to allow the gas to escape. He wandered around in a normally secured building looking for everyone. He eventually made his way to the back door and came out oblivious to the critical situation around him.

At one point the topic switched to SPR responses from DEC. The response judged most confusing was: "In response to your SPR, we would like to thank you for telling us we had attacked the wrong problem. But we would like to mention that this led us to fix another problem. In the case of your problem, you were correct with your first SPR". The most cryptic was: "SHANG GINT FINT YINT R/Q SHEE ARS YIN MIF SCHLEBFER". Undoubtedly the line printer had a problem but you still have to admit it makes it difficult to know whether your SPR has been fixed or not. The SPR submitter's dream response came to one deserving person. It read: "Thank you for your SPR on SORT. We are especially grateful for your work on this problem. We are using your material almost verbatim from the patch. You have correctly diagnosed and cured the bug and have thereby simplified our work. Thank you very much". This response is contrasted with the response people often receive: "We have chosen to implement your patch in a slightly different manner which we feel is more efficient".

Again, these are just a few of the many stories that were shared that afternoon. I'm sure you too have some stories you could tell --perhaps some that could even top these.

TRIVIA BOWL

The 36-bit Trivia Bowl was patterned much like the old television series the "College Bowl" but of course the questions dealt with trivia from the world of the 36-bit computers from Digital. There were two teams of players trying to answer the sometimes impossible trivia questions dreamed up. One team was made up of current Digital employees and their team name was the "STACKED DEC". The other team consisted of Digital customers whose team name was the "BIT BUSTERS".

The preparation for this wasn't trivial. Clive Dawson and Reed Powell spent many long hours preparing the potential questions. Clive was instrumental in getting the elaborate signaling hardware created. Each team member had a button in front of him. When a question was asked the first person to press the button had to answer. Once he pushed the button all other signals were locked out and a team light and buzzer sounded, and a light went on near the individual's button.

Each "toss up" question was scored based on its relative difficulty and most had bonus questions associated with them which only the one team that won the toss up were eligible to answer. The score was maintained on overhead projectors so that everyone in the audience could keep track of who was ahead. (We had hoped to have the scoring computerized but time didn't permit it so we had to use primitive means).

The teams consisted of the following people:

STACKED DEC
Per Hjerppe
Jim Flemming
Peter Hurley
Dan Murphy

BIT BUSTERS
Mark Crispin
Glenn Ricart
Tony Wachs
Clyde Poole

The game consisted of two 20 minute halves with a intermission between. At the halfway point the score was: STACKED DEC 100; BIT BUSTERS 190. By the end of the game the BIT BUSTERS had widened the gap some more with a final score of : STACKED DEC 320; BIT BUSTERS 520.

The next 35 pages contain the questions prepared for the Trivia Bowl. Each question indicates whether or not it was used and who if anyone answered it correctly. See how well you would have done compared to the experts!

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 1

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 10 POINTS):

What does A.O.H. stand for?

ANSWER:

Ancient Order of Hibernians This was a bar in Marlboro
which was a hangout for many of the TOPS engineers

****36 BIT TRIVIA BOWL**** TOSSUP # 2

USED AT ANAHEIM? Y TOSS-UP WON BY Digital BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 10 POINTS):

When a DEC salesperson quotes a price as being MLP, what
does MLP stand for?

ANSWER:

Maynard List Price

****36 BIT TRIVIA BOWL**** TOSSUP # 3

USED AT ANAHEIM? y TOSS-UP WON BY Digital BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 15 POINTS):

What is the difference between MF10A and MF10G

ANSWER:

32K versus 64K

****36 BIT TRIVIA BOWL**** TOSSUP # 4

USED AT ANAHEIM? Y TOSS-UP WON BY Digital BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 15 POINTS):

What is significant about the phrase "STARS & STRIPES"
relative to KL10s?

ANSWER:

A "Bicentennial DECSYSTEM-20" was used for photo shoots in
1976, and was painted red, white and blue.

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 5

USED AT ANAHEIM? y TOSS-UP WON BY Digital BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 15 POINTS):

In TOPS10, what is at location 40+2N if N=0?

ANSWER:

UUO trap location

****36 BIT TRIVIA BOWL****

TOSSUP # 6

USED AT ANAHEIM? y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 15 POINTS):

How much space did the required code in 4S72 of TOPS10 occupy: a) 6.2K
b) 14K c) 21.4K

ANSWER:

A - 6.2K optional device code took up to 4.4K, plus 73
words per job for tables and buffers

****36 BIT TRIVIA BOWL****

TOSSUP # 7

USED AT ANAHEIM? Y TOSS-UP WON BY Digital BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 15 POINTS):

The PDPIO instruction set contains a distress call. Name the instruction.

ANSWER:

SOS

ASSOCIATED BONUS QUESTIONS - VALUE IS 10 POINTS FOR EACH BONUS QUESTION

1. name the TREE
A. ASH
2. name the WHALE
A. ORCA
3. name the BIBLICAL CHARACTER
A. CAIN
4. name the NAVAL VESSEL
A. SUB
5. name the RECENT MOVIE
A. TRON

****36 BIT TRIVIA BOWL****

TOSSUP # 8

USED AT ANAHEIM? y TOSS-UP WON BY Customers BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

The first 2040 customer ships occurred in what year?

ANSWER:

1976

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. What were the first two customers?
A. Boston City Hospital, Marshalls

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 9

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

According to the 1975 DDT manual, what did DDT originally stand for?

ANSWER:

DEC Debugging Tape

****36 BIT TRIVIA BOWL****

TOSSUP # 10

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

To what customer did DEC ship the 1000th KL processor?

ANSWER:

Federal Judicial Center

****36 BIT TRIVIA BOWL****

TOSSUP # 11

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY Customers

TOSSUP QUESTION (VALUE OF 20 POINTS):

What does the PLOVER command do?

ANSWER:

Gets you into the PLOVER room

ASSOCIATED BONUS QUESTIONS - VALUE IS 5 POINTS FOR EACH BONUS QUESTION

1. What language was ADVENTURE written in?
A. FORTRAN
2. What language was DUNGEON originally written in?
A. MUDDLE
3. What was the other name which DUNGEON went by?
A. ZORK

****36 BIT TRIVIA BOWL****

TOSSUP # 12

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

Whose name was listed as the last writer for the majority of the release 4 TOPS20 monitor distribution tape files?

ANSWER:

Hovsepian

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 13

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

What award did both the 2020 and the 2040 win?

ANSWER:

IR100

ASSOCIATED BONUS QUESTIONS - VALUE IS 5 POINTS FOR EACH BONUS QUESTION

1. What year for 2020 award?

A. 1979

2. What year for 2040 award?

A. 1976

****36 BIT TRIVIA BOWL****

TOSSUP # 14

USED AT ANAHEIM? Y TOSS-UP WON BY Digital BONUS WON BY Digital

TOSSUP QUESTION (VALUE OF 20 POINTS):

What did TOPS20 originate from

ANSWER:

TENEX

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. What did DEC inherit with TENEX?

A. Dan Murphy

****36 BIT TRIVIA BOWL****

TOSSUP # 15

USED AT ANAHEIM? Y TOSS-UP WON BY Digital BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

What does TGHA stand for?

ANSWER:

The Great Heuristic Algorithm

****36 BIT TRIVIA BOWL****

TOSSUP # 16

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

What was "PIP1"

ANSWER:

1K version of PIP

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 17

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

What were the "Sewers of Piing Poong"?

ANSWER:

an ADVENTURE like game written entirely in TECO

****36 BIT TRIVIA BOWL**** TOSSUP # 18

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

In the mid-70's a security bug existed allowing one to walk up to a not-logged in TOPS10 TTY, and type 4 well-timed characters with a frightening result. What were the four characters, and what was the result?

ANSWER:

! CR ^C ^C When the control-C's were timed properly, the result was a [1,2] job!

****36 BIT TRIVIA BOWL**** TOSSUP # 19

USED AT ANAHEIM? Y TOSS-UP WON BY Digital BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

In 1971 various bits of 36-bit lore were immortalized in a recording by a well known comedy group. Identify the group or the recording

ANSWER:

Firesign Theater "I think we're all bozos on this bus"

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. Name the other (group or recording)
- A. see above

****36 BIT TRIVIA BOWL**** TOSSUP # 20

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

What time will be displayed by the DEC20 DAYTIME command if it's typed 1 second after 1:59:59 AM on the last Sunday of October?

ANSWER:

2:00:00 - the switch back to Standard time occurs at 3:00 AM Daylight Time

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 21

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

What did the very first SPR form published in the first issue of the
TOPS20 DISPATCH contain?

ANSWER:

Nothing - it was a blank sample

****36 BIT TRIVIA BOWL****

TOSSUP # 22

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

What is significant about the number 21963283741?

ANSWER:

It is the only positive number whose fixed point and floating
point representations are the same on a PDP10

****36 BIT TRIVIA BOWL****

TOSSUP # 23

USED AT ANAHEIM? Y TOSS-UP WON BY Digital BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

The world almost came to an end for all TOPS10 systems on a cold day in Jan.,
1975. name the SYMPTOM, PROBLEM, CURE, and give the exact date

ANSWER:

12-bit date overflowed not enough bits in date
add 3 bits to the date 5-JAN-75

JOKE: WHY WAS IT A BAD IDEA?

ASSOCIATED BONUS QUESTIONS - VALUE IS 10 POINTS FOR EACH BONUS QUESTION

1. When does the new date run out?

A. 1-FEB-2052

2. what year did DEC test DATE75 bugs with?

A. 1984

****36 BIT TRIVIA BOWL****

TOSSUP # 24

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

What processor had a light labeled MAGIC#+1

ANSWER:

K110

ASSOCIATED BONUS QUESTIONS - VALUE IS 10 POINTS FOR EACH BONUS QUESTION

1. During what instructions was it used?

A. Int divide, and UUO processing

2. what bay was it in?

A. bay 1

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 25

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

Why is the word "SYSTEM" in lower case for DECsystem-10, and upper case for DECSYSTEM-20?

ANSWER:

Uppercase SYSTEM-10 was an existing trademark of Singer

****36 BIT TRIVIA BOWL**** TOSSUP # 26

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

How many times is the COMND% JSYS used in the EXEC?

ANSWER:

once

****36 BIT TRIVIA BOWL**** TOSSUP # 27

USED AT ANAHEIM? y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

When the KI was first released to the field, it was possible to power it off remotely by exercising a hardware bug. How was this accomplished?

ANSWER:

Sending a succession of control-G characters to the console

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. Why did this occur?

A. induction between CTY and PWR fail cable

****36 BIT TRIVIA BOWL**** TOSSUP # 28

USED AT ANAHEIM? y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

According to the September 1, 1969 PDP10 Pricing Summary CARD (which was not a confidential document), what was the maintenance price per month for 24 hour field service coverage on a KA10 CPU?

ANSWER:

\$548

ASSOCIATED BONUS QUESTIONS - VALUE IS 10 POINTS FOR EACH BONUS QUESTION

1. What was the list price of the KA10 then

A. \$142K

2. What was the most expensive item then?

A. RB10A dual positioning DMA disk - \$220K

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 29

USED AT ANAHEIM? y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

In what year did Digital combine under one manager the engineering, programming marketing and production departments for a single product?

ANSWER:

1964

ASSOCIATED BONUS QUESTIONS - VALUE IS 10 POINTS FOR EACH BONUS QUESTION

1. What was this organization called?

A. The Product Line

2. What was its product?

A. PDP6

****36 BIT TRIVIA BOWL****

TOSSUP # 30

USED AT ANAHEIM? y TOSS-UP WON BY Digital BONUS WON BY Digital
TOSSUP QUESTION (VALUE OF 20 POINTS):

In what year did Digital move into the Marlboro facility?

ANSWER:

January, 1974 ANSWER WAS DISPUTED, JUDGES AGREE WITH

PER HJERPE THAT THE CORRECT ANSWER IS 1973

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. Who built the Marlboro facility?

A. RCA (unless someone knows the contractor's name!)

****36 BIT TRIVIA BOWL****

TOSSUP # 31

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

Identify BASI BLUE

ANSWER:

Color of the DECsystem-10

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. What is the official color of the DECSYSTEM-20?

A. Terra Cotta

****36 BIT TRIVIA BOWL****

TOSSUP # 32

USED AT ANAHEIM? Y TOSS-UP WON BY Digital BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

What does the TOPS10 command YQAOS do?

ANSWER:

Sets the TTY ELEMENT for a 2741 correctly so that subsequent commands function correctly. YQAOS means LOGIN.

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 33

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

The lights on a DEC-10 were presented as a futuristic computer in a science fiction film. Name the film-maker or the title.

ANSWER:

George Lucas THX1138

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. Name the other answer

A. see above

****36 BIT TRIVIA BOWL**** TOSSUP # 34

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

What was the first 36-bit processor Digital designed?

ANSWER:

PDP3, but was never brought to market

****36 BIT TRIVIA BOWL**** TOSSUP # 35

USED AT ANAHEIM? y TOSS-UP WON BY Customers BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

What was the physically smallest PDP10 ever built?

ANSWER:

KO10 - 1 board, only 1 was ever built

DISPUTED BY DEC, JUDGES AGREE WITH CUSTOMERS THAT "MINNOW" IS CORRECT RESPONSE

****36 BIT TRIVIA BOWL**** TOSSUP # 36

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

What light on the KI10 CPU celebrates motherhood?

ANSWER:

MA MA light - it was a memory latch [SIDENOTE: CUSTOMERS TRIED FOR "PI", DISPUTED "MA MA", BUT JUDGES DECIDED AGAINST THE CUSTOMERS]

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 37

USED AT ANAHEIM? y TOSS-UP WON BY Digital BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

On the KL, what was BRUCKERT'S PI BUG?

ANSWER:

If a CONO PI,PIOFF was issued after an int was arbitrated,
1 int could still occur after the PIOFF

****36 BIT TRIVIA BOWL**** TOSSUP # 38

USED AT ANAHEIM? y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

What would happen on early KL systems if a page fault and a PDL OVERFLOW occurred
at exactly the same time?

ANSWER:

The PDL OVERFLOW would be lost DEC LOST THE QUESTION, BUT CUSTOMERS
DID NOT GET A CHANCE TO TRY FOR THE ANSWER.

****36 BIT TRIVIA BOWL**** TOSSUP # 39

USED AT ANAHEIM? y TOSS-UP WON BY Customers BONUS WON BY Customers
TOSSUP QUESTION (VALUE OF 20 POINTS):

What ws the IMMEDIATE ancestor of TOPS10 BACKUP?

ANSWER:

FRS [CUSTOMERS ALSO GOT BOTH BONUS QUESTIONS
ASSOCIATED BONUS QUESTIONS - VALUE IS 10 POINTS FOR EACH BONUS QUESTION

1. Name its other ancestors

A. FAILSA

2. again

A. FAILCD

****36 BIT TRIVIA BOWL**** TOSSUP # 40

USED AT ANAHEIM? Y TOSS-UP WON BY Digital BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 20 POINTS):

What does SOS stand for?

ANSWER:

Son of Stopgap

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. BILOS is another editor. What does it stand for?

A. Brother in law of stopgap

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 41

USED AT ANAHEIM? y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 25 POINTS):

All editions of the PDP10 PROCESSOR REFERENCE MANUAL since the mid-70's mention the names of two musical composers. Who are they?

ANSWER:

Bach and Baharach

ASSOCIATED BONUS QUESTIONS - VALUE IS 15 POINTS FOR EACH BONUS QUESTION

1. What was it in a discussion of?
A. DATA0 APR instruction
2. What was the line containing the names?
A. "...to play Bach or rock or Bacharach."

****36 BIT TRIVIA BOWL****

TOSSUP # 42

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 15 POINTS):

What was the first TOPS10 STOPCD named after a developer, and who was the developer for which it was named?

ANSWER:

RCC - Robert C. Clements

****36 BIT TRIVIA BOWL****

TOSSUP # 43

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 15 POINTS):

What date corresponds to "1" in Universal Date/Format?

ANSWER:

November 18, 1858

****36 BIT TRIVIA BOWL****

TOSSUP # 44

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 15 POINTS):

What was the list price of the 1971 PDP REFERENCE HANDBOOK - the last of the telephone books?

ANSWER:

\$5.00

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 45

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 15 POINTS):

What does the /Q switch to PIP do?

ANSWER:

Displays help info for PIP - complete list of switches

****36 BIT TRIVIA BOWL**** TOSSUP # 46

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 15 POINTS):

What is an MK10?

ANSWER:

A device which allows you to hook up speakers to the console lights for listening to music

****36 BIT TRIVIA BOWL**** TOSSUP # 47

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 15 POINTS):

What character is typed on older terminals instead of the underscore?

ANSWER:

back-arrow

****36 BIT TRIVIA BOWL**** TOSSUP # 48

USED AT ANAHEIM? Y TOSS-UP WON BY Digital BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

Which takes longer to build on an idle system, TOPS10 monitor or TOPS10 GALAXY?

ANSWER:

TOPS10 GALAXY

ASSOCIATED BONUS QUESTION - VALUE IS 15 POINTS

1. Which GALAXY module take the longest?

A. QSRMDA - longer than all of TOPS10

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 49

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

What product had the longest single patch published as an SPR answer in the DISPATCH?

ANSWER:

TECO, 53 pages SORT had a multiple patch answer which was 65, and LINK had a multiple patch answer which was quite big

ASSOCIATED BONUS QUESTIONS - VALUE IS 10 POINTS FOR EACH BONUS QUESTION

1. What year was it published

A. OCT 1, 76

2. What was the bug

A. TECO did not understand SFDs

****36 BIT TRIVIA BOWL**** TOSSUP # 50

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

What comes last in an alphabetic list of the KA10 instruction mnemonics?

ANSWER:

XORM

****36 BIT TRIVIA BOWL**** TOSSUP # 51

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

The present version of the TOPS10 DECTape service routine is known as DTASER. The older version was known as DTASRN. What does the "N" stand for?

ANSWER:

NEW

****36 BIT TRIVIA BOWL**** TOSSUP # 52

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

Onto how many DECTapes did the sources for the 2.15 monitor fit?

ANSWER:

3 [SIDENOTE FROM DISCUSSION AFTERWARD:

PETER HURLEY, WHO ANSWERED THIS ONE, REMARKED THAT HE STILL HAS THOSE TAPES IN HIS OFFICE]

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 53

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 25 POINTS):

If you execute the instruction TRCE AC,400001
three times in a row, what is the net effect?

ANSWER:

Reverses bits 400000 and 1 in AC [SIDENOTE: DISCUSSION OVER WHETHER THE
FINAL TRCE SHOULD BE A TRC: DOESN'T MATTER. STU NELSON IS CREDITED WITH
DISCOVERING THAT EFFECT]

ASSOCIATED BONUS QUESTION - VALUE IS 15 POINTS

1. Who is credited with discovering this?
A. Gosper

****36 BIT TRIVIA BOWL****

TOSSUP # 54

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 10 POINTS):

What preceded FILCOM?

ANSWER:

SRCCOM & BINCOM

****36 BIT TRIVIA BOWL****

TOSSUP # 55

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 10 POINTS):

What does PDP stand for?

ANSWER:

Programmed Data Processor

****36 BIT TRIVIA BOWL****

TOSSUP # 56

USED AT ANAHEIM? Y TOSS-UP WON BY Customers BONUS WON BY NO-ONE
TOSSUP QUESTION (VALUE OF 15 POINTS):

What does TOPS stand for?

ANSWER:

Total Operating System [PDP10 REFERENCE HANDBOOK,
1971, p. VIII]

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 57

USED AT ANAHEIM? Y TOSS-UP WON BY NO-ONE BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

In TOPS10 where does the comment NEVER COME HERE ANYMORE occur?

ANSWER:

On a halt instruction in COMCON

****36 BIT TRIVIA BOWL****

TOSSUP # 58

USED AT ANAHEIM? y TOSS-UP WON BY Customers BONUS WON BY NO-ONE

TOSSUP QUESTION (VALUE OF 20 POINTS):

Which UUC expects its arguments to follow it in the code (inline args)?

ANSWER:

INIT

****36 BIT TRIVIA BOWL****

TOSSUP # 59

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

Which PDP10 instruction is the "Number of the Beast"?

ANSWER:

TRON - opcode 666 SIDELIGHT IN DISCUSSION OF ANSWER:

6/6/66 WAS THE DAY TONY WACHS STARTED AT

DIGITAL

6/6/84 WAS THE DAY HE LEFT DEC

****36 BIT TRIVIA BOWL****

TOSSUP # 60

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

When TOPS20 rel 2.0 went to the field, its disk performance was less than should be expected. Explain how replacing one NO OP with another NO OP fixed this problem.

ANSWER:

replacing a SETMM with a SKIP. to reference a page, thus doing a reference without causing a write. SETMM was used to create new pages.

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 61

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

How many words of associative memory on the KI-10?

ANSWER:

32 words

ASSOCIATED BONUS QUESTIONS - VALUE IS 5 POINTS FOR EACH BONUS QUESTION

1. How wide is the word?

A. 24 bits

2. What is the organization of its fields?

A. 9=VPN 1=USR 1=VALID 13=PH ADDR

****36 BIT TRIVIA BOWL**** TOSSUP # 62

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

In what monitor did STOPCD change from a HALT instruction to a call to a debugging routine?

ANSWER:

5.06

****36 BIT TRIVIA BOWL**** TOSSUP # 63

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What was the first "Last KA Monitor"?

ANSWER:

5.07 (or 5.07B)

ASSOCIATED BONUS QUESTION - VALUE IS 5 POINTS

1. What is the purpose of KASER?

A. KA instruction simulation.

****36 BIT TRIVIA BOWL**** TOSSUP # 64

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

In 1971, how many binders were in the TOPS10 Software Notebooks?

ANSWER:

six

[PDP REFERENCE HANDBOOK, 1971]

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 65

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What was the date of DEC's announcement of the DECSYSTEM-20?

ANSWER:

13-JAN-76

****36 BIT TRIVIA BOWL****

TOSSUP # 66

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

Which PDP10 instruction is the "Number of the Beast"?

ANSWER:

TRON - opcode 666 SIDELIGHT IN DISCUSSION OF ANSWER:

6/6/66 WAS THE DAY TONY WACHS STARTED AT

DIGITAL

6/6/84 WAS THE DAY HE LEFT DEC

****36 BIT TRIVIA BOWL****

TOSSUP # 67

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

When TOPS20 rel 2.0 went to the field, its disk performance was less than should be expected. Explain how replacing one NO OP with another NO OP fixed this problem.

ANSWER:

replacing a SETMM with a SKIP. to reference a page, thus doing a reference without causing a write. SETMM was used to create new pages.

****36 BIT TRIVIA BOWL****

TOSSUP # 68

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

How many words of associative memory on the KI-10?

ANSWER:

32 words

ASSOCIATED BONUS QUESTIONS - VALUE IS 5 POINTS FOR EACH BONUS QUESTION

1. How wide is the word?

A. 24 bits

2. What is the organization of its fields?

A. 9=VPN 1=USR 1=VALID 13=PH ADDR

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 69

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

In what monitor did STOPCD change from a HALT instruction to a call to a debugging routine?

ANSWER:

5.06

****36 BIT TRIVIA BOWL****

TOSSUP # 70

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What was the first "Last KA Monitor"?

ANSWER:

5.07 (or 5.07B)

ASSOCIATED BONUS QUESTION - VALUE IS 5 POINTS

1. What is the purpose of KASER?

A. KA instruction simulation.

****36 BIT TRIVIA BOWL****

TOSSUP # 71

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

In 1971, how many binders were in the TOPS10 Software Notebooks?

ANSWER:

six

[PDP REFERENCE HANDBOOK, 1971]

****36 BIT TRIVIA BOWL****

TOSSUP # 72

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

On the average, what percentage of the time does a K110 based TENEX system spend in the pager simulation code?

ANSWER:

30%

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 73

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

Name two things which the following have in common:
RCC & WEM

ANSWER:

TOPS10 STOPCODES TOPS10 developers initials

ASSOCIATED BONUS QUESTIONS - VALUE IS 5 POINTS FOR EACH BONUS QUESTION

1. Who was EJW
- A. Rick Werme
2. DAL
- A. Don Lewine
3. DMC
- A. Dave McClure
4. DIB
- A. David Bell
5. DRL
- A. Dave Lyons

****36 BIT TRIVIA BOWL****

TOSSUP # 74

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 15 POINTS):

What is the hardware definition of the term SMALL USER?

ANSWER:

16K or less - used in K110

****36 BIT TRIVIA BOWL****

TOSSUP # 75

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 15 POINTS):

What was the first TOPS10 monitor with ^T support?

ANSWER:

5.07

****36 BIT TRIVIA BOWL****

TOSSUP # 76

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 15 POINTS):

What program preceded SPRINT?

ANSWER:

CDRSTK

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 77

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 15 POINTS):

What language is SCDSET written in?

ANSWER:

FORTRAN

****36 BIT TRIVIA BOWL**** TOSSUP # 78

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 15 POINTS):

What facility gave COBOL multi-key ISAM file access?

ANSWER:

RMS

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. In what version did this appear?

A. 12B

****36 BIT TRIVIA BOWL**** TOSSUP # 79

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 15 POINTS):

What was the difference between the RPO4 and the RPO5?

ANSWER:

RPO4 manufactured by ISS, RPO5 by Memorex

****36 BIT TRIVIA BOWL**** TOSSUP # 80

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 15 POINTS):

Name two types of devices which Digital OEMed from CDC?

ANSWER:

Disks (RM03) Line Printer

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 81

USED AT ANAHEIM?
TOSSUP QUESTION (VALUE OF 15 POINTS):
Who was the primary author of REACT?
ANSWER:
Bob Clements

****36 BIT TRIVIA BOWL**** TOSSUP # 82

USED AT ANAHEIM?
TOSSUP QUESTION (VALUE OF 15 POINTS):
Who ws the primary author of OPSER?
ANSWER:
Frank Natoli, Stevens Tech.

****36 BIT TRIVIA BOWL**** TOSSUP # 83

USED AT ANAHEIM?
TOSSUP QUESTION (VALUE OF 15 POINTS):
What is the meaning of the "U" flag on published SPRs?
ANSWER:
Unanswerd
ASSOCIATED BONUS QUESTION - VALUE IS 5 POINTS
1. What are the other 6 SPR flags?
A. D - DOCUMENTATION S - SUGGESTION

****36 BIT TRIVIA BOWL**** TOSSUP # 84

USED AT ANAHEIM?
TOSSUP QUESTION (VALUE OF 15 POINTS):
What does Level-D refer to?
ANSWER:
TOPS10 file system starting with 5-series monitors

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 85

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 15 POINTS):

What is the READIN code for the paper tape reader?

ANSWER:

104

****36 BIT TRIVIA BOWL****

TOSSUP # 86

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 15 POINTS):

If only the sign bit is on in a PDP10 word, what is the instruction which is being represented?

ANSWER:

SETZ 0,0

****36 BIT TRIVIA BOWL****

TOSSUP # 87

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 15 POINTS):

What's the major difference between the TU55 and the TU56?

ANSWER:

TU55 had only one drive, the TU56 had two.

****36 BIT TRIVIA BOWL****

TOSSUP # 88

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 15 POINTS):

What is an LA37?

ANSWER:

LA36 with APL option

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 89

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

You are logged into a TOPS10 PPN which has POKE privs, but all you have to work with is a FILDDT with no monitor symbols and no access to the monitor's EXE file. How do you make yourself [1,2]?

ANSWER:

.PJOB .R FILDDT /M/P 410/ TAB LF LF TAB
.+job#/ 1,,2

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. What is the symbol 410 points to?
A. NUMTAB

****36 BIT TRIVIA BOWL****

TOSSUP # 90

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

Name the two PDP10 hardware options that normally housed an XY10 controller?

ANSWER:

BA10 TD10

****36 BIT TRIVIA BOWL****

TOSSUP # 91

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What type of file has the .BCM extension?

ANSWER:

Binary compare output file

ASSOCIATED BONUS QUESTIONS - VALUE IS 2 POINTS FOR EACH BONUS QUESTION

1. .SVE extension
A. Save file from the single user 10 monitr
2. .ALP
A. Printer forms alignment
3. .CKP
A. LIBOL/COBOL checkpoint file
4. .RTB
A. READIN mode, RIM10B format file

****36 BIT TRIVIA BOWL****

TOSSUP # 92

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What are the differences between the DN80, DN81, and DN82 ANF10 remote stations

ANSWER:

DN80 - unit record only DN81 - terminals only
DN82 - unit record and terminals

ASSOCIATED BONUS QUESTIONS - VALUE IS 5 POINTS FOR EACH BONUS QUESTION

1. DAS85 vs DN87?

A. DAS85: sync lines only, DN87: mixed

2. DN87A vs DN87b?

A. DN87A: 16K, DN87B: 32K

3. Which of the DN8X series had mem mgmt?

A. DN87S (but software never used it)

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 93

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

When TOPS20 was introduced, what was the minimum memory configuration?

ANSWER:

64K words

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. What was the maximum at that time?

A. 256K

****36 BIT TRIVIA BOWL**** TOSSUP # 94

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What organization wrote MIC?

ANSWER:

Hatfield Polytechnic

ASSOCIATED BONUS QUESTIONS - VALUE IS 5 POINTS FOR EACH BONUS QUESTION

1. What does MIC stand for?

A. Macro Interpreted Commands

2. What did Hatfield replace with MIC?

A. BATCON

3. How do you initiate Background jobs?

A. COJOB

****36 BIT TRIVIA BOWL**** TOSSUP # 95

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What vendors did Digital OEM RPO2 disk drives from?

ANSWER:

ISS (or Sperry) Memorex

AMPEX is not valid - they sold RPO2 lookalikes, but Digital did not OEM them

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. From whom did Digital OEM the RPO3?

A. ISS

****36 BIT TRIVIA BOWL**** TOSSUP # 96

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

Name the subroutine call instructions as categorized by the PROCESSOR REFERENCE MANUAL

ANSWER:

JSR JSP JSA PUSHJ

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 97

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What preceded the RSX series of front end software for the KL10 processor?

ANSWER:

KLDCP

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. What does KLDCP stand for?

A. KL Diagnostic Console Program

****36 BIT TRIVIA BOWL**** TOSSUP # 98

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What do code and comment references to "SM10" refer to?

ANSWER:

KS10 -or- 2020

ASSOCIATED BONUS QUESTIONS - VALUE IS 10 POINTS FOR EACH BONUS QUESTION

1. What was the first TOPS10 KS10 monitor?

A. 6.03A LIR

2. What was the first TOPS20 KS10 monitor?

A. 3A LIR

****36 BIT TRIVIA BOWL**** TOSSUP # 99

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What does LAP stand for?

ANSWER:

Logical Address Plug

****36 BIT TRIVIA BOWL**** TOSSUP # 100

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What is the significance of location 135 to GALAXY programs?

ANSWER:

Non-zero in location 140 makes the component part of a private GALAXY system

01/29/85

36 BIT TRIVIA BOWL TOSSUP # 101

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What programming languages is the DX10 microcode written in?

ANSWER:

PAL-10

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. What was the control CPU in the DX10?

A. PDP-8/A

36 BIT TRIVIA BOWL TOSSUP # 102

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What is the difference between the DECsystem-1040 and 1050,
or between the DECsystem 1060 and 1070 (same difference)

ANSWER:

RC10 support -or- FHx device support -or-
Support for disk AND drum

36 BIT TRIVIA BOWL TOSSUP # 103

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

If abbreviations were not allowed in TOPS10 commands,
what command would be used to move your virtual terminal
connection to another DEC10 node on ANF10 or DECnet?

ANSWER:

SET HOSTES

36 BIT TRIVIA BOWL TOSSUP # 104

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What currently popular JSYS was implemented but disabled
in TOPS20 V4?

ANSWER:

SMAP%

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 105

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

Exactly what does SOUP stand for?

ANSWER:

Software Updating Package

ASSOCIATED BONUS QUESTION - VALUE IS 5 POINTS

1. Name the components of SOUP

A. CAM, FED, CAMIO

****36 BIT TRIVIA BOWL**** TOSSUP # 106

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What does opcode 247 do?

ANSWER:

Trap as illegal - it is unassigned

****36 BIT TRIVIA BOWL**** TOSSUP # 107

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

How do you enter Supervisor mode on a KL or KI

ANSWER:

Turn on PUBLIC, turn off USER

****36 BIT TRIVIA BOWL**** TOSSUP # 108

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

You are logged in to a TOPS10 PPN without any privileges.

Can you successfully execute a CONO instruction?

ANSWER:

Yes

ASSOCIATED BONUS QUESTION - VALUE IS 5 POINTS

1. To what range of 10 device codes?

A. 740-774

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 109

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What is TOPS10 ersatz device FFA?

ANSWER:

[1,2]

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. What does FFA stand for

A. Full File Access

****36 BIT TRIVIA BOWL**** TOSSUP # 110

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What do monitor addresses 147 and 400 have in common?

ANSWER:

default start addresses for TOPS20 & TOPS10, respectively

****36 BIT TRIVIA BOWL**** TOSSUP # 111

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

How do you make DSKRAT run significantly faster?

ANSWER:

deposit non-zero data into location 141

****36 BIT TRIVIA BOWL**** TOSSUP # 112

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What manufacturer made the XY10 series of plotters for PDP10 systems?

ANSWER:

Calcomp

ASSOCIATED BONUS QUESTIONS - VALUE IS 5 POINTS FOR EACH BONUS QUESTION

1. What was the Calcomp model for XY10A?

A. 565

2. What was the Calcomp model for XY10B?

A. 563

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 113

USED AT ANAHEIM?
TOSSUP QUESTION (VALUE OF 20 POINTS):
Who made the TU20 tape drive?
ANSWER:
H-P

****36 BIT TRIVIA BOWL**** TOSSUP # 114

USED AT ANAHEIM?
TOSSUP QUESTION (VALUE OF 20 POINTS):
What is Celtic for "Free" or "Free Man"
ANSWER:
KERMIT

****36 BIT TRIVIA BOWL**** TOSSUP # 115

USED AT ANAHEIM?
TOSSUP QUESTION (VALUE OF 20 POINTS):
How many rocker switches on the console operator and maintenance panels
of the KA10?
ANSWER:
86.

ASSOCIATED BONUS QUESTIONS - VALUE IS 5 POINTS FOR EACH BONUS QUESTION

1. Break down the number in each grouping
A. 36 DATA
2. .
A. 18 ADDRESS
3. .
A. 20 OPERATION
4. .
A. 8 READIN
5. .
A. 4 MAINTENANCE

****36 BIT TRIVIA BOWL**** TOSSUP # 116

USED AT ANAHEIM?
TOSSUP QUESTION (VALUE OF 20 POINTS):
What does the KT10A hardware option provide?
ANSWER:
Dual protection and relocation
Two Segments [PDP10 REFERENCE HANDBOOK,
1971, p. A-1]

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 117

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

The DEC10/20 PROCESSOR REFERENCE MANUAL contains a reference to carcinogens.
Where do these carcinogens come from according to this reference?

ANSWER:

Spray cans use to clean the CPU cabinets.
[p. F-2]

****36 BIT TRIVIA BOWL**** TOSSUP # 118

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

When the DECSYSTEM-20 was introduced, a specific applications program caused
Fast Memory Parity Errors when run. Name the program

ANSWER:

USAG20

****36 BIT TRIVIA BOWL**** TOSSUP # 119

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What used the MEMSTAT command, and what did it do?

ANSWER:

TENEX INFORMATION MEMORY type output

****36 BIT TRIVIA BOWL**** TOSSUP # 120

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What is the NULFEK and where can it be found?

ANSWER:

Prototype FEK block for TOPS10 networks

01/29/85

****36 BIT TRIVIA BOWL**** TOSSUP # 121

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

In what year was the PDP10 announced?

ANSWER:

1967 [DIGITAL: 1957 TO THE PRESENT]

****36 BIT TRIVIA BOWL**** TOSSUP # 122

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What software did Digital announce at Spring 1975 DECUS?

ANSWER:

DECnet

****36 BIT TRIVIA BOWL**** TOSSUP # 123

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

Identify the following sequence of letters:

A B C D E F H J K L M N P R S T U V

ANSWER:

It is the "DEC ALPHABET" which is used to label backplane pins.

****36 BIT TRIVIA BOWL**** TOSSUP # 124

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

When booting a DX10, what is the name of the BIN file?

ANSWER:

DXMPA.BIN

01/29/85

36 BIT TRIVIA BOWL

TOSSUP # 125

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

On the KA and KI, what did the button MI PROG DIS do?

ANSWER:

Prevented programs from changing the switches and lights

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. What does MI PROG DIS stand for?

A. MEMORY INFORMATION PROGRAM DISABLE

36 BIT TRIVIA BOWL

TOSSUP # 126

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What block number is the directory on a DECTape?

ANSWER:

100

ASSOCIATED BONUS QUESTIONS - VALUE IS 10 POINTS FOR EACH BONUS QUESTION

1. How many files could you put on DECTape?

A. 22

2. How many user usable blocks on a DECTape

A. 574 (578 - 4 directory blocks)

36 BIT TRIVIA BOWL

TOSSUP # 127

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

what was the first 36-bit computer Digital designed?

ANSWER:

PDP3, in 1961, but was never brought to market.

[COMPUTER ENGINEERING, p. 491, Bell, Kotok, Hastings, Hill]

36 BIT TRIVIA BOWL

TOSSUP # 128

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

On TOPS20, what is the one UUU that does not invoke PA1050?

ANSWER:

GETTAB to get operating system type

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 129

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What was the earliest model of TU7X series magnetic tape drives supported by the PDP10?

ANSWER:

TU79 - it ran off of the TM10A on KA-era systems

****36 BIT TRIVIA BOWL****

TOSSUP # 130

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What was the date (month and year) in which the TOPS20 DISPATCH went from monthly to twice month?

ANSWER:

September 1, 79

ASSOCIATED BONUS QUESTION - VALUE IS 10 POINTS

1. When did its cover go from black to orange
A. August 1, 1982

****36 BIT TRIVIA BOWL****

TOSSUP # 131

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

Without using the FM disable switch, how could the very early KA10s be programmed to reference physical locations 0 thru 17? Assume you have [1,2] privs/

ANSWER:

SPY U00 to examine monitor high segment
Then examine locations 400000 thru 400017

****36 BIT TRIVIA BOWL****

TOSSUP # 132

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What DEC product discovered the MOVNI AC,1 bug in the KL?

ANSWER:

The FORTRAN in the field at the time had a MOVNI AC,1 instruction as the last instruction on a page

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 133

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What was DECUS library submission 20-1?

ANSWER:

CTLGEN - batch control file generator

ASSOCIATED BONUS QUESTIONS - VALUE IS 5 POINTS FOR EACH BONUS QUESTION

1. who submitted it?

A. anon

2. What was 20-2

A. Nagel's PASCAL

3. what was 20-3?

A. TOPS20 INTERLISP

****36 BIT TRIVIA BOWL****

TOSSUP # 134

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What widely used TOPS20 program creates its own JSYS?

ANSWER:

SYSDPY

****36 BIT TRIVIA BOWL****

TOSSUP # 135

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

How many instructions are listed as NO OPS in the PROCESSOR REFERENCE MANUAL

ANSWER:

10

ASSOCIATED BONUS QUESTIONS - VALUE IS 5 POINTS FOR EACH BONUS QUESTION

1. NAME THEM

A. SETA SETAI SETMM CAI CAM JUMP TRN TLN

2. TDN TSN

A.

****36 BIT TRIVIA BOWL****

TOSSUP # 136

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 25 POINTS):

In what year was DECUS founded?

ANSWER:

1961 [DIGITAL: 1959 TO THE PRESENT

1977]

01/29/85

****36 BIT TRIVIA BOWL****

TOSSUP # 137

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 30 POINTS):

When and where was the last LCG DECUS HELD?

ANSWER:

Atlanta Spring 1979. After that all DECUS' were combined
in both Spring and Fall

****36 BIT TRIVIA BOWL****

TOSSUP # 138

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 30 POINTS):

On a K110, what happened if you deposited the number 30
into location 30 with sense switch 5 set on?

ANSWER:

BOOTS was loaded without taking a dump first

****36 BIT TRIVIA BOWL****

TOSSUP # 139

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What was the purpose of the TOPS10 monitor module REMSER?

ANSWER:

DC71/DC72 DECsync network support.

ASSOCIATED BONUS QUESTION - VALUE IS 5 POINTS

1. What was the last monitor to support it?

A. 5.07

****36 BIT TRIVIA BOWL****

TOSSUP # 140

USED AT ANAHEIM?

TOSSUP QUESTION (VALUE OF 20 POINTS):

What do these file extensions have in common: BAC BIN BUG

CNH DAE DCR DMP HGH LOW MSB OVR QUC QUD QUE QUF REL RIM

RMT RTB SAV SFD SHR SVE SYS TMP UFD XPN VMX EXE OVL DBS SCH ATR UNV

ANSWER:

Files with those extensions can only be printed if /OKBIN
is included on the PRINT cmd

PIONEER'S ROUNDTABLE

This was the keynote session of the 36-Bit 20th Anniversary celebration. A select panel of people who played a significant role in the development of the 36-bit family reminisced about the early history of the product line. The following transcript has been edited slightly for purposes of space and clarity.

PANELISTS:

GORDON BELL -- Vice-Chairman of the Board, Encore Computer Corp.
ROBERT CLEMENTS -- Senior Computer Scientist, Bolt Beranek and Newman Inc.
JIM FLEMMING -- Consulting Software Engineer, Digital Equipment Corp.
RALPH GORIN -- Director, Academic Computer Center, Stanford University
RICHARD GREENBLATT -- Vice President and Technical Director, LISP Machine Inc.
ALAN KOTOK -- Corporate Consulting Engineer, Digital Equipment Corp.
DAN MURPHY -- Senior Consulting Engineer, Digital Equipment Corp.
GLENN RICART -- Director, Computer Science Center, University of Maryland
TONY WACHS -- Computer Architect, Wang Laboratories, Inc.

Clive Dawson:

Welcome to the 36-Bit Pioneers' Round Table. We consider this the keynote session of our 20th Anniversary celebration. We have with us a panel of nine people which form a very small subset of the pioneers who are responsible for all of us being here today. I have to begin by saying that one of the hardest tasks I've ever had was selecting the people on this panel out of the dozens, even hundreds, who easily deserve to be called pioneers. I have no apologies other than to say that in some cases the choices were determined simply by who answered their phones.

To begin the discussion, I would like to toss out a few questions. For historical purposes, we would like to know:

- . What it is about the 36-bit architecture that has made these systems stay around for as long as they have?
- . What do you consider the most important contributions that this architecture has made to computing?
- . What features of the 36-bit systems do you think will have the largest impact on computing in the 21st century?
- . Who among your co-workers would you most like to have up here with you today?

- . Which of your personal contributions are you personally proudest of?
- . You and the other pioneers made history with your contributions to the development of the modern computer. Did it ever feel like you were making history, and did you suspect you'd be talking about it like this, years later?
- . Finally, it goes without saying that you should feel free to add all of your favorite war stories while answering these questions!

Gordon Bell:

I think that when people decide that 8 bits aren't enough to store a character set and if they want to go to 9 or some larger number of bits, that is going to extend the life of these systems. Maybe the fact that the 10 is so adapted to handling various character sets is one reason that it will last. Basically, I have one view as a student of computer history which is that the life of a machine will be totally determined by its ability to remember; that is, its brain size or capacity for accessing memory. The degree to which the 30-bit address extensions work well for real problems will have a major effect on how much will be here at the 25th, the 30th, and the 50th anniversaries.

I have got to put a plug in here for just the issue of implementing machines. It's conceivable that there will be a new way to implement machines so that we realize they are all software and that we will be able to "compile" machines easily. I think that will be the reason that there will be a 50th anniversary here. The other reason will be Stu Nelson's ability to design machines. When we started out with the PDP-6 initially it was simply just a big PDP-1. We fooled everybody and said it was just a mini. It turned out it was a very big mini and it had an enormous effect on the organization, of course. But the ability to address memory is certainly the thing that determines machine ability and then also the willingness of somebody to implement those architectures. I would draw attention to an exhibit at the Computer Museum by Seymour Cray, clearly the world's greatest computer designer. He says that the best computer designs are done by one individual.

So Stu's been at work on designing the Systems Concepts machine and I think he's done an absolutely magnificent job of building another PDP-10; he's got many more 10's after that. So the answer is address space, Stu Nelson, and a silicon compiler are what will determine the longevity of this machine.

Dan Murphy:

I'd like to say the PDP-10 is a word-oriented machine done right. Back at some point people thought it was important to compact the size of the instruction set and so they were led into byte-oriented order codes. Nowadays that's much, much less important; I think that as people become concerned about the speed of machines they'll be driven back to the word-oriented type of machine and when they look for how to do one of these, the place they'll go to for the most part is a PDP-10.

Gordon Bell:

And also the PDP-10 is a hard-wired machine -- the first machines actually had a hard wired instruction set. Alan [Kotok] fell into the microprogramming abyss in 1972 and still managed to make a fast machine. But if you really want fast machines, you make them simple and you hard-wire their interpreter; that is, you don't put a little machine inside the machine. So the PDP-10 is a good machine to hard wire. Stu cheated a little bit. He did some hard wiring and some microcoding.

Alan Kotok:

I was trying to think in terms of the original question. I think what got us off on the right foot is that we were in the right place at the right time. We, Gordon and I, and the others who you see in the picture that's around, were obviously in a very small company. At the time we didn't think we knew everything there was to know about computers and we talked to a lot of people. We talked to people at MIT, we talked to John McCarthy, and we talked to a lot of our friends. We thought about LISP and things like that which today, finally after all these years, people are saying are important. Also I want to suggest that the simplicity of the architecture was due to the fact that there were only a few of us and we couldn't build an excessively complicated machine. I think there were only about 700 modules and they only had 3 or 4 gates each. There were incredibly few gates in that machine. The fact that it had some inherent simplicity has helped us all along. The pendulum has swung and now I think it's swinging back towards simplicity as Gordon points out.

Dan Murphy:

Clive, one of your questions had to do with people here and not here who had a lot to do with the evolution of the machine. I think when you first asked me about this panel I got to thinking of pioneers of one sort or another involved in all this. There's a few that I've come up with that I wanted to pass along a few stories about.

I think that its appropriate that we're holding the convention, as we have several times in the past, opposite Disneyland. Because, after all, Walt Disney was one of the pioneers in automation. He, many years before most of us here, was pioneering in film animation, and I submit that what most of us programmers have been doing for many years is trying to make an inert pile of metal act alive and do something useful. As a matter of fact, I think Walt Disney was my childhood hero. He's the only famous person I ever had an autographed picture of. I think you also see it when you look around at how many Mickey Mouse programs we have these days.

Another pioneer who I certainly couldn't leave out is Murphy, I don't mean me -- I mean my distant relative who created Murphy's Laws. Now, given the close association over many years, I have been collecting compendiums of Murphy's Laws as they continue to grow because they hold a great many truths and secrets about what we do. As a matter of fact, I have one that I brought along that someone gave me some years ago. There's a couple of things on here I think are particularly appropriate to DEC over the years. This one's called the Murphy Philosophy. It says "Smile! Tomorrow will be worse." There is also the Law of Applied Confusion that I am sure you can relate to: "The one piece the plant forgot to ship is the one that supports 75% of the balance of the shipment." Or in DEC terms: "The part that breaks is probably the cable." Another one which we always say is, "Never time to do it right, always time to do it over." And finally, "The first myth of management is that it exists."

I'd also like to recognize one other Murphy. As I sat down here and looked around I realized that we don't have any women on this panel. There's one in particular that has been involved with the 6 and the 10 for a long time. I first met her when she was programming the PDP-6 at the MIT AI lab in about 1964 not long after it arrived. I subsequently married her and we've been working together ever since. I'd like Sarah Murphy to stand up and take a bow. [Applause.]

I was thinking about the panelists here. Of course, a number of them have been involved in the computer business longer than I have. At one point, I thought John McCarthy might actually be here, and I remember my first acquaintance with John McCarthy was in a computer class that I took as a freshman. This was Introduction to Computers in 1961. We didn't know a whole lot about computers in those days and so we spent 2 or 3 weeks in this course just talking about how to load an AC and things like that. I forget who taught the course, but in any event John McCarthy came in as the guest lecturer one day to talk about LISP. It was quite an experience. He started off and filled the blackboard with CAR's and CDR's and CADADR's and parentheses -- hundreds of parentheses -- and by about 20 minutes into the class everybody was totally confused and the class was literally in a riot. John, of course, looked terribly offended at that. A whole class of obviously

ignorant freshmen were unable to understand what he was about. That was my first acquaintance with John McCarthy. I don't remember to this day whether that lecture made any sense or not.

Gordon Bell right here on the panel is very well known for unlabeled graphs -- the canonical graph with no labels and no dimensions. I remember one day when we had a customer of some importance into the plant and Gordon was explaining some things. He filled a black board with graphs and curves going up and down like crazy -- never a number on any of them. But that customer was absolutely convinced -- he just sat there in total awe. It was certainly an impressive moment!

Alan Kotok:

I just wanted to add that I took that computer course when John McCarthy taught it all the time and I even survived.

Dan Murphy:

There have been a number of changes in DEC over the years. Of course I can't even speak from that much history since I came to work at DEC in late '72 or '73. I started in the Maynard mill. That's where DEC started, and much of the operation was still there in '73. It's a wonderful old building, about 80 years old, next to a mill pond. It's made of brick and wood and is kind of damp. There are lots of bugs and spiders in the buildings, at least there were back then. They were actually quite legendary for that. When I left BBN to go to work for DEC, a couple of people who had been at DEC, Bob Clements and Ted Strollo, gave me a farewell present of a flyswatter and a can of bug spray. Now here it is 11 or 12 years later and DEC has shiny new buildings all around the country. I think Marlboro is an example of a concrete and steel and glass structure and not many spiders at all, really. You still get managers remarking on it, "Not many spiders around here anymore..."

Gordon Bell:

Up in the mill, I recall a sign by the PDP-10 group that had numbered instructions to follow in case of fire. I don't know if it was Kotok or not who added: "0. Call broker." I always think of the 10 group as having their priorities straight and understanding systems!

Bob Clements:

I can certainly remember the spiders very fondly. I remember the manufacturing technicians and the engineering technicians had a battle one day. One or the other of these groups decided that they had had enough of the spiders. They got appropriate cans of bug spray and cleaned them out of their area which was on one side of a not-all-the-way-to-the-ceiling wall. The other group immediately went out and got their cans of bug spray and decreasing numbers of spiders oscillated back and forth over this wall. At the time I started there, DEC had a total of 500 employees and they didn't occupy the whole mill because Dennison Paper was using a large

part of it as a storage area and spiders love that. Every time DEC would go occupy a new space they would have to go chase out all the spiders. Those of us who were there in those days really do remember those spiders very strongly.

I'm going to tell another old story. I committed a great breach of DEC security, unintentionally. When we first checked out the KA-10 prototype, our main job was of course to get the timesharing system running and get it ready to sell to people. We did pretty well on that by the way. From the first time we powered on the prototype KA-10 to the time it was actually running the operating system was, as I recall, nine days. And that involved finding all the bad modules and fixing all the logic bugs.

Alan Kotok:

I don't think that's ever been repeated, and I don't know what we did.

Bob Clements:

I think we worked pretty hard is what we did! It was fun and I enjoyed it a lot. But one of the next programs I decided to work on was the music program which was mentioned in the trivia quiz with the MK-10. That, of course, came out of the MIT AI Lab, and was written by Pete Samson. It was a fine program that we all enjoyed back in the days when you could take your large 36-bit time sharing machine and make it stand-alone to play music on in the dark of night. So I brought this program up and hooked up the prototype MK-10 and got music out of it, but it didn't seem to be working right. I knew that one of the characteristics of the program was that it watched the power line clock to tune the tones of the program. I had the mistaken impression that it did all the timing from that power line clock. I was getting these strange results and the timing just seemed to be wrong. I figured it was because the PDP-6 made extra memory references it didn't really need, and on the PDP-10 we had solved that, but that might have been affecting the timing problem. Anyway, I called up Project MAC and got my friend Greenblatt on the phone. I said, "Greenblatt, I thought that program tuned itself up to the power clock." He said, "Yes it does." And I said, "Why is it running so fast?" He said, "Well, it just tunes the tones -- it doesn't tune the tempo. What does it sound like?" So I held the phone up next to the speaker and started a Bach fugue. And Greenblatt's reply, which I remember to this day, was "Wow, what a fast computer!" So that was a security breach. He shouldn't have known how fast it was at that time.

Ralph Gorin:

Speaking of music, the PDP-6 that's now on exhibit in the exhibit area last was used seriously for making music. That's appropriate also because Peter Samson was the principal designer of the Samson music box that was attached to that processor. That processor last saw real activity in 1979 when it was part of a triplex system involving a KL, a KA and the PDP-6 itself. So not only do

these systems continue to be in use but they seem to hang around. I confess that the PDP-6 seems to be the first computer that I remember the Stanford Computer Science Department actually retiring. We ran out of room.

Gordon Bell:

There's a reason why that happens -- why that PDP-6 still exists. Every time there's a new PDP-10 it turns out that Stanford trades in the PDP-6 for the next computer.

Ralph Gorin:

That's not quite true. We only did that once!

Gordon Bell:

You did it three times!

Bob Clements:

I claim a point of order and I will tell one war story about that particular PDP-6 and John McCarthy who has been mentioned here and we all know. I was the poor guy who was sent to California with the PDP-6 to install it. John McCarthy had been on the phone to DEC essentially everyday saying, "Where's my computer? Where's my computer?" for a long period of time. We kept saying, "Soon. Soon, John." Finally one day we shipped it. It was quite clear when we got there that he hadn't really expected it. They were in this beautiful round building up in the hills I'm sure many of you have seen. The building was brand new, and did not yet have any air conditioning, and it was August. So we brought this machine in, and after the normal amount of debugging of the PDP-6 on its first installation which took a little while, we got it running. But it never stayed running very long because it was being cooked by the heat that it generated, and the lack of air conditioning, and the sun on the roof. The machine just didn't survive it. We'd fix it, it would run for a while, it would die. It soon became clear that this was going to go on interminably. The regional manager at that time finally came up with a scheme for how to get our money for this computer. He forced me to do the following rather impolite thing: I walked up to John McCarthy and Les Earnest and said, "I've been instructed to tell you that you are not meeting the environmental specs for this machine. At any time you have the room at the proper temperature, we will be very glad to come in here and try and make it work. But you can't use it at any other time and we'll just keep trying whenever you have the temperature right." Of course this was impossible for him to accept because he had scheduled a demonstration of this first timesharing system on Stanford campus and his reputation was on the line. Then I continued as instructed, "On the other hand, you could accept the machine and pay for it, at which point I'll be glad to stay around for a while longer and try and make it work. I might even work outside of normal working hours." Since there was only about a day to go before the demo, he and Les went over in the corner, sweated blood for about 30 seconds, came back and signed the acceptance form at a time when the machine didn't even run. So we dutifully

kept our part of the bargain, and tried to get this machine running. I have this beautiful image -- my favorite image of John McCarthy: He and Les Earnest went out all over the entire Palo Alto area, found every block of dry ice that could be found, and placed them under the false floor so that the computer would draw up cooled air. Then John went up on the roof in his Bermuda shorts and sprayed the black roof with a water hose to get convection cooling going. We actually got the machine running and did the demo for the computer center people who were dutifully impressed. Everything came off fine.

Alan Kotok:

I've been making some notes here, keyed by things other people have said, about some of the people who I remember and some of the pioneers. One is Dave Plummer. He joined DEC back in the beginning of the PDP-6 days and was in the development of the operating system for a while. He later became a salesman and I imagine some of you know Dave for his very good presentations. Another Dave is Dave Gross who is still at DEC. He was one of the PDP-10 developers who came in around the time of the KA and worked on the KI.

Bob Clements:

We've talked about the early hardware. I have a couple of names related to the early software. I think we should add Dit Morse and Tom Hastings as developers of the PDP-6 timesharing system which led to all the rest of them.

Gordon Bell:

And we ought to remember that we could have a whole session on the first programmer who we carefully didn't invite, I trust.

Alan Kotok:

Right. Harris Hyman.

Gordon Bell:

You said it Alan! Harris caused me to learn about mass protest for the first time. The assembler spec had gone out for the machine; we were beginning to run assemblies on the PDP-4 for the 6 and it was the Harris Hyman assembler which caused mass riots. Its features were masked only by the fact that it was so unreliable. Harris played a very important part; he had various key pieces in the program. One year we had to ship a machine right at the end of the year -- the famous Brookhaven machine. It was a trivial machine to ship, since it went in the trailer.

Bob Clements:

With me and my suitcase and guitar!

Gordon Bell:

(With Bob Clements. There's another little story there.) But as I was saying Harris was building the assembler that sat on the back of the syntax directed compiler that Pete Samson built. But Harris's assembler didn't work and

I ended up writing half of it in the last two or three weeks. This was at a time when DEC had \$15 million in sales and another million made a real difference -- it was called profit -- at the end of the year. We really had to ship this machine. I said, "Harris, absolutely everything is depending on you getting this Fortran thing done." He'd been working a lot and said, "Ahhh...take it out of my pay!" And there are more, but that's enough.

Alan Kotok:

Another story about the infamous McCarthy PDP-6 was that when McCarthy was negotiating to buy this machine he told us that LISP was very important to them and that he'd like us to put something into the machine to help LISP operate. And so we talked about that for a while and decided that the appropriate thing to do was to put in a CONS instruction. So, we worked it out and got it into the machine. As I understand it, there was a switch in the LISP system that would enable the use of this instruction since it had to run on other machines. Several years later it was determined that this switch had never been turned on in the Stanford machine!

Tony Wachs:

You asked about people from the old times and Bob mentioned Dave Plummer. Dave was working there when I started -- except in the summer. Dave had a thing about bugs. The machine that I was working on when I started was up on the top of building 12; I still worked my crazy hours, even then, starting at 3:00 in the morning. There were 27 zillion bugs in there -- one of the things that was standard was a can of bug spray on the console. You could not get Plummer up there. I tried a number of times and couldn't do it. He got back at me, though. For some reason we had moved to a new building and I had an office and he didn't. Given that I started at 3 and went home at noon and he came in at 2 in the afternoon and went till midnight, he asked me if he could share my office. Being the nice person that I am, I let him share my office. I never saw him so it worked out just fine. Then he got promoted to supervisor of the monitor group, and at that point he needed an office with a door. Mine was the only one that had it, so he kicked me out of my office.

Most of the crazies were gone when I came there. I heard some interesting stories about Pete Samson and Harris Hyman, of course. There were some real strange people there. Don Whitcraft came along after them and cleaned up the code and saw what they had done in patches and made it permanent source code. The only one that was there when I got there was Dick Gruen. Probably a number of you have met Dick -- he's an interesting person. The thing that I remember most about Dick was one morning when I came in at 3 and he had gone home at 2. Absolutely nothing that I had would work anymore and it took me about an hour of debugging to figure out what had happened. Gruen had gotten in there with his soldering gun and changed PUSH to an immediate instruction. Apparently, he did that a lot and most of the time he remembered and unsoldered it before he went home; that time he didn't.

Gordon Bell:

There's a book I would also like to recommend in which it turns out the PDP-6 is the real hero. It's a very nice book called Hackers, Heroes of the Computer Revolution, by Steve Levy. In fact, the east coast hackers are going to rendezvous at the museum on Sunday for a book signing. Steve is going to be there. I think it's a very excellent book about that era -- the early to mid 60's -- and certainly the PDP-6 is the hero.

Bob Clements:

I'll comment on that. I was sitting at a meeting of BBN when my pager went off and it said Steve Levy was on the phone. Well, Steve Levy is the president of BBN. So I immediately left the meeting to go take this call, but I suddenly found myself being interviewed for that book. He got my name spelled wrong, and misquoted me somewhat, but that's history.

Clive Dawson:

If you read this book, I guarantee you'll love it. But you really have to be prepared for when you get to a particular page which mentions the "TICO" text editor. It almost makes you want to throw up. But, except for the typos, I'll second that recommendation.

Dan Murphy:

Steve obviously doesn't understand the real fundamental philosophy of the hacker, which is that you have to remember and get right the trivial details. You may not know what day it is, but by God, you remember the name of a winning program!

Alan Kotok:

Which I believe Dan had something to do with.

Clive Dawson:

One of the people who is featured most prominently in that book -- who in fact has an entire half-chapter devoted to him -- is Richard Greenblatt himself. Maybe this would be a good time for Richard to tell us a little bit about the MIT AI Lab. Many of us don't know too much about this, since they didn't follow the DEC corporate product line that much especially in terms of software.

Richard Greenblatt:

Maybe the best thing would be to talk about some of the early chess-playing escapades. In those days, having a terminal connected to a machine was a lot different than it is now. We had this chess playing program we decided we wanted to play in a human chess tournament. The chess tournaments were located in the scrungy old buildings of downtown Boston, and we had the problem of how to get a model 35 teletype there. What we finally wound up doing was getting a BIG taxi cab -- one of those Checkers with a big trunk in it. We loaded the 35 into the trunk and got it down to Boston. It took 2 people -- we had to

wrestle it up to the third floor of the Boylston YMCU which is kind of an old grungy YMCA type building. Stu Nelson was around to hack around with their telephones (we had various telephone hackers). These old guys were all over us because we were messing up their phone lines. They would pick up the line and hear a feep, and this would of course drop our connection. We did it. It was really quite an effort in those days, involving the whole laboratory. We had to have 2 people at the tournament, 2 people at the machine, and a person running back and forth. Each game at a chess tournament is four hours and if you play 5 or 6 rounds over a weekend that's really quite a lot of manpower for a small laboratory to put together and to make that show go. Nowadays, of course, you take the computer with you to the tournament or you just have a portable terminal, so I'm afraid those days are gone forever. But it was a community effort and I think that the people did feel that they were participating in something at the time.

I guess another thing that someone suggested I talk about was what kind of an instrument I would have liked on the machine as a tool that I didn't have. The particular one that was brought to mind for me was called the MAR -- Memory Address Register. I had seen it on the TX2 at Lincoln Labs. There was a switch register which you could set up with an address, and if the machine referenced that memory address it would stop. When we got our PDP-6 we put it on the PDP-6 as an extra hardware mod. Then we proceeded to try to sell it to DEC for a number of years. Everyone at DEC would say, "Gee, this is a great thing, its going to save us lots of time developing a machine." Now my impression -- it may not be what actually happened -- is they said, "That's \$10 worth of hardware for those gates and switches and whatever..."

Alan Kotok:

They probably just didn't fit!

Richard Greenblatt:

So, it never really made it, at least in the days when I was hacking PDP-10's.

Alan Kotok:

Sort of like fast divide. There's always something we intended to put in but it never quite makes it.

Richard Greenblatt:

I don't know how many hours people have spent wondering how some variable get clobbered. Something like that would have saved a lot of time.

Dan Murphy:

Given that TECO has been mentioned in the past couple of minutes together with the difficulties of dealing with old terminals, I thought I might say a little bit about that. Its been fascinating for me for a number of years to see what has happened to TECO. I

haven't really had that much to do with it over the years that's its been on the 6 and the 10. As I was going through some of my files, I came across a truly fascinating document here. It's actually a whole set of articles entitled "TECO as a Development Language." One of the articles here is "Structured Programming in TECO" written by Jacquie Stafsudd at Hughes Research Laboratories, Malibu, California. It goes on and on here, with diagrams and examples and so on, all about programming in TECO. This cover memo on the thing was from a well-known manager at DEC who was asking for a report on the possibility of making TECO a standard development language within DEC. They didn't decide to, I think fortunately for us all. A few years before that, of course, a Special Interest Group was started about TECO and this is the first edition of the "Moby Mungler" which was the SIG newsletter that Stan Rabinowitz started. It has pages and pages of fun things having to do with TECO and one line hacks you could do with it.

TECO has been one of the more popular interactive editors. I don't know if it was the first, but it was certainly one of the better known early ones. That's kind of an example of something that doesn't turn out like you figure it will when you start with it. TECO was never intended to be an interactive editor. The PDP-1, which was of course the predecessor of the PDP-6 by a few years, was where TECO was first written. The PDP-1 had a console terminal, actually an electric typewriter, which was the only terminal connected to it. We prepared the programs off-line on another type of electric typewriter called the Flexowriter which had a paper tape reader and punch. Paper tape was the program storage and I/O medium on the PDP-1. So you sat off line, typed up your program, carried it over to the machine when your machine time was scheduled, and tried to run it. If there were bugs, of course, then it was a case of running back to the Flexowriter and running your original tape through the reader while punching a copy of it, stopping just before whatever it was you wanted to change, and fixing it up. Clearly, this was prone to error. There was an on-line editor called Expensive Typewriter. It was a fairly dumb sort of line-oriented editor, and its name suggests what people thought of it. If you were sitting there editing your program on the PDP-1 you were frowned upon because you were wasting valuable computer time, instead of going off and doing it on the Flexowriter. I wrote TECO originally with the idea in mind that you could go off line to the Flexowriter and type up not your whole program, but just a list of commands that would say how your program would be changed. And you would take that correction tape, along with your original program, to the machine when your time came around, read them both in, and the editor would punch out a corrected version of your program. I designed the TECO command syntax to be so completely obvious and transparent that you could write it in advance and have it correct your program completely without any difficulty. I am sure that those of you who use raw TECO understand how well I succeeded at that! One final thing, of course, is that it lasted in that mode for only about a day or

two before people immediately realized that what they wanted to do was type in their commands, not off-line on the Flexowriter, but on-line. The PDP-1 had six switches that the program could sense. So I added a feature: If one of the switches was up, instead of reading the command tape, TECO would just wait for commands from the console typewriter. I don't think that switch was ever put down!

Richard Greenblatt:

The one I remember was the other sense switch. There was a search command, and instead of having a separate N command and S command like real TECO, the difference was reflected in this sense switch. So if you had the sense switch in one position and your search failed, it just typed out an error message and that was all there was to it. In the other position, it punched out your current page on the paper tape punch and then it read in the next page from the paper tape reader and continued the search. To this day I remember sitting there typing along, doing a search for something, all of a sudden hearing that paper tape punch start and saying, "Oh, sh*t!" There was nothing you could do but duplicate the whole paper tape and start all over again.

Another story about TECO was that when we got our PDP-6, DEC let us keep our PDP-1 for a while. So we actually used TECO on our PDP-1 as the editor for the PDP-6. Finally, one weekend DEC called said that on Monday morning they would be coming to pick up our PDP-1. This would leave us without any editor at all for the PDP-6. So Nelson and Holloway and I worked 24 hours around the clock for that weekend, and just as DEC was coming to pack up the PDP-1 the following Monday morning we had PDP-6 TECO editing itself enough to just barely stand on its own and serve as an editor. One thing I'll note about that, is that even that early version of TECO had a display. TECO was never ever considered to be usable without a display -- we had a 340 display on it after that first weekend of work. Later TECO made its way to DEC, and was used by I don't know how many people without any display. How they ever managed to live with it, I'll never know. This never happened even a little bit at MIT. TECO was never used even for a day without having a display so you could look at your buffer.

Bob Clements:

I'll plead a little bit guilty on that -- this is a very incestuous group here. It was during the time that I stayed at Stanford after we agreed to work on their PDP-6 in the evenings that I made the [MIT Project] MAC TECO work on the DEC operating system, having previously used the MAC TECO down at Brookhaven.

Glenn Ricart:

The 340 display was really a very good idea because you could run programs like BIGSPY that would show you where all the jobs were in memory. If you wanted to see what the performance of your system was you could go in and watch the jobs being shuffled and slotted out to memory and back in again. When you saw

a job that was killing the system performance, you would notice what its job number was and go tap that person on the shoulder and say, "Hey, you're the person who's causing us problems. Why don't you come back some other time?" The 340 display was only one of the unique hardware features.

While today's students sometimes queue for terminals or to wait for a line through a port switch, I remember the days at Case when you would take your DECTape and put it in line on top of the DECTape cabinet. When a DECTape drive came free, the first person whose DECTape was at the far left would get to take down their DECTape and mount it on the drive. That meant that they were able to get on the system. There wasn't really any login -- the critical resource was the number of DECTape drives. Of course, one had to be reserved for the system tape -- how else could you load your programs? So, I remember that you put your DECTape at the end of the line, and if there were too many DECTapes there was a convention that people would move the DECTapes down. If you weren't there when your DECTape was at the front that meant that you missed your turn and the DECTape would go back to the end of the queue. So, this was one of the first queueing systems implemented on a DEC-10 system. All you Galaxy people, read and weep!

I think that we should say from the customer's perspective that one of the things that really appealed to people was the idea that a PDP-6 or PDP-10 was so approachable. And I think DEC captured that later in an advertising message that called it the Personal Mainframe. That was really the case because you have to remember that back in the late 60's and early 70's, people thought a big computer was one you loaded card decks into, and which had scheduling boards and operators who would put the right card decks in at the right time to get things through. Or conversely, you might have a PDP-8 which was doing some useful work but on a very small scale. People got very excited when they saw the power of the PDP-8 expanded and multiplied with an approachable, friendly operating system. 36 bits meant that you could divide the word in half and have two pointers in each word, each of 18 bits. As Gordon said, 18 bits was enough to give it a sufficient brain power that it became a fairly interesting machine to work on. It had a number of very friendly instructions and a very consistent instruction set that the programmers found easy to understand and apply rationally. That of course, led to a lot of user-written software which together with the DEC software made it such an obvious machine especially in scientific applications, that it began to see a lot of growth. Of course, DEC has received some of its best software from customers. I don't know that I could or should mention it all, but the Tenex operating system became the basis for TOPS-20. I distinctly remember Erich Knobil's micro/macro scheduler when we were talking about schedulers in those early days. A lot of software came out of the University of Arizona, John Edgecombe, Ed Mulrean, the list goes on and on. Many of them are here in this audience. It was partially that software exchange that made the TOPS-10 system so valuable.

We were talking about some of the environmental things like putting water on the roof and ice under the floor. When I was at the National Institutes of Health we didn't have to go to those extremes -- we had natural occurrences that would help us out! One day we turned off the machines and the air conditioning kept going anyway; there was definitely frost in the room by the time we tried to turn the machines back on again. There were supposed to be thermostats but I guess they didn't work. Well, we tried to compensate for that. We were really sorry, and we apologized to DEC for having frozen their machine. A little while later, we did the next best thing we could do. On Friday afternoon, the machine was left running unattended over the weekend. The fire department got a call that there was something going wrong in the computer room. They came in with sirens screaming and hooks and ladders, looked around, couldn't find anything wrong, and went home. The rest of us went home too. I later found out that the fire department had come back a little while later. Again, their alarm had gone off, but they couldn't see anything wrong. So they decided the alarm was faulty and shut it off. Well the next point in the story is that Monday morning at 00:01, the DEC customer engineer came to do the preventive maintenance on the machine. When he opened the door he was pushed back by a wall of high-pressure steam. What had happened was that a steam pipe had broken outside and the fire alarm had been set off by a little trail of steam running along the ceiling that no one could see which was setting off the fire sensors. Well, since they turned off the alarm, no one knew that that steam pipe had finally burst and completely saturated the room with high-pressure steam. The DEC CE, knowing exactly what to do in such circumstances, closed the door, called his boss, and said he couldn't do PM that day. The next part of the story comes up at about 7:30 or 8:00. The operator came in and was rebuffed again by a wall of high-pressure steam. He notified the fire department, and it was pretty clear that things were already pretty bad in the room. The steam had, of course, condensed on the ceiling. It was raining in there like a rain forest and there was dirt and debris coming down off the ceiling running through the equipment. We managed to don big hoods that the fire department uses to go through fires to get in to turn off the equipment. It took them about 4 hours to get the valve shut off because a) no one knew where the valve was and b) it had been rusted and corroded shut. It turns out that we ended up saving most of the data -- we actually washed and dried the disk packs and all of the tapes in the room. It took about a week to get the equipment back up, but there is a very golden lining to the story. Having good management on the system we'd been keeping track of the number of system failures per unit time. There would be little peaks and valleys but it had been running along at a constant rate. Right after the steam bath we had almost 6 months of completely error-free performance from our TOPS-10 system. So we've since recommended this to customers who need a highly reliable system!

Jim Flemming:

People have mentioned names, and Tom Hastings has already been mentioned. You could always tell when Tom was debugging something and he was frustrated because you would come in in the morning and the model 35 would probably be lying upside down, but for sure the glass on top would be broken. That's my only anecdote about people.

Actually, you mentioned in the introduction of Ralph the fact that he wrote the simulation for the KA instructions. There were a lot of interesting things that went along with that. As a matter of fact, I recall a comment that said only cretins divide by SETZ. For those of you that don't know what SETZ is, it is the 40000,0 instruction. In fact, there were some cretins around that divided by SETZ and the simulation didn't hack it very well. So I decided to investigate it. I really didn't know what the right answer was for dividing by SETZ. So I tried it on the KA-10, I tried it on the KI-10, I tried it on the KL-10 and on the KA-10 it generated a number that I later on dubbed Kotok's Constant. The answer on the KL-10 was probably closest to right. It actually generated an overflow of some sort and on the KI the answer was 1. So dividing SETZ by SETZ gives you 1. Now in the simulation on Tops-20, it actually just caused your fork to loop. On Tops-10 since we don't reschedule in Exec mode, it caused a keep-alive cease.

Tony Wachs:

I can't not talk about TECO. I've been at Wang now for a year and a half and they've got plain vanilla editors and...God, I want TECO!! It's the one piece of software I really want. A guy at Wang sent around a questionnaire. He was going to build a new corporate-supported editor, and asked us what we wanted. Rather than just filling out a questionnaire, I went into his office. The guy takes courses at Wang Institute where they have a lot of VAXes, and he had used TECO. As soon as the word TECO got out of my mouth, he kicked me out of his office. Two months later, an old DEC customer came to work at Wang. About a week after he had been there, he came up and asked me what editor I used. I told him about one that was slightly better than the official supported one and pointed him at this guy's office. Same thing -- he went in and asked for TECO and got kicked out of the office.

Jim Flemming:

While we're on TECO, I've got to tell a story about Tony. I had received some TRACK performance data from a customer in the field, and there was something in particular I wanted to look for in the data. It turns out the ASCII TRACK file is not particularly easy to deal with in a Fortran program. So the first thing I did was I went down the hall and found my friends who are SITBOL giants and asked them if they would write me a little SNOBOL program to extract the data. They scratched their heads and messed around, and after a couple of days, why, they weren't certain that they could do it. It was about 11:15, and

Tony said he could do that in TECO. By 11:45 he had extracted the data that the SITBOL wizards couldn't get out of the file for me.

Richard Greenblatt:

Just to stick up for poor TECO, I really think that it may not be realized what a powerful programming language it really is. Many of you may know about the EMACS editor which is quite an elaborate editor with a very fancy, easy-to-use human interface. It has probably set the standard for a large class of what might be considered the state-of-the-art in easy to use editor interfaces. That of course is programmed in TECO. The programming is very compact. I might even go so far as to say that with the address space on the PDP-10, if you didn't have something to program it as compact as TECO is, you wouldn't have much space left for editing your buffer. By now, people have implemented EMACS-type interfaces in quite a few other machines and languages, for VAXes, for LISP machines, etc. But the amount of programming involved and the amount of run-time space it's taken to do that is many times what's involved in PDP-10 EMACS and also in many cases it has less functionality. So, TECO does really have its points as a programming language even today.

Alan Kotok:

I can't let that go by without remembering the LISP interpreter that Dave Gross and I wrote...in TECO!

Bob Clements:

One of the first compilers that ran on the PDP-1 was DANTRAN which Dan wrote in PDP-1 TECO immediately after having written TECO. It was not the world's most elaborate compiler, but it took $A = B + C$ and compiled up the appropriate PDP-1 instructions having been written in TECO.

Dan Murphy:

Well, that's right. In fact, a number of the commands got added to TECO back in those days because of these peculiar hacks that we were doing with it. I don't know if I should tell this story, but I'll give it a try. I didn't come from the model railroad club at MIT. I came from the student radio station, as did Bob over here and a few other people. Whatever the Hackers book says, there WAS another source of some of us there at MIT and that was the radio station. The original looping control in TECO on the PDP-1 was a sort of open parenthesis, condition to be tested, stuff to be done depending on whether the condition was true or false, followed by close parenthesis. This came about from the fact that one of the guys at the radio station had a particular talent. He would read newscasts in a Chinese dialect. I hope no one takes offense -- this was 1964. He did that by simply mentally reversing all the l's and the r's in the text as he read it. And we decided that it would be a darn good idea if we had an editor or some computer program that would do that. Of course it took us one pass to realize that we couldn't just change all the r's to l's and the l's to r's since we'd

end up all r's. So the original looping was put in there so that we could go through, search for an r, change it to something else, search for an l, change it to an r, and then change the something else to an l, producing the text all ready to read. For whatever it's worth, that's where looping came from.

Clive Dawson:

That'll be one of the 40th anniversary trivia questions! Does anybody have any closing comments? We only have about 3 minutes left.

Glenn Ricart:

The DEC-10 was one of the first computers that I know of that saved a life. One of the chemical structure databases on the PDP-10 at NIH was used in 1974 to determine the kind of antidote that was needed to save the life of a child who had accidentally swallowed a very bizarre compound to which no known antidotes had been understood at that time.

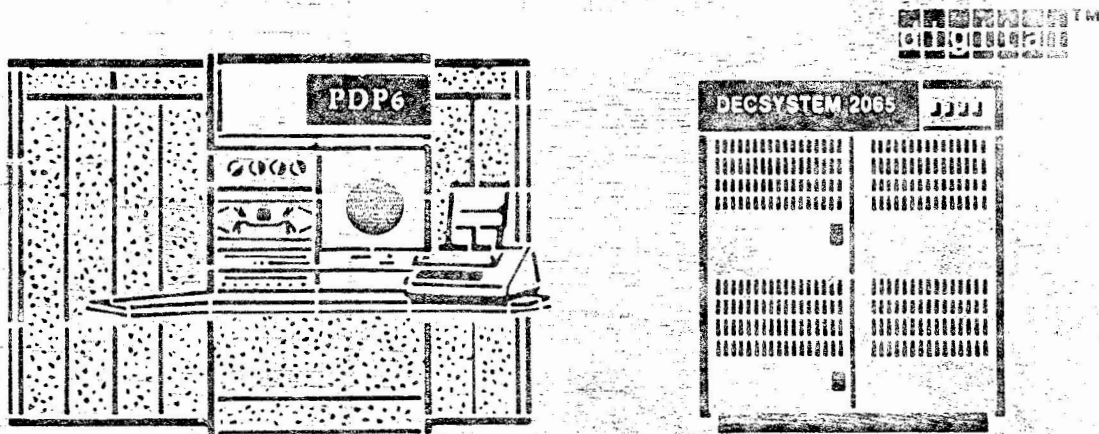
Clive Dawson:

I want to repeat what I mentioned at the beginning, which is that it was totally impossible to even begin to think of all the people who deserve the title "36-Bit Pioneer". To all of them, and to all of you up here, I just want to say: Thank you for making it happen for us!

GALA ANNIVERSARY PARTY

On Wednesday evening, after a day filled with many old timers reminiscing over the genesis of the 36-bit world, we filled the dining room with close to 600 people for a gala dinner party to celebrate the twenty years past. The cost of the dinner had been decided at the previous DECUS symposium. The question was asked at the Town Meeting attended by several hundred people: How much are you willing to pay for a fantastic party? \$20?, \$30? Someone in the audience shouted "36" and there was immediate resounding agreement. And so the fee was set at \$36. As we finalized plans for the party on Monday and Tuesday we found we had to keep expanding the size of the dining room needed. From 400 to 500 and then to 600.

DEC provided souvenirs for everyone -- a laser engraved walnut pencil holder depicting the PDP-6 on one half and the DECSYSTEM-20 on the other half. Here's what it looked like:



1964 20 Years of 36-Bit Computing 1984

Following dinner we heard comments from such people as Leslie Maltz, the current chairperson of the Large Systems Special Interest Group and RoseAnn Giordano, the Vice President of Large Systems Marketing to name a few. An award was given to Christine Medeiros, Marketing Communications Specialist from Digital who coordinated all of the activities of the week dealing with the celebration. She was responsible for obtaining the booth, setting up the dinner, designing and ordering the souvenirs, to mention just a few.

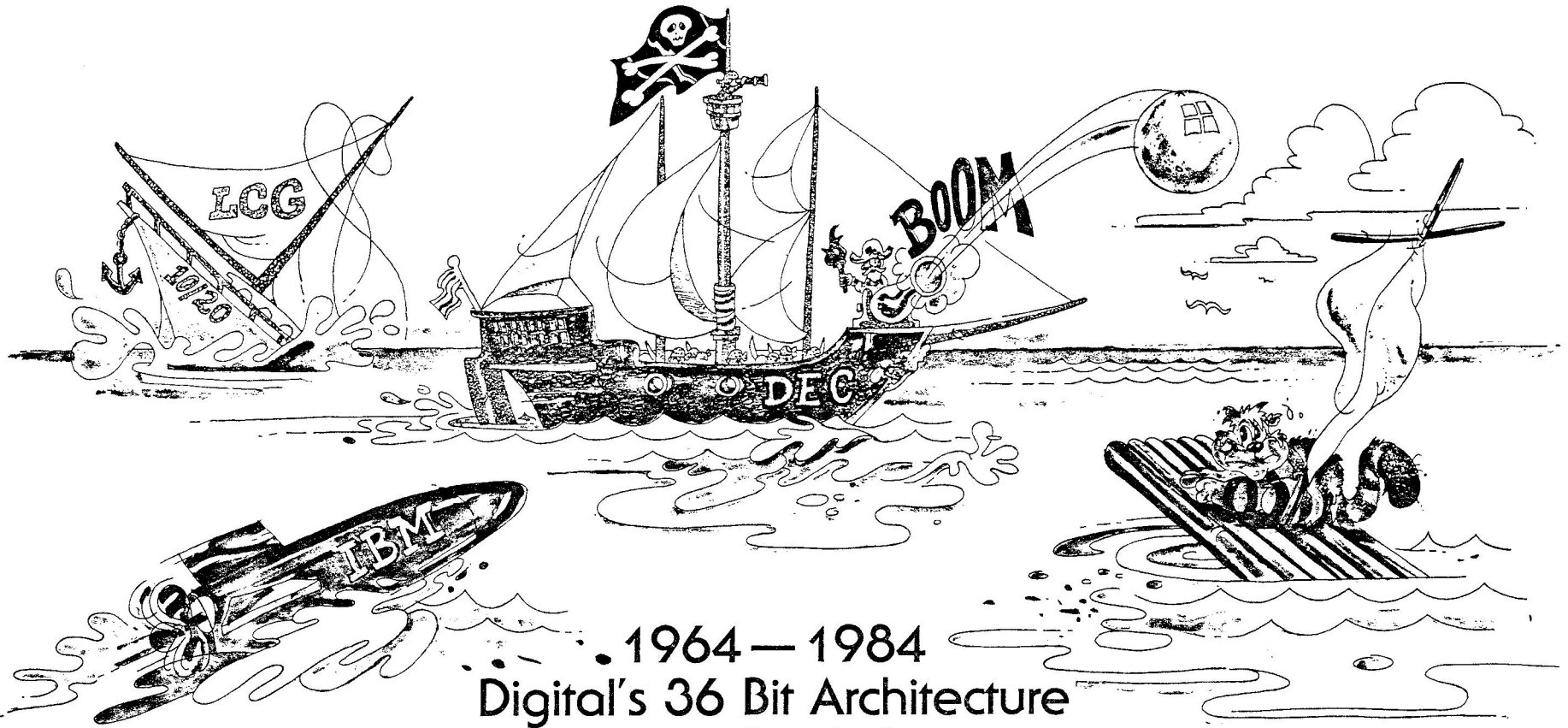
Peter Hurley, Group Manager of Software Engineering at Digital gave a roast of sorts to the developers of the 36-bit line. He told tales and anecdotes of events surrounding the early development. For example Peter related stories about the first two PDP-6's delivered to customers. The first one went to Australia. Obviously someone who signed that account was either looking for a challenge and test for quick response from Field Service or someone wanted a remote vacation spot. The second PDP-6 was delivered to a site a little closer to Maynard, Massachusetts -- or at least almost delivered. In those days DEC didn't have their own trucks so they commissioned a moving van to deliver it. It was packed along with some house furniture sharing the van since the PDP-6 didn't take up the entire space. The van proceeded to its destination but only made it to the next town where the twelve foot van encountered an eleven foot bridge. At that point the van returned to Maynard where the PDP-6 was repaired for subsequent delivery. The furniture, by the way, made great firewood! It wasn't good for much else.

The finale of the evening was the awarding of door prizes and the auction. Two complete Rainbow PC's were first raffled. Both were donated by Digital as was the main prize of \$20,000 worth of hardware, software, and/or services from DEC given to one lucky site through a drawing. Next came two KA consoles which were donated by user sites. They too were given away by drawing. And the final door prize was a certificate for the "Acceleration of an SPR fix". The recipient could choose the SPR of his choice to be accelerated for immediate fix. We never heard what the choice was. With all the prizes given away, the auctioneer marched up to the block and began to sell off two consoles -- one a KA and one a KI. At first the bidding was slow and no one knew what they might bring. The bidding picked up substantially and the final outcome was the KA panel went for \$300 and the KI panel for \$500. The \$800 was donated to the Computer Museum in Boston with the express purpose of preserving the 36-bit history within the museum.

LCG POSTER

On the next page there is a reduced copy of the LCG Poster which went on sale in the DECUS store. This was produced with praise to DEC in mind for, as the bottom caption reads; "Nobody did it better" even though it pokes fun at the demise of Jupiter and the 36-bit world. A couple of comments about the artwork on the poster seem appropriate. First, the reverse direction of the sails was a technical error and was unintentional -- although come to think of it maybe it's appropriate. Second, the poster was drawn by a prominent individual in the VAX SIG who was willing to help us when we were looking for an artist. Maybe this is the symbolic start of our migration to VAX.

Smooth Sailing Through The 80s



1964 — 1984
Digital's 36 Bit Architecture
Nobody Did It Better

 Decus Large Systems Sig.

ODE TO VAX CLUSTERS

At the dinner party on Wednesday night a mysterious lot of T-shirts were quickly gobbled up by a group of enthusiastic 36-bit adherents. The tan colored T-shirts had a picture of the VAX cheshire cat with a red circle and line looking very much like a take off on the popular "Ghostbuster" T-shirt. The caption on the bottom of the T-shirt read: "I ain't afraid of no VAX".

On each morning of the five day symposium a small four page newspaper called "Update Daily" was produced giving the latest changes in sessions, the latest reports on events and in some cases, where space allowed, just some clever comments by some unknown author. On Friday morning there was one such article called "ODE TO VAX-CLUSTERS". This ode must have been inspired by someone who received one of those T-shirts. The ode went as follows:

ODE TO VAX-CLUSTERS

Unknown

(Sing to "Ghostbusters" by Ray Parker Jr.)

(CHORUS) VAX CLUSTERS!

When there's somthin' strange,
With you VAX's speed,
What ya gonna blame?
(CHORUS) VAX CLUSTERS!

What the LAT is down,
And you're behind,
What ya gonna blame?
(CHORUS) VAX CLUSTERS!

I ain't 'fraid of no VAX.
I ain't 'fraid of no VAX.

When a pointer points,
And nothin's there,
What ya gonna blame?
(CHORUS) VAX CLUSTERS!

Your program's lost,
and you don't know where,
What ya gonna blame?
(CHORUS) VAX CLUSTERS!

I ain't 'fraid of no VAX.
I ain't 'fraid of no VAX.

What ya gonna blame?
(CHORUS) VAX CLUSTERS!

When your VAX is down,
and all is lost,
What ya gonna blame?
(CHORUS) VAX CLUSTERS!

I ain't 'fraid of no VAX
Fill up my coffee mug.
I ain't 'fraid of no VAX.
Yeah, yeah, yeah, yeah.

What ya gonna blame?
(CHORUS) VAX CLUSTERS!

Just create a node,
That is all it takes,
When you blame...
(CHORUS) VAX CLUSTERS!

Hackin' makes me feel goo-oo-ood!

I ain't 'fraid of no VAX.
I ain't 'fraid of no VAX.

Don't program alone, no, no, no.
(CHORUS) VAX CLUSTERS!

If the "last bug" won't go,
And other bugs start to show,
I think you'd better call ...
(CHORUS) FIELD SERVICE!

What ya gonna call?
(CHORUS) FIELD SERVICE!

What ya gonna call?
(CHORUS) FIELD SERVICE!

I can't hear you!

What ya gonna call?
(CHORUS) FIELD SERVICE!

Louder!

What ya gonna call?
(CHORUS) FIELD SERVICE!

THE SOUL OF AN OLD MACHINE

Clive B. Dawson

(C) 1984

I started work for the University Computation Center in 1975 as a systems programmer for the DEC-10, just a couple of months after it arrived on campus. My previous experience with a DEC-10 had ended when I graduated from Stevens Tech. Since then, I had spent four rather painful years doing graduate work on a CDC 6600 system. The fact that it was many times faster than a KA did not make up for the fact that I had to learn how to keypunch again. I welcomed the arrival of the 10 with the joy of someone being released from prison. I can't begin to count the hours I spent on that system--well over 10,000 connect hours-- developing software, fixing bugs, and teaching others about it. I was proud to be known as a hacker (at a time before the term's respectability was destroyed). In turn, the DEC-10 helped produce dissertations for both my wife and me, and was an endless source of fun and relaxation as well. (It was also responsible for extending my graduate school career by at least four years!)

The KI processor had served the campus well for seven and a half years. Now the user population was drifting over to the two new DEC-20's, and it was only a matter of time before the rising maintenance costs could no longer be justified. A flurry of last-minute rescue efforts followed the announcement that the system would have to be shut down. It seemed incomprehensible that a perfectly good machine would be removed from service given the chronic state of saturation common to most computer systems on most university campuses. The efforts failed, and on October 31, 1982, the DECsystem-10 at the University of Texas at Austin was turned off for the last time.

The event did not pass without due ceremony. We held a farewell party on that Halloween Sunday, well attended by current and ex staff members as well as a few users. Many brought cameras to record a vanishing breed--they don't make 'em with lights anymore. In one of the stranger moments we cranked up the PTP: and had paper tape (might as well use it up) and scratch magtape draped all over the place. The laughing and joking helped. Many of us on the staff had built up an extremely close-knit group over the years which had slowly drifted apart as new machines and new responsibilities came along. This "wake" had a good cathartic effect, bringing us together at a time when we needed to share feelings that had hit us harder than we might have cared to admit.

I wondered about the users--all the faceless people scattered throughout dozens of small offices and terminal rooms throughout the campus--the complete opposite of our small, close-knit staff. Were they feeling the same emotions? If so, who could each of them share with?

At home very late that night, I felt the urge to dial up one last time. As I went through my normal routine of checking mail, the Bboard, and the various system mailboxes, I discovered something completely unexpected. During the last few hours users had logged in and sent mail to the bboard and to other system mailboxes like Operator. The curious thing is that these people had no way of knowing that anybody would ever be around to read these messages. They were, in the best way they knew how, sharing their feelings directly with the machine. Some of the messages are reproduced here as I found them, with only the senders' names altered.

. From: R. B.
. Subject: Dec10
. To: GRIPE
Farewell DEC10 and thank you!

. From: [4435,244]
. Subject: The death of a friend
. To: Bboard
Goodbye, DEC-10, you've been a great friend and co-worker. I'm going to miss you for a long time. I feel worse than when they killed Hal in 2001.

. From: B. J.
. Subject: November the 2 is too late
. To: Bboard
it feels like this is the end of an old friend. who says computers haven't got any personality?

. From: GVCE333
. Subject: Good-Bye old paint
. To: Bboard
The glue factory beckons... Sigh!

. From: [1276,1]
. Subject: Good-bye, DEC-10
. To: Bboard
As a well-spent day bring happy sleep,
so life well used brings happy death.
Leonardo Da Vinci, 1452-1519
Notebooks [c. 1500]

DEC-10, you've been a good and faithful (for the most part) servant and companion. Farewell.

. From: BSAB553
. Subject: bye
. To: GRIPE
this is last "bye" to the DEC 10; too bad. I liked the DEC 10 better than the DEC 20. I find it hard to believe that this system could not have been supported to some extent... So long forever!

. From: LSDF141
. Subject: Bye
. To: OPERATOR
BYE BYE FAITHFUL FRIEND - THE DEC-10

. From: C
. Subject: Farewell
. To: Operator
Do not go gentle into that good night,
Rage, rage against the dying of the light...

The next day, one more message appeared on the DEC-20 Bboard:

Date: 1 Nov 1982 2133-CST
From: P.M.
Subject: the death of the dec-10
To: bboard

I was there till the bitter end. First, the one or two faithful logged on via the micom were detached and automatically logged off. As the only telephone hook-up, I was privileged to be at his side a little longer. I fondly reread the last farewells of those who had cared enough to write a bboard message. Then I, too, was detached and logged off. But even then the DEC-10 lingered on. Systat and help functioned for several more minutes until the operator sent the last message I or anyone will ever receive from the DEC-10:

Time sharing is over permanently! Good-bye.

The stone has been rolled in front of the grave, my friends.
The DEC-10 is no more.

About six months later in St. Louis I heard DEC announce the end of the 36-bit systems. I wondered then how many times in the next few years the events told here would be repeated.

Recently I had occasion to visit the machine room where the old KI had stood. On one side of the room was a shiny new VAX 11/780. The other side of the room had boxes of IBM PC's stacked to the ceiling. Someday these machines would be old too. But somehow I knew that they would never have a day for themselves like Halloween of 1982. They don't make 'em with souls anymore.

Printed in the U.S.A.

"The Following are trademarks of Digital Equipment Corporation"

ALL-IN-1	Digital logo	RSTS
DEC	EduSystem	RSX
DECnet	IAS	RT
DECmate	MASSBUS	UNIBUS
DECsystem-10	PDP	VAX
DECSYSTEM-20	PDT	VMS
DECUS	P/OS	VT
DECwriter	Professional	Work Processor
DIBOL	Rainbow	

Copyright ©DECUS and Digital Equipment Corporation 1985
All Rights Reserved

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation or DECUS. Digital Equipment Corporation and DECUS assume no responsibility for any errors that may appear in this document.

POLICY NOTICE TO ALL ATTENDEES OR CONTRIBUTORS "DECUS PRESENTATIONS, PUBLICATIONS, PROGRAMS, OR ANY OTHER PRODUCT WILL NOT CONTAIN TECHNICAL DATA/INFORMATION THAT IS PROPRIETARY, CLASSIFIED UNDER U.S. GOVERNED BY THE U.S. DEPARTMENT OF STATE'S INTERNATIONAL TRAFFIC IN ARMS REGULATIONS (ITAR)."

DECUS and Digital Equipment Corporation make no representation that in the interconnection of products in the manner described herein will not infringe on any existing or future patent rights nor do the descriptions contained herein imply the granting of licenses to utilize any software so described or to make, use or sell equipment constructed in accordance with these descriptions.

It is assumed that all articles submitted to the editor of this newsletter are with the authors' permission to publish in any DECUS publication. The articles are the responsibility of the authors and, therefore, DECUS, Digital Equipment Corporation, and the editor assume no responsibility of liability for articles or information appearing in the document. The views herein expressed are those of the authors and do not necessarily express the views of DECUS or Digital Equipment Corporation.