Department of
Computer Science
Newsletter

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1974
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no

yes

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PRINTOUT, the newsletter of the Department of Computer Science of the University of Maryland at College Park, is published sporadically and distributed to faculty, staff, and students in the Department. Opinions expressed in signed articles may be those of the author, but no opinions represent the policy of the Department, or of the College Park Campus, or of the University.

Contributions may be submitted to the editor, and unless they are obscene or seditious they will probably be used, but minor editing may be done. Complaints directed to the newsletter will be investigated and publicized when possible. It is well to keep in mind however that the Department is subordinate to higher levels of administration, not the other way around; and, the Department does not provide computing service to the campus. Complaints in these areas are best directed to other publications.

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PRINTOUT

Volume 1
Number 1

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UNIVERSITY OF MARYLAND

COLLEGE PARK, MARYLAND

DEPARTMENT OF COMPUTER SCIENCE

Chairman's Memo

TO: Newsletter Readers
FROM: Jack Minker

This is the first issue of the Department of Computer Science newsletter. This newsletter is to provide an informal means of communication containing information of interest to all members of the Department--faculty, staff, undergraduate and graduate students.

I hope that you will contribute items to the Newsletter editor, Dr. Richard Hamlet. We want to publish items of personal interest (marriages, births, etc.); of technical interest (papers presented or published awards received, etc.); informal articles on some topic related to computer science; and information of general interest. You can help shape the contents of the newsletter by contributing information.

In addition to this newsletter there are other new developments in the Department, some discussed elsewhere in the newsletter. A weekly student and faculty colloquium series has been started under the direction of Dr. G.W. Stewart. Faculty members, students and invited lecturers will speak at the colloquia. All students are urged to attend the colloquia as a way to learn more about computer science. Students and faculty will have an opportunity to chat informally at the coffee-half-hour that precedes each colloquium.

In January 1974, the Department's undergraduate curriculum was approved by the University, and our undergrad-uate program was underway before any announcements could be made for the spring semester. Hence, this semester represents the real beginning of our undergraduate curriculum. The faculty welcomes all our new undergraduate majors in computer science, and our entering graduate students.

Although we expected a significant increase in the number of students enrolled in computer science this fall, we were surprised and delighted by the large enrollment we've had. There are approximately 1,750 student-course enrollments in computer science. The previous highest enrollment was approximately 1,200 students. The three beginning courses (CMSC 103, 110 and 120) have a total of 850 students enrolled. The high number of beginning students shows how much an undergraduate program was needed at Maryland. We also have about 10% growth in our graduate courses, with about 250 student-course enrollments.

I am pleased to inform you that we have just received approval to purchase a minicomputer, a PDP 11/40 for use in our undergraduate course work. The machine should be available for the spring semester and it will initially be used in CMSC 415 to give students hands-on computer experience.

This is my first year as chairman. I know that we will all have an exciting year. Our undergraduate program is beginning to mature. We expect to add additional professorial faculty and to work towards excellence in all areas--in service to the University, in teaching, in advising, in research, in administration, and in our students. With the active participation and involvement in the affairs of the Department by students, staff, and faculty, we can make Maryland a model for other departments of computer science in the country.

Carriage Control

On certain IBM line printers, the "carriage control character" is what you must put in front of what you really want to print, but which does not appear, since the printer deletes it. The analogy to a news letter editorial has some failings, but it's the reason for the title.

Professor Minker would like to provide communication through the newsletter, and perhaps he would like to bring us together, but didn't use that phrase which another administration has tarnished rather badly. In such an endeavor his choice of editor was probably unwise. The last thing I edited was a college humor magazine called the Wisconsin Octopus, and that experience would be more useful when it comes to driving people apart. In any case, since raising my first beard and hearing an Air Force Captain explain with relish how he intended to pull it out one hair at a time in front of his assembled cadets should I persist in retaining it on ROTC drill day, I have been suspicious of people coming together, particularly in large groups or uniforms. So perhaps I support the impersonal,

professional side of communication more strongly than the one based on personalities, as this issue shows. However, a newsletter is what its contributors make it, and copy in the hand before deadline is copy the editor doesn't have to write.

In physical format we can use anything that can be held down on an 8-1/2 x 11 page and copied; photographs cost a little extra, as does color, but they are not ruled out. When it comes to content, popularizations of technical material and semi-technical articles are most welcome. The newsletter staff just happens to overlap the staff of our Annual Report, and it is my hope to include some technical material therein, yet not have to write it at the last minute.

--Dick Hamlet
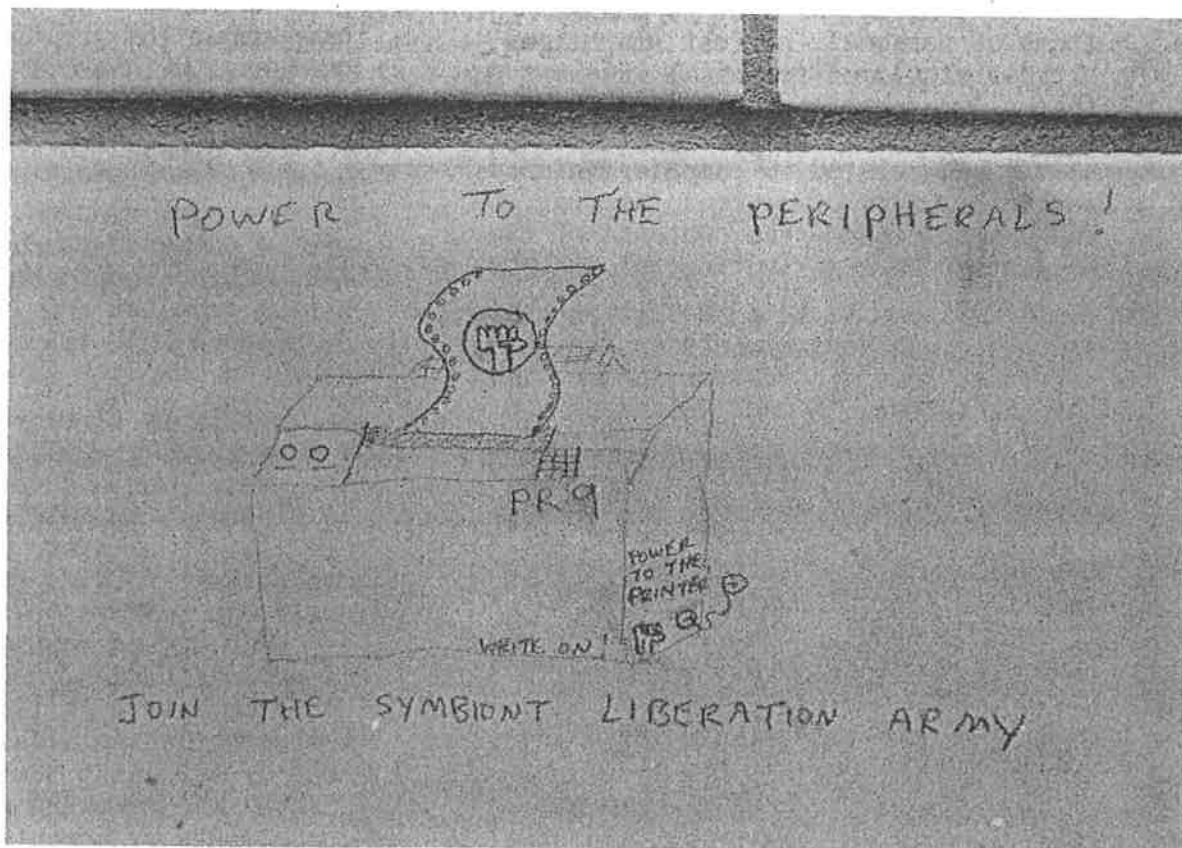
"The professors are hindered by a miserable text. However, since they wrote it themselves, I find little sympathy for them."

"Prof tells jokes occasionally. They're not funny but they're not partial differentials, either."

"He cured my insomnia."

--Comments made by students in a 1966 evaluation of courses and teachers at the University of Washington

The ordering in the list of Computer Science courses at the right is that supplied by students who have taken them since Fall, 1972. Complete data on which the study is based can be found on reserve in the Programming Library; if you seek it out, don't neglect the individual comments provided by students in the back of the binders.

Only courses which can be expected to have a relatively stable definition have been included. The rating system at present applies only to the graduate program.

COURSE CRITIQUE

NOTES

1. The scale runs from a high of 4 to a low of 1. The description which goes with the 3.00 response around which many courses center is "good."

2. The scale is from a "too difficult" of 4 to a "too easy" of 0. The description which goes with the 2.00 response is "about right."

3. The small number of students in a single section makes these numbers suspect.

4. One section received an abnormally low rating.

5. One offering was numbered 838D, but the content was similar. If this section is excluded, the rating would rise slightly.

6. There was no evaluation in Fall, 1973.

7. This course no longer exists with the content evaluated here. The number has been retained, but a new course was instituted in Fall, 1974.

Course number	Number of evaluations (sections)	Weighted evaluation[1]	Weighted difficulty[2]
415[3]	4(1)	3.75	1.75
477[3]	7(1)	3.43	2.00
420	106(7)	3.20[4]	2.13
400	37(2)	3.18	2.24
670	72(4)	3.10	2.31
600	82(4)	3.06	2.16
440	190(9)	3.04[4]	2.23
630[5]	87(4)	2.95	2.51
460	53(2)	2.94	2.58
640	35(3)[6]	2.91	2.13
610	71(4)	2.83	1.93
410	143(7)	2.73	2.06
470	72(3)	2.73	2.30
450	55(3)[6]	2.54	1.94
620[7]	76(4)	1.82	1.96

ESTABLISHING SUBACCOUNTS

In this presentation it is assumed that the class account number is 001999, for concrete examples. The actual account number should be substituted where 001999 appears.

After the account processor is started (@ACCOUNT), the following input will establish subaccounts 00199901, 00199902,...,00199975:

    ENTER/01(75)

and will list these account names along with randomly-generated passwords, which can then be distributed to students. It is often a good

CLASS   USE   OF

idea to restrict funds below the default $100 limit, so that no one person can use too much of the common funds at once by accident. After all the accounts are generated, the input

    CHANGE,ALL,FUNDS/25

will set the limit at $25. Later, as students run out of funds, an across-the-board increase of $20 can be provided by

    CHANGE,ALL,FUNDS/A20

but perhaps a better scheme is to cause the recorded use to be reset so that everyone starts toward the original limit afresh.

    RESET,ALL

does this. (The various changes can also be applied to individual subaccounts. For example, to add $50 to 00199913, the input is

    CHANGE/13,FUNDS/A50

and similarly for RESET.)

Some instructors don't like the all-numeric codes and random passwords, and so adopt a different scheme. Each student is asked to punch and turn in a card in the form

    ENTER/JONES,PASSWORD/SEEKRT

with last name and a chosen password (here JONES and SEEKRT). These cards can be submitted as a batch run:

    @RUN   (for the account manager)
    @PASSWD (master account)
    @ACCOUNT
     [Deck of student cards]
    CHANGE,ALL,FUNDS/25
    LIST,ALL
    @FIN

The result will be to enter the subaccounts under the given names with the given passwords. For example, the sample card above would result in the account 001999JONES. Two problems can arise. (1) There may be duplicate names (duplicate passwords are OK). (2) There may be keypunch errors. Both difficulties will result in an

account not being created, and can be located and corrected using the batch run output. Small changes may be necessary to force unique names. (Is it a responsibility of computer scientists to apologize to students for tampering with their identities?)

A final note on establishing student accounts. It may be useful to have a "global number" established like

ENTER/EVERY1,PASSWORD/NONE,FUNDS/200

which is easy to remember, and has more money, then to suggest that students use this number only in emergencies. (Files under other numbers may not be available; see below.)

lines total. (An entire file has about 8000 of these 3-line units, so the 150 is about right for a class of 53 people.)

Students put elements into the SAVE-LOAD file with the command

@SAVE

and restore them with

@LOAD

(these move all source elements from/to the workspace). There are other useful commands, described in the *DEMAND USER'S MANUAL, CN-12.1*. The master account can examine the SAVELOAD file with

@SETUP,A

and references to the internal name DUM$PF. Particular students can be

THE 1106/1108

STUDENT FILES

Files made under student subaccounts with the usual @ASG controls do not last through the night, but there is a means of providing student file space which is essential to use of the demand system. A special file (SAVELOAD) can be created, and a processor exists to utilize it for all studends according to subaccount. To create this file initially requires only

@SETUP 001999,150

where the final number is the maximum allocation for each student. Roughly, this number is 1/3 the number of line images permitted, so the above would give each person about 450

recognized by version names corresponding to subaccount. For example, if the sample student above was the only one to save a file, and saved only the element named SOURC, then

```
@SETUP,A
@PRT,T DUM$PF.
```

would list out

```
SOURC/001999JONES
```

only.

It can be useful to provide read-only or unprotected files for class use, for example to supply assignment data, or make space for absolute elements. The normal @ASG,UP control will do this if used under the master account number.

MESSAGES FOR STUDENTS

If students are required to include the card

```
@NEWS,AF
```

in every batch run, and to type this when using a terminal, a means is provided to convey timely messages, to correct assignments between classes, announce exams, etc., and to know that every student sees the messages. The messages come from a file which the master account must establish with a particular name. If you believe that keys are not needed,

```
@ASG,UP NEWS$*001999
```

is enough. The editor may be used to put elements into this file, with their names serving as keywords, and version as an expiration date after which the item will not be listed. Thus

```
@ED NEWS$*001999.EXAM/103174
```

would be used for an item keyed EXAM which would not be listed after Halloween. The first line of text is the item headline. Use of keywords and headlines is further explained in *DEMAND USER'S MANUAL*, under the NEWS processor.

--Roger Nagel
--Dick Hamlet

Professional News

Werner C. Rheinboldt was appointed Director of the Applied Mathematics Program on July 18, 1974. The interdisciplinary program within the Division of Mathematical and Physical Sciences and Engineering at College Park was established during the 1973-74 academic year.

○○○

The Washington D. C. Chapter of the Association for Computing Machinery has awarded Marvin V. Zelkowitz $150 for his paper "Simulation and Implementation of a Computer Network" contributed to its 13th Annual Technical Symposium, co-sponsored by the National Bureau of Standards. The D. C. Chapter also awarded honorable mention in its Samuel N. Alexander Fellowship competition to A. Bruce Carmichael and Tomlinson Rauscher, who each receive a $100 award.

○○○

William F. Atchison is on leave this year at the National Institute of Education. In the Program for Productivity and Technology he will be helping to prepare long-range plans and reviewing grants and contracts in the educational application of computers. Professor Atchison recently received a citation from the International Federation of Information Processing Societies in recognition of his work as chairman of Working Group 3.1 on Secondary School Education. WG 3.1 is primarily concerned with teacher training at the secondary-school level where computer use is rapidly increasing.

It's a Girl

Marci Ilene Hecht
July 29, 1974

It's a Girl

Geetika Agrawala
August 21, 1974

Departmental Equipment

By now most faculty realize that some form of minicomputer is in Room 4364; however, not everyone realizes what other resources are available in the Department. This is a brief report outlining the facilities currently available. (The next installment will cover equipment owned by research grants held by Departmental members.)

MINICOMPUTER EQUIPMENT

The Department currently owns a PDP 11/45 with 24K 16-bit words of core memory. Attached to this machine is an ASR 33 Teletype, a Canberra 2020 cassette tape unit with three drives, and an International Memory Systems 113 disk with 2.5 million words of storage. One of the two packs on this disk is removable, allowing users to insert their own systems or data storage. The PDP 11/45 also has two DC-11 communications links which allow telephone connection with other devices at 110 or 300 bits/second.
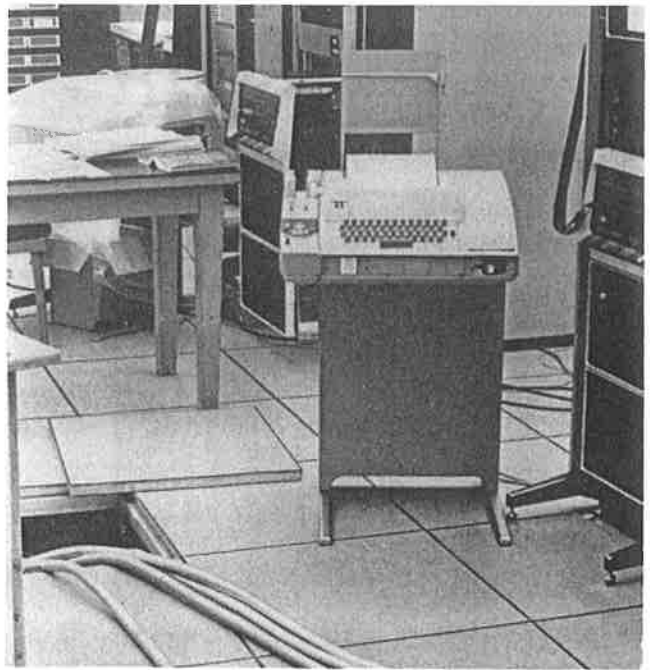
The order has just been placed for a PDP 11/40, with 16K words of memory and a Teletype console.

COMPUTER TERMINALS

The Department has an assortment of terminals to use with PDP 11s, the 1106 or 1108 systems, or any machine which can be dialed from a data set. The terminals include the following:

An ASR 33 Teletype that permits 110 bits/second (bps) communication using either the keyboard or paper tape. An ASR 38 Teletype permits 132-character lines with upper and lower case printing, at 110 bps from keyboard or paper tape.

Two Hazeltine 2000 CRT terminals (one still undelivered) have been purchased. These permit communication (upper and lower case) at speeds up to 9,600 bps; however, the fastest data sets now available are 300 bps. The undelivered Hazeltine is to be equipped with video circuits to drive two Conrack monitors (also on order). This system can be used to display terminal output to a class.

A Tektronix 4002 storage tube display is also on loan from the Computer Science Center. It is not is good repair, and will probably soon be replaced by another device.

OTHER EQUIPMENT

The Department also has the following:

Two viewgraph projectors (blank transparencies can be obtained from the Departmental Office, and there is a means to make transparancies from opaque copy);

16 mm film projector;

35 mm Carousel slide projector;

4" x 5" slide projector;

Portable projection screen (some classrooms have built-in screens).

--Marv Zelkowitz

Colloquium

This year's series begins with a special Thursday colloquium on September 12, then continues with the regular Monday schedule. Coffee is served at 3:30 in the Lounge (Room 3316); talks begin at 4:00 in Room 2324.

The first five speakers are:

September 12: Prof. Wesley Chu, "Performance of Paging Virtual Memory Systems."

September 16: Dr. Michael Flynn, "An Emulation Laboratory."

September 23: Dr. Anthony Mucciardi, "A New Class of Search Algorithms for Adaptive Computation."

September 30: Dr. Victor Basili, "A Structured Approach to Language Design."

October 7: Dr. Walter Jacobs, "The Robot Chauffeur."

The public is invited to attend.

Publications, Etc.

Zelkowitz, M. V. *PLUM Reference Manual*. Computer Science Center Computer Note CN-8, College Park, July, 1974.

Basili, V. R. *The SIMPL Family of Programming Languages and Compilers*. Computer Science Technical Report 305, College Park, June, 1974.

Auguston, J. G. and J. Minker. *Global Parallel Unification for Large Question-answering Systems*. Computer Science Technical Report 307, College Park, June, 1974.

McHugh, J. and V. R. Basili. *SIMPL-R and Its Application to Large' Sparse Matrix Problems*. Computer Science Technical Report 310, College Park, July, 1974.

Zelkowitz, M. V. *PLUM: The University of Maryland PL/1 System*. Computer Science Technical Report 318, July, 1974.

Hamlet, R. G. *Introduction to Computation Theory*. Intext Educational Publishers, New York, September, 1974.

Agrawala, A. K. and T. G. Rauscher. Microprogramming: perspective and status. IEEE *Transactions on Computers C-23* (August, 1974), 817-837.

Lay, W. M., D. L. Mills, and M. V. Zelkowitz. Operating systems architecture for a distributed computer network. *Proceedings of the IEEE/ACM Conference on Trends and Applications of Minicomputer Networks*, Gaithersburg, April, 1974.

Rosenfeld, A. Picture processing: 1973. *Computer Graphics and Image Processing 3* (June, 1974), 178-194.

Hayes, K. C., Jr., A. N. Shah, and A. Rosenfeld. Texture coarseness: further experiments. IEEE *Transactions on Systems, Man, and Cybernetics SMC-4* (September, 1974), 467-472.

G. W. Stewart

The newest member of the Department's faculty is Professor G. W. ("Pete") Stewart, who holds a joint appointment with the Institute for Fluid Dynamics and Applied Mathematics. Born in Washington, D. C. some 33 years ago, Dr. Stewart has done scientific programming for Union Carbide (Oak Ridge) and General Electric (Phoenix). His academic appointments include the University of Texas and Carnegie-Mellon University. His interest in computer science dates from Oak Ridge--he still considers himself an East Tennesee hillbilly.

Dr. Stewart was a student of Alston Householder, and has about 40 publications and invited talks to his credit, including a text, *Introduction to Matrix Computations* (Academic, 1973). He is a member of the editorial board of the SIAM *Journal on Numerical Analysis*. Although numerical analysis is his forte, he is not above teaching courses to learn about other things. This semester he is teaching CMSC 878B, and is chairman of the Colloquium Committee.

Talking Computer Blues

```
                G                            C
Here's a story 'bout you people in physics and math
     D7
Who trudge along the scientific path.
     G                       C
You get an idea that you think's real nifty,
        D7
So you run to try it out on IBM's 650.
```
[1]
```
             G
     It's a marvelous machine...
     C
     Does practically everything;
     D7                      G
     Has an I. Q. of 0.1.
```

You dash over to Phillips[2] like a real hell-benter,

Come charging in to the computing center

Where you're politely informed by the local
    authority

That three other jobs have top priority:

    There's chicken-feather sampling for the Ag
        School;

    Sandbox correlation for rural sociology;

    And some idiot in game theory is trying to
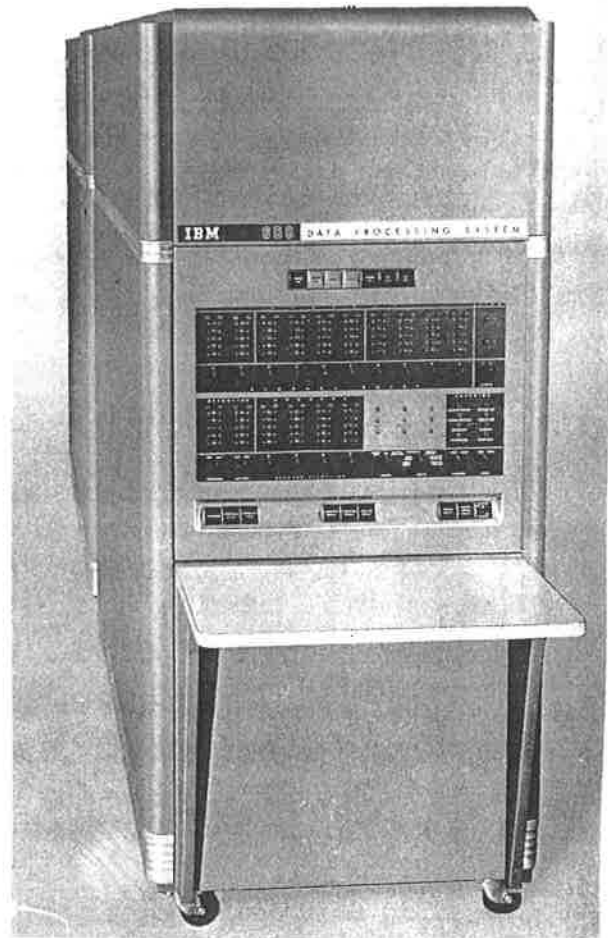   program it to play "steal the old man's
        bundle."

But you control yourself, don't fly in a tizzy,

Just sign up for a time when the machine's not busy.

You think you're pretty smart out-foxing them--

You show up on the machine at 3:00 A. M.

    But it's got a' clocking error...[3]

    There's a card jam at the input...[4]

And you've got triple bits in your lower accumulator.[5]

1. IBM 650 console, and (behind) 655 power unit.

2. This version of the TCB was written at Cornell, where the computer was in Phillips Hall (Electrical Engineering). It has moved several times since.

3. The 650 placed great stress on hardware reliability. It had a number of internal checks designed to see that it would not run if a problem existed. This meant that it often didn't run. I imagine there were the usual number of experts about who "explained" what was wrong with phrases like "clocking error," and thought they were being helpful. In fact, there is no shortage of such people today.

4. Most IBM card equipment had a tendency to take in more cards than were let out. This was called a "card jam" by those whose cards had not been eaten, and other things by those whose had been.

5. *The number system of the 650 was "bi-quinary," a seven-bit representation indicated this way:* [diagram] *The lower five bits represented either 0,1,2,3,4 or 5,6,7,8,9 depending on which upper bit was lit. Such a code should always have just two bits on, one upper and one lower. When three were on it was "triple bits" and it caused a stop. The accumulator of 20 digits was divided into two 10-digit parts called "upper" and "lower."*

But you manage to untie this Gordian knot--

You kick the machine in a vital spot.

Now flushed with success you're on top again,

You get all set to run, and then...

> It blows a fuse.
>
> You blow a fuse;
>
> Your output becomes unprintable.

When they open up the center at 9 the next day,

They find you there behaving in a very strange way.

You're running around like you're all out of joint

Screaming four-letter words (in floating point).[6]

> But they're understanding.
>
> They separate the cards you've chewed from the unused ones.
>
> Someone punches you "OUT".[7]

But when all's said and done, things turn out well

'Cause after spending six months in a padded call

You come out, and now you've got experience a-pleanty...

But they've replaced the damn machine with a Burroughs 220![8]

> But you don't get excited...
>
> You follow a perfectly rational course of action.
>
> This is your story, George Lincoln Rockwell.[9]

6. *Since the 650 had no floating-point hardware, users were expert at converting in and out of this representation.*

7. *This line is probably not from the original version. It seems to fit, but probably describes Burroughs 220 operating procedures, in which a regular time clock was used for accounting.*

8. *The 650 had an assembler of sorts, and the first FORTRAN compilers were written for it. But most programmings didn't bother with such nonsense: they programmed in 10-digit decimal absolute. For these people a new machine was complete disaster--that is, reprogramming. The Burroughs 220 supposedly solved the problem, since it had a predecessor of ALGOL 60, but there is a 220 version of the TCB, too, since the successor (a CDC 1604) had only FORTRAN and assembler. "You come up to the center/ And they're tearing up the floor/Installing a CDC 1604..."*

9. *In the original version the name was that of a current newsmaker, the "mad bomber" of New York City. But his name was forgotten, and the head of the American Nazi Party was substituted. Perhaps now we can use a name that will be remembered for quite some time: Richard Nixon.*

--Dave Goldberg (c. 1960)
annotated by Dick Hamlet