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NEWS LETTER

March 20, 1967
Volume 1, Number 2

26 North Hall
St. Paul Campus

It gives us a great deal of pleasure to announce that our long awaited IBM 360, model 30 computer has been installed and is operational. We are very pleased with its speed and capabilities. Because of its highly versatile Operating System which can be tailor made to fit our specific needs and its inherent capability for easy expansion in terms of both performance and application, we feel it should adequately satisfy our needs and the needs of those we serve for some time to come.

BRIEF DESCRIPTION OF THE IBM 360 COMPUTER

For the most part the Computer is operated via a Monitor called the "Supervisor". Its Operating System (more specifically called the "Disk Operating System") consists of a comprehensive set of commercial and scientific programming aids that operate under the supervisory control and coordination of an integrated set of control programs.

--- Devices on the System ---

1. Card Reader (1000 card per minute) FORTRAN Unit number is 1
2. Card Punch (400 card per minute) FORTRAN Unit number is 2
3. Printer (600 line per minute) FORTRAN Unit number is 3
4. Console Typewriter (used for communications to and from the computer) FORTRAN Unit number is 15
5. One Disk Drive (7.25 million character capacity).

Approximately 3.75 million positions are required to hold the Operating System and the remainder, 3.5 million positions, is available as easy access work area for user programs.

The work area currently contains 3 files which together could store approximately 25,000 eighty column card images or about 500,000 FORTRAN words. The FORTRAN Unit numbers for these disk files are 4, 5 & 6. It should be mentioned that these work areas are temporary in nature and are released to the Operating System between jobs.

6. One Tape Drive (23,000,000 character capacity per reel of magnetic tape).
Here the capacity is dependent on record length. A reel of tape can contain approximately 40,000 eighty character records (3,200,000 characters) or it may contain 2,700 eight thousand character records (21,600,000 characters) -- the difference in records stored is dependent on the number of inter record gaps needed (gaps are .6 inches long).
The FØRTRAN unit number for this tape is 9. Before writing or reading magnetic tape an outside user should make the necessary arrangements with the Center for the use of a reel tape. Incidentally, a reel contains 2400 feet of tape.
7. Two additional Tape Drives will be installed December 1, 1967.
8. Memory size is 32,000 bytes (8000 FØRTRAN 32 bit words). This is about three times the size of the 1401 Computer because of the reduction in instruction length.
9. 1401 Compatibility feature.
10. Interval timer.
11. Universal character set.

--- Software available on the system ---

1. FØRTRAN compiler (FØRTRAN IV, E LEVEL)
2. CØBØL compiler (Common Business Oriented Language)
3. RPG Compiler (Report Program Generator)
4. ASSEMBLY Compiler
5. PL/1 Compiler (to be implemented soon)
6. Utility programs (about 30)
7. Disk and Tape Sort / Merge programs
8. Control programs and routines (about 200)
9. Scientific subroutines (about 150)
10. Stacked job processing control programs
11. Compatibility initializer program
12. Multiprogramming control routines

SUBMITTING COMPUTER RUNS FOR THE 360

All computer runs for 360 will require a header card having the following format:

Columns	1 - 2	=	"//" (two slashes)
Column	3	=	Blank (not punched)
Columns	4 - 6	=	"JOB"
Column	7	=	Blank (not punched)
Column	8 - 11	=	Project number (the 4 digit number which was assigned to you when the project was started).
Column	12	=	Blank (not punched)
Column	13-15	=	Initials of the individual requesting the service.
Column	16-80	=	Optional (any other information to further identify the project).

It is very important that columns 1 through 15 be prepared as indicated by each customer submitting a 360 computer run. This card must be the first card of every program deck (or data deck when generalized pre-programmed routines are being used). If this card is not present the job will not be run. It is recommended that customer's full name, department and phone number be placed in columns 16-80. Customers who have regularly scheduled runs need not prepare this card. This card will be used for accounting purposes, in that it will automatically call the computer clock and give a time stamp on the printer and console typewriter at both the beginning and end of the job, thus giving the interval the computer was utilized for each project. The time stamps are of the following format:

HH . MM . SS

where HH means the hour of the day (08 = 8 AM; 13 = 1 PM;
20 = 8 PM; etc.).

where MM means minutes

where SS means seconds

The System printer will also output the date of the computer run, which will have the following format:

MM/DD/YY (no explanation needed).

THE CONSOLE TYPEWRITER

Although it serves many other functions, the main objective of the console typewriter is to log all of the computer's activities on a job-to-job basis. The console's printed output will not be made available to the customer (basically the same information is printed on the System printer). All of the activities recorded on the console will remain on file for billing purposes and for resolving questions which may arise with regard to "time on" and "time off" the machine or with regard to what the "operator replies" were when external action was requested by the operating system, etc.

UNIVERSAL CHARACTER SET

This feature, which will be installed about April 1st, will expand the current 48 character set to a 60 character set. The 60 character set contains the following graphics:

10 Numbers 0 - 9

26 Alphabetic characters A - Z

24 Symbols . < (+ | { \$ *) ; ~ - / , % _ > ? : # @ ' = "

A special feature of the system allows the programmer to load the print buffer with any code he wishes and associate it with any desired symbol; e. g. , all 9's could be made to print out as asterisks, or all alphabetic information could be made to print as blanks, etc. This may be of interest to individuals who wish to develop plotting or graphing routines.

PUNCHING OF FORTRAN PROGRAMS

The I B M 360 FORTRAN IV E Level compiler will accept both the old and the new assigned codes for the following 4 symbols:

Old-Code		New-Code	
<u>Symbol</u>	<u>Card Code</u>	<u>Symbol</u>	<u>Card Code</u>
%	0-8-4	(12-8-5
□	12-8-4)	11-8-5
€	12	+	12-8-6
#	8-3	=	8-6

We recommend that the new codes be used in all cases except when the FORTRAN program might also be run on the CDC 6600 in which case the old codes should be used. If the old codes are used on the 360 the old graphics will be printed out. Incidentally the Center has a program which will switch any desired card input code to any desired punched output code, so programs for either machine may be converted quickly.

SCIENTIFIC SUBROUTINE PACKAGE

IBM has released a large scientific library of computer programs (about 150) which is now in shop. These programs will be brought up to an operational stage one by one and when they are performing satisfactorily they will be announced. A list of the programs with a brief description will be made available shortly and will be announced via a newsletter. Only the most frequently used routines will be made operational at the outset. Anyone desiring a particular routine should make it known to the Computing Center personnel.

BRIEF DESCRIPTION OF FORTRAN IV

--- Additions --- (over and above that available on the 1401)

1. COMMON statement
2. EQUIVALENCE statement
3. REWIND statement
4. BACK SPACE statement
5. END FILE statement
6. DOUBLE PRECISION, REAL, INTEGER (type statements)
7. The third Dimension
8. Mixing of REAL and INTEGER arithmetic is now legal
9. Disk utilization capabilities
10. Magnetic tape utilization capabilities
11. On line compiler
12. SUBROUTINE facility
13. FUNCTION facility
14. RETURN statement
15. 'T' and 'D' conversion codes
16. Literals in format statements
17. READ and WRITE statements (FORTRAN IV format)

--- Differences --- (with that of the 1401 compiler)

1. The IF (SENSE SWITCH n) statement is no longer supported.
2. The library functions no longer end in 'F'.
3. The A conversion maximum field width is now 4 (or is 8 if Double Precision is used).
4. Compilation is about 15 times faster than that of the 1401.
5. Program execution is about 10 times faster than that of the 1401.

A much more detailed description of FORTRAN IV will be announced in the near future. In the meantime FORTRAN IV orientation sessions will be held Tuesday afternoons from 1:00 until 3:00 PM starting March 28th. and ending May 2nd. Those attending these sessions should know basic FORTRAN and should have successfully programmed a Computer application at least once. If you wish to attend any of these sessions please contact our Secretary, Mrs. Eva Klein at 647-3397, leaving your name and phone number. If less than 5 people are scheduled to attend by 9:00 AM each Tuesday the session will be cancelled and the people contacted. A maximum of 20 people will be allowed in each session and will be handled on a first-call first-served basis. The sessions will be held in Room 6A North Hall (our conference room area).

DISPOSITION OF THE 1401 COMPUTER

The 1401 will be shipped back to IBM for reassignment the first week in May. All of the 1401 computer programs such as the MEDCOMP statistical library, the FORTRAN II compiler, and many other generalized routines are operational on the 360 computer with the use of the compatibility feature. This feature permits all of the programs written for the 1401 to be executable on the 360.

DELIVERY SERVICE TO NAC

The Computing Center has discontinued having daily runs to and from the Numerical Analysis Center and starting Tuesday, March 21st, only two runs will be made per week --- these days being Tuesday and Thursday. The delivery man (from the Farm Maintenance shop) will leave from Room 26, in North Hall, approximately 1:00 PM and should return about 3:00 PM on those two days. He has been asked to return to the Center all projects and materials having the prefix "2250" (first 4 digits of NAC account number) and/or all materials marked "SPCCC". Thus, if you wish to take advantage of this service but do not have the "2250" prefix number, please mark the associated input materials with "SPCCC". Those individuals who have a "2250" prefix number but do not wish to have their materials returned should mark the materials "Do not return to SPCCC". For those using the service it is suggested that all the input data decks (and card boxes) be clearly marked with the proper account number or the labeling mentioned above.

POWER OUTAGE

The Computing Center will be closed Good Friday, March 24, 1967. The electrical supply to the Computing Center will be turned off that day to allow workmen to install the proper control panels for the new computer system.

KEY PUNCH WORK NEEDED

At the present time we are right up to date on all our Key Punching and would like to 'beat the bushes' for possible new Key Punching Projects. We are interested in long-term, high-volume projects for fill-in purposes. In any case, individuals who have any punching to be done in the near future might submit their jobs now to avoid possible layoffs in this section. Please call or see Agnes Miron, Key Punch Supervisor (647-3668).

ENTRANCE TO ST. PAUL CAMPUS COMPUTING CENTER

We wish to encourage the use of the south entrance to North Hall (at the top of the hill near the Student Center) to gain entrance into the Computing Center for customers having business with our Computer Programming and/or Key Punch sections. An attempt is being made to hold the traffic through the Computer room to a minimum in order to maintain necessary environmental conditions in that area. Customers requiring the services of the Manager, Secretary, and/or Operations section should use the east doors at the base of the hill.

If you wish to be included in our newsletter mailing list or wish to remove your name from the list, please fill out the following form and return it to Mrs. Eva Klein, 26 North Hall. If you have any colleagues to whom the newsletter might be of interest, please show them this issue.

Name _____

Dept. _____

Campus Address _____

Name _____

Dept. _____

Campus Address _____

Name _____

Dept. _____

Campus Address _____