COMPUTER USAGE COMMUNIQUÉ

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COMPILATION

FUNCTION (INFORMATION RETRIEVAL)

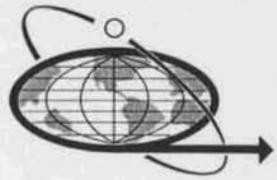
Technological developments over the past fifty years have added immeasurably to the available literature in all fields. Coupled with the increase of information on existing disciplines has been the opening up of completely new areas. Nucleonics and Bionics, for example, are relatively recent.

A scientist, indeed a professional man of any sort, finds himself overwhelmed by a plethora of information. How much of it is vital? Where is the particular answer he wants now? There simply is not enough time to read all the information in his own field. Peripheral disciplines are hopeless.

The problem is more than individual. It is corporate and governmental as well. Abstracting services have been set up to sift material produced and make it easier to use. There are 500 such services in the U.S. alone. Computers have been drawn into the struggle to classify, translate and catalogue. Many firms are devising schemes to index and abstract needed information in their own libraries. We at CUC have been called upon to assist Bell Telephone laboratories in using their 7090 to prepare abstracts for their scientists and engineers. Ascher Opler has long been involved with the problem and the many proposed solutions. The Keyword method is in widespread use and seems practical in certain fields.

There are many facets to the problem. No universally accepted indexing scheme has been developed. Indeed, there isn't even agreement on the approach to be taken. The problems of dissemination, transmission and display have yet to be thoroughly explored. Translation looms ever larger.

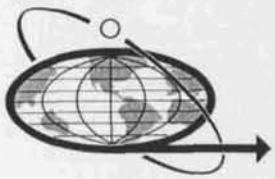
The present world political climate adds an extra factor of importance to a viable solution. Russia maintains a center in Moscow which gets all publications. They are translated and disseminated with such rapidity that it is sometimes faster to get a publication from Russia rather than the original publisher, even in the country of its origin. A national center is opposed here in the U.S. by many who have studied the problem. It



is felt that regional centers with rapid tele-communications systems, are more feasible. The role of government in this activity has been hotly debated.

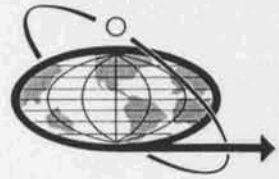
One development clearly emerges. Information storage and retrieval must be done by machine to be done efficiently. A very large problem in devising a scheme is that of obsolescence of technique. Current advances in science and their concomitant increases in volume and classification of necessary fact are simply dizzying.

Whatever the ultimate basis for the emergent national IR System may be, computers will play a vital part. As users of EDPM we will be concerned in implementing the techniques. The problems posed present an interesting challenge.



ENVIRONMENT DESCRIPTION

Computer Usage has been continuing to grow. Dr. F. John Fayers has joined the New York office as Director of Scientific Programming. John comes to CUC from UCLA, English Electric Company, and the California Research Corporation. Barbara Ann Fleischman from CBS will be secretary to Anthony Penta and Liston Tatum in New York. Eric Krupnick of J. R. Wiliston and Beane has joined the office staff of CTS. Jane Lichtenstein is a programmer. Jane's experience includes programming for American Telephone and Telegraph. Carmel Mecca has come to the New York office from Standard-Triumph Motor Company, Incorporated. Carmel will be secretary to John Fayers and John Sheldon. Judy Morrison will be senior programmer in the New York office. Judy has been programming for the New York Telephone Company. Yvonne Saleh, formerly of Socony Mobil Oil Company in New York is a senior programmer. Robert Scheiter brings his experience on RCA computers at Moorestown to the CTS staff of assistant console operators. Peter Quint from Sperry Gyroscope will be an analyst in the New York office. Analyst Richard Watson has been added to the Washington office staff. He joins CUC from IBM where he was a technical sales assistant.



COMMON

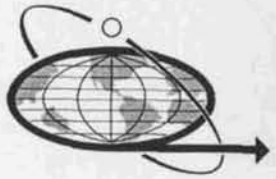
The critical path scheduling phase of the IBM 1401 "LESS" program was used and found to be most satisfactory. The program was used on an 8K machine and running time was four minutes for 38 node points. For future users there is just one caveat. The deck contains "clear to nines" cards for 8, 12, and 16K memory. It is important to use the appropriate "nines" card in loading the deck. M. Merritt.

A new ARGUS Sort and Collate Manual has been announced. It is DSI-43A, a revision of the current manual and has been ordered for the library.

Version 2 of 709/90 FORTRAN has been announced by IBM. Tapes have been sent to SHARE for copies of the Master, Symbolic and Listing Files.

The Burroughs B200 series computers are designed for two markets: first, for the smaller sized 1401 type applications for installations entering the field for the first time and for installations needing a small satellite computer for card reading and punching and for printing; and second, for bank and insurance accounting. From my rather limited sources sources of information, Burroughs has been losing out somewhat to NCR locally in the latter area, the B200 series is designed to put them back in the market. This summary will concentrate on competitiveness with the smaller 1401's in the general purpose field.

The ability to compete with the 1401 is based on more effective through-put for less money. The basic central processing unit for each of the four systems B250, B260, B270, and B280 contains 4800 alpha-numeric characters of memory, two input buffers for card readers or banking equipment (one or two card readers at either 200 or 800 cards per minute or one of each speed). The card handling equipment utilizes a magnetic rather than a mechanical clutch so that the CPU does not have to wait until the next card cycle to obtain the next card. The mechanical clutch gives the 1401 an effective speed of 100 or 200 cards per minute in many pure card operations. The B321 printer has its own buffer and a rated speed of 732 lines per minute (the literature only claims 700) single spaced, and will be slowed down only to the speed that output is delivered to the print buffer as a print cycle will start with the printer drum positioned to any character. Spacing and skipping speed is 33 1/3 inches per second. Both card and printing equipment contain extensive checking features to insure the accuracy of the mechanical equipment.

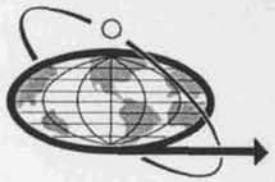


At the EJCC Burroughs is planning to exhibit an accounting oriented system in full operation and will deliver said system to a bank at the end of the conference. The series is in production, with ten or not many more weeks delivery time on most configurations. If a customer placed an order now, he could test with the 220 or the 205 simulator. Also if the computer were to be used as an off-line satellite with IBM equipment, there is no conversion problem as the tape units can be described as 729 II's which operate at 90 inches per second instead of 75. This gives a transfer rate of 18 KC at 200 characters per inch density and of 50 KC at 555.5 characters per inch. In addition to the input-output equipment listed, Burroughs is preparing but is not yet ready to announce paper tape equipment and some sort of random access large cheap memory. (It came to my attention some time ago that they had stopped working on a CRAM type of storage for something that they thought would obsolete it. However, I have heard nothing since.

The characteristics of the computer itself are as follows. Memory access cycle is 10 microseconds. Each character in memory is alphanumeric and individually addressable by a three character address. An instruction requires 12 characters. The first character is the operation code, the next two field size (there are no word marks in this machine) or I-O information, and the rest of the instruction word consists of three character addresses. For example, an add instruction is add A to B and store in C. For a full description of the address structure see page 2-4 of the reference manual. In accord with Burroughs policy of trying to reduce programming to analysis there are only 13 commands for internal processing: add, subtract , multiply, divide, compare alphabetic, compare zone, compare numeric (multiply, divide, HiLoEq compare are standard), branch conditional, branch unconditional, halt, nop, transfer data, and mask. Appendix 1 of the reference manual has a summary description of each of these and of the input-output commands. In addition to ease of programming there is a working report generator which they claim is terrific in efficiency and in ease and simplicity of use. As I have not yet used it, I have no comment. There is a sort generator, also working, which will work on any system with four or more tapes. On the negative side the assembly program must generate a macro-instruction to perform address modification as there are no direct instructions to do so. I was told four instructions will do this, but even with three address logic, I am dubious. The memory of 4800 characters is not expandable save for the unannounced mass random access storage. This does avoid the problem caused by program incompatibility from 1401 to 1401.

In conclusion, if the extensive error checking and the immediate access clutch work as specified, Burroughs, with its integrated data processing approach, may be re-entering the computer field.

A summary of a one day evaluation conference at Burroughs' Washington, D.C., office on November 14, 1961 by A. Rundquist.



OUTPUT

Automation Begins at Home

Jill Kelly and George Kabouchy have written a two pass program which will partially automate CUC's cost accounting. Both passes were designed to be run either on a 4K or 8K 1401. The program consists of two passes. Pass 1 - summarizes the total hours of each employee's work on each project; distributes his cost (i.e. salary) to the various projects he worked on; prints a report which lists the total projects by employee, and punches out cards containing total hours and cost per project by employee (one card per employee per project). Pass 2 - utilizes the output from pass 1 to print a summary report containing hours and cost totals for each project, and a final breakdown on hours and cost, both billable and non-billable, for programmers, senior programmers, analysts etc. The input for this package depends on you. Please submit your time sheets promptly. G. Kabouchy.

INPUT

TEXTS

The Executive Secretary by Burke
Probability Theory by M. Loeve
Programming and Coding for Automatic Digital Computers by G. Evans and C. Perry

MACHINE MANUALS AND BULLETINS

IBM 7090

Bulletin: Sorting Times for the IBM 7090 with IBM 729 VI Magnetic Tape Units
IBM 7090 Generalized Sorting Program Using IBM 7340 HYPERTAPE Drives.
IBM 7090 with IBM 7340 HYPERTAPE Drives; Programs and Programming Systems

7340 HYPERTAPE

Reference manual
Bulletin 7080 HYPERTAPE
Bulletin 7074 HYPERTAPE
IBM HYPERTAPE Input/Output Control System for 7000 Series Data Processing Systems
Bulletin 7090 HYPERTAPE

IBM 7074

IBM 7074 Generalized Sorting Program Using IBM 7340 HYPERTAPE Drives: Specifications and Timing Estimates
IBM 7074 with IBM 7340 HYPERTAPE Drives: Programs and Programming Systems

IBM 1410

IBM 1410 Input/Output Control System for Card and Tape Systems: Preliminary Specifications.

IBM 1401

Bulletin: Disk File Organization for the IBM RAMAC 1401
Reference manual A-24-1403-4; A MAJOR REVISION as of September, 1961. The revisions affect: Bit configuration for sign indication in arithmetic operations. Compare instructions 7330 tape print operation 1407 inquiry station. Contents of B-address register after operation for instructions of fewer than 7 positions.
Document Design Requirements for IBM 1418

IBM 1620

Bulletin: IBM 1620 FORTRAN; Specifications J 26-5598.
SUPERSEDES J 28-4200, J 28-4200-1 and J 28-4200-2
Bulletin: IBM 1620 FORTRAN II: Preliminary Specifications.

IBM 705/7080

7058 PROCESSOR DECISION ARITHMETIC AND TABLE LANGUAGES, Preliminary Reference Manual.
7058 PROCESSOR: REPORT/FILE WRITING LANGUAGE Preliminary Reference Manual.
IBM 7080 Preliminary Utility Manual - parts I thru V
IBM Generalized Sorting Program Using IBM 7340 HYPERTAPE Drives: Specifications and Timing Estimates

CDC 1604

FORTRAN Manual
Programming Manual
Approximations for the CDC 1604

CDC 160

Input - Output Specifications

CDC 1610

Description and Operation - Volume I

CDC 1607

Magnetic Tape System - Volume I - Description and Operation

Honeywell 400

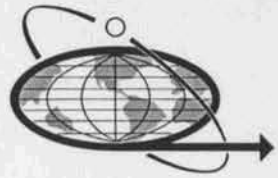
Installation Planning Manual

GENERAL INFORMATION MANUALS

729 V and 729 VI Magnetic Tape Units Bulletin.
PERT ... A dynamic project planning and control method
7330 Magnetic Tape Unit Original Equipment Manufacturers Information.
COGO - Language for coordinate geometry.
General Information Manual - FORTRAN

SHARE DISTRIBUTIONS:

#1097 GNSRBL 1401 peripheral simulator.
#1098 NA 1-1Z1X 1401 tape duplication or compare
#1195 LP - 90 System tape; usage manual; squoze cards. Linear programming system for 7090
#1198 COMT, manual, binary deck; language for symbol manipulation for 7090
#1188 GNCPS; FORTRAN deck; critical path scheduling program.



7070 PROGRAMS

H.3.006 Multiple regression; FORTRAN and object
Collins Radio PERT - object deck

PAPERS

Preprints of Papers Presented at the First International Conference
on Machine Translation of Languages and Applied Language Analysis

SYSTEMS CORRECTIONS

7090 32K FORTRAN #120
9 PAC EDITOR #24
SOS, complete MOD 11

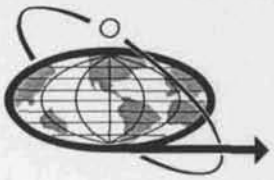
NEW SYSTEMS

7090 32K "COMMERCIAL TRANSLATOR"

FORMS

IBM 1401 Timing estimate sheet
IBM 1401 storage layout
COBOL coding form

Printed by Systems Dept., Computer Usage Company, 18 East 41st St.,
New York. Managing Editor A. Opler, News Editor Miss D. Walsh,
Art Editor C. Dieli.



Memo to 1401 programmers, re address-modification.

1. It is legitimate for the SBR (store B-register) instruction to have a B-address. Watch what happens:

   (a) SBR X1, 000
   The 000 enters the B-address-register before the SBR is executed. Hence it is this 000 which is stored, not B_p. The net effect is to put 000 in X1 without creating a literal of 000. This might be useful if for any reason one wished to avoid creating literals.

   (b) SBR X1, 025+X1
   Suppose X1 contains an address. The effect of the SBR is to store that address, incremented by 025, back into X1. Thus we have modified an address without using the MA instruction.

   (c)

```
TAG   MCW   ALPHA,    BETA        Line 1
      MCW   TAG+6,    X1          Line 2
      SBR   TAG+6,    025 + X1    Line 3
```

   The net effect of Lines 2 & 3 is to increase by 25 the B-address of the Move instruction in Line 1. Again, we have modified an address without using the MA instruction.

2. Why this aversion to the MA instruction? Because using the MA instruction it is not possible to compile so as to obtain an object deck which will run interchangeably on a 4K or an 8K machine, and interchangeability is sometimes essential. See para. 3 if you want to know why it isn't possible to obtain an interchangeable object deck.

3. (a) If I use the MA instruction as follows:

```
MA      @025 @, TAG+6
```

   and compile for an 8K (or larger) machine, the MA compiles normally. My object deck will run okay on an 8K (or larger) machine, but will hang up on an 4K because the 4K does not have MA in its instruction repertoire.

(b) If I compile for a 4K machine, Autocoder treats the MA as a macro-instruction, and generates:

```
SW      TAG+4
 A      @025@,      TAG+6
CW      TAG+4
```

This will run okay on a 4K machine, but no on an 8K, since the ADD does not handle the zone bits correctly.

(c) Also note that

```
MA      @025@,      089
```

will generate, when compiling for a 4K

```
SW      087
 A      @025@,      089
CW      087
```

This won't even run properly on a 4K, since index registers must have a work mark under the high-order position.

4. I will be glad to explain the SBR gimmick further to anyone who does not understand how it works or why it is useful.

Jill Kelly