

# *the* I.P. Sharp *newsletter*

MARCH/APRIL 1974



## COMPUTING BY CANDLELIGHT!

On a recent visit to Britain, Maurice Elliott of Massey-Ferguson was not deterred in his terminal work by blackout restrictions - witness the above photograph. Maurice is a welcome contributor to the Newsletter, and a busy one as you'll see by his "bug work" on page 5.

## UP AND RUNNING ... more or less

It's all over but the shouting; our Toronto offices have moved to large new premises on the 14th floor of York Centre. The Computer Centre move went reasonably well, thanks in large measure to the efforts and extremely long hours put in by members of the Operations staff, the Software Development group, and also by Bell Canada computer communications installers. As some of our APL users will know however, we did encounter some problems in the first week. Specifically, one "terminal control unit" (responsible for control of 96 telephone lines) was badly jarred during the move. This resulted in considerable down time for the Canadian system computer. The problem was compounded by the difficulty in assessing the damage. Diagnostic routines worked fine on the unit, with failures occurring only when it operated under live APL conditions. A power failure on the entire north side of the building was coincident with our first day of operation in the new location, and we're naturally hoping that this isn't predictive of things to come. Apropos such operating difficulties, the article "Workspace Crash Recovery" on page 3 may be of some interest.

You might be interested to know that the Canadian Overseas Telecommunications Corporation (COTC) last year incurred total costs of:

\$24,000,000.00

Their total operating profit was:

\$18,000,000.00

Not bad for a Canadian federal government agency, established for the sole purpose of ensuring that Canadians get a fair shake in the overseas communications business.

# APL 6

## May 14-17

Right next door to Disneyland, this year's International APL Users Conference takes place in Anaheim, California, May 14-17th. The Users Group, led by Professor Garth Foster, Syracuse University, has in five years grown from a small collection of APL enthusiasts to an organization which is formally accorded the title of SIGPLAN Technical Committee on A Programming Language (STAPL). APL is the only computer implemented language to be so recognized by the Association for Computing Machinery.

The Conference promises to be a stimulating one, with over 60 papers on the session list, and more than a dozen exhibiting companies. A sample of the topics includes: *TECHNIQUES FOR COMPUTER ADMINISTERED EXAMINATION OF RESTRICTED OR CONFIDENTIAL MATERIAL*, Leslie Davis and Daniel Macero, Syracuse University; *APL AS A LANGUAGE FOR INTERACTIVE COMPUTER GRAPHICS*, Alfred Bork, University of California; *MANAGEMENT INFORMATION/DECISION SYSTEMS USING APL*, John G.H. Carlson and Richard Gilman, University of Southern California; *APL AND MIS - TWO COMPATIBLE CONCEPTS*, Rolland A. Hurtabise and Yves Poulin, University of Quebec; *THE USE OF APL IN THE TEACHING OF PROBABILITY*, K.W. Smillie, University of Alberta; *FLEXIBLE BUILDING OF SPECIALIZED RETRIEVAL SYSTEMS*, Jean-Claude Pages and Anne Mauboassin, IBM Paris Scientific Centre.

The Conference is being held at the Sheraton-Anaheim Hotel, hosted by the Coast Community College District, Costa Mesa, California. Registration is \$40 (\$15 for Students) and includes one copy of the proceedings, Banquet, session refreshments, and evening reception. Contact: John R. Clark, Orange Coast College, Costa Mesa, Ca. 92626.

Don't miss this important event in the APL community!

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### TEXT MANAGEMENT SYSTEM

A Text Management System will be announced in the near future. This is a comprehensive package designed to help the users who wish to process textual material. It should be of particular interest to librarians (for bibliographic information, indexing, etc.), to those who wish to process questionnaires containing literal answers, and to those whose interest is in textual retrieval based on a key-word-in-context or a key-word-out-of-context index.

The package includes provision for the indexing of text without a prewritten keyword list. It uses a deadword list to inhibit the indexing of certain words, but makes the keyword list from all the remaining words in the text. It has options for handling text that is stored as vectors with or without an arbitrarily defined delimiter to delineate fields as well as text that is in matrix form with columns designating fields. Retrieval, keyword indexing and concordancing are available options. The amount of text shown with the retrieval option, which permits combinational techniques, is also conversationally adaptable to the user's needs. This system will be found in library 75 by about April 15, 1974.

WORKSPACE CRASH RECOVERY

Until now, system "crashes" have caused complete loss of the user's active workspace. Files are recovered after a crash and this has always been an important feature of the File System. Now we have a similar capability for recovering active workspaces. After a system crash, APL recovers and saves into each user's Continue the most recent copy of the user's workspace from the WS SWAP device. The APL scheduler insures that the most recent copy is within 4 seconds of the crash. The *LOAD* of a recovered WS reports *RECOVERED* (rather than *SAVED*) followed by the time and date when the WS was saved (not the time and date of the crash).

It is important to understand that the WS is recovered as of some seconds before the crash. This means that statements may have been executed after the state represented by the *RECOVERED* WS. If the WS does not have side effects (i.e. affects only itself and does not use files), execution can simply be resumed. If the WS does use files considerable care and analysis must be used. The important point is that the WS is recovered at an arbitrary point before the crash and Files are recovered at an unrelated arbitrary point.

WSDOC CROSS REFERENCING NOW AVAILABLE

The cross referencing feature of the *WSDOC* package in 7 *WSDOC* (detailed in the February Newsletter) is now ready. It is a fairly expensive routine (about \$100 for a full and complex workspace) but it provides detailed information concerning the use of every name in the workspace. It is possible, using this package, to determine exactly what functions are used by what other functions, whether line labels are superfluous, and when a variable is local or global.

To use the cross referencing feature, type the state setting function *XREF* after the prompt which is part of the *WSDOC* routine.

FINANCIAL POST DATA BASE  
Additional N.Y. Indices

The following new indices have been added to the New York Financial Post data base:

<u>Symbol</u>	<u>FPCO Number</u>	<u>Index Name</u>
<i>DJIND</i>	21564	Dow Jones Industrial
<i>DJTRA</i>	21571	Dow Jones Transportation
<i>DJUTL</i>	21576	Dow Jones Utility
<i>DJSFV</i>	21596	Dow Jones '65'
<i>SPFTW</i>	21597	Standard & Poor's '425'
<i>SPFHU</i>	21626	Standard & Poor's '500'
<i>NYSEC</i>	21623	NYSE Composite

For further information, contact your SHARP APL representative.

ENHANCED FUNCTION DEFINITION EDITING

A very useful editing feature has been added to SHARP APL. [N□0] formerly equivalent to [N□1] now has a unique meaning: line *N* is displayed and the keyboard unlocked at the right hand end. This permits editing the right hand end of a line; for instance, code may be added to the end of the line after the keyboard unlocks. The user may also edit the line by backspacing to a specific point in the line, hitting ATTN to delete the portion of the line to the right of the caret and then typing the new portion of the line.

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IT'S GO FOR "GOFER"

A new APL application has recently been developed by our Calgary office personnel. The GOFER (Gas and Oil Field Economic Reporting) System is designed to help analyze the profitability of developing gas and oil fields. It provides a data base system which enables the user to evaluate the alternatives and do sensitivity analysis studies. Simply by describing the physical and economic characteristics of the project, the user may receive the following information: production of gas, condensate, propane, butane and sulphur; prices; gross and net revenues; royalties calculated by a chosen scheme; operating expenses with an inflation factor as chosen; operating profits; capital investments, with a choice of many categories; allowable deductions; depletion allowance; taxable income, and income tax; net cash flows; present values. The output is available in four different reports, one of which is illustrated on the following page.

The GOFER system features all the advantages of an APL application; it is flexible and easy to use, minimizing both time and cost for producing results. GOFER represents, not a single program approach, but a sophisticated information system to solve the user's problems. Its characteristics include: an easy entry system; the ability to store and retrieve cases; the ability to make changes in the input data; the ability to cumulate clusters of oil fields; the choice of various royalty and tax schemes for North America and Britain; a flexible discounting procedure; and a flexible capital investments section.

The forerunner of the GOFER System was a package implemented for Dome Petroleum of Calgary, to provide them with decision-making information regarding the profitability of gas and oil field development. A basic system to perform the calculations and produce the reports showing cash flows, royalties, taxes and present values was completed in one week in SHARP APL. It was then felt that the usefulness of the system would be magnified by providing an integrated information system for inputting, storing and cumulating projects. This was developed in a more relaxed atmosphere over an eight week period. Myrna Graham and Lib Gibson, of our Calgary office, co-operated in the implementation of this system for Dome. Due to the interest shown in the system's capabilities, an expanded and revised package, named GOFER, is now available to all I. P. Sharp customers. For further information, or a GOFER manual, contact your SHARP APL representative.

INPUT

TITLE←'GOFER EXAMPLE'  
 LIFE←20  
 Y←1974  
 WINT←1  
 DISR←.08  
 ROYALTY←'ALBERTA OLD'  
 OPEXPW←2 INFLATE 500  
 OPEXPT←2 INFLATE 15  
 NWD←2 2 THEN 0  
 INTW←5 INFLATE 40  
 TANW←5 INFLATE 10  
 SUR30←5 INFLATE 500 500 THEN 0  
 RESIDUE←1430 3500 6 TIMES 4000 DECLINE 10  
 PRRES←39 TO 77 BY 2  
 BTU←1030  
 END

TITLE = Name of gas and oil field  
 LIFE = Life of project  
 Y = Starting year  
 WINT = Working interest  
 DISR = Discount rate  
 ROYALTY = Name of royalty scheme  
 OPEXPW = Operating expenses per well  
 OPEXPT = Operating expenses for plants  
 NWD = Number of wells drilled  
 INTW = Intangible cost per well  
 TANW = Tangible cost per well  
 SUR30 = Surface facilities with 30% CCA  
 RESIDUE = Gross yearly production  
 PRRES = Price of residue  
 BTU = Gas BTU content

MINI

GOFER EXAMPLE

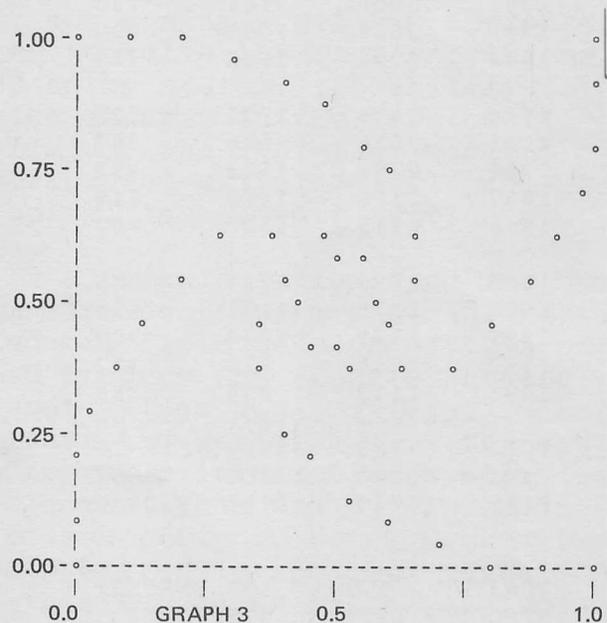
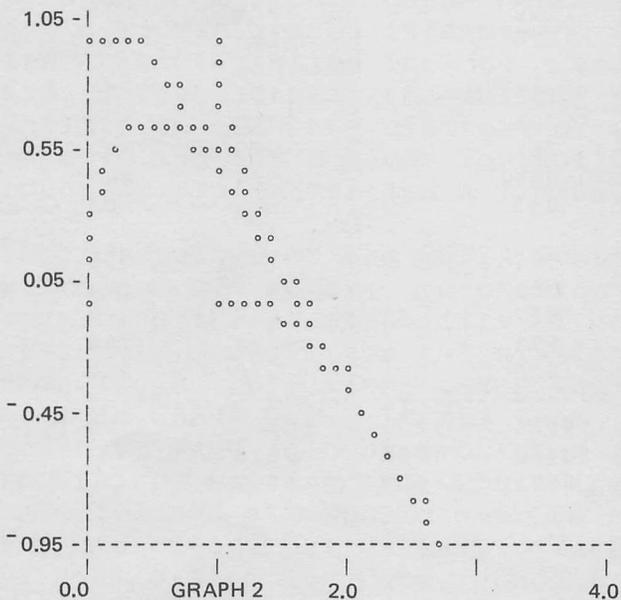
YEAR	GROSS		ROY'TY \$M	OPER'G EXP \$M	OPER'G PROFIT \$M	CAP'L INV \$M	NET CASH FLOW	
	RES MMCF	REV \$M					BEFORE TAX \$M	AFTER TAX \$M
1974	1430	574	158	15	402	600	(198)	(254)
1975	3500	1478	423	15	1040	630	410	182
1976	4000	1772	524	16	1232		1232	885
1977	4000	1854	565	16	1273		1273	731
1978	4000	1936	606	16	1314		1314	704
1979	4000	2019	648	17	1355		1355	710
1980	4000	2101	689	17	1395		1395	721
1981	4000	2184	730	17	1436		1436	734
1982	3600	2039	694	18	1328		1328	675
1983	3240	1902	658	18	1226		1226	621
1984	2916	1772	622	18	1131		1131	571
1985	2624	1649	587	19	1043		1043	525
1986	2362	1533	553	19	961		961	483
1987	2126	1423	519	19	884		884	444
1988	1913	1320	487	20	813		813	408
1989	1722	1224	456	20	747		747	375
1990	1550	1133	426	21	686		686	344
1991	1395	1049	400	21	627		627	314
1992	1255	970	377	21	571		571	286
1993	1130	896	355	22	520		520	260
TOT	54763	30828	10478	364	19985	1230	18755	9719
PVBT	30940	16303	5357	177	10768	1096	9673	
PVAT	16769	8707	2839	95	5772	695	5077	

WORKING INTEREST 100 PERCENT  
 DISCOUNT RATE 8 PERCENT  
 CAPITAL WAS DISCOUNTED AT END OF YEAR  
 OPERATING EXPENSES WERE DISCOUNTED AT MID YEAR  
 TAXES WERE DISCOUNTED AT MID YEAR

BUG-ers ALL!

Response to our Bug Problem may have been slim in quantity, but it certainly was rich in quality. Below is Maurice Elliott's letter on the subject. Due to space limitations, only two graphs are reproduced.

"The latest I.P. Sharp Newsletter bugged me so much I had to do something about it. So I decided to train the bugs in our system. I carefully selected the four most intelligent-looking bugs, dabbed their paws in ink, and placed them at the corners of a square, as recommended by Martin Gardner. They promptly walked off in all directions, as you can see from Graph 1. I then sat them down and gave them a good lecture. That seemed to help, because on the second attempt (Graph 2) there was only one unsociable one (he was obviously a bad choice on my part). So I took him aside and asked him what the problem was. It appears that as I put him down I knocked his spectacles off, and he, being short-sighted, had simply gone bug-eyed and wandered off not knowing where he was going. Anyway, we retrieved his spectacles for him and tried again (Graph 3). This time they went fine, but they complained about the size of steps I was forcing them to make. We discussed it, and agreed to compromise - they could take smaller steps but I wanted them to take more steps. That improved matters no end (Graph 4), but they then complained of having to keep dodging a great big ball that kept coming out of the sky and hitting the paper (some bugs are never satisfied). I explained that there was nothing I could do, since we don't have a fineplot golfball, and asked them to try again. However, this time they had obviously had enough (Graph 5), and refused to cooperate - in fact they deliberately walked away from each other, and finally flew away. So if anybody sees four well-trained bugs suddenly appear, please let me know - I should hate to have wasted this effort."



Thanks for your entertaining contribution, Maurice!

Many thanks also to Sidney Cooper of Acadia Life Insurance Company, who sent in his successful Bugpathing. He comments: "An interesting point is that the assumption that the bugs move in small discreet steps, leads to the end position where they are all exactly one such step apart and are playing an endless game of musical chairs. We can waste a lot of CPU time if we do not branch out of the programme before this position is reached."

Here now are Clement Kent's functions for producing Bugpaths such as the one shown in the February Newsletter. Clement took a simplified approach, using three separate functions to produce his general solution and the co-ordinates for a Bugpath.

```

      ∇ Z←BUGPATH;BUGS;STEP;DISTANCE
[1]  'ENTER STARTING POINTS'
[2]  Z←BUGS←□
[3]  'ENTER STEP LENGTH'
[4]  STEP←□
[5]  LP:Z←Z,BUGS←BUGS CRAWL STEP
[6]  →(DISTANCE>1.1×STEP)/LP
[7]  'BUGPATH FOUND'
[8]  Z←⊕Z
      ∇

      ∇ Y←BUGS CRAWL STEP;V
[1]  Y←BUGS-1⊕BUGS
[2]  DISTANCE←[ /V←(+/[1] Y*2)*0.5
[3]  Y←BUGS-Y×STEP÷(⊖Y)⊖V
      ∇

      ∇ X←START N
[1]  X← 2 1 ⊙.002×(1N)÷N
      ∇

```

As an example, the input might be:

```

      PLOT BUGPATH

      ENTER STARTING POINTS
□:
      START 6
      ENTER STEP LENGTH
□:
      .03

```

For his output, Clement used the Fineplot option of the Library 3 Plot. In other words he would )COPY 3 PLOT and set the 'state' to FINEPLOT.



# Update

- Please amend my mailing address as indicated.
- Add to your mailing list the following name(s).
- Send me SHARP APL manuals and product literature as listed.

Note my comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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