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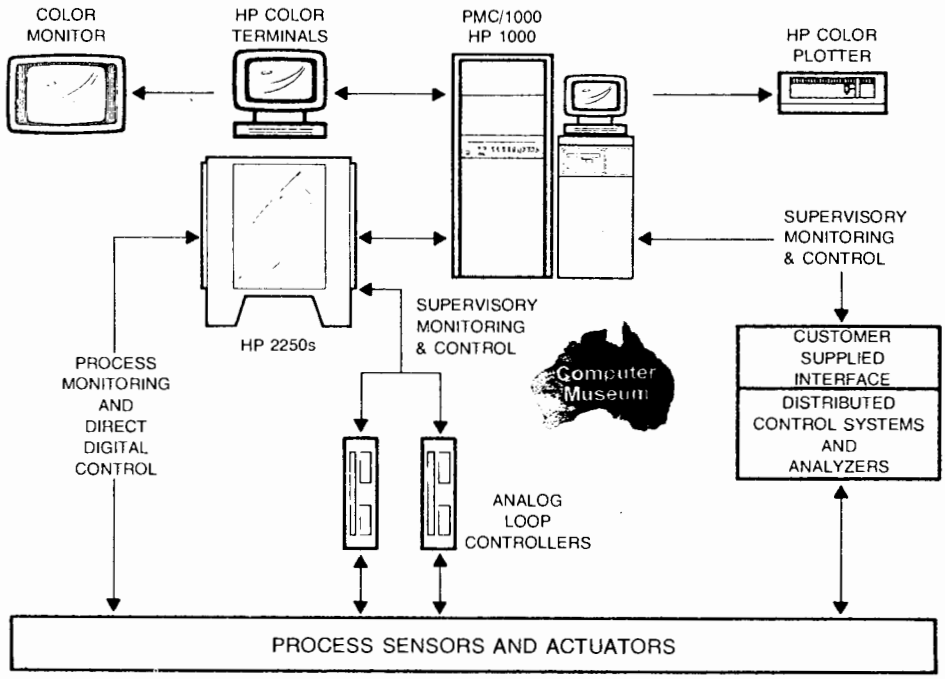
Process Monitoring and Control/1000

PMC/1000 Software

PMC/1000 is an applications software package for the monitoring and direct or supervisory control of continuous industrial processes. The software resides in an RTE-6/VM based F-Series computer, and is interfaced to the process by the HP 2250 Measurement and Control Processor. A fill-in-the-blanks approach to specifying point names, engineering unit conversions, alarms, control loops, historical logs, and color displays allows process engineers without programming experience to implement systems. A function block architecture and extensive "hooks" for custom algorithms or programs provide a very high degree of flexibility.

FEATURES

- Ease of use for process engineers and process operators.
- "Help" key guides first time users.
- Interactive, menu-driven configuration procedure specifies hardware I/O and function blocks.
- Function block architecture accommodates a wide range of applications.
- Color graphic and alphanumeric display of status and alarms on HP color graphics terminal.
- User defined scan intervals of analog and digital inputs and outputs.
- Engineering unit conversion, thermocouple and RTD linearization, and nonlinear computations.
- Extensive alarm capabilities, including event initiation on alarm.
- PID, Boolean logic, ratio calculations, delay, filtering, path select, bumpless transfer, anti-reset windup, and other functions for closed loop control.
- Historical logging, trending, and color plotting.
- Autoscheduler automatically specifies the order of function block execution.
- Autodocumenter prints out alphanumeric groupings of blocks to illustrate interconnections.
- Memory resident data base for current data, configuration, and algorithms.
- HP 2250 Measurement and Control Processor supported for data acquisition and control.
- Support of user-supplied interfaces to non-HP equipment.
- Support of user-written programs for added customization, including the addition of other algorithms.
- Security code control of access.



CONTENTS

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APPLICATION EXAMPLES

- Direct monitoring and control of small to medium processes, in discrete manufacturing environments, such as wastewater treatment and furnace control.
- Analysis and control of experimental processes such as pilot plants.
- Direct digital control (DDC) for processes requiring sophisticated control techniques.
- Supervisory setpoint control of analog loop controllers for upgrading older plants to do process optimization, balancing, and analysis.
- Replacement of older process computers.
- Supervision of distributed control systems to provide optimization, analysis capability and a link to other computers and process analyzers. User hardware and software interface must be provided.

FUNCTIONS AND USE OF PROCESS MONITORING AND CONTROL/1000

The major functions performed by PMC/1000 include off-line configuration; on-line, real-time acquisition, computation, control and display; and logging of process data. Each of these real-time functions is executed at an interval which is a multiple of the base scan interval (the unit of time used to co-ordinate the scheduling of PMC/1000 software). A typical base scan interval is one second.

PMC/1000 is memory resident, except for the configurator and historian. The memory database contains the current value of all points and block outputs, the parameters for each configured block, pointers linking the blocks, and the list ordering block execution. Also stored in memory are the display layouts and active alarms.

The disc database includes the configuration data for each PMC/1000 system configured, the historical process log, and a log of alarms and errors. The configuration files are mapped into memory when PMC/1000 is put into the operating mode, thereby making real-time operation disc independent.

Database access routines provide full read and write capability to the memory database, and read capability from disc. PMC/1000 may be extended considerably, using these high level FORTRAN subroutine calls. For example, optimization or analysis programs may be incorporated.

Softkeys are used to step from screen-to-screen and to invoke all PMC/1000 functions. Only menu selections, names, and parameters need to be typed into the terminal. A complete system can be implemented without any user-written code. The user is shielded from the operating system unless access to it is expressly desired.

CONFIGURING PMC/1000 TO THE PROCESS

Using a fill-in-the-blanks menu-driven format, the Configurator is used to customize PMC/1000 to the process application. Several separate configurations may be created and stored on disc, facilitating changes and experimentation. A new configuration may be created while another is in operation. The five configuration steps are hardware, block, display, historian, and schedule.

1. **The Hardware Configuration** maps the physical I/O points to user-assigned names. Each HP 2250 or other subsystem is given a scan interval. HP 2250 card types and locations are specified. With user software, I/O points in non-HP 2250 subsystems may be specified as well.
2. **The Block Configuration** determines monitoring and alarm functions and control loops. This is done by configuring and linking blocks, and setting parameters such as alarm limits, engineering unit conversions, loop tuning constants, and execution rates.
3. **The Display Configuration** specifies the blocks to be included in each of the 128 or more area and group displays. Additional groups and areas can be created on-line.
4. **The Historical Configuration** specifies the disc cartridges which will be used to log historical data as well as the rate at which this data will be logged.
5. **The Schedule Configuration** specifies the timing of function block execution. This is easily done using the Autoscheduler, and the results may be manually adjusted.

The Autodocumenter provides an alphanumeric listing and hardcopy of function blocks, indicating their groupings and links. Each loop typically is listed as one grouping.

FLEXIBLE BLOCK ARCHITECTURE

The function block architecture permits cross-linking of information to accommodate a wide range of monitoring, analysis and control strategies, such as material/energy balancing, and feedforward, cascade, and nonlinear control. Each block may access any points or variables in the process data base. The output of each block is fed to as many other blocks as desired. In this way, simple or complex monitoring functions and control loops are created. Figure 1 shows a typical loop.

Block types include:

1. PID with bumpless transfer, anti-rest windup, local/cascade with setpoint tracking, output limiting.
2. PID as above plus lead/lag compensation on error, control bypass option, non-linear error correction option.
3. Analog and digital constants.
4. Alarming and limiting, high-low, and critical/advisory, with event initiation and deadband.
5. Computation, for engineering unit conversion and other calculations, using 10 predefined algorithms such as filtering, scaling, lead/lag, polynomials, etc. Eight user definable algorithms may be added.
6. Thermocouple and RTD linearization.
7. Nonlinear curve fitting.
8. Analog trending and delay, including accumulations, averaging, and standard deviation.
9. Analog output, positional or incremental with alarms.
10. Analog comparison and multiplexer.
11. Digital output, with alarm.
12. Digital alarming.
13. Boolean logic constructs, using 5 predefined equations. Eight user definable equations may be added.
14. Digital trending and delay.
15. Digital comparison and multiplexer.
16. Schedule user written program, with parameter passing.

ON-LINE OPERATION

When the configuration is complete, it may be loaded into memory with one softkey, putting PMC/1000 into operation. The following describes the major modules that are automatically brought into operation, and how the operator uses them.

Monitor: This program contains the base scan interval clock and schedules all PMC/1000 functions in the operating mode. At each tick of the clock, operating functions are scheduled in this order: scan inputs, execute blocks, save historical data.

Scanner: This module handles all I/O communication with the HP 2250 or other front end subsystem. All data from a given front end is gathered at the same rate, while ouputs are executed on an as-needed basis. The scanner provides comprehensive 2250 support. Using an HP 2250, PMC/1000 can perform I/O directly to the process for monitoring or direct digital control. Equally well, the 2250 and PMC/1000 can perform I/O of pulses and analog or digital signals to loop controllers, thus performing supervisory setpoint control.

The 2250 can scan hundreds of process control points, updating the value of each to provide input and output signals to control the process. The 2250 takes care of analog input and output conversions and is automatically programmed by PMC/1000.

PMC/1000 can also interface to other devices or subsystems, such as analyzers or digital control systems. The scanner can accommodate these subsystems in addition to the 2250. Optionally, the data access routines may be used to link or network other systems directly to the memory database. In either case, user written software is required, but PMC/1000 provides the necessary "hooks".

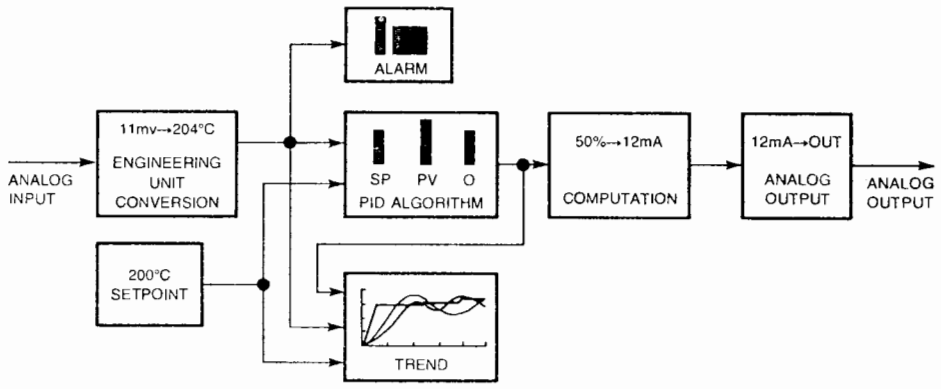

Figure 1: Typical Control Loop

Scheduler: This module includes the function block algorithms and the list indicating timing and order of block execution. The algorithms act on the data in memory, calculating new block output values which are fed to downstream blocks or out to the process.

Historian: The historian performs data logging and retrieval. All points and block outputs are logged to disc at the same, specifiable rate. Magnetic tape backup is supported. The historian provides graphical trend displays and color hard copy plots, showing up to four variables and spanning up to 1000 time samples. Database access routines make data available for analysis and reporting programs.

Real-Time Displays: Color graphic displays are created and updated from the memory database. Softkeys and names select area, group, detail, point, trend, and alarm color displays. The area display shows any four groups. The group display shows any four to 16 blocks, including trends. For example, a group might include a trend, two PID blocks, three alarms, two calculated variables, and four digital states.

Detail displays may be called by name or directly from a group display. Each detail display includes two pages. The first page summarizes key parameters and status, and permits changes such as setpoints or outputs. The second page shows all configured parameters such as loop tuning constants. The point display shows up to 10 scanned input points.

A trend display shows up to three variables versus time. Trends may be cascaded to show both short and long term variations. Historical trends and plots are described above under Historian. Alarm displays are discussed below.

Manual Intervention and Changes: Block parameters are changed from the detail displays. Five levels of security determine whether a user can:

1. Change setpoints, status, and outputs.
2. Change tuning or computation parameters.
3. Configure systems off-line.
4. Start/stop operation.
5. Access the RTE operating system.

Using softkeys, the current memory database configuration, parameters and variables may be stored on disc. This saves the state of a "tuned" system for later recall or power fail restart.

Alarms: Color graphic alarm blocks may be shown on area, group or detail displays. If any new alarm occurs, the operator is notified, regardless of display being viewed. From any display, pressing the "Alarm" softkey presents a color coded summary. This alphanumeric screen shows the time, description, and status of each of 15 alarms at a time. The cursor selects an alarm for further detail and acknowledgement. Alarms are printed and logged to disc. An historic alarm display shows a similar summary.

SPECIFICATIONS

Maximum recommended total number of process input/output points: 500.

Maximum recommended total number of blocks: 3000.

Maximum number of each type of block: 1023.

Number of function block types: 16.

Maximum number of HP 2250s and/or other I/O subsystems: 32.

Maximum number of HP 2250s and/or I/O subsystems: 32.

FATHER OF RPN

Jan Lukasiewicz (WookashAYveech) was one of the brightest stars in the constellation of remarkable logicians that emerged in the first decades of this century. His work affected areas of study ranging from the history of Greek philosophy to computer science.

Lukasiewicz was born December 21, 1878 in the Polish city of Lwow, then under Austrian rule, which is now part of the Soviet Union. His father was a captain in the Austrian army. Polish was spoken at home, and Roman Catholic was the practiced religion.

Young Lukasiewicz studied mathematics and philosophy at the University of Lwow, and obtained his Ph.D. in 1902. He remained at that university, advancing rapidly through the faculty ranks, until 1915. He then accepted an invitation to lecture at the University of Warsaw, which was in German occupied territory.

Between the World Wars, as a citizen of independent Poland, Lukasiewicz was Minister of Education (1919), professor at the University of Warsaw (1920-1939), Dean of the School of Philosophy, and twice Rector of the university. By the time he left Warsaw, in 1944, he had published approximately eighty works, with articles on psychology, mathematics, and philosophy (mainly logic). His publications also included studies on the history of philosophy, major book reviews, scholarly monographs, and introductory textbooks. Lukasiewicz was a much-admired and gifted teacher. His lucid lectures attracted students from all the departments represented at the University of Warsaw.

Lukasiewicz and his wife Regina endured much suffering during World War II. In the first months of the war, his house was bombed and burned; and his library, including all his manuscripts, was lost. In his own words, "it was impossible to continue the work during the war." Unable to work, he began giving lectures at the underground university in Warsaw. He also helped govern the city under the German occupation.

Shortly before the disastrous Warsaw uprising of August, 1944, friends in Switzerland and Germany helped him out of Poland. He was illegally in the German city of Munster when it was liberated by American troops in April 1945.

In 1946, Lukasiewicz, then exiled in Belgium, accepted the Chair of Logic at the Royal Irish Academy and became a member of the Institute of Advanced Studies — both in Dublin. There he resumed the scholarly work interrupted by the war, producing ten additional publications. Lukasiewicz remained in Dublin until his death in February 13, 1956.

Following early essays on logic principles, Lukasiewicz had arrived, by 1917, at the conception of a three-valued propositional calculus — True, False, and Don't Know. (Propositional calculus is literally a method for calculating the truth value of a sentence, just as algebra is a method of calculating the truth value of a numerical equation). A notable by-product of this logic was the idea of a "truth table" which now appears in elementary schools all over the world.

Included among Lukasiewicz's major contributions was his development of "Polish Notation". This notation simplifies the evaluation of arithmetic expressions by eliminating parentheses and needless punctuation. Reverse Polish Notation (RPN) is implemented in HP calculators by means of the four-register stack, the Enter key, and the convention of postfix operators. (The term "postfix operators" simply means that you specify the operation to be performed after the entry of one or two variables, rather than before, as provided by Lukasiewicz's notation). In other words, Lukasiewizc developed the notation; and HP, through extensive research, developed RPN as a workable system for calculators. RPN makes it possible to perform compound calculations with a minimum of special symbols, and no punctuation. The probability of making errors on the RPN system is lower, and error recovery is straightforward and simple. With the elimination of parentheses, and the consistency of the entry convention, the system is designed to accept more of the problem-solving burden, while minimizing the operator's time and energy expenditures.

Lukasiewicz lived long enough to see the emergence of the computer age and the implementation of some of his ideas. In his statement about the philosophy of science and mathematics, he repeatedly emphasized the intrinsic value of this work:

"Just as art grew out of the craving for beauty, science was created by the urge for knowledge. Seeking the goals of science outside the intellectual sphere is as great a mistake as cramping art by considerations of usefulness. The saying 'art for art's sake' and 'science for science's sake' are equally valid."

UNDERSTANDING COMPUTER TECHNOLOGY

Some more excerpts from the computer jargon glossary:
Real time: A night out with Raquel Welch.
On-line Real Time: A phone call to Raquel Welch.
Circuit Board: To avoid top company executives.
Virtual Memory: To recollect age of innocence.
Cyclic Redundency Check: Crackdown on staff
Async: For washing dishes.

Puzzle Place

I have always been keen on puzzles, particularly mathematical puzzles, and over the years have built up a reasonable collection. Since these days I get no time to do them, I thought I would give our readers the opportunity. Each edition of 'Crosstalk" I shall include a puzzle for you all to test your wits, and include a reader's correct solution (hopefully) in the following edition. So, all you keen puzzle-people, watch for this regular spot in 'Crosstalk'. Here is your first one:

There are two integers each between 1 and 100. P. knows their product; S. knows their sum. Obviously, if they told each other the sum and product, they could figure out what the integers were. Instead, they have the following conversation:

P: I don't know what the numbers are.
S: I knew you didn't. Neither do I.
P: Oh! Now I know.
S: Oh! So do I.

What are the two integers?
Clarification: The two integers are between 1 and 100 exclusive. This allows a unique solution.

Questions:
* Can anyone solve this without a computer. (Or to rephrase the questions, can anyone solve this WITH a computer)?
* How significant is the 100?
* What solutions are possible if the restriction is 1-200?

PHILIP GREETHAM

NEW PRODUCTS

New HP 9888A Expands HP 9826/36 Memory and I/O

The New HP 9888A Bus Expander increases the I/O and memory capabilities of the HP 9826A, 9836A, and future additions to DCD's personal technical computer line. The expander has 16 card slots; eight are for either I/O or memory cards, and the others are for memory cards only.

A system with a 9826/36 and expander can contain 11 I/O cards, as well as 3Mb of RAM (12 98256A RAM cards). But the capabilities don't stop there. Up to four expanders can be interfaced to a 9826/36, providing far more memory and I/O than any other personal computer on the market. A system with a 9826/36 and multiple expanders can extend the memory and I/O capability to the limit of the processor's address space — more than 7Mb of RAM (29 98256A RAM cards) and 24 I/O cards!

The 9888A can be mounted easily into an instrument rack, since it's housed in a full rack width, 7H System II type cabinet. The expander interfaces to the computer via a 5-foot (1.5 metre) cable and an I/O card, which takes up one I/O slot in the computer. The cable length permits placing the expander away from the computer, leaving the surrounding space uncluttered.

EXPANDS 9826/36 APPLICATIONS
In computer-aided testing applications, 9826/36 customers can now interface to large measurement and control systems. The 9888A will accept more I/O cards for additional instruments and peripherals, and more memory to analyse all the test data quickly. In computer-aided engineering, customers will be able to have virtually as much memory as needed for computation involving large data structures.

The following cards are supported on the 9888A:
98254A 64KB RAM
98256A 256Kb RAM
98622A GPIO Interface
98623A BCD Interface
98624A HP-IB Interface
98625A Disc Interface
98626A Serial Interface
98627A Color Video Interface
98628A Data Communications Interface
98629A Resource Management Interface

Cards that are not supported include the 98620A DMA Controller card and any ROM-based language system card. These cards must be plugged into the computer, not the 9888A.
The 9826/36 powerfail option is not supported on a 9826/36 with a 9888A. The expander automatically resets the computer at power-up, and would, therefore, erase computer memory contents when power is restored after a power outage.

EXPANDER PERFORMANCE
Reads and writes to memory cards plugged into the 9888A take 20 per-cent longer than accesses to memory stored in the computer. Also, I/O performance is slightly degraded. With I/O buffer memory and I/O cards plugged into the expander, I/O speed can be up to six per-cent slower in interrupt mode compared with when the cards are plugged into the computer. In burst DMA mode, I/O speed can be up to 25 per-cent slower.

MIKSAM for Series 80

HP is pleased to announce the MIKSAM ROM (multiple indexed keyed sequential access method) for the HP-86/87. MIKSAM, a single, standard ROM, allows you to create and maintain a customized file management system. This capability is provided in the form of 13 additional BASIC commands which provide you with the necessary tools to efficiently retrieve, add, and delete information from data base files. And since you have complete control of the structure and the interface to the data base, interaction with the data is placed completely under BASIC program control.

Use MIKSAM with your HP-86/87 and a minimum of one disc drive to serve as a core around which custom file management requirements can be designed.

HP-86/87 MATRIX ROM IS NOW AVAILABLE

The HP-86/87 Matrix ROM (P/N 00087-15004) gives you a powerful set of statements and functions for working with arrays, both matrices (two-dimensional) and vectors (one-dimensional). It lets you perform calculations with more convenience, speed, and accuracy than you could using your HP-86/87 Personal Computer alone.

Some of the statements and functions include:

- Determinants of Matrices
- Dot Products
- Cross Products
- Matrix Input/Output
- Transpose an Array
- Generate Identity Matrices
- Solves Matrix Equations
- Determine Inverse of Array.

NEW PRODUCTS

New BASIC/1000C

BASIC/1000C, the new BASIC language subsystem is now released.

The HP 1000 BASIC can now meet your most demanding challenges. BASIC/1000C not only includes 15 character variable names and labels, powerful string support, bit manipulation operators, and HP-1B statements, but it's fast too. Where did the speed come from? BASIC/1000C includes a compiler; compiled code runs faster than interpreted code. What about the friendly program development environment an interpreter provides? BASIC/1000C includes an interpreter, complete with a built-in line editor and a debugger.

Since this runs on RTE-A. 1 and RTE-6/VM, is there real time programming? You bet. BASIC/1000C includes statements to implement interrupt handling applications. Multiple user/programs can be using interrupt handling features simultaneously. (BASIC/1000D only allows one user/program at a time to handle interrupts).

A BASIC/1000C program can call compiled subroutines which have been written in other languages. Your program can call Pascal, FORTRAN 77, and MACRO subroutines. It can also call other HP 1000 subsystem routines such as GRAPHICS and IMAGE subroutines.

BASIC/1000C has a multitude of features. It includes user error handling, user sub-programs and functions, and labelled COMMON. Large data areas are available using EMA/VMA. And, you have your choice of data types: integer, double integer, two-word and four-word real.

Customers familiar with HP BASIC available on HP desktop computers will be pleased with the similarity and performance of BASIC/1000C.

DESKTOP FORUM

USING HP-85 GRAPHICS MEMORY

Do you use an HP-85 with maximum memory (32 kbytes) but sometimes wish that you had some extra memory for data storage.

The HP-85 uses a separte 6 kbytes of memory for the graphics display. If you aren't using the graphics display for plotting, etc., you can utilize the graphics memory for data storage by using two instructions from the Printer/ Plotter Rom viz. BPLOT & BREAD.

Consider the situation where you have a test station which is not equipped with floppy discs. The test program is loaded from tape each morning and uses most of the memory. If you wish to have more user instructions or more detailed diagnostic messages, then you have two choices. You can read the data messages from tape when required (too slow!!) or you can read all the data messages from tape and store them in the graphics memory using BPLOT. When a particular data message is required, it can be randomly accessed by using a MOVE instruction followed by a BREAD instruction. String data may be stored and recalled in any lengths from one to 6144 bytes. Recalling data is not as fast as normal memory storage, but it is much faster than recalling data from tape.

Here is a simple program to demonstrate the application of this technique.

Phil Leece, STC

```
10 !            Program to demonstrate usage of
20 !          graphics memory to store string  data.

50 DIM A$[32]
60 CLEAR @ DISP "ENTER or RECALL DATA (E/R)";@ INPUT Z$
70 IF UPC$(Z$[1,1])="E" THEN 1010 !

100 CLEAR @ GCLEAR
110 SCALE 0,255,0,191
120 ASSIGN# 1 TO "DMESG"
130 FOR I=1 TO 100
140 ON ERROR GOTO 180
150 READ# 1 ; A$@ A$[1,32]=A$&RPT$(" ",32-LEN(A$))
160 MOVE 0,192-I @ BPLOT A$[1,32],32
170 NEXT I !

180 IF ERRN=72 THEN 200 ELSE ERRM @ STOP !

200 CLEAR
210 DISP "Data item ";@ INPUT N
220 MOVE 0,192-N @ BREAD A$,32
230 DISP A$ @ GOTO 210
240 PAUSE !

1000 ! Enter data and store on tape

1010 CLEAR @ ASSIGN# 1 TO "DMESG"
1020 DISP " Number of data items ";@ INPUT J
1030 FOR I=1 TO J @ DISP "Data item ";I;
1040 INPUT A$
1050 PRINT# 1 ; A$ @ NEXT I
1060 ASSIGN# 1 TO *
1070 END
```

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9885 STATUS CHECKING WITH THE 9825

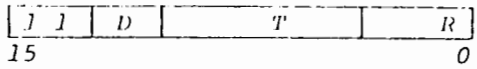
(by Rob Robason, El Paso)

Because the 9825 cannot recover from disc errors d0 thru d4, d8 and d9 some occasions may arise where it is worthwhile to check the disc status prior to an operation which might generate one of these errors. For example, if the power to the drive is off, the door is open, no disc is in the drive, etc., a user might want to switch to another drive (a redundant system). Since d2 (door open) for example is a non-recoverable error, no "one err" statement will trap it and the 9825 program will simply halt and display the error (not too kosher in an unattended data logging application, eh?).

The problem can be resolved to some degree with the program described below, which will find the condition before the error occurs. But beware: if the condition occurs during the MS ROM's control of the disc you will still get a hard failure.

```
0: gsb "door check routine"
1: stp
2: "door check routine":
3: sfg 14
4: wti 0,8
5: wti 5,16
6: otd127207:A
7: gsb "wti"
8: otd147777:A
9: gsb "wti"
10: 0:A
11: gsb "wti"
12: rdi 4:A;dsp A
13: if bit(8,A) and bit(9,A);gsb "disc"
14: if bit(8,A) and not bit(9,A);gsb "power"
15: if bit(9,A) and not bit(8,A);gsb "door"
16: ret
17: "wti":
18: "w1":if iof8=0;gto "w1"
19: wti 4,A
20: ret
21: "door":beep;prt "door open";ret
22: "disc":beep;prt "no disc";ret
23: "power":beep;prt "no power";ret
24: end
*577
```

The first step is to send the password to allow entry of commands (lines 6 & 7). The next step in the process is to perform some dummy operation on the disc which will cause the 9885 status register to get the error condition nibble. This is accomplished with the "seek-a-record" command: (Lines 8 & 9).



D: Drive # (0-3)
T: Track # ($0-114_8$)
R: Record # ($0-35_8$)

Next, since the I/O lines are wire-ored at the disc, you must clear the R4 out register so you will not confuse the response word of the 9885 with your seek command. (Lines 10 & 11).

Reading R4 in will now automatically give you the status word, bits 8 through 11 of which are the error codes: (line 12).

ERROR CODES (OCTAL)	DEFINITION
0	No Error
1	No Drive Power
2	Drive Door Open
3	No Disc on Drive
4	Invalid Command
5	Record Not Found
6	Track Not Found
7	Data Checkword Error
10	Data Overrun
11	Verify Error

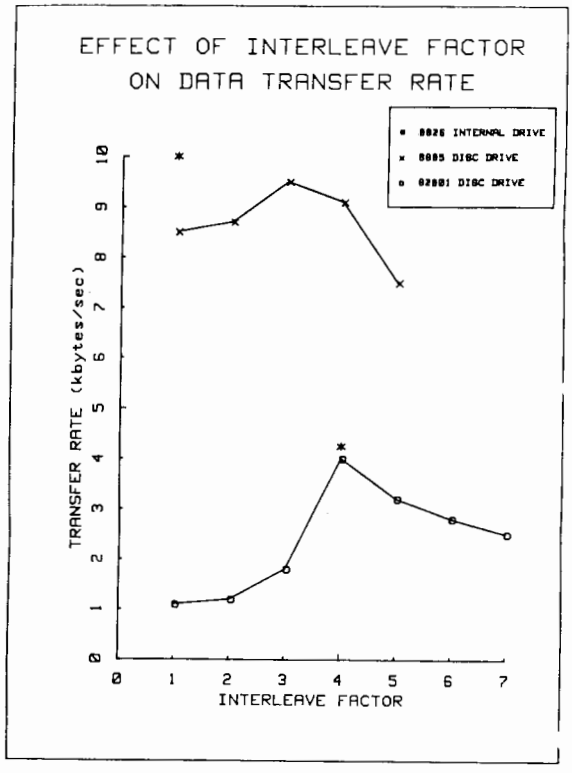
Error codes 1, 2, and 3 are of particular interest but any could be used to cause selection of a new drive in an unattended situation.

Interleave Factors on External Flexible Discs supported by the Series 200

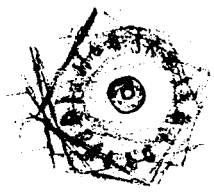
(by Jerry Watkins)

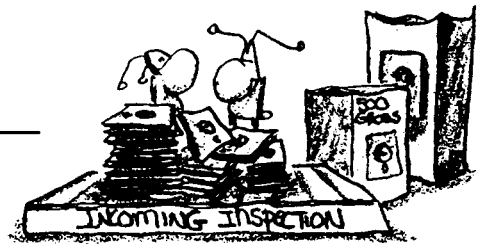
Since it is now possible to have several flexible disc mass storage devices on Series 200 machines, it is possible to choose interleave factors which optimize data transfer speed. The following results were obtained using the 9826 with soft BASIC 2.0.

The graph shown below is for the HP 9895 and the HP 82901. As can be noted, an interleave factor of 3 appears optimal for the 9895 and an interleave factor of 4 is optimal for the 82901. For the internal disc, an interleave factor of 1 works best giving a transfer rate of about 10,000 bytes/second. With an interleave factor of 4, the internal disc transfer rate is about the same as the 82901. Thus, there is a tradeoff between disc interchangeability between the internal disc in the 9826 and the 82901 and average data transfer rate. If all 5¼" floppies are initialized with an interleave factor of 4, comparable performance can be obtained with the 9826 internal disc drive and the 82901. Conversely, discs initialized with an interleave factor of 1 work very well in the 9826 internal drive but perform quite poorly in the 82901.



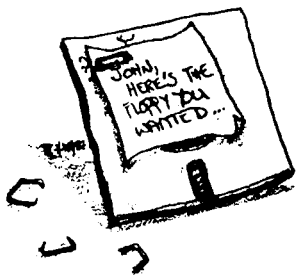
Flexible disc care





by Rick Spangler
Hewlett-Packard Company
Greeley Division

Minimizing media wear is critical to the reliability of flexible disc drives. For this reason, Hewlett-Packard undertakes extensive testing and control over its selection of media for use on the HP line of 5 1/4-inch and 8-inch, double-sided, double-density flexible disc drives.



It is a common misconception that a flexible disc will last forever. When the medium fails, critical data can be lost. You might blame the disc drive. You could point the finger at medium. More likely you should blame yourself. Proper media handling, storage and periodic replacement are critical.

The best way to optimize your success with flexible discs is to treat them carefully. The magnetic coating on the surface of the disc is only 100 microinches thick, so the smallest scratch can ruin it.

A good rule of thumb is to treat your disc as you would a valuable record album. Here are some DOs and DON'Ts to protect your disc.

• DO return disc to storage envelope when not in use — if the disc is laid on a desk unprotected, it will collect dust. This is the most common cause of media failure. Also, the disc is not a frisbee; don't throw it around.

• DO remove disc from drive when not in use. This is especially important on eight-inch media because the disc continues to rotate even if it is not being accessed. This rotation causes wear due to particles trapped in the jacket.

• DO operate your system in a clean environment — a dusty environment is deadly to a floppy disc, causing both data errors and premature wearout. The most common contaminants are dust, smoke, ashes, erasure crumbs, bread crumbs and chemical vapors.

• DO maintain proper temperature and humidity — the proper operating range is 10 to 40C (50 to 104F) and 20% to 80% relative humidity. Variations in temperature and humidity cause the disc to expand, which moves the head off track. High humidity reduces wear. Low humidity allows static buildup which attracts dust.

• DON'T touch the magnetic surface — fingerprints are killers, particularly on the double-sided discs. The thickness of a fingerprint is enough to lift the head off the disc and cause errors.

• DON'T damage the disc — don't bend, fold, staple or mutilate the disc in any way. Label the disc with a soft felt tip pen, not a ball point.

• DON'T try to clean a disc — the inside surface of the disc jacket is covered with a special material that cleans the disc as it rotates. Any other cleaning method may cause solvent damage or scratches.

Besides proper handling, there are two other essential procedures you should follow for successful system operation.

First, always make a backup copy of critical data. Since flexible discs are susceptible to damage and wearout, it is important to have a backup so you won't lose your data.

The second procedure is to replace discs before they approach wearout. Because a flexible disc is in direct contact with the read/ write heads, wear is inevitable. If the medium is used beyond the recommended life span for a given application, it can fail.

The table below gives some recommended replacement times for double-sided media in different applications. Single-sided discs generally wear longer (when in doubt, be conservative). ◼

Recommended replacement frequency for double-sided flexible-disc media is:

Usage	Example	Media Replacement Frequency
<20 minutes/day	Disc backup, software distribution	1 year
4 hours/day occasional access	Program storage or file access	6 months
4 hours/day moderate access	Business application some use of data base management	4 months
8 hours/day moderate access	Business application some use of data base management	2 months

Reprinted from Keyboard

DESKTOP FORUM

H.P.D.C.U.G.V. – CHANGE IN PLANS

To avoid a clash with the HP seminars, the venue for our next meeting, scheduled for March 1, has been changed to the Douglass Room, Windsor Hotel, Melbourne, at 4.00 pm.

In order that our members may similarly have an opportunity to meet the guest speakers from the U.S. addressing the Productivity '83 seminar, the venue and date for our Annual General Meeting has been re-scheduled for April 13 at the Hilton Hotel following Productivity '83, starting time approximately 4.30 pm.

You are reminded that voting at the A.G.M. is restricted to financial members only. ALL subscriptions fall due at the end of February.

Bernie O'Shannessy,
President/Secretary H.P.D.C.U.G.V.

Focus 1000

System Improvement Committee (SIC)

Norm Kay (CSIRO)

As a member of the System Improvement Committee of the IUG I receive the minutes of their meetings, drafts of articles for Interface 1000 and also lists of proposed candidates for inclusion in the ballots in the Interface articles. Mailing delays do not permit me to actively participate in the preparation of the lists included in the Interface articles.

At present the best I can do is to pass on to local members, via Crosstalk, the articles included in Interface 1000, and to promise to pass on to the System Improvement Committee any comments sent to me by local members. The survey results from Interface 1000 are reprinted by permission.

I can be contacted via the HP1000 User Group postal address which is P.O. Box 132, Mt. Waverley, 3149. I would be glad to hear from any users who have any comments to make on system improvements.

RESULTS OF THE SYSTEMS IMPROVEMENT COMMITTEE SURVEY

(by Glen A. Mortensen)

In the June/July '82 issue of **Interface 1000** the Systems Improvement Committee provided you with two ballots. The first ballot listed candidates for what you like most about your HP 1000 system, and the second ballot contained a set of candidates for what you would like most to be improved. Recall that you had five votes to distribute any way you desired on each of the two ballots. Your response was very good; over 50 ballots were received by the administrative office within the first three days. The office has tabulated the results of all the ballots received and these results are reported here.

As you can see, EDIT/1000 came out the winner by a large margin. In fact, many of the ballots contained multiple votes for this fantastic piece of software. Further down the scale are the transfer file capability in FMGR, IMAGE, and the two FORTRAN compilers: FTN4X and FTN77.

The three system improvements most desired by a large majority of users:

- time stamp in the FMGR file directory,
- unpurge command if the cartridge has not been packed, and
- a faster loader.

Other improvements that received a significant number of votes are: let rename (RN) command change the security code, an extension to the directory list (DL) command to sort the directory, allow 32 bit integers and 64 bit floating-point data in IMAGE data bases, allow terminal output control to break, resume and return to system command like control S, etc., command stack and multiple data sets in QUERY, and system updates in READR/SAVER format instead of READT/WRITT format.

The results of both these ballots have been sent to George Low of Hewlett-Packard; the Systems Improvement Committee expects HP's responses to the most popular improvements to be published in the next issue of **Interface 1000.**

Members of the Systems Improvement Committee who attended the Long Beach Conference in August held a meeting and decided upon a method of operation. Based upon the minutes taken by Glen Simpson, the mode of operation will be as follows. Results of the recent ballot will be sent to HP in September. HP will respond to those improvements on the ballot that receive more votes than 20 per cent of the total ballots returned. HP's response will be received in time to be published in the next issue of **Interface 1000.** In the meantime, the Systems Improvement Committee will go over all the write-in candidates that were submitted and will come up with a new ballot for the next issue of **Interface 1000.** Working on this time schedule, it looks like we can get feedback from HP for every third issue of **Interface 1000,** or every six months. While this is not as often as the committee would like, until the magazine is published every month, this is the best we can do.

The committee also decided to take on the additional task of identifying work-around solutions to suggested improvements requested by users when such a work-around solution exists, such as a user-contributed program in the CSL/1000. However, even though a work-around solution exists, if the committee decides that HP should respond to an improvement request, it will be put on the ballot to get user feedback.

BALLOT 1

127 TOTAL BALLOTS RETURNED

WHAT DO YOU LIKE MOST ABOUT YOUR HP 1000 SYSTEM?

155	EDIT/1000	2	Multipoint
25	FMGR	0	RTE-XL
36	Transfer File Capability	35	FTN4X
25	RTE-IVB	31	FTN77
30	RTE-6/VM	1	Assembler
7	RTE-A.1	23	MACRO Assembler
26	Price/Performance	12	CS-80 Discs
9	Friendliness	14	MAC Discs
12	PASCAL	2	H Discs
42	IMAGE	10	Graphics/1000-II
23	8 Channel MUX	1	Datacap/1000-II

BALLOT 2

127 TOTAL BALLOTS RETURNED

WHAT WOULD YOU LIKE MOST TO BE IMPROVED?

Votes	Candidates
31 FMGR	Let RN command change the security code.
74 FMGR	Time stamp in the FMG file directory.
20 FMGR	Expanded capability for the LI command such as double space, no line numbers, time stamp the listing, no page eject, and checksum printed at end.
54 FMGR	Unpurge command, if cartridge has not been packed.
34 FMGR	DL command expansion to sort the directory.
3 FMGR	Expand duplicate error messages in FMGR to separate error messages.
3 FMGR	Dual but separate files maintained by the system for disaster recovery.
20 FMGR	Expand the MC command capabilities such as allowing the cartridge to be inserted into the middle of the list and allowing a cartridge to be mounted to a session user as well as to the system.
13 SORT	Routine that uses its own EMA mapping.
14 SYSTEM	Post-mortem dump.
4 Utility	File dump in OCTAL/ACII format.
11 FORMATTER	Hexadecimal format.
59 LOADR	Faster loader.
32 IMAGE	Allow 32 bit integers and 64 bit floating point data.
29 DRIVERS	Allow terminal output control to break, resume and return to system command like Control S, etc.
13 READR/SAVER	Expand to allow restart if full cartridge, expandable directory, multiple saves and save negative security code files.
5 SYSTEM	New EXEC call for combined then read into same buffer for interactive programs.
22 SYSTEM	I/O cancel command.
11 FTN4X	Extendable type 1 and 2 files.
6 FTN4X/77	ENCODE/DECODE error exit.
35 QUERY	Command stack and multiple data sets.
37 UPDATES	Use READR/SAVER instead of READT/WRITT for system updates.

HP1000 USERS GROUP (VIC.)

The Annual General Meeting will be held on the 24th March, 1983, at Hewlett-Packard, Joseph Street, Blackburn, commencing at 4.00 pm.

The main business of the meeting will be the election of office bearers for 1983. This will be followed by a discussion with H.P. and demonstration of some of the newly released equipment.

SH.53>

THE SH (Shell) COMMAND INTERPRETER

During this last year I have been using a software package which has saved me a lot of time and effort as well as being a pleasure to use.

Before we go into more details on the working of SH, let me give you some background information.

The SH command interpreter was mainly engineered by Bill Haffey at HP-Roseville. It was designed as a vehicle to try out new ideas and to provide a more user friendly interface to the HP1000. Quite a few of the features of SH have been incorporated in new operating systems like RTE 6/VM and RTE A.1.

The rest of this article will consist of extracts from the user manual and examples of some of the features.

1.1 Introduction to SH

SH is a command interpeter which allows somewhat friendlier conversations with RTE. The FMGR program is not involved in most operations, and when it is, it is used as a slave of SH. SH features include:

1) Editable command stack that can be saved across logouts

2) Folds lower case to upper case in commands and allows blanks to delimit parameters

3) Allows multiple commands on a line

4) Allows the user to define command macros which can optionally be saved across logouts

5) Implements commands through programs, allowing the users to add or remove commands as needed

1.2 Running programs with SH

SH accepts commands of the form:

```
'<program>,<parameter-1>,<parameter-2>,...,<parameter-n>

                - or -

  <program> <parameter-1> <parameter-2> ... <parameter-n>
```

<program> is run with the given parameters pretty much as FMGR does. As with FMGR, specifying a security code of "IH" on the program name inhibits cloning of permanent edition programs.

<program> must start with an alphabetic character. All special characters as the first character of a command are reserved for SH use.

Program parameters are free to use most commonly used characters (a special character summary appears later). Parameters are separated by either a comma or space(s). For example, to run FTN4 from SH you can say either

```
SH.nn> ftn4 &foo::xx -::xx -::xx

          - or -

SH.nn> ftn4,&foo::xx,-::xx,-::xx
```

Commands are separated by a <cr> or ';'. If a command begins with an '&', that program is scheduled without wait. For example, to start a compilation of one file while you edit another, you could say:

```
SH.nn> &ftn4 &file1 - -; edit &file2
```

which would allow you to edit &file2 while &file1 is compiling.

1.9 Talking to FMGR and RTE from SH

If the <program> field of the command begins with a '!', the rest of the command is passed to RTE for execution. For example, to change the priority of a program you can say:

```
SH.nn> !pr baz23 120
```

You can pass a command to a FMGR clone by preceeding the command with a colon. For example, to mount and pack a disk you can say:

```
SH.nn> :mc 16
SH.nn> :pk -16
```

The command separators work for FMGR and RTE commands too, so you could have gotten the same effect by saying:

```
SH.nn> :mc 16; :pk -16
```

We note in passing that ':' is a FMGR command itself, so you can execute a FMGR command file from SH by saying:

```
SH.nn> ::namr param1 param2 ...

          - or -

SH.nn> tr namr param1 param2 ...
```

To make FMGR more accessable, macro definitions for some FMGR and RTE commands are available in your system's standard SH macro definition file (SH.MAC on some system disk). If you created and initialized your session file with SH.MAC (see beginning of this document) then you already have these available to you.

If you have the standard macros then the preceeding mount and pack commands could be done by the line:

```
SH.nn> mc 16; pk -16
```

See the chapter on SH macros for information about how to roll your own macros.

To hold a longer conversation with a FMGR clone you can run FMGR just like any other program. The FMGR command "EXIT" will get you back to SH.

If you want to set your FMGR list device or severity level for FMGR commands executed from SH, you can do so through the LL and SV macros in the standard macro file (note: you cannot just stick a colon in front of it!). SH keeps your last LL and SV command around between FMGR commands. The initial value for LL is your terminal LU. The initial

1.4 SH command files
C

The first parameter in SH's run string is the file to get command lines from (defaults to none). All commands which you can give from a terminal are legal in the command file. SH exits when the end of file is encountered or the "#exit" command is encountered.

You can execute a file of SH commands by passing the file namr to a SH clone, e.g.,

```
SH.nn> sh namr
```

Note that since the commands are executed by a clone of SH rather than your current copy of SH, any macros you use in that file must have been permanently defined the last time your session file was updated. Temporary macro definitions which are made in the command file are treated the same as they would be if you had entered them from your terminal, i.e., they are local to that SH clone and go away when that copy of SH exits.

For those programmers who want to use SH all the time, you may want to rig your hello file to run SH for you. There is a sample hello file in appendix A which puts you in SH's hands at login and allows you to logoff by typing control-D (or whatever). Remember, you can always get to a FMGR clone by using the "fmgr" command.

1.5 SH command stack

SH keeps your most recently typed commands in a "command stack" which you can edit and re-execute if you are running on a 264x or 262x terminal (it hasn't been tested on any other type as yet). To display the last twenty lines of the command stack and enter editing mode, you type '/' followed by a <cr>. You can then move up to the command you want via the cursor movement keys (far right hand keypad on the 264x keyboard, unshifted arrows at the top of the 2621 keyboard). The line can be edited with the INSERT CHAR and DELETE CHAR keys, and is executed when you type <cr>.

If you know how far back into the command stack you want to go, you can patch/execute just one line by following the '/' with the number of commands you want to go back. A few lines following the specified command are also displayed in case you missed. A very large number like "/999" will display the oldest commands in the command stack.

When a new line is entered into the stack, the old entries are checked for an exact match. If one is found, the old entry is deleted.

Some uses for this feature are: 1.) doing repetitive things, e.g., OFFing and SPing SG01P through SG24P 2.) patching a long command line with a typo rather than retyping it completely 3.) remembering what command you gave a minute ago (Where did I send that listing?)

It is recommended that the new user practice using this feature with harmless commands (like asking for the time of day) until you get the hang of it. Remember that there is no way to avoid executing a line once you enter this mode, but if you move the cursor to a blank line before hitting <cr>, nothing bad should happen. <home><clear-display> is another good way to escape from this mode if you prefer something more dramatic.

If you get a command with nasty escape sequences in your command stack by accident, you may want to give the SH internal command "#clear_stack", which clears the command stack.

1.6 Session files

Your session file (SH.SES) is used to keep your command stack, permanent macro definitions, and other good stuff around across logoffs. This file is read when your SH starts up, and is updated when you exit from SH. Note that if you have more than one copy of SH running from your session file, all overwrite the session file as they exit, and the last one to write it determines its final state.

1.7 SH special characters

The following characters are currently special to SH throughout the command string:

<cr>	Command terminator
;	Command terminator
,	Parameter separator
blank	Parameter separator

The following are special only as the first command character:

/	Command stack access
@	Schedule without wait
:	FMGR command
!	RTE command
#	SH internal command
+	Define a macro
-	Remove a macro
_	Display a macro

SH allows the user to define his own commands through macros. The macro name is given in the <command/program> field of the run string. Macros can be written to do simple text substitution of the parameter fields of the command line.

A macro may contain more than one line. When the macro is expanded, these lines are processed as if you had typed them on your terminal. SH.MAC, the standard SH macro definition file, contains many simple examples of macro definitions.

2.1 Displaying existing macros

To display a macro definition, type the macro name preceeded by a backarrow (or underscore, or whatever you call ASCII character 137 octal). For example, to display the definition of the MC macro, you might say:

```
SH.nn> _mc
   MC ^0 ^1 ^2 ^3 ^4 ^5 ^6 ^7 ^8 ^9
   :sl,^0,^0
   :mc,^0,^1,^2,^3,^4,^5
```

The first line printed is a header, not a part of the macro. MC is the name of the macro, and ^0 through ^9 represent the 10 possible parameters. Wherever ^0 through ^9 appear in the macro definition lines, text substitution will be done using the corresponding string from the command line.

This macro's body contains two lines. The first one takes the first parameter (in this case the LU) and puts it in the session switch table. The second line does the MC command, passing through the assorted parameters.

To see a list of all macro names currently defined for your copy of SH, give the underscore followed immediately by <cr>, e.g.,

```
SH.nn>
?? AC BIGNAMEHUH BR CLAL CLEAN CN COPY CR CRUSH CS DC DL DN DU E ED EQ
IN LI LL LU MC MOVE OF OFF ORC PK PR PRI PU RD RN RP SL SP SS ST SV SZ
TR UP VERIFY WH
```

2.2 Defining temporary macros

Temporary macros are defined at the terminal for use by your current copy of SH. They go away when you exit from SH. Macro definitions begin with a line whose first character is '+'. The definition line must contain the name of the macro to be defined and any dummy strings for any string parameters. You will then be prompted for the macro body, one line at a time. A blank line terminates the macro definition. For example, to define a command named "a" which assembles a file for you, you might do something like:

```
SH.84> +a xxx
Macdef: :sl,6,,,6
Macdef: asmb &xxx::me 6 %xxx::me
Macdef: :cs,6
Macdef:
SH.84>
```

If we call this macro with the command string "a prog" the assembler would be passed the command string "RU,ASMB,&PROG::ME,6,%PROG::ME".

NOTE: all occurrences of the dummy string parameters which are found in the macro definition body are taken as string replacement targets. If we had defined the above example in terms of "s" rather than "xxx", string substitution would have been done for the "s" in the "sl", "cs", and "asmb" as well as where we intended. You should therefore pick dummy string which do not look like anything in the macro body definition.

You can use "/" to get at the command stack from the "Macdef:" prompt the same way you use it from the terminal. This is useful for including a string you are tired of typing in a temporary macro.

2.4 Permanent macros

If you decide that a temporary macro does something useful and you want to make it permanent, you can do so by preceeding the macro name with two plus signs. For example, if you want to make macro "foobar" a permanent macro, give the command:

```
SH.nn> ++foobar
```

3.1 General info

3.1.1 Wildcard namrs

Some of the SH commands allow a "wildcard" namr as a parameter. A wildcard namr is used to describe a set of files with a single namr parameter. For most commands where wildcard are legal, a namr parameter is processed as a wildcard if either the filename or cartridge field is wild. A file name is wild if it is either null or contains one or more '-'s. A cartridge is wild if you specify zero (as opposed to not specifying one). If the file name specification is wild, a null cartridge specification is taken to mean all cartridges in you cartridge list.

To specify a subset of all possible filenames, type the name with the character '-' in the character positions you want all names to match on. For example, the specification "ABC---::2" refers to all files on cartridge two beginning with "ABC". If the security code, type, or size fields are non-null, files which do not have that security code, etc. are not considered a member of the file set. Care should be taken when using wildcard namrs with commands whose effect is permanent (e.g., the PU [purge files] command). Some examples:

foo	No wildcard processing
foo::xx	No wildcard processing
foo::0	All files named "FOO" in your cartridge list
---xyz	All files ending in "XYZ" on all cartridges
abc---::xx	All files beginning with "ABC" on cartridge XX

3.2 ? - Interactive help program

The "?" program provides on-line help for the various things, including other programs in the SH package. It is pretty self-explanatory, just say:

```
SH.nn> ?
```

and it will talk at you. The data is organized as a network of help messages. You give short keywords to get from node to node in the network. Try it and see.

3.3 HE - help program

HE will try to give you some help with various things, including the cryptic error code numbers some programs generate. :HE's data files begin with the character '?', and usually contain a screenful of info about a program. Running HE with no parameters is equivalent to running the RTE HELP program (in fact, that's what it does).

Examples:


```
SH.nn> he ftn4 27
  FTN4 027
  DOUBLELY DEFINED STATEMENT NUMBER.
GQHGGSH.nn> he asmb dd
  ASMB DD
  Doubly defined symbol

SH.nn> he l 10
  L 010
  THE RUN STRING SUBMITTED TO THE LOADER WAS IN ERROR.  TRY AGAIN.

SH.nn> he fmgr -6

  FMGR-006
  FILE NOT FOUND
  AN ATTEMPT WAS MADE TO ACCESS A FILE THAT CANNOT BE FOUND.

SH.nn> he sc05
  SC05
  THE PROGRAM GIVEN IS NOT DEFINED.

SH.nn> he who
    The WHO program displays who is logged on at each session and the
    programs that they are currently running.  If no parameter is given
    only your session gets displayed.  Current legal options are:

    A      All option, lists all programs for all sessions
    F      Fast option, just lists the login name of each session
    nn     Tells only about session number nn

    The terminal locations are found in file ?WHERE, which should be
    edited by the system manager to reflect terminal locations.
```

The individual entry data files use basically the same format file as the RTE HELP program (the RTE HELP database supplies some of the information). This command will probably be replaced by the FMGR help command when its parameter scanner becomes more tolerant and its database includes the language error codes.

3.4 PN - file rename

PN renames files with wildcard processing. pairs. In the second namr of each pair, only the file name is necessary. See wildcard description for how the first namr of each pair is interpreted. '-'s in the second namr of each pair are replaced by the corresponding character in the first namr. PN tells you the cartridge involved whether you include it or not. For example, to .17qme all files named FOO to BAR and all files beginning with "ABC" to the corresponding name beginning with "XYZ" we could say:

```
SH.nn> pn foo bar abc--- xyz---
```

3.5 MOVE - move a file to another disk

The MOVE command copies file manager files from disk to disk and verifies that the copy is correct. It is used mainly to copy files between crowded permanently mounted cartridges and removable or less crowded cartridges. The command is:

```
SH.nn> move source-file destination-file
```

The file name and security code of the destination file will default to those of the source file. Wild card specifications and character substitution work much the same as with the PN command. For example, to move all listing files from disk XX to disk YY:

```
SH.nn> move '-----::xx ::yy
```

Unlike FMGR's STore command, records of length zero are kept.

3.6 COPY - file copier

The COPY command looks the same as the MOVE command, except that the source file is not purged after the copy is made.

3.7 CRUSH - extent removal supervisor

The CRUSH command will remove the extents of a file by:
£

1) Making a copy of the file under an odd name
2) Purging the source file
3) Renaming the odd name file to what it should be.

The command is:

```
SH.nn> crush namr1 namr2 ...
```

3.8 CAT - text file concatenator

The CAT program is somewhat similar in flavor to the FMGR commands DU and ST. It concatenates a number of files into one file. The command string is:

```
SH.nn> cat source-1 source-2 source-3 ... source-n destination-file
```

If only two parameters are given, the result is a copy. If only one parameter is given, the data is typed on your terminal (you probably want to use TY for this anyway). There is currently a limit of 10 source files. LU's are legal as CAT parameters. Unlike their FMGR equivalents, zero length records recieve no special processing; they are passed along like any other record.

3.9 DIR - directory list

DIR has one or two parameters. The first is a wildcard namr describing the files to be listed and the second is the place to send the list of files. Unlike most commands, DIR will always do wildcard expansion on the wild parameter. File extents are ignored.

Default list destination is the terminal. The default listing mode GZ,\6ays the cartridge, file name, type and security code. DIR attempts to interpret the file type.

Example: find all type 6 files on LU 3 beginning with the letter P and place them in file X::16.

```
SH.nn> dir p-----::-3:6 x::16
```

DIR can also be used to generate a file of namrs for command file generation by preceeding the wildcard namr with "+n" (we cannot use a '-' on the switch because it would be ambiguous). Example: same as the previous one with namr format listing.

```
SH.nn> dir +n p-----::-3:6 x::16
```

3.10 MAIL - inter-user message system

The mail program is used to send messages to other users on your own system or other systems connected to yours through DS. The two basic modes of operation are simple mail sending and message recieving/archiving.

To send mail to somebody:

```
% mail
To:  <receiver-name-list>
Subject: <one-line-saying-what-this-message-is-about>
Type mail terminated by a blank line:
-<line-one-of-message>
-<line-two-of-message>
    ...
-<last-line-of-message>
-
Send, Edit or Abort (S,E,A)[S]:
```

3.11 DIFF - text file comparison program

DIFF finds the differences between two very similar files and prints the differences in pairs. It is useful for finding out what changes have been made to a program source file or a command file, since such files tend to diverge with customizations. To run DIFF:

```
SH.nn> diff <input-file-#1> <input-file-#2> <output-file>
```

If no output file is given, differences go to your terminal.

3.12 PRELD - Relocatable merger and library searcher

PRELD merges the relocatables for a program to ease program distribution problems within the lab. The run string is:

```
SH.nn> preld <command-namr> <output-namr>
```

PRELD recognises three commands: RE, SE and END. All others are passed without processing; commands like "OP,LB" are ignored. This means that a simple LOADR command file will probably do the trick for simple cases. Note that SE does a single pass search; one of these days a MS (multiple search) command will appear. <command-namr> can be your terminal.

3.13 Other miscellaneous programs

Program	Description
TI	Prints time of day on your terminal
CALC	Handheld calculator
CL	Cartridge list with free space
FUDGE	Relocatable library summary lister- Parameter is the file to examine
PRINT	File printer, see ?PRINT
FL	File list for a specified cartridge with 6 files per line

Disclaimers

These programs were done as a G_job, and have no maintainance commitment whatsoever. These programs are still experimental, use at your own risk.

WARNING

Due to the fact that:-

1) DIR,... will list all file security codes
2) UNPU,,, can mangle directories if not properly used
3) SU,SUPER make you omnipotent

These programs should be saved with negative security codes on a RTE 4B system or SP ed with a capability of 63 on a RTE 6 system and only the System manager should have access to them.

HP Management Round Table

As always, the HP Management Round Table, an interactive session in which a panel of top HP management answers users' questions, was one of the most popular events at the conference. Conference attendees crowded eagerly into the Flamenco Lounge to hear what HP representatives had to say about a variety of vital issues, ranging from product support to support services to new products. At future conferences, the one-hour session will be extended to at least two hours. The HP participants in the question-and-answer session included:

Dave Yewell, Sales Manager, DSD
Gaylan Larson, General Manager, DSD
Marc Hoff, Worldwide SE Manager, CSD
Dick Lampman, R&D Manager, DSD
Dick Warmington, Marketing Manager, CSD
Terry Eastham, Data Terminals, Sales Manager, DTD
Jeff Hornung, Product Manager, IND

I have heard rumors that HP will soon delete some product support. Which products are most likely to be deleted and how long do we have before we have to migrate to something else?
First of all, there are several product families at HP: the 1000 family, the 3000 family, desktop computers and several smaller personal computer systems. The strategy at HP is to gear these families to every need. For example, the HP 3000 is particularly suited to data handling and is mainly used in commercial, database types of applications. Desktop computers are being directed towards the engineering workstation application because they offer a lot of computing power with access to large peripherals and disc. Meanwhile, the HP 1000 is probably the most useful because it is used for real-time functions. Of course, computational capabilities as well as quick response and power contribute to diverse and unique applications. We're going to continue to support all of these products; we're not going to phase out any of them in favor of something else. But, products do get old, in the case of peripherals as well as operating systems. HP's policy is to give a one-year's notice before obsoleting a product and then support it for five years after that. You have plenty of time to see what's ahead and make plans.

There's another issue related to this that not all of you may be aware of: There are FCC requirements for certain computers. As of October of 1983 we won't be able to ship computers that violate FCC requirements to any site. E- and F-series products will meet FCC requirements if we put them in steel cabinets. So some people who are now buying them in boxes will have to purchase them with a steel cabinet or qualify the boxes to the FCC. Obsoleting products depends on customer demand; we generally let sales obsolete products.

What are HP's plans for the support of MAC interfaces for the A-series? Will MAC be available in the future?
We're not emphasizing support of a primary product disc controller in the A-series. What is new is that we're presently developing a special handling product that allows a MAC disc or the A-series. Those of you who are interested should contact your HP sales representative. MAC itself is approaching obsolescence but we'll give a one-year notice of that. There are federal regulations for 1983 that must be resolved.

Seven representatives from Hewlett-Packard addressed users' concerns in the Management Roundtable session at the Long Beach conference.

What about support for Datashare?
That does not come automatically with supporting MAC disc. There are special problems involved with supporting Datashare and Datasafe on the A-series, although that is something we plan in the future. Whether or not we will use the MAC disc is uncertain at this time.

Are there any plans to support the RTE-A.2 file structure manager under RTE-6?
No, we're not planning to do that. There are a number of factors that influenced our decision, ranging from the significant update requirements to the fact that it would require a major change to RTE-6. This was a particularly difficult choice for us because the RTE A.2 file structure would provide a lot of features that people would like, but we're presently concentrating our efforts on other things.

Would you consider putting the file manager source in the contributed library so we can do it?
There are other questions about putting source code in the Contributed Software Library. We wouldn't want to donate active products to the CSL/1000 because we would be unable to control support of our products.

Are diagnostics moving to on-line or off-line?
Our R&D Group has developed a unified diagnostic strategy (UDS) which was developed to look at the whole spectrum of the system, including interfacing in the future. The UDS can be characterized by self-testing diagnostics, a direction we'll be going in more and more, as well as smaller peripheral products. We'll be developing both on-line and off-line diagnostics.

Is there a way to attach the new line of 262x terminals so that baud rate can be controlled from the keyboard?
As far as I know there is no way to alter the baud rate on the 262x terminals in this manner.

Almost every conference-goer attended the Management Roundtable, making it the most popular session at the conference.

Are your moving towards the 422 standard in many of your products?
We certainly are and we provide option 35 on most of our terminals today, so that those people who want the larger distances can have them.

What about communication to IBM equipment other than RJE; for example, IBM 3270 series protocol? Can a 1000 act like a 3274-type terminal, or act like a host to a 3274-type terminal?
Ours is a single division responsible for networking strategies in all divisions in the Computer Group. In brief, we're currently working on a product called MRJE which is due out at the end of this year. It will provide Multi-leaving RJE communications to IBM hosts from HP 1000 systems running RTE-6/VM and RTE-A.1. Also, we are working on a 3270 emulator for the same HP 1000 system. The 3270 emulator will provide programmatic communication to IBM hosts via a set of HP-supplied intrinsics. Pass-through mode, in which the HP terminal appears to be directly connected to the IBM host, will not be included in the product. We are investigating adding this capability at a later date. The HP 1000 will emulate IBM 3274 and 3276 cluster controllers using bisynchronous protocol.

On the subject of protocols, when is HP going to address the problems of full modern support and XON and XOFF support?
There is some work underway to add modern support for multiplexors and

to enhance existing protocol so that it provides XON/XOFF. I don't have a time frame on that, but it is currently underway. We are also working on adding XON/XOFF protocol to the 12005A interface card.

Our software subscription service is still messed up. Is this still a widespread problem? What can we do to get our problem resolved?
Your local office is responsible for the software subscription service's database. We thought if we decentralized data entry to area offices more care would be taken to see that the data was entered properly.

The subscription software distribution area was a separately-run service. We're making some significant changes in the manner in which we do distributions, and so forth. Be assured that we are looking into this situation and are planning some vast improvements. Also, we're trying to get the supply of materials to the distribution center in a more timely fashion. I hope by mid-1983 we can resolve these problems for the 1000 product line. I think we will have to limit the selection of media on which we offer our updates — that must change because it took 4 ½ months to reproduce the software for the last update.

I'm a consultant, and I am quite aware of different bugs. I would like to be able to report a bug and get some response.
HP does not require you to have a subscription service in order to submit a service request. If you're a consultant, you don't have to have your customers' systems manager report it — you can do it. In the first half of next year we'll improve our entire service request service by putting it in our area offices on-line to a central database that will eliminate paper-flow. We expect a much quicker turn-around for bug reports and system enhancement requests.

There are vastly different interpretations of site and environmental requirements for HP 1000 systems. How can this problem be resolved?
It's become clearer that we have not been performing consistent site-preparation services. We plan to start a new inspection program for SEs within the next three months. We plan to do thorough on-site visits and offer alternatives and recommendations to make the environment adequate. The set of recommendations for customers will be consistent.

Could a workshop on HP internal procedures, HP software configuration management, and software distribution be offered as a session at the users group conference?
I'd certainly be willing to back such a session. Would a session like this be of general interest? (A vote was taken, and the majority present voted yes).

Will we see HP 3000 or desktop programs, like HP Word, for the 1000?
I think the best indication of that is a program that's already in place, although it's not a software product for the HP 3000, the 125 or a desktop. Rather, it is a product available through the HP Plus program. The HP Plus program has almost 100 different packages available today.

The HP Plus Spreadsheet is not as good or cheap as Visicalc; are there any plans to make a Visicalc for the HP 1000?
I think that's a real opportunity for someone. We invite you (or anyone interested) to develop such a product and we'll put it in our HP Plus program through the normal procedures.

Users should be able to buy CSS for RTE-6 operating systems only and not have to buy it for all the subsystems. Current HP policy leads to outrageous costs (over $9,000 per year) for a single site.
It boils down to a philosophy of supporting the system or supporting the products. We feel that supporting individual products leads to incorrect diagnosis of system problems. For example, you may blame a problem on a subsystem though it's really a file system problem. We make a conscientious effort in to support both the operating system and the subsystem, equally. We review our support policy every year, trying to make adjustments; however, I don't foresee a change from this current policy.

Why don't you offer a discount if a user has to buy, say, six subsystems at once?
We can't do that. The subsystems are reasonably priced, considering the amount of time and effort put into them.

HP-IB links are intolerable for us due to cable restrictions. Why won't HP support serial links to their new graphics devices on the 1000?
It is possible to support serial devices and we have supported a number of them. We need to look into this more.

It seems the new A-series is designed for small systems only. Will the forthcoming A 800 be able to support 20-30 terminals, 644 megabytes of disc space and over 40 interface cards or should I buy a VAX?
You have heard comments today about planning enhancements for the A operating system, such as expanded capacity, discs, terminals, and resources. We have an 1/0 expander planned.

It seems that the 1000 is headed toward a modular approach to industrial automation. What about the customer who needs it for scientific number crunching?
The next 1000 computer model is an example of the direction in which the product line is going. The recent product introductions have been much lower in cost. I'm sure you're going to find the next HP 1000 model a significant improvement over the current F-series. We're planning to keep our prices at about this level.

We are headed toward industrial automation, where computation is a very necessary capability. People who are using our systems for general-purpose capabilities will find them even more useful.

What is planned to promote computer system compatibility for the entire HP product line?
We've been giving this some thought; part of our problem is languages. We have developed a language philosophy for the company that we are now implementing. Various front ends such as FORTRAN emit a standard intermediate data structure. This allows development of various code emitting modules, one for each hardware architecture. Once all front ends are developed, only one code emitter need be developed for the entire architecture to contain the whole family of languages.

The second problem to overcome is operating systems. We plan to have UNIX available on all of our systems. That won't solve any problems today, but if we develop if for the future, you'll be able to move from computer to computer.

What about communication between the 3000 and the 1000? The two must talk to each other; hopefully, in the most transparent way possible.
We are working on a Distributed Systems product which will provide a common set of services such as file transfer, virtual terminal and inter-processor communication across HP product lines.

In databases?
No, not databases. There are still different databases and data formats that the user must take into account and handle.

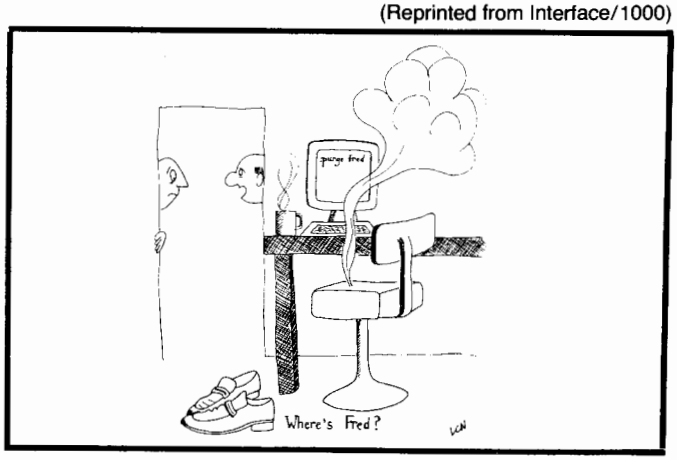
We need to have program performance capabilities, like system tuning.
Program performance seems to be handled by two current products, ACCEL/1000 and the new Symbolic Debugger. System performance needs further investigation.

What is IMAGE II? When will it be released?
The major features of IMAGE II are transaction logging and rollback recovery. It will be released in early 1983.

Would it be possible for HP to contribute the sources of obsolete software to the IUG library? Second, does HP have problems if users submit the above-mentioned software in case HP doesn't have the source anymore?
That's a good idea. We'll have to screen them and then submit them. Sometimes we'll have to keep it, if for example, we obsolete a product but there's a significant amount of code in it that is still current.

I'm still concerned about the length of time it takes to get bugs resolved. Our bugs don't even seem to reach the Software Status Bulletin — what's going on?
We are doing a number of things that will result in improvement. This year we started something called CCE that is supposed to ensure that bugs are taken out of the system. The entire system in the field will be more direct. In the factory, we have improved staffing to cope with this problem.

(Reprinted from Interface/1000)



COMING EVENTS

21, 22 Feb:	HP Seminars on personal computers and HP 9000. Windsor Gardens, 258 Mowbray Rd., Sydney
23 Feb:	HP Seminars on personal computers and HP 9000. Crest International Hotel, Anne St., Brisbane
25 Feb:	HP Seminars on personal computers and HP 9000. Lakeside International Hotel, London Circuit, Canberra
28 Feb:	HP Seminars on personal computers and HP 9000. Hotel Windsor, 103 Spring St., Melbourne
28 Feb:	RTE-6/VM Session Monitor course. HP Sydney
1 March:	HP Seminars on personal computers and HP 9000. Hotel Windsor, 103 Spring St., Melbourne
1 March:	H.P.D.C.U.G.V. Meeting at Windsor Hotel at 4.30 (immediately following the HP seminars)
4 March:	HP Seminars on personal computers and HP 9000. Riverside Hotel, 150 Mounts Bay Rd., Perth
14 March:	Series 200 Operating & Programming course, HP Sydney
21 March:	RTE-6/VM System Manager course, HP Sydney
21 March:	Pascal Language course, HP Melbourne
21 March:	Series 80 BASIC Programming course, HP Melbourne
24 March:	Annual General Meeting of HP 1000 User's Group, Melbourne, 4.00 pm. at HP, Joseph St., Blackburn
6 April:	HP 1000 User's Group Meeting, Sydney. At a venue to be announced at 4.00 pm.
11 April:	RTE-A System User course, HP Melbourne
11 April:	Image/DBMS 1000 course, Sydney
12-14 April:	Productivity '83, Melbourne
13 April:	H.P.D.C.U.G.V. Annual General Meeting with HP speaker. Hilton Hotel, Melbourne, at 4.30 pm.
18 April:	RTE-A System Designer course, HP Melbourne
18 April:	HP BASIC Programming course, HP Sydney
19-21 April:	Productivity '83, Sydney

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