# Introducing HP's PC Instruments System

The Hewlett-Packard PC Instruments System links test and measurement instrumentation to the personal computer which is fast becoming the workhorse of the technical environment. It represents a cost-effective way to achieve a faster time to solution and more consistent results over a wide range of test and measurement applications including manufacturing, research and development, process control and monitoring, and data logging.

Creating your own automated instrument system is easy: You simply connect the instruments and accessories to your PC and load the software. Your system can be up and running in just a few hours, and can be easily customized to suit your individual needs.

**With Hewlett-Packard PC Instruments, your HP 150 Touchscreen or IBM PC, PC/XT, or PC/AT personal computer can be used for:**

- Temperature monitoring
- Final testing
- Prototype testing
- Incoming inspection
- Component evaluation
- Subassembly testing
- Environmental testing
- Process monitoring and control
- Academic research
- Biological research
- Analytical chemistry
- Botanical research
- And more

**Fully integrated instrumentation**
Hewlett-Packard PC Instruments form a unique system of hardware and software that allows you to monitor and control up to 8 different test instruments simultaneously from the screen of your personal computer. You can set up test equipment, analyze test data, program test procedures, and log test results. Test programs can be generated faster, allowing you to automate procedures that you might otherwise perform manually. You can blend test and measurement with business functions, thus turning your personal computer into a totally integrated work site.



*PC Instruments — a practical solution for the automated-test-and-measurement requirements of a wide range of technical professionals — has been introduced by Hewlett-Packard Company. The components of the personal-computer-based system include up to eight of the most widely used technical instruments, offered in modular, stackable cases. These components, driven by HP's PC Instruments system and applications software, are designed to work in concert with the HP Touchscreen and IBM PC. (PR2101501).*

# CONTENTS

# HP Computer Museum
# www.hpmuseum.net

**For research and education purposes only.**

# CO-ORDINATOR'S COMMENTS

Unfortunately the good response to our last STOP PRESS has not continued on for this issue. We need your continuing contributions to make CROSSTALK an interesting and successful journal.

At this stage we are extremely light on for articles for the next issue. We know from previous issues that many of you have a wide variety of interesting applications that would make excellent articles.

We can only re-iterate that CROSSTALK is the Journal of Hewlett-Packard Technical Computer Users Group and without members contributions will become just a new products and coming events release.

On a brighter note, the Marketing Communications Group is pleased to be co-ordinating CROSSTALK for the first time with this issue. However, whilst we have taken over this role we will still be calling on John Green for his invaluable technical assistance.

> **Regards,**
> **Derrin Johnson,**
> **HP Melbourne**

# Desktop's May Meeting

Our May meeting was only fairly attended for what was a most interestinng presentation by Henry Drillich on his "BudgProf" program. Henry has managed to tackle the budgeting problem from a completely different angle which not only indicates which areas of a manufacturing organization require more or less attention but also gives a general overview of a company that allows the monitoring of trends before they become problems. The system appears to have been designed for manufacturing organizations but Henry assures us the principles used apply to almost any company. Henry also offered to anyone interested a free copy of a program of his for down loading the contents of a Winchester to floppy disk drive. Henry can be contacted on (03) 857 6816. The written text of Henry's presentation appears in this issue.

John Green gave us an interesting run-down on all the features of the latest version of the HP 71B which appears to offer pocket size with desktop performance. From what John showed us the HP 71B should prove to be a popular machine.

> **— Peter Hendy**

# STOLEN

The following items of computer equipment were recently stolen from Henry Drillich:-

**One HP 86A, Serial No. 2230A75316,**
**One 82912 Monitor Option 001,**
**    Serial No. 2232A52820,**
**One HP 9135A Winchester,**
**One HP 9121 S.**

Should anyone locate any of these items, would you please immediately contact Henry Drillich, (03) 857 6816.

# NEW PRODUCTS

## The HP Touchscreen II personal computer family

Hewlett-Packard is proud to announce the HP Touchscreen II family of personal computers. The new HP Touchscreen II personal computer combines the benefits of the original HP Touchscreen personal computer with additional benefits to make the HP Touchscreen II the best solution ever for the business professional. It's easy to use — yet expands to meet the demands of the most sophisticated business needs.

The HP Touchscreen II is designed to be completely compatible with previous members of the HP 150/Touchscreen family. This means that with the HP Touchscreen II you still get ease of use — from the Personal Applications Manager, softkeys, HP Touch, and Easy Config to set up your peripherals — and you can still choose from more than 600 software packages already available for HP Touchscreen personal computers. Complete hardware compatibility means users have access to all of the available hardware accessories to meet expansion needs.

### System features
Like the previous members of the HP 150/Touchscreen family, the HP Touchscreen II features the MS™-DOS (version 2.11) operating system, powered by the Intel 8088 16-bit microprocessor. The HP Touchscreen II comes standard with 256K bytes of RAM and may be expanded to a maximum of 640K bytes. In addition, the HP Touchscreen II offers a host of new features, including a new ergonomic display, enhanced graphics capability, new accessories, and new peripherals.

Designed for the office, the HP Touchscreen II has a high-resolution 12-inch display with built-in display tilt. It offers the best resolution available today on a personal computer, providing you with crisp, clean text and graphics. The HP Touchscreen II, with its larger display and new ergonomic design, still provides the same footprint of the original HP Touchscreen personal computer — 12.8 inches wide by 12 inches deep.

The HP Touchscreen II also offers room to expand with four accessory slots in addition to four standard ports. You can easily add accessories such as memory cards, an internal modem, a Centronics interface, and other available hardware accessories. Hardware accessory cards are easily installable through the HP Touchscreen II's removable top panel.

Recognizing the importance of communications, the HP Touchscreen II comes standard with four ports: one HP-IB parallel port, one RS-232/RS-422 communications port, and one standard RS-232 port. In addition, the HP Touchscreen II offers HP-HIL (HP Human Interface Link), which allows users to simultaneously daisy chain up to seven input devices, including the HP Mouse, graphics tablet, and bar code reader, to the keyboard. HP-HIL provides flexibility and expandability so personal computer users can operate input devices interchangeably, moving from the HP Mouse to the keyboard to the touchscreen.

### Advanced ergonomics
The HP Touchscreen II is ergonomically designed for user comfort and convenience. The built-in tilt allows you to adjust the high-resolution, 12-inch display for optimal viewing. The power switch, brightness control, and keyboard connection are located on the front and side panels for easy access. The new design also includes a cable-management system that eliminates exposed cables and enables the HP Touchscreen II to be set flush against a wall.

### New accessories and peripherals
In addition to the already available accessories from the HP 150/HP Touchscreen family, new accessories are available with the HP Touchscreen II. HP Touch is now offered as a user-installable accessory for the HP Touchscreen II for those who desire touch capability to enhance the user interface. The HP Touchscreen II also supports the new 8087 Match Co-processor that allows you to speed up scientific and other real-number-intensive applications.

Several new mass storage options are available for the HP Touchscreen II family. The HP Touchscreen II System offers the new HP 9123D dual 3½-inch floppy disc drive with a capacity of 710K bytes each. The HP Touchscreen II MAX offers a choice of Winchester disc drives with an integrated 3½-inch floppy disc drive, including 10 and 20M-byte versions.

# NEW PRODUCTS

## *Modular spectrum analysers*

A family of modular test instrument components that offers a new, economical way of making a wide variety of radio frequency measurements has been released by Hewlett-Packard.

The HP 70000 family of modular measurement system components includes a mainframe enclosure, two display units and a number of modules that fit into the mainframe. The first modules allow manual and automatic spectrum analysis from 100Hz to 325GHz.

A major benefit of the new measurement system is that the user need only buy those system components required for present measurement tasks. Components can be added later to provide the additional capability.

Comprising a single spectrum analyser instrument, the system includes a minimum set of three spectrum analyser modules, a display unit and a mainframe. A system containing more than one independent instrument such as a programmable signal generator also can be configured, with the advantage of central operator control and monitoring of all instruments from one display unit.

A high speed digital interface bus in the system provides rapid communication among the system components. HP 70000 systems can communicate with other instruments and controllers through the Hewlett-Packard IEEE488 interface bus (HPIB).

The measurement system allows for rapid repair, made possible by on-site replacement of faulty modules. Service diagnostics help to locate malfunctioning modules quickly and faulty components can be replaced at the site where the system is used.

The modular spectrum analyser systems make several performance contributions:

- Broad frequency coverage: RF range: 100Hz to 2.9GHz; microwave range: 50kHz to 26.5GHz; and millimetre range: up to 325GHz, with as many as four bands covered simultaneously by one analyser.
- Absolute amplitude accuracy: + 2.3dB at 2.5GHz at any place on the display.
- IF resolution bandwidth: adjustable in 10% increments.
- Good millimetre amplitude accuracy and sensitivity using HP 11970 Series harmonic mixers: + 2.7dB accuracy at 60GHz; − 124dBm sensitivity at 60GHz (10Hz resolution bandwidth).

More information from Hewlett-Packard, Australia.

## Logic analyser provides two oscilloscope channels

The new HP 1631 A/D is a dedicated benchtop logic analyser that provides state analysis, timing analysis and digitizing oscilloscope functions.

As a general purpose, system integration tool for the digital hardware designer, the Hewlett-Packard product windows in on specific analogue events to provide information for troubleshooting and characterizing systems.

Two analogue oscilloscope channels are available with 200 megasample per second digitizing rate, allowing simultaneous single shot capture and storage and waveforms up to 50MHz bandwidth.

Single shot capture, storage, simultaneity and speed plus pretrigger viewing provide an excellent means for observing parametric faults in a digital system design.

Single shot storage yields permanent, credible, jitter free waveform records. Simultaneous capture allows real time correlation of parametric events.

Simultaneous data acquisition in the state, timing and analogue domains provides effective trigger qualification by any one of the three domains to locate problems in the remaining two. Simultaneous acquisition allows events of interest in one domain to be time correlated to events in the remaining two.

Single shot time interval measurements can be made with an accuracy of up to + 1.5ns.

Trigger qualification is possible through a technique that compares data with a preset specification.

Specific events in time can be isolated directly and rapidly using the search-and-then-stop acquisition method.

More information from Hewlett-Packard, Australia.
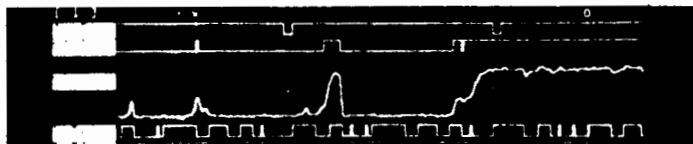


*The third waveform (MI SWan) is the analogue representation of the timing waveform immediately above it (MI SW).*

## Chromatograph

Hewlett-Packard has introduced a chromatography workstation designed to meet the data-acquisition, analysis and file-management needs of individual chemists or small laboratories.

The standard configuration includes an HP 9000 Series 200 computer with substantial memory capacity, HP Think-Jet printer and 15 MB Winchester-disc drive from Hewlett-Packard, and Xtra-Chrom chromatography software and an intelligent A/D interface made by Nelson Analytical.

Up to 10 instruments, each interfaced to a maximum of two detectors, can be controlled by this chromatography data system. In addition to standard gas and liquid-chromatography applications, the system can be used for a variety of other applications including capillary GC, ion chromatography and amino-acid analysis.

The software provides capabilities for method and sequence generation; data acquisition and data processing; post-run recalculation; comparison, ratio and difference computations; and custom graphics.

More information from Hewlett-Packard Australia.

## NEXT H.P.D.C.U.G.V. MEETING

The next meeting of the H.P.D.C.U.G.V. will be held on the 30th of July from 4-6.30 pm. at CSIRO Geomechanics Division, Syndal, Vic.

Mark Levenspiel who has been a staunch member of the user group for 3 years will make a presentation on "Talking to Mills". Mark's presentation should be very informative. He is well qualified to make this presentation as he runs a thriving automotive engraving business.

The following meeting is scheduled for the 3rd of October. Alan McNamara will make a presentation on super graphics. The new Managing Director of Hewlett-Packard Australia Malcolm Kerr will be attending the meeting.

**Meeting dates for 1985/86 are:**
30/7/85, 3/10/85, 26/11/85, 30/1/86, 8/4/86 (A.G.M.).

**Presentation given to November Meeting of the HPDCUGV**

# HP 85 MAKES TABLETS

### By Chris Burford

Fawns & McAllan Pty. Ltd. is a Pharmaceutical manufacturing company in the eastern suburbs of Melbourne. They specialise in solid dose preparations of pharmaceuticals for human and veterinary use. Fawns and McAllan make over 350 million tablets and capsules per year using 15 machines, the fastest of which is capable of over 60,000 tablets per hour. To aid in the Quality Control of these medicines Fawns and McAllan use an HP85 desktop computer coupled to a Mettler KWT 10 Automatic weighing system.

## BACKGROUND

Standards for pharmaceuticals in Australia are set down in various State and Federal acts of parliament. These are policed by the respective Health Departments. As the Federal Government also pays for many pharmaceuticals through the National Health Scheme and public hospitals they are also the pharmaceutical industry's biggest customer. The Health Departments are therefore vitally concerned with maintaining the standards of Australian pharmaceuticals and frequently review the tests applied to them.

One of the current tests required by law for tablets and capsules is the "Uniformity of Mass" test. Most doses of drug are expressed in terms of mass of active ingredient (e.g. Aspirin 300 mg). It would be inconvenient for a patient to have to weigh their own drugs, especially of potent substances that are active in less than milligram quantities so tablets were developed. By diluting the drug with inactive material (usually Lactose or starch) it can be more easily measured out and compressed into a tablet or put into a capsule. The patient then has a known quantity of drug in an easily managed form.

For efficiency and speed of production the powder that goes into each tablet is measured by volume rather than mass. (Think how much slower you would be putting 5g of sugar in your coffee instead of 1 teaspoon). Mass, however, is still the prime concern and it is closely monitored throughout a production run.

If the active drug is uniformly distributed through the diluent and all tablets are the same mass then all tablets would contain the same amount of drug. Unfortunately in the real world many factors combine to produce unavoidable variations in tablet mass. It is this variation that the HP85 monitors. Separate tests are done on the homogeneity of the mix and together the tests ensure that tablets contain the stated quantity of drug.

The manufacturer is faced with the familiar cost/effectiveness decision — spend more on Quality Control and you spend less on reprocessing reject stock. Spend less on Quality Control and you risk missing a bad batch which could get into the market-place and end up in a costly recall.

The volume of production at Fawns & McAllan demanded some form of rapid assessment of tablet samples to avoid the need for handling and storing large amounts of stock awaiting test. With batch sizes up to 1,000,000 units automated weighing was necessary to process the number of samples required to obtain meaningful results. By using a desktop computer to process test results the complex statistical calculations can be performed rapidly with immediate feedback of compressing machine performance to the

operators. By using a basic language computer F. & M. could write their own program to use Australian limits and tests instead of EEC standards supplied with the Mettler weighing system.

The HP85 was chosen because it fulfilled the above criteria, was an ideal instrument controller and was easily interfaced to the Mettler equipment via the GP10 interface configured as two 8 bit parallel ports. It uses the cassette tape for data and program storage and produces a printed report of the sample and batch evaluations for permanent storage as required by the authorities.

## HARDWARE

The hardware consists of an electronic balance, a vibratory feed unit with photocell, a control/data transfer unit with A/D converter to control the feed unit and receive the balance output, and the HP85 for data acquisition, analysis and reporting. To operate this system a sample of tablets is placed on the feed unit, the machine room from which the sample was taken is fed into the 85 and the start button is pressed. The Mettler will tare itself, weigh each unit individually, send the weights to the 85 and clear itself ready for the next sample. The 85 will retrieve the previously stored information about the product being made in the room indicated, (Description, form, batch number, machine, target mass), calculate the appropriate limits, accept weights from the Mettler, evaluate the sample against the limits, print a sample report and store the results for a batch report.

## SOFTWARE

The program was written by F. & M. personnel because they were familiar with the test requirements and limits and the sampling plans being used. Extensive use was made of routines in the Standard Pac programs as no programming experience was available at F. & M. Such routines as the date conversion and storage, and the histogram printing were taken directly from this source. The main criterion for program development was the KISS principle — Keep It Simple, Stupid. In order to keep the number of operations to a minimum parameters like sample size and number were written into the program. Control operations were also written into the program where possible.

The program has three main functions:-

    i) Enter product data
    ii) Weigh product samples
    iii) Print a batch report

The machine spends most of its time weighing samples so the program loops within each function until told to exit back to the selection menu. Loop control is by the machine room number. If a valid number is entered the HP85 will direct the Mettler to weigh a sample from that room. If Zero is entered the program leaves the loop and returns to the function selection menu.

Selection of functions is by the soft keys rather than entering a number from a menu. This has the disadvantage of not being easily able to check the selection but the advantage is that some functions can be available all the time, not just at specific points in the program. The soft keys are activated when necessary by calling subroutine 175. e.g.

```
255 GOSUB 175
260 CLEAR @ KEY LABEL
275 GOTO 275

175 ON KEY #1. "HGC" GOTO 6000
180 ON KEY #2. "LIMITS" GOSUB 300
185 ON KEY #3. "ENTER" GOSUB 600
190 ON KEY #4. "WEIGH" GOSUB 1100
195 ON KEY #5. GOSUB 895
200 ON KEY #6. "BCHRPT" GOSUB 900
210 ON KEY #7. K$ GOSUB 4700
220 ON KEY #8. "STORE" GOTO 2700
230 RETURN
```

The program waits at line 275 for a soft key press and returns to line 275 after exit from a routine. Each routine then turns off the soft keys not wanted (with the OFF KEY #X statement) at the beginning and reactivates them at the end, e.g.)

```
1100 OFF KEY # 1 @ OFF KEY # 2 @ OFF KEY # 3
1110 OFF KEY # 4 @ OFF KEY # 6 @ OFF KEY # 8
      Body of routine
1790 GOSUB 175
1795 CLEAR @ KEYLABEL @ RETURN
```

The use of K$ for the key label allows a variable label depending on the mode the program is using. Key 7 is a toggle which changes between two sample sizes and shows the current sample as the key label.

```
4700 IF A = 32 THEN 4730
4710 A   32 @ K$ = "32"
4720 GOTO 4740
4730 A = 100 @ K$ = "100"
4740 ON KEY #7. K$ GOSUB 4700
4750 KEY LABEL @ RETURN
```

The machine room number is also used as the pointer to the data storage arrays and strings. The following subroutine checks the room number input and retrieves the target mass for the product in that room (T) by referencing the P(,) array.

```
1800 DISP "ENTER ROOM No. (Enter 0 to change function)"
1820 INPUT R
1830 IF R   - 0 THEN RETURN
1840 IF R   - 15 THEN 1870
1850 IF R# INT (R) THEN 1870
1860 T - P (0, R) @ RETURN
1870 BEEP @ DISP "INVALID ROOM — PLEASE RE-ENTER"
1880 GOTO 1820
```

Other data items for room R are stored in the array in row R columns 1 to 25. String information like product name are stored in S1$ which is dimensioned to take 63 characters for each room. Data for a room R is then retrieved by extracting a substring, e.g.

```
460 C1$ - S1$ [R*63-62. R*63]
```

The main programming difficulty was developing the I/O routines. The series 80 owners manual is written for the beginner and is an excellent text. However, the I/O Programming Guide assumes that the reader is an expert. Coupled with the misprint in the interface manual (p14 S2(6) Data line logic sense) this user was completely lost in bits and bytes for some time.

The first version of the I/O routines to work brought considerable jubilation. These used ENTER and OUTPUT statements in a strictly sequential logic. The problem with this arrangement was that a user had to be present to see everything was OK. If the Mettler ran out of samples or the user forgot to press the Start button the HP85 would happily wait forever for the next data. In some instances an interface timeout was successful, e.g.

```
5000 CLEAR @ DISP "ACTIVATE METTLER"
5010 BEEP 200, 75 @ RESET 4
5020 SET TIMEOUT 4:8000
5030 ON TIMEOUT 4 GOTO 5010
5040 ENTER 402 USING "#,K". C$
5050 IF C$ = "A" THEN OFF TIMEOUT 4 @ RETURN
5060 GOTO 5040
```

This routine waits 8 seconds before sounding a reminder beep. In other case the time delay was still causing samples to bank up on busy days. This was eventually overcome by using interrupt transfers. These are used as follows:-

i) Operator starts Mettler (see 5000 above)
ii) HP sets up I/O buffer to accept sample data (Lines 1170 and 1180 below)
iii) HP can then proceed with retrieval of report header details and mass limits calculation without holding up the weigher. When this is complete the HP arrives at line 1216. sets a time limit of 30 seconds on its wait for data then proceeds to enter and evaluate the data.

```
1170 IOBUFFER I$
1180 TRANSFER 402 TO I$ INTR
     Retrieve and print sample header
1216 ON TIMER #1, 30000 GOTO 1410
1217 STATUS I$, O; T1, T2, T3
1218 IF T2  = T1 THEN 1240
1220 IF T3 THENN WAIT 100 @ GOTO 1217
1230 TRANSFER 402 TO I$ INTR @ GOTO 1217
1240 ENTER I$ USING "#,A"; C$
1250 IF C$="A" THEN 1215 @ REM START OF SEQUENCE
1260 IF C$="C" THEN OFF TIMER #1 @ GOTO 1465
     @ REM END SEQ
1270 IF C$="+" THEN 1290 @ REM DATA FOLLOWS
1280 GOTO 1217 @ REM IGNORE NEGATIVE RESULTS
1290 STATUS I$,O, T1, T2, T3
1292 IF T2  ≤ T1+9 THEN 1298
1294 IF T3 THEN WAIT 20 @ GOTO 1290
1296 GOTO 2900 @ REM BUFFER FULL ERROR
1298 ENTER I$, W9
```

Evaluate Data

```
1400 IF N   A THEN 1216
1410 OFF TIMER # 1 @ ABORTIO 4
1420 OUTPUT 403 USING "#,K"; "L"
1430 WAIT 200
1440 OUTPUT 403 USING "#,K"; "T"
1455 CONTROL I$,0;1,0
1460 TRANSFER 402 TO I$ INTR
1465 HALT 4 @ GCLEAR
```

Print sample report

Lines 1217 to 1220 loop waiting for data

Line 1230 restarts the transfer if terminated

Lines 1240 to 1280 check the first character of the data and branch accordingly (reject or evaluate).

Lines 1290 to 1296 wait for 9 characters to be available in the buffer ("XXXX.XXXX") before entering a measurement.

Line 1400 checks to see if more samples have to be weighed and loops if Yes.

Lines 1410 to 1465 stops the I/O and sends the close down controls to the weigher.

The size of the I/O buffer can be chosen for optimum efficiency but as we have spare memory capacity we chose enough buffer to accept 110 weights. (Up to 100 samples plus some reject weights — e.g. an empty balance when a tablet bounces out or a double weight).

Other useful tips discovered during program development and use have been:-

— When testing the graph routines variables were used for scaling and initialised to likely values, e.g.

```
10 X1 = -100 @ X2 = 100 @ Y1 = 0 @ Y2 = 100
2000 SCALE X1, X2, Y1, Y2
```

Then if the scale is not correct the program can be paused, the values of X1, X2, Y1 and Y2 can be changed and the program continued from line 2000. This avoids the delay of rerunning the program and reading in all the data from tape for small scale adjustments. When the scale is decided put the values in line 2000 and delete line 10.

— The program is always edit protected to prevent loss of data if it crashes. Otherwise a number entered will be taken to mean a line to delete and the program cannot be CONTinued. An unprotected copy is available for program development.

— The keyboard is appropriately masked to prevent accidental pausing and SFK 5 is left active to allow programmer access by unmasking the keyboard and pausing the program. The CONT key will restart if an operator presses K5 by mistake and no damage is done. (So long as the program is protected). Interrupt transfers stay active and no data is lost.

Samples of the reports are attached.

## CONCLUSION

By installing a computer controlled automatic tablet weigher, Fawns & McAllan has been able to reduce In Process Quality Control costs and at the same time reduce the amount of rework and reject material resulting in cost savings to Production.

Statistical assessment of samples has also increased confidence in test results and allowed reassessment of control limits. The machines are stopped for adjustments less often with resulting productivity improvements.

```
TRIAL TABLETS

BATCH No.              12345
PRODUCT No             T21
ROOM 24                X-PRESS
DATE                   15/4/1985
TIME                   10:03 AM
TARGET MASS            630 mg

=====================

SAMPLE No.                   3

SAMPLES OUTSIDE ICL
Nil

Number of weights            32

Average mass             626.7

Maximum                  639.3

Minimum                  621.1

V Ratio                   22.4

PRODUCT WEIGHTS ACCEPTABLE.

Disintegration(m)
Hardness(N)
Thickness(mm)
Friability(%loss)

*********************


TRIAL TABLETS

BATCH No.              12345
PRODUCT No.            T21
ROOM 24                X-PRESS
DATE                   15/4/1985
TIME                   9:54 AM
TARGET MASS            630 mg

====================

      ============
      AVERAGE MASS
      ============
INNER CONTROL LIMITS      623.3
                          636.7

OUTER CONTROL LIMITS      618.6
                          641.4
      ==============
      INDIVIDUAL MASS
      ===============
```

```
INNER CONTROL LIMITS      607.1
                          652.9
OUTER CONTROL LIMITS      601.4
                          658.6

Disintegration(m)

Hardness(N)

Thickness(mm)

Friability(%loss)

*********************


      BATCH REPORT
      ============

TRIAL TABLETS

BATCH No.              12345
PRODUCT No.            T21
ROOM 24                X-PRESS
DATE                   15/4/1985
TIME                   10:04 AM
TARGET MASS            630 mg

=====================
```

```
Number of units weighed       806

Average mass (mg)           630.8

Standard Deviation          6.7728

Number of samples taken       22

Batch V ratio               35.5

Disintegration(m)

Hardness(N)

Thickness(mm)

Friability(%loss)
```



```
        **********************
m9
598.5
604.8
611.1
617.4
623.7
630
636.3
642.6
648.9
655.2
661.5

No. off histogram
    HIGH 0
    LOW  2

**********************
```
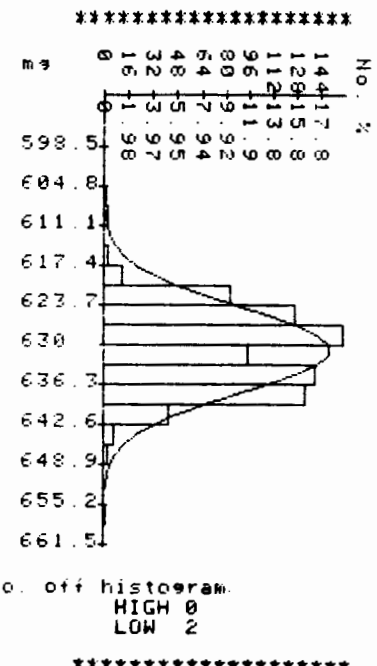
# Budgeting for Profit

## An Introduction to "BudgProf" Programme.

The unique feature of "BudgProf" programme lies in:
1. Synthesis of operations, and
2. Great flexibility of the system and the amount of independent control exercised over the business.

It is usual to analyse results of operations, and even in forward budgeting, this is done by analysing the projections.

The Budgeting for Profit, as emulated by the computer programme "BudgProf", approaches this complex problem differently.

It starts with a desired profit on sales, and after formulating the strategy, follows with a preferred scenario. More detailed budgeting is next. At the same time key-parameters are posted for monitoring of realization.

Any manufacturing company presents a more or less complex picture of inter-relations between buying materials, using materials, manufacturing Finished Goods, marketing, stock control, etc., all resulting in Profit or Loss on operations.

For a given company all activities are locked together, because changes of one element affect directly or indirectly other elements.

This can be expressed as a system of mathematical equations which reflect these interdependencies. The equations and a range of carefully selected factors make it possible to detect any abnormal trend or activity. This gives the system its great flexibility and independent control.

As an example, the system will high-light such diverse problems as labour efficiency and losses due to malpractices. It may be also helpful in discarding the "window dressing" when analysing a potential acquisition.

From this brief introduction one can glean that "Budgeting for Profit" has the following objectives:
1. To select a proper strategy to obtain the desired profit on sales.
2. To create a preferred scenario to realize strategy leading to desired profitability.
3. To create budgetary details of operations and key factors.
4. To monitor various aspects of operations, including independent evaluation of profits, stocks and other important budgetary items.

These objectives are met by "BudgProf" programme which becomes in the hands of manager-user a powerful management tool.

The Budgeting for Profit introduces a few concepts which will be now briefly described.

A manufacturing activity can be described in many ways, e.g. as a gross value of manufactured goods, number of hours worked etc.

In the Budgeting for Profit approach, manufacturing activity is described by the value of Materials, Packaging and Outside processing (MPO) used for production of finished goods.

It is obvious that the more goods are produced (by the same company) the higher the value of MPO will be. The MPO value is used as a parameter expressing manufacturing activity.

The manufactured goods are usually sold at various profit margins due to marketing requirements. The Budgeting for Profit introduces Product Profitability Factor denoted Ks. This is the ratio of the average selling price to its MPO cost.

If we assume that the activity of a company resulted over a period of time in no variation of the stock of manufactured finished goods, then dividing all sales of manufactured finished goods by the total value of MPO (Materials, Packaging and Outside processing) we obtain an overall Product Profitability Factor Ks.

It can be shown that for a given company, the profit/loss depends entirely on combination of MPO and Ks.

This is implemented by "BudgProf" in its "Truth-Table".

It consists of two parts:
1. Data Base.
2. Profit/Loss Map.

The Data Base lists all expenditures both fixed and variable. Certain items are high-lighted e.g. rent. However this presentation introduces also another concept. Variable manufacturing expenditure is an expenditure directly related to manufacturing activity, that is the higher the activity — the higher the expenditure.

As explained before, MPO is the measure of manufacturing activity. Because the expenditure is proportional to MPO, dividing expenditure by MPO will result in a constant factor.

So for instance if you take the balance sheet with accompanying information, and divide labour cost by its associated MPO you will obtain Labour-Factor. It should be stressed here that this factor itself is not a measure of productivity as it depends on changes of both labour costs and materials (inflation).

However if the activity of the company has not changed drastically from that of a previous accounting period (acquisitions, vastly different range of goods, new manufacturing processes or facilities) then the change in this factor is very small. Conversely a major change must be justified by a change in factors. The same procedure of division of variable expenditures by MPO and converting them into fixed factors is adopted for all variable expenditures.

It must follow that fixed expenditures divided by MPO will become variable factors.

In arriving at the Data Base we have to examine critically last year's Data and modify them accordingly to circumstances.

Once The Data Base is established, the computer prints the second part of the "Truth-Table"-Profit/Loss Map.

You can select a desired profits on sales, a range of MPO and Ks.

The appropriate Profit/Loss lies at the cross-section of MPO-row with K-column.

The "Truth-Table" lists also the necessary overall Product Profitability Factor and cost of Manufactured Goods, both as a function of MPO.

The name Profit/Loss Map stems from the fact that one can discern different regions on the "Map".

So we can find a region where an increase in manufacturing activity will result in increased losses, a region of static results where changes of manufacturing activity have little, if any, effect on Losses, region of rapid growth of profits, etc.

In addition to above the Table shows also the effect of Fixed expenditures on profits, as well as Break-Even Product Profitability Factor.

The "Truth-Table" gives a true picture of the position of the company and its prospects.

If the obtained results are unsatisfactory, it simply means that the Data Base must be changed with all its ramifications.

So the overall strategy may involve not only selection of a region of "Truth-Table" with appropriate MPO and Ks but also specific changes to the Data Base.

Realization of the strategy is executed using K-Table section of the programme.

However before proceeding with K-Table we need to introduce another definition. This involves establishing of a non-inflationary, inherent value of products. In this respect each product is allocated a certain fixed value — the unit of which is nuV (new unit value).

The nuV for any product, once allocated, remains constant for the life of the product. The total production of a factory may be now expressed in nuV units.

As nuV ratings remain constant, the ratio of labour costs over manufactured nuV gives expression of labour efficiency. It shows improvement, if any, of productivity against rising costs of labour. If correction is introduced for difference in average hourly rate, the ratio will give current productivity factor.

Whilst nuV of each unit remains constant the material cost, etc (MPO),

of this product changes. If one divides the total value of MPO by associated nuV, one obtains MPO cost of a single nuV, which is designated (MPO) 1, or MPO/nuV. The computer programme facilitates both allocation of nuV as well as calculation of (MPO) 1.

To create a scenario we project a range of products which we wish to manufacture and expect to sell.

In its standard version a scenario can include up to 187 products. The K-Table section of the programme will analyze the scenario and show the resultant MPO, Ks, total nuV and (MPO) 1. The printout includes also information on profitability of individual products and their significance in overall product-mix. The scenario can be modified, added to, stored, recalled and printed.

In general it has to be manipulated until both requirements of MPO and Ks are simultaneously met. A preference of one scenario against any other is established by returning to "Truth-Table" and specifying the relevant MPO and Ks values. Once this is established we have a definite range and quantity of products to manufacture, total MPO, total cost of production and average selling prices.

The next stage involves breaking the yearly K-Table into 12 monthly K-Tables.

These are our monthly scenarios and are used for detailed monthly budgeting. It should be pointed out that final selection of a scenario involves management decision. Truth-Table helps to make it a right one.

The data from monthly scenarios are keyed-in in the next stage of detailed budgeting. This allows for variation of stock of raw materials (MPO) as well as stock of Finished Goods.

The computer calculates details of budgeted expenditure under various headings, as well as Profit/Loss, stock variations, etc. These become key data which require monitoring. The system is flexible for instance whilst both monthly and total MPO is known, it may be necessary, for supply or production reasons, to increase temporarily stocks. This can be easily implemented allowing also for proper stock reduction at a later period. The same may apply to the stock of finished goods.

There is a provision for monthly entry of actual results as well as progressive results.

Due to break-up in detail of various expenditures, one can pin-point quickly unwelcome variation and try to correct it. If this is not possible, then it is necessary to go back to scenario evaluation. This in conjunction with Truth-Table will help to establish the best way out of difficulty.

It is also possible to evaluate the marginal effect on cost structures and profitability caused by an addition of a range of Goods Bought for Resale (GBR). Whilst the Truth-Table assumes that these goods will have the same Product Profitability Factor as goods manufactured, the budgeting stage and entry of actual results allow for different values. Also profitability and stock variations are shown separately. Running two Budgeting Tables, one with and one without GBR, makes it possible to examine in detail the effect of introduction of GBR.

The "BudgProf" is a powerful tool which is not restricted to manufacturing companies only.

It can be used also by Merchandising companies. In such a case MPO stands for Merchandise, Packaging and Outside processing. Needless to say GBR is set to 0.

All manufacturing expenditures become merchandising expenditures and all selling-administrative expenses become only administrative ones.

In major companies it is advisable to create separate sets of budgeting for individual divisions, or plants, or subsidiaries, and a combined one for top management.

Another application lies for conglomerates in ascertaining the best strategy, etc. in which case products in K-Table are replaced by industries.

The above lists some of the features of "BudgProf" and indicates flexibility, range of applications and power of the programme.

The details of operation of the programme are found in Operating Manual, which includes also annexes and printouts, where concepts and examples are further explained.

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# HIBBERTS PROVIDE LASER SOLUTION TO AUSTRALIAN INDUSTRY

The use of Laser Measurement Systems is becoming more widely spread in measuring and precision alignment in manufacturing environments — and Australia is no exception. At Boyer, near Hobart, Australia's largest newsprint mills churn out thousands of tonnes of newsprint every month to supply Australia's daily press, and more recently Telecom, who require paper for Australia's telephone books.

Hewlett-Packard and Hibberts Pty. Ltd. play an important part in the production and quality of the end product. Using a 5526A Laser Measurement System in conjunction with an HP 9825 controller, Hibberts use the straightness feature of the Laser to measure 15m plus distances on the 9m long paper rollers where tolerance of 1 micrometer over the flight of the carriage is required. The roll grinding machine made by Churchill is spring mounted on a special seismic isolation block, making it difficult to achieve accuracy using conventional levelling methods. The machine is a hefty investment at around $1 million and is able to grind rolls 13m long x 1.8m diameter, weighing 40 tonnes.

Hibberts use the Laser System to align the roll grinder to allow accurate re-grinding of the calendar stack rolls. This is the last set of rolls that the paper goes through and is responsible for sizing the paper, so precision is essential. Accuracy decline of the rolls is through wear caused by vibration and friction so the parallel rolls have to be reground to be within + or - 1 micrometer (.001mm) over the diameter.

An almost clinical environment of temperature (22.5 degrees Celsius) control is required inside the grindroom, which has double insulation, no windows and roof fans to stop stratification. Even the radiation effects from the lighting are controlled.

Hibberts chose the HP 5526A Laser System primarily because of its linearity and the digital nature of the data it outputs. Those two aspects make it possible to use computer numerical methods to extract extremely accurate measurements from raw data that is mostly "noise" due to environment.

# CAD system pays off for Wilson

The Wilson Electric Transformer Company has achieved dramatic productivity gains through the use of a computer aided design system. The Australian-owned manufacturer produces transformers for distribution, power mining, and furnaces in capacities ranging from 20k VA to 200MVA. at voltages up to 330kV. It also markets reactors, tapchangers and high voltage switchgear.

The computer system is based on an HP 1000 A700 computer, with some software from Hewlett-Packard, and the remainder developed in-house.

Wilson Transformers managing director Robert Wilson, said that extensive software development had paid off, as not only had productivity increased in the design department but drafting, production scheduling and manufacturing had also recorded significant gains. For example, he estimates that rating and diagram plate drawings can now be made 10 times faster by computer than manually.

"Another important benefit derived from computer-assisted designing is the maintenance of accuracy. When designs were prepared manually, they were susceptible to errors, due mainly to the tedious detail designers had to work with. Now, using the CAD system, designers need not spend hours and hours working out a bill of materials and cutting and assembly instructions for manufacturing, as the computer system calculates these results, precisely, in minutes", he said.

Two of the company's 10 terminals are used for programme development in Fortran and Pascal. Of the others, four run design programs and four are used for drafting — an area which is currently being incorporated into the CAD system.

The company settled on its system because of price and upgradability. "The system did not have to meet the commercial needs of the company, as the area of production scheduling, word processing and accounting is handled by a Honeywell", said Wilson. "Initially, our investigations did cover buying one large computer to do both jobs, but we decided that two separate systems would work better. This means if we need to shut down one of the systems, the other is not affected.

"The investment in state-of-the-art technology at all our manufacturing sites reinforces our status and capabilities as a supplier of power and distribution transformers to the Australian market and surrounding regions — a competitive and technically demanding market", he boasts.
Hewlett-Packard
Joseph St. Blackburn 3130

---

# HP1000 Users Group — Membership 1985/1986

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---

# New HP 1000 A-Series I/O Extender now available

The HP 1000 A-Series now has an I/O Extender to help you support a variety of interface cards designed to meet the needs of your computer integrated manufacturing (CIM) and real-time applications. Users with large I/O requirements will find the HP 1000 solution even more attractive. The A-Series Extender has the following features:

- Available for A600+, A700 and A900 Series computers.
- Choice between 12- or 18-slot versions.
- Compatibility with A-Series DMA I/O architecture.
- Transparent to application software.
- Supports up to 24 I/O channels today.
- Will support up to 48 I/O channels with the new release of RTE-A.

**Range of solutions**
The I/O Extender effectively extends the backplane of the A-Series, although the maximum bandwidth of the computer does not change. With two versions and multiple extender support, a range of I/O expansion solutions provide you with flexibility today and growth paths for the future.

The product structure of the Extender is straight-forward yet versatile. The 12025A is based upon the Micro 1000 box and offers 12 additional I/O channels to any of the HP 1000 A600+, A700, or A900 Series computers. The 12025B uses the larger 20-slot box and provides 18 additional I/O channels. Multiple Extenders can be used with one CPU by adding combinations of either version for a maximum of 48 total I/O channels.

Upgrade options are required for Extender use for earlier revisions of the A900 and A700 Series computers. The A900 upgrade is customer installable while the A700 requires customer engineer installation (included with the upgrade).

---

# International Users Group Membership

At its Annual meeting the Melbourne HP/1000 Users Group announced that it was about to become a full member of the International Association of Hewlett Packard Computer Users (INTEREX). This will include a copy of the full contributed library. The Treasurer of the Melbourne Group Norm Kay (03) 544 0633 will be the holder of the tape and limited copies of software will be available for members to use, without the need to join INTEREX.

---

# UNIX WORKSHOP

A short note to remind technical users of the HP/1000 User Group Unix Workshop which will be conducted at HP Blackburn on Wednesday, July 17.

The workshop will commence at 9 am. and continue until 5 pm. when drinks will be served.

The workshop will cover the history of Unix, its future from a commercial view, HP-UX software. HP Unix hardware and Unix case studies.

The cost is only — $40 for non-members or associates of members.

— $30 for financial members of HP/1000 or Desktop Users.

To enrol please advise the Secretary, Chris Emery (03) 667 2328 ASAP.

# Focus 1000

# MANY CHANGES IN A.85

The latest revision of RTE-A known as A.85 is a very extensive update from A.84.

The features which have been enhanced or added are:

- User defined and predefined variables
- New commands added along with new fmp routines
- Accounting information with session connect and CPU times
- New utilities to handle some accounting functions and to obtain system status
- Enhancements to the I/O system
- Changes to the generation to allow partitioning of system modules

This article will briefly describe user defined and predefined variables and the new commands.

The other topics mentioned above will be discussed in the next issue of Crosstalk.

## USER DEFINED AND PREDEFINED VARIABLES

Users can define their own variables and can reference them by preceding them with '$'.

Example: $ABC will reference the user defined variable ABC and replace $ABC with the string ABC contains.

## PREDEFINED VARIABLES

| | |
|---|---|
| $auto_logoff | Allows for automatic logoff of session if inactive. If assigned non-zero value n, CI will time-out after n terminal timeouts. After 4 CI time-outs, an "EX,B" will be executed, terminating the session if CI is the only program. Initialized to zero (no automatic logoff). |
| $log | ON/OFF flag indicating if commands are to be logged to the terminal when executed from a command file. Default is OFF (no echo). |
| $opsy | Value of the operating system. |
| $prompt | The displayed prompt that shows CI is waiting for input. Default is "CI >". |
| $return1 - $return5 | Five integer values (ASCII representation) returned from execution of last command. Updated on most commands (see Return from Command Files). |
| $return_s | 80-character string returned from execution of last command. Updated on most commands (see Return from Command Files). |
| $ru_ first | TRUE/FALSE flag indicating if RU or TR is to be assumed if just a file name is entered to CI. Initialized to TRUE (assume RU first). |
| $save_stack | TRUE/FALSE flag indicating if command stack is to be saved at logoff and when user changes command stack file with the WD command. Initialized to TRUE (save the stack). |
| $session | Shows session number. |
| $wd | Name of current working directory. Updated after each WD command. |

The "$" is not used when setting a variable's value with the set command.

## COMMANDS

Command strings can be quoted and escaped. Quoting is done by using the grave accent (" ` "), so by placing a string in these quotes the command interpreter will pass the string untouched.

Example: `un` altered will produce unALTERED.

Escaping is done with the back slash character ("\"). This will pass the next character immediately following the backslash exactly as is.

Example: \aaa would produce aAA.

Commands can be separated by semi colons (";").

---

example:

```
CI> wh; cl
Program                    DataPartition CodePartition
Name     Pr  PCntr Seg  Size Status   Size Status  Program Status
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
Session  65 Superuser STANLEY
CI       51  35605         32 in                   waiting for WH
WH        5   6346         12 in                   scheduled
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
Fri Jan 11, 1985   4:03 pm
File System Disc LUs:  17  23  30
FMGR Disc LUs (CRN):   16(16)       31(31)
```

## NEW COMMANDS

### CO

The copy command CO has an option added to it to specify that a file has no carriage control when copying to a printer device.

The option is "n" no carriage control in file.

### ECHO

Displays parameters at the terminal.

```
Examples:

    CI> echo \abc              (displays 'aBC'.)
    aBC

    CI> echo 'lower' case      (displays 'lowerCASE'.)
    lowerCASE

    CI> echo $abc              (displays the value of user-defined variable ABC)
    HELLO                      (in this case, $ABC = 'HELLO'.)

    CI> echo abc def           (displays 'ABC,DEF'.)
    ABC,DEF

    CI> echo $session          (displays the value of variable $SESSION.)
    65                         (in this case, my session number is 65.)

    CI> echo Your session number is  $session
    Your session number is 65
```

### IF-THEN-ELSE-FI

**Conditional decision making structure:**

```
Usage:  IF command-list1
            THEN command-list2
            [ELSE command-list3]
            FI

        command-list   is a list of commands separated by semicolons or
                       new lines.

    example of IF control structure:

    CI> li test.cmd                          (Show contents of command file.
    if ftn7x $1.ftn 0 -
    then link $1.rel
    else edit $1.ftn
    fi

    CI> li test.ftn                          (Show program.)
        program test
        write (1, *) 'this is a test'
        end

    CI> test.cmd test                        (Execute command file with)
    IF                                       (logging on.)
    FTN7X,TEST.FTN,0,-
    END Ftn7x:  No disasters, No errors, No warnings.
    THEN
    LINK,TEST.REL
     Program TEST.RUN:::6:41 ready; 5 pages
    RU,TEST
     this is a test
    ELSE
    EDIT,TEST.FTN
    FI
    RETURN

    CI> set log = of                         (Turn off logging and execute)
                                             (with logging off.)
    CI> test.cmd test
    END Ftn7x:  No disasters, No errors, No warnings.
     Purging old file: TEST.RUN:::6:41
     Program TEST.RUN:::6:41 ready; 5 pages
     this is a test
```

```
IS -- Compares two character strings or numbers.

Usage:  is <string1> <relational operator> <string2> [option]
```

IS compares two strings either with an ASCII comparison
or optionally after converting both to integers.  The
ASCII comparison is normally performed with alphabetic
characters folded to a single case.

The recognized options are:

```
   -i    Integer comparison.  A suffix of B in either upper
         or lower case indicates an octal value.  A leading
         - sign is accepted on decimal values.

   -a    Don't fold alphabetics before comparison.
```

IS returns the following status values in $RETURN1:

```
0 = relation is true
1 = relation is false
2 = relational operator missing or invalid
3 = option not recognized
4 = non-digit appears with -i option in effect
```

In a ASCII comparison, a shorter string is extended with blanks
before the comparison is made.

The relational operators that are recognized are:

| Set 1 | Set 2 | |
|---|---|---|
| = | eq | Equal To |
| <> | ne | Not Equal To |
| < | lt | Less Than |
| <= | le | Less Than Or Equal To |
| > | gt | Greater Than |
| >= | ge | Greater Than Or Equal To |

## LI
The LI command will now accept file masks.

## PATH
Display/Update User-Definable Search Paths (UDSP's).
The path command is used to display and/or update a user defined
search path (UDSP).  There can be up to 8 UDSP's per CI invocation
but the actual number is controlled by limits set up with the USERS
command.

Some examples will give one an idea of how the PATH command is
used.

```
path 1 . /mine/progs /programs
                  - set UDSP 1 to:
                  1) current working directory
                  2) /MINE/PROGS
                  3) /PROGRAMS
path 2 . /mine/cmds /cmdfiles
                  - set UDSP 2
path -e -f setpath.cmd
                  - take input from SETPATH.CMD without
                    echoing to the terminal
    SETPATH.CMD contains the following command lines:
         0 /mine
         1 . /mine/progs /programs
         2 . /mine/cmds /cmdfiles

path -n:2 1      - display entry 2 of UDSP 1
path -n:2 1 /mine/utils
                  - set entry 2 of UDSP 1 to /MINE/UTILS

path 2 !         - delete all of UDSP 2
path -n:2 1 !    - delete entry 2 of UDSP 1
path -a !        - delete all UDSP entries

path -e -n:2 3 - return the contents of the second entry
                 of UDSP 3; returns value in return
                 string without displaying to the terminal
```

## PRINT
Print now accepts a file mask.

## PS
PS Displays program status of a program given the name or ID segment.
The PS command has many codes for various status results.  One
should check the manual for these.

```
Examples:  CI> ps test1
           TEST1  PR(    99)  PC(     0)    OF
           CI> ps
           CI     PR(    51)  PC(66330)    XQ
           CI> ps 1
           D.RTR  PR(     1)  PC(23115) M  OF
```

## RETURN
Return to the previous level of command file nesting or to interactive
mode.

The RETURN command can also return some parameters to the calling
command file.  These parameters are returned into the variables RETURN

1 to RETURN 5 and RETURN_S of the calling command file.  RETURN 1
to RETURN 5 are integer and RETURN_S is a string up to 80 characters
long.

Example:  The following command exits a command file and specifies
          5 integer values and a string:
          return 0 2 3 4 5 'Command file successful'

## SET
The SET command is used to define variables and/or give them a value.

SET without parameters will display all previously defined variables.

The parameters for SET are:
    variable name = string value

All variables are string variables since they are used in textual substitution.
See also the IS command for treating them as numbers.

Examples:
To define a variable called FILENAME:
    CI> set filename = /scott/sam.ftn

To redefine the variable AUTOLOGOFF:
    CI> set autologoff = 3

To define a variable GREETING that has lower case letters and blanks:
    CI> set greeting = 'How are you today?'

To have defined variables and their values displayed:
    CI> set

## TR
The transfer command can now be implied as with the ru command.

It is recommended that one uses the Extension '.CMD' for all command
files.

The following search paths are used for the TR command.

When you enter an implied or explicit TR command, the following
procedure is used to find the command file:

1. If a directory is specified, this directory is searched for the file.  If the
   file is found, it is executed.  If the file is not found and a file type
   extension was not specified, .CMD is assumed and the directory is
   searched again.  If the file still is not found, an error is returned.

2. If no directory information is given, the following occurs:

   a. The TR command checks User-Definable Directory Search
      Path (UDSP) number 2.  If defined, the search path specified by
      UDSP 2 is used to find the file.  If a file type extension is not
      specified, .CMD is assumed.  If the file is not found, an error is
      returned.

   b. If UDSP 2 is not defined, the following default search sequence
      is used:

      — The current working directory is searched.  If the file is not
        found, a default type extension of .CMD is assumed and the
        working directory is searched again.

      — If you do not have a working directory, all mounted FMGR
        cartridges are searched.

      — If the file is still not found, global directory CMDFILES is
        searched, using the .CMD default file type extension.  If the
        file is not found, an error is returned.

For example, if MYCMD is the name of the command file specified in the
TR command, a working directory exists, and UDSP 2 is undefined, the
default search sequence is as follows:

1. Search for MYCMD in working directory.
2. Search for MYCMD.CMD in working directory.
3. Search for MYCMD.CMD in directory /CMDFILES.

If there is no working directory, the search sequence is as follows:
1. Search for MYCMD in FMGR cartridges.
2. Search for MYCMD.CMD in directory /CMDFILES.

## UNSET
UNSET deletes a string variable from CI (the user defined string variable).

The form of the UNSET command is UNSET variable name.

## WHILE-DO-DONE
The WHILE command is used for looping in a command file.  While a
condition is true the group of commands between the DO command and
the DONE command are executed.

The form of the WHILE command is

Usage:  WHILE command-list1
            DO command-list2
            DONE

        command-list   is a list of commands separated by semicolons or
                       new lines.

Note: 2 WHILE commands may not appear on one input line, but can be nested.

Example:
```
set count = 5
WHILE is $count gt 0
    DO calc $count - 1
        set count = $returns
        print somefile
DONE
```

In this example the file SOMEFILE will be printed 5 times. CALC is a simple calculator program that accepts 2 ascii representation of integers, converts them to integer, and performs the specified arithmetic operation on then. The result, in ascii form, is passed back to CI in a string and is then stored in variable $RETURNS for the user to access.

## WHOSD
WHOSD Reports who is using a CI directory or volume.

Examples:

| | |
|---|---|
| whosd /PROGRAM | — scan for anyone using /PROGRAM as a working directory, or in a UDSP |
| whosd 45_ | — scan for anyone using a directory on CI volume 45 as a working directory, or as part of a UDSP. |

— **John Green,
Hewlett-Packard**

# *PUZZLE PLACE*

The Teaser Club was formed in the winter of 1969. Each Christmas each member sent a Christmas card with a puzzle to each other member. Membership increased each year.
In 1970, they sent 330 more cards than in 1969.
In 1978, they sent 330 more cards than in 1977.
In 1977, they sent 330 more cards than in 1976.
How many Christmas cards were sent in 1975?

— **Mark Michell**

# WANTED TO BORROW —

RS 232 Interface for 80 Series
82939A for a week or so.

**Phone Sebastian Ziccone, (03) 344 2236, Royal Women's Hospital.**

# New mass storage alternative for HP 1000 and HP 9000 systems

Introducing the HP 7907A — a new fixed/removable disc drive that offers high performance and special features at a very affordable price. Now users of HP 1000 and HP 9000 systems have an alternative to the fixed disc ¼-inch cartridge tape solutions (HP 7942A/46A).

The HP 7907A disc drive has a total of 41M bytes with 20.5M bytes of removable storage on an easy-to-handle 8-inch cartridge. It's a complete mass storage subsystem with features such as a small lightweight package, off-line store/restore capability that can be completed in 2-3 minutes, and 19-inch EIA rack mount option. The drive is also capable of 22 I/Os per second and has an environmentally rugged design.

## THE BENEFITS OF THE HP 7907A
- Twice the storage capacity of the HP 7906 and one-third the cost per megabyte.
- Offers a fixed/removable solution to HP 9000 users for the first time.
- Completely user installable.
- Complete data security due to the removability of the 8-inch disc cartridge.
- Drastically reduced system downtime for backups and data interchange, as compared to using a ¼-inch cartridge tape. The HP 7907A is up to five times faster.
- Affordable data interchange/backup alternative to fixed Winchesters with ¼-inch tape cartridges.

The HP 7907A was designed with the following applications in mind:
- Computer aided engineering and manufacturing.
- Government OEMs for military intelligence/security information.
- Automatic test systems.
- Data logging.

## COMPARE THE HP 7907A WITH THE HP 7906

| HP 7906MR | HP 7907A |
|---|---|
| Option 102 | 20.5M bytes fixed, 20.5M bytes removable storage |
| 9.8M bytes of fixed, 9.8M bytes removable storage | |
| 14" removable cartridge disc drive based on the MAC family controller | 8" removable cartridge with an intelligent controller using the CS-80/HP-IB protocol |
| Height: 15.75" | Height: 6.8" |
| Width: 18.95" | Width: 12.8" |
| Depth: 28.00" | Depth: 18.2" |
| Net weight: 267 lbs. | Net weight: 55 lbs. |

# SPECIFICATIONS FOR SUBMISSION OF ARTICLES AND ADVERTISEMENTS

All material for Crosstalk should be sent to one of the addresses listed at right, from where it will be forwarded to the co-ordinator for publication. Publication dates are subject to receipt of sufficient material. For specific details contact Glenda Patterson on (03) 895 2576.

**ARTICLES:** Articles should be typed with any diagrams and program listings in camera-ready form (Author's name, address and phone number should be included).

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HP Desktop Users Group (N.S.W.)
Dr. R. W. Harris,
C/o C.S.I.R.O. Division of Mineral Physics,
PMB 7, Sutherland, N.S.W. 2232.

## COMING EVENTS

| | |
|---|---|
| **17th July:** | HP1000 User Group UNIX Workshop, HP Melbourne |
| **30th July:** | H.P.D.C.U.G.V. Meeting, 4.00 — 6.30 pm. at CSIRO, Syndal. |
| **12th August:** | Series 200 Basic Programming Course, HP Melbourne. |
| **19th August:** | Series 200 Basic Op. and Programming Course, HP Melbourne<br>RTE-A Prog. and Sys. Mgr. Course, HP Melbourne<br>Getting Started on HP 150 Course, HP Melbourne |
| **20th August:** | Wordstar on HP150 Course, HP Melbourne |
| **21st August:** | Lotus 123 on HP150 Course, HP Melbourne |
| **22nd August:** | Advanced Use of HP150 Course, HP Melbourne |
| **23rd August:** | Programming HP150 Course, HP Melbourne |
| **26th August:** | Datacomm HP150 Course, HP Melbourne |
| **2nd September:** | Image/1000-II Course, HP Melbourne |
| **9th September:** | RTE-6VM Session Monitor Course, HP Melbourne |
| **16th Sept.:** | RTE-6VM Session Monitor Course, HP Melbourne<br>HP1000 — Introduction to Datacomm Course, HP Melbourne<br>Introduction to HPUX Course, HP Melbourne<br>HP9000 Introduction to Datacomm Course, HP Melbourne<br>Getting Started on HP150 Course, HP Melbourne |
| **17th Sept.:** | Wordstar on HP150 Course, HP Melbourne |
| **18th Sept.:** | Lotus 123 on HP150 Course, HP Melbourne |
| **23rd Sept.:** | HP9000 UX Sys. Admin. Course, HP Melbourne |
| **3rd October:** | H.P.D.C.U.G.V. Meeting, 4.00 — 6.30 p.m. at CSIRO, Syndal. |

**NOTE:** If you have requirements for training on any HP products not covered in our formal training programme, please contact Audrey May on (03) 895 2661.

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## PUZZLE SOLUTION

Answer to last issue's puzzle is:

Caesar is the cleverest; Alexander is the greediest; Darius is the fattest.

The solution for this is fairly involved and is best expressed in a sort of shorthand. Are you interested to have it? If so, I can send you my version.

— **Mark Michell**

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## OR HIRE

### 9800 Series Computers, Peripherals & Accessories

— 9835, 9831, 9825, etc.
— Disc-drives, Printers, etc.
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— Pertec Tape-drive
— 9876A fast Thermal Line-printer (new)
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**MANY CONTACTS also wish to buy/sell all kinds of desktop computer equipment.**

**CHRIS SIMPSON — (03) 859 6643**

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## CLASSIFIED ADVERTISEMENTS

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### 1 9825 A Based Audio
### Production Testing System

The system includes:-

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|---|---|---|
| 3 | 626913 | Power Supplies |
| 1 | 9825A 24K | |
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| 1 | 6940B Multiprogrammer | |
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| 1 | 5300B Measuring System | |
| 1 | 2131A B. & K. Digital Frequency Analyser | |

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**Telephone number for enquiries:**
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**Ask for David Butler**

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80 characters wide, 120 cps dot matrix, HP-IB interface, 9 months old. No longer required. Best Offer.

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# FOR SALE

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| | 3075A | 004 Alpha Keyboard | |
| | 3075A | 015 220-240 Volts | |
| | 40204A | 307X Upgrade Kit | **$3800** |
| 1 only | 3075A | Data Capture Terminal (NEW) | |
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| | 3075A | 015 220-240 Volts | |
| | 40204A | 307X Upgrade Kit | |
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| | 3075A | 004 Alpha Keyboard | |
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| | 40204A | KO 1 Dual CRT Upgrade | **$4900** |
| 1 only | 3075A | Data Capture Terminal (USED) | |
| | 3075A | 004 Alpha Keyboard | |
| | 3075A | 013 Serial I/O | |
| | 3075A | 015 220-240 Volts | |
| | 40204A | 307X Upgrade Kit | **$4200** |
| 2 only | 40204A | 307X Upgrade Kits (NEW) | ea. **$750** |
| 1 only | 82905A | Printer (USED) | **$500** |
| 1 only | 2631B | Printer (USED) | **$1500** |
| 1 only | 7470A | Plotter (USED) | **$950** |

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**Telephone No. for enquiries —**
**429 8867 (Melbourne)**
**Monday to Friday after 10.00 a.m.**
**Ask for Julie Jones**