CROSSTALK Journal of Hewlett-Packard Technical Computer User Groups
April/May 1983

CO-ORDINATOR'S COMMENTS

The dreaded words have been spoken — "Sorry, I don't have any material for you for Crosstalk." It is not so bad when one or two groups, or even the majority of groups, give this answer, but when the response is unanimous . . . . HELP!!!

I know you already have more to do than what you have time to do it in, but Crosstalk just cannot survive without your help. If you consider Crosstalk a worthwhile publication, please consider sparing a little time and effort to keep it going. This does not mean that you have to write long, highly technical articles, but rather anything you think may be of interest to other users, be it a simple programming tip or even something more light-hearted. With such a diversity of applications involving technical computers, we should be able to publish a regular Applications Corner containing brief descriptions of one or two of your applications.

The suggestion has been made that awards be offered for Crosstalk contributions. Perhaps an award could be made for the best user article published for the year. Alternatively, an award could be given on the basis of a draw, where a user's name is placed in the barrel every time he/she has something published. Therefore the more one submits, the greater one's chances of winning! Please think about these suggestions and make your opinions known to your group; and remember, "you have to be in it to win it."

Editorial

Have you ever had the yearning to see your name in print?
Why not write an article for CROSSTALK.
As from this issue, if you submit a feature article we will pay you $25 per typeset page.

A feature article should consist of two or more typeset pages (diagrams and photographs not included) and should be on a subject of interest to CROSSTALK readers such as:

User applications
System software
Languages (Review/Comparisons, etc.)
Database management
Software Packages
(eg. CAD/CAM, STATS, etc.).

As an added bonus, the writer of the best feature article in the next twelve months will receive a HP11C or HP12C personal calculator for his efforts.

If you don't have time to write a feature article, why not a little snippet on your favorite subject, or that programming hint which can save some other user a lot of time and frustration.

Corrado DiQual
President HP1000 Users Group (N.S.W.)

HP's Personal Computer Group

In an evolutionary step to consolidate its fast-growing personal-computer activities, Hewlett-Packard Company has formed a new product group with responsibility for all of the company's personal-computer and workstation activities.

The Personal Computation Group (based in Corvallis, Ore.) and the Computer Terminals Group (based in Sunnyvale, Calif.) have merged to form the new Personal Computer Group. Cyril J. Yansouni, former general manager of the Computer Terminals Group, has been named general manager of the new organization to be based in Sunnyvale, Calif.

C. Richard Moore, former general manager of the Personal Computation Group, will take on a new assignment, defining a broader HP strategy for products aimed at the engineering-productivity marketplace. Moore will also oversee activities already under way in several HP product groups.

Included under the auspices of the new Personal Computer Group are HP's Series 100 personal office computers, Series 80 personal computers for business and engineering, Series 70 portable computers, Series 40 hand-held computers and Series 10 programmable calculators, as well as peripherals associated with Series 10 and Series 80 products. Also included is HP's entire family of computer terminals.

Series 200 personal engineering workstations — including Models 16, 26, and 36, aimed primarily at the engineering marketplace — will remain within HP's Technical Computer Group. However, since the recently introduced Model 16 effectively bridges the gap between general computer applications and traditional technical applications, the new Personal Computer Group and the Technical Computer Group will share responsibility for its marketing and future development.

NOTE: This article was reprinted from INTERFACE 1000, Vol. 2, Issue 1.

CONTENTS

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NEW POLYGON AND COLOR FUNCTIONALITY IN GRAPHICS/1000-II

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Cupertino, CA 95014

Abstract: Polygons and color modeling are two recent additions to GRAPHICS/1000–II. These enhancements permit the user to specify colors for color combinations and ensure that color and pens match; and to easily fill areas.

Hewlett-Packard has recently added two significant capabilities to its GRAPHICS/1000–II family: polygons and color modeling. The new functions include the ability to define a set of polygons as an output primitive and the ability to define the color attribute using one of two color models. These functions will benefit many applications such as charts and graphs, graphic arts, and design schematics. (Figure 1 shows the use of polygon capabilities on a graph.)

Polygons and color modeling allow users to define color shades easily and to fill complex surfaces with various patterns. Normally, it would be a difficult problem for programmers to fill any surface shape more complex than a rectangle. The Device Independent Graphics Library (DGL) polygon output primitives provide tools that easily generate filled general convex, concave, or self-intersecting figures in two dimensions. The Advanced Graphics Package (AGP) provides two-dimensional, as well as three-dimensional, absolute and relative polygon output capabilities. Although these new features are device independent, they take advantage of any hardware device intelligence to perform polygons and area fill. If the output device is incapable of producing polygons or filling areas, software performs these functions.

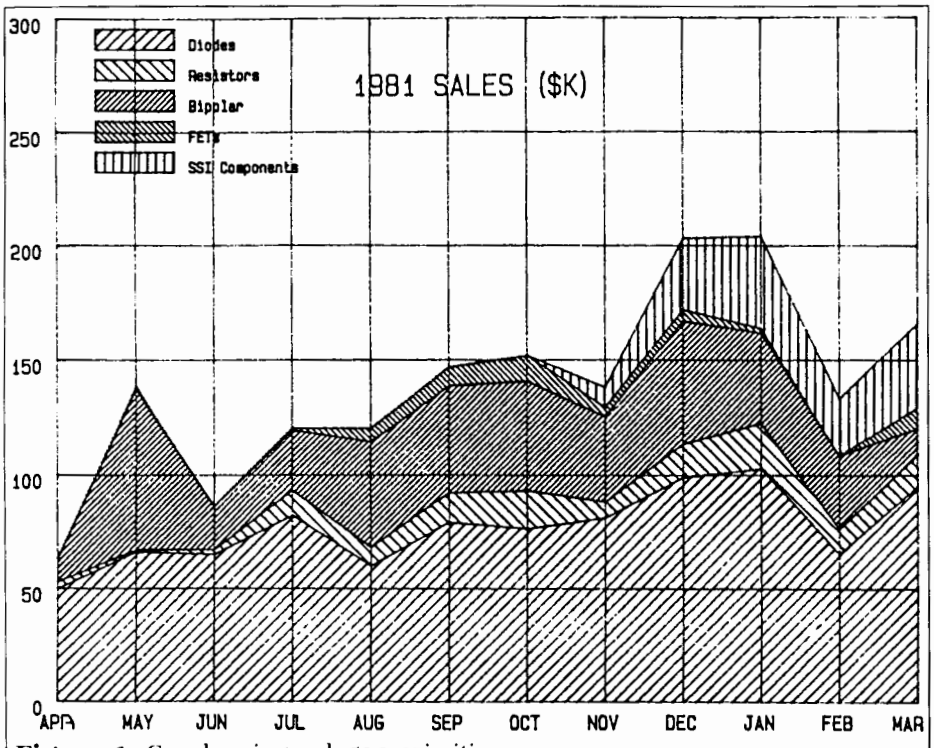

Figure 1: Graph using polygon primitives

The new color modeling features allow color attributes to be defined using either RGB (Red, Green, Blue) or HSL (Hue, Saturation, Luminosity) models. The software will select the nearest equivalent color within the capability of the output device. These polygons and color modeling capabilities will nicely complement the new HP 2627A low-cost color graphics terminal. Enhancements will be available on A.83 Production Change Order (2301 PCO) with both the AGP and the DGL.

Color Modeling

Before color modeling, the GRAPHICS/1000–II user specified the color attribute as an integer index into a device dependent table. The index did not always correspond to the desired color on the graphics display device. If the application required that color two be red, and the pen in slot two of the plotter was red, everything was fine. If not, the results were sometimes comical. With the recent introduction of the HP 2627A color graphics terminal, the user has much more flexibility in the use of color. Colors can be defined so that the exact color required is actually displayed.

Users can now combine colors to create new colors, via two types of color models. Colors can be defined in terms of either an RGB cube or an HSL cylinder model. (Figures 2 and 3 show these color models.) Each model uses a triplet of three values, ranging from 0 to 1, to determine the color. For example, white is (1.0,1.0,1.0) in RGB notation and (0.0,0.0,1.0) in HSL notation. Cyan is (0.0,1.0,1.0) in RGB, and (0.5,1.0,1.0) in HSL.

The RGB model is easiest to understand because it is based on the three primary colors. The color

spectrum, as defined by light color theory, has three dominant areas: red, green, and blue, which are separated by small bands of cyan, magenta, and yellow. A rainbow is a good example of a color spectrum. However, we see its colors as pastels because lightwaves from the rainbow become mixed with other light. Red, green, and blue are the primary colors for the additive system. The laws of additive mixture apply to radiant energy devices such as a CRT screen. If these primary colors are mixed at maximum intensity, white is produced.

The HSL cylinder model, on the other hand, is easier to use when objects are shaded to simulate three-dimensional curvature. The circumference of the HSL model is hue. Hue is the subjective term for color, as opposed to dominant wavelength, which is the objective term. The hue can range from red (the beginning of the visible spectrum) through yellow, green, blue, and (circularly) back to red. The radius of the cylinder is saturation. Saturation is the component of color denoting its degree of departure from achromatic color of the same brightness, that is, black, gray, or white. Saturation is the subjective term, while purity of color concentration is the objective terminology. The height of the cylinder is luminosity. Luminosity associates a color with the amount of light emitted, transmitted, or reflected. For example, consider the amount of light emitted from a three-way bulb at its various settings. The difference between them is described subjectively as a difference in luminosity and objectively as a difference in luminance. The settings have the same hue and saturation in subjective terms and the same chromaticity in objective terminology.

With color modeling, the color attribute calls of JCOLR or ZCOLR now are used to set an index into a color table. The color table contains a list of triplet values between 0.0 and 1.0. The graphics system interprets these values using the current color model in effect. The system then sets up the graphics device to produce as close an approximation to the color specified by the index of the JCOLR (for AGP) or ZCOLR (for DGL) calls.

If the device is capable of hardware color modeling, the entries in the color table may be programmatically modified. If an application program requires that color one be red, color two be yellow, and color three be gray, the values should be set in the color table as seen in Table 1.

The graphics system always attempts to reproduce the color as close as the device hardware will allow. On a monochromatic terminal, the color table is only one entry (white) and may not be modified. On multiple pen plotters, the table can be modified to contain the colors of the pens in the

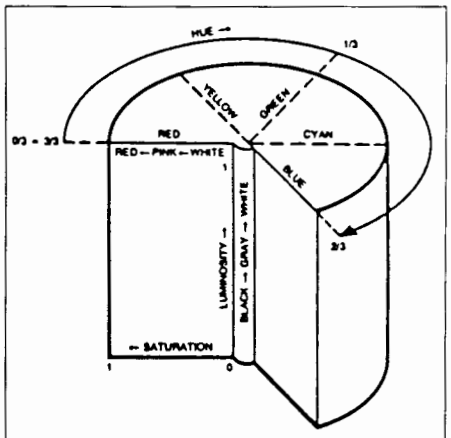

Figure 2: RGB color model

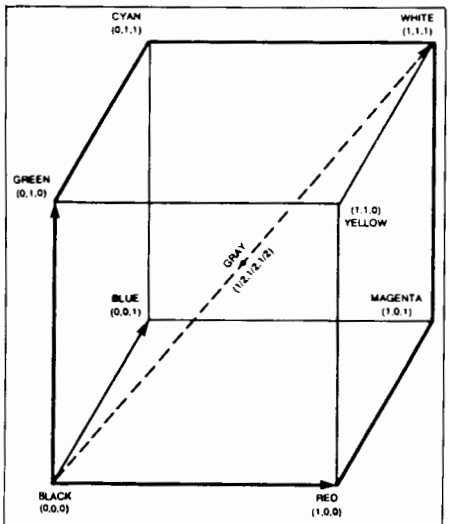

Figure 3: HSL color model

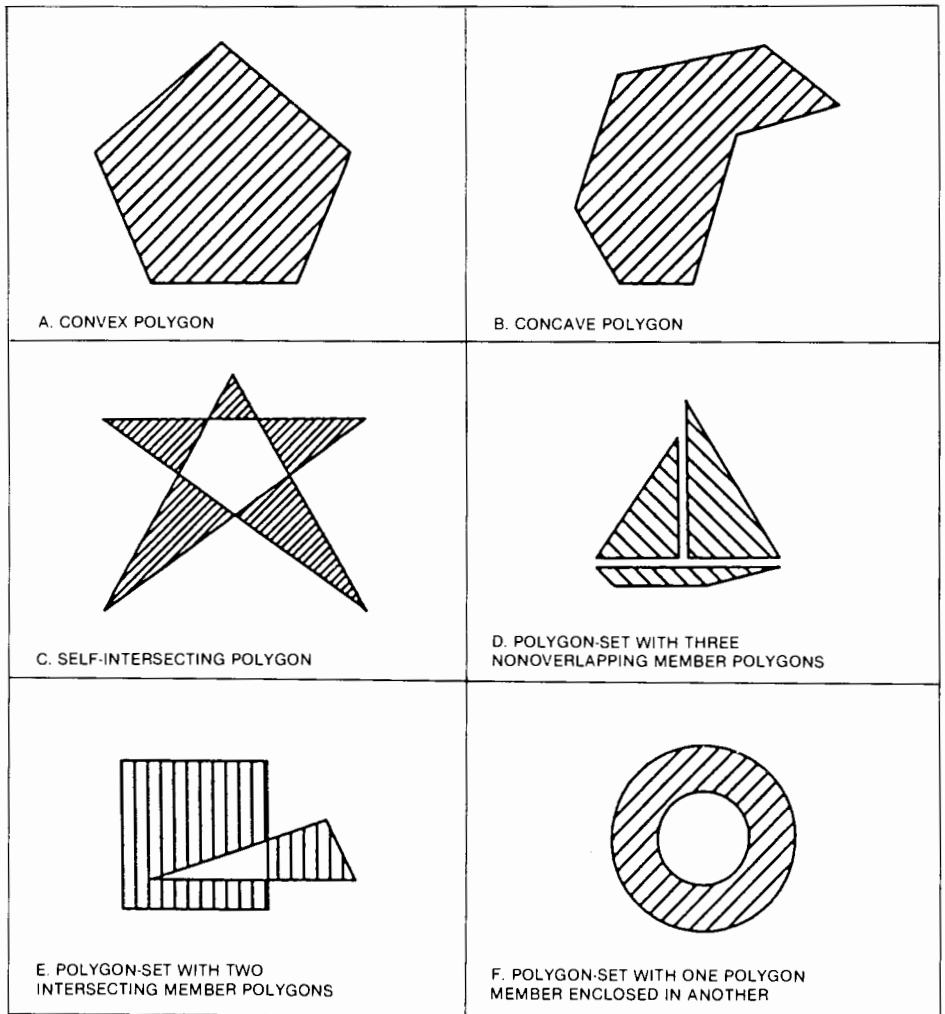

Figure 4: Different Polygon Types

slots (the user must manually place the appropriate pen in the respective pen slot). On some devices the user may specify background color (for example, on HP 2627A). Background colors have a variety of uses. For example, a white background can be used to visualize how plots will appear on white paper. Altering the color table entry at the index zero will set the background color.

Polygon Output

Before describing GRAPHICS/1000–II polygon functions, some detail about a polygon's physical characteristics is needed. A polygon is a closed planar surface. In other words, a polygon is a bounded plane whose distinct boundary delineates the interior and the exterior of the polygon. The boundary of the polygon is defined by a set of vertices. The edge of a polygon is the set of line segments drawn on that boundary. Figure 4a shows a polygon with five vertices and an edge on the boundary. A similar polygon could have been drawn without an edge. The interior of 4a has been filled with a certain color (black) and a hatched interior style.

GRAPHICS/1000–II requires polygons to be specified as closed planar surfaces, in two or three dimensionals. Figure 5 shows the use of three-dimensional polygons using AGP. The data for a polygon are stored as an ordered set of vertices in several arrays. The polygon area fill algorithm allows polygons to be convex, concave, or self-intersecting (Figures 4a, 4b, and 4c, respectively). In addition, the user can define surfaces with holes using the polygon set capability.

	RGB			HSL			
	Table Entry			Table Entry			
Index	P1	P2	P3	P1	P2	P3	
1	1	0	0	0	1	1	red
2	1	1	0	1/6	1	1	yellow
3	1/2	1/2	1/2	0	0	1/2	gray

Table 1

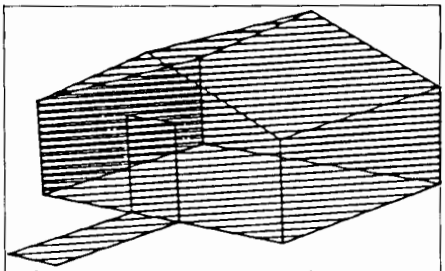

Figure 5: 3–D House using AGP polygon primitives

Individual polygons may be grouped together into sets (polygon sets) having one surface (Figure 4d). If members of a polygon set overlap, the overlapping areas may act as holes (Figures 4e and 4f). The polygon set capability could be useful for developing cross-sections of mechanical parts.

As you know, device independence is an important feature of GRAPHICS/1000–II. For polygons, if a device is capable of performing the polygon function in hardware, the intelligence of the device will be used to create the polygon. Software-generated polygons with interior fill can be used for devices with limited or no polygon capability. Therefore, an application program can use the same code to generate displays using polygons on intelligent terminals, and still send similar output to plotters.

Polygon Attributes

The appearance of polygon primitives are affected by the general attributes of color, linestyle, and line width, as well as the polygon specific attributes of interior color, interior style, and interior linestyle. The general attributes apply only to polygon edges. Polygon specific attributes apply only to polygon interiors.

The polygon interior color index is set by the calls ZPICL for DGL and JPICL for AGP. The value specified by the interior color call is again used as an index into the color table, the same color table used by ZCOLR or JCOLR. Two separate attributes for color and interior color allow users to create polygons with different colored edges.

The polygon interior style is selected independently of the interior color by a call to ZPSTL or JPSTL. The interior style attribute value is used as an index into a polygon style table, a similar arrangement to that of the color attributes. The polygon style table contains a list of various interior styles. Polygon interior style is specified by three or more parameters that include interior density, interior orientation, and edge.

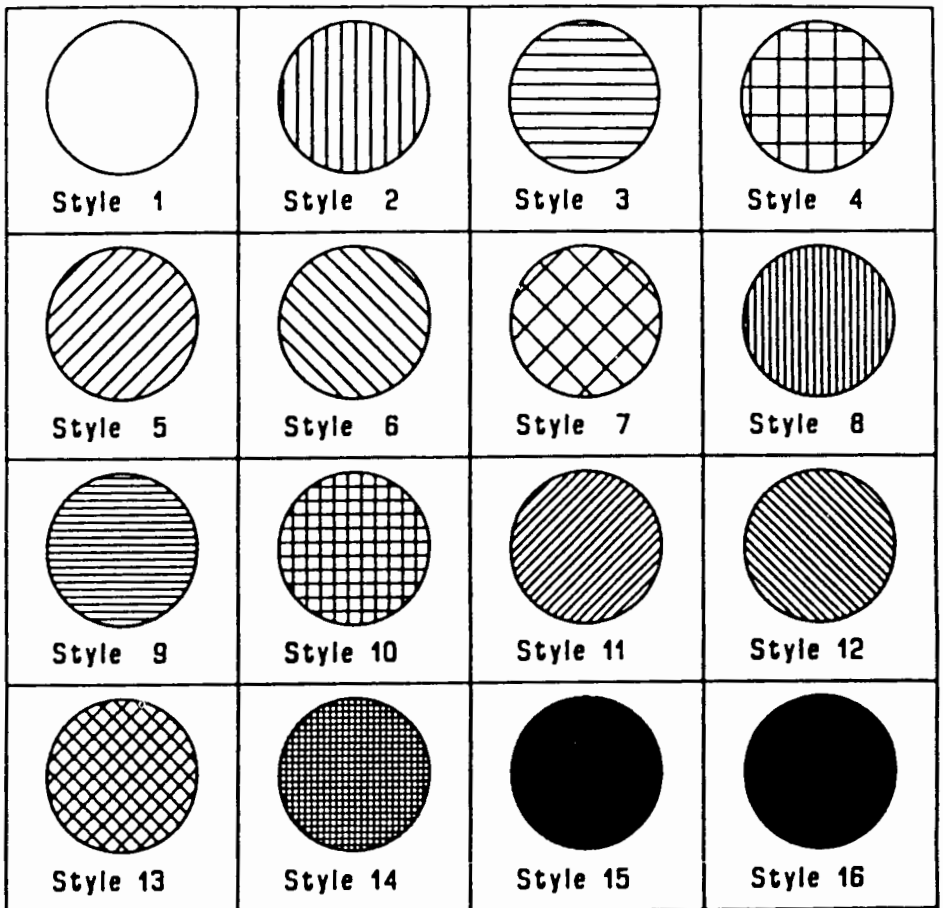

Figure 6: Different polygon interior styles

Interior density refers to the density or spacing of the lines used to fill the interior of a polygon. Density can range from -1.0 to 1.0. A density of zero represents a transparent polygon as shown in Figure 6, style 1. A density of 1.0 or -1.0 represents a solid fill, styles 15 and 16. Negative densities produce cross-hatched fills (styles 4, 7, 10, 13, 14). Positive densities produce a parallel line fill (styles 2, 3, 5, 6, 8, 9, 11, 12, 14).

Interior orientation refers to the angle of the fill line with respect to the horizontal. Styles 3, 10, 14 have an orientation of 0.0 degrees. Styles 5, 11, 13 have an orientation of 45.0 degrees, while styles 6 and 2 have orientations of -45.0 degrees and 90.0 degrees, respectively.

The edge parameter determines whether the edge of the polygon will be drawn on the polygon boundary or not. The polygon style table comes with a set of default entries represented by Figure 6. As with the color table, the entries may be programmatically redefined.

The linestyle of the interior fill lines may be varied by a call to ZPILS or JPILS. The linestyle parameter refers to the same set of linestyles used by the general line style calls, ZLSTL and JLSTL.

Additional Resources Required

The addition of polygon and color modeling capabilities increases the memory utilization of both AGP and DGL. The additional memory is used by buffers for intermediate calculations as well as for the increased code.

DGL uses 3K additional words of memory for the new enhancements. If the enhancements are not used, only a small increase should be noticed. AGP uses about 3K additional words for its Work Station Program because WSPs include DGL. The AGP User Program will need about 1K word of additional memory. Again, if the functions are not used, only a small increase will be noticed in the User Program.

For those programs not requiring these enhancements, tools are available to bypass the functions, thus reducing additional overhead to a minimum.

Conclusion

Color modeling and polygons provide GRAPHICS/1000-II users with some additional powerful capabilities: the capability to define colors in terms of two color models and the capability to easily create filled areas using polygon primitives. The applications of these features are found across the entire spectrum of computer graphics, from charting to computer-aided-design.

Note: This article was reprinted from INTERFACE 1000, Vol. 2, Issue 1.

ERROR IN FEBRUARY ISSUE OF CROSSTALK

In the advertisement for BBJ on page 6, the phone number for the 8 Jackson Court, Doncaster East branch should have been (03) 848 4460.

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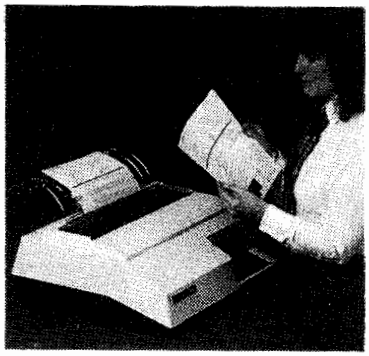

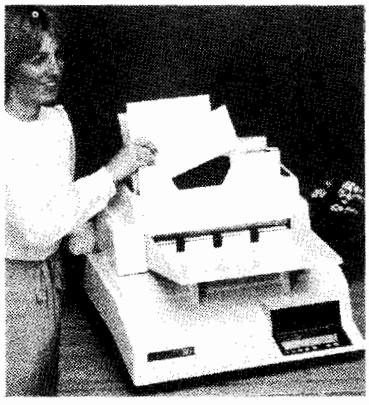

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STC
Computer Products Division.

PUZZLE PLACE

I must confess that I was a little disappointed in your first efforts at problem solving! Despite a number of our user's recently telling me that they were interested in the puzzle, I still did not receive one solution. Well if you think that I am going to supply you with a worked solution each edition you're mistaken! I will give you a few of the conclusions which I drew from the information and leave you with those as clues.

P: I don't know what the numbers are. (P knows x,y=Pp)
=> x,y is not unique. ie. both x and y are not prime numbers
S: I knew you didn't. (S knows x+y=Ss)
=> S cannot be the sum of any two primes. (If the sum was possible with two primes S would not be able to say that he knew P did not know.)
Neither do I.
=> x+y is not unique.
Both know that Pp is not prime since we are told that x and y are between 1 and 100 exclusive.
With those few hints I'll leave you with it.

And now for this month's puzzle. Don't forget, all solutions to;
Philip Greetham
c/- Hewlett Packard
P.O. Box 36, Doncaster East
Vic 3109

Decode the following division. You may assume that each different letter stands for a differnt digit (and that the arithmetic is correct).

```
          A B J
        -------
E C A ) F D B H J
        C G G
        -----
        A G A H
        A A E A
        -------
          K D D J
          K D B H
          -------
              A J
```

NEW PRODUCTS

HP Model 36C Color Engineering Workstation Is Here!

The Model 36C is just what it sounds like — a color version of the popular 36A.

The key feature is a programmable color map which, when combined with intensity controls on the CRT color guns, provides a palette of 4096 true colors. Four graphics memory planes allow 16 colors to be displayed simultaneously from this palette. You can display 16 shades of blue, 16 shades of grey, etc., for an almost limitless number of color combinations. Just a subset of the Model 36C capabilities provides a color graphics mode compatible with the 9845C, i.e., 4913 dithered shades.

In addition, the Model 36C contains a new processor board with 128K bytes of on-board RAM. A new boot ROM allows boot-up from external mass storage devices (including SRM), and provides configuration information. An ID PROM contains the computer's serial number, a feature which can be used for software security. This new processor board will become standard on all Series 200 products except the Model 16.

LANGUAGES

New language systems provide the necessary drivers for the color top, and allow fast, easy color graphics programming. BASIC Extensions 2.1 includes a new graphics binary, which is required on the Model 36C. Similarly, Pascal 2.1 provides a new graphics procedure library for use on the 36C. HPL is not supported on the 36C.

APPLICATIONS

All existing Series 200 software will run on the Model 36C if a new language system is resident. The graphics in the programs will be monochromatic, with the exception of Graphics Presentations, which has been revised to provide color graphics. In addition, software suppliers are enhancing their HP PLUS programs to take advantage of the benefits of color on the 36C.

The Model 36C will be the perfect hardware for applications such as:

- PC layout
- IC design
- Noise and vibration analysis
- Finite element analysis

and the secondary markets of:

- Graphics presentation development
- Operations monitoring.

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New HP Model 20 Offers Series 20 Power in a Flexible, Configurable Package

The Model 20 packages the capabilities of Series 200 desktop computers into modular components. The modules include a box computer, a card set for alphanumeric and graphics video output, a choice of two HP-supplied CRTs, a keyboard, and a card for interfacing a custom keypad or switches to the computer.

Modularity means that a system's integrator can pick the modules, interfaces, and peripherals that are right for the application. A system consisting of the computer, video output, CRT, and keyboard becomes a powerful engineering workstation with the addition of soft language system, memory cards, flexible disc drive, and printer.

9920 BOX COMPUTER

The heart of the Model 20 is the 9920A Box Computer, which is rack-mountable. The computer features an 8MHz 68000 CPU, the 3.0 Boot ROM, and 128K bytes of RAM resident on the processor board. The computer's card cage has 15 free card slots, seven of which can be used for I/O cards. A card that contains an HP-IB interface, an interface for the keyboard, and a 20 millisecond resolution clock comes standard.

The 3.0 Boot ROM allows the Model 20 to boot up from EPROM, Bubbles, and external mass storage devices, including the Shared Resource Manager.

MODEL 20 ACCESSORIES

The 98204A Composite Video Card set outputs 80-character by 25-line alphanumerics and 400×300 resolution graphics to an external CRT. The card set consists of two cards, which take up an I/O card slot and an adjacent accessory slot. Option 090 is available to eliminate graphics capability. This saves some money and eliminates one card from the set. The 98204A comes with a 1.5m (5 ft) coax cable for CRT interfacing.

NEW PRODUCTS

The video output from the 98204A is compatible with many commercially available CRTs. Most Model 20 customers, however, will choose to buy the HP-supplied 82913A 12-inch or 82912A 9-inch CRTs. They are the same CRTs that are featured with the HP-86. A rack-mount kit, being developed for the 12-inch CRT, will be available in the summer of 1983.

The 98203A keyboard is the same one that is featured with the Model 16. A large keyboard that contains all of the 98203A features plus a numeric keypad, additional system control keys, and a palm rest will be available shortly.

The 98201A Custom Keypad Interface enables the systems integrator to easily interface a custom keypad or simple switches to the computer. It consists of a card containing a subset of the keyboard electronics, a cord that attaches to the computer's keyboard interface, and a connector that interfaces to the custom-designed keypad or switch assembly. Each pin of the connector corresponds to one key of the keyboard. All keys are represented except for the alpha keys.

MODEL 20 SOFTWARE

Pascal and BASIC language systems will be supported on the Series 200 Model 20. Although HPL appears to run on the Model 20, our current plans are not to support it.

Programs developed on the Models 16, 26, and 36, using Pascal 2.0, Pascal 2.1, BASIC 2.0, BASIC Extensions 2.0, and BASIC Extensions 2.1 are directly transportable to the Model 20.

ABLE/1000

ABLE/1000 is a financial modeling and reporting package that combines a high-level instruction set and mathematical expression evaluator to form a system capable of producing a wide variety of financial and management reports.

At TUSC we use ABLE to produce our monthly cash flow and provide an updated Profit and Loss report for the year. Having set up the instructions to create these reports using the Editor, we simply run ABLE and supply it with the month's cash flow transactions and the name of the file containing our Cash Flow instructions. ABLE then prints out our Cash Flow report and saves the matrix of data ('Ins', 'Outs' and 'Balance') in a file, so that it can be used as input for our Profit and Loss Report.

We have also found it useful in quote situations, where we need to estimate the cost of a computer installation over five years and provide comparison costs for hardware alternatives. In these estimates we have to consider the cost of leasing the equipment as opposed to buying it, and the effects of inflation, interest rates and depreciation.

ABLE's computational ability includes both boolean and arithmetic expressions, percentages, maximum/minimum selection and 'If-Then-Else' logic, which would cover most business requirements.

It can also append, add or subtract the current matrix from a matrix on disc.

If ABLE needs a matrix element for input to a calculation that has not been computed yet, then it can delay (lag) the calculation until the necessary element has been derived.

Although there are several modelling and reporting packages on the market such as Visicalc, we believe ABLE provides us with more computational power and reporting flexibility.

A TEST PROBLEM FOR MATRIX MANIPULATORS

The Widgit Manufacturing Company wants to project its cash flow and borrowing requirements four quarters into the future, with totals for the year. There are three variables which will affect their projections. These are:

- Selling price per unit
- Estimated sales in units
- Material cost per unit

A model is to be set up which will use the variable inputs to calculate the following values by quarter.

1. The cash flow resulting from sales. This is the sum of:
   A. 25% of total sales from the previous quarter, using the selling price from the previous quarter. (Use $262,500 as the value from the prior quarter to start the projection).
   B. 50% of total sales for the current quarter, using the selling price for the current quarter.
   C. 25% of projected sales for the following quarter, using the selling price for that quarter (down payments).
2. The cash required for material purchases. This is the estimated unit sales for the following quarter times the current-quarter unit material costs.
3. The cash available for operations. This is the difference between cash flow from sales and cash required for material purchases.
4. The operating costs. These are to be equal to $4,000,000 plus $1,000 for each unit projected to be sold in the next quarter.
5. The interest expense. This is to be 4% of the borrowing balance as of the previous quarter. (Use $1,500,000 as the beginning borrowing balance).
6. The borrowing requirement or the cash available to pay down the loan balance. This is to be determined by subtracting the operating and interest costs from the cash available for operations.
7. The total borrowings. These are equal to the prior quarter borrowing balance plus the borrowing requirement. Surplus cash is to be used to reduce borrowings until they zero out.
8. The net cash flow. This is equal to the cash available after borrowings have been reduced to zero.

PROBLEM SOLUTION

THE WIDGIT MANUFACTURING COMPANY
ONE YEAR CASH FLOW AND BORROWING REQUIREMENT PROJECTION

	QTR. 1	QTR. 2	QTR. 3	QTR. 4	TOTAL
VARIABLE INPUTS					
SELLING PRICE	30,000	30,000	30,000	30,000	120,000
ESTIMATED SALES (UNITS)	400	450	375	490	1,715
MATERIAL COST PER UNIT	14,550	14,550	14,550	14,550	58,200
CASH FLOW & BORROWINGS					
CASH FLOW FROM SALES	9,637,500	12,562,500	12,675,000	14,662,500	49,537,500
CASH REQUIRED FOR MATERIALS	6,547,500	5,456,250	7,129,500	8,730,000	27,863,250
CASH AVAILABLE FOR OPERATIONS	3,090,000	7,106,250	5,545,500	5,932,500	21,674,250
ESTIMATED OPERATING COST	4,450,000	4,375,000	4,490,000	4,600,000	17,915,000
INTEREST EXPENSE	60,000	116,800	12,222	0	189,022
CASH REQUIRED FOR OPERATIONS	4,510,000	4,491,800	4,502,222	4,600,000	18,104,022
BORROWING REQUIREMENT OR AVAILABLE FOR LOAN PAY DOWN	1,420,000-	2,614,450	1,043,278	1,332,500	3,570,228
TOTAL BORROWINGS	2,920,000	305,550	0	0	0
NET CASH FLOW	0	0	737,728	1,332,500	2,070,228

```
0001  * FILE "DEMO1" - ABLE/1000 DEMONSTRATION FILE
0002  *
0003  COLUMNS
0004  01,,)JAN
0005  02,,)FEB
0006  03,,)MAR
0007  04,,)1ST QTR
0008       )TOTALS
0009  *
0010  TOTALING
0011  4=1+2+3
0012  *
0013  ROWS
0014  .WIDTH 25
```

NEW PRODUCTS

```
0015  ROW1   SALES (UNITS)
0016         100,110%ROW1(-1)
0017  .SKIP
0018  ROW2   SALES ($)
0019         ROW1*998
0020  ROW3   COST OF SALES
0021         22%ROW2+3000
0022  .LINE -
0023  ROW4   GROSS PROFIT (LOSS)
0024         ROW2-ROW3
0025  .SKIP
0026  ROW5   EST. EXPENSES
0027         8000+(423*[-,120,ROW1])+(380*[+,0,ROW1-120])
0028  .LINE -
0029  ROW6   NET PROFIT (LOSS)
0030         ROW4-ROW5
0031  .LINE =
0032  .SKIP 2
0033  .TEXT          PROJECTION ASSUMES 10 % PER MONTH
0034  *                                        SALES GROWTH
0035  PRINT
0036  PITCH 12
0037  HEADINGS
0038   ABLE/1000 DEMONSTRATION
0039  DESCRIPTION 1,2,3,4
```

BASIC/ 1000C

Hewlett-Packard Company announces a new BASIC language subsystem that runs on the HP 1000 computer. The new BASIC/1000C runs under either the RTE-A.1 or the RTE-6/VM operating system. It is unique in offering both a multiuser real-time interpreter and a multiuser real-time compiler.

Now a customer can have both the conversational environment of an interpreter (including a line editor and multifunction debugger) and the execution speed of a compiler.

BASIC/1000C includes these features: user subprograms and functions, fifteen character variable names and line labels, labelled COMMON, large data areas, powerful string support, multiple data types, and bit manipulation operators. In total, it includes approximately 180 statements, functions, operators, and commands.

This new product includes statements for easy instrument control, multiuser interrupt handling features, and user error handling features. Not only is it good for simple calculations, it is ideal for instrument control and test programs.

Owners of single user HP desktop computers who want to move to a multiuser minicomputer will be glad to know that BASIC/1000C was based on HP desktop BASIC's.

HP 1000 subsystems such as GRAPHICS/1000 II and IMAGE/1000 are accessible from programs written in the new BASIC. In general, a compiled subroutine written in FORTRAN, Pascal, or MACRO can be called whether it is part of an HP 1000 subsystem, or a custom routine written by the customer.

NEW PRODUCT RELEASE

from Nortronic Instruments

ADD BAR CODE TO RS 232C TERMINALS

Bar code data input may now be easily added to VDU terminals operating in RS 232C systems. The Databar 401V Bar Code Reader is designed to connect into these systems and allow either bar code or keyboard entry from the terminal.

The bar code reader receives and retransmits all data from the terminal keyboard without change and as it is connected through a simple patch cable no modifications are necessary to either the computer or terminal hardware or software.

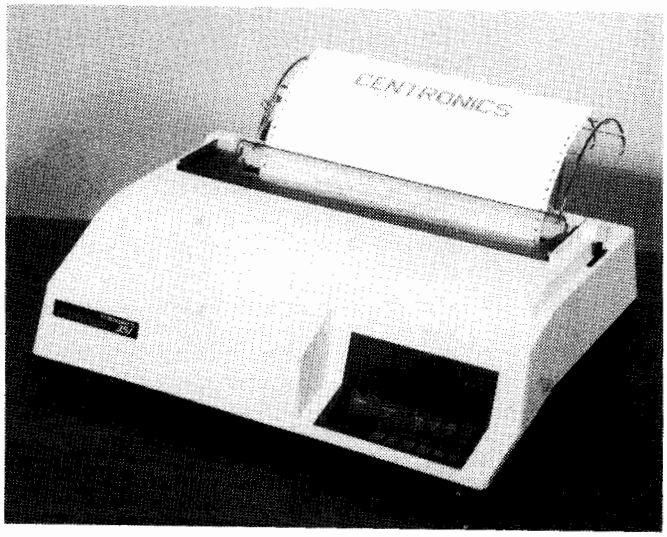
To allow its use in a wide range of operating systems and hardware configurations, a selectable inter-character delay is available in 10mS increments to a maximum of 50mS. Data transmission rates from 110 baud to 9600 baud are also switch selectable.

The Australian designed and manufactured Databar 401V Bar Code Reader is available with any of the commonly used bar codes. Depending on the code selected, the reader may perform a check digit calculation before transmission, transmit or ignore start-stop characters or test for a specified message length.

Bar code readers are commonly used in libraries, blood banks and other organisations requiring fast and accurate date entry to a computer system.

Editorial enquiries may be made to Harold Norrie, (02) 290 2844.

CENTRONICS 351



200 CPS at 10 CPI. Pin addressable graphics. Bar Code Printing. Printhead life 300 million characters. Heavy duty 100% duty cycle. Noise level 60 dBA. MTBF 4350 hours. Price excluding tax: $3,500.

OPTION
Pedestal with paper basket: $220.
Special discount to members of HP Users Groups.

AVAILABLE FROM STC —
Sydney (02) 438 4977; Melbourne (03) 480 1255.

H.P.D.C.U.G.V. AT THE WINDSOR

Our March meeting was held at the Windsor Hotel following an H.P. seminar which a number of members had attended.

Our first speaker was Bill Bailey, Business Manager for Series 80 Products, who was visiting for the seminar. Bill's talk, given in an informal manner, was on Series 80 Products and plans.

Bill began by outlining how H.P. traditionally organised itself into relatively unrelated product groups and this had been the case with desktop computers. Now some effort was being made to draw them together into the Corvalis Division and this would lead to more standardisation of operating systems and languages. It should lead to the appearance of more 3rd party software. He then went on to talk about future improvements in his product line in speed and slot expandability. This drew a host of questions which we eventually had to cut short to let Bill go.

Then Chris. Simpson took the floor to talk about String and String handling functions on the different H.P. machines. With the aid of a series of detailed charts Chris. systematically compared the various languages used. He then went on to detail a number of very efficient techniques for storage of data using strings. From the extent and duration of the question asked Chris. can count his talk very successful.

In the small amount of time remaining Ian McWilliam explained the system he has developed using the 9825 for processing our club membership listing. Ian has worked out a simple system which will cope with all likely additions, deletions and changes in our membership.

The meeting concluded with refreshments and much discussion between members about their own experiences and problems in handling strings on their own machine.

Bernie O'Shannessy

Using the 7470A Plotter with Series 80

Quite some months ago, HP released a new low-cost, 2-pen plotter, the 7470A, which uses the micro-grip drive technology. This plotter, understandably, has proved very popular with Series 80 users.

Although the plotter may be purchased with either a serial (RS-232-C) or HP-IB interface, the only **'supported'** interface when used with Series 80 is HP-IB.

For a peripheral to be 'supported' on a product, it must first be safe and 'legal' in that configuration. A peripheral must work with the designed mainframe, it must be repairable, and HP must be able to support the customer with any questions. The following is a good guideline for support requirements.

(i) The peripheral must pass EMI and safety requirements (.U.S.).

(ii) It must make sense to want to support that peripheral (or option) on the particular computer.

(iii) Drivers in the language to be supported have been checked out, and it is known that the peripheral will work with that language.

(iv) We have the appropriate documentation support.

(v) The factory has a way to support the product via the sales office sales reps., systems engineers and customer engineers.

(vi) The CE has the appropriate tests/diagnostics to test and repair the peripheral according to the prescribed repair method.

(vii) The customer must have a way to verify that the peripheral works i.e. a test routine available.

As can be seen from this list, a peripheral is not necessarily supported simply because it happens to work. HP also does not necessarily test every possible configuration of mainframe/peripheral combination.

Over a period of approximately 6 months I have had three 'phone calls from customers with Series 80 machines with difficuity in driving the 7470A plotter with a serial interface. My response has been to, initially, point out that this is not a supported configuration. In the next breath, however, to point out that it will work. The trick is that you must tell the plotter what the line turn-around time will be and what the end-of-line characters will be. To communicate with a Series 80 machine the line turn-around is 50 milliseconds, and the EOL is carriage return/ line feed. Here is how to set this up: Assuming the serial interface is on select code 10:

```
PRINTER IS 10
PRINT USING "K", CHR$(27)&".M50;;;13;10:"
PLOTTER IS 10
```

A final word of warning, non-supported peripherals are not encouraged, and in some cases they are specifically **discouraged.**

Philip Greetham
H.P., Melbourne.

BANNER PROGRAM

```
10 !     RE-STORE "banner"
20    !  BANNER ON 9845B INTERNAL PRINTER:   TWO LINES,  SMALL CHARACTERS.
30    !  EACH LINE 0 TO 80 CHARS.  LINES MAY BE OF UNEQUAL LENGTH.
40    !  Rex Jooste, HEWLETT-PACKARD Co., SYDNEY, AUSTRALIA, Mar 83.
50    !
60    DIM Top$[80],Bot$[80],T$[6]
70    LINPUT "PERFORATED PAPER (Y/N)?",T$
80    IF POS(UPC$(T$),"Y")=0 THEN Skip
90    PRINTER IS 0
100   PRINT CHR$(27)&"&l0T"              ! IGNORE PERFORATIONS
110 Skip:  !
120   PRINTER IS 16
130   INTEGER K,L
140   LINPUT "MESSAGE FOR TOP LINE? ( 0 - 80 CHARACTERS )",Top$
150   LINPUT "MESSAGE FOR BOTTOM LINE? ( 0 - 80 CHARACTERS )",Bot$
160   L=MAX(LEN(Top$),LEN(Bot$))
170   IF L>LEN(Top$) THEN Top$[1,L]=Top$ ! PAD TO LENGTH OF THE OTHER STRING.
180   IF L>LEN(Bot$) THEN Bot$[1,L]=Bot$ !    ditto
190         FOR K=1 TO L STEP 2
200         PLOTTER IS "GRAPHICS"
210         GRAPHICS
220         CALL Labl(90,180,75,149,(Top$[K;1]))
230         CALL Labl(0,90,75,149,(Bot$[K;1]))
240       IF K=L THEN Out
250         CALL Labl(90,180,0,75,(Top$[K+1;1]))
260         CALL Labl(0,90,0,75,(Bot$[K+1;1]))
270 Out:    !
280         DUMP GRAPHICS
290         NEXT K
300   !
310   EXIT GRAPHICS
320   DISP "FINISHED"
330   END
340   ! ************************************************************
350   SUB Labl(X1,X2,Y1,Y2,M$)
360   DEG
370   LIMIT X1,X2,Y1,Y2
380   SCALE 0,100,0,100
390   CSIZE 100,1
400   LDIR 270
410         FOR J=0 TO 10
420         MOVE .5*J+25,.5*J+90
430         LABEL M$[1,1]
440         NEXT J
450   SUBEND
460   ! ************************************************************
```

Minutes of Meeting on 6th April, 1983, of the HP1000 Users Group (N.S.W.)

The meeting was opened by an announcement of the recent appointment of Anne Barker as SEO District Manager.

Harold Norrie (NORTRONICS) gave a demonstration of the DATABAR line of bar code readers.

Liz Drummond (STC COMPUTER DIVISION) introduced the Centronics 351 printer. Special features were 200cps and half the price of a HP2631G.

A demonstration of DEBUG/1000 followed and the main comments were
. . . . HOW MUCH IS IT??
. . . . WHEN CAN I GET IT??
. . . . WOW!!

The next meeting will be held on WEDNESDAY, 1st JUNE, 1983, AT HEWLETT PACKARD OFFICES, NORTH RYDE.

Corrado DiQual,
President, HP1000 Users Group (NSW)

FMGR PROCEDURE FILES WITH LABELS

One of the least lovable aspects of FMGR procedure files is the fact that all their jumps are relative. Apart from the initial chore of counting all the lines to set up the jumps, it becomes really painful to find that not enough blank lines have been allowed for future modifications, and that all jumps must be found and re-calculated for any extra line that is added. I have therefore developed a program that will allow procedures to be written with labels and then transformed into runnable procedure files. In addition, it will take an existing procedure file and add labels to it so that it can easily be modified and then unlabelled again.

The form of the label is a hash sign followed by a three digit number. This is normally (but not necessarily) the number of the line, and is therefore sufficient for files up to 999 lines. For example the file:-

```
:IF,-33P,EQ,30060B,3
:PU,1G
:CA,-33:P,-33P,-,1
:IF,1,NE,2,-4
:AN,FINISHED
```

would be labelled

```
#001  :IF,-33P,EQ,30060B,#005
      :PU,1G
      :CA,-33:P,-33P,-,1
      :IF,1,NE,2,#001
#005  :AN,FINISHED
```

Any lines can now be inserted or modified, further labels or references to labels added, and then it can be run through the program to produce the runnable form.

The program is written in RATFOR (1). This is a pre-processor which produces compilable FORTRAN as its output. The FORTRAN source and/or relocatable of the label program should also be available through the users group. I shall be happy to provide any of them on 9885 floppy disk.

The program is run by supplying the source filename, a destination filename and the terminal LU in the run string.
e.g. RU,FMLAB,FMPROC,FILOUT,10

The first line of the source is examined to see if labelling or unlabelling is required, FILOUT is created if necessary and the output is sent to both the file and the terminal. Warnings and error messages are printed on the terminal for such conditions as duplicate or undefined labels, or labels out of range. A warning is also printed if a relative jump is found when unlabelling. I have found the program very simple to use, effective and hassle-free.

(1) RATFOR is described in SOFTWARE TOOLS by B. W. KERNIGHAN and P. J. PLAUGER (ADDISON-WESLEY 1976). I would also like to express my thanks to Rolf Exner for his assistance in implementing it on RTE. I hope that Rolf can be persuaded to write an article on this excellent language for the magazine.

Peter Bury,
Victorian College of Pharmacy

```
#program fmlab - label/unlabel FMGR procedure files    28 jan 1982
define (MAXLN,999)          # largest no of lines in file
define (MAXCHARS,91)        # largest no of chars per line
define (MXF,2)              # no of files
define (HASH,'#')           # label identifier
define (LABEL,1)            define (UNLABEL,2)

block data
common/ciop/nbufs,maxbuf,lastc(7),iobuf(MAXCHARS,MXF)
integer nbufs,maxbuf,lastc,iobuf
data lastc /7*0/
data nbufs/MXF/
data maxbuf/MAXCHARS/
end

program fmlab
integer larray(MAXLN),lino,point,labno,pass,mode,flag,len
integer obuf(MAXCHARS),ibuf(8),flnam(30)
integer fstch,char,flag
integer getc,putc,ctoi,itoc,robuf,wobuf,getar,posn
if (getar(3,flnam,30) ~= -1) {
                          I=1;I0=ctoi(flnam,I) }     # terminal lu
if (getar(2,flnam,30) ~= -1) call opin (2,flnam,2)  # output file
if (getar(1,flnam,30) ~= -1) call opin (1,flnam,1)  # input file

do i=1,MAXLN                                        # clear label table
   larray(i)=0
pass=1
# first pass to make table of labels/line numbers
for (lino=1;lino<=MAXLN;lino=lino+1)
   {call readl(obuf,len,1)
   if (len==-1) break                               # test eof
   if (lino==1)
      if (obuf(1)==':') mode=LABEL                  # mode = 1 for labelling
      else mode=UNLABEL                             # mode = 2 to unlabel
# labelling.  Create a table of referenced lines
   if (mode==LABEL) {
      if (obuf(1) ~= ':' ) write (I0,104) obuf(1),lino
      if (obuf(2)=='I' & obuf(3)=='F')     # no action needed unless IF
         { call robuf (obuf,flag,labno,len)         # get relative jump,
         labref=labno+lino+1                        #   calc referenced line
         larray(labref)=1                           #   and flag it
         }
      }
# unlabelling.  Create a table containing the line no. of each label
   if (mode==UNLABEL)
      if (obuf(1)==HASH)
         {istart=2                                  # label found
         labno= ctoi(obuf,istart)                   # decode it &
         if (labno <= 0 | labno > MAXLN)            # check not
            write (I0,106) labno,lino               #   outside table limits
         else if (larray(labno) ~= 0)               # check not duplicate
                 write (I0,105) labno,larray(labno),lino
         else { write (I0,103)labno,lino            #   display it &
              larray(labno)=lino}                   #   save the line no
         }
      else if ( obuf(1) ~= ' ')
         write (I0,104) obuf(1),lino                # error if first char
   }                                                #   neither space or #
103 format ("Label ",i6," on line"i6)
104 format ("Unexpected char '",r1,"' in line ",i5)
105 format ("Duplicate label",i5," at lines",i5," and",i5)
106 format ("Label",i5," out of range on line",i5)
# end of first pass


# second pass calculates displacement/label & writes new file
ipos=posn(1,1)                                      #  rewind file
for (lino=1;lino<=MAXLN;lino=lino+1)
   {call readl(obuf,len,1)
   if (len==-1) break                               # test eof
   if (mode==UNLABEL)              # if unlabelling, shift rest of line in
      { do j=7,len
         obuf(j-6)=obuf(j)
      len=len-6 }
   len2=len
   if (obuf(1) ~= ':') write (I0,121)obuf(1)
   if (obuf(2)=='I' & obuf(3)=='F')     # no action needed unless IF found
      { call robuf (obuf,flag,labno,len)            # parse label
      if (flag==mode)
         { if (mode==LABEL) newno = labno + lino + 1  # calc. label or
         else { if ( larray (labno) == 0)
                  { write (I0,124)labno,lino
                  larray(labno)=labno      }    #  default to line no.
               newno = larray (labno) -lino-1       #        offset
               }
         call wobuf (obuf,mode,newno,len,2)         # write into buffer
         }
      else { len = len2                             # restore original length
           if (mode==UNLABEL)                       #  & print warning if
              write (I0 ,122) lino                  #      unlabelling
           else  write (I0 ,123) lino  }            # else error
```

```
    }
  if (mode==LABEL)              # now is the time to make room for label
    { for (i=len;i>=1;i=i-1)
        obuf(i+6)=obuf(i)
    len=len+6
    do i=1,6              # blank fill is left if no label
         obuf(i)=' '
    if (larray(lino) ~= 0)  call wobuf (obuf,mode,lino,len,1)
    }
  call wrtln (obuf,len,2)          # write the new/old line to file
  write (IO,130) (obuf(iwr),iwr=1,(len+1)/2)          # & to terminal
  } # & repeat it all till eof
if (lino>=1000) write (IO,131)
121 format("colon missing, char is ",a2)
122 format ("WARNING.........IF found with no label on line",i5)
123 format ("ERROR.............label mode mismatch on line",i5)
124 format ("WARNING.........undefined label #",i3," on line",i5)
130 format (45A2)
131 format ("File too long for 3-digit labels")
call stopp
end

#subroutine robuf  find & decode labels at end of line
subroutine robuf (obuf,flag,lab,len)
integer obuf(MAXCHARS)
integer i,flag,lab,len,sign
integer ctoi
flag=1
while (obuf(len) ~= ',') len=len-1       # work back to last comma in line
len=len+1                                # this is where new chars will go
i=len
if (obuf(i)=='-')
   {sign=-1;i=i+1}
else if (obuf(i)==HASH)
   {sign= 1;i=i+1;flag=2 }               # flag label
else sign=1
lab = ctoi(obuf,i)                       # decode label number
lab=lab*sign
return
end
#subroutine wobuf  write number into obuf
subroutine wobuf (obuf,mode,newno,len,flag)
integer obuf(161),ibuf(7)
integer i,mode,newno,len,flag
integer itoc
if (mode==UNLABEL)
   { i=itoc (newno,ibuf,39)              # convert to 6-digit blank filled
   do i=1,6
       if (ibuf(i) ~= ' ')  { obuf(len)=ibuf(i);len=len+1 }
   obuf(len)=13 }
if (mode==LABEL)
   { i=itoc (newno,ibuf,52)         # convert to 3-digit zero filled ASCII
   if (flag==1)
       { obuf(1)=HASH
       do i=1,3
            obuf(i+1)=ibuf(i)
       }
   else
       { obuf(len)=HASH
       len=len+1
       do i=1,3
            { obuf(len)=ibuf(i)
            len=len+1 }
       obuf(len)=13 }
   }
 return
 end
```

HP1000 Installed Base Courses

TO ALL HP1000 USERS

Many of your sites have now been installed with an HP1000 E/F Series for quite some time. As a result, we have been compiling, locally in Australia, some training courses which will increase your system's productivity by:-

- — Assisting you in improving your system's performance
- — Providing insights with the sys. gen. procedure to optimize the use of system resources
- — Further understanding of RTE internals
- — The use of distributed systems technology between your HP1000 and other systems
- — The use of graphics as a management tool

Each course has been designed for the user who would like to use his system more efficiently and thus make productivity gains. The courses will be of benefit to both RTE-6/VM and RTE-IVB users and will be conducted at the Sydney training facility.

For your further information on these courses, following is a detailed outline of each course, as well as a scheduled run date, and cost of these special installed-base courses.

I look forward to hearing your comments about this schedule of installed-base courses.

Anne E. Barker,
District Systems Engineering Manager,
HP Sydney

SCHEDULE OF INSTALLED BASE COURSES

1. Introduction to HP1000 Architecture and MACRO/1000 Programming

Course Content:
Topics include:- Overview of the HP1000 MEF series architecture as an introduction to MACRO/1000 programming.

- — HP1000 instruction set
- — Interfacing MACRO/1000 programs with high level language programs
- — Macro programming techniques
- — Macro's conditional assembly
- — Machine instructions and pseudo operations

LAB: approx. 30% of total course

DATE: 6th June, 1983

DURATION: 5 days

COST: $800.00

2. Performance Aspects of RTE System Generation

Course Content:
Topics include:- Track map table design and positioning of system and other libraries.

- — Driver partition allocation/size
- — The table and other areas
- — Equipment table entries
- — Resource allocation of class #'s, resource #'s, buffer limits, ID segments
- — Performance measurements

LAB: approx. 30% of total course

DATE: 27th June, 1983

DURATION: 3 days plus optional 4th "open day"

COST: $600.00

3. HP1000 Distributed Systems and Networking

Course Content:
Topics include:- Concepts of a distributed system and it's organisation. Capabilities and features of a DS network (1000/1000 and 1000/3000).

- — Use of — X.25 protocol
  - — factory data link
  - — IBM communications
  - — DS/1000-IV

LAB: approx. 35% of total course

DATE: 25th July, 1983

DURATION: 5 days

COST: $800.00

4. RTE Internals and Operation

Course Content:
Topics include:- RTE internals — DMS, interrupt processing.
RTE services — class I/O, privileged and re-entrant processing.

- — RTE lists and tables
- — SAM usage
- — RTE utilities
- — Operating system mapping
- — Power fail
- — Program states
- — Program dispatching and partition assignment

LAB: approx. 30% of total course

DATE: 29th August, 1983

DURATION: 5 days

COST: $800.00

5. RTE System Performance Optimization
Course Content:
Topics include:-
- — Powerfail
- — Memory resident programs
- — Program priorities
- — Partition layout
- — VIS
- — Sizing programs
- — MLS/LOC
- — Shareable EMA

LAB: approx. 30% of total course

DATE: 3rd October, 1983

DURATION: 3 days plus optional 4th "open day"

COST: $600.00

6. Using Graphics on the HP1000
Course Content:
Topics include:-
- — An introduction to the concepts and programmatic use of GRAPHICS/1000-II (DGL & AGP)
- — Production of simple charts through the interactive use of graphics
- — Using various graphics devices of digitizer, plotter
- — Interfacing with the ISPP (Industry Standard Plotting Package)

LAB: approx. 30% of total course

DATE: 24th October, 1983

DURATION: 3 days

COST: $600.00

7. Image-Advanced Workshop
Course content:
Topics include:- Develop an understanding of Image internals in order that it may be used to achieve an efficient and stable database design via data analysis, database prototyping and performance analysis. To develop an understanding of the requirements and techniques required to maintain and recover an Image data base. Also produce an understanding of data auditing concepts and how they aid in maintaining data integrity and data recovery in an Image database.
- — Image Internals
- — Query Processing
- — Data Structures and Relational Forms
- — Database Theory
- — Database Prototyping
- — Performance Analysis
- — Database Maintenance
- — Data Auditing

LAB: approx. 50% of total course

DATE: 8th August, 1983

DURATION: 5 days

COST: $850.00

8. Data Communications of the HP1000
Course Content:
Topics include:-
- — the MUX
- — modems
- — RS232 standard
- — interfacing terminals to the HP1000

LAB: approx. 40% of total course

DATE: November 28th, 1983

DURATION: 5 days

COST: $800.00

Please note that specialized courses are available on demand.

A QUICK LOOK AT PRINTERS

(by Corrado DiQual)

In the last two years I've been investigating the availability of suitable printers for use with our HP1000 computers as well as with our HP9825, HP85, HP9826 Desktop Computers.

SELECTION CRITERIA
We need three basic types of printers for our applications:
1. a low cost, low speed printer for data logging applications (typically less than $1500)
2. a medium speed, fairly good quality printer preferably with graphics capability for program listing and reports (typically less than $3000)
3. a label printer which can print good quality labels for mailing lists and equipment identification. Bar code essential for some applications (typically less than $10,000).

This article is not meant to be an exhausting comparison of all the printers on the market and I'm sure that some readers will disagree with some of my conclusions just as some printer salesman will cry 'UNFAIR' because I haven't included the one they sell.

HOW TO SELECT WHAT TO EVALUATE
1. Ask other users what printers they had.
2. Read the printer ads in magazines.
3. Discard any dealers which will not agree to supply a demo unit for evaluation. This might sound pretty harsh but remember you are the customer and it is your money.

THE PRINTERS
HP2631G opt 200
FACIT 4542
ANADEX DP9501
Texas Instruments TI 810
Centronics 351
Epson MX80 (HP82905B)
DECWRITER III LA120
DECWRITER IV LA38
Teletype 43

INTERFACES
All of these printers were available with RS-232C interface. Some had a Centronics parallel interface as well, but only the HP and Facit had HP-IB (IEE 488) interface.

This lack of HP-IB capability posed a problem because most HP desktop computers work better with HP-IB devices especially if the other I/O ports are all occupied and there's no room to plug in an RS-232C interface. The solution to this was to buy a HP-IB to Centronics Black Box (trade name) converter from Datacraft ($489). The addition of the black box, increases the price of the printers, but as can be seen, this was still an attractive proposition.

WHICH ONE DID WE BUY?
Because our requirements are varied, we have seven out of the 10 types listed and in some cases, four or more of each type.

WHAT INFLUENCED OUR CHOICE?
Originally the HP2631G opt 200 was the cheapest dot matrix printer under $10,000 which could print bar codes. Now however, there are many more with this capability at a cheaper price.

The Decwriters we chose wherever we had the need for printing terminals (except where a terminal was supplied with the equipment, eg. TTY43).

The Centronics mostly everywhere where we needed a fast heavy duty printer. This type had an added advantage of being sold and serviced by one of our own divisions and as a result were much cheaper to us than the other medium priced printers.

The HP82905B (EPSON MX80) we purchased mainly for use with our instrumentation controllers as data logers to produce short reports.

NOISE LEVEL
Dot matrix printing technology is not known for its quietness. If your printer is in high noise environment or in an enclosed computer room, you won't notice them, however, if they're in an office area they can tend to drive you crazy. To this effect my personal policy has been to order a sound abatement enclosure for most of the higher speed printers. This adds about $600 to the printer's price but is well worth the peace of mind it brings.

FURTHER INFO.
Next issue of CROSSTALK I'll continue this article by giving price and performance characteristics of each of the printers.

Corrado DiQual, (02) 699 0044

THIRD-PARTY SOFTWARE

Here is the latest list of HP PLUS programs for the HP1000.

COMPUTER-AIDED ENGINEERING & DESIGN (CAE, CAD)
Zuken 2000 PC Board Design System (SAT), F Series
NISA Numerically Integrated Systems Analysis (EMRC), F Series
DISPLAY/DIGIT Finite Element Graphics (EMRC), F Series
Structural Dynamics Modification (SMS), E & F Series
STAAD-III Structural Analysis & Design, (Res. Engrs.), E & F Series
GES/1000 General Earthworks System (Associates II), E & F Series
Survey/Design Pkg. for Civil Engineers (Nichols), A, E & F Series
Structural Engineering Package (Omni Software), L Series
CEADS-CADD Computer-Aided Drafting (Holguin), A, E & F Series
GDS-1 2D Drafting System (Genesis Data Systems), A, L, E & F Ser.
ILS Interactive Laboratory System (STI), E & F Series

FACTORY AND PLANT AUTOMATION (CAM)
Message Dispatcher (ITP Boston), A, L, E & F Series
Vendor Rating-1000 (Hansford), E & F Series
Incoming Quality Mgmt.-1000 (Hansford), E & F Series
Process Analysis-1000 (Hansford), E & F Series
Acceptance Sampling-1000 (Hansford), E & F Series
Production Quality Mgmt.-1000 (Hansford), E & F Series
Zeiss CMM Quality Mgmt.-1000 (Hansford), E & F Series
Calibration-1000 (Hansford), E & F Series
Instruction Mgmt.-1000 (Hansford), E & F Series
CEMS/1000 Centralized Energy Mgmt. System (IECS), A, E & F Series
EKOPOW Power Plant Supervisory System (Ekono), A, E & F Series
ABPLC/1000 Allen Bradley PLC Subsys. (Systems Intgr.), E & F Ser.
J/PICS Process Information and Control System (SSS), E & F Series
EKOCON/1000 Process Supervisory System (Ekono), A, E, & F Series

COMPUTER-AIDED TESTING (CAT)
ATLAS/1000 Entry Level Compilation System (Lexico), E & F Series
ATLAS/1000 Compiler for Digital Applications (Lexico), E & F Series
ATLAS-80 Compilation System (Lexico), E & F Series

MATHEMATICS, STATISTICS
MATH/1000 Matrix Spreadsheet (COMPROG), L, E & F Series
IMSL Math/Stac Library (IMSL), E & F Series
Minitab Stat Pac (Penn State Minitab Project), E & F Series
STAT/1000 Stat Pac (Eyring Research), A & F Series
LINDO Linear Programming System (CAC), E & F Series

UTILITIES, TOOLS, OPERATING SYSTEMS
Terminal Manager (ICC), A, L, E & F Series
SCONS/1000 Source Control System (CCS), A, L, E & F Series
DELTA/1000 File Difference Locator (CCS), A, L, E & F Series
FBUG/1000 Source-Level FORTRAN Debug (CCS), A, L, E & F Ser.
TFORM/1000 Text Formatter (CCS), A, L, E & F Series
VEDIT/1000 Text Editor (CCS), A, L, E & F Series
SPELL/1000 Automatic Proofreader (CCS), A, L, E & F Series
Cross Assemblers for Microprocessors (Microtec), L, E & F Series
Meta-Assemblers for Bit-Sliced Microproc. (Microtec), L, E & F Series
Simulators for Microprocessors (Microtec), L, E & F Series
ATLASCAN ATLAS Syntax Checker/Verifier (Lexico), E & F Series
Pascal Development System (Theta), E & F Series
SCREEN/1000 Form Management System (CCS), A, L, E & F Series
SORT/1000 Sorting Tool (CCS), A, L, E & F Series
Dimension-Image Transaction Generator (Polaris), A, L, E & F Series
VIEW/1000 Forms and Data Entry System (Polaris), A, L, E & F Series
NDX-SORT Sort Merge Program (Data Index), E & F Series
Questor Data Entry & Retrieval (C & L Systems), A, L, E & F Series
Qform Forms Generation Package (C & L Systems), A, L, E & F Series
Qtext Text Processor (C & L Systems), A, L, E & F Series
Qmail Information Processing (C & L Systems), A, L, E & F Series
Qsort File Sorting (C & L Systems), A, L, E & F Series
WPIT/1000 Word Processing (System Services), A, L, E & F Series
INSIGHT Reports Package (Polaris), A, L, E & F Series
TASP Transparent Activity Sampling Prog. (Aurelian), E & F Series
SLIP Software Libr. Indexing Prog. (Aurelian), E & F Series
CLU Cartridge List Utility (Aurelian), E & F Series
Cartridge Manager, (Universal Computing), E & F Series

LANGUAGES
Cobol/1000 Compiler (CCS), A, L, E & F Series
HP/C Compiler (CCS), A, L, E & F Series

MANAGEMENT
General Ledger (Theta), E & F Series
Accounts Payable (Theta), E & F Series
Accounts Receivable (Theta), E & F Series
Payroll (Theta), E & F Series
Small Mfg. Business Tool Kik (Portable Software), L, E & F Series
Ledgersystems (DNS), L, E & F Series
Lawyers Ledgersystem (DNS), L, E & F Series
Order Entry-Accts. Rec. (Aim Mgmt. Services), A, E & F Series
Gen. Ledger-Accts. Pay. (Aim Mgmt. Services), A, E & F Series
Payroll (Aim Mgmt. Services), A, E & F Series
Medical Billing System (Aim Mgmt. Services), A, E & F Series
The People Planner, Prop. Maint. System (Data Index), E & F Series
Order Entry (Theta), E & F Series
Inventory-Purchasing (Aim Mgmt. Services), A, E & F Series
ORDER/1000 (Efficient Computing Company), L, E & F Series
IMAGE Interface (ICC), A, E & F Series
ENTRY/1000 (Efficient Computing Company), L, E & F Series
DATA-BASE/1000 (Efficient Computing Company), L, E & F Series
REPORT/1000 (Efficient Computing Company), L, E & F Series
PFAS Pascal File Access System (C.J. Wigglesworth), L, E & F Series
MED/1000 (Efficient Computing Company), L, E & F Series

For details, contact your local HP representative or call George Low, HP Plus Marketing Engineer at Hewlett-Packard Data Systems Division, (408) 257 7000.

SPECIFICATIONS FOR SUBMISSION OF ARTICLES AND ADVERTISEMENTS

Crosstalk will be published each even numbered month. Articles and advertisements must be received by the appropriate group editor by the third week of the preceding month.

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).

ADVERTISEMENTS: Display ads. should be in camera-ready artwork form. The printer may be instructed to layout ordinary typeface ads.

CURRENT ADVERTISING RATES:
Full page — $250
Half page — $125
Column/cm — $4

There is a 20% discount on these rates for regular advertisers. Classified ads. are free for user group members, and $10 each for non-members.

Advertisers will be billed upon receipt of ad. The user groups reserve the right to change rates, limit space availability and reject advertising which is deemed inappropriate.

ADDRESSES FOR SUBMISSION OF ARTICLES AND ADVERTISEMENTS:

The Editor,
HP1000 Users Group (N.S.W.),
Box 3060 GPO,
Sydney, 2001.
N.S.W.

The Editor,
HP1000 Users Group (Vic.)
P.O. Box 132,
Mt. Waverley, 3149
Vic.

The Editor,
Canberra Technical Users Group
C/- Hewlett Packard Aust. Ltd.
P.O. Box 507, Fyshwick, A.C.T. 2069.

Mr Keith Crellin,
Queensland Technical Users Group,
C/- Cameron McNamara Pty. Ltd.,
131 Leichhardt Street,
Spring Hill, Qld., 4001.
Phone: (07) 228 9125.

H.P.D.C.U.G.V. articles only to:
Mr Bernie O'Shannessy,
Arlec,
30-32 Lexton Road,
Box Hill, 3128, Vic.

H.P.D.C.U.G.V. advertisements only to:
Advertising Editor,
HP Desktop Computer Users Group (Vic.),
C/- 47 Bursaria Ave.,
Ferntree Gully, 3156, Vic.

Desktop helps diminish EMI

by Christel Stumbough

EMI, or electromagnetic interference, is an annoying by-product of time-varying electric currents and a pain in the side of computer system designers. When engineers use highly sensitive electronic equipment, for example, EMI can cause output of wrong or spurious characters. In some cases it can cause total shutdown of an electrical system.

One of the many quality control testing procedures performed at Hewlett-Packard's Desktop Computer Division in Fort Collins uses an HP desktop to ensure that the radiated interference level of HP products remains as low as possible. With the help of an HP System 35A Desktop Computer, control technicians perform these "electrical noise" detection tests quickly, and with increased reliability.

According to Ray Padilla, environmental lab supervisor at DCD, radiated interference is just one facet of EMI. The other component, conducted interference, deals with unwanted electrical signals channeled between the noise source and the receiver. However, it is the radiated (or emitted) interference that we perceive as electrical noise and that creates static on our radios, and data interference elsewhere.

To measure this noise, Padilla uses a set of three antennas and three pieces of Hewlett-Packard equipment. A vertical whip, a biconical and a log spiral antenna detect any electrical noise generated by the products being tested. The analysis system itself includes an HP 8568 Spectrum Analyzer, the System 35A Desktop Computer, and an HP 9876A Thermal Printer. An HP-IB Interface links the spectrum analyzer with the System 35 and the printer.

Screen room

As part of the standard quality assurance procedures at DCD, workers take noise measurements in a specially designed, electrically "quiet" test room, called the screen room, or at an open-field test site. The spectrum analyzer takes a reading of the interference radiated by the desktop product in the screen room.

The data from these readings is stored in the System 35, and displayed on the CRT screen of the spectrum analyzer in terms of amplitude (signal level) and frequency. Hard copy samples of the visual data are provided by the printer.

Besides storing noise level data and controlling the thermal printer, the System 35 prompts the computer operator by providing programmed instructions on the correct procedures for taking readings. Padilla set up the system about a year ago, when he ascertained the need for data storage and hardcopy output. Jim Stroh, who works with Padilla, wrote the software.

Time savings and reliability

Padilla also realized the additional benefit of the time savings possible in automating this portion of the quality control testing at DCD. The present test procedure requires two minutes to complete, compared to a previous time requirement of two hours for manual testing.

In addition to saving time, the system has increased test reliability. Since quality checks are performed in such a short amount of time, additional readings are taken to help ensure the accuracy of the results. And unlike the spectrum analyzer, the System 35 stores the data for later reference and for use in quality assurance reports.

Until newer developments increase our understanding of EMI, quality control workers at DCD will continue to use the System 35 to do their best in the fight against electrical noise pollution. K

COPY DEADLINE

All material for the next issue of Crosstalk should reach your local editor by **Thursday, MAY 26.**

FOR SALE
EX DEMO STOCK

2* HP85's desktop computers ..... **$2995 each**
1* Series 80 Mass Storage ROM **$159**
1* Series 80 Input/Output ROM **$330**
1* Series 80 Rom drawer **$49**
1* 82902M Single 5¼" disc drive **$1499**
1* 16K Memory expansion **$199**

FREE: Software will be included from the following:
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Time Costing
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Phone (054) 432 589 — Len Williams

COMING EVENTS

May 30:	IMAGE/DBMS 1000 course, HP Sydney
June 1:	HP1000 Users Group (N.S.W.) meeting at HP Sydney
June 6:	IMAGE/DBMS 1000 course, HP Melbourne
June 6:	Series 200 Operating & Programming course, HP Sydney
June 6:	Introduction to HP1000 Architecture and MACRO/1000 Programming course, HP Sydney
June 20:	RTE-A System User course, HP Melbourne
June 20:	Series 80 Basic Programming course, HP Sydney
June 27:	RTE-A System Programmer/Designer course, HP Melbourne
June 27:	Performance aspects of RTE System Generation course, HP Sydney
July 7:	H.P.D.C.U.G.V. meeting, 4 pm., at C.S.I.R.O., Glen Waverley

CLASSIFIED ADVERTISEMENTS

FOR SALE

(OFFERS INVITED)

COMPUTERS (AND ROMS):
9845A 64k (IO,MM) **$6000**
9835A 64k (MM) **$6000**
9831A 16k (MM) **$2500**
9825T 64k (inbuilt ROMs) **$6000**
9825A 24k (SA,PG,SP) **$3750**

PRINTERS:
9871A, I'face, tractor & basket **$1450**
2631A plus HPIB I'face & cable **$3250**

OTHER PERIPHERALS:
9885M & I'face (Master floppy) **$3250**
9885S (Slave floppy) ..... **Two at $2150**
9869A Card Reader **$490**

BITS & PIECES:
New box 3M 8" 9885 diskettes (10) **$99**
Diskettes and Tapes (used, but good).
Various ROMs, Accessories, etc.
Manuals for some older machines.

FOR HIRE: (Short or long term)
Any combination of the above equipment.
Suggested rates approximately HALF those of a well known instrument hire company.
. . . Make me an offer!

FORUM:
I have a growing list of people either who have equipment to SELL or who wish to BUY.

WANTED:
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PLEASE CALL CHRIS SIMPSON
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(03) 859 6643

FOR SALE

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Upgrading to 400Mb Winchesters.
Contact Corrado DiQual, STC.
(02) 699 0044

NOTE

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