COMPUTER SYSTEMS NEWSLETTER

For HP Field Personnel

Introducing . . .

the Matrix Machine

HP introduces the Matrix Machine.

If you've been thinking that only a 32-bit computer can handle your matrix intensive jobs, think about this: with HP's new Vector Instruction Set (VIS), the HP 1000 does matrix inversions at speeds comparable to a 32-bit mini. At less than one-third the price.

The HP 1000 F-Series computer has built a solid reputation for handling complex scientific calculations involving floating point arithmetic, trigonometric and logarithmic functions, and other computation-intensive problems. And now it's even better.

With VIS, you can perform vector and matrix arithmetic at speeds you wouldn't have thought possible on a 16-bit computer. Yet HP 1000 F-Series systems, including the powerful Vector Instruction Set, are priced from only $43,500.

You can call VIS easily from any FORTRAN program by simply specifying the size of your array and the operation you want to perform. A single vector addition statement like CALL VADD, for example, replaces a FORTRAN DO loop to execute some applications up to 10 times faster.

And by taking advantage of the HP 1000's Extended Memory Area, VIS can address extremely large data sets (up to 1.8 megabytes) in main memory. All array and memory management tasks are handled automatically so you can do large array applications like image processing, three-dimensional graphics, process optimization and simulations. Without writing any new software.

Speed plus accuracy equals performance.

Even if you're just crunching numbers and not matrices, the F-Series has what it takes to handle the most sophisticated computations.

A hardware-implemented Floating Point Processor gives you three levels of floating point precision for up to 17 significant digits of accuracy. The F-Series standard firmware also includes a subsystem designed to improve performance on frequently used FORTRAN routines. Like parameter passing, for example Or normalization functions. Even array address calculations. And separate polynomial and scientific instruction sets make it easy to do highly accurate calculations involving a wide range of trigonometric, logarithmic and other complex functions — all at hardware speed.

Crunch a matrix today.

To find out how the HP 1000 makes matrix arithmetic a snap on a 16-bit computer, call your nearest HP office listed in the White Pages and ask for a hands-on demonstration. It might save you from investing more than you need to

for your sophisticated computation jobs. Or write for more information to Hewlett-Packard, Attn: Roger Ueltzen, Dept. 000, 11000 Wolfe Road, Cupertino, CA 95014.

	Matrix Inversion Times*	
	HP 1000 VIS enhanced	32-bit
Size	F-Series	Minicomputer
50x50	1.8 sec	1.5 sec
100x100	12.3 sec	11.7 sec
200x200	105 sec	92 sec
400x400	690 sec	720 sec

*Benchmark method - Matrix inversion using Gauss Jordan Elimination

Price in U.S. list

HEWLETT PACKARD

In This Issue...

FOR INTERNAL USE ONLY

HP Computer Museum
www.hpmuseum.net

BOISE DIVISION NEWS

Product News

2631A Character Design Kit Available Through Boise Division.

By: Sue Brault/Boise

For your customers who want to print characters on the 2631A that our character options don't offer — we've got the solution.

The 2631A Character Design Kit has been developed so that customers can design characters to fit their printing needs. The kit includes a set of design instructions, dot-matrix work sheets for expanded/compressed and normal characters, and a set of 75 cards (2 characters/card) for plotting the necessary characters.

The 2631A character design kit is available through your Boise Division Sales Development Representative.

How to Order Paper Baskets and Paper Shelves for the 2630 Family

By: Sue Brault/Boise

There has been some confusion in the field on ordering the paper basket and paper shelf for the 2630 Family. We would like to clarify the ordering information for you. The paper basket is specifically designed for desk use only and can be ordered by product number 26093A. The paper shelf was designed to be attached to the stand and can be ordered two different ways:

Paper Shelf (for pedestal)

	2631A/2631G	2635A/2639A
Pedestal & Shelf (order from Boise)	26098A Opt. 002	26097A Opt. 002
Shelf Only (order from CPC)	P/N 26097-00001	P/N 26097-00001

Paper Basket (for disk printer)

	2631A/2631G	2635A/2639A
Product Number (order from Boise)	26093A	26093A

Printing Terminal Accessories

26093A
PAPER BASKET FOR DESK USE

26090A
SOUND COVER

2635A/39A
PRINTING TERMINAL

Computer Museum

26097A
PEDESTAL
(2" SHORTER
THAN 26098A)
← OPT 001 WHEELS
OPT 002 PAPER
SHELF

P/N 26097-00001
PAPER SHELF
ONLY — (ORDER
FROM CPC)

Printer Accessories

26093A
PAPER BASKET FOR DESK USE

26090A
SOUND COVER

2631A/G
PRINTER

26098A
PEDESTAL
OPT 001   WHEELS
OPT 002   PAPER SHELF

P/N 26097-00001
PAPER SHELF
ONLY — (ORDER
FROM CPC)
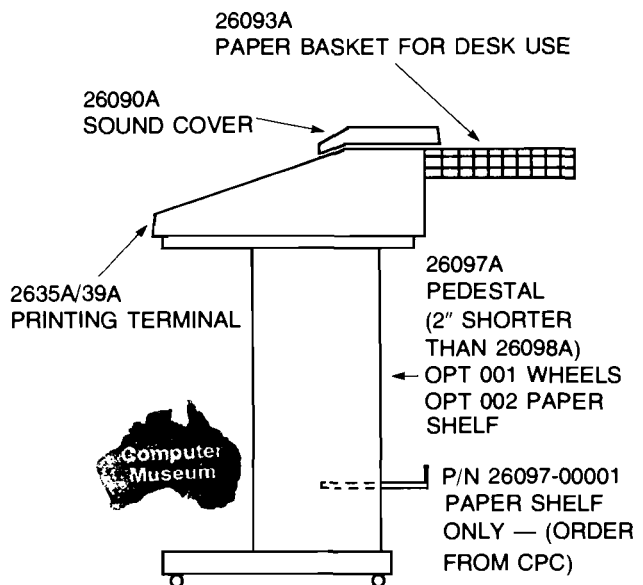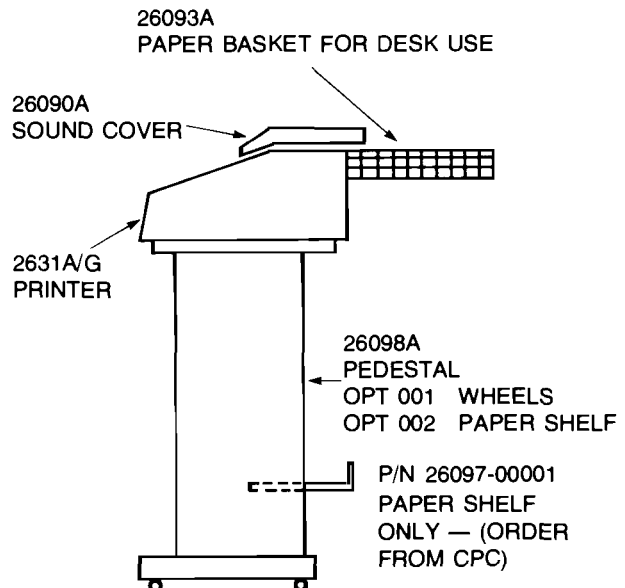
New 2607A's for $5500

By: Dave Melin/Boise

This could be your lucky day — brand new 2607A 200 lpm dot matrix printers for two grand under the sticker price!

Quantity Available	Options
1	015
1	001
5	std

Contacts: *Cindy Taylor* — Order Processing X2243
For questions call your Regional Sales Development Representative.

Year End Clearance Sale

By: Dave Melin/Boise

In an effort to clean out its closets, Boise Division has the following used equipment immediately available:

Product	Options (-888 plus)
2631G	011, 012, 015
2631G	001, 011, 012, 015
2635A	042
2613	Std
2613	Std
2613	Std
2613	Std
2613	001
2617	Std
2617	015
2618	Std

The price of these units will be determined by age and usage. Call your Sales Development engineer for price and availability.

Division News

New Team Member

By: Steve Richardson/Boise

Boise Division has enjoyed phenomenal growth thanks to your efforts. This growth has of course given us many challenges and opportunties. To help us meet these challenges and to take better advantage of these opportunities we have recently added a new member to our Product Marketing Team, *Ron Whiteleather.*

Ron joins us from Missoula, Montana where he received his BS in Computer Science and an MBA. He brings with him experience in working with computers and an eagerness to apply his knowledge to meeting HP's market needs in printers.

We look forward to working with all of you in the future to provide the products you need. Hope you will keep the tremendous growth and challenges coming our way.
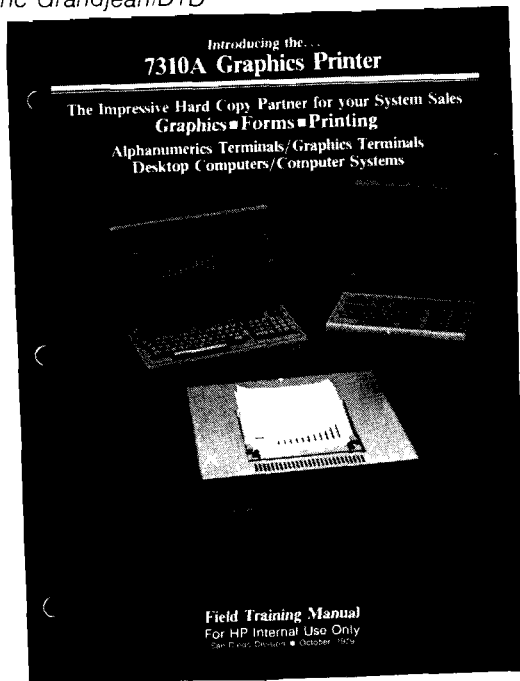
GOOD SELLING!

DATA TERMINALS NEWS

Product News

You Wanted Another Printer? You've Got It!
By: Eric Grandjean/DTD

Introducing the...
7310A Graphics Printer

The Impressive Hard Copy Partner for your System Sales
Graphics ■ Forms ■ Printing
Alphanumerics Terminals/Graphics Terminals
Desktop Computers/Computer Systems

Field Training Manual
For HP Internal Use Only

Thanks to SDD, we now have yet another thermal printer to connect to our 2648-2647 terminals.

- It prints alphanumerics at up to 500 lines a minute!
- It prints both fixed and proportional character spacing in a crisp 7 × 9 character cell!
- It has optional character sets and print enhancements!
- It prints graphics at up to 1.2 inches per second! (That's fast).
- It's got a self test!
- It's got an HP-IB interface in addition to serial and parallel interfaces and a stack of compatible escape sequences for sophisticated controls!
- It's the HP 7310A!

For full details on that new thermal printer, please refer to SDD's new Field Training Manual being distributed now.

GOOD SELLING!

2648A Raster Dump ROM
By: Peter Moulds & Jill Glashow/DTD

No! The Raster Dump ROM does not come standard with the 2648A.

Presently, there are only three ways to obtain the 1818-0746 raster dump ROM.

1. By ordering Option #007 (CTU's). This change was made effective as of July 1, 1979.

2. By ordering a 13296A Option #048.

3. By ordering part #1818-0746 (i.e. raster dump ROM).

An example:

If your customer has ordered a 2648A with Option 007 after July 1, 1979, and he has ordered a 13296A, he does NOT have to order Option 048 to get raster dump.

A special note:

The raster dump ROM #1818-0746 does NOT come with the 13261A #003 (device support firmware). Please correct this in your price guide.

This information has been thoroughly researched and is positively accurate.

2648-2631G Connection
By: Mary Chin/DTD

In order to run the HP 2631G, the HP 2648 must have raster dump ROM (1818-0746) installed on the 2nd control memory board. The raster dump ROM performs two functions:

1. Drives the HP-IB

2. Translates graphics to ASCII format

Therefore, you need the raster dump ROM to dump *alphanumerics* as well as graphics.

2nd Control Memory PCA (02640-60192)

Only 11 jumpers should
be installed
(SWITCHES IN CLOSED
POSITION)
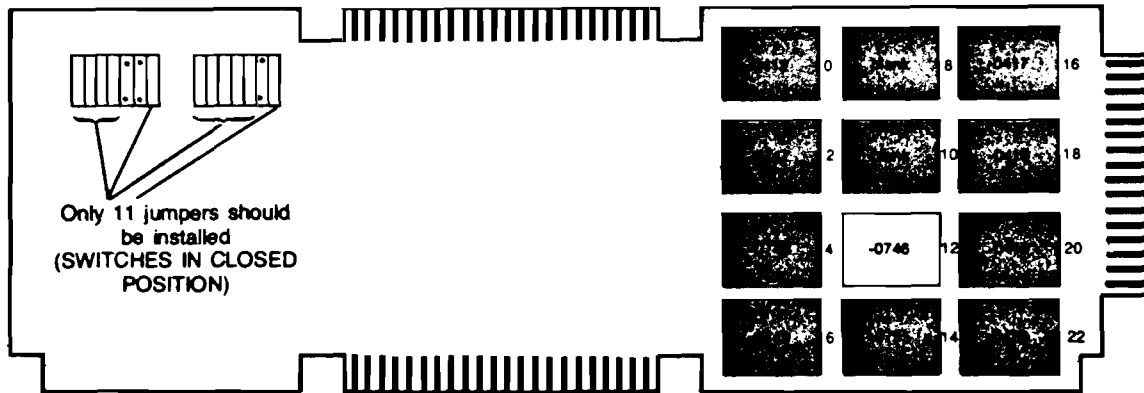
The 2647A Accesses Disc Files

By: Jacques Biard/HPG

The following program is another example of the flexibility of the 2647A to communicate with computers.

```
L
 10 DIM C$(100)[80]
 20 Colon$=CHR$(58)\Dc1$=CHR$(17)\Cr$=CHR$(13)\Lf$=CHR$(10)
 30 PRINT "ENTER THE COMMAND:   ";        !REQUEST COMMAND FROM KEYBOARD
 35 LINPUT Comman$                        !GET IT
 80 PRINT CHR$(27)&"&k1R";                !GO TO REMOTE
 90 GETDCM ON
100 ASSIGN "DA" TO #1                     !ASSIGN DATA COM. TO FILE 1
110 GOSUB 190                             !OUTPUT COMMAND AND WAIT FOR LINE FEED
120 I=1                                   !RECORD COUNT
130 GOSUB 230                             !GET RECORD
140 IF E$<>"END" THEN I=I+1\ GOTO 130     !IF NOT FINISHED, GET NEXT RECORD
150 PRINT Cr$&Lf$&"FILE IS NOW IN C$"     !FINISHED
160 PRINT CHR$(27)&"&k0R";                !GO TO LOCAL
170 GETDCM OFF
180 END
190 A$=" "
200 PRINT #1;Comman$                      !SEND COMMAND
210 IF GETDCM(A$)=0 OR A$<>Lf$ THEN 210   !WAIT FOR LINE FEED
220 RETURN
230 A$=" "\E$=" "
240 IF GETDCM(A$)=0 THEN 240
250 C$(I)[1,1]=A$\C1$=A$                  !GET FIRST CHARACTER
260 IF GETDCM(A$)=0 THEN 260
270 C$(I)[2,2]=A$\C2$=A$                  !GET SECOND CHARACTER
280 REM TEST IF FINISHED (FIRST TWO CHRACTERS ARE :DC1) AND TEST FOR CR LF
290 IF C1$=Colon$ AND C2$=Dc1$ THEN E$="END"\I=I-1\ GOTO 370
300 IF C1$=Cr$ AND C2$=Lf$ THEN 370
320 LINPUT #1;C$(I)[3]                    !GET DATA
370 RETURN
```

With the 2647A connected to an HP 1000 system, running this program in the 2647A will prompt you for a command which accesses a file (LI, XXX or ST, XXX, LU). The file will then be received in the 2647A and stored into an array; local processing of the data can then take place in the 2647A; this program can also be used to start a routine in the HP 1000, which sends data to the 2647A (RU, XXX).

Sales Aids

HP Terminals Connected to IBM 3033

By: Kalli Louis/DTD

DTD just received another "DTD connection" to a non-HP computer. *Scott Guthrie*, a clever Systems Engineer in the Neely Sales Region, hooked an HP 2645A terminal to an IBM 3033. The IBM system was using TCAM under MVS. The 2645A terminal was connected to a TSO port on the IBM system via an acoustic coupler. The BAUD rate switches were set to 300 BAUD. The parity switch was set to NONE.

The keyboard interface straps G, H and Z were opened; all others were closed. Opening the G and H straps disables all handshaking between the system and the terminal. Opening the Z strap with no parity sends and receives 8 bits. It also forces bit 8 to a 'one'. The IBM system expects that bit to be 'one" with no parity.

Inputs such as these help us help the field when the need arises. Keep these "DTD connections" coming in!

More Exciting Multiplots

By: Peter Moulds/DTD

A little known but valuable feature of the Linear Chart mode of Multiplot is month or day labels. You may specify that either month or day names may be used as the X-axis labels. Refer to your 2647A User's Manual, page 7 – 23 for details on using this exciting feature. Add this eye catcher to your bag of demo tricks!!!

# Assemble your own measurement system in weeks, instead of months ...

You can take months to design and assemble your own bus-compatible measurement system, and get just the system you need.

Or now, you can use HP system-designed instruments and computers, and get to your application in just a few weeks.

The reason is simple: All 119 HP system-designed components incorporate HP-IB (Hewlett-Packard Interface Bus). And HP-IB isn't just HP's implementation of IEEE 488-1978.

It's much, much more.

For example, HP has been designing and building HP-IB compatible products for more than a decade. We've put these 10-plus years of experience into bus architecture, and how it can best be designed into instruments and computers. Quickly and easily. Which means that when you choose HP-IB compatible system components, chances are you'll get your measurement system up and running weeks faster than if
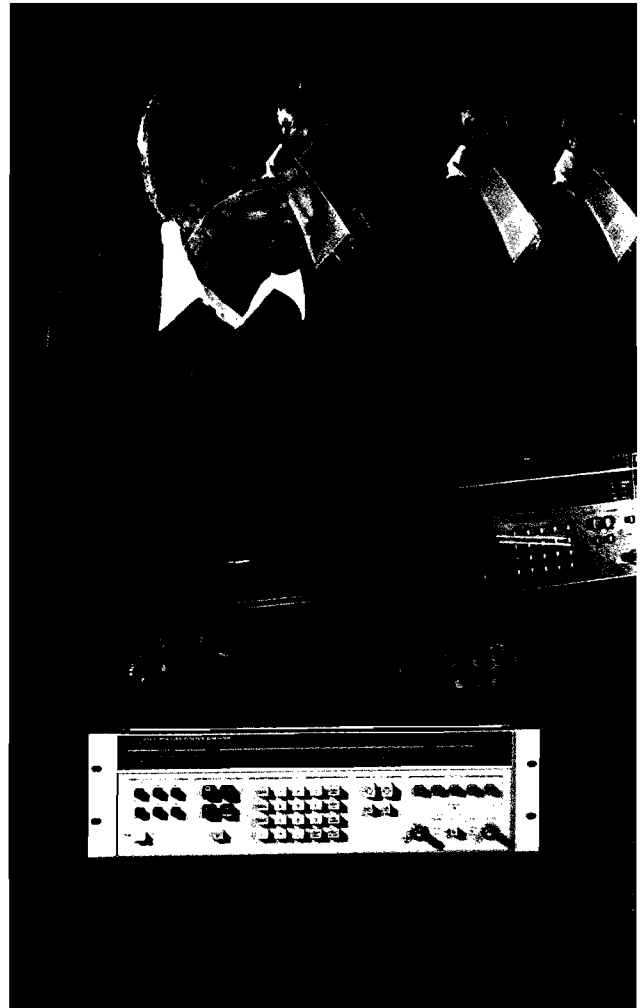
you were to configure it the conventional way.

Because HP offers 119 different HP-IB instruments and computers, you choose just the bus compatible hardware that best fits your system needs.

HP also has developed over 104 application notes on HP-IB compatible products. One of these may be just what you need to get to your application. Quickly and effortlessly.

For that matter, every HP-IB compatible product comes with complete and comprehensive documentation. Many of our computers feature high-level I/O language that eliminates the need for an I/O driver.

Choosing to assemble your own bus-compatible system with HP-IB products also means that if you ever need service on your system, just call H-P. One of our hundreds of field service people will respond to your need.

Find out how much easier and faster
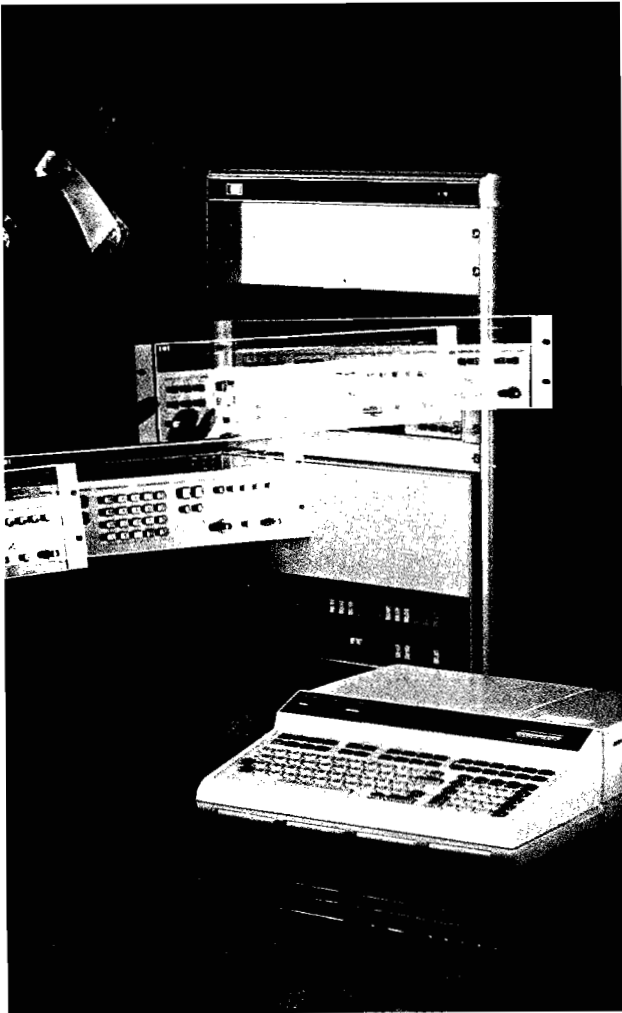
with HP's 119 different system-designed instruments and computers.

system design can be. Write today for our free, 16-page booklet, "Do your own system design in weeks, instead of months." It tells you everything you need to know about HP-IB compatible instruments and computers, about HP software and documentation support, and how to get more detailed information on specific kinds of applications. Or simply call your local HP field engineer.

DESIGNED FOR
HP-IB
SYSTEMS
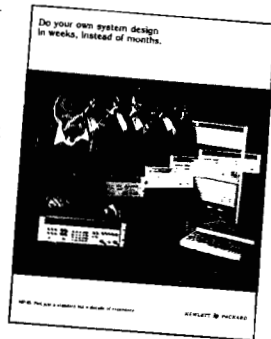
HP-IB: Not just a standard, but a decade of experience.

HEWLETT hp PACKARD

COMPUTER SERVICE NEWS

CSD News

International Quotations for Support Service
By: Olen Morain/CSD

Your enthusiastic response to selling Support Service up-front is quite apparent at CSD Sales Development in the flood of requests for International quotations.

That's the good news.

The bad news is that providing a quotation for support in another country can set wrong expectaitons for the customer in that the customer may expect to sign an agreement and be invoiced centrally rather than in the country of final destination.

At the present time, Hewlett-Packard's Service Information Systems makes central invoicing very difficult (if not impossible). In addition, such things as Value Added Taxes can make the support cost up to 25% more.

Furthermore, it is illegal for one HP Company to accept a contract on behalf of another HP Company (to have HP Domestic accept a contract for HP France for example) without having written permission from the country bound by the contract.

For the above reasons the following guidelines should be followed to make it easy for you to sell International support up-front and for the local country to receive the order in advance of delivery of the system.

1. Price Estimates for budgeting purposes may be obtained from CSD Sales Development by providing the following information:
    a. Name and address of the customer site at which the system is to be installed.
    b. Approximate installation date
    c. Complete system configuration
    d. Hours and days per week of desired coverage
    e. Name, address and telephone number of individual who will contact the local office, request a formal quote, sign the agreement and make local payment.

2. CSD will furnish the estimate to you in U.S. equivalent dollars. You must advise your customers that it is an *estimate* and that the actual charge would be based on a local quotation, and in local currency.

3. Advise your customers to make local contact early to provide plenty of time for Site Planning Preparation and Installation. This local contact assures early establishment of local rapport, readiness of the site and a smooth installation.

4. To assist in this contact and eliminate surprises associated with "Parachuted Systems", CSD will send a copy of the estimate including the name and phone number of the individual to be contacted to the local office.

These guidelines should allow CSD to respond more promptly to your request by eliminating the delay associated with obtaining formal quotes for each request. We need contact the local country only in cases where doubt exists about our ability to provide the support requested.

DATA SYSTEMS NEWS

Introducing · · · the Matrix Machine

The Matrix Machine
By: Joe Schoendorf/DSD

We are dedicating this entire issue to a new superstar, "The Matrix Machine"—the HP 1000 Model 45. It is a "HOT ONE". As you will see from the enclosed articles it is winning regularly against both DEC and DG. It has already beaten VAX. (We got the order.)

In this issue you will find benchmarks, sales successes, ads, seminars, demos training courses — the works. Not just a lot of factory words but comments from your peers — "how they did it" stories — interesting applications. Read! Learn! Sell!

Model 45 Beats VAX-11/780
By: Mark Beswetherick/DSD

Congratulations to *Graham Collins*, part of our U.K. technical sales force, for his recent sale of a large HP 1000 Model 45. *Graham* and the Model 45 won head-to-head against DEC, who proposed both the VAX machine and the 11/60 with no success. This accomplishment is especially notable because the customer is one of DEC's largest European OEM's.

The customer will use the Model 45 for simulation of linear systems. The main computational task is solving systems of simultaneous equations using matrix techniques on large data arrays. The Model 45 is the perfect solution for this application as RTE-IVB's Extended Memory Area and the Vector Instruction Set combine to provide transparent access to large arrays and high performance matrix operations.

Other points about the system: It has 1024Kb of memory, two 2648A Graphics Terminals with slave 2631G Graphic Printers, a 2608A Graphics Line Printer, and a 9872A four color plotter. It is evident that HP's overall graphics capability also played a part in making this sale. The system was also ordered with microprogramming hardware and software and paper tape reader and punch.

The strong price/performance combination of the Model 45 was a key factor in making this sale. With VIS and EMA, the Model 45 achieves performance equal to or better than the VAX in many large matrix applications. And all of this performance is available at less than half the price of the VAX. We defeated the 11/60 in this situation by out-and-out performance. For more details on our competitive position against DEC, see the accompanying article in this issue comparing the Model 45 to the VAX and the PDP-11/70. This is just one example of many scientific and engineering applications where matrix manipulation and large array handling capability are key. The Model 45 holds a unique position by being able to tackle such applications at a low price. Good work, *Graham*, for showing once again how to—

SELL THE MATRIX MACHINE!

Comparing the HP 1000 Model 45 to DEC's PDP-11/70 and VAX
By: Steve Pomeroy/DSD

How does the Model 45 stack up against DEC's PDP 11/70 and the VAX? It's true that those machines are generally faster, and with the VAX, it's hard to penetrate the 32-bit "mystique", but all too often a sale is given up as lost without even giving it a good shot.

So, to let you know how competitive the Model 45 is when compared to DEC's larger processors, I've put together the following information.

	Model 45	**PDP 11/70**	**VAX 11/780**
CPU			
Word Size	16 bits	16 bits	32 bits
Max Memory Size	2MB	2MB	2MB
Memory Access Speed	420ns	1300ns	600ns
effective (w/cache)		400ns	290ns
Type	Parity (EC optional)	EC	EC
Languages Offered	3 FORTRAN BASIC ASSEMBLY	5 FORTRAN BASIC ASSEMBLY RPG COBOL	5 FORTRAN BASIC NATIVE ASSY. PDP-11 ASSY. RPG
Benchmark Comparison			
Whetstone	.40	. 33	.15
Transcendental Function	.50	.678	.30
Matrix Inversions			
50 x 50	1.8 sec	5 sec	1.5 sec
100 x 100	12.3 sec	38 sec	11.7 sec
400 x 400	690 sec	n/a	720 sec
Price			
Typical System	$121,225	$182,800	$238,780
OEM System	$ 34,000	$76,000	$108,800

Typical and OEM system configurations have been matched to facilitate comparison. The typical system includes the CPU, 512 KB fault control memory, floating point processor, cabinets, 170 MB disk capacity, mag tape, line printer, 8 video terminals, 1 hard copy terminal, and operating system including FORTRAN and BASIC. The OEM Systems include the CPU, 256 KB fault control memory, cabinets, floating point processor, terminal and operating system.

A couple of things to notice: the prices and the benchmarks. The benchmarks provide a real measure of computing power. The Whetstone benchmark simulates a mix of typical FORTRAN programs. It's a good way to compare the calculating power of a computer in a "run of the mill" application. Notice that the Model 45 System is 2/3 the cost of an equivalent 11/70, but performs at nearly the same level. The VAX is 160% faster in this application but nearly twice the price.

The Transcendental Function Benchmark illustrates one of the F-Series' strengths — it's ability to calculate sine, exponential and other transcendental functions at extremely high speeds. This is due to the firmware features incorporated into SIS. If the application requires Fourier transforms, 3-D graphics, signal analysis, or other tools that make heavy use of transcendental functions, the Model 45 is the system to use. Compared to the 11/70, it calculates 70% faster, but at 2/3 the cost. Relative to the VAX, this benchmark takes 1/3 longer to run, but the HP system cost is only half as much.

Perhaps the most astounding benchmark result is one comparing matrix inversion times. The Model 45 compared favorably with the VAX, in fact even beat it when inverting a very large matrix. This is due to the performance afforded by the Vector Instruction Set. This very test resulted in a sale going to HP instead of DEC in at least one instance. (See article in this issue of the CS Newsletter.)

DEC's strategy has been to merchandise the VAX by hard-selling their 32-bit architecture with its inherent performance advantages. But because of the HP 1000's floating point processor and firmware-implemented VIS, SIS, and Extended Memory Addressing, the Model 45 is a strong contender for high performance applications. The Model 45 has better performance power for the money than the 11/70 and still has a price/performance edge over the VAX in certain applications.

So don't write off a potential sale if you're going against a PDP 11/70 or a VAX; look hard at the application and sell on the basis of almost equivalent (or better!) performance for much less money.

For more comparative details to help you sell against VAX or an 11/70, write or call me at DSD.

Another Exhiliarating Model 45 Episode
By: Millo Fenzi/DSD

In addition to sales by the best "Matrix Machine" salesmen there are other orders that are interesting for their application or sales strategy!

Kent Wilcox of Neely Santa Clara fame recently added a Model 45 to a small research lab in a data acquisition application. The sales situation was originally wide open with DEC, DG and HP as the frontrunners.

DEC proposed a solution based on an 11/34. *Kent* did not want to compete in that price range so he modified the customers' concept of a solution to include advanced display capability — GRAPHICS/1000 — and enough computational power to accommodate future applications software. A Model 45 was *now* the obvious solution!

At this point DG made a little whimper and died. The DEC salesman hummed and hawwed and came up with an 11/70 based solution. On a price/performance basis the 45 "blew the socks off" of the 11/70 so *Kent* had his sale.

MORAL: A Model 45 in an appropriate application can't be beat.

By: Tim Finnegan/DSD

The HP/1000, Model 45, made quite a splash at September's *MiniMicro Show*—it was one of the star performers. The show was sponsored by the Fullerton and Airport sales offices and was held at the beautiful Anaheim Convention Center, just across the street from Disneyland.

During the show, a prospect, the president of an optics consulting firm approached the DSD'ers at the spacious booth with a computation-intensive benchmark which has run on his large mainframe in 60 seconds. He had heard the Model 45's floating point capabilities highly praised; and he wanted to see for himself just how well it compared. The benchmark contained a loop in which it went through a loop 10,000 times and made double precision floating point and transcendental function calculations.

The FORTRAN program was quickly typed in, made compatible with HP FORTRAN, and starting/ending timers were added. The prospect and the salesman anxiously watched as execution of the program began. A minute passed. Twenty-six more seconds transpired and the program produced the results of 100 thousand calculations. Needless to say, the prospect was very impressed that the F-Series could achieve the same performance level as a large mainframe, costing several times more. *Mike Anderson,* the salesman for the account is now in the process of finalizing the sale.

By: Ron Schloss/DSD

Bob Sanzo out of the Lexington sales office has sold 3 Model 45's and two 2117F's in the past month or so. One of these Model 45's went, in Cambridge, Mass., to the Astro-Physical Observatory which is owned and operated by the U.S. Smithsonian Institute.

The observatory is a large operation with a large amount of equipment already installed, including DG, IBM and a VAX. The application the Model 45 went into was for number crunching, matrix manipulation and fast Fourier transforms. The observatory did some fast Fourier transform benchmarks and came to the conclusion that the Model 45 could do the job while keeping their costs low. They actually claimed that the Model 45 performed better than the VAX.

The observatory is looking towards developing a large network and have already ordered DS. A strong reference account (another observatory in Westford, Mass.) and the high performance of the Model 45 have provided what was needed to enter what could prove to be a very valuable account.

Bob also sold a Model 45 to the Navy for their tactical display systems investigation. The Navy wants to determine what their future directions in graphics should be. The Model 45 will be used for interfacing some very high speed display and in simulation. After doing some benchmarks in the Lexington office, the Navy was sufficiently impressed with the speed of the F-Series that they wrote their RFP around HP equipment. The Navy was also going to write their own micro-code for matrix operations but VIS met that need.This application is another example of the Model 45 offering a relatively inexpensive solution for a high performance application need.

SE Training Plan to Include Computation Course
By: Virginia Hyde/DSD

Data Systems Division will be teaching a Computation Course beginning in February of next year, 1980. This five day course will focus on various techniques of optimizing large computation-related problems. Topics to be covered include the use of the HP 1000 Profiler, different methods of debugging programs, and considerations when segmenting programs.

The course will also include a one day review of some basic methods of Numerical Analysis. Students will be presented with the theory behind topics such as Matrix Manipulations and Differential Equations. They will then use a supplied application program to solve various problems.

Another day will be devoted to discussing the computation tools available on the HP 1000. Various methods of using the Vector Instruction Set (VIS), Scientific Instruction Set (SIS), and Extended Memory Array (EMA), will be discussed at great length.

After discussing optimal techniques of running computational programs on HP 1000's, the course will then discuss how our customers are using HP 1000's to solve their computational needs. The course will cover both the application, for example vibration analysis, as well as the technique used, user mapping of EMA, to solve their particular application.

Although several customer applications have already been selected for the course, I would be very interested in considering any applications that you find particularly interesting. Please contact me at DSD concerning your ideas.

Model 10 Contest Winners — How They Did It!!

By: Joe Schoendorf/DSD

In the last issue of the *Computer Systems Newsletter* we announced the ten top HP 1000 Model 45 salesmen during the contest period. This group of salesmen accounted for nearly 100 Model 45 Systems for the nine month contest! We thought you might be interested in how this feat was accomplished so we are including a series of comments from the winners on how they did it.

Sol Asbagh—Neely Santa Clara

Sol sold a record winning nineteen Model 45's during the nine month period! Three quarters of these went to a previously dormant OEM (*Sol* and the Model 45 brought them back to life) with the remaining quarter each going to different accounts. After refusing to divulge the source of his divine inspiration, *Sol* did shed some light on some of his sales tactics:

- When opening communications with a new prospect *Sol* focuses solely on the Model 45 to avoid product confusion at the early stages. Rather than a "broad product line" approach he hits the Model 45's performance, ease of use and available enhancements and sells the power to grow with the application.

- Rather than letting cost be an emphasis, *Sol* makes sure he sells the benefits of the Model 45 making competitors meet these capabilities. Performance again.

- It is interesting to note that *Sol* sells systems rather than components even to the multiple system OEM. When asked why, *Sol* said he used to sell only boards and boxes until he and *Kent Wilcox* of Neely/Santa Clara went through an analysis to prove to themselves the value of the system as opposed to components. *Sol* now uses this analysis in customer presentations. In general he has found his customers would rather pay the slight uplift in price instead of hassling with components.

- Every sale *Sol* made was associated with an "eye catching" demo of the Model 45's capabilities. Graphics was used as an initial attention grabber (even though the customer might not initially have a requirement for Graphics) with *Tom Engleman* of Neely's SEO providing the in-depth technical and demo support.

- In the case of *Sol's* OEM, 3D plotting was an essential feature of their product and peripherals such as the HP 9872, HP 2631G, HP 2608 and HP 2648 together with GRAPHICS/1000 are used as sales points in the OEM's advertising. (They plan on more than doubling their committment with HP for the next year.)

Sol says it simple "For a few bucks more you can get a whole lot more" with a Model 45. (A new Lord Tennyson is born everyday!)

Jay Friedman—ESR/King of Prussia

Jay sold his ten Model 45's during the contest period mostly into one large CAD project associated with the communications industry. He feels the main reason for these sales were:

1. Careful qualification of prospect — they must need real time, graphics, computation, or FORTRAN

2. Selling the Model 45 based on performance not price

3. Selling single vendor of peripherals and total system

In addition to the above *Jay* uses the tools at his disposal — management visits, New Product Tour customer invitations, demos, and SE help.

Jay's competition has been tough — DEC & IBM, but the above techniques have been up to the task.

Jack Clauson—ESR/Lexington

The third place finisher in the Model 10 Challenge was *Jack Clauson* of the Lexington Office with an impressive sales record of 9 Model 45's. *Jack's* success story (besides his good looks and superb sales ability), starts with HP's reliability and support record.

Jack has sold four 2171A's to a large military prime contractor in early 1978 for a DOD program involving missile testing (the company had previously used their own design computer for the job). In the months that followed, the excellent reliability record and HP support provided in the field convinced the customer that his decision to switch to HP had been a wise choice. Next, entered the features of the HP Model 45 system. On-line missile testing, being very computation intensive (and destructive) requires hi-speed digital I/O capabilities and extremely fast floating point calculations. Another aspect of the simulation required the use of a graphics terminal for manipulation and display.

Hardware floating point, the high speed of the F-Series with high performance memory, and the 2648A as the standard system console made the Model 45 a perfect choice for the add-on systems (5) needed in 1979.

Now let's take a look at *Jack Clauson's* overall sales technique. He attributes his Model 45 sales success to the following philosophy:

- Explore the customers needs and show him that the capabilities of an HP 1000 System will fulfill his needs. (Many times this will be a Model 40.)

- Next, discuss the additional features and high performance available on the Model 45. (F-Series computation, hardware floating point, VIS, Graphics terminal, etc.). Stress the convenient packaging of all these features

- Emphasize the investment security the Model 45 affords (i.e., the customer will not need to upgrade later — the system can grow with his needs). Note: This point, together with the features, make it easy for your *customer* to sell the Model 45 internally (to his supervisors).

- Show the incremental price difference (upgrading to a Model 45) to be small relative to the extra features and security provided. This is especially effective when selling to a large account whose discount is high and *after* funds are allocated is difficult.

In closing, *Jack* (now a DM) was successfully selling Model 45's because they are a "fun product to sell — they get people excited!"

Jack Kollataj — Johannesburg/South Africa

Three of the HP 1000 Model 45's he has sold in 1979 are to the Counsel for Industrial and Scientific Research (CSIR) and the National Institute for Transportation Road Research. These bodies develop programs for road design and distribute them to the four provinces in South Africa.

The bidding process started when they wanted to standardize their specifications for minicomputers. Only ten days were allowed for preparation so *Jack* worked over Christmas and New Year's to prepare the proposal. The specs were written for minimum performance standards for what they thought their budget could afford. *Jack* was able to convince them that much higher performance levels were possible for the same price.

This factor was especially important in competing with Data General. DG let them use a Nova 3 System from stock to develop familiarity. They discovered problems with segmentation when converting their large programs. In order to have the same capabilities as the HP 1000 Model 45, DG would have to offer the Eclipse at much higher price. HP was selected due to its future potential for this application.

Another key factor was DS/1000. The network will eventually consist of 6-7 systems, the longest being 1600 Km away. The provinces in South Africa have varying regulations for vehicle registration. The heavy volume and the red tape involved make for long time delays in registering vehicles to travel across province lines. By entering data at one node in combination with an IMAGE/1000 data base, the information could be distributed to the other nodes.

Jack says he was successful in winning over competition because of the good reputation of HP, the customer was happy with their desktops, HP was price competitive in offering a demo development system and OEM pricing, and the super performance available within the budget constraints.

Jerry Bereda — MSR/Dayton

When we asked *Jerry* how he was able to sell six Model 45's, he immediately responded, "I was lucky, and I wanted to win this contest!" Well, after talking to *Jerry*, we're not sure you can attribute his success to luck, but certainly motivation played an important part. *Jerry* spent a lot of time reading literature and becoming technically familiar with the features of the F-Series.

Jerry sold several systems to OEM's with computation intensive applications where matrix manipulations were critical. One particular customer was doing IMAGE enhancements that *Jerry* described as basically "transposing elements in an array." Therefore, EMA capabilities and the speed of the floating point processor were appropriate selling features.

Other features that were important in the sale of the Model 45's were GRAPHICS/1000, support of the new 7925 disc, and the capability of easily connecting instruments such as DVM's to the machine. Also, *Jerry* felt that packaged systems provided a comprehensive and easy way for a customer to get all the equipment that he needs.

So, in summary, *Jerry* believes that successful selling requires motivation, honesty and good product knowledge.

John Hughes — MSR/St. Louis

John sold 4 Model 45's to McDonnell-Douglas, one to Monsanto, and one to a small firm which makes maps from aerial photos.

McDonnell-Douglas is a well established major HP account, having numerous HP-ATS's, HP 1000's, and HP 3000's installed. Because the customers wanted to install their own high-speed data gathering front-end, and to do computation intensive, real-time performance evaluation of a missile tracking system, the Model 45 was a near perfect solution and at a bargain price. The sale was a relatively easy one because McDonnell-Douglas has many internal references. The customer has confidence in HP's high quality and bought, to a large extent, on our name and his colleague's good experience with us. Several more systems are to follow into this same application.

The sale to Monsanto was especially important because it was our first HP 1000 sale there. The application is a combination of laboratory data collection and instrument automation in a chemical research laboratory, and simulation. The simulation involves mathematical modeling of bearing surfaces and statistical analysis. The system is very large, having four 2240A's, 100 Mb of disc memory, some 6 terminals, graphics, IMAGE and RJE. The sale required a great deal of care and attention over a year's period by *John* and his SE, *Dan Gerberding*. The payoff will be big, however, because Monsanto has at least as large a potential for HP 1000's as McDonnell-Douglas.

The purpose of a system by the map making firm was its largest single purchase ever. The application involves digitizing aerial photos, computing translations and corrections, graphics output, and the delivery of data on mag tape. Competition was not a major factor in the sale. The customer was more concerned about how the Model 45 could be used to do his job and how foreign peripherals could be interfaced. A great deal of sales and SE attention and reassurance was required over a 6 month period.

As a general rule, *John* begins discussions with a customer with the Model 45. He is convinced that it delivers a far greater price/performance ratio than anything in its class.

As a result of his successes, *John* has been promoted to major accounts DM and *Dan Gerberding* to Technical Sales Representative.

Helmut Reinhardt — Frankfurt, Germany

Helmut was able to successfully sell six Model 45's to six different customers mainly due to his price/performance ratio of the 45. His customers were highly impressed by this and felt our competition had no equivalent offers. Two customers initially intended to purchase a Model 40 and he was able to convince them of the advantages of the Model 45. In some other cases *Helmut* motivated the customers to install Model 45's instead of purchasing components or building their own systems.
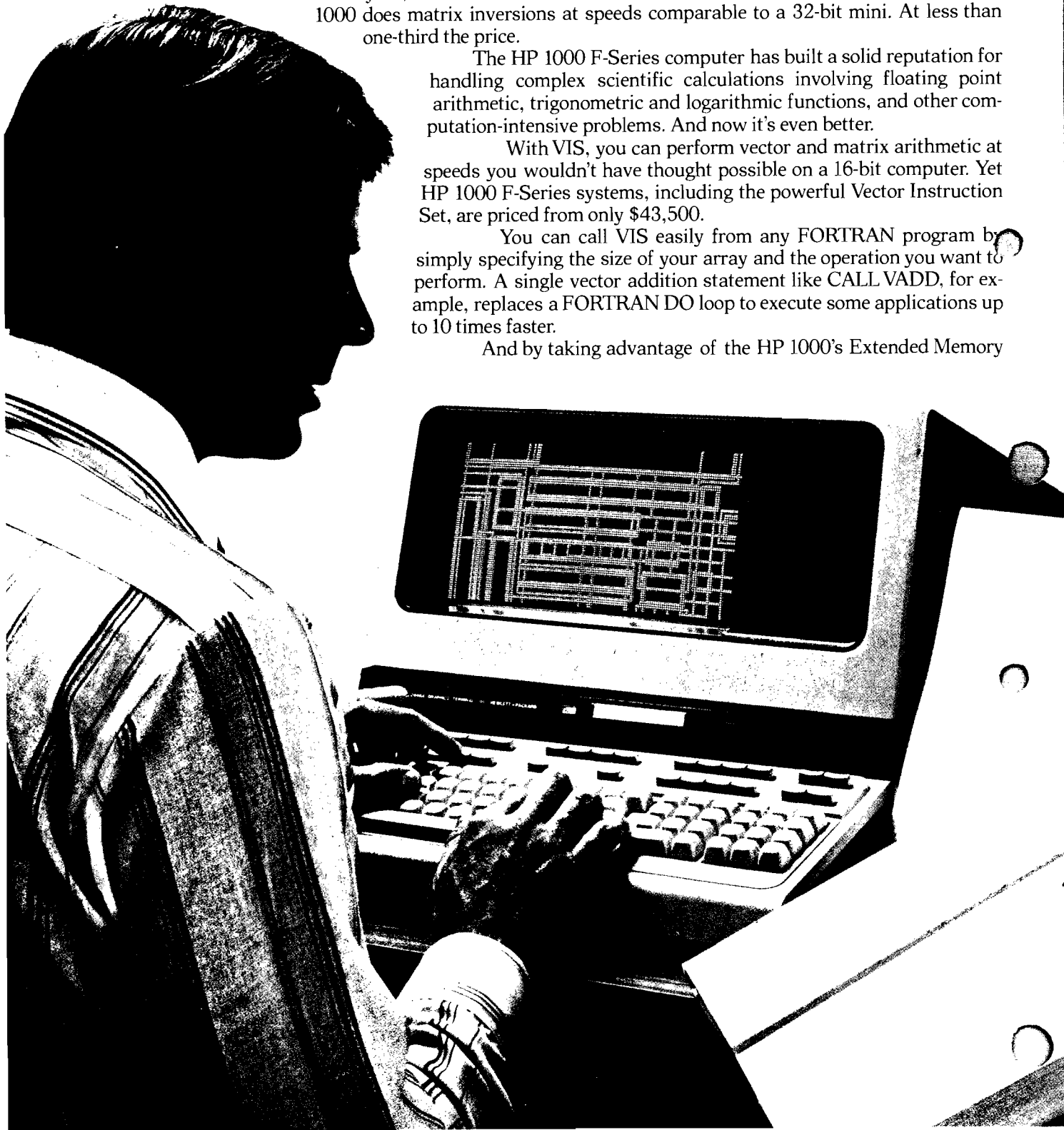
HP introduces the

If you've been thinking that only a 32-bit computer can handle your matrix intensive jobs, think about this: with HP's new Vector Instruction Set (VIS), the HP 1000 does matrix inversions at speeds comparable to a 32-bit mini. At less than one-third the price.

The HP 1000 F-Series computer has built a solid reputation for handling complex scientific calculations involving floating point arithmetic, trigonometric and logarithmic functions, and other computation-intensive problems. And now it's even better.

With VIS, you can perform vector and matrix arithmetic at speeds you wouldn't have thought possible on a 16-bit computer. Yet HP 1000 F-Series systems, including the powerful Vector Instruction Set, are priced from only $43,500.

You can call VIS easily from any FORTRAN program by simply specifying the size of your array and the operation you want to perform. A single vector addition statement like CALL VADD, for example, replaces a FORTRAN DO loop to execute some applications up to 10 times faster.

And by taking advantage of the HP 1000's Extended Memory

Matrix Machine.

Area, VIS can address extremely large data sets (up to 1.8 megabytes) in main memory. All array and memory management tasks are handled automatically so you can do large array applications like image processing, three-dimensional graphics, process optimization and simulations. Without writing any new software.

Speed plus accuracy equals performance.

Even if you're just crunching numbers and not matrices, the F-Series has what it takes to handle the most sophisticated computations.

A hardware-implemented Floating Point Processor gives you three levels of floating point precision for up to 17 significant digits of accuracy. The F-Series' standard firmware also includes a subsystem designed to improve performance on frequently used FORTRAN routines. Like parameter passing, for example. Or normalization functions. Even array address calculations. And separate polynominal and scientific instruction sets make it easy to do highly accurate calculations involving a wide range of trigonometric, logarithmic and other complex functions — all at hardware speed.

Crunch a matrix today.

To find out how the HP 1000 makes matrix arithmetic a snap on a 16-bit computer, call your nearest HP office listed in the White Pages and ask for a hands-on demonstration. It might save you from investing more than you need to for your sophisticated computation jobs. Or write for more information to Hewlett-Packard, Attn: Roger Ueltzen, Dept. 000, 11000 Wolfe Road, Cupertino, CA 95014.

	Matrix Inversion Times*	
Size	HP 1000 VIS-enhanced F-Series	32-bit Minicomputer
50x50	1.8 sec	1.5 sec
100x100	12.3 sec	11.7 sec
200x200	105 sec	92 sec
400x400	690 sec	720 sec

*Benchmark method — Matrix inversion using Gauss-Jordan Elimination.

Price is U.S. list.

HEWLETT PACKARD

22905HPDS26

Computation Promotion Advertising

By: Tom Freed/DSD

DSD is starting off the new fiscal year with a good, aggressive ad program stressing the HP 1000's computation power.

In addition to bringing back the award winning HP 1000 Model 45 "Number Cruncher" ad, we have a brand new ad that will focus on the Matrix Arithmetic Capability through the use of VIS.

This new ad will hit straight at the challenge of using the HP 1000 instead of the more expensive 32-bit machines to do complex arithmetic. The new ad, "The Matrix Machine" will have exposure in such media as:

Mini-Micro Magazine
Computer Design Magazine
Electronics Magazine
Instrument and Control
    Systems Magazine

Datamation Magazine
Control Engineering Mag.
Electronic News
Computer Systems News
Industrial R&D Magazine

Computation Promotion Seminar

Look for additional sales aids to help you sell the HP 1000 into computation applications. We are starting now to formulate a new CAD/Computation Seminar. First, we will conduct some fact-finding customer visits, compute the inputs and then by 2QFY80 have a seminar package developed for you.

Benchmarks

By: Jim Long/DSD

Much of the following article was printed in the *CS Newsletter* in August of 1978. Since then, we have enhanced the computational power of the F-Series so some of our benchmark times have been improved and those new benchmark times are included in this printing.

Also included is a table comparing matrix inversion times between the F-Series, a VAX 11/780 and a PDP 11/60. Those times are in Table 3. The first thing to notice is that the 11/60 has no times listed for matrices of sizes 200 x 200 and 400 x 400; that's because the 11/60 (and the entire PDP 16-bit line) can not handle matrices that large. The F-Series, because of EMA, can handle problems which need matrices as large as 600 x 600.

VAX 11/780 & 32 BITS

VIS and EMA give the F-Series computational power which is matched only by the new 32-bit machines. For matrix intensive applications, we are far and away the best 16-bit minicomputer on the market. How do we stack up against the VAX in areas besides matrix calculations? Table 2 lists VAX benchmark times for more traditional computation benchmarks. These show that the VAX is somewhere between 2 and 4 times faster than the F-Series in raw

computational power. Thus, the VAX's strength lies in overall throughput. We have competed successfully many times against the VAX and here are some of the reasons why:

1. For matrix intensive applications we win on pure price/performance.

2. Many customers who consider buying a VAX find that a distributed network of F-Series makes more sense. In other words, they probably would have ended up overloading the VAX anyway. If they want to take care of many applications, distributed processing is the direction to push them toward.

3. A lot of computational customers really like our graphics software and specifically our graphics peripherals. DEC cannot begin to compete with us in this area; two vendor solutions equal a lot of money in terms of software, and support.

What is a Benchmark?

A benchmark, as it applies to the world of computers, is any program(s) run to determine the capabilities of a computer or its related software. Benchmarks are often used in sales situations. For instance, a company has a need for a computer and must decide which vendor to use. A benchmark can be used by the customer to evaluate the different computers. But, the benchmark must be relevant to the customer's needs or else the results will be misleading. So where does the customer get the benchmark?

1. Write his own benchmark; this is the preferred method because it helps assure that the benchmark is related to the customer's needs. But, it can be costly even if the customer has the resources available to do it.

2. Industry known benchmarks; these relate to programs already written by either another company or "research institution". A benchmark of this type can be useful because information concerning its results may already be available. But, again, it must relate as closely as possible to the customer's needs. This could be a very cost-effective solution.

3. A vendor supplied benchmark; we continue to be amazed at the number of times a benchmark of this type is used. Aside from the obvious bias that may be involved, (the program could be tuned to a particular computer) the benchmark may only apply to the customer's needs from that particular vendor's point of view.

Analysis of benchmark results is another problem and it is usually more subjective than objective. An "apples-to-apples" comparison can rarely be made. Thus, a purchase decision should not be based solely on benchmark results. Indeed, it should be only one of many considerations.

There are many different types of benchmarks, but most fit into two broad categories, those that test operating systems, and those that test CPU performance. Benchmarks which test the operating system usually consist of a number of programs which schedule each other and do a lot of input/output. An example of this type is the General Electric

Benchmark which was run by a number of computer vendors back in 1976. The results were published by G.E. under report #76SPC003-A entitled "RESULTS FROM REALTIME SYSTEM BENCHMARK PROGRAM. MINICOMPUTER PRODUCT COMPARISONS FOR FORTRAN MULTI-TASKING PROGRAMS". CPU testing benchmarks are usually single compute-bound programs. Some may test a number of CPU operations (i.e., floating point, integer, transcendentals . . .) others may only test a specific operation. The WHETSTONE benchmark, which will be discussed later, is an example of this type of benchmark.

What Is DSD's Interest in Benchmarks?

DSD has been running a series of eight benchmarks on various HP 1000 and competitor's systems. The project was begun because there was a need to know how well the F-Series computers performed when compared to other HP 1000 computers. The competitive analysis was added later, and is updated as new information becomes available.

All eight benchmarks are compute-bound FORTRAN programs which require only a small amount of memory. Most were designed to measure CPU performance although some check compiler efficiency. The benchmarks B1 through B11 were written by the National Physical Laboratory in England. They were modified slightly by Lawrence Livermore Labs so they would run on 16-bit machines. NPL designed the benchmarks so they would execute in roughly one minute on an IBM 360/65. The last two benchmarks (FLOATSP, FLOATDP) were written at Data Systems. A brief description of each benchmark follows (the first eight listed are considered the most significant):

1. (B1) (WHETSP) is the Whetstone Single Precision benchmark. It's perhaps the closest thing resembling an industry standard benchmark available. The program is written in FORTRAN from the Whelstone algorithm designed by *B.A. Wichman & H. J. Curnow* at NPL in England. The algorithm was derived from the analysis of 1000 ALGOL 60 programs as an attempt to represent an average program instruction mix. Thus the algorithm includes many different operations, among them being: floating point and integer calculations, transcendentals, array manipulation and conditional jumps. The universality of this algorithm has also been substantiated by subsequent analysis of FORTRAN programs. It was designed to be non-optimizable so that it would test the CPU and not the compiler.

2. (B2) WHETDP) This is the Whetstone Double Precision benchmark which is just a double precision version of B1, above.

3. (B3) (OPT 1) This benchmark tests compiler efficiency as well as single precision floating point by using single dimension array accesses.

4. (B5) (TRANSP) This benchmark tests the transcendental capabilities of the computer it is run on. The program loops around the FORTRAN library routines SQRT, SIN, COS, EXP, and ATAN. It does not call TAN, TANH, LOG, or LOGE which all run very fast using the F-series Scientific Instruction Set.

5. (B6) (TRANSDP) This is the double precision version of B5 although the main loop has been cut from 26,400 iterations in B5 to 1000 iterations for B6. (This was done so it would run in one minute on the IBM 360/65.)

6. (B10) (OPT 2) This benchmark consists of 24 IF statements of the form: IF(1) 101,999,999. It is used to compare FORTRAN compilers. In theory an optimizing compiler could reduce the whole program to nothing, because no useful work is done. In fact, Lawrence Livermore Labs ran the benchmark on an SEL 32-bit machine and it did optimize the benchmark down to nothing.

7. (B12) (FLOATSP) This short program was written at Data Systems and does nothing but single precision floating point calculations. It uses an equal number of add, subtract, multiply and divide operations, about 800,000 each.

8. (B13) (FLOATDP) This is just the double precision version of FLOATSP. It does the exact same number of exact same number of calculations.

What have these Benchmarks shown us?

Table 1 shoes how different HP 1000 configurtions compare to each other with respect to the eight benchmarks. Except for B8 and B10, all benchmarks are strictly number crunchers and thus show a significant difference between configurations. The biggest difference involves the addition of the FAST FORTRAN PROCESSOR (FFP) to an E-Series CPU. The double precision benchmarks B2, B6 and FLOATDP show increases of up to 22 to 1. Even B2, which has a lot of non-double precision code, shows a 14 to 1 improvement. These improvements are due mainly to the extended precision floating point microcode found in FFPO But, programs with no double precision can also show significant improvement with FFP. The other firmware routines in FFP accounted for over a 50% improvement in B1, a program which has no double precision calculations.

High performance memory can also result in significant improvement in a program's execution speed. B10 got a 45% performance increase when run with high performance memory because IF statements contain many memory references. Most programs will get between a 15-20% increase. The less time a program spends crunching numbers, the better the performance increase due to the addition of high performance memory. Our average computational FORTRAN program (The Whetstone Single Precision) achieved almost a 100% performance increase by adding FFP and high performance memory to an E-Series CPU.

Thus, for E-Series users who are also concerned about maximum performance, FFP and high speed memory are very cost-effective additions. They can easily account for a 25-75% improvement in program execution speed, and up to a 15:1 improvement when using extended precision.

But what about the F-Series? Hopefully, the numbers speak for themselves. For most computation intensive applications, the F-Series will show a 2-3 times performance increase over the fastest E-Series configurations. For the single precision floating point benchmark, for the F-Series is 2.8 times faster

than the fastest E-Series, and for the double precision floating point benchmark, it is over three times faster. The -Series Scientific Instruction Set makes itself known with a whopping 7.5 to 1 improvement over the E-Series for single precision transcendentals. So how did the Whetstone single precision benchmark do? It ran over 2.5 times faster on the F-Series than it did on the E-Series. Thus, for computation intensive programs, the F-Series easily outperforms any other computer Hewlett-Packard has offered to date.

Table 1 also shows the performance difference for the F-Series with and without fault control memory. (The F-Series comes standard with high performance memory.) Again, B10, because of the many memory accesses, showed the biggest difference. (14.7% faster with standard high performance memory as opposed to fault control.) The Whetstone benchmarks shows about an 8% difference. And the average program can expect between an 8-11% performance difference between the two types of memory.

Thus, the F-Series offers two memory paths:

1. High performance memory for applications where maximum speed is required.

2. High performance fault control memory for fault control critical applications. Note that high performance fault control memory is quite a bit faster than standard performance fault control memory!

Table 2 lists benchmark execution times for the F-Series, Digital PDP 11/70, Data General Eclipse S/230, Prime 300, Modcomp 2, and the HP 3000. Both the 11/70 and Eclipse S/230 represent the highest performance 16-bit machines offered by DEC & DG respectively. Both machines are very fast and generally can outperform the F-Series. Their speed advantage is most pronounced in floating point calculations. For the single precision floating point benchmark (FLOATSP), the 11/70 is 58% faster and the S/230 is 42% faster than the F-Series. But remember, these programs do nothing but floating point calculations. Let's see what happens to the "performance gap" as the programs get more complex. B3 combines single precision floating point calculations with single precision dimensional arrays. This complicated addition cuts the S/230's gap from 36% faster for FLOATSP to 22% faster than the F-Series. The 11/70 was

less affected, dropping from 59% faster to 54% faster. But, by using an even more complicated program, for example, our "average" program the Whetstone Single Precision Benchmark, the performance gap diminishes remarkably. For WHETSP, the 11/70 is only 16% faster and the Eclipse S/230 no faster than the F-Series. Thus, the F-Series is very competitive when compared to other "high performance" 16-bit minicomputers. And if a program uses single precision transcendentals, the F-Series really shines. For TRANSSP (B5), the 11/70 is 67% slower and the Eclipse S/230 is over 100% slower than the F-Series.

Again, these benchmarks only compare CPU performance. For a true competitive analysis of the 11/70 and S/230 many other factors, such as operating system power and friendliness, peripherals, customer service, etc., would have to be considered.

The Prime 300, Modcomp 2 and HP 3000 Series III are included in Table 2 for reference purposes. The Prime 300 is Prime's least expensive computer system. The Prime 400 and 500 are more powerful, but also much more expensive. From the benchmark results, it appears that the F-Series is a much better computational machine than the Prime 300.

The Modcomp 2 is the intermediate member of the Modcomp computer family and was designed for real-time system operation. It has floating point hardware.

The HP 3000 Series III was included here to clarify the fact that, for technical applications, the HP 1000 is Hewlett-Packard's best solution.

The competitive machines were all owned by HP customers who had some interest in the outcome of these tests. None of the machines or benchmarks were "tweeked" in any way to improve run times. An experienced operator may be able to affect run times, but this would make an improper test. Slight variations also occurred in run times on the same machine for no apparent reason, but in all cases, the "best" times have been used. Thus, these times and comparisons should not be taken as "gospel truth", but never-the-less, they do represent actual execution times as run on the various computers.
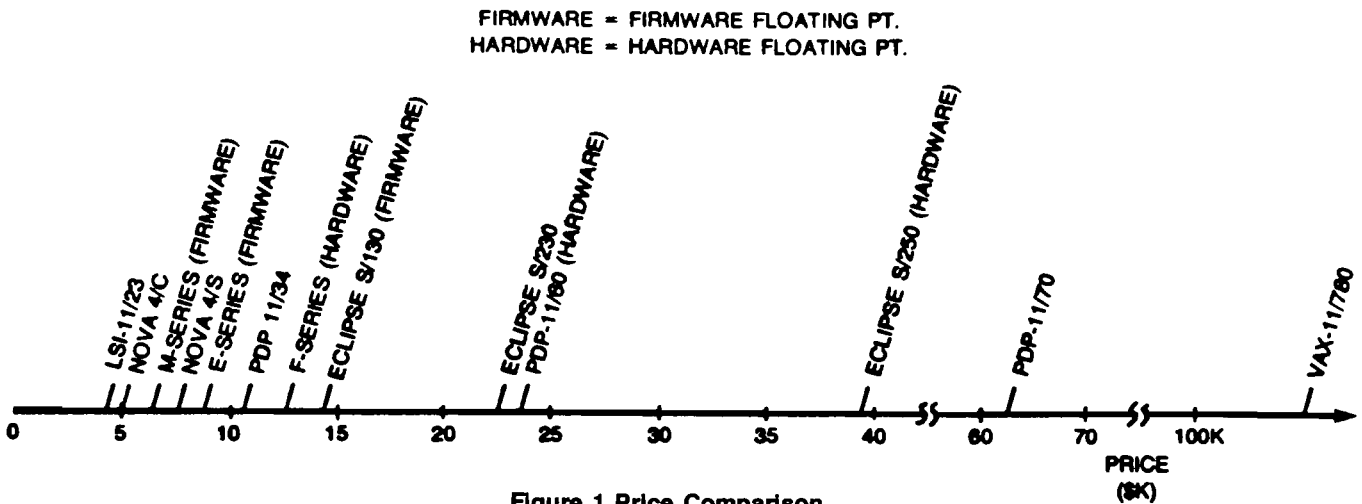
FIRMWARE = FIRMWARE FLOATING PT.
HARDWARE = HARDWARE FLOATING PT.

Figure 1 Price Comparison

Table 1 HP 1000 Benchmark Results*

	M-SERIES REG MEM FFP	E-SERIES REG MEM	E-SERIES REG MEM FFP	E-SERIES H.S. MEM FFP	F-SERIES H.S. MEM	F-SERIES ERROR CORRECTING H.S. MEM
WHETSP (B1)	2.033	2.02	1.2	1.02	.400	.43
WHETDP (B2)	3.23	29.88	2.06	1.8	.58	N/A
OPT 1 (B3)	3.1	1.966	1.96	1.58	.88	N/A
TRANSSP (B5)	5.85	3.56	3.36	3.0	.40	.42
TRANSDP (B6)	.466	4.20	.283	.25	.05	N/A
B10	3.05	1.88	1.88	1.28	1.28	1.5
FLOATSP (B12)		1.76	1.75	1.63	.92	.65
FLOATDP (B13)			3.2	2.91	.82	N/A

*All times in minutes.

Table 2 Competitive Results*

	F-Series H.S. Mem	Digital VAX-11/780	Digital 11/70 Cache FP11-C FORTRAN 4+	Digital 11/60 Cache FP11-E FORTRAN 4+	Digital 11/34 FP11-A FORTRAN 4	Data General Eclipse S/230 FORTRAN 5	HP 3000 Series II	Prime 300	Modcomp 2
WHETSP (B1)	.40	.15	.33	.40	2.25	.40	.84	1.52	.75
WHETDP (B2)	.58	.23	.416	.54	2.95	.47	2.03	2.28	.96
OPT 1 (B3)	.88	.16	.418	.54	4.41	.72	1.26	2.0	1.6
TRANSSP (B5)	.40	.30	.678	.93	2.97	.81	2.45	3.10	1.20
TRANSDP (B6)	.05	.02	.037	.05	.18	.04	.299	.27	.08
OPT 2 (B10)	1.28	.56	.95	1.39	10.23	.77	1.55	2.27	2.7
FLOATSP (B12)	.58	.11	.24	.23	2.31	.37	1.08	1.32	.84
FLOATDP (B13)	.82	.21	.33	.36	3.46	.47	2.83	2.22	1.1

*All times in minutes.

Table 3 Matrix Inversion Times

SIZE	F-SERIES	F-SERIES & VIS	PDP-11/60	VAX-11/780
50 x 50	10 SEC	1.8 SEC	5 SEC	1.5 SEC
100 x 100	78 SEC	12.3 SEC	38 SEC	11.7 SEC
200 x 200	1502 SEC	105 SEC	*	92 SEC
400 x 400		690 SEC	*	720 SEC

*Exceeds Memory Capacity

Computational Demos for the HP 1000

By: Virginia Hyde/DSD

Now that we have a very powerful 16-bit minicomputer for computation-related applications, we need to advertise this power. What better way to show the true power of the HP 1000 than by some computation intensive demos. Several of these demos exist today and many more are planned for release in the future.

Existing demos range from computer aided design programs to demos that draw an HP 45 Calculator in three dimensions. The Penny program, written at DSD, is a line drawing program which is used in the design of digital schematics. It was introduced here at DSD during the 1978 Regional Sales Seminars. It has since been distributed to several field offices and has been used successfully as customer demos.

Two other programs were introduced in the Spring 1979 New Product Tour. The VIS demo VIVIDLY displays how the Vector Instruction Set, "MATRIX MACHINE", can be used to manipulate large arrays of data. The second program introduced on the NPT shows how VIS can be used to rotate an object in three dimensions. This program uses the HP 1350A Graphics Translator (Colorado Springs Division) and HP high resolution display to rotate two cubes in three dimensions. These programs were very successful during the NPT Tour and are now being used as presales material at many sales offices. Some training centers are even using them to augment their course material.

The 1979 Spring Management Seminar introduced two more computation intensive demos. The Calculator program draws four different views of a three dimensional HP 45 Calculator on one screen. The Wave program, on the other hand, designs a waveform in three dimensions. These programs proved very effective in demonstrating the power of the HP 1000.

The Applications Development Group here at DSD is developing some computer aided design programs which will be made available to customers. These include some digital and analog circuit analysis programs in addition to an overhead slide generation package.

Now that we have the most powerful 16-bit minicomputer and the method by which to advertise it to customers, let's sell HP as the ONLY solution to our customers' computational needs...Sell HP as the HIGHEST PERFORMANCE in the computation marketplace.

HP 1000 Power? The Proof is in the Computing

By: Gary Ericson/DSD

When the demos are over and the smoke begins to settle, one of the first questions asked concerning the performance of an HP 1000 computer system is, "Okay, now how well does it do in the "real world"? That's a fair question. And the first place to look for the answer is the HP 1000 Contributed

Library. Here is a collection of application programs contributed by real-life users who have solved real-world problems with the HP 1000 computer. Judging from the quality and variety of contributed programs continually being added to the library, it's apparent that users all over are finding the HP 1000 to be a very useful problem-solving tool.

One of the very popular areas in the Contributed Library is the area of computation-oriented programs. These programs range from general-use applications such as microcoded trigonometric functions, to highly specialized calculations such as one contribution (IMBUI) designed to support the study of fast neutron time-of-flight spectroscopy.

A subset of this computation area is graphics. This can be the most demanding test of a computer's speed and agility because not only are graphics applications programs so heavily computation-bound, but any sluggishness on the computer's part is immediately and clearly visible. And it's been shown time and again that here the HP 1000, and especially the high speed F-Series, really shines.

Two new programs in the Contributed Library deal with graphics!

1. JGL (part no. 22683-13352)

Jim's Graphics Library is a set of FORTRAN routines that interface graphics applications programs to the HP 2648 graphics terminal. It was designed for the purpose of creating demos of the HP 1000, and has been used very successfully in that endeavor. Nothing seems to make an impression better than watching a computer smoothly and quickly step through a complex series of graphics gymnastics.

2. PENNY (part no. 22683-13353)

A brand-new library addition is the program PENNY. This is an exciting program that should gain a lot of popularity very quickly. Basically, PENNY allows the user to create graphics drawings from conversing interactively at the terminal. When he has the drawing as he wants it, the user can store it away in a database maintained by PENNY. Drawings in the database can be retrieved, modified, combined with other drawings, and then stored away again. Final results can be output to a plotter to create a high quality hardcopy. PENNY can be used for digital schematics design, floor layouts, piping diagrams, and a host of other graphics applications.

These programs working in graphics imply a confidence in the HP 1000's capability in handling complex computations quickly and easily. In fact, the entire Contributed Library testifies to the confidence users have all over the world in using the HP 1000 computer system to provide high-speed solutions to their "real-world" problems.

CAD Programs (SAP IV)

By: Jim Long/DSD

Data Systems Division would like to announce an exciting structural analysis package now available on the HP 1000. The program is known as SAP IV and is a finite element analysis program. SAP IV was originally written at the

University of California for 3-D structural analysis. In the past, SAP IV was available on many large time-share networks (e.g., Sybernet) and was recently announced for the VAX 11/780. Any salesrep who has a customer interested in SAP IV, please contact *Dave Evans* (OEM Development Group, Sales Development) at Data Systems Division.

DSD is making a committment to get into the CAD (Computer Aided Design) marketplace. As many of you already know, CAD users require many canned or public domain design programs to solve their problem. DSD is presently beginning an effort to get many of these CAD program's running on the HP 1000. PENNY is a step toward this and there are many other programs now running on the HP 1000 which are being readied for general distribution.

As these CAD programs become available we will announce them in the *CS Newsletter*.

Price Increases for HP 1000's
By: David Carver/DSD

Effective December 1st, the price of the HP 1000 F-Series computers, M and E-Series Boardcomputers, and several HP 1000 Systems will be increased by 3% to 8%. The F-Series (2117F only) and Boardcomputer price increases are due to increasing material costs, and the system increases are to reflect price increases on the 7906 and 7920 discs and the 2648A console.

In addition, the old HP 1000 Model 40 and 45 systems are being removed from the price list effective December 1st.

The increases are detailed below:

Product Number	Description	Old Price	New Price	% Δ
2175A/B	HP 1000/25 System	$27,500	$28,500	4
2176C/D	HP 1000/40 System	37,000	38,000	3
2176C Option 033	50 Mb Disk	4,240	4,840	14
2176C Option 034	120 Mb Disk	8,490	8,340	-2
2176D Option 033	50 Mb Disk	3,240	3,840	19
2176D Option 034	120 Mb Disk	7,490	7,340	-2
2177C/D	HP 1000/45 System	43,500	46,000	6
2177C/D Option 018	Delete 2648A & Accessories	-7,940	-8,390	-6
2177C Option 033	50 Mb Disk	4,240	4,840	14
2177C Option 034	120 Mb Disk	8,490	8,340	-2
2177D Option 033	50 Mb Disk	3,240	3,840	19
2177D Option 034	120 Mb Disk	7,490	7,340	-2
2117F	F-Series Computer	15,000	16,000	7
2108K	M-Series Boardcomputer	1,475	1,800	22
2109K	E-Series Boardcomputer	1,850	2,200	19

Sales Aids

HP 1000 International Users Group Gets Underway
By: Phil Ebersole/DSD

November marks the introduction of the newly formed HP 1000 International Users Group. Over the past two months, the group's Board of Directors and various committees have finalized the Users Group charter, activities, membership types, and financial structure. The result has been the creation of a Users Group brochure, newsletter and press release, all of which are being distributed right now.

Brochure Describes Two Types of Membership

The HP 1000 Users Group brochure describes all of the features and benefits of membership in the Users Group. There will be two types of membership: General and Individual.

General membership in the Users Group includes:
1. Newsletter subscription
2. The new Contributed Library — PLUS/1000
3. Periodic library updates
4. Voting privileges
5. Conference proceedings

General membership dues are $250/year (compare this to the $500 fee HP used to charge for the old LOCUS library).

The less expensive Individual Memberships ($20/year) include all of the above benefits except the library.

INTERFACE/1000

The Newsletter of
THE HP 1000 INTERNATIONAL USER GROUP

November 1979

Vol. 1 No. 1

HP 1000 Users Establish A User Group

On August 23 and 24, the HP 1000 International Users Group was born. On these dates, a steering committee of 15 HP users met at Hewlett-Packard headquarters in Cupertino, California. The steering committee personnel represented a cross section of industries using HP 1000's within Canada, Europe, and the United States. The committee began developing a set of by-laws and elected an interim executive board and subcommittee chairpersons.

The purpose of the user group is to provide a forum for sharing information among users to enhance their HP 1000 systems, increase their professional development, and to help their development effort for software, firmware, and systems. The group will also provide a formal communication channel between the membership and Hewlett-Packard.

The user's group membership entitles the member to an annual newsletter subscription, an optional user library subscription, voting privileges, and reduced price admittance to the annual conference. This conference will provide both technical and tutorial presentations as well as vendor exhibits.

Hewlett-Packard has indicated that the LOCUS library is being redesigned. When the redesign is complete, which is expected to be late this year, Hewlett-Packard will transfer the library to the users group. The users group will be responsible for maintenance and semi-annual distribution of the complete library to the membership.

The first annual HP 1000 International Users Group conference is planned to be held in mid 1980. The users group by-laws will be discussed and voted upon. Also, an executive board will be elected to succeed the interim board.

—Joe Getkin, Startup Committee Chairman

You are about to be removed from our mailing list!

In fact you were never on it! This first issue of the newsletter is being distributed free of charge to everyone we know of that has an interest in the HP 1000, but future issues will be sent to HP 1000 User Group members only. So if you wish to continue receiving the newsletter you must submit your application to join the User Group today.

You should have received a membership application form along with this newsletter. If you did not receive it, write to the address on the back of this issue to request a form today.

IN THIS ISSUE

Send newsletter items to Dick Martin, Code 8111 Topside, Naval Ocean System Center, San Diego. purpose of dissemination of information to members of the HP 1000 International User Group. members. The HP 1000 International User Group are not responsible for the accuracy of technical are welcome and are not considered to be construed as official policy of Hewlett-Packard Corp.

1

HP 1000 International Users Group
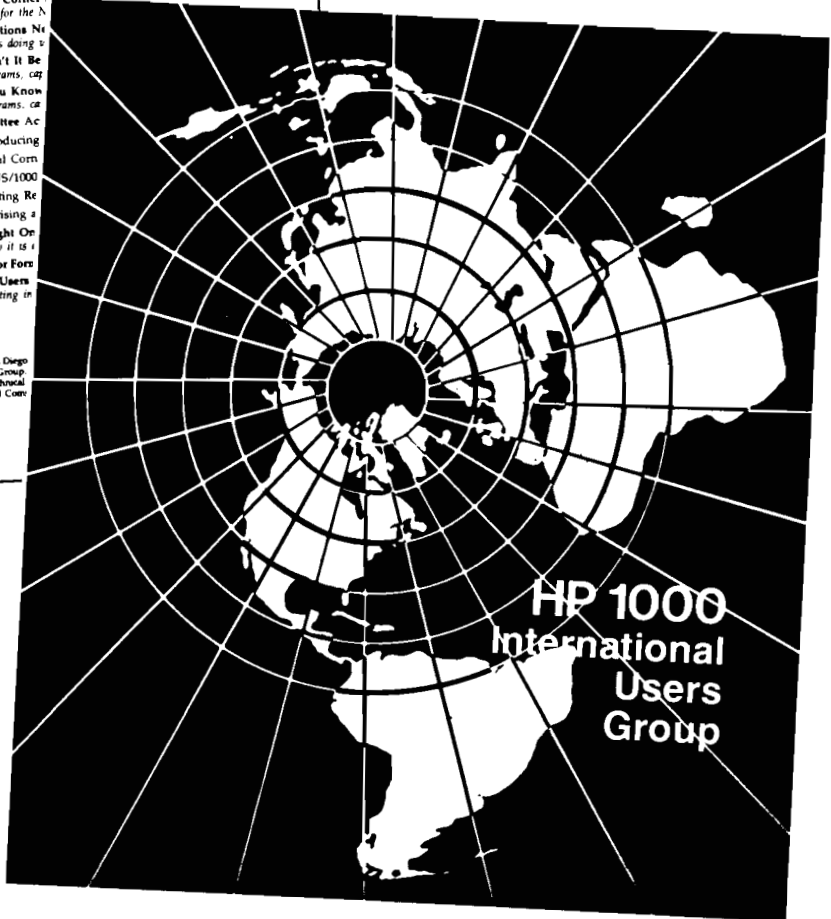
Newsletter Enhances User Communication

The first issue of the Users Group newsletter, known as INTERFACE/1000, is chock full of information of interest to HP 1000 users, including:
1. Minutes of Executive Board Meetings
2. Technical/Application News
3. Classified ad section for Buy, Sell or Swap (e.g., old equipment)
4. A "Wouldn't it be nice if..." column
5. A "Did You Know" column
6. Local Users Group news, and more!

Distribution of Brochure/Newsletter This Month

Thousands of copies of both the brochure *and* the first newsletter are being distributed worldwide right now.

Known HP 1000 users are being reached via the software support database, OEM Newsletter database, and local Users Group mailing lists. Additional copies are being shipped directly to HP 1000 training centers.

HP employees are being reached via the CSG Literature Distribution Database and DSD's IC OEM mailing list. And a full bulk distribution will be done to *all* sales offices so that you will have plenty of copies for new customers.

Press Release Ready

Trade journal coverage of the Users Group start-up activities, based on a press release developed by the Users Group, should appear later this month.

Action Needed

The Users Group needs your help to get started. Here's what you can do:

1. Spread the Word!
   Let your customers know about the new Users Group and encourage them to join right away. Some may even want to get more involved and become committee members. There is still lots of work to be done on the new library and next year's conference.

2. Join the Users Group!
   Why not purchase at least one general membership in the Users Group for your office? You'll obtain the new contributed library, PLUS/1000, and you'll be automatically kept up-to-date on Users Group activities.

3. Help Start Up A Local Users Group
   Get together with some active users in your area and help them to form a local Users Group. Already, in the past 3 months, new groups have started up in the Bay Area, Chicago, and South Africa.

4. Help Start A Special Interest Subgroup
   Other HP divisions using HP 1000's may want to encourage their users to form a special interest subgroup, based on their own products. The Waltham Division is already evaluating this idea for their 5600A users.

For More Information

Users should be informed to write to the Users Group at the following address for more information:

   HP 1000 International Users Group
   P.O. Box 1000
   Norwood, Massachusetts 02062
   U.S.A.

(Love that address!)

GENERAL SYSTEMS NEWS

Product News

Terminal Support on the HP 3000
By: Tom Black/GSD

I have received some inputs recently regarding the support of asynchronous terminals on the HP 3000. I would like to outline HP's position on this, and to explain the background to terminal support.

Asynchronous, point-to-point, terminals are available on all HP 3000's. In the case of the Series III, the Asynchronous Terminal Controller (ATC) is used, and for the Series 30 and 33 the Asynchronous Data Communications Controller (ADCC) is used. These provide either hardwired or modem connection to terminals via an RS-232-C interface.

Although RS-232-C is a standard interface, it is unfortunately not possible to simply connect any RS-232-C compatible terminal to an HP 3000. This is because terminals respond differently to special characters, and can require different responses to certain characters, e.g., carriage return. To support these different requirements, a series of "term types" have been defined on the HP 3000. The term type is a number which is entered during the configuration dialog or "Hello" log on sequence, and enables the terminal driver to correctly respond to the terminal. The available term types are detailed below, along with the terminals they were designed for:

Term Type	Available Series III	Available Series 30/33	Terminal* Model
0	x		HP 2749B, ASR-33
1	x		ASR-37
2	x		ASR-35
3	x		Execuport 300
4	x	x	HP 2600A; Datapoint 3300
5	x		Memorex 1240
6	x	x	HP 2672A/B; GE TermiNet 300 and 1200
9	x	x	HP 2615A; Beehive Mini Bee
10	x	x	HP 262X; 3075, 6, 7; 264X
11	x	x	HP 264X
12	x	x	HP 2645K
13	x		Telenet Psuedo Term
15	x	x	HP 2635A (8-bit word)
16	x	x	HP 2635A (7-bit word)

*See HP 3000 Price Configuration Guide for full details of HP terminals supported.

Only the terminals detailed in the list above are formally supported by HP. Most of the non-HP terminals were supported because there was no equivalent HP terminal at that time. We don't intend to drop any terminals from the lists although in the future we will use only HP terminals whenever possible.

An often-asked question is "what foreign terminals are supported on the HP 3000?" The answer is — only those terminals in the list above. Other terminals can be connected to an HP 3000 and often work, but we will specifically support only the functioning of the term types listed. It is the customer's responsibility to ensure terminal compatibility with the term type. Supported HP terminals are of course, the best option. We guarantee satisfactory operation, and if problems are discovered we will make whatever modifications are necessary.

Addendum to Volume 4, Number 24, October 31, 1979

Editor's Note:

The following entries were inadvertently omitted from the GSD section of the Index to Volume 4 of the *CS Newsletter*.

These entries can be conveniently removed from this issue and inserted between pages 24 and 25 of the Index to Volume 4.

HP 3000 BMMC Prices as of November 1, 1979

By: Chosen Cheng/GSD

BMMC prices are preiodically re-evaluated to enable HP to offer service contracts at the most current rates.

The basic monthly maintenance charges (BMMC) for HP 3000 systems and add-on memory have just been re-calculated based on latest material costs and labor standards. These new BMMC figures reflect price decreases from previous levels, resulting in an even better value for your customers about to sign service contracts. As customary, these new rates will not affect the BMMC rates for customers on existing contracts.

As of November 1, 1979, customer quotes should conform to the contents of the BMMC microfiche:

System Processor Unit			New BMMC	Old BMMC
32435B	Series III		$412	$452
32412B	Series 33	60 Hz	$261	$277
32413B	Series 33	50 Hz	$261	$277
32430B	Series 30	60 Hz	$226	$242
32431B	Series 30	50 Hz	$226	$242

Add-on Memory

		New BMMC	Old BMMC
30078A	Series 30/33 add-on memory 128 Kb array	$ 7	$ 15
30008B	Series III add-on memory 256 Kb array	$ 27	$ 38

These figures may be related to the BMMC prices for full systems (including system disc and system console) by adding $98 for 7906M-102, $96 for 7920M-102, $16 for 2621A, and $36 for 2649E. This would show $524 for the Series III, $395 for the Series 33, and $360 for the Series 30.

Applications

Dave's Dandy Dozen

By: Pat Wilcox/GSD

Dave Fullerton, Neely Santa Clara SE, participated in the sale of, and is now supporting 12 HP 300 computers. The computers are located from Fresno to Honolulu.

An OEM in San Carlos installed one system with a welding company on the San Francisco Peninsula and another at a

major supermarket headquarters in South San Francisco. An OEM in San Francisco, installed a system at a property management firm in Burlingame. A multinational manufacturer in Redwood City, another of *Dave's* customers, is setting up a world-wide sales office network.
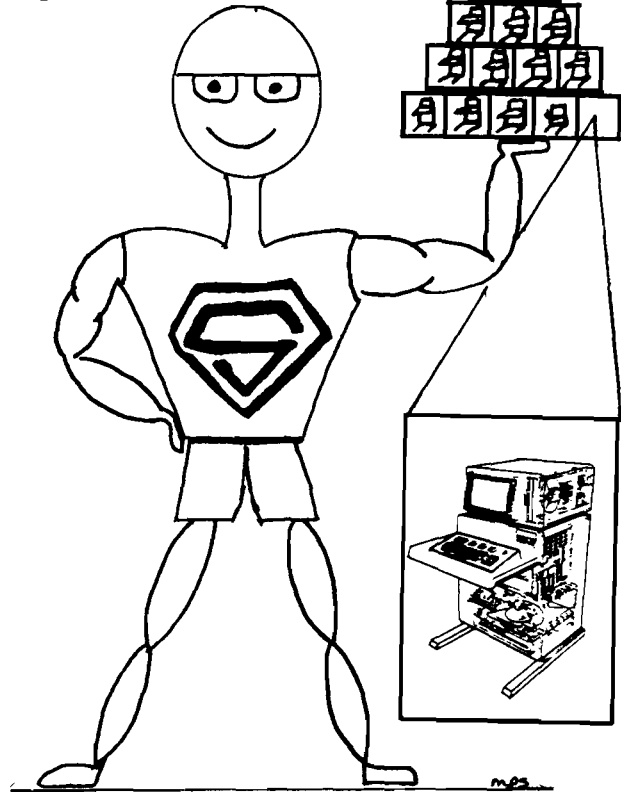
Some of *Dave's* other HP 300 sites are: the electrical engineering department of a world-famous university, a Hawaiian property management firm, a bay area ride-sharing service, and a Sacramento trucking company.

When *Dave* was asked how he managed so many successful installations, he said there were two secrets to success:

1. Customer satisfaction is a *team-effort* — sales representative, SE, CE and factory support.

2. The customer needs computer *solutions* not just price and hardware. Sometimes that requires finding an OEM or software supplier to assist the customer.

Dave will have more customers will installations shortly; these include *more* systems at that famous university and a system at a well-known laboratory in Livermore, to be used for document control.

If one of these situations fits any of your prospects, give me a call on extension 3733 at GSD. We can all benefit from *Dave's* successful installations.

General News

More HP 3000 Performance Specialists
By: Gwen Miller/GSD

Yet another class of SE Performance Specialists has graduated! And, in the tradition begun by the first class, they have demonstrated their abilities not only in MPE and system internals, but also in T-shirt design!
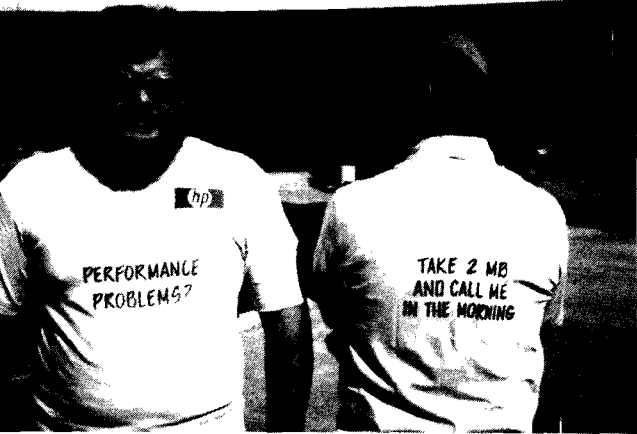
Below is a list of the students in this class. Like their predecessors in previous classes, they deserve a lot of credit for their hard work and dedication — often working on labs from 6:00 a.m. to midnight. You can count on them to help your customers understand the performance profile of their systems!

Neal Kelley/Baltimore	*Sergio Mastripieri*/Milan
Mike Grady/Paramus	*Sum Esther*/Singapore
Jim Kramer/St. Louis	*Stan Amway*/Waltham Div.
Tim Redeker/Atlanta	*Robert Day*/GSD

Corrections!
By: Steve Zalewski/GSD

The picture with the article, "HP 3000: Terminal Communications Over A Public Packet Switching Network" (October 15 issue), incorrectly showed an HP 3000 Series 30 and Series 33 connected to a packet switching network. An HP terminal can only correct over a packet switching network to a *Series II or Series III*. In the article, this is pointed out.

Also, in the second paragraph, the fourth sentence should read: "The locations, which may be sales offices for example, do not have sufficient *volume* to justify their own HP 3000 or even a leased line." "Volume" had been typeset as "value."

HP Exhibit at APICS — a Success!
By: Martin Gonzalez/GSD

Hewlett-Packard actively participated in the annual convention of the American Production and Inventory Control Society (APICS) in St. Louis on October 16-19, 1979. General Systems Division and Data Systems Division combined to exhibit a wide range of computer hardware and its MFG applications packages under the main theme of "Lifting the Ceiling on Productivity".

Based on the feedback from the attendees at the conference and on the statistics acquired and analyzed, the exhibit was truly a success! The objectives of increasing brand recognition of Hewlett-Packard as the manufacturer's computer company; and to demonstrate the capabilities of MFG/3000, MFG/250, DATACAP/1000, as well as the general purpose capabilities of the HP 3000 (Series 30), the HP 250, and the HP 1000, were not only met but greatly exceeded.

Here are some highlights of the convention:

— Over 5,000 attended. As expected, most (61%) were managers from the production and inventory control departments of manufacturing firms from around the U.S. and Canada. The rest were MIS/DP managers (22%) and V.P.'s, General Managers, and Consultants (17%).

— A sampling of attendees revealed this breakdown of customers/prospects: Midwest 45%, South 9%, Eastern 26%, Canada 3%, and Neely 17%.

— The large majority of visitors at our booth were familiar, some very knowledgeable, about HP's computer hardware and manufacturing software offerings; which was an encouraging sign of HP recognition in the manufacturing community.

— Several sales reps took advantage of their prospects' attendance at the convention and were successful in arranging future calls.

HP GRENOBLE NEWS

Division News

3075/76/77 Reference Manuals
Guenter Kloepper/HPG

We have mailed two copies of the 3075 Reference Manual to each SEDM in North America, plus one copy to selected SR's and SE's who we knew has an interest in Data Capture. If you are a North American or ICON SR or SE and would like a copy of the manual, drop me a line at DTD and we will mail one to you. Offer good as long as supply lasts. After that, you'll have to order through Corporate Parts Center.

CS GROUP NEWS

Product News

New Computer Supplies Program Promotes HP's Support Service

By: Fran Jeffries/CSG

HP SUPPORT SERVICES

IMPORTANT INFORMATION

...dedicated to your ongoing success

Computer Supplies

Software Support

Training

Documentation and Software Updates

Maintenance Agreements

⊕ HEWLETT PACKARD

I am interested in the following Hewlett-Packard Support Services:
☐ Computer Supplies ☐ Maintenance Agreement Services
☐ Training Services ☐ Software Support Services
☐ Documentation and Software Update Services

Name

Title

Company

Address

City   State   Zip

Phone   Extension   Country

HP System Used

For more information about these services contact your local Hewlett-Packard office or return this card

— An important time to remind users of HP's computer supplies capability is when new systems or peripherals are delivered and put into service.

— That's why Computer Supplies Operation (CSO) has developed a promotional message for inclusion with peripheral product shipments. (The HP Computer Supplies

You expect superior performance from HP Computer Products... and HP Supplies help you get it.

Supplies Ordering Information

How HP Makes and Tests Quality Disc Packs

HEWLETT-PACKARD
Literature Distribution Center
1820 Embarcadero Road
Palo Alto, California 94303
U.S.A.

Catalog is already being included with DSD and GSD system documentation.)

— These messages (which we call "piggy-back" cards, since they ride along with or inside the peripheral) not only offer the Computer Supplies Catalog — but they also promote and offer information on the entire range of HP's support services. These include Training, Maintenance Agreements, Software Support, and Documentation/Software Updates.

— Starting this month, these support message cards will be included on/in all disc drives, printers and tape units shipped by Disc Memory and Boise Divisions. Work is moving ahead on messages for inclusion with all other computer peripheral products.

COMPUTER SYSTEMS NEWSLETTER