COMPUTER SYSTEMS NEWSLETTER

For HP Field Sales Personnel

HEWLETT **hp** PACKARD

Vol. 2, No. 10
Apr. 1, 1977

DMD Has 7920 In Production
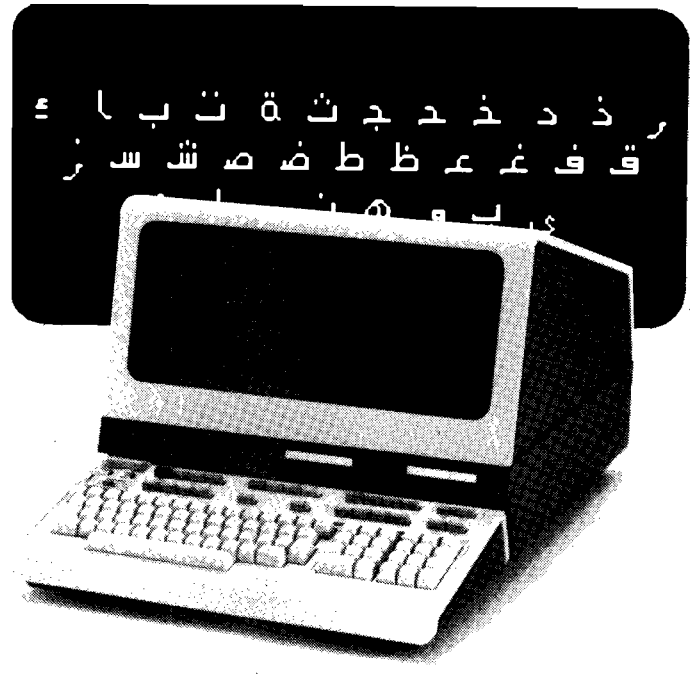
DTD Unveils The 2645R

DSD Introduces Models 20 and 21

Introducing HP 1000 Models 20/21 And Enhancements to Models 30 And 80

DMD Has The 7920 In Production

Unveiling The 2645R From DTD

In This Issue...

AMD DIVISION NEWS

Division News

Regional Sales Engineering Organization Changes
By: Tom Freed/AMD

The big dust cloud has settled since *Bill Mohr* announced the Marketing Department organization changes (Vol. 2, No. 7). It is therefore time to let you know about some additional RSE changes.

Greg Gillen has taken on the task of Regional Sales Engineer Manager, creating a vacancy and need for an RSE for the Neely Region. This spot has been filled by *Harry Haayer*. *Harry* has been at AMD for about 10 years in the area of Operations and in Production Engineering. With his background, he will certainly help AMD in support of the Neely Region.

Since I have moved into my recent, new job assignment, I have found it increasingly difficult to support the European Sales Region in an effective manner. Therefore, I am turning support of the region over to *Larry Sanford*. *Larry* has been with AMD for about 12 years in the Manufacturing, Product Support, and Sales Support areas. Again, a good solid background to give HPSA good solid support.

I know that *Harry* and *Larry* will provide the traditionally strong RSE support that you have become accustomed to at AMD.

AMD SALES DEPARTMENT ORGANIZATION

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                    Sales
                 Development
                  Tom Freed
                   (X2412)
                      |
                 ___ Lill White
                     (X2414)
   _____|_____
   |                  |                |
Program         Applications       Regional
Development      Rich Irwin          Sales
Bill Klauer       (X2423)         Greg Gillen
 (X2415)                            (X2432)
   |_____           _____|_____
   |         |           |         |          |            |
Air Force  Army/Navy  Worldwide  ESR/SSR     Neely      MSR/CSR/
Programs   Programs     85XX      Dick      Harry      International
Dave Kline Andy Mills Ralph     Crepeau    Haayer     Larry Sanford
 (X2455)   (X2452)    Kenton    (X2427)    (X2433)      (X2425)
                      (X2410)
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Computer Museum

HP Computer Museum
www.hpmuseum.net

For research and education purposes only.

Product News

Obsolescence Info!
By: Herb Pardula/AMD

9510D: The 9510D Automatic Test System activity has fallen off sharply during the last year with no visible improvement ahead. The 1977 forecast shows one order for the system.

It has therefore been decided to obsolete the 9510D during FY 77.

The step has been taken to remove it from the CPL starting April 1, 1977. After that date the 9510 will be quoted only as a special until announcement of its obsolescence.

Please inform all potential 9510D customers about the status of this product.

8580B, Option 300: CTEST software, 8580B option 300, has had marginal customer interest and since it does not contribute to the sale of the 8580B Automatic Spectrum Analyzer, it has been decided to obsolete CTEST.

Starting April 1, 1977 the option will not be on the CPL. Effective immediately, AMD will no longer accept orders for CTEST. A new Brochure and new Ordering Information, reflecting the change, will be sent out to the AMD Sales Force in April.

The CTEST software will *not* be made available to the 8580B customers via the 85XX Subscription Service. It would require substantial support which AMD cannot supply.

Ordering Processing News
By: Tom Freed/AMD

To end confusion before it starts — when a transmitted order containing individual line items is placed with AMD, we handle each line item as if it were a separate order and we will ship the line item as available (but not before 30 days of the required date), unless it is coded "No Partial", or "Coordinated Shipment", or there are Special Instructions (such as item X and Y must be shipped together, etc.).

HP 9571A Delivery
By: Dick Crepeau/AMD

In order to maintain short deliveries on the HP 9571A Digital Test Station we must generate accurate forecasts and we need your help.

Please forward copies of all HP 9571A quotes to your RSE, along with the percentage of likelihood of an order and the month it is most likely to be ordered in. Without this information we are unable to forecast accurately and effectively.

9603R/9611R Delivery Times Tumble
By: Ron Carelli/AMD

On November 1, when these products were transferred to AMD, our materials and manufacturing people went into a huddle to strategize on how to get the delivery times down to 10 weeks to coincide with the 21MX/HP 1000 System delivery times. Well, they have met *and* exceeded their target. Both the 9603R and 9611R are on the availability schedule at *less* than 10 weeks.

What we need now is to get those cards, letters and, most of all, orders in to take advantage of this opportunity. Delivery time can be a big plus for you in a competitive situation and now you have an edge.

9603R/9611R Literature Corrections
By: Ron Carelli/AMD

Thanks to your inputs we have noted some errors in our sales literature. We will be putting out a corrected version at a future date. In the meantime, beware:

DAC Cards for 9603R Option 013 and 9611R Option 008:

The limitations for the amount of DAC cards (91113A, 12757A) which can be put into a 2313B subsystem along with other cards is found on page 2-8 of the Measurement and Control Peripherals Technical Data Book (6952-8506, 10/76). Unfortunately, these same limitations are not repeated in the 9603R/9611R Data Sheets in this book, nor are they in the configuring guide. Therefore, when configuring either a 9603R or 9611R system that has DACS in it, please refer to page 2-8 of the Data Book for the limitations on the usage of DACS.

91203A Option 002, 003:

In the description of the isolated digital input card specifications on page 2-14 of the Technical Data Book, please change "Option 002" to "Option 003" and change "Option 003" to "Option 002". After the changes, this information will correspond to the CPL and New Jersey Division's documentation.

BOISE DIVISION NEWS

REMEMBER

- New package price of $3000 for each 2762A 30 cps Terminet purchased and shipped within next two months in quantities of five or more!

- The HP 7260A OMR with a terminal is now supported on the HP 3000 Series II!

- HP 3070A's help sell HP 1000 systems!

Sales Aids

A Successful 3070 Seminar In Lexington
By: Bernard Guidon/Boise

Last month more than 40 prospective users of data collection systems gathered in the Lexington Sales Office for a 3070 presentation. As always, the 3070 had more than its fair share of success. Numerous EDP managers, manufacturing managers, and production people reacted very positively to the multi-drop, error-free communication and HP-IB expandability of the product. Thanks to Moe Cote (Lexington S.E.), an impressive demo of 2 applications, one for factory data collection and one controlling appropriate HP-IB devices, were running concurrently, demonstrating the independence of the units. The seminar brought very interesting prospects to Ted Mc Carthy and his people, together with increasing HP visibility and penetration in the district.

Boise and Grenoble Divisions want to express their thanks to Ted and his team for the fine job in putting the seminar together.

Congratulations, Teddy!

Did You Read Computerworld's February 28 Issue?
By: Alic Rakhmanoff/Boise

If yes, you probably noticed an article entitled: "HP Drum Allows Printers to Handle Mark Forms" which stated:

> Turnaround documentation, a hardware based data collection capability allowing optical mark forms to be printed on drum-based line printers under software control, has been announced by the Hewlett-Packard Company.
>
> The optical mark printing is accomplished with a printer drum introduced by HP that is capable of printing a character in the mark locations of optical forms, according to a spokesman. The printed forms can then be read by the HP 7260A and HP 7261A optical mark reader.
>
> The printer drum can be ordered with an HP drum printer as standard equipment at no additional cost.

So next time when your customer wants a 2613A or 2617A or 2618A line printer, encourage him to order it with a FREE option 002/003 (64 or 96 character set) which in addition to the OMR slug character will provide an OCR-B character set.

Sell OMR's!

Order Processing

2762B Being Obsoleted
By: John Whitesell/Boise

The time has come to obsolete the 2762B 120 cps Terminet. We have a few left, so get your orders or APO's in soon.

After all the 2762B's have been sold, we suggest the following alternatives:

1. Sell your customer a 2762A 30 cps Terminet at the new low price of $3950 ($3000 if ordered and delivered within the next two months in quantities of five or more.)

2. Give us a call, and we'll help you work out a strategy to get the business.

Good Selling!

Used Equipment At Great Savings
By: Steve Davis/Boise

All of the following units carry a full 90-day warranty and have been refurbished and tested. They are available on a first come, first served basis. When transmitting orders for these products, be sure to specify option 888 (designating used equipment) and the serial number of the unit. Prices are F.O.B. Boise. Before transmitting your order, contact Boise Division Order Processing to insure that the unit you desire is available.

Product	Options	Serial No.	Sale Price
12845B	888	(3 kits available)	$ 520.00
13196A	001/888	(1 available)	460.00
2607A	STD/888	1627A-00569	5,375.00
2607A	STD/888	1627A-00882	6,140.00
2607A	015/888	1627A-01269	6,525.00
2752A	STD/888	1302A-04462	1,875.00
2752A	STD/888	1302A-05777	1,875.00
2752A	STD/888	1302A-06160	1,875.00
2754B	STD/888	0825A-02132	4,865.00
2754B	STD/888	0825A-02263	4,865.00
2762A	001/888	1310A-00393	3,625.00
2762A	STD/888	1310A-00658	3,465.00
2762A	STD/888	1310A-00833	3,465.00
2762A	018/888	1545A-01091	3,860.00
2762A	018/888	1545A-01120	3,860.00
7261 (or 12986A)	002/888	1316A-00319	3,075.00
7261 (or 12986A)	003/888	1509F-00169	3,075.00
7970E	007/151/888	1443A-01610	7,685.00
7970E	007/151/888	1606A-02048	8,135.00
7970E	007/151/888	1606A-02422	8,135.00
7970E	020/165/888	1621A-02810	8,890.00
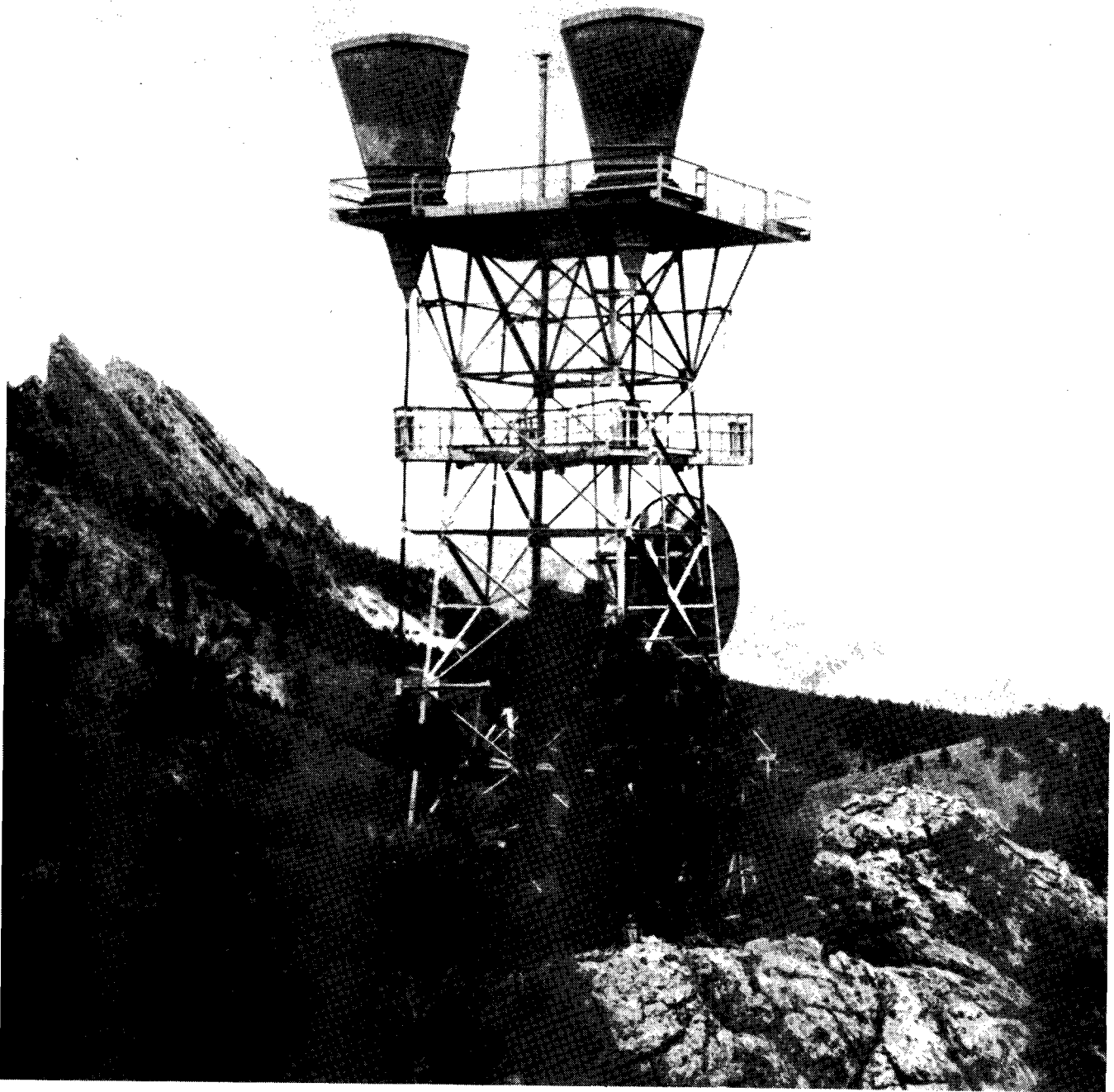
This lone radio relay station at Boulder Junction, Colorado, is one of thousands of unattended telephone transmission stations across the country that are remotely monitored and controlled 24 hours a day. SCOTS, a computerized monitoring system, is helping to do the job more efficiently and accurately than ever before, using HP 7970 magnetic tape drives.

DISC MEMORY NEWS

Division News

Disc Memory Division News

By: Dick Hackborn/DMD

On January 7, 1977, the 7920 disc drive was formally trans-
ferred from the Lab to Production (Manufacturing Release
sign-off). This was an outstanding achievement of the 7920
engineering and manufacturing teams which not only main-
tained a tight time schedule but also introduced a *solid*
product into production. Just how solid the 7920 disc drive is
can be seen from the following statistics:

1. 119 production level drives have been produced by
    March 1st (when it was placed on the Corporate Price
    List) and we expect another 103 drives to be produced
    during March for a total of 222 by April 1st.

2. Similarly, the excellent productibility of the drive has
    allowed us to implement an aggressive plan for having
    7920 repair kits available to the field CE's — 44 kits have
    been produced by March 1st with the expectation of
    adding another 40 during March for a total of 84 kits by
    April 1st.

3. We are currently meeting our production plan start-up
    targets and have high expectations of continuing to
    meet this plan which schedules us at 10 drives/working
    day in July (only six months after manufacturing
    release).

4. So far, we have been maintaining linear daily production
    rates — an excellent accomplishment for a new disc
    drive and one which is not always achieved even with
    older, more stable, products.

The above was achieved because, in my opinion, we did *not*
take any short-cuts in our final design and manufacturing
introduction cycles. When technical problems did arise dur-
ing pilot run or early production (as they will for any new
product) the engineering team did a thorough analysis of
each problem, carefully designed the necessary corrections
and *fully tested* the newly modified drives. Likewise, we
allowed a full month between the completion of our 20 unit
pilot run and the start of the first production run to give us
enough time to get the design corrections incorporated in
the first production units. This approach exemplified the

engineering and manufacturing teams attention to details
and absolute dedication to having the 7920 be the best new
disc drive in the minicomputer industry.

In parallel with the above engineering and manufacturing
accomplishments, *Fred Reynolds* (DMD Support Engr. Mgr.)
and *Harry Albert* (DMD 7920 Support Engr.) did an outstand-
ing job of getting a 7920 service plan into operation which
was aimed at achieving top field repair levels for the new
disc drive. Over 80 CE's (worldwide) have already been
trained on the 7920 — eleven of which are disc product line
specialists. Furthermore, we will meet our goal of having 80,
7920 repair kits available for the field by April 1st (one month
after the new product was placed on the price list). The
repair kits are well thought out and I have been getting very
positive feedback from the field CE's on the quality of the
training programs and the ease with which the 7920 drive
can be maintained and repaired. All of this results in some of
the most competitive service contract prices in the industry
(as can be seen in the next article).

During March, we had two DMD teams cover the NPT. *Bob
Hoke* (Marketing) and *Herb Stickel* (Engineering) presented
the 7920 to the European field sales force while *Dick Byhre*
(Marketing) with *Lynn Weber* and *Bob Widmayer* (Engineer-
ing) did the same for the U.S. and Canadian sales forces. A
summary of our competitive position as presented in the
NPT, is given in the next article. There are two important
points to remember from the NPT material:

1. The 7920 is a high-performance drive and this is ex-
    tremely important for today's on-line minicomputer sys-
    tems which often depend upon fast disc access times.
    The 7920 track-to-track access time is 20% to 40%
    faster than our major competitors (this can be very im-
    portant in some system software applications when you
    have a lot of adjacent track accessing). Likewise the
    7920 average data access is between 8% and 30%
    faster than the competitors' drives shown on the NPT
    graphs.

2. Most of the larger minicomputer systems require two or
    more disc pack drives for performance and/or con-
    venience reasons. The 7920 allows a user to economi-
    cally get started for about $32,000 for two drives versus

anywhere from around $50,000 to over $70,000 for our major minicomputer competitors. This is done without any significant disc or service contract price penalties up to at least 200 or 250 Megabytes. Thus HP provides an excellent low-cost alternative for the user who does not require more than 100 Megabytes disc storage (formatted) to get started. And, 100 Megabytes is quite a lot of disc storage as will be demonstrated in a subsequent Newsletter article which compares on-line data processing applications with the associated disc capacity requirements.

Competition

7920 Competitive Summary
By: Bob Hoke and Dick Byhre/DMD

The competitive picture looks bright for the new 7920 disc drive — the second in a family of controller - compatible disc drives from HP. The product continues to sell beyond forecast and is solid as a rock. The following summary is an "apples-for-apples" comparison using the prices and performance specifications stated in our competitors' literature or from the trade newspapers. Also, please remember that the 7920 is fully CSG end-user and OEM discountable — an advantage *not* shared by some of our competitors' drives.

A. **How The 7920 Compares With The Major Minicomputer Vendors:**

Figures 1, 2, and 3 show the price versus formatted disc capacity for each of our major competitors. (Note: The first disc drive includes the controller price as well in all cases.) The shaded areas indicate where HP has a price advantage today. (Note: The DG 6061, 192 Megabyte drive, is not shown as this competitive analysis only compares drives which currently have, or are about to have, volume shipments.) Figure 4 shows the corresponding service price (BMMC) versus formatted disc capacity. HP has made significant advancement in this area as can be seen from Figure 4.

B. **How The 7920 Compares With Independent Peripheral Vendors Offering Add-On Disc Drives for 3000 Systems:**

From what we have heard so far, there appears to be two companies planning to offer add-on disc drives for HP 3000 systems. One is Telefile and the other is Memorex. There are so many conflicting stores about Telefile's disc offering, it is impossible to make any accurate comparisons at this writing. When we get some solid information, we will pass it on to you. The Memorex offering was described in a recent issue of *Electronic News*. Based on that article, we constructed the comparison graph shown in Figure 5. (Note: The first Memorex add-on drive includes its own controller, while the first HP add-on 7920 does not, since its controller is already part of the system.) Also note that the add-on capacities are in addition to the original 50 Megabytes offered with the HP 3000 Series II. We do not have any information at this time to compare service prices between the two drives.
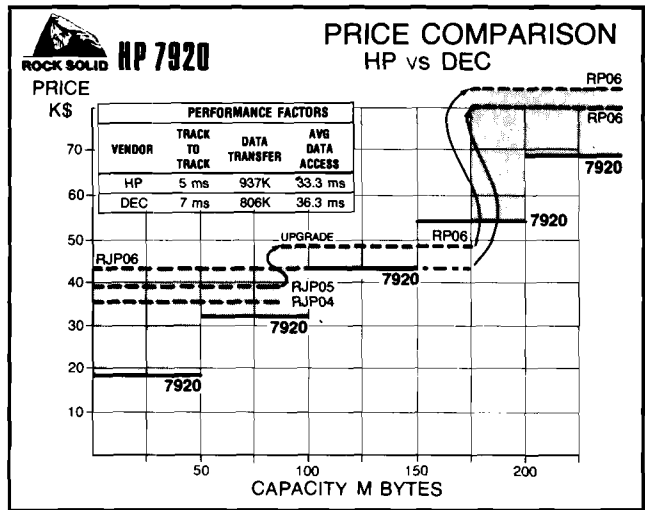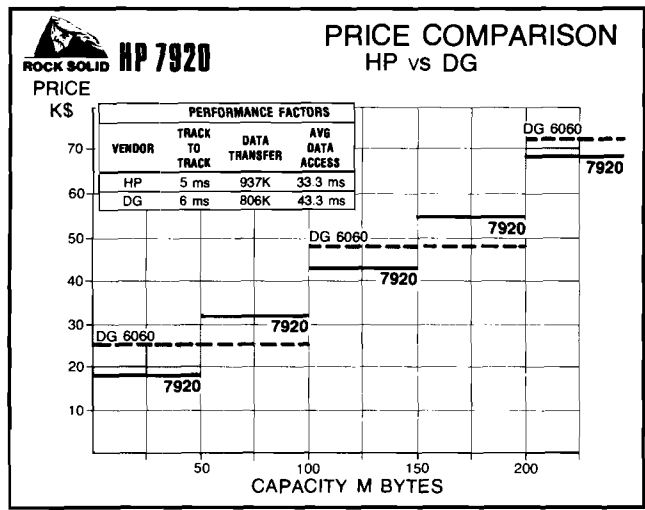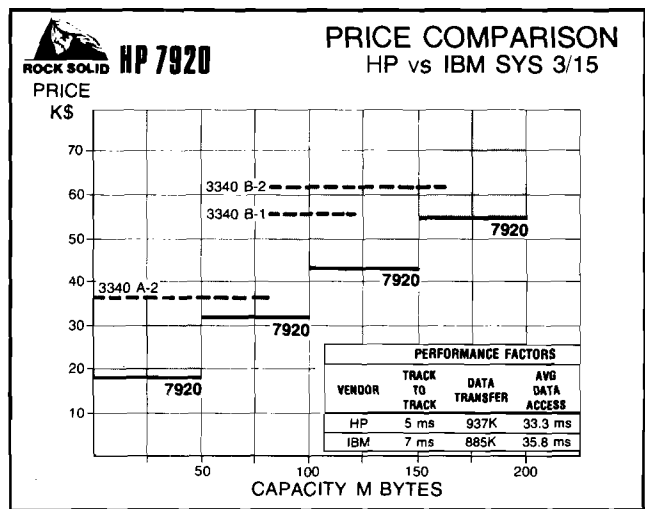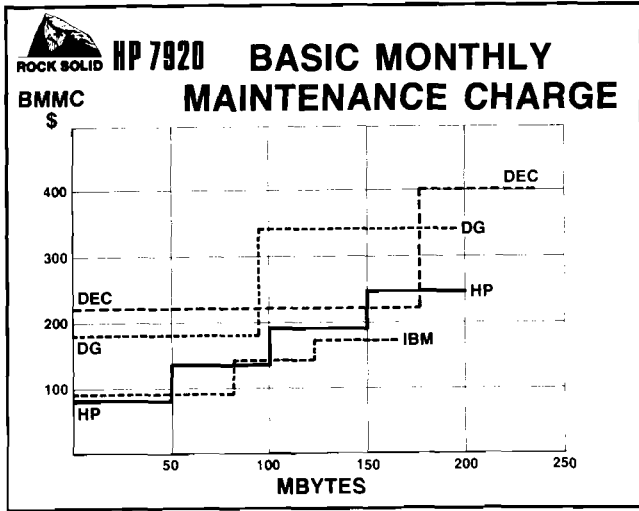

Figure 1

Figure 2

Figure 3

HP 7920 BASIC MONTHLY MAINTENANCE CHARGE

BMMC
$

Figure 4

HP 7920 PRICE COMPARISON HP vs MEMOREX ADD-ON STORAGE

PRICE
K$

PERFORMANCE FACTORS			
VENDOR	TRACK TO TRACK	DATA TRANSFER	AVG DATA ACCESS
HP	5 ms	937K	33.3 ms
MEMOREX	7 ms	806K	36.3 ms

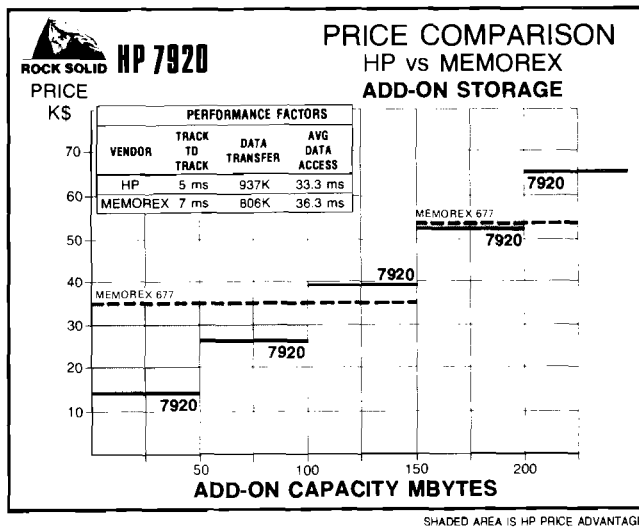ADD-ON CAPACITY MBYTES

SHADED AREA IS HP PRICE ADVANTAGE

Figure 5

Product News

New 7900 And 7905 Price Reductions Effective March 1st!

By: Dick Byhre/DMD

The proven reliability, performance, and convenience of HP's two Cartridge Disc Drives — the 4.9 Megabyte 7900A and the 14.7 Megabyte 7905A — is now available at new low prices:

7905 DISC PERIPHERALS REDUCED 10% IN
PRICE AND 25% IN BMMC:

	Product	Description	Previous List	3/1/77 List	Old BMMC	New BMMC
Rack	12962C	7905A SUBSYS	$15,000	$13,500	$126	$95
Versions	13180A	7905A ADD-ON	$10,500	$ 9,500	$ 95	$62
Minirack	12962D	7905A SUBSYS	$16,200	$14,500	$132	$99
Cabinet						
Versions	13180B	7905A ADD-ON	$11,700	$10,500	$101	$66

7900 DISC PERIPHERALS REDUCED 17% TO
18% IN PRICE (SAME BMMC):

	Product	Description	Previous List	3/1/77 List
Rack	12960A	7900 SUBSYS	$11,000	$9,000
Versions	12960A-010	7900 ADD-ON	$ 9,975	$8,300

We have manufactured over 10,000 of these drives and they continue to lead the minicomputer industry in price/ performance capabilities. In fact, the 7905A (having the same performance as the 7920A) is unbeatable in cartridge disc access times and both drives are extremely price competitive compared to other major minicomputer companies. (This will be shown in a subsequent Newsletter article.) For small to medium-size minicomputer systems which require the advantage of having a built-in fixed disc (for back-up, copying, system use, etc.) and the convenience and low-cost of a front-loading cartridge, the HP 7900A and 7905A remain the best buys in the 5 Megabyte to 30 Megabyte range!

DATA SYSTEMS NEWS

Product News

Introducing HP 1000 Models 20/21 And Enhancements To Models 30 And 80
By: Van Diehl/DSD

Just five months after the introduction of the HP 1000 Computer Systems, we are introducing new models and a number of important enhancements which should make it even easier to sell HP 1000 systems.

The HP 1000 has been very successful! More than 150 systems have been sold worldwide in the first quarter of fiscal 1977. A few examples of the applications HP 1000's have been sold into are:

- Analysis of telescope observation data
- HP-IB data acquisition for testing bubble memories
- A freight car routing information system
- IMAGE DBMS for warehouse parts control within an engineering department of an aircraft manufacturer
- A terminal-oriented data information system for use by sportscasters at professional football games

The HP 1000 has outpaced the competition in processor performance and operating system capabilities. Both Auerbach and Datapro have praised the HP 1000 systems. IMAGE/1000 was placed in the Datapro "Honor Roll" — the only software package for small computers to receive such an honor.

We are now introducing two new models, the 20 and 21. They are the entry level models of the HP 1000 family. These models have unique features, such as compatibility with other models, size of memory supported, etc. that are fully discussed in the following pages. With these new models the entrance fee to the HP 1000 club is substantially lowered (in fact, by more than 30%). You now have an excellent competitive posture in the lower end of the minicomputer market.

With these two new systems and important new enhancements for Models 30 and 80 we hope to make you even more successful with HP 1000's.

Happy Selling!

What's New With The HP 1000 Family
By: Van Diehl/DSD

- **A new sprint speed computer** — the 21MX E-Series is the nucleus of each HP 1000 System. The new processor executes most instructions 60-100% faster and performs floating point operations 250% faster than its predecessor. **And now 20 to 30% faster with optional high performance memory.**

- **2 New Entry Levels Models** — Models 20 and 21. Ideal for smaller or dedicated applications. All models have a single operating system — RTE-M — upward compatible to RTE-II/III.

- **New 512K byte Flexible Disc Drive,** expandable to 2048K bytes. The subsystem can be used with RTE-M or RTE-II/III.

- **HP 1000 Models 20/21** support concurrent multi-user program development and execution. This is the only non-disc based real-time system in the market that supports this feature in a mapped environment.

- Same file calls are used in RTE-M or RTE-II/III to OPEN, READ, WRITE, etc. Thus, to the user program it is transparent if he is using the 12732A floppy, 7900 or 7905 discs. Who in the competition can say the same?

- **High Performance Memory** — (350ns vs 560ns). Increases processor performance by 20 to 30%. Useable on all models of the HP 1000. Lock-out specs: DEC and DG do not have it. And, our prices for high performance memory are lower than DEC's or DG's slower memories.

- **RTE-M Operating System** can be configured as a single program (BCS-like) system or as a multi-programming, multipartition system, supporting up to 608K bytes of memory. In the larger, mapped configurations, RTE-M will be ideal for applications such as shipboard or industrial environments where moving head discs are not acceptable.

- **HP 1000 Models 20/21 Support the HP-IB** — Now the Models 20/21 can control multiple cluster of instruments, each consisting of up to 14 HP-IB compatible instruments. A Model 20 can, in a mapped memory configuration, support multiple BASIC/1000M user programs, each one controlling a separate cluster of HP-IB instruments.

- **BASIC/1000** is provided in two versions: RTE-M based or RTE-II/III based. RTE-M's BASIC/1000M is a scaled-down version of RTE-II/III's BASIC/1000D. It supports multi-user operation, real-time statements, character string manipulation, bit manipulation and support of external subroutines functions in FORTRAN, ALGOL or Assembly Language.

- **RTE-II/III's BASIC/1000D** now supports IMAGE/1000. A big plus for those testing applications that often are programmed in BASIC and have DBM requirements.

- And now you can add pennies without losing them using the new DECIMAL STRING ARITHMETIC routines callable from BASIC, FORTRAN or even Assembly language on RTE-II/III Systems.

- Has your customer run out of disc capacity? Don't despair! Now you can have 50M byte add-on disc capacity with the new 7920 disc. Seven 7920 drives can be added to the 7905 controller of the HP 1000 disc-based models for a total of 365M bytes total storage.

- All HP 1000 systems are on the OEM discount schedule!

- Memory expansion kits that dramatically reduce the price of memory for systems larger than 64K bytes. Available with standard and high performance memory modules.

HP 1000 Computer Systems are a powerful new series of HP Computer Systems for Computation in Science and Engineering, Manufacturing information control, Measurement and Control, Data Collection, Automatic Electronic Testing, and Distributed Computer Networks.

HP 1000 Systems offers a choice of models, each one of which provide specific capabilities, or physical configuration.

TABLE 1. HP 1000 Basic Configurations

	Model 20	Model 21	Model 30	Model 31	Model 80	Model 81
Processor	21MX E-Series					
Cabinet	Desktop	Upright	Desktop	Upright	Desktop	Upright
Main Memory Std Size (KB)	64	64	64	64	64	64
Opt. Expansion To	304	608	304	608	304	608
Operating System Standard/ Optional	RTE-M	RTE-M	RTE-II/RTE-III	RTE-II/RTE-III	RTE-III + IMAGE/1000	
Disc Subsystem Type Capacity (MB) Opt. Expansion	Flexible Disc (optional) 512K 2048K	512K 2048K	Cartridge Disc 15M 365M	5 or 15M 365M	15M 365M	15M 365M
System Console	2645 Display with Dual Mini cartridges (110KB)					
Standard Peripherals Line Printer Mag Tape	None None	None None	None None	None None	200-1250 lpm 800-1600 bpi	
Base Prices	21,000 or 25,500	22,000; or 26,500	36,500	31,500 or 36,000	61,700	62,700

I/O Extender For 21MX-E Series
By: Frank Jackson/DSD

21MX-E Series compatible 12979A I/O Extenders will be shipped with all orders after April 1, 1977. Orders for 12979A I/O Extenders (U.S. price $4500) may be placed now for delivery after April 1.

Customers with existing I/O extenders date-coded prior to 1712 who wish to be 21MX-E compatible can order an upgrade kit through C.S.D. Part number 12979-90001; price $1100. This kit is non-discountable and does not include installation.

Cabinets Being Removed From Corporate Price List
By: Jim McCabe/DSD

Because of low sales volume, the 35", 70" and old style 2860 56" cabinets will be removed from the Corporate Price List *effective May 1*. The following product numbers are affected:

    29401B 35" Cabinets
    29403/5/7 70" Cabinets
    2860B/C/D/E Old Style 56" Cabinets
    All options and accessories associated with the above cabinets

Since a few OEM and EU customers still order these cabinets, they will be made available in the future through *Ivan Henkle's* Special Handling Group on a build-to-order basis. Deliveries will be about 12 to 14 weeks and prices will increase slightly. The next Newsletter will carry new price, delivery, and order instructions. You may want to alert your customer that delivery will change to 12 weeks in June.

I/O Extender Now Compatible With 21MX E-Series
By: Bob Frankenberg/DSD

Data Systems is happy to announce that the 12979A I/O Extender is now compatible with 21MX E-Series computers. Extensive testing of the 12979A in system environments revealed noise and timing problems which have been solved by circuit board relayouts and logic changes to the I/O extender, the extender's DCPC (12898A), and the E-Series DCPC. These changes have been implemented in production and all I/O extenders shipped after March 31, 1977, will be E-Series compatible.

As these changes are also compatible with M-Series computers, the I/O Extender's model number will remain 12979A as will its list price of $4500. A date code of 1712 or later is required for E-Series or HP 1000 compatibility. When ordering I/O extenders with HP 1000's the upright configurations are required (Models 21, 31, 81) as rack space for the I/O extender is not available in the desk style. For customers who have earlier 12979A I/O extenders and want to upgrade them to work with the E-Series an upgrade kit (P/N 12979-91001) should be ordered from the Computer Service Division for $1100. This price is not discountable and installation is not included.

The 91200B TV Interface Card is currently not compatible with operation in an I/O extender used with an E-Series computer. Circuit changes are being made to the 91200B to correct this problem.

As the I/O extender is now compatible with the E-Series and HP 1000, you're able to quote larger system configurations where very competitive memory, disc and overall system prices should help you win the business.

Good selling!

OEM CORNER

It Makes Sense to Sell HP 1000's
By: Bill Burger/DSD

The following charts compare three HP 1000 models to ordering the exact equivalent in hardware components.

An inspection of the prices at list, and at various quantities show that it often costs less to buy an HP 1000. Where the HP 1000 costs more, it is usually only a few hundred dollars, a reasonable price to pay for all the extras that are provided by HP on a system order, including:

- Ease of ordering and coordination
- Operating System Software and Manuals
- Factory System configuration
- Drop Shipments made easier

Do yourself *and* your customer a favor, Sell HP 1000's.

<div style="text-align:center">

2170A Syst 1000 Model 31 — 7900A
vs.
Component Buy

</div>

2645A	Terminal	$ 3500
-007	Adds minicartridge	1600
-030	Deletes Standard I/F	-160
-001	128 Char Set	100
-013	5 blank cartridges	90
13260B	Adds Asynch card to terminal	325
2113A	Computer	6850
2102B	Memory Control	600
13187A	16K Memory module (2)	3200
12897B	DCPC	750
12892B	Mem Protect	500
12991A	Power Fail Recovery	600
12992C	Terminal Loader	100
12539C	Time Base Generator	350
12960A	7900A Subsystem	9000
29402B	Cabinet	1150
-120	Power control module	550
12966A	Terminal Interface	750
24396F	Diagnostics on minicartridge	450
92723A	Racking Service	725
12869A	Disc Pack (normally for grandfather disc)	125
13304A	Firmware Accessory Board	300
12903C	Rack slides for CPU	150
	Installation (average price)	375

Sum of Boxes	$31,980	Δ = $480
2170A System	$31,500	

UNBUNDLING ANALYSIS

		QTY→	LIST	1	5	15	50
a.	OEM BUYER	COMPONENTS	$31980	$27367	$25,727	$24209	$22021
		SYSTEM (2170A)	31500	27720	25,830	22995	22050
		Δ =	480	(353)	(103)	1214	(29)
b.	VEU	COMPONENTS	31980	31980	31,980	28850	26950
		SYSTEM (2170A)	31500	31500	28,980	27090	26460
		Δ =	480	480	3000	1760	490

NOTES: 1. A Δ which is (Δ) indicates that components are less expensive than Sys.
2. Component buyers do not get a configured system. If a configuration is required it will add an average of $400 to installation cost.
3. O.E.M. comparisons without installation except quantity 1.
4. Operating system software price not included in component price.

FOR COMPARISON PURPOSES ONLY — DO *NOT* USE FOR QUOTING.

2171A Syst 1000 Model 31/81 — 7905A
vs.
Component Buy

2645A	Terminal	$ 3500
-007	Adds Minicartridge	1600
-030	Deletes standard Interface	-160
-001	128 Char Set	100
-013	5 blank cartridges	90
13260B	Adds asynch card to 2645A	325
2126A	DISComputer	22400
13187A	16K Memory	1600
12892B	Memory Protect	500
12991A	Power Fail	600
12992C	Terminal Loader	100
12539C	Time Base Generator	350
29402B	Cabinet	1150
-120	Power Control	550
-K05	Disc	250
12966A	Terminal I/F	750
24396F	Diagnostics on minicartridge	450
92723A	Racking Service	725
13304A	Firmware Accessory Board	300
12940A	Disc Pack (normally for grandfather disc)	180
	Installation (average price)	375
12903C	Rack slides for C.P.U.	150

Sum of Boxes	$35,885	
2171A System	$36,500	Δ = (765)

UNBUNDLING ANALYSIS

		QTY→	LIST	1	5	15	50
a. OEM BUYER	COMPONENTS		$38,885	30694	28862	27113	24617
	SYSTEM (2171A)		36,500	32120	29930	26645	25550
	Δ =			(615)	(1426)	(1068)	468	(933)
b. VEU	COMPONENTS		35,885	35885	35885	32370	30239
	SYSTEM (2171A)		36,500	36500	33580	31390	30660
	Δ =			(615)	(615)	2305	980	(421)

FOR COMPARISON PURPOSES ONLY — DO *NOT* USE FOR QUOTING.

2172A Syst 1000 Model 30/80 — 7905A
vs.
Component Buy

2645A	Terminal	$ 3500
-007	Adds Minicartridge	1600
-030	Deletes Standard I/F	-160
-001	128 Char Set	100
-013	5 Blank Cartridges	90
13260B	Adds Asynch Card to Terminal	325
2113A	Computer	6850
2102B	Memory Control	600
13187A	16K Memory Module (2)	3200
12897B	DCPC	750
12892B	Memory Protect	500
12991A	Power Fail Recovery	600
12992C	Terminal Loader	100
12539C	Time Base Generator	350
12962D	Disc Subsystem	14500
29421A	Desk Cabinet	1600
12966A	Terminal I/F	750
24396F	Diagnostics on Minicartridge	450
93723A	Racking Service	425
12940A	Disc Pack (normally for grandfather disc)	180
13304A	Firmware Accessory Board	300
	Installation (average price)	375

Sum of boxes	$36,985	Δ = $485	
2172A System	$36,500		

UNBUNDLING ANALYSIS

		QTY→	LIST	1	5	15	50
a. OEM BUYER	COMPONENTS		$36985	$31584	$29682	$27849	$25,241
	SYSTEM (2172A)		36500	32120	29930	26645	25 550
	Δ =			485	(536)	(248)	1204	(309)
b. VEU	COMPONENTS		36985	36985	36985	33330	31,115
	SYSTEM (2172A)		36500	36500	33580	31390	30,660
	Δ =			485	485	485	1940	455

FOR COMPARISON PURPOSES ONLY — DO *NOT* USE FOR QUOTING.

Sales Aids

Product Content Guide "The Missing Link to DSD Documentation"
By: Bill Senske/DSD

A new fiche that answers the following questions:

- What is supposed to come with this product
- What manuals apply to this product
- What is the controller manual number with the disc subsystem
- What cable is normally provided with the xxx line printer

All of these questions have been answered in the past by extended serial searches of the field library or a $5 phone call to the Division sales development/support personnel.

The answers are now available on a "Product Content Guide" fiche that is being sent to all SE's, CE's and librarians. Look at this fiche and familiarize yourself with it. It will save you hours of searching. A sample entry is typed below:

* *

12962A   2100 IF & SUBSYS

* *

SOFE	12962-16001	DG-7905 DISC	1
DOC	12962-90001	MOD 7905 DISC	1
DOC	12962-90003	SS-2K FINSR MNL	1
MISC	12904A	RACK SLIDE KIT	1
ACC	12940A	FRMTTD DISC CART	1
SNI	13013A	MULTI UNIT CABLE	1
INST	13037A	DISC CONTROLLER	1
SMI	13037A-002		1
SMI	13213A	DATA CABLE	1
INST	7905A	CARTRDG DISC DR	1

* *

* *

9640A		RT MPRG SYS	

* *

MISC	0590-0789	NUT CHAN 1/4-20	2
MISC	2190-0032	LKWSHR 1/4 HEL	2
MISC	2680-0119	SCR 10-32X.625	24
DOC	5080-6595	PAD-COD FORTRAN	1
DOC	5080-6596	PAD-COD ASSY	1
DOC	02116-9014	MNL-ASSEMBLER	1
SMI	09600-14003	16K SIO KIT	1
SMI	09600-14004	24K SIO KIT	1
SMI	09600-14005	SIO MNL KIT	1

SOFT	20100-60001	BINARY TAPE	1
SOFT	20548-60001	FTN COMP PASS 1	1
INST	12892A	MEM PROTECT	1
INST	12897A	DCPC	1

* *

There is a significant cost to put this out so if you want me to follow up in the future please get me plenty of feedback.
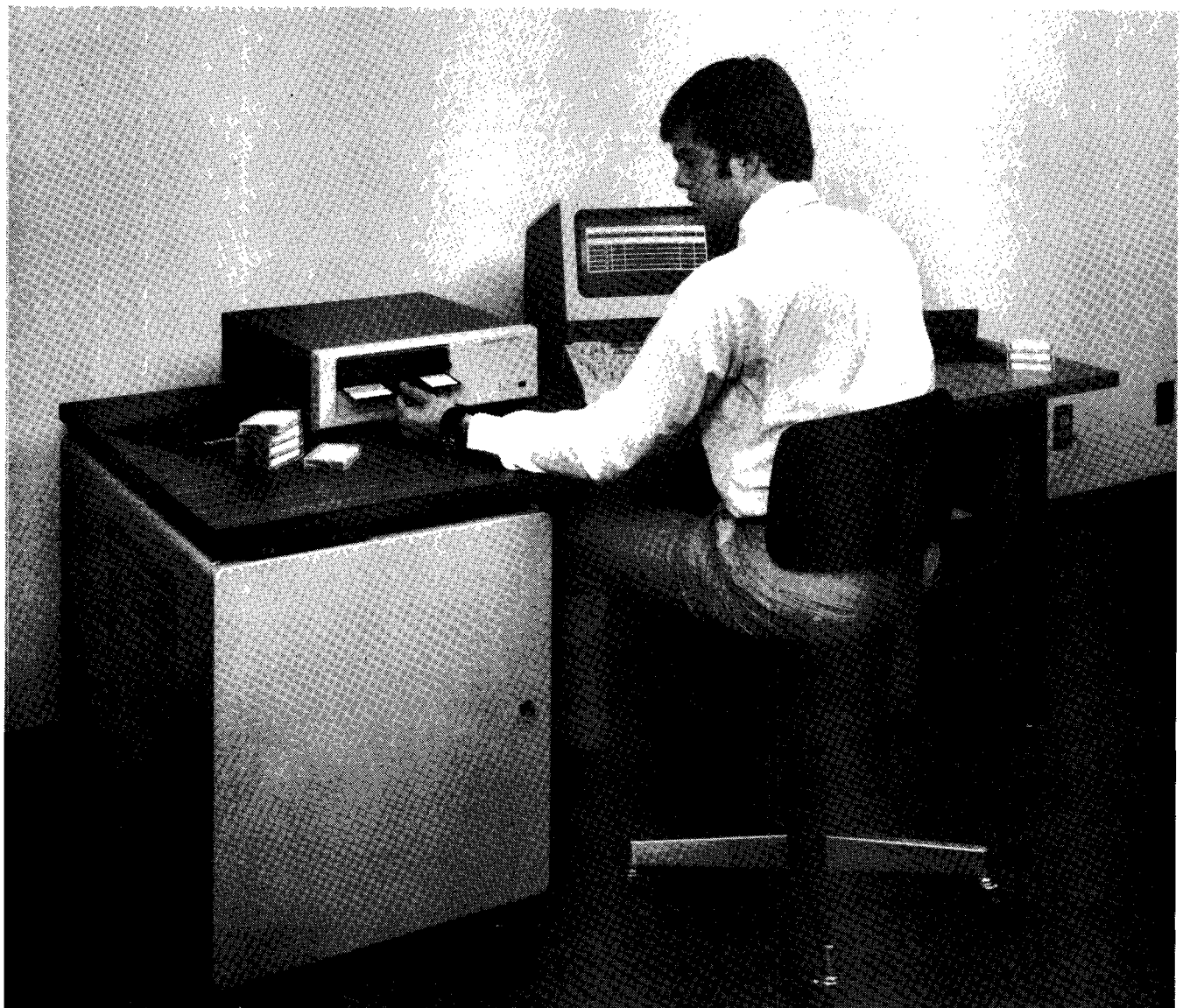
Model 20

DATA TERMINALS NEWS

Division News

Unveiling The 2645R!
By: Dave Goodreau/DTD

Have you ever wanted an Arabic-speaking terminal for 1001 Arabian nights?? Well, DTD has it!

The 2645R has all the super features of the 2645A plus it speaks Arabic. The 2645R displays both standard Roman characters and 31 Arabic characters. It operates in two modes at a "flick of the switch," Roman and Arabic. In Arabic mode, characters are displayed from right to left. The display is fascinating to watch (it is the mirror image of Roman mode.)

If you have an interested customer who needs Arabic, send him the 2645R data sheet (P/N 5952-9979). The price is $4350 without tapes and it has an eight (8) week availability.

2645R features:

- Arabic or Roman operation
- Combination Arabic-Roman Display
- Combination Arabic-Roman Keyboard
- Plus all the standard 2645A features

2641A APL Customer Response Rivals 2645A
By: Jim Elliott/DTD

One of the methods used at the factory to gauge product acceptance is the monitoring of customer responses to ads run in the trade media. To date, DTD's best response level has been from ads run on the 2645A High-Performance Display Terminal, and, not surprisingly, the highest monthly sales levels have been derived from the 2645A. However, the results for the 2641A APL Display Station are now in and the 2641A did 61% as well as the 2645A in one trade media and 88% as well in another. This latter response level was even more surprising since the media used had no method by which customers could easily request literature or a sales call; i.e., there were no "bingo's" to circle or post cards to fill

out. Each respondent had to take the time to personally write Hewlett-Packard for additional information.

Customers are asking about our APL terminal and we believe that it's for good reason, since price/performance wise, the 2641A has no significant competition. It can be operated strictly as an APL terminal, or with a single keystroke, it can be switched to 2645A type operation. And remember, APL users are a select group, keenly interested in the promotion of the APL language and associated products. So, take the time to process that APL inquiry — it could easily lead to a many-terminal sale!

Product News

On Line Read and Record With a Soft Key!
Soft Key Application Note #11
By: Carl Flock/DTD

The online READ function from a soft key.
With one soft key you can select the source device and "soft press" the READ key. FOR EXAMPLE:

■ L
`t&p1&4D%&c171000&315d5d50d311d171000&E`

This soft key has the effect of pressing the GOLD key, FROM: LEFT TAPE key and the READ key. Three keys in one.

The online RECORD function from a soft key.
With one soft key you can select the destination device(s) and "soft press" the RECORD and CARRIAGE RETURN key. FOR EXAMPLE:

■ L
`t&p2d3d4D%&c171000&315d43d70d76d15d315d32d120d311d171000&E`

This soft key has the effect of pressing the GOLD key, TO: LEFT TAPE key, TO: DISPLAY key, TO: PRINTER key, RECORD key and CARRIAGE RETURN key. Seven keys in one!

Note: These soft keys include some user contributed routines that are not part of the standard product offering and as such, are not warranted to work under all conditions and releases of 2641/2645 firmware.

The Cabalistic Cable Connection
By: Rich Ferguson/DTD

So you want to hook up a 2640-series terminal to an RTE system?

For character mode operation, a 12531D or a 12880A interface would be used at the RTE. In this case, use the 13232C cable from Data Terminal Division. This cable connects to the cable coming from the computer interface. Optionally, you can order a 50 foot hood-to-hood cable from Data Systems Division, which are options to the interface. The 13232B 50 foot hood-to-hood cable from DTD will also work with the 12531D and 12880A for character mode operations.

If you want to run block mode (DVR05) you need to use the 12966A computer interface. This again requires the 13232C cable from Data Terminals.

You can order the 50 foot hood-to-hood cable from Data Systems which is 12966A-001. In any case, the only Data Terminal Division cable is the 13232C that would be used to connect with an RTE system for block mode unless you specify 12966A-001. Contrary to popular belief, the 13232B cable which is a 50 foot hood-to-hood cable cannot be used with DVR05, but can be used for character mode applications with the 12531D or the 12880A interface.
There you have it!

Who Said It Couldn't Be Done?
Soft Key Application Note 5A
By: Eric Grandjean/DTD

If you are an ardent reader of this section, you have undoubtedly perceived that the wonderful world of the 2645 family of display stations is opening up a bit more every time. Today, we will reveal another of its many secrets. Certain applications require that internal functions be stored and executed from tape. Excellent examples are our dynamic demo tapes! There are rare cases, however, where certain codes will not execute as one would expect, when originated from a tape, due to some obscure timing conflicts inside of the box. That's no reason for discouragement.

The general approach to get around those conflicts is to program one of the soft keys with the stubborn function or sequence and record it at the beginning of the application tape.

What you do next is to record on tape the control sequence which will trigger the execution of that soft key! Call it indirect execution if you wish — it works.

Here is the recipe in short:
1. Program your soft key(s)
2. Record soft keys on tape
3. Append at beginning of application tape. (When you read tape back, function keys will be loaded automatically.)
4. At the appropriate place(s) of the application, record the function key trigger sequence as follows:

Esc&c177417a360dd10D	To trigger	f1
Esc&c177417a361dd10D	To trigger	f2
Esc&c177417a362dd10D	To trigger	f3
Esc&c177417a363dd10D	To trigger	f4
Esc&c177417a364dd10D	To trigger	f5
Esc&c177417a365dd10D	To trigger	f6
Esc&c177417a366dd10D	To trigger	f7
Esc&c177417a367dd10D	To trigger	f8

This method is another example of the tremendous flexibility and never-ending adaptability built into our 2645A terminals.

Cookbook Approach To Developing 2649A* Terminal Applications
By: Steve Stark/DTD
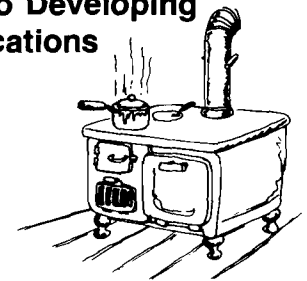
During several recent discussions with both field sales people and customers alike, I discovered that some confusion exists regarding the effort required to develop and implement firmware applications utilizing the HP 2649A Mainframe Terminal. In an attempt to remove this confusion, I should like to present a brief overview of the steps involved in the development of such applications.

Step 1
Develop an Understanding of the Operation of the Terminal Hardware and Firmware Subsystems. This is the most important step in the entire process because the level of understanding which is achieved is inversely proportional to the amount of effort which is required to apply the HP 2649A. A customer may achieve a high level of understanding by attending the HP 2649A Terminal Applications Course (13294A) and by purchasing and reading the Technical Information Package (13255A). This step typically requires 4-6 weeks of effort.

Step 2
Design Necessary Hardware/Firmware Additions/ Modifications to Allow Terminal to Function in Desired Fashion. There are several different approaches which may be used in the design of terminal applications and the effort required for each varies accordingly. The simplest approach is to modify and/or supplement the existing terminal firmware in a manner that yields the desired performance characteristics. This approach provides the user with the greatest

leverage because many of the utility subroutines which would have to be generated for most applications already exist in the terminal firmware. This step typically requires 4-6 weeks of effort.

If the application substantially differs from that of a data entry/retrieval/editing terminal, then the user may have to discard the terminal firmware and develop a totally unique firmware package. Obviously, the amount of effort required for this development will be dependent upon the application and is extremely difficult to estimate.

Step 3
Write Source Code and Assemble the Applications Firmware. All source code is written using Intel 8080 microprocessor assembly language. Once the source code is complete, it may be assembled using an Intel MDS-80 Microcomputer Development System or an HP RTE-II/III equipped with the RTE 8080 Cross Assembler Program which is provided as part of the 13256A Firmware Support Package. If any errors are detected during assembly, the source code will have to be edited to correct the errors and assembled again. This step typically takes 3-5 days of effort.

Step 4
Test and Debug Firmware. Once the firmware has been assembled, it is loaded into the 13290A Development Terminal for test and debug using the ROM loader on the 13293A Diagnostic/Loader ROM Module. The Intel ICE-80 In-Circuit Emulator, which is used in conjunction with the MDS-80 system, may prove to be helpful when debugging applications firmware since it allows the user to view the

instructions and data which the microprocessor in the terminal is processing. In certain situations, the user may find it more efficient to develop and utilize a special purpose debug program which resides along with the applications firmware. The amount of effort required for this step is typically 2-4 weeks.

Step 5
Produce Applications Firmware ROMS. The final version of the applications firmware is usually converted to a ROM media for mass production. The firmware ROMS are then installed in the HP 2649A Mainframe Terminals and the terminals are then shipped to the end user. This step typically requires 1 week of effort.

I want to emphasize the fact that the amount of effort required for each step in the process will vary according to the application. The amounts indicated above are gross approximations based on some typical applications (if there is such a thing) and are intended solely to provide the reader with some representative values. I would hope that, in the event that you quote any of the figures in this article, you would qualify them.

Now, with the confusion cleared up, you should have no trouble in capturing the imagination of at least one OEM who is interested in buying 300 terminals or more!

*Note: The 2649A products, accessories, options, documentation, training and discounts are available only for the U.S. and Canadian customers!

HP GRENOBLE NEWS

Division News

New OP Organization

By: Serge Boivineau/HPG

Now that *Catherine Celli* has returned to us in the OP department, we have reorganized our group in order to give every OP coordinator more time in their relation with the field.

Our department is always structured so that one person is responsible for your particular country:

ANNIE BARBE — France, Netherlands.
CATHERINE CELLI — Italy, Finland, Norway, Sweden, Denmark.
GABRIELLE MINGAT — Germany, Spain, Switzerland, Austria, Icon.
MARIE-THERESE POT — United Kingdom, Belgium.

From left to right: *Annie Barbe, Marie-Therese Pot, Gabrielle Mingat, Kathy Romani, Catherine Celli*

Please, contact only your OP coordinator (fully trained and capable to handle your orders) for all inquiries concerning availability, acknowledgement status, APO's, etc.

However, please feel free to call our OP Supervisor, *Kathy Romani*, should the need arise.

European RSM Meeting In Grenoble

*By: Guenther Kloepper/HPG*
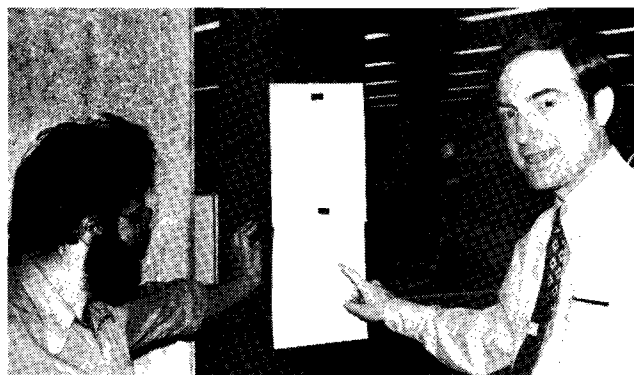
Ed Hayes put on his famous smile as the first quarter European results were posted (Product Line 67 44% above quota).

While being shown around the Grenoble 2640 product line, (above), he expressed his satisfaction when *Gilbert Celli*, production line leader, presented the first production results.

Bob Puette discusses the finer points of DSD business strategy with *Guenter Kloepper, Pierre Ardichvili,* and *Georges Rezwiakoff.*
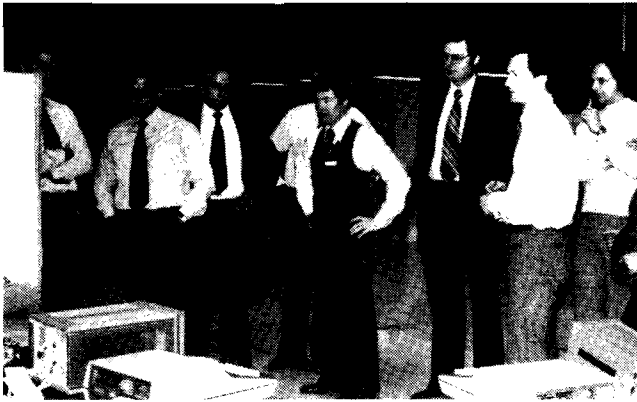
Everyone had a chance to see an impressive 3070/HPIB demo on the HP 1000. Four remote 3070A's with a whole bunch of instruments (among them a 6940 Multiprogrammer) were run simultaneously.

From left to right: *Cyril Yansouni, Heiner Blaesser, Erik Bek, Jean-Pierre Baudoin* (hidden), *Georges Rezwiakoff, Peter Schoeltzel, Georges Ouin* and *Marc-Henri Bricquet*.

Product News

264X And RTE Systems
By: Francis Marc/HPG

Many of you encountered intermittent failures when connecting a 264X terminal driven by the DVR05 of an RTE-II/III/1000 System and spent a long time fixing it.

In that case, check first the "extended data communications" board for switch positioning.

The best start is to set all the switches open, except A11, A10, A9 and THE that must be closed.

Then, consult the appropriate reference manual (2640X page 7-18 or 2645A page 7-25) if you wish to know about the other communication possibilities.

What Will Be Option 017 In Your 264X?
By: Francis Marc/HPG

You all know that option 015 covers the 220V/50Hz operation and is almost a general rule in Europe.

In the same way, our countries have some specific requirements about safety, electromagnetic/radio frequency interferences and communication standards. So, a new option 017 was created and will also be offered (at no charge) with all the units shipped to Europe.

The 2640B, 2641A, 2645A (options 015 and 017) have received the VDE, FTZ and SEV approvals. Submission to DEMKO, BSI, EI, OVE is in process. *Benny Herbst* is actively managing these procedures.

The option 017 includes mainly:

- Special silver paint on the inner side of cabinet molded parts.
- Shielding plate in the keyboard and grounding of the keyboard cable.

In addition:

- Option 015 already comprises the new power supply (safety requirements).
- The new "extended data com." board (fully CCITT V24 compatible) is now available.

The option 017 is not available yet, but the new parts manufacturing has started and within a few weeks we will be glad to stick a lot of meaningful labels on the back of your terminals.

Where To Order Your 264X Accessories?
By: Francis Marc/HPG

Some cables and accessories manufactured at Grenoble are common to the whole terminal family:

Cables   13232   A,B,C,F,G,H,J,K,L,M,N,S

Accessories   13234A, 13238A, 13245A, 13246A/B, 13254A, 13349A

If they are ordered with 2641A or 2645A, please be consistent and send the complete order to DTD (Division 42). In this way, you will have only one supplier. To do so, ask your OP coordinator to override on the order.

Sorry for this temporary inconvenience which will disappear whenever we will have the 2645/2641 transferred here.

Order Processing

Ordering An "Asynchronous Communications Interface"
By: Francis Marc/HPG

You might have gotten confused, so let's clarify the situation:

There are two point-to-point/asynchronous/data communications interfaces available (see the reference manuals for characteristics).

- The "standard" one is normally included in the 264X, except if you specify:

    2640X   option 020
   2641A or 2645A   option 030

    You may also receive it as a 2641A/2645A add-on when ordering a 13260A.

- The "extended" one *was* supplied if ordering:

  option 020
     or   for 2640's
  13250A* (add-on)

  13260B for 2641A/2645A.

- The PC board forming the "extended data com." was recently modified (old part number 02640-60089, new one: 02640-60143) and got important improvements so it is now PTT approved almost everywhere:

  – monitoring of the CC line (data set/modem ready) will light on a LED on the keyboard overlay.

– selecting the modem baud rate (600/1200) with the CH line.

- The "extended data com." board *is now* supplied if ordering:

  option 020
     or   for 2640's
  13250B* (add-on)

  13260B for 2641A/2645A.

*The 13250A is now obsolete and replaced by the 13250B. Order that last one if you need a *serial printer interface*.
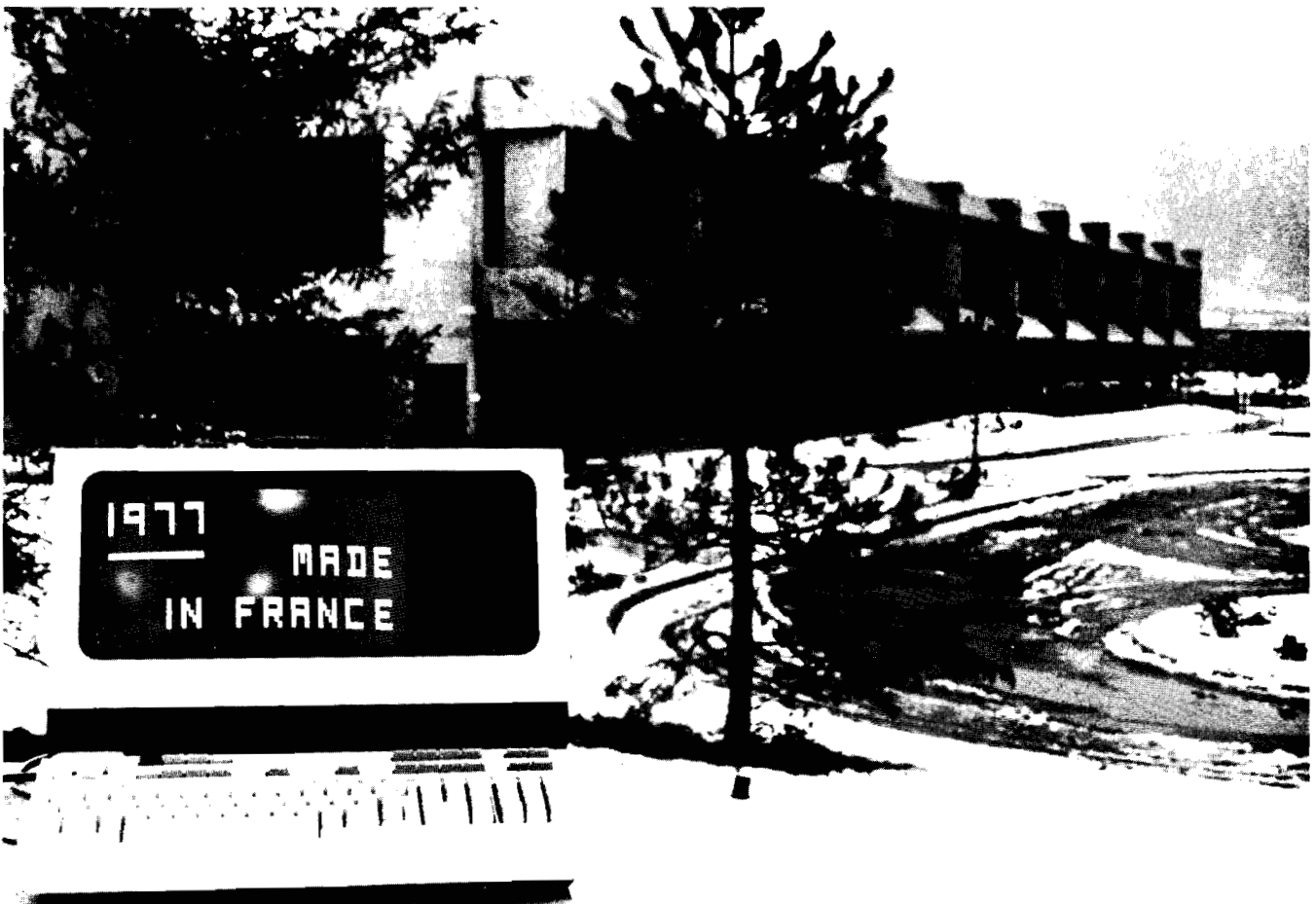
GENERAL SYSTEMS NEWS

Product News

30409A Becomes 30409B, April 1
By: Ross Hunt/GSD

Effective on the April 1 Corporate Price List 30409A is being replaced with 30409B. This change will impact your volume contractual customers because it changes the functional unit credit for the upgrade to Series II from four functional units to two functional units.

If you have any situations where your customer is adversely affected, please contact either *Dave Sanders* or myself for clarification and resolution at (408) 249-7020.

Locking/Unlocking Files From COBOL
By: Gregg Gloss/GSD

Beginning with versions B.02.04 and C.01.02 of the COBOL/3000 Compiler, both on the 1701 MIT in distribution, files may be dynamically locked and unlocked from COBOL programs. Before locking a file, it must be opened with dynamic locking enabled. There are two ways to specify this feature from COBOL.

1. A new parameter on the $CONTROL command:

    $CONTROL LOCKING

    This will enable dynamic locking for all files specified in an FD entry. The command may appear any place in the source program.

2. Since all concurrent users of a file must specify the same value for the dynamic locking bit, it may be inconvenient to enable locking for all files. Therefore, a parameter has been added to the system-file name clause of the SELECT statement. This parameter allows you to selectively specify which files are to be opened with dynamic locking enabled.

    SELECT file-name ASSIGN TO "fname [.class [, . . . , formsmsg [,L] . . .]"

    The "L" after the formsmsg parameter will enable dynamic locking for that file. If something other than an "L" is specified, a warning message will be issued and locking will not be enabled (unless the $CONTROL LOCKING command was also specified).

The actual locking and unlocking must be done by calling an SPL *procedure*. For this *purpose, two new user-callable* procedures, COBOLLOCK and COBOLUNLOCK, have been added to the COBOL Library.

1. COBOLLOCK

    a. Three parameters:
        1. FILE-NAME (from FD entry)
        2. LOCK-COND (PIC S9(4) USAGE COMP)
        3. COND-CODE (PIC S9(4) USAGE COMP)

    b. This procedure may be used to lock a file which has already been opened with dynamic locking enabled. The LOCK-COND parameter corresponds to the second parameter of the FLOCK intrinsic; that is, an odd (TRUE) value specifies that if the file cannot be locked immediately. the process suspends until it can be locked. An even (FALSE) value will return to the calling process if the file cannot be locked. The COND-CODE parameter returns the condition code from the FLOCK intrinsic as shown below.

    c. Result:

        – 1 (CCL) Request denied because this file was not opened with dynamic locking, or the request was to lock more than one file and the calling process does not possess the Multiple RIN Capability.

        0 (CCE) Request granted.

        + 1 (CCG)Request denied because the file was locked by another process. (Not returned if LOCK-COND was odd (TRUE)).

    d. Sample Call:

        CALL "COBOLLOCK" USING UPDATE-FILE. LOCK-COND, COND-CODE.

2. COBOLUNLOCK

    a. Two parameters:
        1. FILE-NAME (from FD entry)
        2. COND-CODE (PIC S9(4) USAGE COMP).

    b. This procedure may be used to unlock a file. The COND-CODE parameter returns the condition code from the FUNLOCK intrinsic as shown below.

    c. Result:

        – 1 (CCL) Request denied because the file was not opened with the dynamic locking aoption of the FOPEN intrinsic, or the file is not open.

0 (CCE) Request granted.

+ 1 (CCG) Request denied because the file had not been locked by the calling process.

d.   Sample Call:

CALL "COBOLUNLOCK" USING UPDATE-FILE, COND-CODE.

Sales Aids

Performance Notes
By: John Page/GSD

There are really two types of performance data found in the Technical Summary (5953-0503) which was distributed to you during the recent NPT Tour.

1.   How Do I Use The Performance Data?

There are really two types of performance data in the technical summary:

1.   Tests that represent real life situations
   (a) Light Commercial — Mix 1
   (b) Medium Commercial — Mix 2
   (c) Heavy Commercial — Mix 3
   (d) Dedicated APL — Mix 6
   (e) Multilingual APL — Mix 7

These tests can be pointed at and the customer told "See! this is just like your System."

2.   Tests designed to prove a point
   (a) Dedicated Transaction Processing — Mix 4 (KSAM)
   (b) Dedicated Transaction Processing — Mix 5 (IMAGE)

In spite of going up to 63 terminals, these loads are actually quite light. This is because the data file structures and transactions themselves are very simple in relation to real life. The point is, it is not the system that limits the performance in these environments — it is the design of the files, data base, transactions, and programs. The user will have to determine for himself whether he can run on a 3000.

One other point — the transaction processing tests (MIX 4 and 5) were run in character mode. Block mode would certainly cause degraded figures. We are working hard right now to characterize systems with block-mode terminals and we will let you have the results just as soon as we get them.

2.   How Many Controllers? How Many Selectors? Do We Overlap Disc I/O?

In most cases, having two disc controllers and selectors makes little difference to system performance. We will first look at how the system behaves and then offer an explanation of this behavior.

For drives on the same controller, no overlap is attempted. This means that a whole seek and transfer cycle has to complete on a drive before another cycle can be

started on another drive. However, two drives on one controller will usually result in better performance than one drive because of the reduced probability that the head will have to move.

If there are two controllers, MPE manages them totally independently and thus will allow operations to go on in parallel on both controllers. However, a single selector would still prevent this parallelism from taking place. So two selectors would be required before true parallel operation would begin.

If you were to buy two controllers and two selectors you would find the performance only a few percent better than the system with 2 discs on one controller/selector.

Why?

1.   When a process is running and requests a disc transfer, it is suspended until the transfer is complete and then immediately gets control of the system back again.

2.   During this 30mSec or so of suspension, the CPU is free, so the dispatcher tries to find someone who can use it. However the dispatcher realizes that the CPU is going to be available for only 30mSec, so it knows that it would be pointless to try to run a process that is not already in memory since it would take longer than 30mSec. to make it present. (It may even be on the disc that we are already waiting for.)

3.   For this reason the dispatcher will only run someone else in this period that is:
   (a) Already in Memory
   (b) Ready to run (not I/O suspended etc.)

If no such process exists, the CPU pauses. The probability of finding such a process is about 0.3 in a full memory size machine.

4.   Assuming that such a process can be found, it may not request any disc I/O in this period. If it does not then no simultaneous I/O would be started up. The probability of the process asking for I/O to disc is about 0.2 based on typical programs.

5.   Even if we get this far, the I/O request might be to the same controller that is already running — preventing simultaneous operation. The probability of hitting the free channel in a 2 disc system is 0.5.

6.   Therefore the probability of actually starting parallel transfers is a conditional probability equal to 0.3 x 0.2 x 0.5 = 3% approximately.

7.   With smaller memory sizes the increased swapping makes the overlap a little better because the swapping tends to be on one drive and file system I/O on the other. However, it is much cheaper to increase performance in this case by adding memory than messing around with disc channels.

Conclusion:

Do we overlap seeks and Disc I/O? Yes sometimes.

Can two disc channels *ever* help? Yes. If you have a dedicated application with one or two processes running where the disc I/O load is very evenly balanced across the discs, two channels make a difference. This is very, very rare though.

HP 3000 Series II Systems

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A computer advance in information processing

Technical Summary

5953-0503

Division News

Such A Deal
By: Dan Davis/GSD

Bill Payne, F.E. Cleveland office is currently working with a customer who plans to upgrade 3000CX to a Series II. Upon doing this, the customer is making available for sale: 1-7970B without controller, 1-7905A without controller both racked in a single 56" cabinet. Price for the tape drive, disc, and cabinet is $12K. For further details contact *Bill* directly at (216) 243-7300.

Erratum
By: Carol Budkowski/GSD

In the March 15th issue of the Newsletter, an article appeared about the HP 3000 User's Group Newsletter (see page 20) which references a January, 1976 issue.

Please note that it is not the January, 1976 but the January, 1977 issue which should have been referenced.

COMPUTER SYSTEMS NEWSLETTER