

data systems newsletter

For HP Field Sales Personnel

FRANKFURT HEWLETT  PACKARD
REINHARDT HELMUT

Volume 2
No. 17
June 13
1975

DIVISION NEWS

9600MX SERIES SYSTEMS NOW ON GSA

by Ed Smith

In time for the end of the Government fiscal year, your Class 66 GSA schedule for Data Acquisition Systems now has the 9602A, 9603A, 9604A, 9611A, 9611R, and **9640A** systems. (As of May 27th, the 9603R was not included. But, this is an apparent oversight and should be corrected by the time you read this.)

This type GSA schedule is very easy for your Government customer to use. No lengthy procedures are required. Terms and conditions are virtually identical to the expired 9601 contract, and include one year warranty, F.O.B. destination, two percent cash discount, and two percent service credits. Contract number is the same as the previous one (GS-00S-29650). Contract date is May 27, 1975 through April 30, 1976.

Options currently on the schedule are the majority of those on the April Corporate Price List. (Excluded are the 50 Hz and slower mag tape options.) We expect to be able to add the newer 7905, RTE-III and 2112 options on July 1.

The printed catalog will be distributed around the end of June. Until then, contact *George Fernandez* for system and option prices. They are *not* identical to the Corporate Price List (because of the extended warranty).

Sell up a storm with **9600MX's** and **9640's** on GSA!

HEWLETT  PACKARD

GSA ADP CONTRACT AWARDED!

by Ed Smith

Now the 2000 and 3000 systems, 21MX computers, Discs, Mag tapes, etc. are available on the GSA ADP schedule. Contract number is GS-00C-00437, effective May 30, 1975 through June 30, 1975. We should shortly be awarded another contract for the year beginning July 1, 1975.

As of this writing (May 30), we haven't worked out what printed documentation we can use to capitalize on year-end money. By the time you read this, your D.M. will have further details.

HEWLETT  PACKARD

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UL APPROVAL FOR THE 2640

by Joe Schoendorf

THE 2640 CONTINUES TO BE A FANTASTIC WINNER, THANKS TO YOUR FINE EFFORTS. TO KEEP THE MOMENTUM GOING, WE JUST SECURED UL APPROVAL EFFECTIVE JUNE 1. BY THE TIME YOU READ THIS, ALL UNITS SHIPPING TO THE US OR CANADA WILL BE UL APPROVED.

HEWLETT  PACKARD

Company Private

HP Computer Museum
www.hpmuseum.net

For research and education purposes only.

NEW 21MX PRODUCT MANAGER

by *Bill Krause*

I am pleased to announce that *Bill Senske*, currently our Neely Sales Development Manager, has agreed to accept the position of 21XX Components, Product Manager. As 21XX Components Product Manager, *Bill* will be the Marketing representative on the 21XX Product Line Business Team.

Bill has been with Hewlett-Packard since June of 1970 and has had assignments in Production Engineering, production line management, as well as Sales Development; and we are certainly delighted to have *Bill* joining our product management team.

Bill's move will be effective June 15. He will be looking forward to hearing from all of you (on ext. 2591), regarding any current 21MX OEM sales situations, and in particular, future product needs from your current and potential OEM customers.

Joe Schoendorf will be announcing *Bill's* replacement in Sales Development shortly. I am sure all of you join me in wishing *Bill* success in his new assignment.

HEWLETT  PACKARD

DATA SYSTEMS RECEIVES ITS BIGGEST ORDER

by *Barry Klaas*

In May the Data Systems Division received the largest single order it has ever received, nearly \$3 million worth of M/210 systems with 2640's. All of our division salutes *COLIN HOWARD* of Australia, our D.M. who developed this sale. The customer, the New Zealand State Services Commission, will be installing 41 DOS systems with 192 2640's by September. This multipoint network will link up with the New Zealand government's data processing center and will form a network used primarily for data entry of government social service and revenue information.



Malcolm Kerr, Barry Klaas, and Ben Holmes with the order in hand at Cupertino.

A typical system consists of an M/210 system with DOS-IIIB, 2762B terminal printer, 16-channel asynchronous multiplexor, 32K word memory, Synchronous Interface Card, TCS, SLC, and about five 2640 CRT's.

This order is a reminder to us all of the importance of our international business which for all of HP is now exceeding the domestic business. As a matter of fact, the rest of the DSD Intercon orders booked in May exceeded sales targets without counting this huge order. Even without their order Intercon is 84% ahead of last year.

Kudos to *Bruce Graham*, the country Computer Systems Regional Sales Manager for his astute management of the sale.

These systems will see service throughout New Zealand in such places as Upper Hutt, Lower Hutt, Tauranga, Waunganui, Whangarie, Rotorua, and Wiri.

CHERRIO AND GOOD SELLING!

HEWLETT  PACKARD

HP — THE SUPERSTAR AT NCC

by *Nev Griffin*



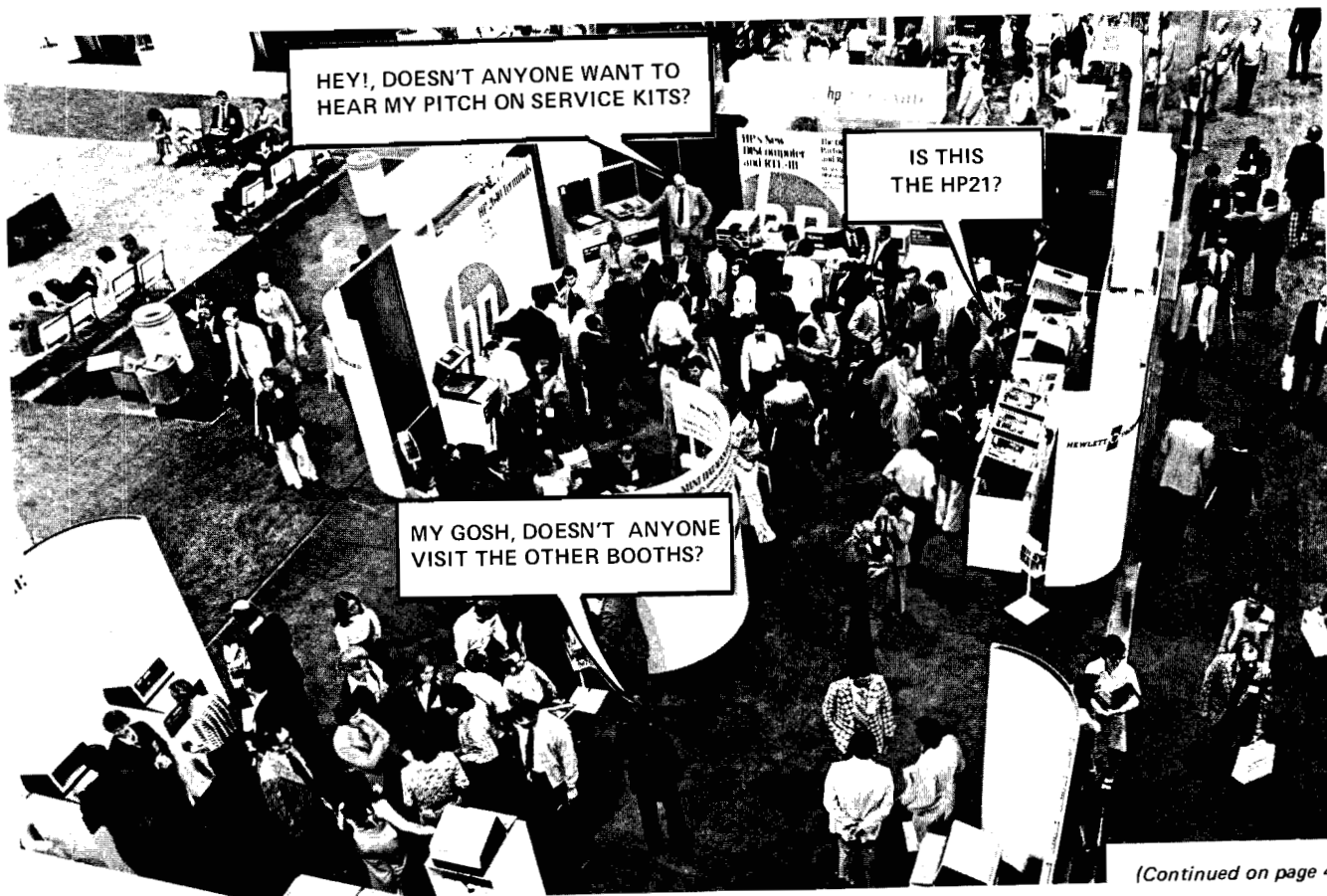
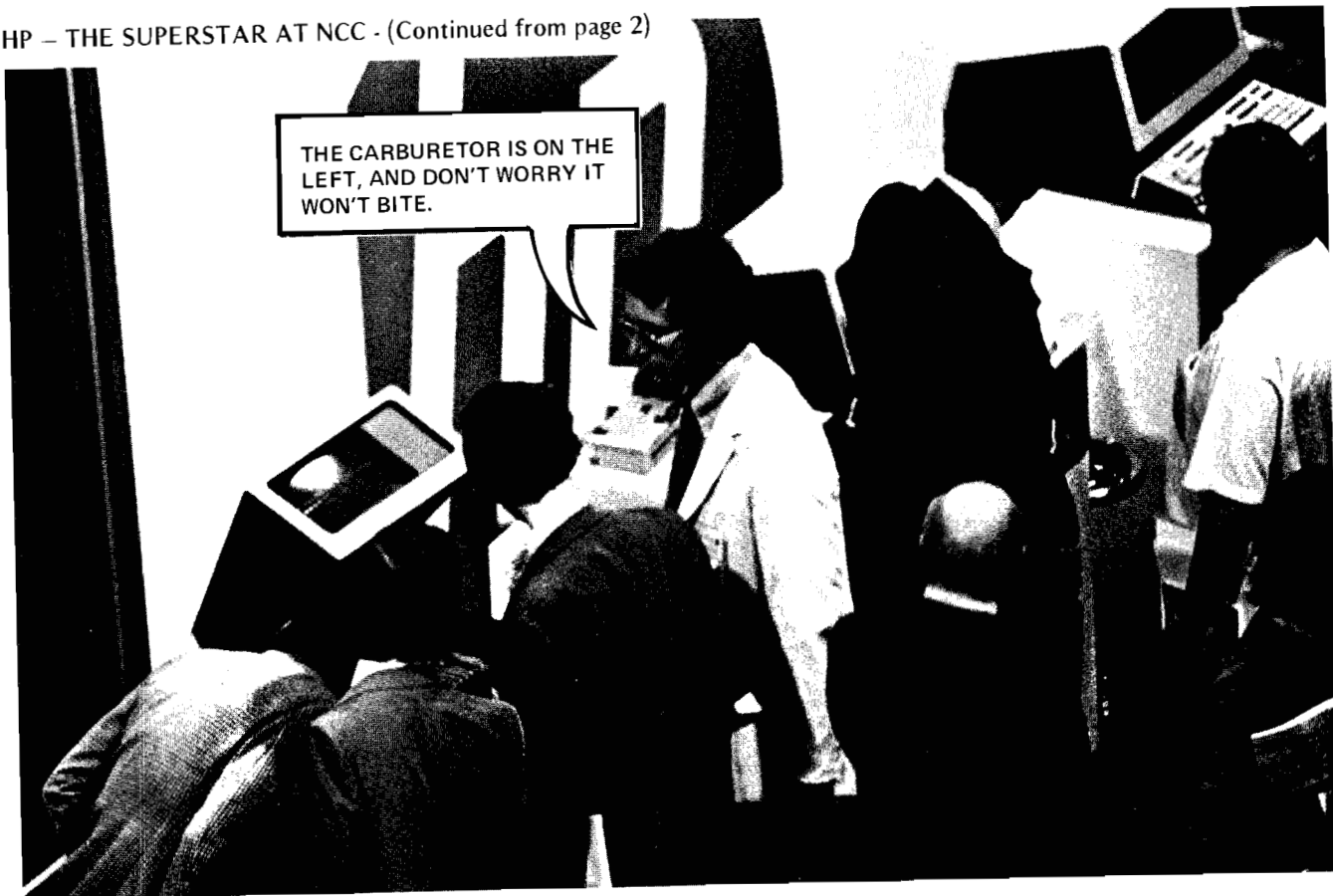
"The most effective minicomputer booth at the Show!" This quote was stated time and time again by visitors to our display. Featuring the 3000CX, Discu/15, RTE with the color video monitor, 21MX family and the 2640's (with service kits, no less), our booth captured the highest inquiry and "hot lead" count since we began attending the computer conferences. This breaks down as 1130 and 134 respectively with the hot ones forwarded directly to the regions.

Supplementing our effort on the floor was an informal press reception hosted by *John Young*. *Dick Anderson*, et al held Monday evening attended by over 75 media people. This turnout certainly reflects the strides Data Systems has made in press relations over the last two years.

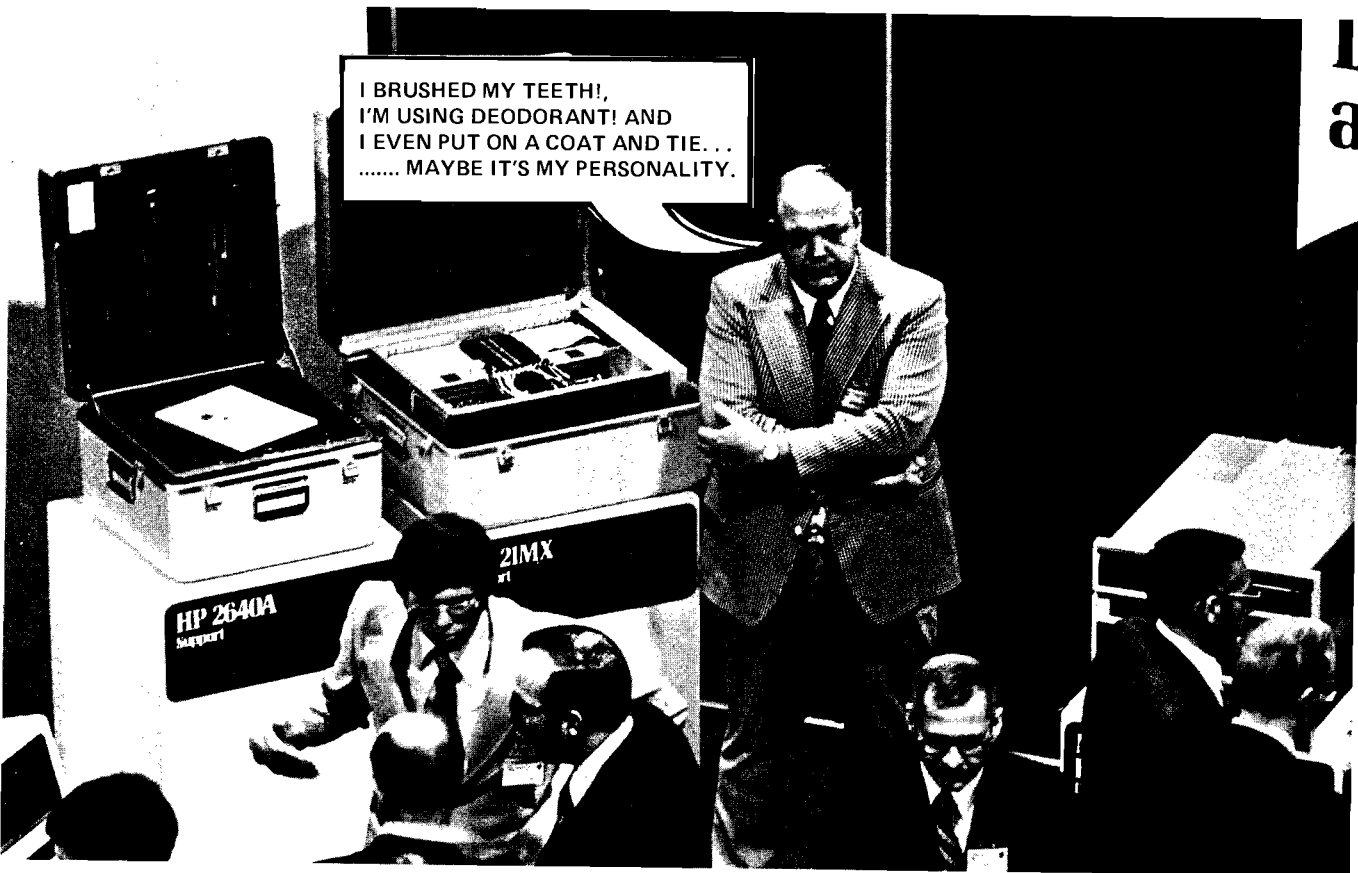
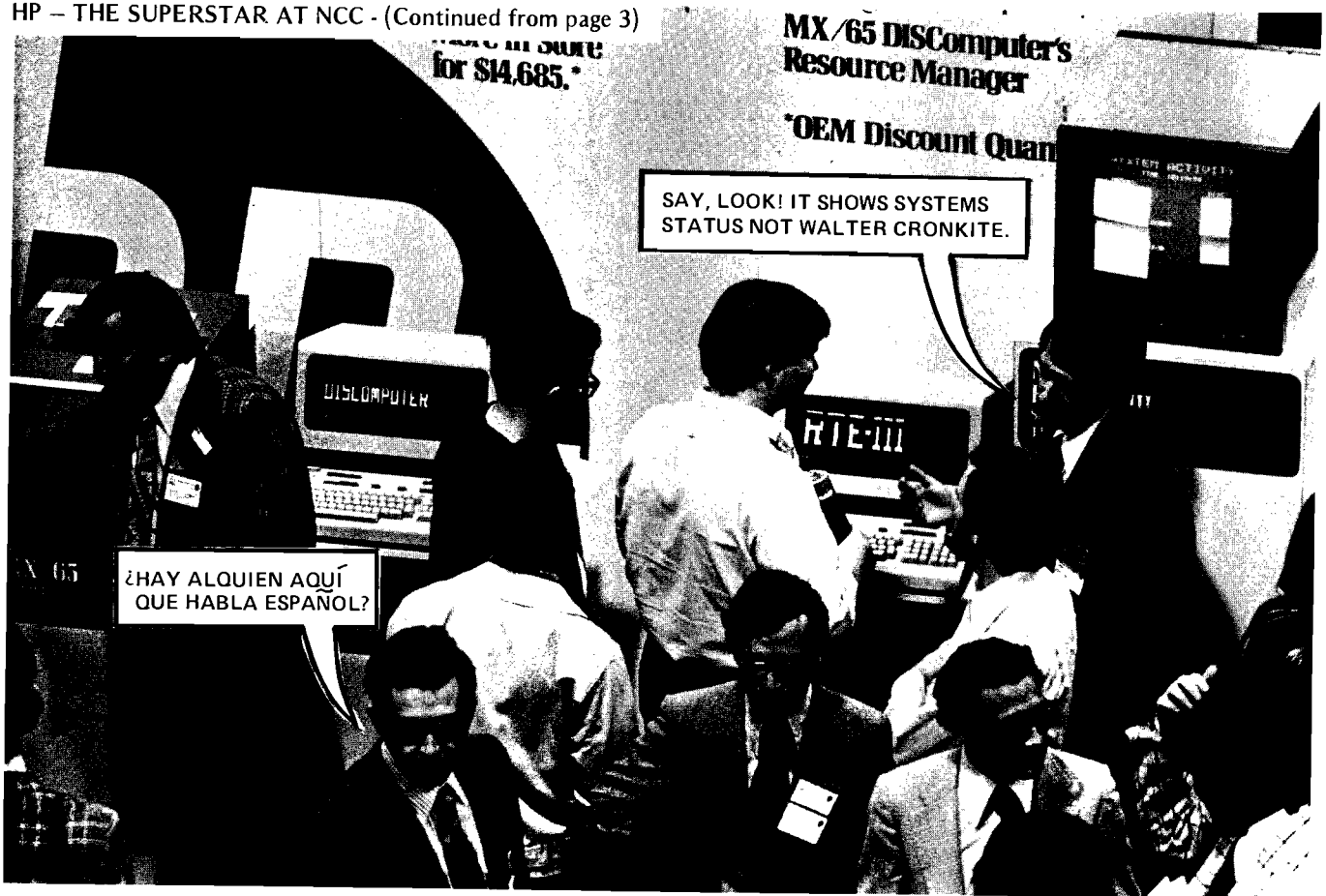
In addition, six 3000CX seminars were held focusing on the commercial, scientific and technical attributes of the system. Between 40 to 60 people attended each session!! Congratulations to *Tom Bailey* and his team for spearheading this successful effort.

We've already reserved our spot for next year's show in New York — so — Watch out, Digital!, we're moving!!

(Continued on page 3)



(Continued on page 4)



DIVISION POLICY

APO POLICY

by Ken Newton

Let us restate our APO policy so as to avoid confusion and broken promises to your customer.

- APO's for Systems (including Rack Only Systems) will be held open for 4 weeks.
- APO's for instrument orders will be held open for weeks; an additional 4 weeks will be granted if requested.

APO's will be acknowledged via TWX with an automatic cancellation date in the TWX.

Any exception to this policy must be initiated by the District Manager to the appropriate sales development manager (Joe Schoendorf or Nev Griffin). Good selling!

HEWLETT  PACKARD

SALES AIDS

PERIPHERALS CLOSE ACCOUNTS!!

by Ed Hayes



Want to close orders at new accounts?
 Want to close orders at competitors accounts?
 Want to close orders at your existing accounts?
 Yes, Yes, Yes!!!
 How? Sell peripherals, HP's strong suit.

We have a Royal Flush with the 2640A, 7905A, 7970B, 21MX and 7260 series of products.

You've done it in the past and several salesmen are doing it now. So expand your customer base and sales by selling peripherals, getting you and HP in the account and then selling the 21MX, 3000 and systems as your customers discover what a good outfit you and HP are to do business with.

PRODUCT SELLING SITUATION

Customer Category	Computer System (disc based) buys everything from one vendor	Computer (memory based) or Peripheral, buys from any mix of Peripheral, buys from any mix of vendors	Peripheral, makes his own CPU or controller																														
Product	<table border="1"> <tr><td>Description</td><td>Model</td></tr> <tr><td>CPU</td><td>21MX 3000/50</td></tr> <tr><td>Subsystem</td><td>12960/2</td></tr> <tr><td>Disc</td><td>12970/2</td></tr> <tr><td>Tape</td><td>12970/2</td></tr> <tr><td>Terminal</td><td>2640A</td></tr> </table>	Description	Model	CPU	21MX 3000/50	Subsystem	12960/2	Disc	12970/2	Tape	12970/2	Terminal	2640A	<table border="1"> <tr><td>Description</td><td>Model</td></tr> <tr><td>CPU</td><td>21MX 3000/50</td></tr> <tr><td>Disc</td><td>13390 (DISCU/15)</td></tr> <tr><td>Tape</td><td>7970B/E</td></tr> <tr><td>Terminal</td><td>2640A</td></tr> </table>	Description	Model	CPU	21MX 3000/50	Disc	13390 (DISCU/15)	Tape	7970B/E	Terminal	2640A	<table border="1"> <tr><td>Description</td><td>Model</td></tr> <tr><td>Disc</td><td>13390 (DISCU/15)</td></tr> <tr><td>Tape</td><td>7970B/E</td></tr> <tr><td>Terminal</td><td>2640A</td></tr> </table>	Description	Model	Disc	13390 (DISCU/15)	Tape	7970B/E	Terminal	2640A
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Competitors	DEC DG	DEC DG PERTEC WANGCO DIABLO	PERTEC WANGCO DIABLO HAZELTINE ADDS																														
Pricing	DISComputer MX55 = \$13,035 MX65 = \$15,675 Discount based on CPU count, terminal count	13390A = \$8,448 7970E = \$7,194 2640A = \$2,550 2108A = \$5,808 2112A = \$6,402	13390A = \$8,448 7970E = \$6,187 2640A = \$2,550																														
Selling Thrust																																	

Quantity 50 ea, 16K,
2640A - Quantity 75

HEWLETT  PACKARD

IMAGE 5-75 OVERHEAD SLIDE PITCH

by Jean Toth Kelley

A new overhead slide pitch with features, advantages, and benefits of IMAGE/3000 is now available through Data Systems. The pitch is divided into three modules:

- I. Traditional File Management vs. Data Base Management
- II. Implementation of Data Base Management on the 3000CX
- III. Query/3000

(Continued on page 6)

IMAGE 5-75 OVERHEAD SLIDE PITCH - (Continued from page 5)

A 15-minute video explaining the slides accompanies the overheads. Please order on an IOS through the mail to *Bob Hall*, Cupertino. Specify IMAGE 5-75 with video as reel-to-reel or cartridge. Price \$50. Slides are not available separately.

Happy selling!

HEWLETT-PACKARD

SALESMEN'S CORNER

HIGHER BID WINS Foothill COLLEGE CONTRACT

by *Don Lund*

Bill Hilliard, Neely, has closed an order with the Foothill College District for two 2000/Access Systems, one RTE, and 17 - 2640A's (Interactive Display Terminal). The 2000/Access Systems will be used in instructional areas on the DeAnza and Foothill campuses in Cupertino and Los Altos Hills, respectively.

The competition for the 2000/Access Systems was Decision, Inc., a division of Ball Computer Products. Their bid for the two systems was about 40K less. The Foothill College computer selection committee justified their choice of our systems with the following reasons:

1. HP has over 300 programs in the contributed library which will help us get started. The other vendor has 19.
2. HP response times are superior by a factor of at least three.
3. HP has superior system support capability.

Super work, *Bill!*

Enclosed is an article which appeared in the Palo Alto Times describing the HP award. There good selling info here!!

HIGHER BID WINS Foothill CONTRACT

The trustees of the Foothill Community College District have accepted a Hewlett-Packard bid for an instructional computer that was \$59,000 higher than a rival bid.

The 3 to 2 vote by the board of trustees came Thursday after the district administration recommended acceptance of the HP 2000G computer for \$238,000 over the Ball Computer Products Nova II computer for \$179,000.

Reportedly, the board will be asked to accept a higher Hewlett-Packard price on terminals for the instructional system Monday night.

William Lambert, controller for the district, said the Hewlett-Packard computer came with 300 programs designed for instructional use, while the Ball equipment had only 19 programs suitable for community college use.

The computers will be used in several courses at both Foothill and De Anza colleges. Classes in engineering, business, physical sciences, math and the library will utilize the system.

Trustees Franklin Johnson and Norman Shasky opposed the board action, claiming the bid specifications were not clear. Trustee Robert Smithwick, joined by Howard Diesner and Al Chasuk, noted the district had been criticized in the past for making specifications too specific and limiting bidders.

Lambert said Hewlett-Packard was a specialist in computers for educational uses, was local and was well-known.

Ball Computer Products of the East Bay was a new firm with few educational customers.

Lambert said suggestions that the district use the \$60,000 savings on the Ball computer to hire people to write the necessary programs was unrealistic. Delays in having the programs by the fall could result in a loss of enrollment the district is counting on to pay for the computers.

The district receives funds based on enrollment and is counting on attracting 230 new students into classes using the computers. If the programs are not ready for the fall, Lambert said, the district could lose \$70,000 in anticipated income for that quarter.

A slower response time and a problem on computer disc files for the Ball system contributed to the recommendation for the Hewlett-Packard computer, he said.

The \$238,000 price tag covers the computer and software package, and the district will still have to purchase equipment with which to use the computer, including classroom terminals.

The terminal purchase or lease-purchase will be discussed Monday night when the board meets at 8:15 p.m. at the district offices, 12345 El Monte Road, Los Altos Hills.

HEWLETT-PACKARD

THE HP "CURE"

by *P. Danzer-Ramirez*

Long Beach Community Hospital is a medium sized hospital (300 beds) in Long Beach, California. They have been renting a Xerox Sigma 5 for \$13,000 a month. It is expensive and is somewhat limited in terminal support calibration.

(Continued on page 7)

THE HP "CURE" - (Continued from page 6)

The administrators decided to take a look at mini's to see if one could do the job. They saw an ad for the HP 3000 in *Computer World* and contacted the HP office. According to *Bob Ulery*, the man who prescribed the "cure" for the hospital, sixteen other mini computer vendors were also involved in this sales situation.

The hospital needed on-line capability for data base management and all finance work. *Bob* proposed the 3000 with COBOL-IMAGE to do the following for Long Beach Community Hospital:

- admitting
- charge — collection
- discharges
- bed census each day
- billing
- insurance company files
- accounts receivable
- accounts payable
- payroll
- inventory control

In addition to the added capabilities using the HP 3000, the hospital would save about \$5,000 a month and in 3-1/2 years own the system outright!

As a final convincer -, thanks to *Dave Walmsley* the Systems Engineer, HP did an outstanding job on the benchmarks. DEC tried an end run by using unformatted files when formatted files were required, which *Dave* discovered.

Bob believes that this performance plus the fact that HP understands hospitals and, that, as one vendor can provide a more total medical systems solution, convinced Long Beach Community Hospital to place their order for a 3000.

The order was entered in April, the system will ship in late August. *Bob* also mentioned that the hospital is willing to provide their software to other hospitals.

Our congratulations to *Bob* and *Dave* for a job well done!

HEWLETT  PACKARD

C.E. CORNER

FIELD RACKING OF COMPONENTS

by *Doug Hoffman*

There have been numerous cases recently of CE's sending charges into the factory for racking or re-racking of customer's systems.

In the first case, the customer has ordered individual instruments, and has been shipped those parts. He has not

ordered or paid for a complete system, racked or tested. It is the job of the salesman to inform the customer that if he wants a system, he must order a system.

The re-racking has occurred in cases where the factory has shipped a system or a set of racked instruments. When we rack a system at the factory we take into consideration such things as power distribution, heat dissipation, cabling, RF noise, safety, EMI, operation, and individual needs of the specific instruments. If the customer wants a specific racking, send in the site-prep. information with the order. Site-Prep. manual P/N 02000-90098.

RERACKING A SYSTEM VOIDS THE SYSTEM WARRANTY AND MAY VOID WARRANTY FOR THE INSTRUMENTS

Check with the factory first.

HEWLETT  PACKARD

PRODUCT NEWS

ANNOUNCING . . . NEW TV INTERFACE CARD

by *Peter Palm*



For those who need . . .

- Low cost computer graphics . . .
- Large screen displays
- Color or grey scale displays
- Multiple displays up to 1650 ft. away

Already we have received 40 orders for this important capability. The 91200A TV Interface card uses 4K RAM memories on a single 21MX plug-in I/O card to continuously refresh a 256 x 256 dot matrix display, eliminating CPU & memory overhead. The card output is industry standard EIA-RS170, compatible with low cost \$400 — \$600 commercial TV monitors. European standard capability is also included. Two or three 91200A cards can be synchronized together for color or grey-scale displays. Software drivers exist for RTE-B, RTE-C, RTE-II and RTE-III operating systems. And a display software library is provided with subroutine calls for character generation, vector generation, flashing and display of any rectangular screen area. Data sheets are already in distribution.

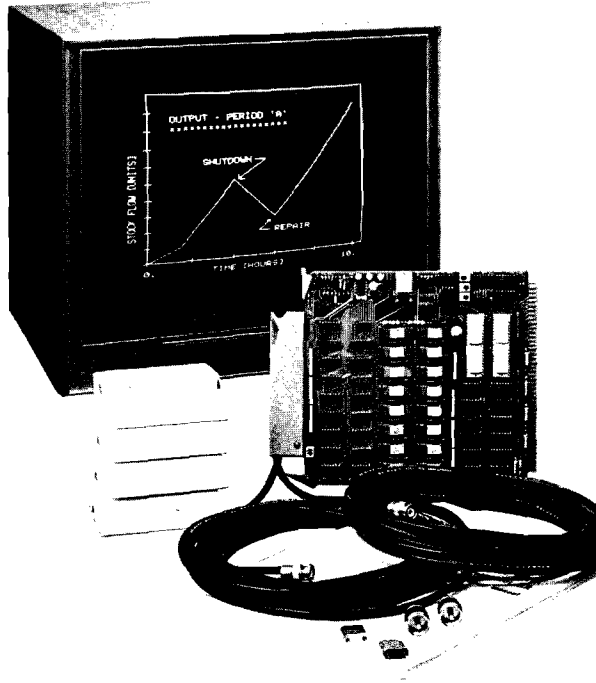
The 91200A was demonstrated at the National Computer Conference at Anaheim, California, held May 19-22. A large crowd gathered to watch flashing color graphics illustrating RTE-II system activity. The demo was implemented with three 91200A cards (red, green, blue TV channels), a 2112A, 7905A, three 2640's and RTE-II.

The forty orders were received from the HP Medical Group, of which twenty will be installed in July at a large hospital complex in Brazil. The 91200A TV Interface Kit is priced at \$3120 each. Multiple orders, like the Medical Division's installation, are expected and OEM's may buy the card on their OEM agreements. TV monitors will normally be sup-

(Continued on page 8)

**ANNOUNCING . . . NEW TV INTERFACE CARD -
(Continued from page 7)**

plied by the customer, but the Medical Group does offer HP 5671B black-and-white 14" monitor. The 5671B is also available from Motorola as model S1244A for \$593. The color monitors at the NCC show were RGB-type from CONRAC (Model 511C19, 19") and Tektronix (Model 670-1, 17"). Order the new TV Interface Kit as 91200A or as option R87 on 9602A, 9603A, 9640A, 9611A and 9700A systems. Availability is 16 weeks.



TV Interface Kit (91200A) shown with HP 5671B Monitor

HEWLETT  PACKARD

**THE 2640 PRINTER SUBSYSTEM AIDS
YOUR TERMINAL SALES IN 3-WAYS**

by Jim Elliott

A moderately priced high performance printer subsystem for the HP 2640 Series Terminal is now available to help you expand and enhance your current terminal customer base.

For the customer that wants a *FAST* (up to 240 lines/minute at 80 columns), *QUIET* (it uses a thermal print mechanism), 5 x 7 dot matrix printer for *Hard Copy Output*, this is the way to go. And, it has been configured to assist you in 3-ways.

1. The Add-On

For your customer who originally bought the 2640 in a stand alone unit and now wants hard-copy output; sell him this:

13246A — 2640 Line Printer Subsystem \$3,295 (9866). Includes HP 9866 Thermal Printer, interface, and cable for HP 2640 CRT. Not subject to discount.

2. The Bonus

For that customer that wants a super terminal with a sweet discount, sell him this:

2640 CRT Terminal (Option -012) \$3,295
2640 Printer Subsystem adds HP 9866 Thermal Printer, interface, and cable to HP 2640. Subject to 12% discount when 6 or more 2640's are specified on a single order.

But this configuration has a bonus in it. Since the printer subsystem is an option to the 2640 terminal, both the terminal and printer are subject to the Type V — OEM, End User and combo discounts as well.

3. The Gravy

The above printer subsystems are now on the Corporate Price List which means that while complimenting your customer base you get both Quota Credit AND its associated Commission Check.

So remember Team, *when* you would like to optimize your terminal market effort *and* help your customer be more productive *while* increasing the size of your wallet width, sell 2640 Series Printer Subsystems: they'll help make you a winner 3-ways.

HEWLETT  PACKARD

2762A & B ON THE 3000

by Frank Hublou

The 3000 now supports both the 300-baud 2762A G.E. TERMINET terminal and the 1200-baud 2762B. When hard-copy is needed, the 2762's can be the right answer. The lower-priced 2762A is an excellent upgrade for teletypes — it is three times faster, has upper and lower case characters and its heavy-duty design permits continuous operation. The 2762B is particularly well suited for 3000 applications. Programmable horizontal and vertical tabs, 120 columns, variable-width forms tractors and 120 characters per second make it great for *producing commercial documents*. Data Systems Manufacturing uses the 2762 extensively on the 3000 to generate a variety of transaction forms. They are very satisfied with its capabilities and reliability.

The 2762A and B are now easier to order on the 3000 — they are ordered simply as a 2762A and a 2762B (the 30120A designation for 3000's is being discontinued). Delivery Times are as published for Boise products in the Availability Schedule. There are a couple of cautions to be aware of, however:

1. The 2762B does not work as a console on the present 3000 (i.e., forego all those cards and letters requesting a special to switch consoles).
2. 202 half-duplex modems do not work between the 2762B and the 3000 at this time, but the lab is continuing to work on the problem.

When 1200 baud phone line communication is needed for a 2762B, the recommended solution is a 1200-baud full-duplex modem such as the VADIC VA3400. Full duplex provides much cleaner operation than half duplex in all respects. Unfortunately, Europe presently does not allow full duplex at these speeds. We are working on that situation and hope to come up with a solution soon.

HEWLETT  PACKARD

NEW 9600MX/9700MX OPTIONS

by Pete Palm

RTE-III with both the 2112A and 7905A disc was announced at the National Computer Conference last month. The associated 9600MX/9700MX systems options will be announced to the press in mid-June 1975. The new RTE-III

options include both Dynamic Mapping Hardware (DMS) and the Batch Spool Monitor (BSM). All 7905 based systems include a cabinet (CAB) for the disc.

The following 9600MX options are orderable as of June 1, 1975. 9700A options will not be on the Corporate Price List until July 1, 1975. Order these new 9700A options by HEART override until then.

Opt	Description	Price	96XX AVAILABILITY (WKS)					
			9 6 0 2 A	9 6 0 3 A	9 6 0 4 A	9 6 1 1 A	9 6 4 0 A	9 7 0 0 A
P24	Replace 2108A with 2112A	\$ 1,025	16	16	16	16	16	16
A04	RTE II, 7905, CAB, 60 Hz	18,000	16	16		16	16	
A06	RTE II, 7905, CAB, 50 Hz	18,000	16	16		16	16	
A07	RTE III/BSM, DMS, 7900, CAB, 60 Hz	17,000	16	16		16		
A08	RTE III/BSM, DMS, 7900, CAB, 50 Hz	17,000	16	16		16		
A09	RTE III/BSM, DMS, 7905, CAB, 60 Hz	21,000	16	16		16	16	
A10	RTE III/BSM, DMS, 7905, CAB 50 Hz	21,000	16	16		16	16	
A11	RTE III/BSM, DMS, 7900, 60 Hz	16,000					16	
A12	RTE III/BSM, DMS, 7900, 50 Hz	16,000					16	
Q85	7905 SLAVE, CAB, 60 Hz	10,950	16	16		16	16	16
Q86	7905 SLAVE, CAB, 50 Hz	10,950	16	16		16	16	16
P32	12990A Memory exten.	3,500	16	16		16	16	16
Y15	Multi-user BASIC Software	1,000	18	18		18	18	18
R87	91200A TV Interface	3,120	16	16		16	16	16
9700MX Unique Options								
020	Replace RTE II w/RTE III/BSM, DMS	3,000						16
021	Replace 7900 w/7905 (60 Hz)	5,500						16
022	Replace 7900 w/7905 (50 Hz)	5,500						16

HEWLETT-PACKARD

SPECIAL NOTICE — PRICE CHANGE

by Leroy Nelson

Due to cost changes in the manufacturing process on the 2100A & S, we are restructuring the pricing schedule on July 1.

		From	To
2100A	Computer		\$ 9,200
004	with 4K Memory		11,000
008	with 8K Memory	9,965	11,400
012	with 12K Memory	12,565	13,200
016	with 16K Memory	12,865	13,600
024	with 24K Memory	15,865	15,800
032	with 32K Memory	17,865	18,000
2100S	Systems Computer w/16K Memory	13,950	14,400
024	with 24K Memory	16,950	16,600
032	with 32K Memory	18,950	18,800
2155A	2100 I/O Extender	3,965	5,150

Remember — the 2100A is still one of the best price/performance minicomputers in the industry.

ED HAYES BUILDS 2640

by Terminal Tiger

Your Peripheral Marketing Team leader recently built a 2640. Since product knowledge is one of the keys to successful selling, your friendly peripheral marketeer got an appointment to try building a 2640A and see if he liked it! (I liked it!)

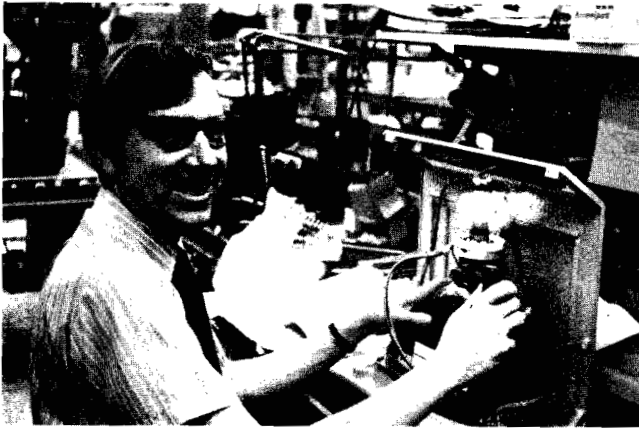
With the patience and guidance of the peripheral manufacturing team and his borrowed safety glasses Ed proceeded to match Bill Hewlett's time and then go on to align and test his unit. IT WORKED, first time. The 2640 is a great product — sell it to close competitors accounts and key accounts.



I better make this look difficult.

(Continued on page 10)

ED HAYES BUILDS A 2640 - (Continued from page 9)



If Hewlett can do it, so can I!



*Say, ahhh
There is an OEM Tiger in there!*



*... and it works, too!
... do I hear 6 for \$2640?*

P.S. It's rumored Manufacturing will sell the serial number of the 2640 Ed built at the Division picnic, June 7.

HEWLETT  PACKARD

CONTRACTS CORNER

DATA SHEETS AND REFERENCE MANUALS

by Ilene Birkwood

Customer: Hey, I tried this feature of your widget processor: the manual says if I push the X button during the reload phase, the mag tape will thread itself. It doesn't — I just get tape all over the floor

HP Field Rep: Maybe the manual is wrong?



Customer: Can't be. manuals are *never* wrong. My widget processor is obviously faulty — I want this feature fixed before I accept the system.

HP Field Rep: Let's take a look at the Data Sheet for your widget processor to see if automatic tape threading is specified. Hmmmmmm . . . it's not. Since this is the only legal spec. for this product I think we'd better take another look at the manual. *Now* I see your problem — you haven't got the latest version — they changed that feature — it's all documented in the April update package to the manual.

The data sheet contains the complete specification of a product and is the only document that carries a legal commitment on the part of Hewlett-Packard. Reference manuals describe the features of a product and provide the information needed to use those features — programming information, operating procedures, etc. However, information contained in these manuals is not a specification of the product, and if there is a conflict between information found in the reference manual and the way the product works, the data sheet will always be the final authority. Therefore, in common with other manufacturers, we will be publishing the following notice in all manuals in the future:

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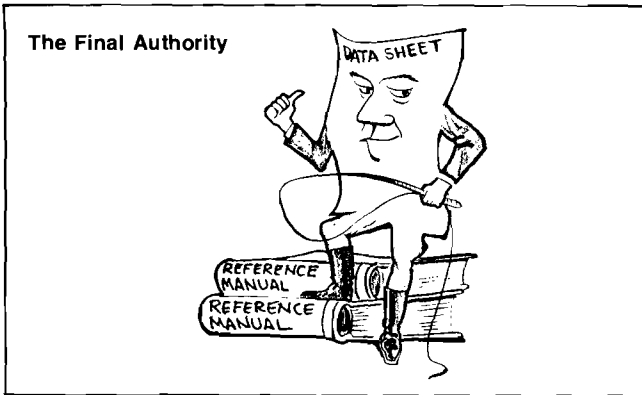
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Needless to say, we'll continue to provide you with accurate reliable information in our manuals, and to make sure that this sort of incident doesn't occur, we will be publishing information about manual updates in "The Communicator".* However, we just wanted to emphasize that when you're checking the legal specification of a product - the Data Sheet is what you need.



*The first issue of "The Communicator" will be published in June and will be distributed to customers, F.E.s, C.E.s and S.E.s.

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MEASUREMENT NOTE

by Bill Senske

There is a lot of discussion about common mode rejection among the data base management gurus. The discussion goes something like — "Hey-do you know what CMR is?"

The basic differential amplifier as shown in figure 1 consists of 2 transistors and their collector load resistors which form the legs of a bridge. The two common emitter (BUZZ) amplifiers share a single emitter resistor. The base of each transistor is the input terminal and the collectors are the output terminals.

Assuming that the transistors and the collector load resistors are perfectly matched, with no input signals on the bases, there will be equal collector currents in the two legs of the

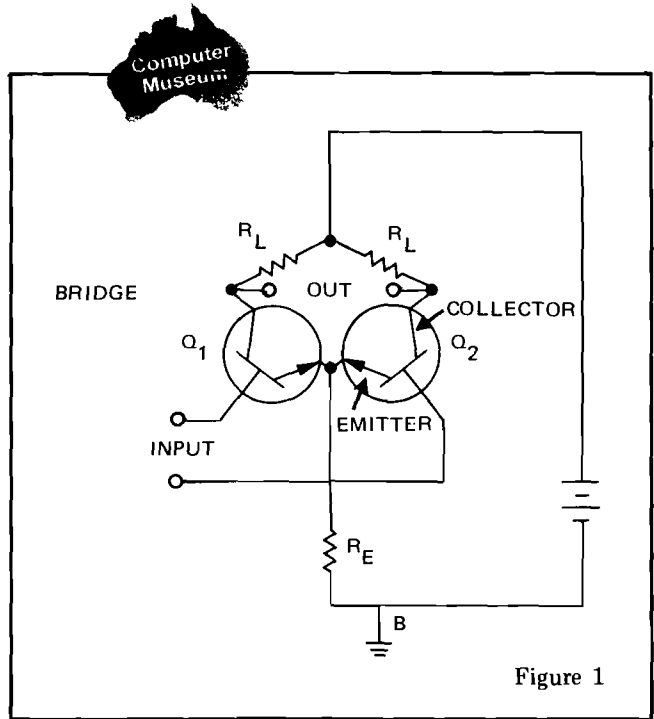


Figure 1

bridge. If the output is taken between the two collector terminals, there is zero output voltage. If signals of equal amplitude and polarity are applied to both sets of input terminals, the collector currents and collector voltages remain equal, and the output remains zero. Thus, for equal inputs to the differential amplifier, the differential output voltage (collector to collector) is zero. This type of operation is referred to as COMMON MODE OPERATION. Noise from lighting (etc.) usually affects both inputs equally and results in no output. If, however, a signal is applied between the two input terminals an amplified form of the signal will be reflected at the output terminals.

TECHNICAL NOTE

For instance, if the Q₁ base is driven positive and the Q₂ collector current decreases. As a result, Q₁ collector voltage decreases and Q₂ collector voltage increases. This produces a voltage difference between the output terminals, with the one at Q₂ more positive. On the other hand, if the Q₁ base is driven negative and the Q₂ base positive, opposite conditions occur, and the resultant output is more positive at the Q₁ collector end.

Thus, an output voltage appears only when there is a difference of potential between the two inputs. This mode of operation is referred to as DIFFERENTIAL MODE OPERATION. The ratio of the differential output voltage to the differential input voltage is referred to as the DIFFERENTIAL VOLTAGE GAIN (A_d) of the amplifier.

Common mode operation of a differential amplifier provides an important advantage in many applications. Undesired signals such as noise and other forms of interference tend to be injected with equal amplitude and polarity into both inputs. Because equal common mode input signals produce zero output, the differential amplifier is quite effective in rejecting undesired signals.

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In practice, slight variations in component values prevent complete rejection of common mode signals. The ratio of common mode output voltage to common mode input voltage is called the COMMON MODE VOLTAGE GAIN (A_c). This gain is usually far less than 1. The ratio of common mode voltage gain to differential mode voltage gain is the COMMON MODE REJECTION RATIO (CMRR) of the amplifier, expressed in decibels. Typical CMRR ratings are -80 to -120 dB. That is, undesired common mode signal outputs are 80 to 120 dB below the desired output.

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COMMON MODE VOLTAGE REVISITED

by Joe Schoendorf

The above article is a very technical description of common mode voltage to satisfy the "bit nuts". How about for those of us who can't even remember "Twinkle, twinkle little star... power equals I squared R." For all of us another explanation of CMV.

Suppose the signal source is grounded, which is the case with most transducers. Since the A/D converter is also grounded at some distance from the transducer there is usually going to be a difference in ground level. This difference in voltage between the two is the common mode voltage. This is bad as it can cause significant measurement errors. The ability of an a/d to reject this common mode voltage is its common mode rejection. Our HP 2313B has a CMR of 115 db. This is approximately 1,000,000 : 1 Thus a 1 volt common mode signal will produce 1 microvolt of error in the output due to CMV. Next issue *Mr. Wizard* will discuss Normal Mode Rejection and give you another easy jingle with which to remember power.

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