BUSINESS SYSTEM 800

Benefits

- Choice of six high-performance systems utilizing the 990/12 CPU.
- Expandability minimizes initial expenditure and maximizes development potential.
- Mass storage options allow configuration flexibility with Winchester technology reliability.
- Comprehensive DX10 and DNOS operating systems facilitate application development.
- 64K DRAM memory increases reliability and reduces maintenance costs.
- Wide range of software available allows user to select most beneficial package.
- Peripheral and software compatibility with DS990 hardware protects previous and future investment.
- Competitive five-year cost of ownership.

BUSINESS SYSTEM 800 PRODUCT ANNOUNCEMENT
October 22, 1982

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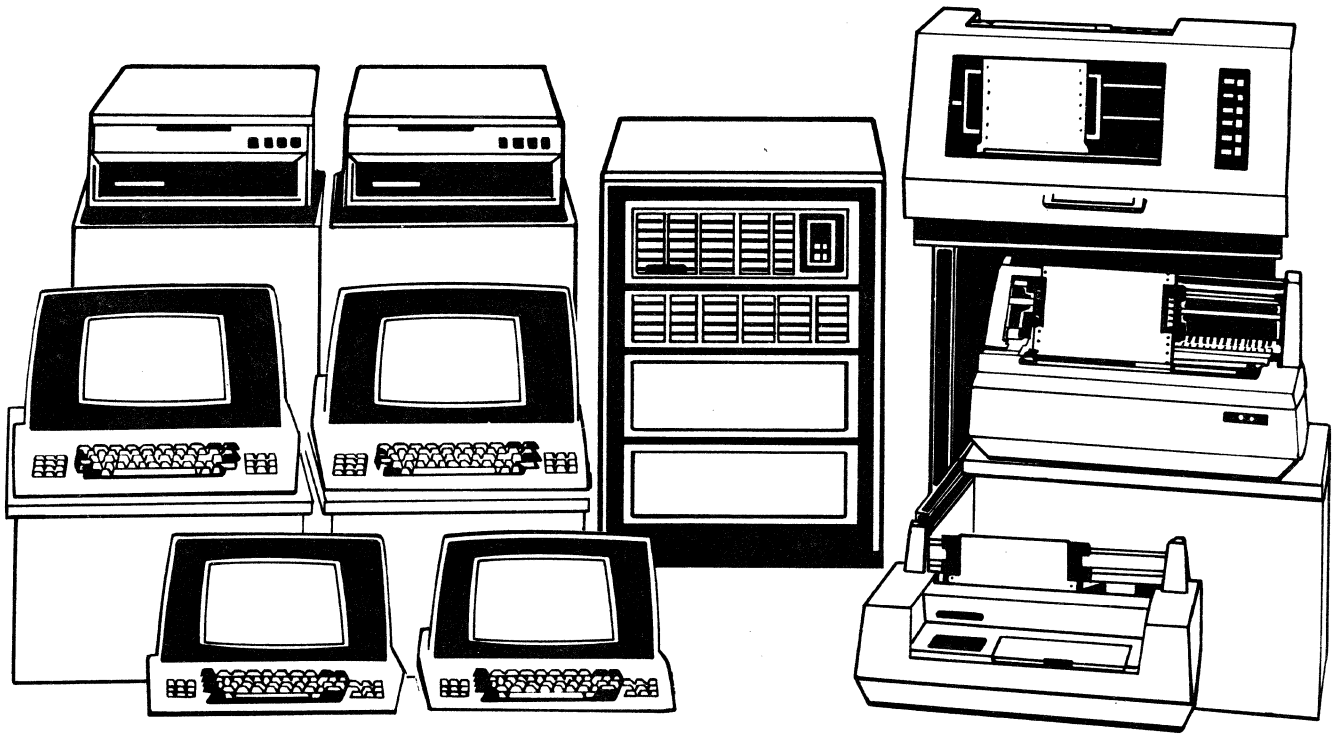


BUSINESS SYSTEM 880

■ Introduction

The Business System 800 Series of computer systems comprises the high end of the Business System Series. These systems combine the processing power of TI's 990/12 high-performance minicomputer with the high speed of cache memory. They are multitasking, multiuser systems that offer many features often found only in large mainframe computers. For instance, they have the power to process at speeds up to twice as fast as the mid-range Business System 600 Series. Mass-storage capability is another strength of these units; they have the ability to store up to 800 megabytes of information in high-speed disk storage.

The new systems feature the 990/12 minicomputer with a 512K-byte cache memory subsystem. They differ in data storage capacity and technology, enabling the customer to tailor the system to a specific application. With the 64K DRAM memory technology and the elimination of the 17-slot chassis utilized with similar DS990 configurations, the Business System 800 Series offers the customer greater system reliability and increased price/performance. The S800 systems provide the same performance as the equivalent 990/12 based DS990 systems but with a significant price reduction.

The main selling points associated with the Business System 800 Series are increased reliability, increased price performance, lower maintenace rates, and lower price tags than similar DS990 minicomputer configurations offered today.

The Business System 800 configuration prices range from the S872 at $51,000 to the S884 priced at $86,000. Both of these systems include 512K bytes of memory, a 990/12 CPU, the 990A13 chassis, the 32-inch cabinet, Business System office styling and two 911 VDTs with controller. The S800 system prices reflect an 11 to 15 percent savings over similar DS990 configurations.

The discount schedule to be utilized with the Business System 800 is the 'H & X' discount schedule. System point value of 80 will be the same as the current 990/12-based DS990 systems.

The Business System 800 product announcement is scheduled for October 22 of this year, with first product ship anticipated in January of 1983.

■Product Description

HARDWARE OVERVIEW

The Business System 800 Series is a family of minicomputer systems utilizing the 990/12 LR (low radiation) CPU, the new Cache memory controller with 64K DRAM technology, the 990A13 chassis, the 32-inch cabinetry, two standard 911 VDTs, and the TI light grey office styling front panels. The standard memory capacity offered with each of the mass storage subsystem configurations is 512K bytes. Refer to the table below for the various Business System 800 configurations and the associated system numbers.

BUSINESS SYSTEM 800

CONFIGURATIONS

SYSTEM	CPU	MEMORY SUBSYSTEM	CHASSIS	CABINET	TERMINAL	MASS STORAGE	BACKUP
861	990/12	512K, CACHE 64K DRAM	990A13	42-IN.	2-911/D-CTRL	CD1400, 67/13MB	CART., 13MB
872	990/12	512K, CACHE 64K DRAM	990A13	32-IN.	2-911/D-CTRL	WD800, 43MB	MTC, 14.5MB
880	990/12	512K, CACHE 64K DRAM	990A13	32-IN.	2-911/D-CTRL	2-DS80's, 127MB	REMOVABLE PACK, 63MB
882	990/12	512K, CACHE 64K DRAM	990A13	60-IN.	2-911/D-CTRL	DS80, 63MB	MT1600 MAG TAP
884	990/12	512K, CACHE 64K DRAM	990A13	32-IN.	2-911/D-CTRL	2-DS300's, 476MB	REMOVABLE PACK, 238MB
886	990/12	512K, CACHE 64K DRAM	990A13	60-IN.	2-911/D-CTRL	DS300, 238MB	MT1600 MAG TAP

BUSINESS SYSTEM 800 COMPONENTS

990/12 High-Performance Minicomputer

The 990/12 is the same high-performance minicomputer utilized with the DS990 Models 26, 29, and 36. The 990/12 is implemented with Schottky MSI circuits on two full-size, 279 mm. by 356 mm. (11 inch by 14 inch) circuit boards and is fully upwardly compatible with the 990/10A computer. The two boards are interconnected across the top edge by two short cables, and must be adjacent to one another in slots one and two of the CPU chassis. There is an unusual degree of compatibility between the 990/10A and the 990/12 in that both machines use identical interfaces to the chassis. Board-level upgrades are possible since the 990A13 chassis provides the power and cooling required for both the 990/10A and 990/12.

The 990/12 interfaces to the TILINE high-speed, multiuser bus to support memory and high-speed peripherals, and interfaces to the CRU bus for low speed peripherals. It generates a 16-bit address for 64K bytes of direct-address capability. The 990/12 implements a mapping scheme that increases total memory capacity to 2048K bytes (990/12 mapping is a superset of the 990/10A mapping, with all the 990/10A features, plus the ability to specify read-only and execute-only access protection). Application task memory space is 64K bytes although application tasks larger than 64K bytes can be implemented with the use of segmentation.

The 990/12 implements a total of 143 instructions. Seventy-six of the instructions are indentical to those used in the 990/10A, and any software implemented with these instructions will execute on either the 990/10A or the 990/12 in most applications. Unique 990/12 instructions include: floating point, byte strings, extended precision binary, conversions, stack operations, and bit and field manipulation.

The 990/12 Loader/Self-Test ROM provides CPU self-test and loading from magnetic tape and all disk subsystems. The 990/12 uses the same universal loader algorithm as the 990/10A. The "LOAD" switch causes the system to boot from TILINE address 0F800, unit 0. The "ALTERNATE LOAD" switch causes the system to attempt to boot from the following devices in the order indicated:

* MDU unit.
* Online magnetic tape unit at 0F880, units 0-3 respectively.
* Online unprotected disk unit at 0F800, units 0-3; at 0F810, units 0-3; and at 0F820, units 0-3.
* First online disk unit at 0F800, units 0-3; 0F810, unit 0-3; or at 0F820, units 0-3.

If no device is ready, the system continues to search for a ready device, restarting the search with the magnetic tape unit.

The 990/12 features include: an on-board, real-time clock; signed multiply and divide; power fail/auto-restart logic; 16 vectored interrupts; 16 extended operations (XOPs); workspace cache; error trace memory; high-speed TILINE multiuser bus; and CRU low-speed bus.

In addition to the Business System 800 packaged systems utilizing the 990/12, a "boxed" CPU is also offered. This consists of a 990A13 chassis, a 990/12 CPU, and 990/12 System Memory Interface (SMI). Memory must be determined separately by selecting one of the Memory Subsystems (EC Subsystem P/N 2262000, 16K DRAM Cache Subsystem P/N 2262002, 64K DRAM Cache Subsystem P/N 2261999, or the 64K DRAM Cache Controller P/N 2309335) to be installed in the "box". The standard interrupt PCB is supplied with the "boxed" 990/12.

64K DRAM Cache Controller

The 64K DRAM Cache memory controller includes all of the features of the 16K DRAM Cache controller: TILINE interface; error correcting circuits; an error logging feature that reports all single and double bit errors; refresh circuits; onboard MOS dynamic random access memory (DRAM); and a high speed TTL cache memory. The 64K DRAM Cache controller doubles the cache memory size to 4K bytes, and the DRAM memory to 512K bytes through the use of 64K-bit DRAM devices. The high speed cache memory acts as a buffer for the MOS memory to improve access and cycle time. With the 990/12 CPU, the cycle time is 350ns. for a cache memory cycle, and 740ns. for a MOS memory cycle. Cache operation is automatic and invisible to the user.

This controller is capable of driving up to four 16K DRAM array boards and/or 64K DRAM array boards, for a maximum of 2048K bytes. Where necessary, multiple cache controllers can be used in a system to provide the full 2048K-byte address space. The cache memory controller should not be intermixed with other types of memory controllers or system performance will be degraded. The interface cable required is Part Number 2261998, the same cable as required for the 64K DRAM arrays.

990A13 Chassis

All Business System 800 configurations utilize the 990A13 chassis. This is the same 13-slot chassis being utilized with the S600. Slot assignments for the new 990A13 chassis are as follows:

SLOT
1. 990/12
2. 990/12
3. Memory
4. Spare
5. Spare
6. Spare
7. TPBI/Disk
8. Spare/P2 Programmable
9. 911/940/931
10. 911/940/931
11. Spare/Floppy
12. Line Printer/Spare
13. Spare

Cabinetry

Three of the standard Business System 800 system configurations (S872, S880, and S884) utilize the 0.81m (32-inch) cabinet. Configurations utilizing the MT1600 magnetic tape drive (S882 and S886) use the 60-inch cabinet. The S800 configuration (S861) with a CD1400 disk drive uses the 42-inch cabinet. Since all S800 configurations utilize the 64K DRAM expansion arrays and the 990A13 chassis with a 65 amp power supply, the 17-slot chassis and the 70-inch cabinet used with the 990/12 based DS990 systems are no longer required.

Cabinetry and front panel styling for the S800 and the S600 is the same, providing a unified appearance to the DSG minicomputer product offering.

Video Display Terminal

Two 911 VDTs with controller will be packaged with all 800 Series systems. This is the same VDT utilized on the Business System 600. Use of the 911 VDT provides DX10 and DNOS software continuity across the Business System 600/800 and the existing DS990 Family.

Although the Business System 800 will be packaged with the 911 VDT, as an option the add-on VDT terminals could be either a 911 or 940 VDT.

LP300/600 LR Printers

The LP300/600 LR (Low Radiation) is functionally the same as the old versions although changes were made to the interface and cables for FCC compliance. The only change on the printer itself is in the cable connector.

990A13 Fixed Mount Kits

These kits, for use with the 990A13 chassis, provide fixed mounting in the 0.81m (32-inch) cabinet, while allowing side access for board maintenance. Two units are available. One is for mounting in the top of the 0.81m cabinet, and one for the bottom. Regular chassis slides (P/N 0945127) are also available for mounting the 990A13 chassis in the 1.6m. (60 inch) and 1.1m. (44-inch) cabinets, or other standard 0.48m. (19 inch) wide enclosures.

WD500 and WD800 slide kits

Slide kits are for mounting the WD500 and WD800 expansion disk subsystems so they can slide forward for service access. They are used only in those configurations of the 0.81m cabinet where a second WD500/WD800 disk subsystem is installed.

Mass Storage Options

The S800 provides a choice of mass storage options, so that the user can match storage to specific applications. This is a major benefit to a user, potentially increasing systems throughput for specific applications and possibly reducing the cost of data storage. Disk storage devices utilized on the S800 are the same devices currently utilized on similar DS990 systems. Expansion of the Standard S800 configurations is possible as follows:

System	Mass storage
861	- Up to 1 additional Cd1400 or 2 DS80/300 drives per controller
872	- Up to 3 additional 8" winchester drives and up to 3 additional MTC's per TPBI
880, 884	- Up to 2 additional DS80/300 or 1 CD1400 drives per controller
882, 886	- Up to 3 additional DS80/300 or 1 CD1400 drives per disk controller and up to 3 addtional MT1600 magnetic tape drives per controller

Note: The TILINE PERIPHERAL BUS INTERFACE (TPBI) allows connection of up to eight logical devices. In the case of the S872, one device is disk and one is tape. Only four of each per TPBI is allowed.

Communications Hardware

All standard communications hardware supported with the current DS990 and S600 systems is available with the S800 systems.

PRODUCT MIXING

990/12

The 990/12 LR (Low Radiation) board set can be used in two chassis, the 17-slot chassis and the 990A13 chassis. It is funtionally interchangable with the old 990/12, except it uses the new "universal" load algorithm, which makes it compatible with S200, S300 and S600 operation. The 990/12 LR AU & SMI boards cannot be mixed with old 990/12 AU & SMI boards. The 990/12 LR can be used with the ECC controller (P/N 2261980) found in the EC memory subsystem (P/N 2262000), the 16K DRAM cache controller (P/N 2261990) found in the 16K and 64K DRAM cache memory subsystems (P/N 2261999 and P/N 2262002), and the 64K DRAM cache controller (P/N 2309335). Best performance is achieved with one of the cache controllers.

Cache Memory

The 64K DRAM Cache Memory controller (P/N 2309335) will function with both the 16K DRAM (P/N 0948955) and 64K DRAM (P/N 2262035) array modules. The cable (P/N 2261998) needed to connect the controller to memory array boards is the same cable used with the 64K array and the old controller. Up to four memory modules can be attached to the cache controller, though maximum memory size cannot exceed 2M bytes.

LP300/600 Printers

The new LP300 (P/N 2271814-0015) and LP600 (P/N 2271815-0015) are functionally compatible with the old units (P/N 2271777-0003 and P/N 2271801-0003 respectively) at the master kit level. In order to comply with FCC regulations on EMI, the interface board, cable and connector on the LP300 and 600 have all been modified. Conversion kits will be available from service to enable new interface boards and cables to connect to old printers, and vice versa. This will provide spares for existing LP300 and LP600 users.

The LP300/600 interface kit (P/N 2271777-0017) is compatible only with the new LR version of the LP300 and LP600 printers. Connection to a non LR printer is possible only if the conversion kit has been used to change the connector on the printer.

■Software

Software requirements for the Business System 800, like the mid-range of the DS990 line, will utilize both the DX10 and DNOS operating systems. Customers who need networking capabilities will choose DNOS, while those with more centralized, local needs will build their systems around DX10.

Associated software for both operating systems includes:

* Languages: Pascal, Fortran, Basic, RPG II, and COBOL.

* Productivity tools: DBMS, Query, Data Dictionary, Sort/Merge, TIFORM, and TIPE.

* Communication: 3780/2780, 3270, RTC, DNCS SNA(DNOS only), DNCS X.25(DNOS only).

* UCSD p-System* can be run on the S800 as a task under DX10.

*Trademark of the Regents of the University of Calfiornia

■ Selling Strategy

The sales strategy for the S800 is centered around increased price/performance, higher reliability with the 64K DRAM memory, and increased serviceability due to 64K DRAM memory technology and easy board access provided by the new 32-inch office cabinet. The Business System 800 Series offers these improvements at a price 11 to 15 percent lower than current prices for equivalent DS9900 systems.

The Business System 800 Series utilizes the 8-inch Winchester, the CMD cartridge disk, and the DS80/300 removable pack disk with or without the MT1600 magnetic tape drive, providing the user the ability to select the storage device to best fit application requirements. In addition to data storage selection flexibility, the S800 offers the added flexibility of upgrading memory and display terminals when those requirements change.

A current DS990 customer can easily make the transition to the new Business System 800 Series because the new systems provide hardware and DX10/DNOS software compatibility with the older DS990 Family and the Business System 600 Series. The Business System 800 Series will be sold to those customers requiring more terminals (up to 40 when utilizing DNOS), large data storage capability provided by the DS300 removable disk pack storage drive, and increased performance over the 990/10A based Business System 600.

990/12 Box

One of the major selling points for the 990/12 is its compatibility with the rest of the 990 family. It offers the user of S200, S300 and S600 systems a migration path to higher performance, while still retaining software compatibility. BE EXTREMELY CAUTIOUS, however, when attempting to capture new markets with the 990/12 if you are competing against small 32-bit machines such as the VAX 11/730 or Perkin Elmer 3210A, as they appear to offer a better price/performance ratio. Although the two 32-bit processors cited are acknowledged to be of higher performance than the 990/12, benchmark data is not available to make a meaningful comparison. Selling to an existing customer against these machines is far easier because of TI's software and peripheral compatibility.

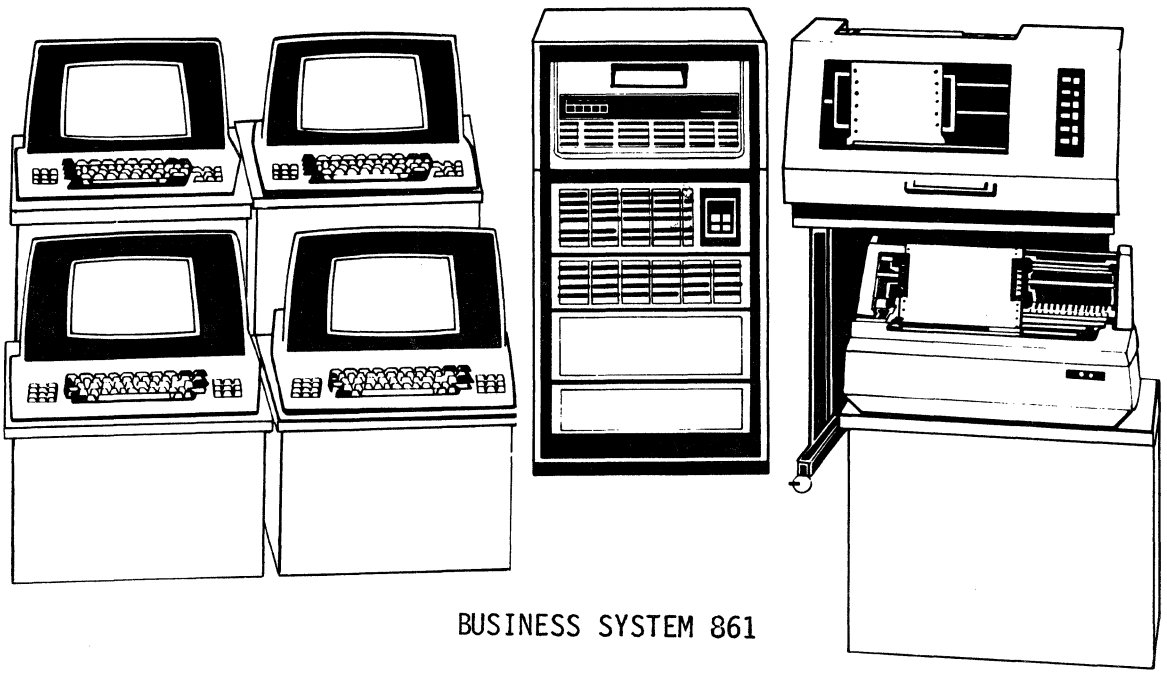
64K DRAM Cache

The primary use of this memory subsystem is for the 990/12 minicomputer, although it can also be used with the 990/10 and 990/10A minicomputers. (CAUTION: Use of the cache controller with the 990/10A will not provide the improvement in performance normally expected when increasing system memory because the 990/10A accesses off-board expansion memory through the TILINE bus, rather than through direct memory access of on-board memory.) Sales attributes of the 64K DRAM cache include lower price per byte, lower service rates, and less slot space used.

DISTRIBUTION STRATEGY

Distribution strategy is to market the Business System 800 Series through the OEM, Authorized Dealer, International, Named Account/End User and Internal Distribution Channels. All systems of the Business System 800 Series will be offered through all distribution channels. This is the same strategy currently being used with the 990/12 based DS990 systems. The target market for the Business System 800 series is the same as for the current 990/12-based DS990 family. The 800 Series is targeted for Class III and the low end of the Class II minicomputer marketplace. The Business System 800 Series can serve the medium sized and large end users either as a standalone system supporting specific applications in a local environment, or as a target system for a host computer via a communications link. Some of the application areas that can be served are:

1. General business accounting
2. Insurance
3. Manufacturing
4. Medical/Hospitals/Healthcare/Dentists
5. Lawyers/CPA
6. Construction
7. Transportation
8. Education
9. Motel/Hotel
10. Distribution
11. Real Estate
12. Local Government
13. Wholesalers



BUSINESS SYSTEM 861

■ Features & Benefits

Key features and customer benefits associated with the BUsiness Systems 800 are as follows:

FEATURE	FUNCTION	BENEFITS
64K DRAM MEMORY	INCREASED RELIABILITY	REDUCED MAINTENANCE COSTS
CHOICE OF MASS STORAGE	FIT THE TYPE OF STORAGE DEVICE WITH THE SPECIFIC USER APPLICATION	INCREASED THROUGHPUT AND PRODUCTIVITY WITH POSSIBLE DATA STORAGE INVESTMENT REDUCTION
WINCHESTER TECHNOLOGY	INCREASED MASS STORAGE RELIABILITY	INCREASED USER PRODUCTIVITY AND LOWER MAINTENANCE COSTS
EXPANDIBILITY	BUY SMALL, ADD LATER	REDUCES INITIAL INVESTMENT
32 INCH CABINET	OFFICE CABINETRY WITH EASIER SERVICE ACCESS	EASIER ACCESS WHILE SERVICING REDUCES REPAIR TIME AND MAINTENANCE COSTS
FAMILY OF COMPUTERS	FUTURE PRODUCT CHOICES	SECURITY FROM HARDWARE AND SOFTWARE OBSOLESENCE
DX10/DNOS	COMPREHENSIVE OPERATING SYSTEMS	USER CAN CONCENTRATE MORE ON APPLICATION DEVELOPMENT THAN INTERFACING WITH THE HARDWARE
WIDE RANGE OF SOFTWARE	CHOICE OF OPERATING SYSTEMS, LANGUAGES, AND PRODUCTIVITY TOOLS	USER CAN SELECT THE SOFTWARE THE BEST FITS THE NEED
DS990 SOFTWARE COMPATIBILITY	DATA AND PROGRAMS COMPATIBILITY	NO ADDITIONAL USER SOFTWARE INVESTMENT
PERIPHERAL COMPATIBILITY	USAGE OF DS990 OR BUSINESS SYSTEM 600/800	HARDWARE INVESTMENT PROTECTED
COMPETITIVE 5 YEAR COST OF OWNERSHIP	PURCHASE SYSTEMS NOW	EARLY PAYOUT REDUCES FUTURE COMPUTER EXPENDITURES

■ Product Support Plan

Several levels of Business System 800 demo support are planned for the second quarter of 1983. First, the field office existing 990/12 based systems and their peripherals will be replaced with S800 systems with a variety of peripherals. Specifically, the eight larger sales offices (New York, Fairfax, Atlanta, Dallas, Arlington Heights, Detroit, Santa Clara and Costa Mesa) will have an S800 including the MT1600 magnetic tape in a 60-inch rack, a WD500 subsystem, a tabletop WD800 8-inch Winchester subsystem, a CD1400 cartridge disk subsystem, a DS80, and a DS300 removablbe pack disk subsystem.

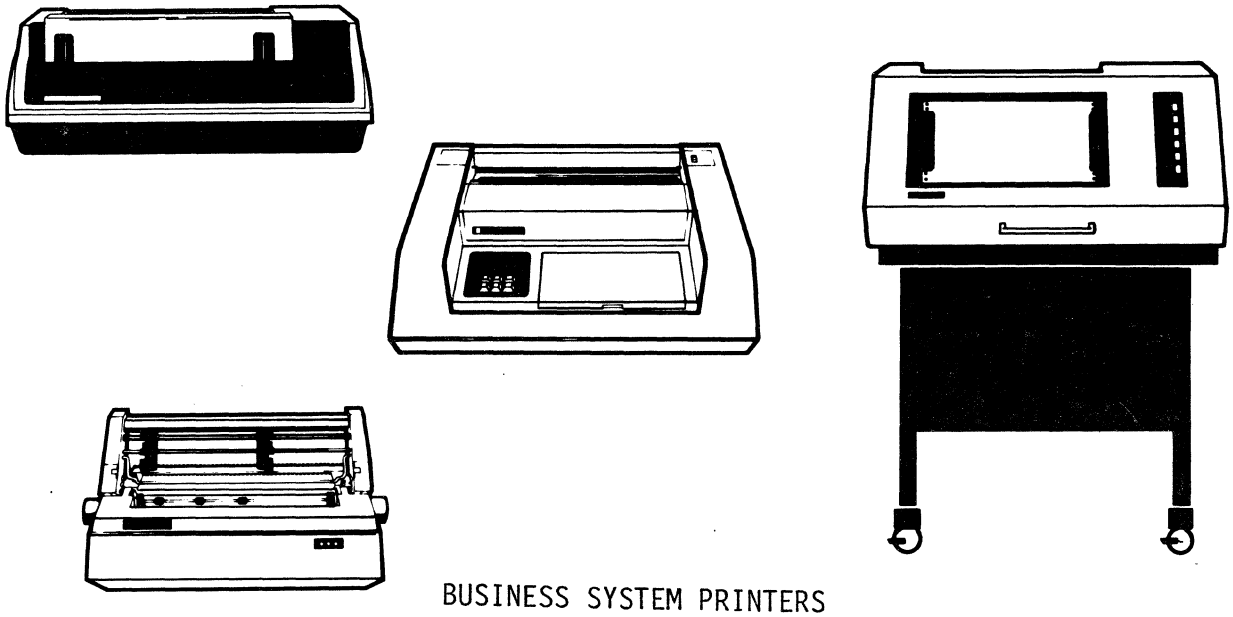
Another level of demo support is the Austin Marketing demonstration area. The Model 26 system currently on display will be replaced with a S882.

The S800 Series will be displayed at the major trade shows in 1983 starting with TI-MIX in March. Later, the S800 will be shown at NCC and COMDEX.

PROMOTION

Promotion for the Business Systems 800 Series will be via a press release on October 22, 1982, and articles in the Computer Users News and OEM News (November). S800 advertising will be done in conjunction with the various distribution channel advertising plans. A new product brochure, similar to the brochures created for the Business System 600, will be available.

Manuals for the Business System 600 will be updated to include the S800 systems and subassemblies.



BUSINESS SYSTEM PRINTERS

■ Competition

990/12 Box

Perkin-Elmer 3210/A
32-bit processor, 512K, with control panel and two communications lines as basic configuration. Memory expandable up to 4 MB. Nine additional slots available in chassis for expansion. **$19,100** in 100 quantity lots, and priced **$29,400** with 512K at quantity one.

Digital Equipment VAX 11/730-77
Includes 32-bit CPU, 1MB of memory, dual TU58 tape cartridges, and license for VMS version 3 software. The price is **$28,500** in OEM quantities, plus basic monthly charge of $75.

Texas Instruments
990/12 box qty. one price, including a 990/12 CPU, a 512K-byte Cache memory subsystem, a 990A13 chassis, and a two channel multiplexor would be $34,900, or $24,081 at an average discount of 31%. A 990/12 box qty. one price for a 990/12 CPU, 1024K-byte cache memory subsystem, single drive FD1000, 990A13 chassis, and DX10/DNOS license would be $48,940, or $33,769 at an average discount of 31%. Without FD1000 disk, the prices are $44,150 qty. one, and $30,464 at 31% discount.

NOTE: Although the two 32-bit processors cited are acknowledged to be of higher performance than the 990/12, benchmark data is not available to make a meaningful comparison.

64K DRAM Cache

DEC PDP-11/34A
Two board set gives 2K of cache memory and 512K of user memory. Combined price is **$17,600**, qty. one.

Texas Instruments
64K DRAM Cache qty. one price is $12,500 for 512K bytes, or $8,625 at 31% discount.

LINE PRINTERS

Data General
Printer kits with 300 lpm performance are priced at **$8,900** and $11,440, and those with 600 lpm performance are priced at **$12,900** and $20,750.

DEC
Printer kits with 300 lpm performance are priced at **$8,350** to $17,700, and those at 600 lpm are priced at **$20,200.**

Hewlett Packard
Printer kits at 300, 400 and 600 lpm are priced at **$14,400, $11,400, and $20,580** respectively.

Texas Instruments
Our 300 lpm printer kit is priced at $8,500, and the 600 lpm printer kit is priced at $11,950.

All prices shown are domestic U.S. prices.

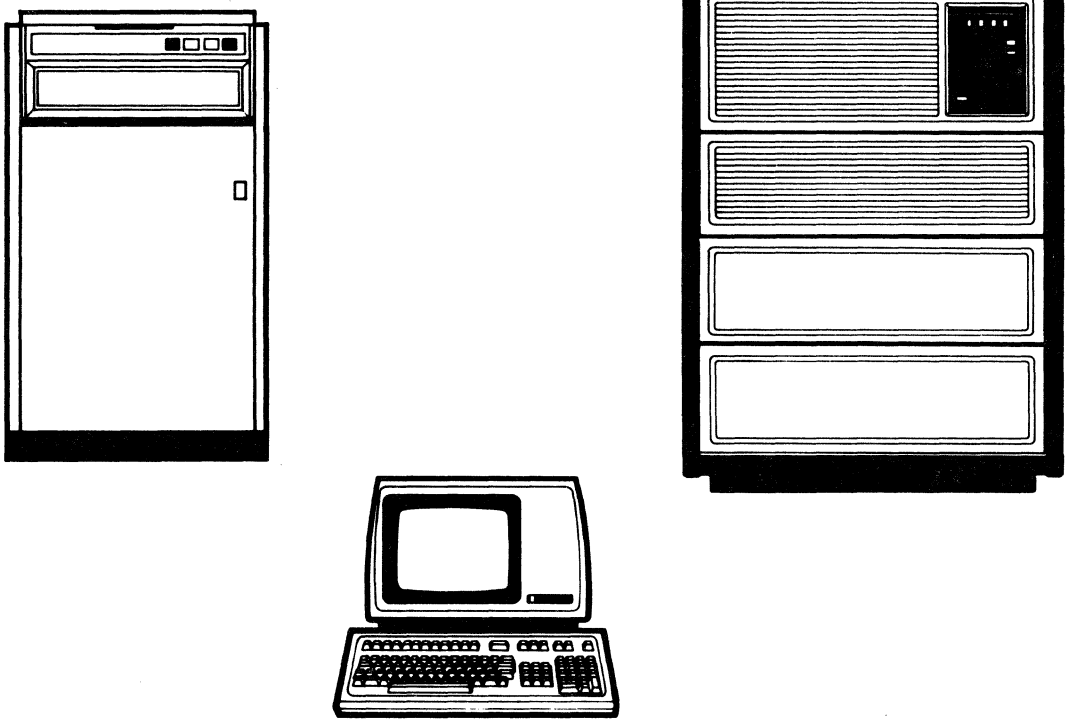
S800 competition will come primarily from IBM, DEC, Wang and DG. HP also provides competitive hardware products, but they are oriented toward the manufacturing industry. Emphasis will be placed on competition from IBM, DEC, Wang and DG since their target markets are comparable to those of TI.

IBM's strength lies in its ability to control the marketplace via powerful marketing and sales capabilities. This strength allows IBM to charge a premium for their products. This means the S800 product will offer a lower price than equivalent IBM configurations found in the low end of the 8100 and S/38 lines and better price performance than the upper end of the Series 1 line. Target markets for these products include the large end-user where an SNA network node is required(8100, S/1), manufacturing, and general business(S/1, S/38) where stand alone operation or communication via bisync protocols is required. With the exception of the Series 1, these systems are currently marketed exclusively through the IBM direct sales force.

DEC's strength lies in an established OEM distribution channel, a large installed base, and an advanced VAX family based on a 32-bit architecture. S800 competitors from DEC include the PDP 11/44 systems, the Datasystem 53X line, and the new VAX 730. Each of these products will be sold into the small to medium business marketplace with the PDP 11/44 also serving the commercial and government markets, the Datasystem 500 line serving the turnkey commercial markets, and the VAX 730 targeted toward office automation and CAD/CAM. These systems may offer equal or better price performance than equivalent S800 configurations and can be marketed through DEC's OEM channel as well as their direct sales force.

Wang will continue to be a strong competitor in non-IBM, office automation type environments. Their VS family, based on a 32-bit bus and 16 or 32 bit processors, is an industry leader in the area of office automation. The newer VS-25 and VS-45, while not hardware performance leaders over the S800, have greater functionality due to their software, communications and networking. Wang sells these systems primarily through direct sales channels to their large end-users. In OEM accounts, IBM communications environments and non-office automation functions the S800 and its compatible family still have a good story compared to Wang.

Of the three major competitors, DG is the least impressive. For the last eighteen months the company has suffered significant declines in growth rate, continued weakness in their low end product line, and a poor image in the marketplace. DG's older competitive offerings include the Eclipse S-130 and C-140 systems and the CS60 packaged Eclipse system. In 2Q '82, DG announced packaged versions of their two microEclipse processors. The CS200, the larger of the packaged versions, will compete with the S800. The CS200 may use either the microEclipse or Eclipse processor. The microEclipse version has a limit of 13 terminals but is less expensive. The Eclipse processor has higher performance but is considerably more expensive. DG has packaged office automation software known as CEO which includes networking, electronic mail and word processing. An insurance package similar to ours has been developed for DG by Lycor. The CS200 and Eclipse models will continue to sell through both OEM and direct large end-user channels.



SYSTEMS FEATURE COMPARISON

HARDWARE	TI S800	DEC VAX730	DEC PDP11/44	DG CS200* Eclipse	HP 3000 S40	WANG VS 45
WORDLENGTH	16	**32**	16	16	16	**16/32**
VIRTUAL MEMORY	NO	**YES**	NO	NO	**YES**	**YES**
MEMORY CPCTY	2MB	5MB	4MB	2MB*	2MB	1MB
MEMORY TYPE	64KB	64KB	16&64K	64KB	16KB	64KB
CACHE	YES	NO	Y, 8K	NO	NO	NO
MAX TERMINALS	40 devices (DNOS)	24	50 (RSX) 127(RSTS) O/S limits	25* Eclipse version	56	20
DISKS**	43MB W 96MB C 64,241MB P	20 MB C 121MB W	21MB C 56,67MB P 121,205MB W	12,15,25 73,147MB W	27,64MBW 20MB C 50-404MB	34,64MBW 30-640MB
MAX DISKS	No limit	**151MB**	820MB 4 Drives	1400MB	8 Drives	4 Drives
SOFTWARE						
O/S	DNOS DX10	VMS	RSTS-E RSX11M, +	RDOS AOS	MPE-IV	VS
UPWARD COMPAT.	NA	Y(3 SYS)	Y(RSTS)	Y(AOS)	YES	YES
DOWN COMPAT.	YES	Y(RSTS)	YES	Y(RDOS)	**NO**	YES
LANGUAGES	B,C,F,P RPG	B,C,F,P PL/1,'C' MACRO PDP11 LANG	B,C,F RPG,DIBOL MACRO	B,C,F MACRO	B,C,F,P APL,RPG MACRO	B,C,F PL/1 RPGII ASSEM.
ADD. FEATURES	DBMS QRY,WP DCTNRY	E-MAIL OA, DBMS DCTNRY	DBMS QUERY	WP E-MAIL	DBMS QUERY WP,E-MAIL	OA DBMS E-MAIL
COMM/NETWORK	SNA 3270 2780/ 3780	DECNET X.25	DECNET 2780/ 3780 3271(RSX) SNA (RSX)	RJE80 HASP II X.25	DSNET SNA 27/3780 X.25 3270	WANGNET 327X- SNA 2780/ 3780
ENTRY PRICE						
MEMORY	256KB	1MB	256KB	256KB*	512KB	256KB
STORAGE	43 MB	20 MB	21 MB	15 MB	27 MB	34MB
O/S	DNOS	VMS	RSX11M	RDOS	MPE IV	VS
PRICE		$48,900	$52,000	$25,190	$42,100	$28,000

* The DG CS200 has two different CPU versions. Entry price shows the micro-Eclipse with less capability. Features are of the better Eclipse version.
**Disk types: P - pack; C - cartridge; W - winchester

DEC VAX 730

STRENGTHS
- DECNET PHASE IV ALLOWS LINKAGE WITH ETHERNET AND HAS DISTRIBUTED DATA BASE
- LARGE ADDRESSABLE MEMORY
- OFFICE AUTOMATION FUNCTIONS IN VENDOR PACKAGED SOFTWARE
- FULLY COMPATIBLE LARGER SYSTEMS; SMALLER TO BE ANNOUNCED 1Q-2Q '83
- NEW LOW-COST 121MB WINCHESTER GIVES EXCELLENT PRICE COMPARISON

WEAKNESSES
- MICRO LEVEL SYSTEMS NOT AVAILABLE YET
- VAST MAJORITY OF SOFTWARE IS PDP-11 BASED
- VAX 730 LIMITED TO 4 DISK DRIVES; ONE MAY BE 121 MB WINCHESTER, OTHERS MUST BE 10MB CARTRIDGE

DEC 11/44

STRENGTHS
- DECNET PHASE IV ALLOWS LINKAGE WITH ETHERNET AND HAS DISTRIBUTED DATA BASE
- NEW LOWER PRICED 205MB WINCHESTER WILL BE OUT SPRING '83
- NEW LOWER PRICED MODELS AVAILABLE SPRING '83 USING 64K CHIPS

WEAKNESSES
- S800 LESS EXPENSIVE WERE HIGH PERFORMANCE NOT REQUIRED
- NEW SALES BEING UNDERCUT BY DEC'S OWN VAX 730 (WHEN S/W BASE IS NEW)

WANG VS45

STRENGTHS
- OFFICE AUTOMATION AND NETWORKING CAPABILITY EXCEED TI'S
- WELL DEFINED COMPANY STRATEGY WITH STRONG IMAGE
- FAMILY STORY HAS BROAD COMPATIBILITY; TIES TO NON-COMPATIBLE WANG PRODUCTS

WEAKNESSES
- PRICE/PERFORMANCE FOR THE S800 IS BETTER ON STAND-ALONE BASIS
- WANG STATEMENTS INDICATE OUR TIPE-990 IS VIEWED AS A THREAT
- NO SIGNIFICANT DANGER IN RESELLER CHANNELS

HP 3000 S40

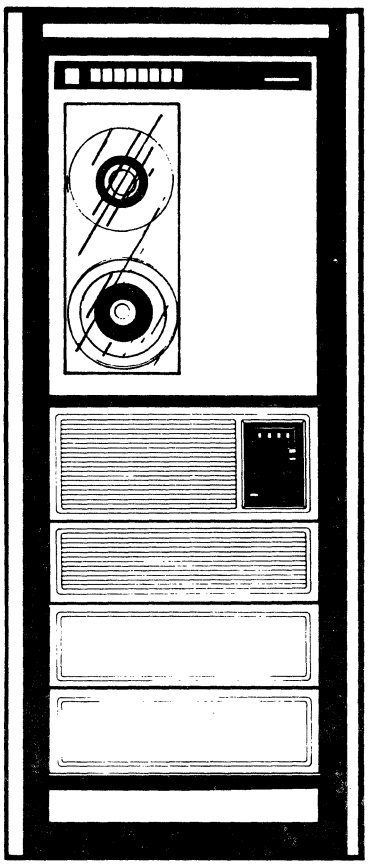
STRENGTHS
- UPWARD COMPATIBLE, HIGH PERFORMANCE SYSTEMS
- SIGNIFICANTLY HIGHER PERFORMANCE THAN S800 FOR LESS PRICE

WEAKNESSES
- NOT DOWNWARD COMPATIBLE (NEW COMPATIBLE HP250 O/S BY 2Q '83)
- DIFFERENT PRIMARY MARKET AND GEOGRAPHIC SEGMENTATION FROM TI

DG CS200, ECLIPSE AND MICROECLIPSE

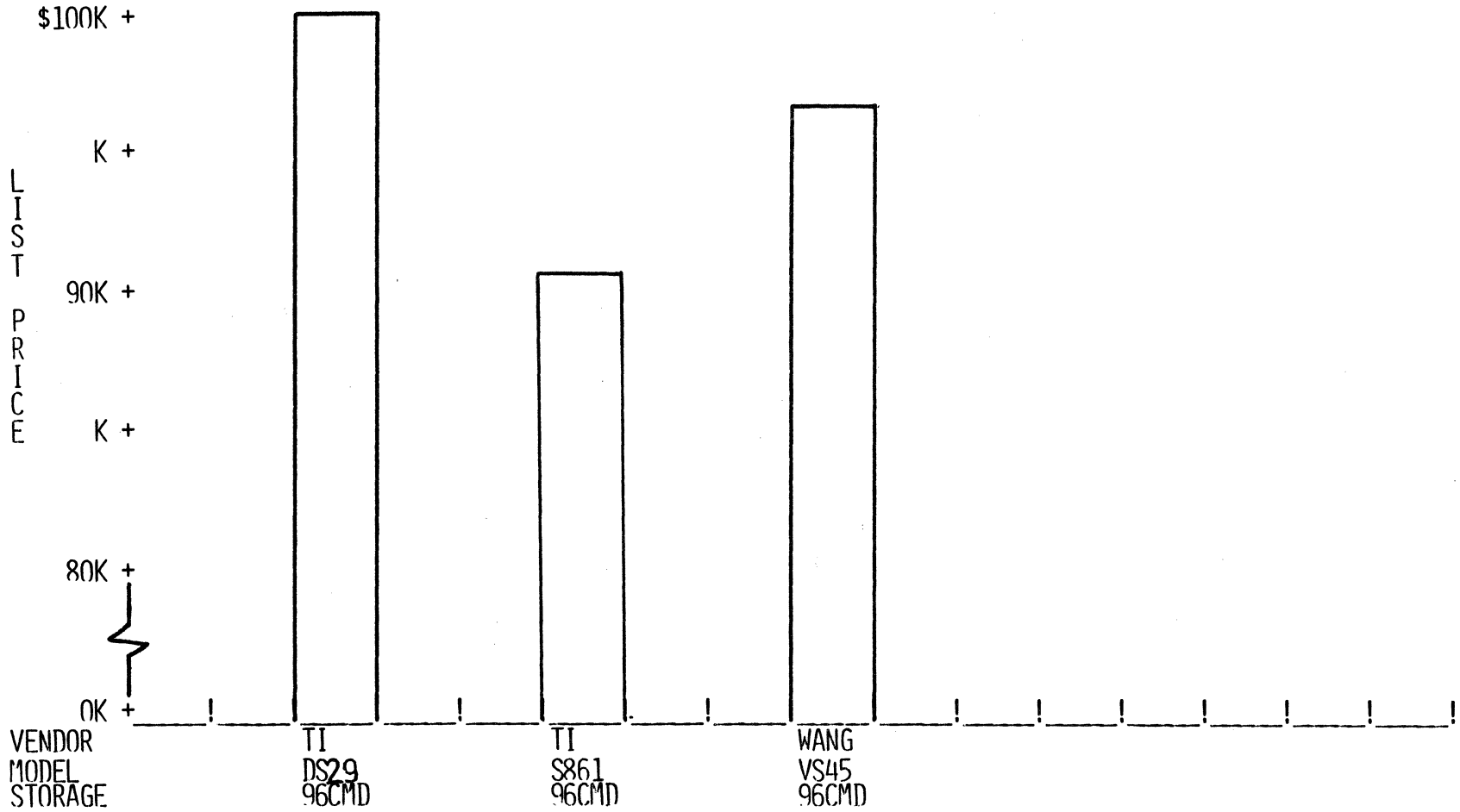
STRENGTHS
- LOWER PRICE BUT HAS LESS PERFORMANCE
- VENDOR PACKAGED OFFICE AUTOMATION PRODUCTS
- SOFTWARE COMPATIBILITY FOR SOME O/S FROM MICRO TO 32-BIT PRODUCTS

WEAKNESSES
- POOR COMPANY IMAGE
- S800 HAS PRICE PERFORMANCE ADVANTAGE OVER ECLIPSE S130 AND C140 SYSTEMS
- NO SNA



C&PD COMPETITIVE ANALYSIS
BUSINESS SYSTEM 861

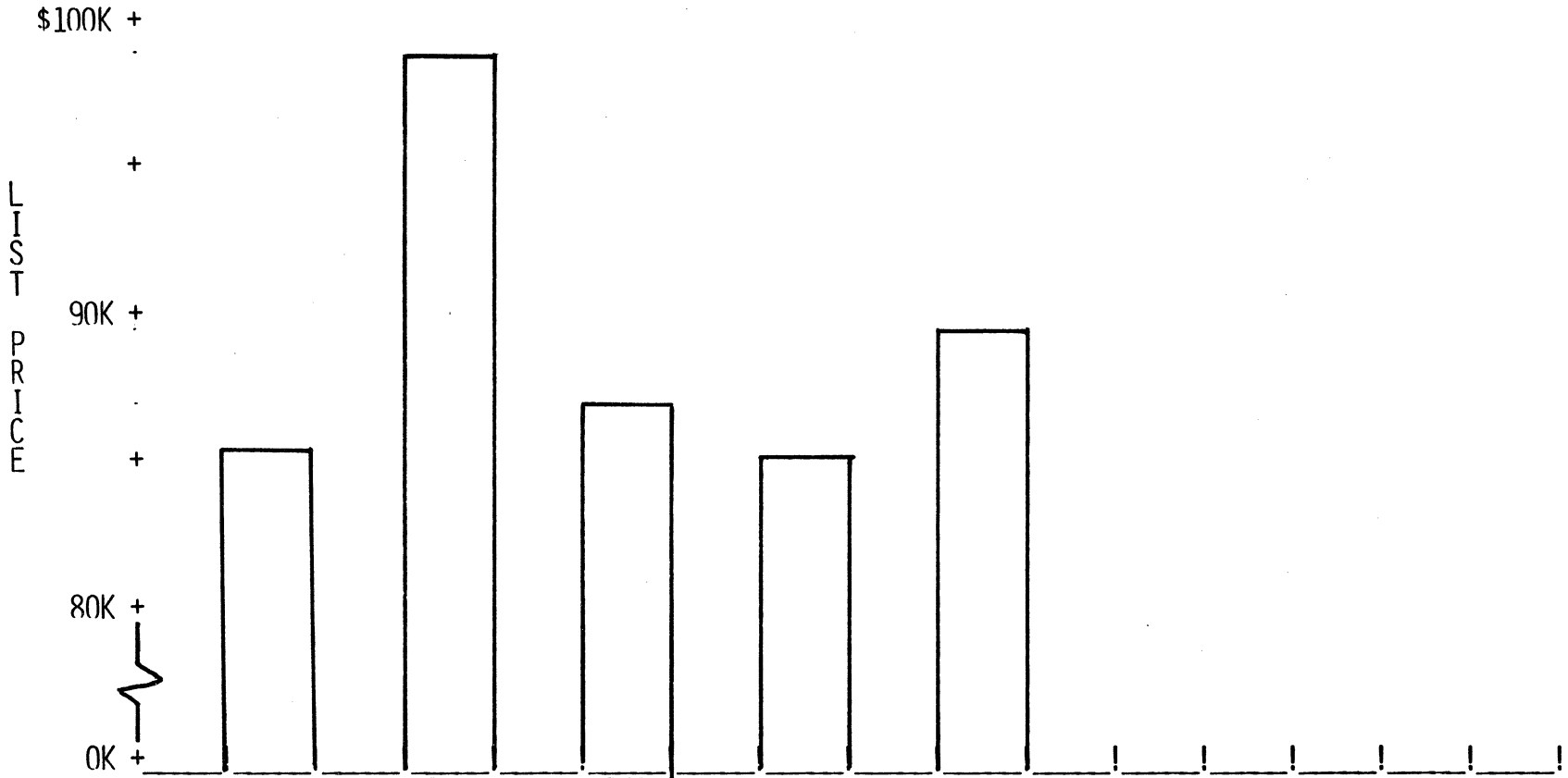
96MB CARTRIDGE MODULE DISK - 512KB



CONFIGURATIONS INCLUDE CPU, 512KB, LISTED DISK, 12 TERMINALS, MATRIX AND LINE PRINTERS, O/S AND LANGUAGE

C&PD COMPETITIVE ANALYSIS
BUSINESS SYSTEM 872

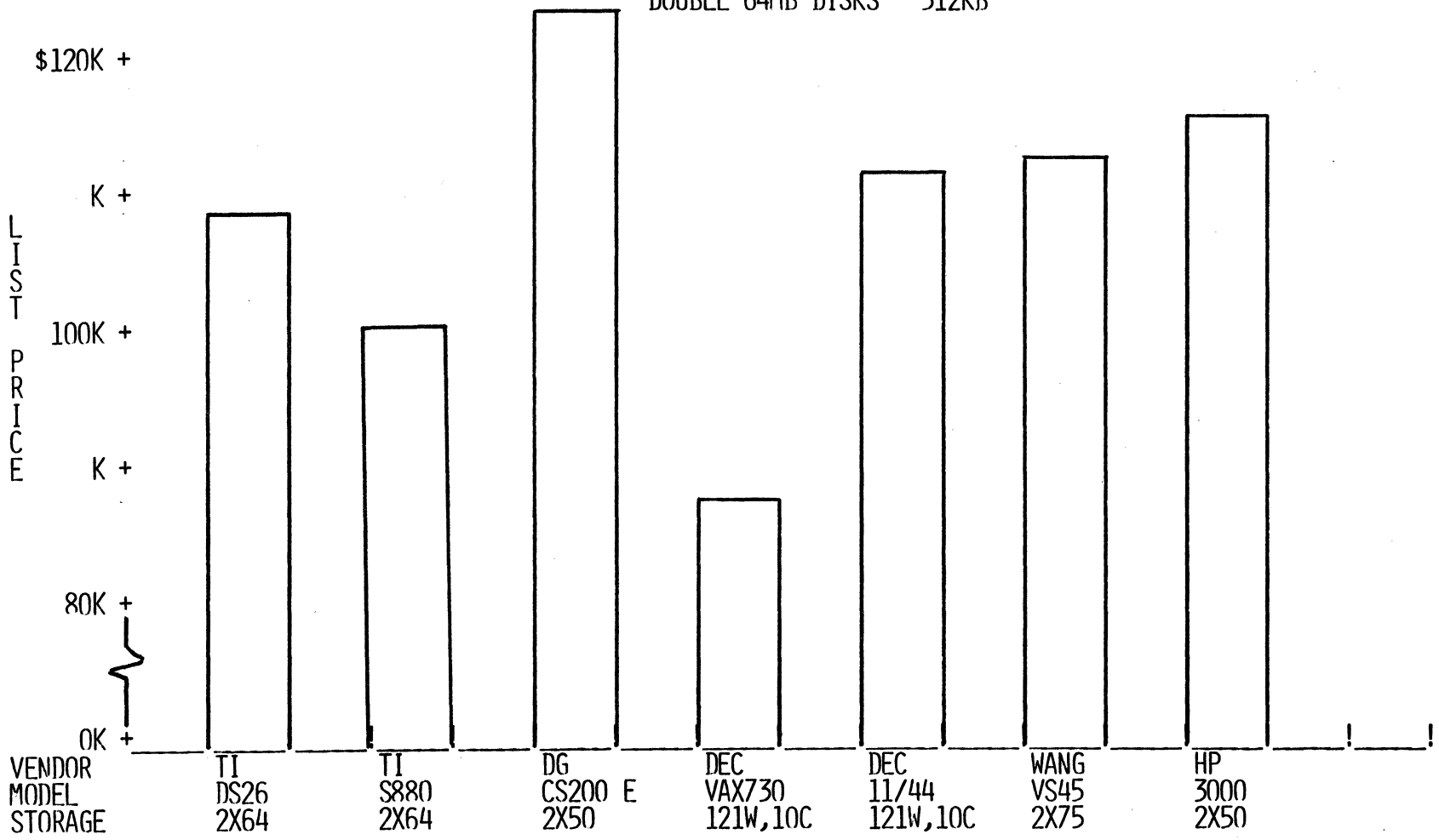
43 MB WINCHESTER - 512KB



CONFIGURATIONS INCLUDE CPU, 512KB, LISTED DISK, 12 TERMINALS, MATRIX, LINE PRINTER, O/S AND LANGUAGE

C&PD COMPETITIVE ANALYSIS
BUSINESS SYSTEM 880

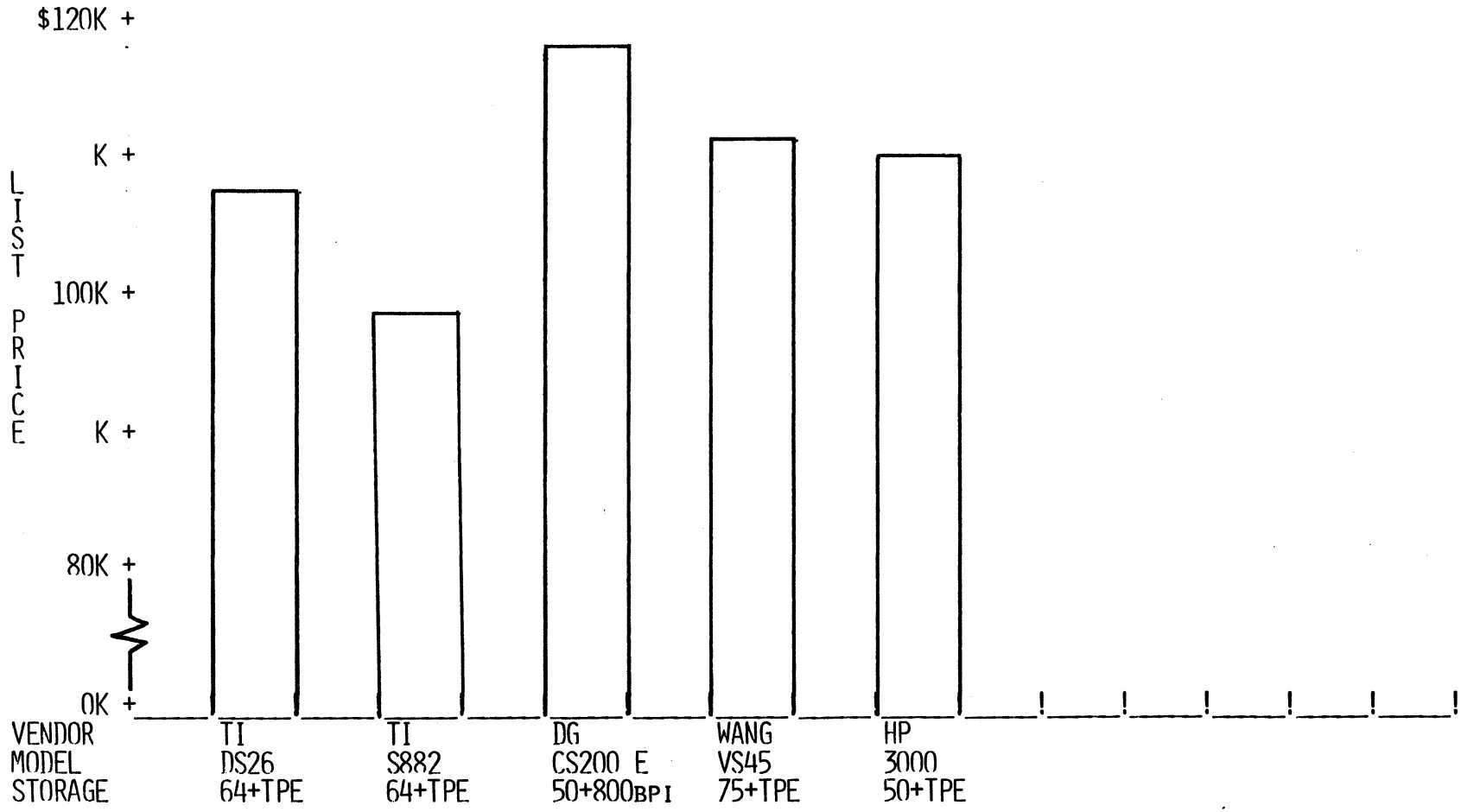
DOUBLE 64MB DISKS - 512KB



CONFIGURATIONS INCLUDE CPU, 512KB, LISTED DISK, 12 TERMINALS, MATRIX, LINE PRINTER, O/S AND LANGUAGE

C&PD COMPETITIVE ANALYSIS
BUSINESS SYSTEM 882

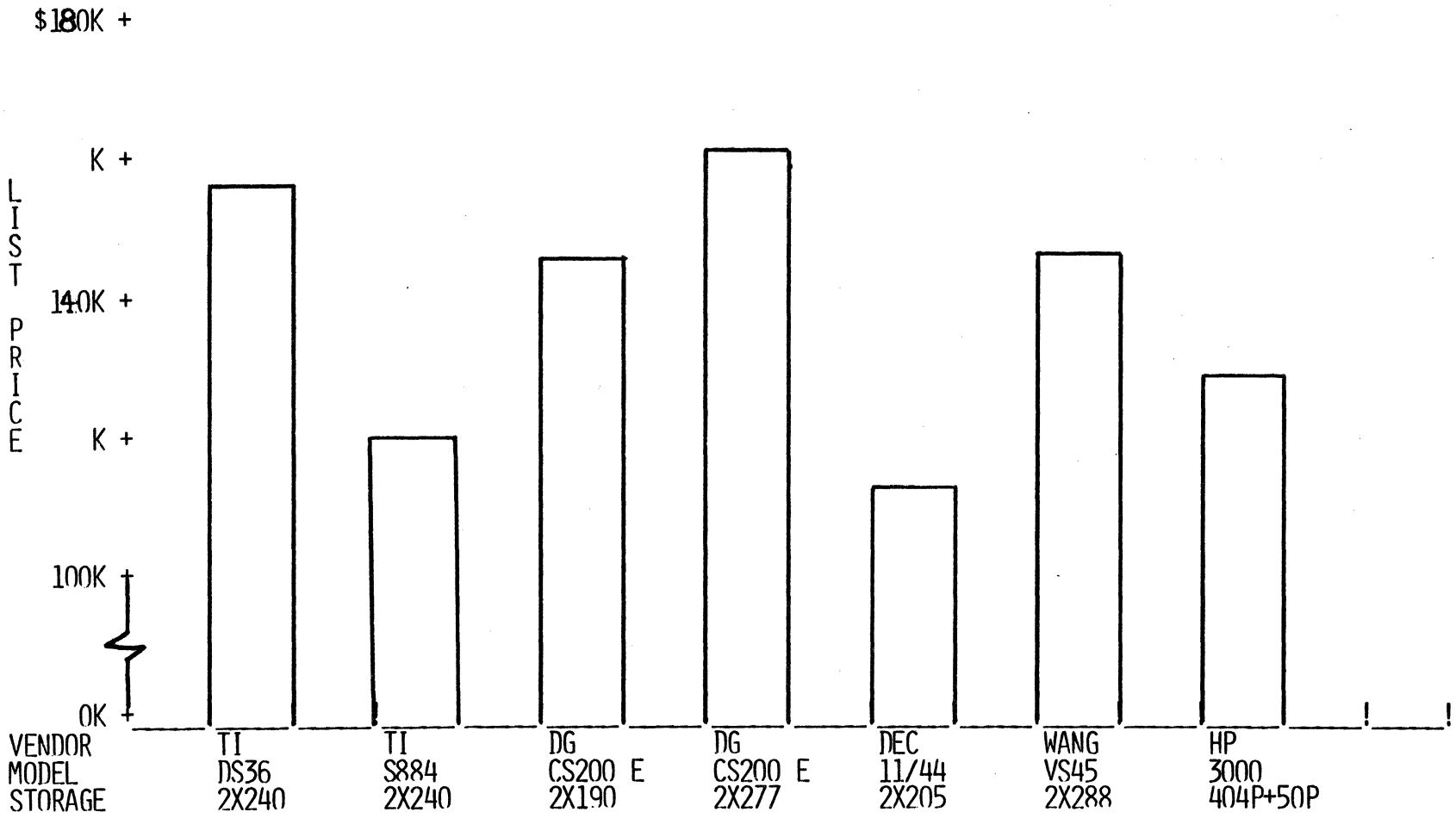
64MB DISK AND MAGNETIC TAPE - 512KB



CONFIGURATIONS INCLUDE CPU, 512KB, LISTED DISK, 1600 BPI TAPE, 12 TERMINALS, MATRIX, LINE PRINTER, O/S AND LANGUAGE

C&PD COMPETITIVE ANALYSIS
BUSINESS SYSTEM 884

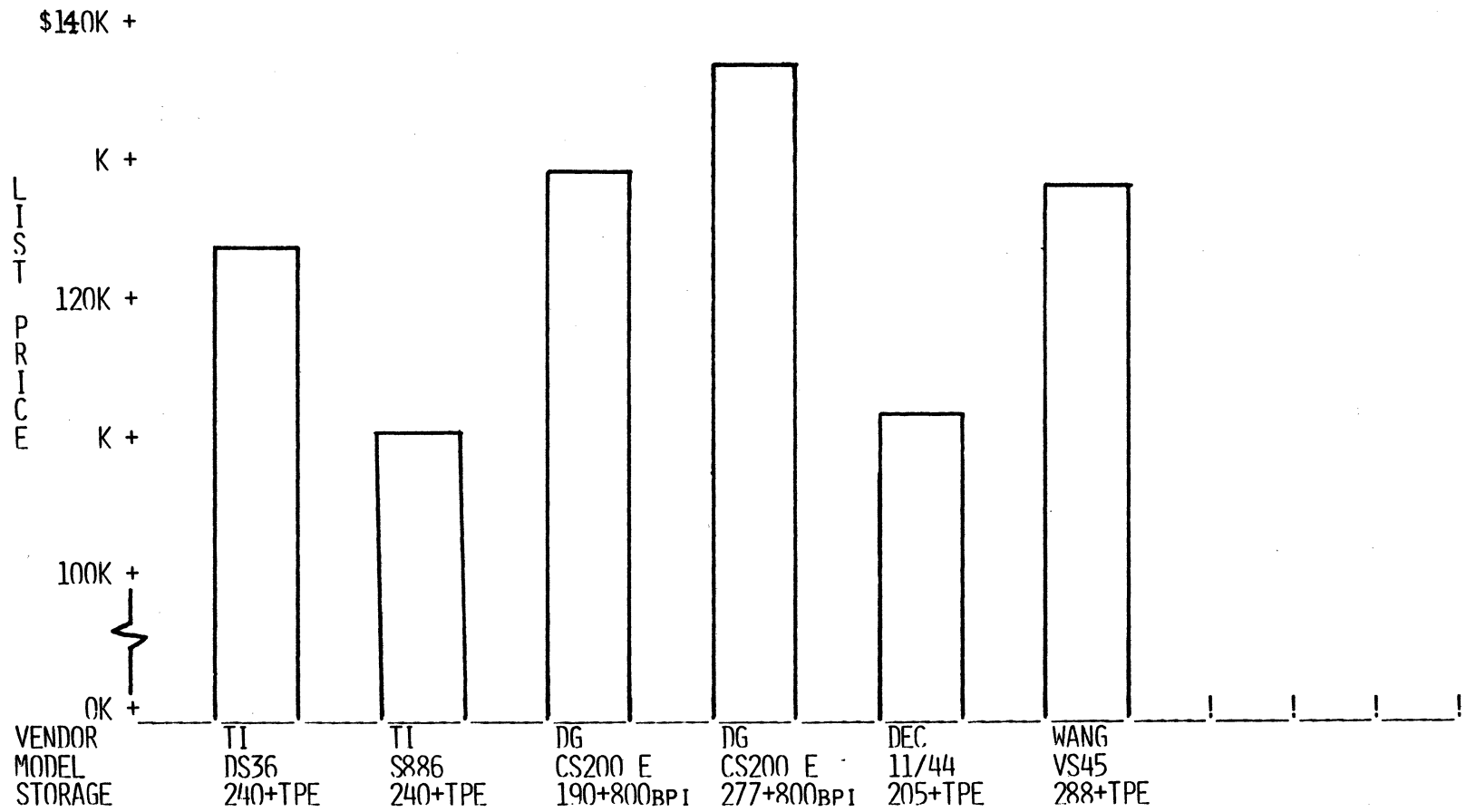
DOUBLE 240MB DISKS - 512KB



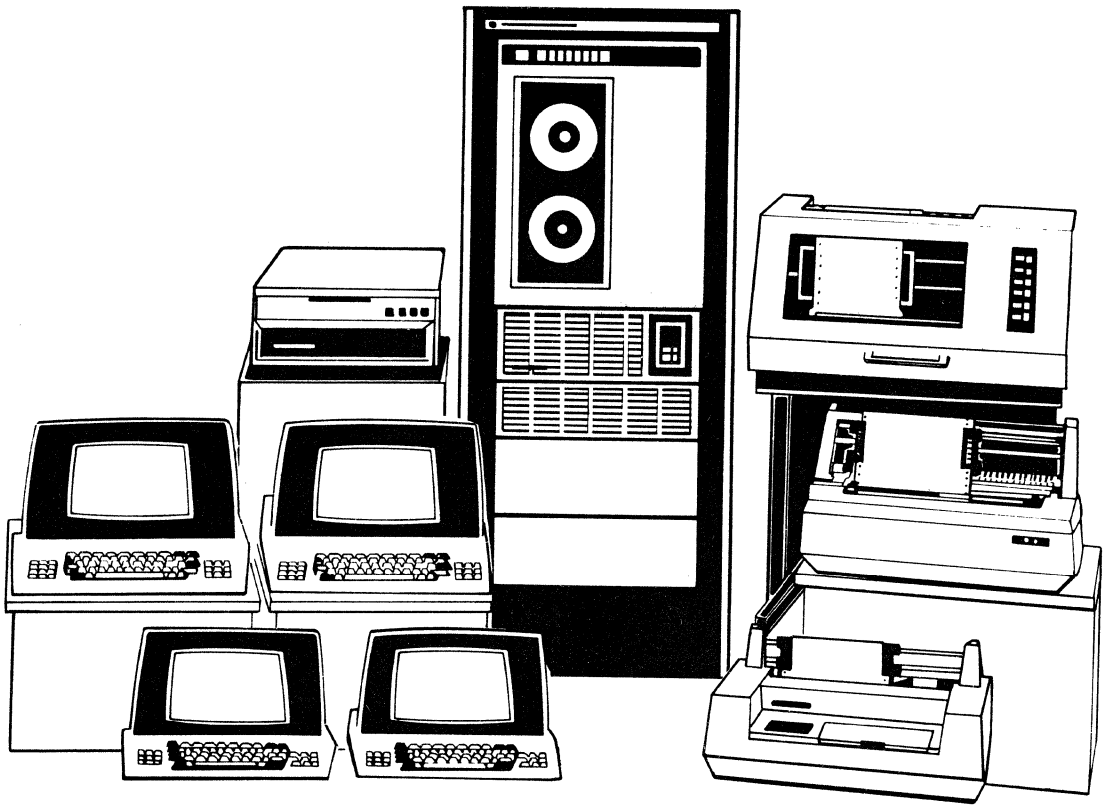
CONFIGURATIONS INCLUDE CPU, 512KB, LISTED DISK, 12 TERMINALS, MATRIX AND LINE PRINTERS, O/S AND LANGUAGE

C&PD COMPETITIVE ANALYSIS
BUSINESS SYSTEM 886

240MB DISK AND TAPE - 512KB



CONFIGURATIONS INCLUDE CPU, 512KB, LISTED DISK, 1600 BPI TAPE, 12 TERMINALS, MATRIX AND LINE PRINTERS, O/S AND LANGUAGE



BUSINESS SYSTEM 882

■ Pricing

BUSINESS SYSTEM 800 SERIES

* 990/12 processor with 512K bytes of cache memory subsystem enclosed in the 990A13 pedestal mounted chassis.
* Dual 911 VDT's with a dual controller.
* Mass storage subsystems available are: WD800, CD1400, or the DS80 and DS300 with or without the MT1600 magnetic tape drive.

The WD800 disk is an 8-inch Winchester disk drive with a capacity of 43MB utilizing a 14.5MB magnetic tape cartridge for backup.
The CD1400 is a cartridge disk drive with a 80MB (67MB fixed and 13 removable) capacity.
The DS80 removable disk pack subsystem is available as either a dual drive (126MB) or a single drive (63MB) with a MT1600 magnetic tape drive configuration.
The DS300 removable pack subsystem is available as either a dual drive (476MB) or a single drive with a MT1600 magnetic tape drive configuration.

STANDARD CONFIGURATIONS:

ITEM	DESCRIPTION	PART NUMBER	LIST PRICE	INST	LEASE RATES 3 MO.	1 YR.	3 YR.	MAINT. MO./PR.	RESELLER PRICE/DISC
	Business System 861 (42-inch cabinet)								
	CD1400/96, 512KB	2310195-0002	57,500	650	____	_____	____	422/---	H(II)X80
	Business System 872 (32-inch cabinet)								
	WD800/43MB, 512KB	2310196-0002	51,000	450	_____	_____	_____	312/---	H(II)X80
	Business System 880 (32-inch cabinet)								
	DS80 Dual, 512KB	2310197-0002	66,500	850	_____	_____	_____	582/---	H(II)X80
	Business System 882 (60-inch cabinet)								
	DS80,MT1600, 512KB	2310198-0002	64,500	850	-----	-----	-----	512/---	H(II)X80
	Business System 884 (32-inch cabinet)								
	DS300 Dual, 512KB	2310197-0004	86,000	900	-----	-----	------	702/---	H(II)X80
	Business System 886 (60-inch cabinet)								
	DS300,MT1600, 512KB	2310198-0004	76,000	900	_____	_____	_____	572/---	H(II)X80

ITEM	DESCRIPTION	PART NUMBER	LIST PRICE	INST	LEASE RATES 3 MO.	1 YR.	3 YR.	MAINT. MO./PR.	RESELLER PRICE/DISC
Model 990/12 Minicomputer									
990/12 CPU, 990A13 chassis									
	990/12 CPU	2309345-0001	$22,000	200	-	-	-	123/	$15,180 /X
Memory									
Cache Memory Subsystems (64K DRAM)									
	512K-bytes	2309335-0001	12,500	80	-	-	-	51/	$ 8,625/X
Line Printers									
	LP300 Master Kit, LR	2271814-0015	8,500	150				110/	$ 5,865/F
	LP600 Master Kit, LR	2271815-0015	11,950	150				165/	$ 8,246/F
Interface Kits									
	LP300/600 Interface KIT, LR	2271777-0017	750	N/A	-	-	-	N/A	$ 518/X
Cabinetry and Hardware Accessories									
	990A13 Hardmount Kit, Upper	2309438-0001	85	N/A	-	-	-	N/A	$ 59/X
	990A13 Hardmount Kit, Lower	2309439-0001	85	N/A	-	-	-	N/A	$ 59/X
	WD500 Slide Kit	2267257-0003	85	N/A	-	-	-	N/A	$ 59/X
	WD800 slide Kit	2270865-0001	85	N/A	-	-	-	N/A	$ 59/X