competitive update

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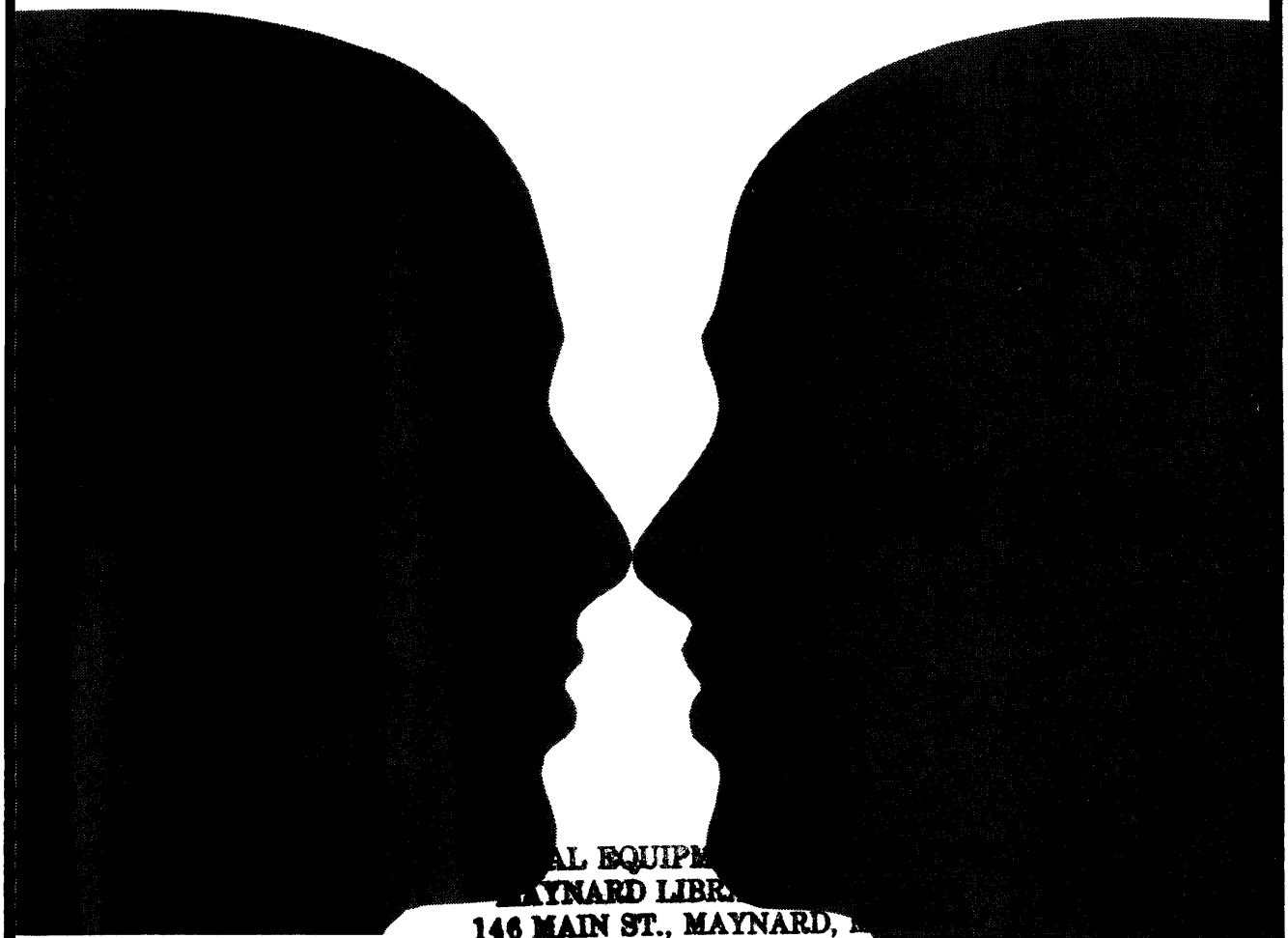
Highlights & Analysis
OFFICE SYSTEMS



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competitive update

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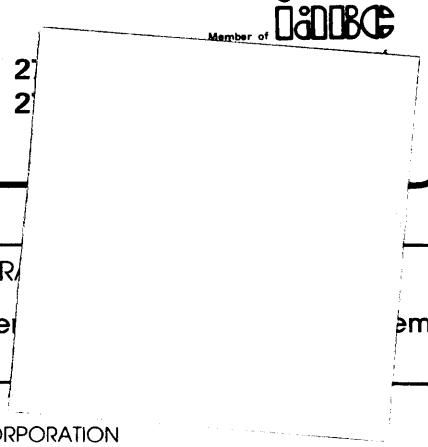


T A B L E O F C O N T E N T S

IBM PROFS VERSUS ALL-IN 1

Richard Case
X7307 MKO1-2/N38
RCS: MK12

This analysis compares IBM's 4300-based electronic mail program product called PROFS -- Professional Office System -- with Digital's VAX-based ALL-IN-1 office system.

EXECUTIVE SUMMARY

ALL-IN-1 is very competitive when compared to IBM's PROFS, as well as other vendor solutions, and has demonstrated that competitiveness in scores of existing and new Digital accounts.

Available features and ease of learning and use are two important issues in office automation. Available features are important to justify the large investment needed to place workstations on the desk. Ease of learning and use are important so that office workers will use the system. If a product is complex, hard to learn and remember, busy managers, professionals and secretaries will not take the time to learn the system. The office automation system could be a failure, no matter what degree of function is provided.

FEATURES AND BENEFITS

Digital's ALL-IN-1 provides more of the functions needed in an automated office than IBM's PROFS. With very few exceptions, ALL-IN-1 has all the features of PROFS and many additional functions not found in IBM's product:

- Computer-Based Instruction which can train existing and new employees quickly and inexpensively.
- User-controlled organization of document folders which allows office workers to organize memos in an individual and familiar way.
- Full screen, easy to learn and use, word wrapping editor with a human interface which allows office workers to create and edit communications easily and increase productivity.
- Professional word processing which is usable by all office workers and does not require secretaries to learn a different set of tools than professionals or managers. The secretary can use a DECmate; the manager and professional can use DECmail with the same user interface. This allows the office to function as a team with reduced training requirements.
- Integration between stand-alone Digital word processors and the office system which allows the benefits of both with reduced training requirements. Our DECmate I, DECmate II and DECword word processors can communicate into ALL-IN-1 far better than IBM can with the DisplayWriter, System/23, 5520 or even the 8100 word processor into the PROFS system.
- Ability of the word processing editor to obtain information from a query language, graphics subsystem and desk calculator and place that information into a document. This allows office workers to create documents with compound information in them without copying from one subsystem to another or rekeying of text.
- Automatic meeting scheduling which allows office workers to control meetings and apppointments far faster, with less work and much less chance for error.

- Desk management functions such as tickler, action items, phone directory, etc., all of which save time and improve the work environment of office workers.

- Flexibility to adapt to the customer's unique needs without massive reprogramming, which allows Digital to customize a solution to a customer's set of requirements with one integrated product.

One of Digital's key functional advantages is ALL-IN-1 editors. The human interface of these editors is far better than IBM's PROFS editor. A video tape is available showing a comparison of these two products. For details on ordering the video tape, see page 13.

EASE OF USE DEMONSTRATION OF ALL-IN-1 VERSUS PROFS

ALL-IN-1 demonstrations can be an effective sales tool against PROFS. A demonstration can make ALL-IN-1 the standard of comparison against which competitive products should be measured. Many of the additional features of ALL-IN-1 can be stressed during demonstrations to show the strengths of Digital's solution without mentioning the competition.

A complete demonstration can show the customer that ALL-IN-1 provides Computer-Based Instruction to make it easy to learn and the ease of use that will make office workers want to use the available functions.

THE PIECES OF PROFS

PROFS requires prerequisite IBM program products to function. These pieces are charged by the month for as long as the customer keeps the machine. Each of these pieces has problems of which you should be aware.

The operating system PROFS uses (VM) is not the mainstream IBM office operating system and does not support such basic functions as complete file and record sharing.

The editor of PROFS (XEDIT) does not support full-screen editing, word wrapping or "on the screen" document formatting. It does not have a good human interface.

The communications subsystem of PROFS (RSCS) is BISYNC only and does not communicate to IBM'S SNA mainstream networking architecture.

The terminals of PROFS (BISYNC 327Øs) are expensive and do not provide the user interface needed in the office.

THE MENU SYSTEM OF PROFS

Examples of the PROFS menu interface are provided to give you a feel of the product and how it interacts with the user.

ALL-IN-1 is a very competitive product when compared to other vendor's solutions and is a valuable addition to Digital's array of tools and customer benefits. This new product provides an opportunity to approach previously unavailable applications and to set a new standard in office information solutions.

ALL-IN-1 versus IBM PROFS Office Function Comparison	VAX-11 ALL-IN-1	IBM 4300 PROFS	Notes
User Interface - Multi-level Menu	Yes	Yes	1
On-line help available	Yes	Yes	
Add/Delete/Modify Menus	Yes	Yes but hard	
Add in user-written applications	Yes	Yes	
Command mode available	Yes	Yes but hard	
Electronic Mail - Multi-node	DECmail V2	Yes	
Computer-Based Instruction	Yes	No	
Good Editor	Yes	Very Poor	2
Full Screen, Word Wrap, Rulers	Yes	No	
Document formatting outside of editor (Like RUNOFF)	Not needed	Required	3
Searching for Memos various ways	Yes	Yes	
User Created Distribution Lists	Yes	Yes	
Multiple User Created Folders	Yes	No	4
Memo forwarding	Yes	Yes	
Attach DP files to memos	Yes	User Written	5
Scheduled posting of mail	Yes	No	
Support WP Systems as terminals	Yes	Limited	6
Usable by both Professionals and Secretaries	Yes	No	7
Word Processing for Professional	Yes	No	
Full Screen, Word Wrap	Yes	No	
Computer-Based Instruction	Yes	No	
Spell check Dictionary (in words)	80,000	10,000	
Automatic Hyphenation	No	Yes	8
Laser Printer Support	Not Yet	Yes-expensive	9
Document Searching by Keywords	Yes	Yes	
By words or phrases in text	Yes	No-possible with STAIRS	10
Exit WP and return with data in paste buffer interface to:			
Query Language	Yes	No	
Graphics	Yes	No	
Desk Calculator	Yes	No	
Calendar - Multi-node	Yes	Yes	
Show appointments	Yes	Yes	
Schedule meeting rooms	Yes	Yes	
Users must view other calendars to schedule meetings	Not needed	Required	11
Automatically Schedule Meetings	Yes	No	
Automatically Confirm Meetings	Yes	No	
Automatically Cancel Meetings	Yes	No	
Desk Management - Tickler	Yes	Yes	
Audio Tickler (beeping at time)	Yes, if logged in	Yes, only in PROFS	
Action Item Management	Yes	No	
Phone Directory	Yes	No	
Desk Calculator	Yes	No	

The previous functional comparison chart shows the major differences between Digital's ALL-IN-1 system compared to the IBM PROFS system. A few items in the chart need further explanation:

1. Both PROFS and ALL-IN-1 have a menu system which is easy to use. PROFS demos well because of this good human interface. The difference between the two products is that PROFS uses the Program Function keys found on 327Ø terminals whereas ALL-IN-1 and DECmail use short one or two letter abbreviations of commands to select functions.

2. A comparison of DECmail's word processing editor and the extended EDT editor in ALL-IN-1 with the IBM PROFS XEDIT program cannot be overemphasized.

3. DECmail and the ALL-IN-1 WPS editor reformat the text of the document right on the screen as it is entered, or with a few keystrokes. The document appears on the screen just as it would look to the reader. IBM does not reformat on the screen. A post editing (Batch) formatter called DCF (SCRIPT) is used to create the final form of the memo. While the DCF formatter is very powerful (like RUNOFF), it does not allow the user to see the text on the screen in its final form.

4. IBM cannot create multiple user-named folders. All memos are placed in one large file. Most people want to divide their memos into separate collections of related information. Moreover, they want to place the same memo into multiple folders as needed to organize the information and make it easier to locate memos at a later date. DECmail allows user-directed memo organization; IBM PROFS does not.

5. IBM does provide information on how to write a user program to take a data processing file (such as a document sent into VM/37Ø via BISYNC communications from a DisplayWriter) and place that file into the memo database of PROFS. It is not clear how a user could address that document to multiple (and changing) recipients or how (or if) the user program could really "send" the mail. DECmail allows the user to "Import" data processing files into DECmail without user programming. ALL-IN-1 and DECmail support a Document Transmission (DX) function which allows transmission of DECmate word processing files into the system. DECmail also supports the "Export" of memos into DP files. It is unknown if IBM can export memos into DP files.

6. PROFS cannot support the DisplayWriter, 81ØØ or 552Ø as an interactive terminal. All of these systems emulate SNA terminals. PROFS requires BISYNC terminals. Only the DisplayWriter supports BISYNC or asynchronous transmission of documents. However, there is no way for the DisplayWriter to command PROFS to add a document to the memo database or send that document to recipients. (We expect IBM to add this feature in the near future.)

7. The editor of PROFS may be usable by professionals who take the time to learn XEDIT's complex user interface. It is unlikely that secretaries will tolerate such an editor. The word processing editors of DECmail and ALL-IN-1 are direct subsets of the DECmate and DECword editors and are usable by both professionals and secretaries. Busy managers are unlikely to take the time to learn how to use a complex editor. The ease of learning and use of Digital's editors should appeal to all these user groups.

8. The DCF (SCRIPT) post editing document formatter can do spell checking and automatic hyphenation of words. It is supplied with a 10,000 word dictionary to which the user can add words. Such a dictionary may be too small to be useful. However, IBM does support automatic hyphenation.

9. PROFS supports the 6670 laser printer via DCF. The 6670 can support multiple fonts, prints at 70 pages per minute, can act as a convenience copier and costs more than $75,000. Digital will shortly announce the LN01 laser printer (reference Sales Update Vol. 13 No. 26 dated June 21, 1982 re: NCC Demonstration). However, ALL-IN-1 software does not support this printer at this time.

10. ALL-IN-1 and the BASIS software allow search of a document database by words or phrases within the text. IBM can support this function by using STAIRS, an inverted file system. STAIRS is expensive and requires high CPU and disk overhead.

11. In PROFS, when arranging a meeting, you must view the calendars, one at a time, of each person attending. The system does not schedule a meeting automatically. For example, if you wanted to schedule a meeting with ten people, each person's calendar would have to be printed, as well as the meeting room and projector calendar. Then study the printout to find a mutual meeting date and time and send a memo to the group requesting their attendance at the meeting. There is no way to automatically cancel a meeting or check on who is going to attend. (ALL-IN-1 does all of this automatically.)

    Since you have to view other people's calendars in PROFS, the privacy of each person has been invaded. You might see an entry in a vice president's calendar to speak to the president about reorganization. Most users would not like this possibility. As a user you can mark an appointment as "PRIV:", in which case that appointment description will not be displayed to anyone else. However, you have to remember to mark private meetings with PRIV:.

    With ALL-IN-1's automatic meeting scheduling, there is no need to view anyone's calendar. In fact, it is not possible to view anyone else's calendar. Digital provides much better security then IBM's PROFS.

HOW TO DEMONSTRATE ALL-IN-1 AGAINST PROFS:

The purpose of demonstrating Digital products is to show the strengths of our solution to the customer. Competitors generally should not be mentioned. However, you can stress features and benefits which set Digital's system apart from the competition. This is a guide to which ALL-IN-1 features to stress when you know the competition is IBM's PROFS:

- Show the menu interface of ALL-IN-1. Point out that people generally remember short abbreviations when learning a new system. The function keypad is used within ALL-IN-1 components when the definition of the keys is displayed on the screen. If the customer asks whether a function key main menu interface isn't faster and takes fewer keystrokes, answer that most of our installed customers prefer the short abbreviation interface. Also note that with PROFS at least two (ALT MODE, PFkey), and sometimes four keys (ALT MODE, PFkey, ALT MODE, PFkey), must be hit before a function is selected. However, because the ALL-IN-1 menu control is so flexible, Software Services can easily alter the interface to be function-key driven.

- Demonstrate DECmail:

  - First show the Computer-Based Instruction. Stress how important it is that current and new employees do not need to read large manuals or go to expensive and time consuming training courses. They can learn right on the system; fast, fun and easy. (PROFS does not have this.)

  - Show DECmail's ease of use by sending a short one or two line memo to someone. Keep the demonstration and the memo very short and to the point. (This is all IBM will show.)

  - Now show the customer how easy it is to edit a longer memo you have previously created with a few errors in it. Demonstrate how easy it is to correct mistakes and add text. Show how the system reformats the text as required. Emphasize how easy editing and reformatting is without post processing and with no complex commands to learn.

    Point out that professionals who are measured by the memos they write need a full function, full-screen editor that they can learn quickly. (IBM generally does not show editing long memos or correcting mistakes because their editor is very hard to use.) The strengths of Digital's editors cannot be emphasized enough against IBM since the editor is what the software users will utilize the most.

  - Show the customer the folder system where they can create any number of named folders to organize information and store the same memo in many folders, while taking disk space for only one copy. Point out that this folder capability is similar to the way they manage their desks now. Needed information can be located easier. Folders can be searched by author, subject, date, etc. (IBM does not support user-named folders.)

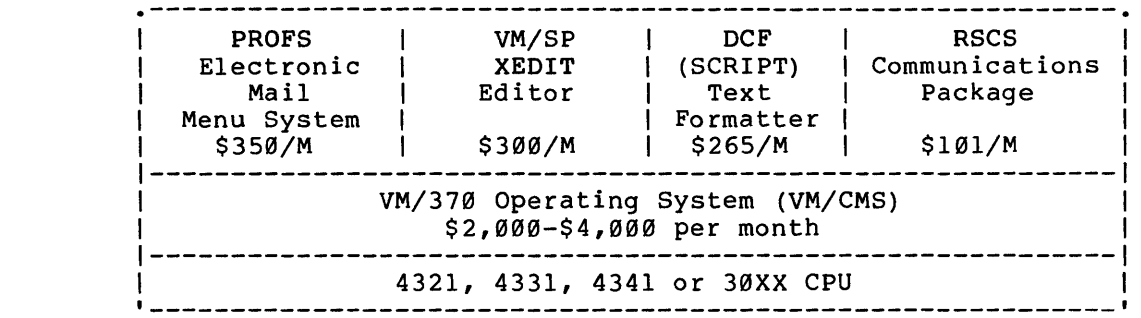
  - Show ticklers and other features as needed. Also show the scheduled or deferred posting of memos. (IBM does not have this.) If the customer is interested, show attaching an RMS file to a memo. (IBM cannot do this without user programming.)

  - Show the easy interface of DECmate into DECmail. (IBM DisplayWriters cannot do this.)

- Demonstrate the ALL-IN-1 calendar system.
  - Show the calendar layout; scheduling appointments, displaying days and weeks, printing calendars. (IBM can do all this.)
  - Then show how meetings can be automatically scheduled among several persons with the system finding the best meeting date and time. (With IBM you have to look at each person's calendar, one at a time.) The system will mark all calendars and send each person an invitation memo. The person can agree to the meeting (in which case his or her calendar is updated accordingly) or can decline (in which case the calendar is cleared and a message sent back to the meeting originator). The meeting originator can check the status of the meeting at any time to see who is attending and who is not. If the meeting is cancelled, all calendars have the meeting removed. (IBM does none of this.)
- Demonstrate the ALL-IN-1 word processing for professionals or managers.
  - Be sure to point out that if the customer needs high-performance, fast results secretarial word processing, that a DECmate is required. Point out that the word processing on ALL-IN-1 uses the same keyboard and is subset compatible with DECmate. User training is nearly the same whichever Digital editor is required. Also, DECmate can easily communicate with ALL-IN-1. (IBM DisplayWriters cannot do this.)
  - Show the Computer-Based Instruction for this special version of EDT. (The IBM editor has no CBI.)
  - Show how a user can exit from word processing and get into DATATRIEVE to create tables or graphics, return to the document and "Paste" the table or chart into the document. Also show the desk calculator. (IBM supports no such integration of function.)
  - Demonstrate the document searching functions which include searching documents using words or phrases in the text. (While IBM can do this, it requires STAIRS, which is expensive and has high CPU, disk and memory overhead.)
- Demonstrate the features of ALL-IN-1 which IBM does not have:
  - All features of DATATRIEVE
  - Action item management
  - Phone directory
  - Desk calculator
  - FMS
  - VAX Information Architecture, and so on

THE PIECES OF PROFS

PROFS, Professional Office System, is an electronic mail system running under the VM/CMS operating system for the 4300 or 30XX computers. PROFS requires the following additional IBM software products to function:



- The VM/CMS operating system.
- VM/System Product (VM/SP). PROFS requires the XEDIT editor which is packaged with this program product.
- Document Composition Facility (SCRIPT). This product is functionally equivalent to the RUNOFF utilities on various Digital operating systems. PROFS uses this program product to format text into memos.
- The RSCS (Remote Spooling Communications System), a BISYNC only communications system, does not support SNA and is not state of the art. PROFS needs this program product to send messages between systems or within a single system. PROFS cannot use SNA to communicate between systems or with terminals.

VM/370

VM/370 (Virtual Machine/370, also called VM/CMS or just VM) is the most interactive and easy-to-use operating system that IBM offers for the 4300s. VM has the following problems:

- Expensive hardware purchase prices and software monthly payments, averaging $2,000 to $4,000 or more per month. (Reference Competitive Update Special Issue on the 4300s dated October 20, 1980 for a comparison of this operating system with VAX/VMS and reference Competitive Update Special Issue dated March 8, 1982 for current IBM 4300 hardware and software prices.)
- It is not the mainstream IBM 4300 office operating system. All other IBM office software runs under MVS/IMS. This software includes DISOSS (DX-like software for 8100s), DIF, DCF and ATMS. (Reference Competitive Update Special Issue dated November 9, 1981 for more information.) VM does not directly support SNA -- IBM's networking system.
- VM can run any other IBM operating system as a "guest." However, this uses up a great deal of CPU, disk and memory overhead. If IBM proposes running PROFS with any other office software requiring MVS/IMS, a benchmark should prove the effects on performance.

- VM users cannot write share files or directories. VM can read share files. It cannot lock records in a shared file. IBM's program product (IFS), which can lock records, requires high overhead which will affect system performance.

Benchmarking Against VM

When benchmarking against VM be sure to require multiple users logged onto the same account concurrently with read, WRITE and DELETE access to the same set of files at the same time, with the operating system protecting users from each other. This allows multiple users working on the same project to log on to the same user account and work concurrently without the danger of overwriting, accessing or inadvertently deleting a file someone else was using. VM/370 cannot support this function.

Also require read, WRITE and UPDATE sharing of records in the same file. This allows applications to be written where users can share data records in a file without the danger of accessing a record someone else is updating or deleting. IBM can support this function but not in the VM operating system. Additional layered software (called Interactive File Sharing) is required which locks records between multiple users of a file. IFS increases monthly charges and causes high system overhead and a performance reduction.

Write sharing of files and records are routine activities for Digital operating systems and are the kinds of features most interactive users will need and want. Make sure the benchmark reflects customer's real needs.

DOCUMENT COMPOSITION FACILITY

DCF is a document formatting program product which is also called SCRIPT. The user must embed commands of the form .COMMAND in the text. The text file does not look like the final output.

DCF should be positioned against RUNOFF, which exists on almost all Digital systems at no charge. In both RUNOFF and SCRIPT, users enter special commands (.COMMAND) within documents to control the formatted output. SCRIPT and RUNOFF command comparisons follow:

Sample COMMANDS	SCRIPT	RUNOFF	Sample COMMANDS	SCRIPT	RUNOFF
Blank line	.SP	.S	Break a line after this word	.BR	.BR
Indent text	.IN	.I	Center a line of text	.CE	.C
Page eject	.PA	.PG	Align right margin	.FO	.F
Title	.TT	.T	Justify text (auto fill lines)	.JU	.J
Single space	.SS	.SP 1	Page Length (lines/page)	.PL	.PS

Additional features of SCRIPT include spelling checks, automatic hyphenation (both from a dictionary of 10,000 words), multiple columns, font control (if a 3800 printer or 6670 is used) and a "Generalized Markup Language." The GML can be used to enforce a set of standards on all documentation at a site. The GML is complex and requires extensive training to use.

Within PROFS, the system manager can pre-define DCF command formats which the memo writer can select when a memo is created. Thus the installation could have a standard memo layout, business letter layout or other format. When a user types and files a memo, it is automatically reformatted. If the user needs a different format, DCF commands would have to be embedded in the document text. PROFS does not provide rulers, automatic word-wrap or other on-the-screen formatting aids.

Some issues for effectively comparing ALL-IN-1 with DCF or SCRIPT are:

- The user must learn complex embedded commands to format text. Each new employee (secretary, professional or manager) must spend a good deal of time training to use this software.

- Because so much training is required, busy professionals may not have the time to learn. If they do not learn, the electronic mail system will be a failure because it will not be used.

- PROFS memo text appearing on the screen as it is being entered does not look like the final memo. Most people prefer the CRT to look like the printed or viewed output.

SCRIPT is a tool for programmers, not secretaries. DCF should be compared against RUNOFF. It cannot match the formatting features of DECmail or DECset. It lacks word processing function and the advanced text formatting and font control of DECset, as well as the textual database control features.

VM/SP XEDIT

VM/SP (System Product) is a base package upon which all IBM advanced function is layered. Part of the VM operating system is free software supplied by IBM in the past. The VM/SP is charged for software which is required for such layered products as PROFS and DCF.

XEDIT, the editor included with VM/SP, is required for PROFS. XEDIT works on IBM's 3270 terminal family or on 3101 asynchronous terminals which emulate 3270s (in host software).

Major Weakness -- the 3270 Terminal Family

The 3270 family consists of polled, buffered terminals which do not have a programmable microprocessor. This terminal does not interactively word wrap as a user enters a document. Words are broken, half on one line and half on another. Insertion of characters does not move text to the next line. The terminal freezes and will not allow the user to continue typing until program function keys are pressed, moving text down to another line to make room. The viewed document does not look like the final printout unless full-screen transmission, text reformatting and retransmission take place.

Installed 3270s cannot be upgraded to support word processing. Most of Digital's installed VT100s can be upgraded to support the word processing editors of ALL-IN-1.

Editing

True full-screen editors do not exist on the 4300/370s because the mainline 3270 terminal does not feature character-by-character interaction. "Full screen" is defined as an editor which can insert/delete characters and lines, vector up and down within the screen, scroll the document and have the computer know what was changed. A good definition of a full-screen editor is the current EDT product on most Digital operating systems. EDT is easy to learn with on-line help and Computer-Based Instruction. EDT in full-screen mode provides a function keypad that allows users to edit with only a few keystrokes.

With XEDIT, the user must "mark" special locations beside each screen line with commands like "A5" or "D2" (add five blank lines or delete two lines). The user then presses ENTER. The screen is transmitted to the host, reformatted and retransmitted back to the screen before the user can continue editing. This is less than interactive and far less than EDT ease of use and function. This is not full-screen editing. XEDIT is one of IBM's most advanced editors and MUST be used as the editor for PROFS.

"FULL-SCREEN" EDITORS CANNOT EXIST ON 3270 TERMINALS.

Word Wrapping

DECmail and the special version of EDT supplied with ALL-IN-1 go one step further by providing word wrapping.

XEDIT cannot provide this interactive function because the 3270s are incapable of word wrapping. XEDIT does provide a special typing mode called "POWER TYPING" which is claimed to be close to word processing function. The user types without placing returns in the text. Words are broken, half on one line and half on the next. The user cannot press the enter key because this will transmit the whole screen into the computer. The user must place pound signs (#) in the text to mark the start of new lines. When finished typing, the user presses ENTER. The screen is transmitted to the host and the host reformats the text, placing whole words on a line and replacing pound signs with returns. The screen is retransmitted back to the user for viewing. If the user changes the text, the text will not be word wrapped and the reformatting process must be repeated.

Next the text can be processed by the DCF (SCRIPT=RUNOFF) text formatter which will format the text using commands set up by the systems manager (defaults) or by commands the user embeds in the text. The user can then view the reformatted text. This is not word processing functionality. Word processing function provided by DECmail or the ALL-IN-1 WPS editor (special EDT) reformats the text as it is being entered, interactively.

"WORD WRAPPING" EDITORS CANNOT EXIST ON 3270 TERMINALS.

Full-screen editing with word processing word wrap is a powerful advantage that Digital's ALL-IN-1 has over IBM's PROFS system.

Only a demonstration of the power and flexibility of DECmail and the EDT full-screen editor can show the customer the advantages of these products.

How IBM demonstrates the PROFS editor

At trade shows, when IBM demonstrates PROFS, they generally only show one or two sentence memos being created and mailed. Have your customer type in a more realistic multi-paragraph memo, make a few errors and correct them. This attempt to use the IBM editor will show the customer the key difference between Digital and IBM products.

The editor for an electronic mail system is very important. Most managers, professionals and secretaries will spend a great deal of time using an editor to create and modify text. If the editor is hard to use, it will not be used. Busy office workers will continue to use paper rather than learn a complex editor.

It is very difficult to adequately describe on paper the human interface differences between two text editors. Only a live demonstration or a video tape will show the dramatic ease-of-use advantage of Digital's products. A video tape of PROFS is available which shows a direct comparison of the DECmail editor and the PROFS XEDIT product. Contact Sales Communications at RCS code CSCG for a copy of this video tape: Order Number: EE-16393-Ø5 for 3/4 inch and EE-16394-BX for 1/2 inch.

RSCS -- REMOTE SPOOLING COMMUNICATIONS SYSTEM

The RSCS system is a batch file transfer system which uses BISYNC communications to pass information between VM/37Ø systems. This package is required even if PROFS is used on a stand-alone system.

PROFS SUPPORTED TERMINALS

327Ø family terminals:

PROFS requires a 3277, 3278 or 3279 terminal in order to work. These terminals have various screen sizes, the most common being 24 lines by 8Ø columns. These terminals are buffered, polled terminals with some local editing functions. Thus the CPU sends the terminal a full-screen load of information. The user must utilize editing functions which are "hard wired" into the terminal locally. Once the user is finished editing, the whole screen is transmitted into the host. This scheme has the advantage of off loading the central processor of the screen editing performance needs.

The disadvantage of this style of terminal management is a significant lack of interactive function and an unfriendly human interface.

The keyboard of the 327Ø family comes in various styles with zero, ten or twelve keypad function keys. If the terminal does not have a separate keypad, the top row of keys (numbers and special symbols) are labeled on the front with PF1 to PF12. The user must press an ALT MODE key to "shift" to the function keys. When a PF key is pressed, it sends the entire screen into the host and the user cannot type until the host responds.

PROFS assumes terminals have twelve function keys. Terminals with less have to hit two keys (ALT MODE, PFkey) to use the system. These function keys are labeled PF1 through PF12. No other labeling is available. The IBM keyboard does not have text-oriented labeled keys.

This cryptic labeling of the keys makes the system hard to learn and remember. The user must continuously employ the system help (by pressing the key marked PF9, there is no key labeled HELP) or write down the meaning of each key. Digital's word processing keyboards on the DECmate, VT100-W, VT102-W or VT125-W all have keys clearly labeled.

BISYNC Terminals only

It is important to note PROFS requires BISYNC 3270 terminals. SNA terminals cannot be directly supported except by high overhead expensive software. SNA is IBM's state-of-the-art networking system which should be compared to Digital's DECnet. BISYNC is very old and ineffective. Most advanced IBM customers are making the move to SNA.

The fact that PROFS functions in a BISYNC communications environment should cause customers to be concerned that PROFS is not a mainstream IBM product.

Benchmarking against 3270s

When benchmarking against 3270 buffered terminals, try to make the benchmark as field interactive as possible. The way IBM would like to structure the benchmark is to send a fill-in-the-blanks form to the screen, let the user locally edit the form and return the whole form back to the CPU. The disadvantage of this is that the user could have made an error on field 1 and not discover the mistake until field 100. If the customer requires field-level response where the computer reacts and verifies the input a field at a time, then a Digital system will outperform the IBM system.

3101 Async Terminal

PROFS also supports the IBM 3101 async terminal. However, when using the 3101, the VM operating system emulates a 3270-style terminal. IBM will claim the 3101 is an inexpensive terminal which can be used in the office or at home. However, running many 3101s on an IBM host will cause a host performance impact since IBM CPUs are optimized to deal with block-mode terminals like the 3270s. Interactive character-at-a-time terminals will degrade performance. Also, because PROFS treats the 3101 as if it were a 3270, the user does not get any of the advantages of an interactive character terminal.

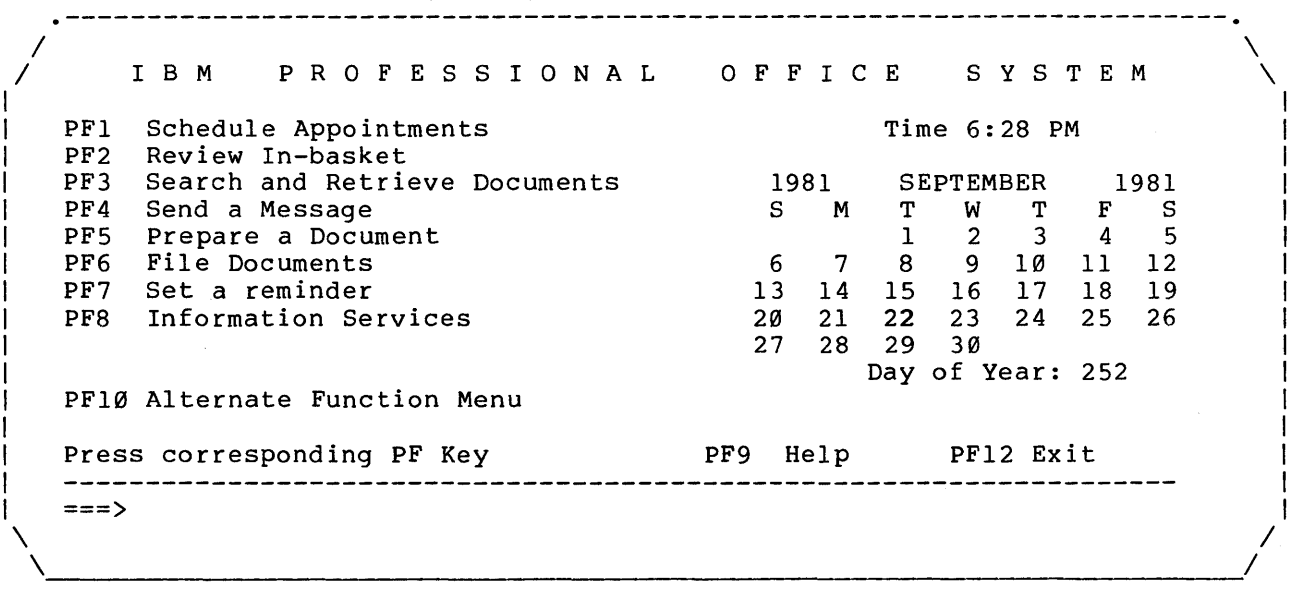
THE PROFS MENU SYSTEM

The examples below show how the PROFS user interface functions.

These examples were taken from an IBM document entitled IBM Professional Office System General Information Manual, GH2Ø-2493-Ø and from numerous observed IBM demonstrations of the product at trade shows such as the National Computer Conference.

This first screen is the main menu of PROFS:

3277, 3278, 3279 or 31Ø1 CRT Screen



PF refers to Program Function keys which are located to the right of the main keyboard or are special labeled keys on the top row of keyboards without keypads. Each Program Function key invokes a function as follows:

PF1 Calendar
PF2 Electronic mail UNREAD memos
PF3 Search for memos
PF4 Send a memo
PF5 Edit an unsent memo
PF6 File a document using keywords, etc.
PF7 Tickler system
PF8 Exit to APL, QBE, etc.
PF9 On-line help
PF1Ø Other options like edit distribution list, etc.
PF12 Exit to operating system

This screen shows the PROFS in-basket. The various codes denote where the document is from and where it is stored. The user would press a Program Function key to view or print the selected document.

```
                    R E V I E W     I N - B A S K E T

AUTHOR                    ADDRESSEE          STATUS  DUE DATE   NUMBER

PF1  TDCSYS2(C39-DXM)     TDCSYS3(C33-RBR)                      Ø2/13/81 1Ø:2Ø
     Staff Meeting

PF2  Percy, P.O.          Lewis, J.N.        Mailed             81Ø43PLPØ15Ø
     System Productivity Data

PF3  TDCSYS3(C33-TCH)     TDCSYS3(C33-RBR)                      Ø2/13/81 1Ø:Ø6
     Field Support

PF4  Lewis, J.N.          Grant, P.C.        Mailed             81Ø43PLPØØØ7
     Product Development Strategy

PF5  Grant, P.C.                             Mailed             81Ø3ØPLPØ211
     Activity Report for January 1981

Press corresponding PF Key to select document or          Screen  1 of 1
Key ALL and press ENTER to select all documents =>
PF1Ø Next Screen   PF11 Previous Screen          PF9 Help   PF12 RETURN
```

Pressing PF12 will return the user to the main menu. The user can look at the current schedule by pressing PF1 (only from the main menu).

```
     I B M   P R O F E S S I O N A L   O F F I C E   S Y S T E M

Schedule For:  G. J. Johnson                      Time 6:29 PM

Schedule Date: 1Ø/ 9/81                  1981    SEPTEMBER    1981
                                           S   M   T   W   T   F   S
PF1   Display Schedule                                 1   2   3   4   5
PF2   Schedule Selection                   6   7   8   9  1Ø  11  12
PF3   Conference Room Selection           13  14  15  16  17  18  19
PF4   Next Month                          2Ø  21  22  23  24  25  26
PF5   Previous Month                      27  28  29  3Ø
PF7   Printer Selection                          Day of Year: 252
PF8   Print Schedule       7 Days   1 Copy
PF1Ø  Next Day
PF11  Previous Day

Press corresponding PF Key            PF9  Help      PF12 Exit
---------------------------------------------------------------
===>
```

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Looking at the previous screen, PF2 is used to select whose calendar you wish to view. In order to schedule a meeting, a user must select each person's calendar and find an open time on each calendar. A message can then be sent to each user requesting them to attend a meeting. PROFS does not do automatic meeting scheduling.

```
                    A P P O I N T M E N T   S C H E D U L E

G. J. Johnson                        10/ 9/81                          Thursday

Begin       End         Purpose/Location

 9:30 AM   11:00 AM     Production Status Meeting
                        -- Make sure performance data is available

 2:15 PM    3:00 PM     Code review - John D.

 3:00 PM    3:30 PM     Review schedule with Disk

 4:30 PM                PRIV:  Salary Reviews

 Notes:                 Need more detail on communications performance

                                                          Time:  9:37 AM

 PF10 Next Day   PF11 Previous Day   PF4 Move   PF5 Copy   PF12 RETURN
```

This screen shows one person's calendar. If the user were looking at another person's calendar, the line marked PRIV: would not show Salary Reviews. This is only true if the user had remembered to place PRIV: in front of the text. This could be a real security violation.

DIGITAL VERSUS WANG IN OFFICE AUTOMATION -- ALL-IN-1 and VS ALLIANCE

Peter V.K. Parsons
X7989 MKO1-2/N38
RCS: MK12

INTRODUCTION

Competitive Update Special Issue dated November 9, 1981 detailed Wang's products, selling tactics and product integration dilemmas. Many Digital sales representatives have said that this analysis provided them with the tools to effectively compete with Wang's 2200, WPS/OIS and VS family of products. The following is a very brief description of these families:

- The 2200 family is positioned against, but not equivalent to, Digital's CTS-300 family. The 2200 is expandable from 1 to 16 terminals for limited data processing solutions for first-time small business users. Since November 1981, the 2200 has not been enhanced significantly and will not be discussed in this analysis.

- The WPS/OIS family has been Wang's mainstream word processing shared logic system. Expandable from 1 to 24 CRTs, the OIS provides full function word processing and very limited data processing that is incompatible with Wang's other data processing families. DECmates offer a much lower cost per terminal than Wang's OIS systems, with almost equal functionality. Positioned against DECword/DP, Wang's OIS provides the lowest cost per terminal below six terminals; however, OIS lacks the data processing solutions that DECword/DP can provide. DECword is functionally equivalent to OIS word processing.

- Wang's VS family provides data processing and word processing solutions for distributed applications. Although the VS does not provide as much functionality as RSTS with DECword/DP, Wang tries to position the VS against Digital's VAX systems. This analysis positions Wang's enhancements to the VS family and details the functional deficiencies of these enhancements.

Since November 1981, both Wang and Digital have announced new offerings that are rapidly increasing Digital's competitive position, and these changes will continue as Digital outpaces Wang with new installations and enhancements for our more comprehensive office products.

Wang's new ALLIANCE software can be briefly described as an upgraded OIS package designed for managers and professionals rather than secretarial or clerical personnel. Alliance offers:

- Full word processing functionality
- A tree-structured database system used to access text files
- Calendar, notebook, buck slip, to do list functionality
- Voice document and messaging using specialized terminals

This competitive analysis provides an update on:

- Wang's ALLIANCE System and its VS software enhancement compared to the functionality of Digital's ALL-IN-1.
- Wang's sales tactics seen with these new products.
- A sales effort road map to help you be effective against Wang.

The primary focus of this analysis is VS ALLIANCE versus ALL-IN-1, while Wang's personal or departmental systems announcements, and lack thereof, are detailed to demonstrate Digital's superior product offering.

EXECUTIVE OVERVIEW

Winning

Digital is winning against Wang competition for word processing and office automation sales at an ever-increasing rate.

- DECmates are winning against Wang stand alones and even large OIS shared logic systems because they offer the best value: 20% lower cost per terminal with the most functionality, versatility, redundancy, security and connectability.

- DECword/DP is winning against Wang's OIS and VS DP/WP systems because DECword offers the best value: most functionality in both word and data processing integration with competitive prices in mid-range systems.

- VAX and ALL-IN-1 are winning against Wang's ALLIANCE and (as yet undeliverable) VS ALLIANCE because ALL-IN-1 offers the best value: most functionality with lower cost per terminal. If equal comparisons are quoted, ALL-IN-1 with DECmates is less expensive than VS ALLIANCE with ALLIANCE terminals. ALL-IN-1 with VT100s is less expensive than VS ALLIANCE with DP/WP terminals.

Industry Consultants

Two of the leading data processing and office automation consultants have given high ratings for Digital's office products as follows:

- Gideon Gartner, a Wall Street investment analyst and highly regarded data processing consultant, has confirmed the value of our OFFICE PLUS strategy based on networking and integration. In the Gartner Group Office Information Systems Biweekly Research Notes dated June 16, 1982, Mr. Gartner states:

> "Digital has special advantages, along with IBM, in the all-important, large-organization environment. Both vendors' products have broad 'system' implications. In this context, the recently announced Wang PC may be somewhat disappointing. The company (Wang) seems to be in a defensive mode a bit too often (Wangwriter is another example). Even where Wang has been innovative, other firms are achieving parity more quickly than heretofore. Thus, Wang's ALLIANCE, a hot product for the professional terminal marketplace, has a new Digital product to contend with called ALL-IN-1; it too will be hot. Bottom line, we think Digital is rapidly moving toward the #2 position in office automation (IBM will be #1 shortly after it announces its token ring-passing, SNA-compatible, local-area network). So Wang will have slipped two positions with respect to leadership, with Xerox right behind it, although it is still #1 in marketplace momentum."

- Patty Seybold, the word processing and office systems consultant and publisher of "The Seybold Report on Office Systems," singled out Digital's ALL-IN-1 at the recent IWP Conference in Kansas City as offering the best usability and highest functionality as compared to Wang's ALLIANCE system and all other office automation systems. Ms. Seybold also rated DECmate I and II and DECword at equal functionality with slightly better usability than Wang's word processing family.

Customers and analysts alike are confirming our strategies based on a foundation of integration coupled with innovative products offering the most usability and functionality. This analysis shows that ALL-IN-1 has far more functionality than VS ALLIANCE (see pages 25 and 26).

Competition

As the economy continues to vacillate, the competitive climate intensifies as customers search for the best value.

Wang's competitive style must be re-examined as Wang continues to use aggressive tactics to:

- Finding customers first and establishing decision criteria based on limited needs which Wang can solve, thus outpositioning the competition.
- Quickly demonstrating simple solutions to meet these limited needs. A futures demo may be used to assure the buyers that Wang will have everything ever needed.
- Closing the sale before the competition even finds the customer.

Digital sales representatives are increasing their competitiveness by countering and redirecting Wang's tactics and consequently winning more sales. Digital's new products and pricing are winners when Digital representatives detail our strategies and demonstrate that our products:

- Address the needs of all office workers, departmental as well as corporate.
- Are easy to use to solve simple needs, modifiable to solve unique or changing needs and integrated to solve comprehensive needs.
- Offer the most value in functionality, performance, service and support.

This analysis provides tactics that win sales against Wang, including advice on how to demonstrate our products to the best advantage.

Road To Success

The road to successful leadership in office automation is based on our comprehensive foundation in:

- Word Processing
- Data Processing
- Networking
- Service and Support
- Integration of Functions

With this foundation, successful selling will depend on our ability to understand the prioritized needs of:

- The personal buyer
- The department buyer
- The corporate buyer

Winning with these buyers will depend on our price/functionality advantage and demonstrating that only Digital can provide:

- Personal computers that interconnect to department and corporate systems to solve all personal needs at affordable prices.

- Departmental systems that interconnect with personal and corporate systems to solve all departmental needs.

- Corporate systems that interconnect to departmental and personal systems with standardized yet versatile communications methods.

Only Digital's solutions address all the personal, departmental and corporate requirements and provide integration for automating the office of the eighties.

OFFICE FUNCTIONAL PRODUCT POSITIONING

	Digital	Wang
Higher Functionality	VAX ALL-IN-1 and DECmates	
		VS and ALLIANCE
	ALL-IN-1 and VT100s	
		ALLIANCE
	DECword/DP and/or DECmates	OIS
	PROFESSIONAL 350	
		Wang PC Wangwriter
Lower Functionality	RAINBOW 100	

OFFICE PRICE PRODUCT POSITIONING

	Digital	Wang
Higher Price		VS and ALLIANCE ALLIANCE
	VAX ALL-IN-1 and DECmates	
	DECword/DP	
		OIS
	PROFESSIONAL	Wangwriter and Wang PC
	DECmate II	
Lower Price	DECmate I RAINBOW 100	

SUMMARY OFFICE FUNCTIONAL/PRICE POSITIONING

- VAX ALL-IN-1 with DECmates has higher functionality and lower price than VS ALLIANCE or ALLIANCE by itself.
- DECmates have reasonably equal functionality to OIS but a much lower price. DECword has higher functionality and equal price in mid-range systems.
- Digital's personal computers offer the highest functionality at the lowest price compared to Wang's stand alones.

ALL-IN-1 VERSUS ALLIANCE FUNCTIONALITY

FEATURES AND FUNCTIONS	VAX ALL-IN-1	VS AND ALLIANCE	ALLIANCE 350
ACCESS VIA			
ASCII TERMINAL	YES	NO	NO
INTELLIGENT LOCAL TERMINAL	YES	YES	YES
REMOTE TERMINAL	YES	NO	NO
REMOTE NETWORK TERMINAL	YES	LIMITED[1]	LIMITED[1]
PERSONAL COMPUTER	YES	LATE 1982	LATE 1982
MULTI-NODE NETWORKING	YES	LIMITED[1]	NO[1]
MENU INTERFACES			
DOCUMENT MAIL	YES	YES	NO[2]
VOICE MAIL	NO[3]	YES	YES
PROFESSIONAL W/P	YES	YES	YES
SECRETARIAL W/P	DECmates	YES	YES
DOCUMENT MANAGEMENT AND QUERY	YES	YES	YES
DESK MANAGEMENT	YES	YES	YES
CALENDAR MANAGEMENT	YES	YES	YES[5]
MENU DELETION	YES	YES	YES[5]
MENU BY-PASS	YES	NO	NO
MENU CREATION	YES	LIMITED	LIMITED[5]
IN PROCESS MENU RECALL	YES	NO	NO
IN PROCESS PASTE	YES	LIMITED	LIMITED
MANAGEMENT STATISTICS	YES	NO	NO
CALCULATOR	YES	YES	YES
HARDWARE INTERFACES			
LINE PRINTER	YES	YES	NO
LASER PRINTER	SOON	SOON	NO
TYPESETTER	DECset	YES	NO
SOFTWARE INTERFACES			
2780/3780	YES	YES	LATE 1982
3270	YES	YES	SUMMER 1982
BASIC	YES	YES	LIMITED
NUMBER OF LANGUAGES	11	4	1
MAXIMUM PROGRAM SIZE	2048MB	1MB	VERY LIMITED
GRAPHICS	YES	YES	NO
FMS	YES	YES	NO
CP/M	RAINBOW	???	YES
ELECTRONIC MAIL (DOCUMENT)			
ON-LINE HELP	YES	YES	NO
COMPUTER-BASED INSTRUCTION	YES	LIMITED	NO
DOCUMENT CREATE/EDIT/SEND	YES	YES	NOT YET
USER-CREATED DISTRIBUTION LISTS	YES	YES	NO
MAIL ANSWER GENERATION	YES	YES	NO
DOCUMENT FORWARDING	YES	YES	NO
MAIL RECEIVED FILING	YES	VERY LIMITED	NO
MAIL SEARCHES ON FILES	YES	YES	NO[1]
MULTI-NODE	YES	BATCH	LIMITED[1]
MULTIPLE USER FOLDERS	YES	NO	NO
DOCUMENT MANAGEMENT			
WORD PROCESSING EDITOR	DECmates[4]	YES	YES
SPELLING VERIFICATION			
STANDARD DICTIONARY	80K WORDS	YES	80K WORDS
DEPARTMENTAL DICTIONARY	YES	YES	YES[6]
PERSONAL DICTIONARY	YES	NO	NO
VIEW IN CONTEXT	YES	NO	NO

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FEATURES AND FUNCTIONS	VAX ALL-IN-1	VS AND ALLIANCE	ALLIANCE 250
DOCUMENT CREATION FROM EDITOR			
ENTER CALCULATOR/PASTE RESULT	YES	NO	NO
ENTER GRAPHICS/PASTE RESULT	YES	NO	NO
ENTER QUERY/PASTE RESULT	YES	NO	NO
DOCUMENT STORAGE			
QUERY FILES WITHIN W/P DOCUMENT	YES	NO	NO
GRAPHIC FILES WITHIN W/P DOCUMENT	YES	NO	NO
DOCUMENT SEARCHING (ALL-IN-1 OR BASIS)			
BY SELECTED WORDS	YES	YES	YES
BY KEY WORDS IN TEXT	YES	YES	YES
BY TEXT PHRASES	YES	NO	NO
BY CREATE/EDIT DATE	YES	NO	NO
ACROSS DISK STRUCTURES	YES	NO	NO
DATATRIEVE VS. VISUAL MEMORY			
BOOLEAN ARGUMENTS	YES - ALL	"AND" ONLY	"AND" ONLY
RECORD INPUT RANGE CHECKS	YES	?	NO
INPUT TABLE LOOK-UPS	YES	?	NO
MULTIPLE DP LANGUAGE INTERFACES	8	4	1 LIMITED
IN PROCESS/USE CALCULATOR/PASTE	YES	NO	NO
FILES STORED WITH W/P FILES	YES	YES	NO
CALENDAR MANAGEMENT			
MULTI-NODE	YES	?[1]	NO[7]
SHOW AVAILABLE TIMES	YES	YES	YES
AUTO SCHEDULE FACILITIES	YES	NO	NO
AUTO SCHEDULE MEETING	YES	NO	NO
AUTO CONFIRM MEETING	YES	NO	NO
AUTO CANCEL MEETING	YES	NO	NO
PERSONAL CONTROL TO DECLINE	YES	YES	YES
DESK MANAGEMENT			
TICKLER FILES	YES	YES	YES
AUDIO BEEP SIGNAL	YES	NO	NO
NOTEBOOKS	YES	YES	YES
PHONE DIRECTORIES	YES	YES	YES
AUTODIAL TO OTHER SYSTEMS	YES	NO	NO
AUDIO MAIL SIGNAL	YES	NO	NO
TELEPHONE AND VOICE MANAGEMENT			
BUCK SLIPS USER WRITTEN	YES	YES	YES
DIRECTORIES	YES	YES	YES
AUTODIAL	SEE TMS	YES	YES
VOICE MESSAGING AND DOCUMENTS	SEE TMS	YES	YES
VOICE EDIT: INSERT, DELETE, MOVE	NO	YES	YES
VOICE RECOGNITION	NO	NO	NO
VOICE TRANSLATION	NO	NO	NO
VOICE PRINT	NO	NO	NO
SEARCH ON VOICE MESSAGES	NO	NO	NO
VOICE ANNOTATED TEXT	NO	NO	NO
TEXT ANNOTATED VOICE	NO	NO	NO
SUPPORT REQUIREMENTS			
SYSTEM MANAGER	YES	YES	YES
TRAINING COORDINATOR	CBI	YES	YES
SUMMARY: OF TOTAL 97 FEATURES	83	55	38
% PERFECT SCORE	86%	56%	39%

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Notes:

[1]Wang's networking capabilities remain disjointed and difficult to confirm in reality. What can be said is:

- Mailway is a multi-node system based on 2780/3780 batch processing.
- All Wang remote networking requires a Wang master CPU running the network and controlling slave nodes. If the master fails, the network goes down.
- Virtual terminal pass through (i.e., CRT to system to another master) is believed to be limited to less than 128 terminals because one CPU must act as a master.

For the ALLIANCE 250 Wang sells a Wang Interconnect Systems Equipment (WISE) for $5,000, which can hook together four ALLIANCE 250s or four OIS systems. OIS and ALLIANCE cannot be connected on the same WISE. Wang states that the second ALLIANCE connected to WISE will not significantly degrade performance (which suggests that the third or fourth connection would). Voice mail can be passed through WISE, but calendar management feature cannot access through the WISE box. Realistically, WISE will probably only support 48-60 ALLIANCE 250 users maximum. Maximum distance between any two users on this limited network (WISE) is 4,000 feet.

Although VS ALLIANCE will not ship for 6-9 months, considering the above limitations, it is very unlikely that voice will have any multi-node or remote terminal capabilities. Calendars may be viewable from remote virtual terminals; however, automatic scheduling is not a feature of Wang's calendar management.

[2]Wang has committed Mailway for ALLIANCE 250 but has given no delivery date. (It may be delivered by Christmas 1982.)

[3]Voice mail is expensive to implement on Wang and requires $6,700 terminal plus 15-30MB disk per user, which adds increased costs.

[4]DECmates give you full secretarial word processing for high-performance, fast results W/P applications.

[5]ALLIANCE comes with a set of menus. You can delete line items from menus to enhance system security. However, there is no known way for the user to create specialized menus or add line options on existing menus.

[6]Wang may say you do not need a personal dictionary because everyone can use a departmental dictionary.

[7]Calendar management does not access through "WISE." See note [1].

ALL-IN-1 VAX AND DECmates VERSUS WANG VS ALLIANCE AND ALLIANCE 250

SYSTEMS COST COMPARISONS

SYSTEM TYPE>>>	11/730 BASED+ DECmate	11/750 BASED+ DECmate	11/780 BASED+ DECmate	ALLIANCE CONFIGURATIONS SYSTEM 250	VS 45	VS 90	VS 100
NO. OF USERS.							
4	$99,200			$85,700	$106,500		
8	$121,400	$205,000		$136,300	$152,300	$178,600	
16	$166,000	$249,500		$233,600		$254,100	
24		$294,000	$437,800			$324,300	$362,200

COST PER TERMINAL COMPARISONS

SYSTEM TYPE>>>	11/730 BASED+ DECmate	11/750 BASED+ DECmate	11/780 BASED+ DECmate	ALLIANCE CONFIGURATIONS SYSTEM 250	VS 45	VS 90	VS 100
NO. OF USERS							
4	$24,800			$21,400	$26,600		
8	$15,200	$25,600		$17,000	$19,000	$22,300	
16	$10,400	$15,600		$14,600		$15,900	
24		$12,300	$18,200			$13,500	$15,100

Notes:

1. All systems configured with one 32 cps LQP for every two DECmate I's (no VT100s).

2. Software prices quoted at DZ unsupported prices.

3. Total number of DECmates attachable will depend on total job mix. See performance analysis for further details.

4. Wang VS ALLIANCE systems were configured using an average price per individual workstation of $5,600. See page 42 for complete specifications on configurations.

5. Wang ALLIANCE 250 systems were configured using a fully configured voice terminal. See pages 44 and 45 for details.

6. REMEMBER THAT THE ALLIANCE 250 DOES NOT HAVE EQUAL FUNCTIONALITY TO EITHER ALL-IN-1 SYSTEMS OR VS ALLIANCE SYSTEMS.

WHAT'S IN A NAME -- ALLIANCE

ALLIANCE was originally introduced as a new shared logic system designed for office managers and professionals. As such, it is a new hardware and software system incompatible with Wang VS or 2200 systems. Although Wang states that OIS systems can be upgraded, there are significant costs to complete this upgrade.

Wang named the product ALLIANCE to denote a partnership or alliance between their customers and themselves in designing and implementing this new office product.

Despite this marketing rhetoric, Wang soon found that the user community would not embrace another incompatible system that magnified integration dilemmas already existing in Wang information management systems.

Subsequently, on June 24, 1982, Wang announced ALLIANCE software as a layered product for the VS100, VS90 and the new VS45. ALLIANCE will not run on the VS25 because the VS25 is limited to 512KB memory; the same amount of memory required to run ALLIANCE software.

Although the ALLIANCE 250 (the incompatible stand-alone system) is known to be in test sites, to date it is not shipping in volume.

VS ALLIANCE availability was announced for December 1982, but this date might be too optimistic. (Reference Competitive Update Special Issue dated November 9, 1981 documenting past Wang delivery problems.)

This analysis details primarily the ALLIANCE software as a layered product on the VS. There are, however, ALLIANCE 250 configurations attached for examination.

The functional comparisons on the preceding pages also include a column for the ALLIANCE 250 with notes; however, most of your competitive encounters selling ALL-IN-1 will most likely be against the VS with layered ALLIANCE.

WHAT ALLIANCE IS NOT

From an examination of the feature/function comparison of ALL-IN-1 versus VS ALLIANCE, you will see that VS ALLIANCE is not a revolutionary third-generation office system as Wang claims. It is, however, Wang's first attempt to address all workers' office needs on one system. The new VS ALLIANCE package is:

- Not deliverable, not installable today
- Not completely integrated or working on VS today
- Not integrated with their personal computers today
- Not as cost effective as ALL-IN-1
- Not functionally equivalent to ALL-IN-1. ALLIANCE has:
  - Fixed, inflexible office applications vs. interactive ALL-IN-1 flow control. ALLIANCE does not offer interrupt functionality, as users must cancel out of every menu and cannot hold working space.
  - Very limited access requiring intelligent terminals, but not allowing access via personal computers, ASCII dumb terminals or via multi-node networks.
  - Limited calendar functionality that does not automatically schedule appointments. This wastes time and money with more chance for human error.
  - Very limited data processing functionality as compared to VAX (reference Competitive Update Special Issue dated November 9, 1981).
  - Very limited database and filing capabilities as compared to ALL-IN-1 with extensions available through the Batelle "Basis" option.
  - Offers no graphics capability or possible interface to third-party graphics.
  - Very limited communications functionality. See functional comparison notes, page 27.

WANG SELLING TACTICS

In the last nine months Wang's selling tactics have become more aggressive in competing against Digital for the following reasons:

- Digital has started to win significant sales against Wang in both word processing and office automation.

- The continuing economic slow down has decreased the number of potential buyers, thereby increasing competition.

ALLIANCE is Wang's first real office automation product. With ALLIANCE, Wang sales representatives can enhance their selling opportunities with minor modifications to their usual selling tactics.

It is very important to fully understand these tactics, and a review of pages 61-69 in the Competitive Update Special Issue dated November 9, 1981 is recommended.

The following modified Wang selling tactics are the result of the ALLIANCE announcement and should be reviewed within the context of a typical selling cycle.

The Qualification Phase Tactics

Wang believes that ALLIANCE will open the door wider for access to senior corporate and MIS management by leveraging off their success as a word processing leader and limited supplier of data processing systems.

Wang has increased the number of high-level corporate visits to their Lowell, Massachusetts headquarters to reach higher into the customer's management structure.

These visits are highly structured sales presentations and demonstrations to dazzle the visitor with new ALLIANCE features and Wang's marketing rhetoric.

Wang says "We are the first office vendor to identify the six key technologies for successful automation; namely:

- Word Processing
- Data Processing
- Voice
- Video
- Networking
- Human Factors

Open your ears to voice with ALLIANCE; open your eyes to video with Wangnet; open your doors to Wang."

Qualification Phase Counter and Redirect

Digital corporate visits are an important sales tool as we embrace all these technologies. However, as a Digital representative, you can do more in the field when calling on senior management.

Presentations should be made by local sales representatives with emphasis on our service and support to demonstrate the strength of our field support organization. Remote or field product demonstrations utilizing our comprehensive networking capabilities show the reality of interconnect that Wang cannot match.

Digital's track record with ALL-IN-1 (Charlotte Package) provides additional reference selling potential that Wang cannot match with ALLIANCE. Reference accounts make it easy to sell ALL-IN-1.

ALLIANCE 250 systems are just starting to ship and VS ALLIANCE will probably not ship until calendar year 1983.

ALL-IN-1 opens wider our door to senior management to sell service, support, networking and integration realities with reference accounts already installed. Do not miss the opportunity to demonstrate these strengths to your customer's senior management locally.

Wang Positioning Tactics

Wang continues to position relative to IBM hoping to limit the customer's choice of competitors. Wang can beat IBM in the office. The following chart details Wang's positioning with IBM:

WANG	IBM
VS 25	SYSTEM/32 SYSTEM/34
VS 45	SYSTEM/3 8100
VS 90 VS 100	SYSTEM/38 4331/4341

If Wang can successfully position against IBM as shown in the previous chart, but are forced to compete with Digital, they will try to position as follows:

WANG'S POSITIONING OF DIGITAL	WANG	DIGITAL'S POSITIONING OF WANG
VAX-11/730	VS 25 VS 45	11/23 11/24
VAX-11/750	VS 90	VAX-11/730
VAX-11/780	VS 100	VAX-11/750

Positioning Counter and Redirect

Use the charts on page 24 to position our products on both functionality and price to show our powerful advantages.

Remind the customer that Wang has tried to emulate IBM and is plagued like IBM with trying to retrofit the integration of all their systems. Wang cannot provide the same level of functionality, service or support as Digital.

Position Wang's strength as limited to word processing without the full range of DDP, graphics, database, networking or support functionality offered by Digital.

Setting Expectations and Establishing Needs

Little has changed with these tactics (refer to Competitive Update Special Issue dated November 9, 1981, page 63).

In general, the Gartner Group and Patty Seybold point out that, yes, Wang has word processing, but has yet to deliver all the ingredients for a total integration of office functionality and the services to support these solutions. Business Week is quoted as follows from the May 17, 1982 edition:

> "Wang is in the midst of a major shift in market strategy, attempting to broaden its product line significantly so that it can participate in the entire office automation field - a move that will put it in nose-to-nose competition with such giants as International Business Machines, Digital Equipment and Xerox."

"Success in the "office of the future" market will hinge on Wang's ability to deliver sophisticated products using data, text, video, audio and networking technologies. Although the company has announced that it will roll out these integrated systems, some industry watchers question its ability to deliver the goods. They point out that the company's first minicomputer was a year late, and its first image printer failed in the field and had to be recalled....Wang's initial IBM communications product was two years late."

The user community is coming to recognize that office automation is a lot more than only word processing. The benefit to the customer is that Digital can supply total office needs today with the required integration at competitive prices.

Establishing Decision Criteria Tactics

Wang Tactic:

"Wang's shared logic word processing systems are the industry leader. In order to have the best, you must have shared logic word processing."

Counter and Redirect:

If you are selling ALL-IN-1 with DECmates, you have a much stronger position against Wang's VS ALLIANCE with the following points:

- DECmates offer a 20-30% lower cost per terminal with the highest functionality for stand alones.
- DECmates offer CPU redundancy, document privacy and virtual independence from a central CPU.
- With ALL-IN-1 documents can be sent, mailed and shared with other users as needed.
- ALL-IN-1 integrates our more cost-effective stand alones with the most complete VAX-based office functionality to produce a total solution for the office.

If you are selling DECword/DP, you can reasonably match feature for feature with Wang's OIS or VS with word processing systems and win with in-depth DP or service and support, like Computer-Based Instruction. These options guarantee maximum utilization of systems and personnel while minimizing expenses.

Wang Tactic:

"Telephone tag is the biggest time waster in the office today. Only ALLIANCE offers voice messaging to eliminate telephone tag."

Counter and Redirect:

Interactive text mail (DECmail) is required more than voice and avoids the very high cost for disk space required with voice messaging (i.e., 5MB per 20 minutes voice). Customers get maximum results with minimum cost, plus a printed documentation audit trail.

DECmail messages can be read, forwarded, printed or stored more efficiently and cost effectively than voice messaging. Voice messages cannot be printed without first transcribing.

Digital embraces effective telephone management systems with announcements for our personal computers that are significantly less expensive and more functional than Wang's voice terminals.

Wang's Premiere Digital Voice Exchange (DVX) product has been available for more than a year and has yet to be installed, even in a beta test site, according to the Yankee Group, Boston, Massachusetts. Customers should seriously consider that fact when evaluating Wang's voice product.

Digital integrates existing technologies as they become cost effective. Voice messaging from Wang is not integrated or cost effective today, exposing customers to low returns with higher costs.

Wang Tactic:

"Digital has to use Computer-Based Instructions because their products are difficult to use."

"ALLIANCE is designed for non-programmers and first-time users, and can be modified easily for these types of users."

Counter and Redirect:

ALL-IN-1 and Digital's Computer-Based Instructions (CBI) are designed to be used by novice, intermediate or highly proficient users. Digital was one of the first to introduce CBI and most vendors are following suit. CBI trains new and existing employees at their own learning rate less expensively. Even Wang has introduced limited CBI for their personal computer.

With ALL-IN-1 EXTENDED, a customer can add specialized multi-vendor solutions developed for shared logic or stand-alone systems. Products like ADE and DATATRIEVE demonstrate our ability to integrate ease of use without compromising the efficiency of all types of office workers.

Wang Demonstrating Tactics

As mentioned, Wang has relied on customer visits to Lowell headquarters to do much of their pre-sales marketing and demonstrations. These demos are powerful tools for selling the features of ALLIANCE. The demos are short (10-15 minutes) and simple, designed to capture an executive's imagination with the dazzle of voice messaging and file searching.

Counter and Redirect

To effectively counter Wang's demonstration tactics, be sure to keep the demo as simple and straightforward as possible. Find the customer's simple needs first for office automation and demo those to get immediate buy in, then show more functionality as required.

Counter and Redirect

Demonstrate calendar management that will automatically schedule individuals or facilities without loss of individual recipient personal control. Wang ALLIANCE only lists available times and actual scheduling requires manual call up and individual scheduling of calendars. Digital's method saves administrative time scheduling meetings with less chance of error, yet still protects the recipients choice to decline any meetings.

Counter and Redirect

Demonstrate ALL-IN-1's ability to move from document creation directly into calculator or graphics or DATATRIEVE, paste results back into the document and then send the document to show immediate delivery of the text. Wang cannot show this kind of flow through from one application into another and back while holding work space as you move. With ALLIANCE, users must cancel out of every menu to get into new functions.

Wang's Mailway product is a batch subsystem that requires finished documents as input. ALLIANCE mail is believed to be similar, requiring exit from one utility, enter second new utility, perform function, exit second utility, enter first utility and paste document. Wang implementation of office applications become tedious. ALL-IN-1 DECmail saves time and money.

Counter and Redirect

Demonstrate remote access via VT100 to ALL-IN-1 from a customer's office. Wang cannot show this inexpensive easy access to full office functionality because Wang does not support dumb terminals. Be sure to use minimum 1200 baud modems and pre-test your demo.

Wang can access Mailway with remote portable printer terminals; however, these cannot access ALLIANCE. Remote demos show the power of Digital systems Wang cannot match.

Counter and Redirect

Demonstrate multiple folders and organizational use of these folders. It is not clear that Wang offers this kind of functionality within ALLIANCE or Mailway. ALLIANCE is limited to 53 libraries per SYSTEM and document searches are limited to one library at a time.

For customers who can afford the ALL-IN-1 EXTENDED package, a demo customized with user data (i.e., telephone directories or unique file names) will be very powerful because it provides proof that our system can be significantly modified to fulfill their exacting and/or changing requirements.

Wang's ALLIANCE cannot be modified to the extent that ALL-IN-1 can. Wang's software support for the VS and especially VS ALLIANCE is very limited in many parts of the country.

Closing Tactics

Wang is trying to close sales now on VS ALLIANCE, although this product will not be available for shipment for 6-9 months. Wang can only deliver the ALLIANCE 250 shared-logic systems which does not have a Mailway interconnect or multiple system interconnect.

Wang is aggressively trying to close a number of very large accounts before these customers learn about Digital's ALL-IN-1. Where we have shown ALL-IN-1, Digital has held up and converted numerous Wang OIS and ALLIANCE sales into either DECmate, DECword or ALL-IN-1 sales, or combinations of all three.

To redirect Wang's closing tactics, tell your customers about ALL-IN-1. Tell them we believe that it delivers more for less and is installable today. Not only can we say this, but our customers and industry analysts are saying it as well.

DIGITAL'S ROAD TO SUCCESS IN THE OFFICE

Digital's principal advantage over Wang is its ability to comprehensively meet the needs of all three office buyers as detailed in the ALL-IN-1 Marketing Guide:

- Personal Buyer
- Departmental Buyer
- Corporate Buyer

Win the Personal Sale

We have seen from earlier analysis (reference Competitive Update Vol. 2 No. 1 dated July 12, 1982) that the DECmate I and DECmate II offer the least costly and most functional office system for the personal buyer, guaranteeing this buyer the highest return for their dollar.

This trend continues for the Digital professional as compared to the Wang personal computers. Wang has not succeeded in producing a cost-effective, stand-alone system with high functionality, and their already small market share is quickly dwindling in the face of both IBM (DisplayWriter) and Digital (DECmate).

The Wang Personal Computer or Wangwriter fails to offer the same personal functionality, price or interconnect that the Digital personal computers provide.

To win the personal sale as well as a total office automation system solution, present our outstanding line of personal computers that address all levels of price/functionality requirements and can communicate to all our systems.

Win the Departmental Sale

In many cases, the strength of Digital's personal computers will meet the functional requirements for the departmental system sale because they offer:

- Lowest cost per terminal
- Increased functionality when the decision criteria is based on:
  - Redundancy, which guarantees user up time
  - Physical movement for versatility or change
  - Systems and document privacy for application security

DECmates are winning sales against Wang's small and large shared-logic OIS systems for the above-mentioned reasons.

If shared logic is an absolute requirement, despite the fact that it is no longer always cost justifiable (considering technological advances and cost reductions), then DECword or DECtype is the best solution to win the departmental sale.

The cost/terminal limitations of small DECword or DECtype systems can be justified by the additional functionality provided via RSTS or CTS-300.

To win the departmental sale, address the trade offs between Wang shared-logic systems or our stand alones that provide higher overall functionality compared to Wang OIS systems. Digital's solution offers both cost-effective stand alones and fully functional VAX ALL-IN-1 systems.

Win the Corporate Sale

The superior price/performance and functionality position of ALL-IN-1 as compared to VS ALLIANCE is only part of Digital's competitive advantage to win the corporate buyer.

In addition to demonstrating higher functionality and lower price provided with ALL-IN-1 for corporate systems sales, you must also include our functionality and price advantages for departmental, as well as personal office systems, to win the long-term commitment of the corporate office buyer.

The culmination of these three superior office products for personal, departmental and corporate solutions is still not our total advantage over Wang for winning the corporate office sale.

The final ingredient to win the corporate sale is to demonstrate Digital's advantages that provide the strongest foundation in office automation.

This foundation, as analyzed in the Competitive Update Special Issue dated November 9, 1981, is based on our superior strengths in:

- Word Processing
- Data Processing
- Networking
- Services
- Integration of all the above

With this foundation, Digital now offers the highest functionality, lowest-cost solutions for all departmental needs be it a:

- Personal Office Computer
- Departmental Office Computer
- Corporate Office Computer

With all of these advantages demonstrated in a simple and straightforward solution for your customer, you can win any sales situation against Wang -- AND DIGITAL CAN DELIVER TODAY.

VS ALLIANCE CONFIGURATIONS

4-User VS System -- ALLIANCE and Mailway

VS 45	
256KB MEMORY 1.2MB DISKETTE 32 SERIAL PORTS VS SOFTWARE AND ONE LANGUAGE	$ 21,000
256KB MEMORY	4,000
DISK CONTROLLER	3,750
75MB DRIVE	17,000
MAILWAY SW/HW	12,000
ALLIANCE SW	21,000
4 WORKSTATIONS @ $5,600 EACH	22,400
2 PRINTERS 20 CPS/LQP	5,390
Total	$106,540
Cost/Terminal =	$26,635

8-User VS System -- ALLIANCE and Mailway

VS 45	
256KB MEMORY 1.2MB DISKETTE AND 68MB FIXED 32 SERIAL PORTS VS SOFTWARE AND ONE LANGUAGE	$ 31,000
756KB MEMORY	12,000
DISK CONTROLLER	3,750
ONE 75MB DISK DRIVE	17,000
MAILWAY SW/HW	12,000
ALLIANCE SW	21,000
8 WORKSTATIONS @ $5,600 EACH	44,800
4 PRINTERS 20 CPS/LQP	10,780
Total	$152,330
Cost/Terminal =	$19,041

16-User VS System -- ALLIANCE and Mailway

VS 90	
1MB MEMORY DISK AND TAPE IOP ARCHIVING WORKSTATION	$ 73,000
512KB MEMORY	8,000
288MB DISK	23,000
15MB CARTRIDGE TAPE	6,000
16 WORKSTATIONS @ $5,600 EACH	89,600
8 PRINTERS 20 CPS	21,560
MAILWAY SW/HW	12,000
ALLIANCE SW	21,000
Total	$254,160
Cost/Terminal =	$15,885

24-User VS System -- ALLIANCE and Mailway

VS 100	
1MB PLUS CACHE VS SOFTWARE ONE LANGUAGE	$103,000
1MB MEMORY	16,000
DISK/TAPE IOPS	7,500
ONE 288MB DRIVE	23,000
ONE TAPE DRIVE	13,000
24 WORKSTATIONS @ $5,600 EACH	134,400
12 PRINTERS 20 CPS	32,340
ALLIANCE SW	21,000
MAILWAY SW/HW	12,000
Total	$362,240
Cost/Terminal =	$15,100

Notes:

ALLIANCE optional software for the VS 45, 90 and 100 is priced as follows:

	License Fee
BASE LEVEL ALLIANCE SYSTEM SECURITY SIGN ON WORD PROCESSING WORD INDEXING AND SEARCH SPELLING VERIFICATION	$10,000
VISUAL MEMORY	6,000
TIME MANAGEMENT	2,000
NOTEBOOK	1,000
VOICE DOCUMENTS	2,000
READABILITY INDEX	3,000

Configurations include all optional ALLIANCE software with the exception of the readability indexing option.

TERMINAL CONFIGURATIONS

Terminal selection for a Wang VS ALLIANCE configuration is very difficult to determine without knowing specific customer requirements.

An average price of $5,600 per terminal was configured with the VS ALLIANCE systems; however, the following options would vary this total cost per terminal to minus $1,300 or plus $1,070. Wang's PC pricing is included for review as well.

Model No.	Description/Limitations	Price
2256C	VS WP/DP TERMINAL	$4,900
	- No Stand-alone Capability - No Upgrade Capability	
5520	ALLIANCE TERMINAL	$5,600
	- No Stand-alone Capability - Voice Upgrade	1,070
	Total	$6,670
PC004	PERSONAL COMPUTER 2 FLOPPIES, VS COMMUNICATIONS WP INTERFACE	$5,595
	- No Announced Voice Option - VS Communications interface not confirmed	

PERSONAL COMPUTER CONFIGURATIONS

PC 001

8086 W/128KB ONE FLOPPY 320KB (5-1/4") MS DOS SW KEYBOARD RS-232 PORT, PARALLEL PRINT PORT	$2,695
PC 002 (DELTA)	
HIGH RESOLUTION CRT (800x300)	700
PC 003 (DELTA)	
SECOND FLOPPY 320KB PC MULTI-PLAN	950
PC 004 (DELTA)	
2 GRAPHICS DISPLAY ADAPTERS PC WORD PROCESSING	750
Total	$5,095

Options

DW 20 - 20 CPS LQP, 10, 12, 15 PITCH	$2,695
PC VOICE OPTION (UNANNOUNCED ASSUMPTION)	1,000
PROPORTIONAL SPACING CRT OPTION	300
HEADSET AND FOOT PEDAL	70

Communications Options

VIRTUAL TO WANG SYSTEM (PER SYSTEM TYPE)	500 EA
3270	500
WANGNET	?
X.25, X.21	?
TTY	INCLUDED

ALLIANCE 250 CONFIGURATIONS

Optional Software for ALLIANCE 250

Part No.	Description	Price	Mo. Maint.
AL-VM	VISUAL MEMORY	$6,000	$60
AL-NOTE	NOTEBOOK	1,000	10
AL-TIME	CALENDAR	2,000	20
AL-VOICE	VOICE	2,000	20
AL-CP/M	CP/M SW	1,000	10
AL-BASIC	BASIC LANGUAGE	3,000	30
AL-RUN	RUN TIME SYS	1,000	10
	Software Total	$16,000	$160

ALLIANCE 250 Terminals

5320	GREEN DISPLAY	$1,200	$20
5300 AL-64	ELECTRONICS UNIT	3,600	15
5300 KBD	KEYBOARD	500	N/C
5300/AUDIO	AUDIO OPTION	1,000	17
5300/PS	PROPORTIONAL SPACING	300	4
	HEADSET	20	N/C
	FOOT PEDAL	50	N/C
	Terminal Total	$6,670	$56

ALLIANCE 250 -- 4-User System

6750	ALLIANCE 250	$19,000	$136
AL/SW	OPTIONAL S/W	16,000	160
6580-3P	80MB DISK (13)	18,000	206
	4 ALLIANCE TERMINALS	26,680	224
5577	LQP/DRAFT 40/190 CPS	5,975	50
	Total	$85,655	$776
	Cost Per Terminal	$21,413	$194

ALLIANCE 250 -- 8-User System

Part No.	Description	Price	Mo. Maint.
6750	ALLIANCE 250	$19,000	$136
AL/SW	OPTIONAL S/W	16,000	160
6580-3P	80MB DISK (13)	18,000	206
6580-3P	80MB DISK (13)	18,000	206
	8 ALLIANCE TERMINALS	53,360	448
5577	2 LQP/DRAFT 40/190 CPS	11,950	100
	Total	$136,310	$1,256
	Cost Per Terminal	$17,038	$157

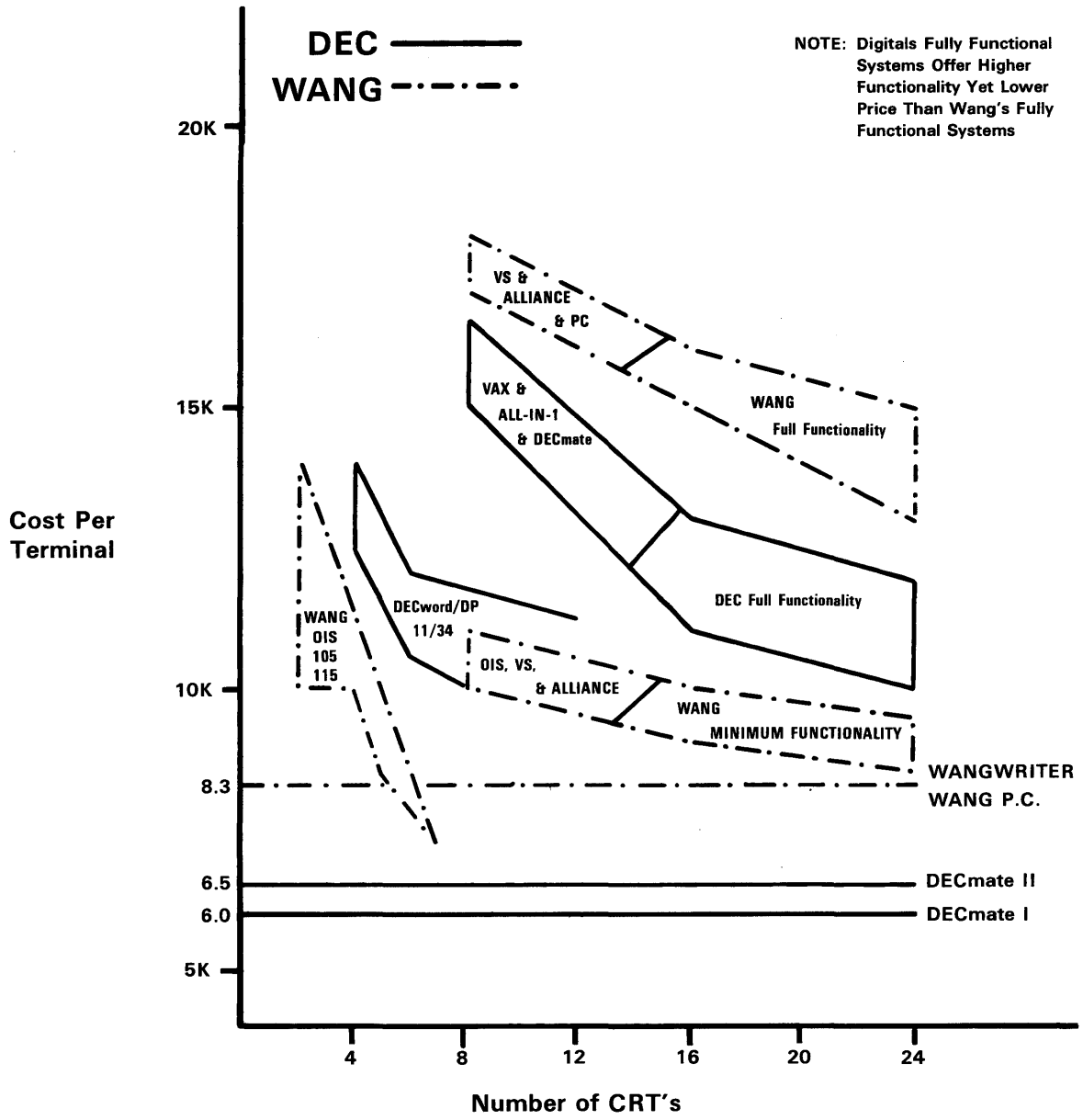
ALLIANCE 250 -- 16-User System

6750	ALLIANCE 250	$19,000	$136
AL/SW	OPTIONAL S/W	16,000	160
6565	275MB DISK	34,000	284
6565	275MB DISK	34,000	284
	16 ALLIANCE TERMINALS	106,720	896
	4 LQP/DRAFT 40/190 CPS	23,900	200
	Total	$233,620	$1,960
	Cost Per Terminal	$14,600	$122.50

DIGITAL VS. WANG

COST PER TERMINAL

List Price No Discounting



FOR INTERNAL USE ONLY

Notes:

Digital versus Wang Cost Per Terminal Graph:

1. The stand alones -- DECmate I, II and Wang's Writer and PC -- are configured with CPU, dual floppies, printer and word processing software.

2. Discounts for stand alones are not shown. Digital has higher quantity discounts today. Wang's maximum is 28%, which could change any day or for any specific sales situation.

3. There are wide ranges in systems cost per terminals because we wanted to show the range in prices at different levels of functionality.

4. For Wang's fully functional systems (i.e., layering ALLIANCE on VS or vice versa), prices were estimated. Some personal computer options for Wang also had to be estimated when the price had not yet been determined.

IBM SERIES/1

Ken Gontarz
X8769 MKO1-2/N38
RCS: MK12

Editor's Note: Ken Gontarz recently completed a course at IBM on the Series/1 where EDX (Event Driven Executive operating system) was used. Below is his analysis and impressions.

Executive Summary

Outlined in this report are the deficiencies of EDX, one of two operating systems offered on the Series/1 (RPS -- Real-time Programming System -- is the second). EDX is primarily sold into commercial accounts and provides somewhat the functionality of Digital's RSX-11M. But, as you will read, the product has limitations in the areas of performance, functionality and ease of use which make it rather inadequate for commercial applications.

Software is definitely not the forte of the Series/1. The two operating systems offered are outdated and are a direct descendant of batch processing IBM/370 software. Under EDX, there is no dynamic file extending, no dynamic memory allocation, no efficient swapping mechanism, no true multi-tasking, a limited screen editor, little protection from other users, inadequate security, little user friendliness, no upward expandability...and the list goes on.

How can the Series/1 sell with the software that is presently offered? For two reasons: 1) the IBM name and reputation and 2) the extensive communications/networking capabilities.

It should be pointed out immediately that benchmarks have shown the Series/1 is an 11/23, 11/24 class machine and should be positioned as such. It is a 16-bit, general-purpose CPU and should not be positioned against Digital's VAX family of processors. The VAX family offers much more performance and functionality.

To give an indication of relative performance, in FORTRAN computational benchmarks, the 4955 (the most powerful Series/1) performed at 70% of an 11/34A (reference Competitive Update Volume 1 No. 7 dated April 5, 1982).

When in competitive situations, bring up the deficiencies discussed in this article and stress the fact that Digital's software and hardware products are more functional and complete.

THE SERIES/1 HISTORY

The 1976 introduction of the Series/1 was seen as a defensive move by IBM to compete with the substantial market penetration of minicomputer manufacturers like Digital. Introduced with very little software, the system was not very attractive to the OEM and end-user communities. In 1978, IBM introduced an assortment of software which included operating systems (EDX, RPS), languages (FORTRAN IV, PL/I) and basic utilities, but sales of the machine were still below the company's expectation. In fact, industry sources close to IBM have indicated that the Series/1 program was almost cancelled in 1979-1980 due to the lack of success. At that point, several large orders were placed by a credit card company, a large phone company and a large retailer which virtually saved the machine. By the end of 1981, approximately 19,000 S/1's were installed (source: IDC) and by the end of 1982 IBM hopes to increase that number to 32,000.

Presently, the major marketing effort is centered around capturing as much of the insurance industry as possible. Several large insurance companies have placed orders for reportedly thousands of units. (According to the March 1982 edition of Datamation, severe performance problems have been reported at a major insurance company with their Series/1's). It is not a commercial machine.

THE FUTURE OF THE SERIES/1

What enhancements can be expected for the Series/1 in the next twelve to eighteen months? Where will the major marketing efforts be focused? This is what to look for:

- A continued high-level, focused marketing attack on the insurance industry.
- An emphasis on software development as opposed to hardware development.
- A continued proliferation of communications software.
- The adoption of the Series/1 as a 'Gateway Processing System.' That is, it will be IBM's single, universal method of tying together both IBM and non-IBM networks.
- A major push to accelerate DDP (Distributed Data Processing) activities in large companies.
- The implementation of LAN's (local area networks) using the new 'token passing/ring' technology.
- A major exploitation of the teleprocessing marketplace. Look for IBM to get especially aggressive in videotext and audio-response environments.
- As far as hardware enhancements are concerned, expect to see low-cost extensions to existing products (i.e., a board-level version of the S/1, a one-megabyte CPU, possibly an array processor). Current rumors are that the 32-bit Series/1 project has been "put on the back burner."

INADEQUACIES/DEFICIENCIES OF EDX

No Dynamic File Extending

Unlike Digital's operating systems (RSX, RSTS and VAX/VMS), EDX has no dynamic file extending capabilities. Since all files are contiguous once they become filled, they must 'manually' be extended. The procedure for doing this involves using a utility to creat a larger file, using another utility to copy the smaller file to the one just allocated, using a third utility to delete the old file and finally using yet a fourth utility to rename the the new larger file to the original name. All this must be done manually. Not impossible to do, but definitely an inconvenience.

Digital's RSX, RSTS/E and VAX/VMS operating systems all dynamically extend files without any human interface.

While using the screen editor ($FSEDIT), if you increase the contents of the work file so that it is too big to be written back into the source file, the source file is deleted (i.e., the contents of your original file are gone) and the work file is the only thing remaining. This can be potentially dangerous, especially if you did not want the modifications to the original file implemented.

While assembling, compiling, sorting or linking, if the data sets allocated to the output files of the operation are not large enough, a termination of the program will occur, at which time the above file allocation extension procedure would have to be carried out to insure adequate space for a successful run. Since Digital's operating systems dynamically extend files, this would never be a problem.

Limited Screen Editor

EDX's most functional editor, called $FSEDIT, provides limited screen capabilities and is a cross between Digital's EDT and the RT-11 V3B editor. For those who have been at Digital awhile and remember that editor (or the RSTS/E V6B editor), you have an idea of the human interface involved. $FSEDIT is basically a line editor with some screen editing capabilities added. Digital's EDT is much more advanced and offers full-screen editing functionality not found in $FSEDIT (word wrapping, keypad editing, Macros).

Example: With $FSEDIT, the following sequence of commands are needed to open a file for update, display the first five lines and insert a sentence after the third line:

```
>$L $SMMAIN              ;bring up system menu
 <select option 1>       ;get into editor menu
 <select option 3>       ;Read in file
 <down arrow>            ;three times
 <position cursor>       ;must be at column 2
 <I>                     ;get into insert mode
 <insert line>           ;type in new line
 <HOME>                  ;get to command mode
 <M>                     ;get to editor menu
 <WRITE>                 ;save modifications
 <NAME DATA SET>         ;specify new file
```

Example: The same operation on any of Digital's full-screen editors is a trivial exercise. For example, using EDT the following sequence of commands would be used:

```
>EDIT FILENAME        ;A screen of text appears
 <c>                  ;get into screen mode
 <down arrow>         ;four times
 <insert line>        ;Type new line
 <Control Z>          ;ready to exit EDT
 <EXIT>               ;Done
```

The IBM editor is verbose, not particularly user friendly and not as functionally rich as Digital's editors. In addition, certain columns are reserved to store control information (e.g., columns 72-80 are reserved for line numbers). This puts a burden on the user to be aware of what columns can be used and what ones cannot.

In a development environment where heavy use of an editor is required, $FSEDIT would be found time consuming, awkward and inefficient.

No Dynamic Memory Allocation

When installing EDX on the Series/1, there are several requirements which must be fulfilled. Among them are: dividing memory into static size regions called partitions (the largest partition can be 64K bytes long), allocating the number of jobs that can run concurrently in each partition and binding terminals to specific partitions. Multiple terminals can be assigned to a single partition.

Problems can arise in several different environments. An obvious problem occurs when multiple terminals assigned to the same partition try to initiate jobs where there is simply not enough room, not that uncommon an occurrence in limited memory configurations. If a system manager is around, they can manually assign the terminal to a free partition that has adequate space. That could solve the immediate problem.

Another example: Your application programs need modification and as a result they get too large to fit into the assigned partitions. Even though there are partitions large enough to handle the job, they cannot be run. They must run in the partition they were assigned. To remedy the situation, one of two actions can be taken:

1. The system manager must 'manually' reassign partitions.

2. A sysgen must be performed to reconfigure partition sizes.

The point being demonstrated is that the EDX operating system is not smart enough to perform dynamic memory allocation of its partitions.

Digital's RSX can be generated to use fixed partitions but can also dynamically allocate memory. RSTS/E, CTS-300 and VAX/VMS all allocate memory without any pre-allocation.

Non-Efficient Swapping Mechanism

An interesting question arises when the topic of job swapping is introduced. How many terminals will the Series/1 'realistically' support running concurrent jobs? Asking that of any processor requires that certain variables be discussed. Are the jobs CPU bound? Are they I/O bound? What is the job mix? What are the sizes of the jobs? Is communication a factor? And the list goes on!

Taking all those variables into account (if possible) and observing the machines first hand at IBM school, it is my opinion that the largest Series/1 -- 4955 Model F -- with 512KB of memory, running both I/O and CPU bound jobs, with no communications will perform as follows:

Series/1 Performance Chart

CRTs/Jobs	Performance/Response
2-4	Excellent
5-6	Good
7-10	Fair
11-16	Questionable

By introducing 'swapping' and specifically running what is referred to as the Multiple Terminal Manager software, the Series/1 will be able to support more than 16 terminals; however, only in a very specialized environment. That environment may be one where approximately 32 terminals are simultaneously on line but at any one time only 25% to 50% of them are requesting service. It should be clearly understood that the Series/1 cannot handle 32 concurrently running jobs. A degradation in response will start being observed when jobs 5 though 7 are added to the system.

Swapping under EDX is performed between a partition and terminals that are specifically assigned to that partition. It is possible for programs to be swapped in and out of core while other partitions are not even being used. This is a non-efficient use of swapping that can seriously impact the performance and response of the system. Any time jobs are being swapped in and out of core, system response is negatively affected.

With Digital's operating systems, the memory allocator is much more sophisticated and efficient. Swapping takes place dynamically throughout all of memory. Under RSX or CTS-300, should fragmentation prevent a job from being loaded, a shuffler will consolidate that memory so the job can run. EDX has no memory shuffler. Memory is wasted.

No Multi-tasking

Unlike Digital's RSX-11 operating system, EDX has no multi-tasking capabilities. Programs running concurrently should not be confused with the concept of multi-tasking. Under EDX, one and only one job can be run from any one terminal, while under RSX multiple jobs can run concurrently from a single terminal. This feature is especially useful in environments where tasks perform no terminal I/O (report preparation, file maintenance, data reduction/analysis, spooling, sorting). With multi-tasking capabilities a user has the convenience of performing multiple jobs simultaneously from one terminal. This allows more jobs to run then there are terminals.

Inadequate Security/Protection

The security and protection features of the EDX operating system are inadequate. There is no concept of privileged/non-privileged users, accounts or jobs. Every user has potential access to all of the systems resources (files, data, programs). Once a user is at the system prompt (>, same as RSX), they have full access to all of the system's capabilities.

It is possible to disable a terminal from gaining access of the system prompt, simply by disabling the ATTN key on the keyboard. This can be done either under software or hardware control.

It might be argued that whenever the system is brought up, menus will be displayed at every CRT and all ATTN keys disabled. However, there should be at least one terminal (the console) with the ATTN key enabled. Any terminal that has the ATTN key enabled has full access to all resources.

Anybody could go to the console terminal, run a utility and simply enable any terminal's ATTN key. This could be devastating. Confidential records, classified documents and privileged information could be accessed.

Under RSTS/E, RSX and VAX/VMS, non-privileged users have limited/controlled access to system resources. When logging into the system, if you do not have an assigned password and account, then you cannot get onto the system. Under EDX, there is no such thing as a password security system. The user is responsible for writing one.

Even if the user decided to write their own security scheme where at IPL time (initial program load - boot time) a startup procedure ran a password application at every screen, security could still be broken. Just go to the console terminal, hit the ATTN key and run a utility to change your terminal's characteristics.

The bottom line is security under EDX is inadequate. Anybody who has an understanding of the operating system can easily break its security.

No Upward Migration Path

The Series/1 is basically a stand-alone point product machine. It is incompatible in terms of running applications software with all other IBM processors (Personal Computer, Datamaster, System/34, System/38, 4300s, 8100s, 30XXs). Should an application running under the Series/1 need more CPU performance (i.e., greater than eight jobs), nothing short of a total rewrite on a new and much more expensive machine is possible.

With Digital, a comparable 11/23 or 11/24 system can be upgraded to an 11/44 or even to an 11/70 with no software conversion at all -- a big plus in the eyes of an OEM whose major expense is software development costs.

No Data Query Capabilities

The Series/1 under EDX has no data query capabilities at all -- nothing like QUILL or DATATRIEVE where quick data access into files (or multiple files) can be performed. Any such capability would have to be programmed by the user. A report writer does exist but the human interface makes it awkward to use.

Backing Up Disks

IBM only offers fixed and floppy diskette mass storage. They offer no removable disk cartridge. For backup they have a 27MB floppy magazine unit (23 floppies -- 3 fixed, 20 removable). However, this can present problems when a file (master inventory file for example) is larger than 27MB. Under EDX there is no disk spanning of files so in order to backup a file larger than 27MB, a program would have to be written to logically break it up. Not impossible, but another one of EDX's inconveniences.

Little User Friendliness

One thing about EDX, everything is menu driven (compiling, editing, file management, diagnostics). The motivation for this is to obviously make the system user friendly while hiding as much of the operating system from the user as possible. In theory a good idea, but the menus under EDX get so involved and the on-screen documentation is so limited that sometimes it is confusing to carry out the intended operation.

Another inconvenience that makes the system user unfriendly is when an error is generated (for whatever reason), you only get a non-descript diagnostic number with no accompanying message. To obtain an explanation you must consult a message manual.

PRICING/POSITIONING

Note: Prices quoted are for licensed systems fully supported.

4-User System

Series/1	Price	BMC	Digital's 11/23-PLUS (DM-RXMMB-DA)	Price	BMC
4954C CPU/64KB	$12,845	$65	11/23-PLUS CPU/256KB	$30,700*	$247
1.2MB Diskette			Two 10MB RL02 Drives		
Three 64KB Memory Boards	3,285	8	DZV11 4-line MUX		
29MB Winchester	11,780	41	CIS chip		
Disk Controller	1,920	5	VT102 CRT		
1310 MAF 4-Line MUX	2,400	10	RSX-11M Operating System		
Four 3101 CRTs	5,620	60	Three VT101 CRTs	4,050	45
4975 160 cps printer	4,175	32	LA120/cntr	2,910	45
Printer controller	1,070	4			
EDX Operating System (License)	340	-			
Total Price:	$43,435	$225		$37,660	$337

*Unsupported system price is $25,700 (DM-RXMMB-DM).

Comment: While it looks like the Digital offering is favorably priced, IBM as part of its VAR Program (Value-Added Remarketer) will give discounts of over 40%. See the following page on discount schedules.

8 Through 12-User System

Series/1

	Price	BMC
4955F 128KB CPU	$13,200	$127
Three 128KB Memory Boards	10,560	126
64MB Drive	13,340	51
64MB Add-on Drive	11,170	48
Drive Controller	1,920	4.50
8-Line MUX (2091)	1,220	10.50
Eight 3101 CRTs	11,240	120
4975 160 cps Printer	4,175	32
Printer Controller	1,070	4
EDX License	340	-
Total Price	$68,235	$523

Comment: For pricing of large Series/1 configurations, there is no standard system that would adequately demonstrate the machine's positioning, so many variables enter into the analysis (communications, backup, foreign disks). Should you need Series/1 pricing or competitive position, please contact me.

IBM discounts must now be analyzed. Below is the OEM discount schedule for the Series/1. IBM refers to their OEMs as VARs (Value-Added Remarketers).

VAR DISCOUNT SCHEDULE FOR SERIES/1

Quantity	Remarketer Discount	Volume Discount	Total Discount
1-4	15%	0%	15%
5-19	10%	10%	20%
20-49	10%	15%	25%
50 or more	10%	20%	30%

It should be noted that IBM has become extremely aggressive with its Series/1 discounting schedules for VARs who can sell more than 1,000 systems over a four-year period. Discounts to those VARs are 40%, with rumors quoting an even higher discount - 50%!!

IBM FIRST HALF FINANCIAL RESULTS

Richard Case
X7307 MK1-2/N38
RCS: MK12

IBM recently reported impressive financial results as follows:

- Second quarter net earnings up 24.4% over Q2/1981.
- Revenues up 16.7% over Q2/1981.
- IBM's first non-fourth-quarter billion dollar quarterly earnings.
- In the IBM announcement, President John Opel stated the good performance was due to purchased 3081 processors and 3380 (2.5 Billion Byte) disk shipments.

	First Half 1982	1982 Q2	1982 Q1	Total-1981	1981 Q4	1981 Q3	First Half 1981	1981 Q2
NOR:	$15.1B	$8,053	$7,066	$29.1B	$8,993	$6,721	$13.4B	$6,900
% Change	13.2%	16.7%	9.4%	10.9%	15.2%	3.7%	12.0%	11.6%
Lease, Rental	$5,690	$2,843	$2,847	$10.8B	$2,787	$2,622	$5,430	$2,674
% Change	4.8%	6.3%	3.3%	5.7%	5.7%	.9%	2.1%	.2%
% NOR	37.6%	35.3%	40.3%	37.3%	31.0%	39.0%	40.6%	38.8%
Sales	$6,361	$3,614	$2,747	$12.9B	$4,703	$2,799	$5,396	$2,930
% Change	17.9%	23.5%	11.2%	18.2%	25.6%	8.0%	17.8%	19.8%
% NOR	42.1%	44.9%	38.9%	44.4%	52.3%	41.6%	40.4%	42.5%
Services plus Software	$3,068	$1,596	$1,472	$5.3B	$1,503	$1,300	$2,527	$1,295
% Change	21.4%	23.2%	19.5%	20.5%	18.7%	15.2%	24.5%	21.5%
% NOR	20.3%	19.8%	20.8%	18.3%	16.7%	19.3%	18.9%	18.8%
Earnings	$1,768	$1,000	$768	$3.3B	$1,081	$693	$1,534	$804
% Change	15.3%	24.4%	5.2%	-7.1%	-12%	-21%	6.2%	5.3%
Earnings /Share	$2.98	$1.68	$1.30	$5.63	$1.83	$1.18	$2.62	$1.37

NOR = Net Operating Revenue
Sales = Purchases or conversions from lease
% Change = Percentage change over prior year Quarter or Year
% NOR = Percentage of Net Operating Revenue

An earnings gain of 24.4% in a quarter during a long and deep recession is impressive. This is relative to a poor Q2 of 1981 when earnings grew only 5.3%. There is a good chance IBM earnings will look very good in the third and fourth quarters as well, since the 1981 quarters had earnings declines.

The results also show a continuing strong shift to outright purchases with sales up 23% over Q2/1981. This is due to customers buying 3081 systems since these products are new technology and due to lease to purchase conversions of older 303X systems because of IBM price cuts on those systems.

IBM has also stopped leasing low-end systems such as the DisplayWriter, System/34, Series/1, 4321 and some terminals. IBM is also making arrangements with CITIBANK and U.S. Leasing to take over low-end leases.

Service and software revenue show continued strong increases due to the high cost of IBM software and the trend to purchased rather than rented licenses on the low-end System/34, Series/1 and some 4300 SSX software.

As Mr. Opel stated, the strong results were due to deliveries of very large 3081 processors and the delayed shipments of 3380 large disk drives. The System/38 is also now being delivered in volume. In each case, IBM has been late (two years in the case of the 3081, one year for the 3380 and System/38) in delivering these products. There was pent-up demand for these three products which IBM volume manufacturing can now produce. This is revenue IBM could have had in 1981 if the products were ready for delivery.

The 3081 D processor is rated at 10 MIPS (Millions of instructions per second) and the larger 3081 K is 14 MIPS. The VAX-11/780 is believed to be from .8 to 1.2 MIPS. A fully configured 3081 system will cost between 8 to 12 million dollars.

The current situation is very similar to 1979 when IBM shipped 303X systems in quantity. IBM revenues and shipments due to systems costing more than $4M were:

	1977	1978	1979	1980	1981
%Revenue	26%	33%	39%	35%	28%
%IF Sold Value	25%	36%	56%	34%	23%

Source: Gartner Group shipment analysis and work done by Rick Case and Don McGinnis to break down revenues by price bands.

The above chart shows truly massive 303X system shipments in 1979. Some went out the door leased where the income is obtained in subsequent years.

The situation today is different in that even in 1979 there were rumors of large "H" series (3081) processors coming and more customers probably leased 303Xs due to those rumors. Today, most people feel the 3081s have a long product life cycle and are buying the processors outright or through third-party leases.

There is no data available showing a breakdown of IBM revenues or shipments in Q2/1982, but most rumors have the Personal Computer, System/38 and DisplayWriter shipments very high; below plan shipments of the 4300s and Series/1; and poor shipments of the 8100, Datamaster, 5520 or 5280 systems.

IBM did not increase prices across the board as they did at the end of June 1980 and 1981. Outside analysts feel that is because they did not need to increase revenue and that they could not use inflation as an excuse at this time. A price increase may come in the fall.

Some Wall Street analysts are looking forward to 1983 when IBM may have satisfied the pent-up demand for 3081s and will have to compare results with a very good 1982.

IBM OFFERING S/38 UNDER VAR PROGRAM

Roger Bisbo
X6777 MK1-2/N38
RCS: MK12

Although not yet officially announced, Richard Matlick, president of InfoCorp (a DP industry market research firm), has informed us that IBM is offering S/38 to selected distributors under its Value Added Remarketer (OEM) program. Previously, IBM offered only end-user volume purchase discounts on S/38 (maximum of 9% for 10+ systems over 18 months). We do not presently know what the VAR discount schedule is for S/38, but the Series/1 and System/23 Datamaster VAR discounts go to 40% and 28% respectively.

We have also learned that a representative of IBM's VAR program approached at least one third-party software vendor at the recent COMDEX show and discussed the possibility of placing the vendor's products on S/38.

We will publish additional information as available.

IBM'S BOOTH AT NCC

Richard Case
X7307 MK1-2/N38
RCS: MK12

IBM's booth at NCC was divided into halfs -- one-half showing small systems and the other showing an office skit. The outside of the booth showed current and future IBM advanced technology. Items of note:

Futures:

IBM showed advanced technology such as:

- Chips out of the 4300 and 308Xs
- The 3380 2500MB disk
- Three dimensional scanning
- Flat Gas Plasma Display with 960x768 addressable points

One of the presentors stated "IBM technology always means more than meets the eye."

I have been watching IBM for a few years now and have never seen them talk or show futures like this. I feel they were saying "trust us, someday we are really going to deliver" or "If you leave us now, you will miss out." No product in the IBM booth could really be called all that advanced or state-of-the-art except perhaps the System/38.

Office:

The office skit had three professional actors -- two with PROFS electronic mail terminals and one with a DisplayWriter word processing system. The actor on the DisplayWriter "mailed" a document to the boss on a PROFS terminal who mailed it to a salesman in the field in time to make a quote. The skit had a lot of energy and showed some of the real benefits of using an integrated office electronic mail system. It got people's attention.

However, they really cannot do what they showed. After the show, I asked how they sent the document from the DisplayWriter into the 4300? "Via BISYNC" was the answer.

How did the document get into PROFS? "We wrote a special program on the 4300 to receive the document and put it into the PROFS database."

Is the program available to customers. "No"!!!

Can a DisplayWriter interactively use PROFS? "No"!!!

Can a DisplayWriter user address mail to multiple addressees (or even a different person than that shown in the skit) on PROFS? "No"!!!

Small systems:

Lining one-half of the booth was: an IBM Personal Computer, two Datamasters (S/23), two terminals on a System/38 and the new IBM instrument (68000 based) computer. All of these systems were using the keyboard layout of the IBM personal computer. IBM is very proud of this keyboard; the IBM presentor called it "the most advanced keyboard on the market."

It is significant that IBM is moving to have one keyboard layout across small systems (however, not on 4300, Displaywriter, 8100, 3081, etc.). The small systems still have different hardware, software and human interfaces. However, one keyboard is a step in the right direction. The IBM PC keyboard has 83 keys which are bunched tight together. I do not think it is "state of the art."

What was missing:

No Series/1
No 8100
No 4300 (however, the PROFS demo communicated via a 4300)

I believe the IBM NCC booth was underwhelming.

WANG ANNOUNCEMENTS

Peter V.K. Parsons
X7989 MK1-2/N38
RCS: MK12

WANG announced ten new products at a morning press conference in Lowell on Thursday, May 27, 1982. A brief comment on the significance of each follows:

1) WANG's Personal Computer the "Professional Computer" was a defensive move to protect their installed base (100K systems) from buying Digital's, IBM's or Apple's Personals.

   Based on an 8088 and 305KB 5-1/4" floppy, the unit will price out 10-20% higher than Digital and offer 10-20% less functionality, depending on which Digital Personal Computer they position against. Availability is slated for "Fall 1982," which might slip. WANG is promising that this unit will act as a terminal to all their systems but did not say where or how much this option would cost.

2) The VS25 and VS45 coupled with VS Graphics, Query, Tape Cartridge back-up and a very competitively priced 640MB disk drive is the significance of this announcement.

   These new VS systems and options could have significant impact on our Office and DDP Market because now Wang can offer Office functionality (Mail, WP, plus Commercial Applications) on a very low-end system with full VS compatibility up through the VS100.

   A small VS 25 configuration could look like the following 8-terminal system:

			Mo. Maint.
1 -	VS 25 512KB ONE DSDD FLOPPY 16 PORT SERIAL DEVICE 34MB FIXED DISK VS OPERATING SYSTEM ONE LANGUAGE	$29,000	$240
1 -	WPS SOFTWARE	5,000	40
1 -	14MB TAPE (BACK-UP)	6,000	53
4 -	DP TERMINALS	12,800	96
4 -	DP/WP TERMINALS	17,200	96
1 -	LQP	6,000	49
1-	250 LPM	9,000	103
		$85,000	$677

   The VS25 was available in July and the VS45 will be available in September. At approximately $10,500/terminal for Office and DP functionality, these low-end VS's will put price pressure on the VAX-11/730 and/or functionality pressure on DECword/DP systems to include mail functionality.

3) WANG's Graphic Terminal -- priced @ $5,975 with Charter software for VS Office users @ $2,000 or VS Graphics software @ $3,000 plus a high-density matrix printer @ $5,975 -- will enhance the VS with basic graphics; i.e., several types of bar, line and pie charts.

4) EZ QUERY is an interactive relational query language for the non-programmer or programmer alike. EZ QUERY will be released in two phases -- August 1982 and January 1983. Prices will range from $1,500-$6,000, depending on VS system type or level of release.

5) VS INFO is an on-line help and information utility to elecronically access VS reference manuals. The software includes scrolling, searching, place markers, full and split screen display mode and will come packaged at no charge with the VS operating system. VS reference manuals formatted for VS Info cost $250 each and are now available.

6) The 14MB tape cartridge priced at $6,000 will be available in December 1982 and can be used on OIS, ALLIANCE, VS 25 and 45, or 2200 LVP and MVP systems.

7) The 640MB disk offers 1.2MB second average transfer rate, 25M sec seek and 8.33M sec latency priced at $38,000 each without controllers. Cost per MB will range from $61. This new Wang disk is a fixed disk and can be compared to Digital as follows.

   Comparing Wang's fixed and removable disks with Digital's fixed and removable disks shows the following Digital price advantage:

Vendor	Model	Type	Capacity	$/MB
Wang	2265V-2	Removable	288	79.86
Digital	RA60-AA	Removable	205	73.17
Wang	2265V-3	Fixed	640	59.38
Digital	RA81-EA	Fixed	456	41.67

   Digital's removable disk prices are 8.38% less expensive than Wang's.

   Digital' fixed-disk prices are 29.8% less expensive than Wang's.

8) Wang lowered the price of 2200 terminals by 18-35%. The new price of $2,200 for a DP/WP terminal is much more price competitive with other vendors in this low-end DP market.

9) Wang additionally will be selling 128KB memory for the VS25 and 45 at $2,000 each.

10) Finally, Wang announced remote diagnosis capability for the VS series. However, no pricing, availability or functional specifics were detailed.

The VS25 and 45 announcement was specifically targetted to replace IBM's Systems/3, 32 and 34 by offering RPGII conversion routines that could "complete conversions in weeks rather than months." With an installed base of more than 80K units of these IBM systems, Wang might now be able to provide a viable replacement.