Integrating PCs in the Mainframe Environment

There was a time when personal computer or microcomputer users did not understand the need to connect to a mainframe/host; today, almost any corporation with PCs in place recognizes that need. Although their PCs may have been installed to perform standalone—independent application processing such as word processing, graphics programs, and spreadsheet analysis—a need soon developed to access and manipulate data that has traditionally been under the mainframe's control. All currently noncommunicating PCs are potential candidates for PC-to-mainframe links, and purchasing policies for PCs, micros, mainframes, and any intermediaries between them need to consider the possibility of interconnection. New, more cost-effective and powerful multitasking PCs will make downloading mainframe applications more feasible. Recognizing the place of PC-to-mainframe products, larger corporations are developing company-wide strategies to include both mainframes and PCs within an overall computing capability.

PC users want not only to obtain mainframe data for their own applications and update the information in realtime (not batch), but they also want to access that data transparently, maintaining full PC functionality. The PC-to-host market is evolving to meet these needs for greater sophistication, and the market continues to enjoy healthy growth.

TODAY'S MARKETPLACE

PC-to-host products comprise software packages or hardware/software combinations that offer, at the very least, terminal emulation and file transfer. For example, simply by emulating a 3270 terminal (the terminal most used in accessing IBM mainframe computers), a PC can communicate with a mainframe. Other functions, of course, are usually added, and PC-to-mainframe products often support features such as file translation and conversion, unattended operation, data compression, virtual disks, and Applications Program Interfaces (APIs). Connections to the host are most often established in three ways: directly from the PC via coaxial or twinaxial cable, remotely via a modem, or through a gateway connection to a LAN. Direct, coax attachment of the PC to the mainframe is the oldest and remains the most common method in place today, although remote and LAN connections are now preferred.

Digital Communications Associates (DCA), a leader in the PC-to-mainframe market (claiming an installed base of over 500,000 users and over 50 percent of the market), established its name with the IRMA product. IRMA, a hardware, add-in terminal emulation board, provided the first coax interface to an IBM mainframe by emulating the IBM 3278 family of terminals.

IRMA soon became *the* emulation board with a coaxial interface against which all other boards were measured. In a clever strategy, DCA provided source code to third-party

As organizations turn to personal computers or microcomputers as the workstation of choice, users become increasingly concerned with the need to access corporate information through the PC. The search for a suitable PC-to-mainframe link has, however, yielded mixed results. Some users are extremely happy with the products they have selected; others bemoan the lack of a "true" PC-to-host link.

This report includes discussions of the basic technology, the state of the market, major vendors in the industry, and a comprehensive specifications listing of approximately 300 products that are currently available. The products listed in the comparison columns range from relatively inexpensive software packages to more costly software/hardware combinations, and their functionality differs vastly. Users must determine which complete solution best suits their purposes.

vendors, widening use of the IRMA board even more. DCA also offers products that provide remote terminal emulation and connectivity with IBM System/3X minicomputers, although the company continues to specialize in 3270 communications.

Although the PC-to-mainframe host market is based on IBM products, IBM is not generally recognized as the market leader. Many other companies followed DCA's lead before IBM released its first PC-to-mainframe product. Despite that, IBM and IRMA are accepted as the de facto standards with which products must be compatible.

Other major PC-to-host vendors include AST Research, Novell Communications Division, Quadram, and Techland BlueLynx. With the exception of Quadram, the companies provide both 3270 and 5250 environment solutions. AST's strength lies in System/36 and System/38 and RJE terminal emulation, while Novell's strength is gateway communications. Quadram concentrates solely on 3270 emulation and offers board products that are both IBM and IRMA register-level compatible. Quadram sells its products both with and without terminal emulation software; users can purchase only an IRMA-like board if PC-to-host communications are already in place. Techland BlueLynx offers 3270 and 5250 emulation products that function in local, remote, or cluster configurations.

Although the products' purpose is identical—providing a PC communications link to a mainframe—vendors' technical approaches and selling strategies differ. Novell's product line, for instance, is modular. Interface boards providing specific connections (coax, twinax, remote, gateway, etc.) are sold separately from the software. In effect, ▷

Integrating PCs in the Mainframe Environment

users select from a menu of products, choosing the type of connection, the type of software, and options such as graphics capabilities. Other companies, such as Techland Blue-Lynx, bundle the software and the hardware, enabling users who want a product that provides a 5250 cluster connection to buy one package that includes hardware and software.

Each selling strategy has its advantages; which one is better depends on the knowledge of the user. The menu approach is convenient for customers who have sharply defined needs and goals, but it may be confusing to novices faced with choosing from a wide array of selections. Novell Communications, however, has been very successful with its menu approach, and the company has fared well because of its already strong reputation in the LAN market.

Users who attempted to set up a system by reading countless product manuals and coordinating selected elements attest that an all-in-one product is easier to install than modular components. Attachmate, a company that offers completely IBM-compatible connectivity software, offers an "all-in-one" product called EXTRA!, a software package that supports remote-modem, LAN, and coaxial connections. Most vendors offer products based on the different types of connections, (i.e., coax, remote), but Attachmate supports all connections within a single package.

End users are calling the tune in today's PC-to-host market. Accustomed to the friendliness of microcomputers, they demand that the packages be equally easy to install, access, and use. The users also want transparent access to the mainframe so that they can work on host applications using the capabilities of the PC. Both users and vendors strive for

pure peer-to-peer communications, but the PC still is distinctly different from the mainframe, and access is not truly transparent.

Vendors have, however, improved basic PC-to-host capabilities by adding several features that make their products much friendlier. Many software programs now contain context-sensitive Help screens, on-line tutorials, and menus to lead the user through installation, configuration, and reconfiguration. Most of the top vendors offer all these features as well as a common user interface among their products. The few major vendors that do not are quickly upgrading their products to remain competitive in this fast-paced market. Multiple sessions, hot keys to DOS, pop-up windows, multiple windows, and printer emulation are other features that add to a package's value and ease of use.

Users are the main driving force behind the changes in the technology. Product improvements, such as the addition of ease-of-use features, continue, but the basic technology is in place. The current market, active and fiercely competitive, will become even more explosive when products break the peer-to-peer communications barrier. Meanwhile, those vendors that respond to users' demands by incorporating their ideas will lead the market.

THE TECHNOLOGY

PC-to-mainframe communications can be looked upon as merely substituting PCs for dumb terminals. PCs were not designed for this role, however, and therefore have characteristics that must be accommodated through the technology and through careful user planning. In order to decide which PC-to-mainframe link is best for a particular situa-

DCA's IRMA emulation board became the de facto standard for coaxial interface cards. The company's IRMA line has been expanded over the years to include PC-to-host products that function in 3270 or 5250 environments. Shown is IR-MAX Multisessions, a PC hardware/software product that performs local terminal emulation through a coax attachment to the host. The product supports up to four host sessions and one DOS session.
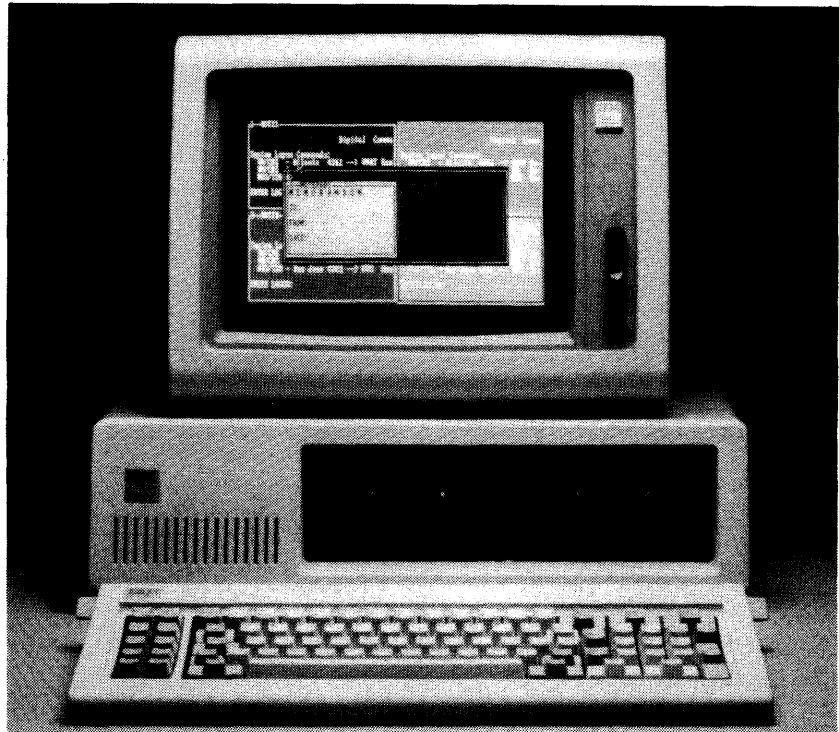
Integrating PCs in the Mainframe Environment

▷ tion, users must gain a basic understanding of the differences between mainframes and PCs and the elements that any communications system must employ.

Some fundamental operating characteristics are quite different. Mainframes and communications systems are both heavily involved with maintaining control over a variety of concurrent tasks, whereas most of the PCs in use are designed to handle a single task at a time for a single user at a time. Most PC users have already encountered frustrations from the limitations of single-tasking systems. While many look with hope toward IBM's new multitasking PS/2-OS/2, its capabilities fall short of handling the complexities faced by PCs when connecting to large communications networks.

Mainframe Communications

Mainframes have a different hardware architecture, usually with multiple supporting processors to expedite different I/O functions and multiprogramming, and so can efficiently handle large, complex networks and databases. People who look at the fast-rising power of the processors in smaller, cheaper systems and predict the subsequent demise of the mainframe tend to forget these architectural differences that support various applications and greater system throughput. It may be cost effective to download certain jobs to a lower level processor (especially since the last generation's large system is this generation's midrange). Some complex jobs are always left over at the high end, and new applications are becoming cost effective, as big mainframes can handle ever larger, more complex jobs.

Communications on a mainframe are usually handled by a separate, freestanding front-end processor (FEP) attached to an I/O channel. Small mainframes and most superminis substitute an integrated communications adapter capable of handling fewer lines. In IBM systems, the front end is tightly bound to the mainframe because the telecommunications access method software ("VTAM" for SNA networks) resides in the mainframe central processor; the Network Control Program (NCP) that serves as the operating system for the front end must be generated by another mainframe program, the System Support Program (SSP). Some mainframe vendors have all this software in the front end, allowing more functional independence between the two processors.

The incoming communications lines attach to ports on boards that, in turn, are often organized into several groups or subsystems, depending on the system type, front-end model, and so forth. A single front end almost always handles a variety of line speeds and, less often, more than one line protocol and code. The front end, in turn, attaches to one of the mainframe's numerous general-purpose I/O channels that, on larger systems, are parallel-transfer multiplexer channels handled by a separate I/O processor. The front end may or may not share the channel with a subsystem of another type—disk or tape, for instance.

In order to provide configuration flexibility, mainframes have multiple I/O channels, each usually designed to attach up to eight subsystems with multiple devices per subsystem. Therefore, one channel can attach up to eight current IBM 3725 front ends, for instance, and the 3725 can conceivably attach up to 256 lines, each supporting multiple subsystem controllers that in turn attach 32 terminals in a cluster. Putting all this on one channel would create an impossible bottleneck, but the flexible attachment capabilities allow configuration adjustments for better performance. All large mainframes are designed to comfortably handle a number of front ends, and each physical front end can handle a number of logical networks.

Although the configuration just described for the 3725 is ridiculously impractical because of the response delays that would result, it is less ridiculous than it might have been in the past. A good proportion of dumb terminal users are data entry operators transmitting steadily all day long, whereas PC users attached to a system are far more unpredictable, depending on whether they are constantly demanding complex calculations or only occasional input.

Midrange and smaller mainframes were traditionally distinguished from minis or superminis by the existence of a more complex I/O structure, a freestanding front end on the mainframe, and a bus-centered I/O with a communications adapter on the mini or supermini. However, this distinction has blurred in recent years. IBM's 9370 Series and earlier systems are software compatible with mainframes but can attach either an adapter or a front end for communications—the adapter is the far more likely choice. Although Digital Equipment Corporation superminis do not have separate I/O processors, they have become very powerful and can be interconnected in groups that allow a distribution of function. As a result, a PC-to-host connection may actually terminate in a mini—which does not usually make any difference from the PC user's point of view, providing the mini is powerful enough to serve in the way needed.

These hardware elements form the backbone of the communications systems, but the network's real definition and management reside in the software. Communications software on big systems is almost always in a strictly defined layer, separate from the application programs; earlier amalgamations of the two led to too much confusion and duplication of effort. PC communications usually require applications interfacing software added to the mainframe, as well as a program and/or board in the PC; users need to check whether they are expected to write the applications interfacing programs themselves if they are missing from a product. Most off-the-shelf products are designed to run on IBM or Digital systems, so this task is almost surely needed if the mainframe is from another vendor.

PC Communications Hardware and Software

Most PCs cannot concurrently process an application and serve as a communications link to a host. A single-task ▷

Integrating PCs in the Mainframe Environment

Quadram's MainLink II and MainLink IIm provide nonhost application-specific links for a single user. Shown here are the hardware boards. While the MainLink II operates in the IBM PC/XT/AT and IBM PS/2 (non-MicroChannel systems), MainLink IIm operates in IBM PS/2 MicroChannel systems.
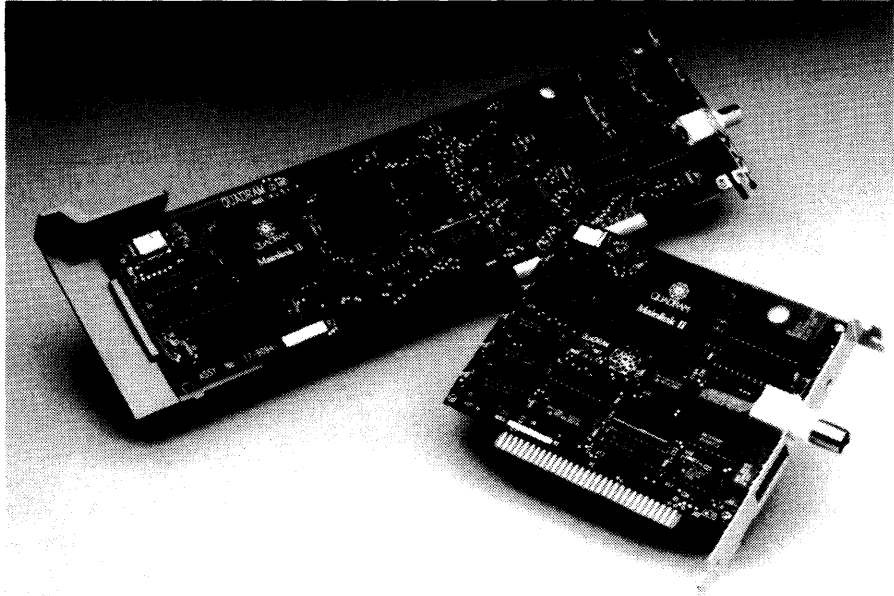
▷ computer can undertake only one function at a time—word processing, spreadsheet, database, or communications. The user must decide when to invoke the particular function, based on current needs. This type of serial work scheduling is normally suitable for human interactions; people's work habits are also typically single minded. But the limitations of single tasking are apparent when quick access to a spreadsheet program is needed in the middle of writing a large report on a word processor. To get it, a user would probably need to save the report to disk, exit the word processor, and enter the spreadsheet program.

Communications interactions are quite different from the characteristically batch processing of most PC tasks. Communicating between a PC and the data center is not an end in itself, but rather an intermediary step in the handling of information. As such, it occurs as part of a job (from the user's point of view) and rarely as a job in itself. Putting it another way, communications between a PC and the data center is naturally interactive. Single-task PCs, on the other hand, are batch oriented. Their "interactive" requests for communications service are therefore normally made outside the application, leaving the user with the problem of manually integrating the data received with local work or extracting and formatting data to send.

The most common communications implementation consists of a board with software support that allows rudimentary dumb terminal emulation. For example, the most basic 3270 emulation allows the incoming code to be displayed, but screen-by-screen printing must occur. Ways have evolved to allow file transfer, but not necessarily in the desired format. Of course, communications programs can be and have been written for the PC, adding multitasking and/or the specific code needed, so that integrating incoming code might be automatic; but this is difficult to implement on existing systems due to the 640K-byte memory ceiling. Third-party vendors must be careful to find applications widespread enough to justify development costs.

The Data Communications Network

The mainframe is a foreign architecture that requires compatibility adjustments. A PC user who wants to link up with a mainframe shortly discovers that he or she must interface to a separate networking world that requires much more intimate knowledge of hardware than was previously needed. Regardless of the complexity of the PC-to-mainframe link, there are certain elements that must be considered and adjusted for before communications can occur at all.

• Codes and Character Sets: The majority of current computers are fundamentally encoded in either the ASCII or EBCDIC code. IBM and IBM-compatible PCs, and all other PCs based on Intel microprocessors, use ASCII code, as do Digital VAX and 8000 Series superminis and IBM Series/1. IBM System/36, System/38 minis, and System/370-compatible mainframes (3080, 3090, 4300, and 9370 product lines) all use EBCDIC. This means, ironically, that an IBM PC communicating with an IBM mini or mainframe must undergo a code translation, whereas an IBM PC communicating with a Digital supermini need not. Admittedly, code translations are not complicated, except that special symbols in one character set that do not exist in the other are usually lost. Translation, however, must occur somewhere during the transmission—either at the outset in the PC, in a protocol converter or departmental node en route; in the receiving program in the front end; or in the destination application program.

• Protocols: A protocol is a set of rules for formatting the transmission control codes and data; as such, it is the key ▷

Integrating PCs in the Mainframe Environment

▷ to how the logical and physical networks interconnect. In all current protocols, headers and trailers are added to the data message to provide information on the source and destination application, the source and destination computers, network routing, validity checking, security codes, clocking bits, and so on. There may or may not be start/stop bits on individual characters. There are two classes of protocols: asynchronous and synchronous.

Asynchronous protocols are lower speed connections with irregular timing, requiring start/stop bits to be added to each character after the session has been established. Session control information is rudimentary, and complex routing is not directly supported, although DECnet's sophistication and success show there are various methods to overcome these shortcomings. Digital's VT52 and VT100, IBM's 3101 and 3160 series, and the familiar Teletype terminal all use asynchronous protocols with the ASCII code.

Synchronous protocols depend on finely tuned clocking to distinguish characters or bits that have been grouped together; this allows higher transmission speeds and better reliability (at the cost of more complex implementation logic). There are two types of synchronous protocols: byte oriented and bit oriented.

Past implementation of byte-oriented protocols such as BSC have tended to be somewhat machine dependent, with certain characters having explicit control functions; as a result, there are slightly different versions for the IBM 3270 interactive terminals, the 2780/3780 batch terminals, etc. This relative lack of transparency also means that different terminal types usually cannot be mixed on a line.

Most bit-oriented protocols, like IBM's SNA/SDLC and ISO's X.25/HDLC, on the other hand, are packet-switching bit-oriented protocols. They are designed to get around these limitations by defining the "data" as a completely unpredictable bit stream that is allowed to have any sequence of bits except one (the data delimiting markers), whereas control characters with specific functions are recognized primarily by their position before and after the delimiting markers. This system easily transmits any type of data or coding, including graphical material. It also provides great routing flexibility, since a new address, or any other new information, can be added by just clapping on a new "envelope" of headers/trailers and delimiters around both the message and its original headers/trailers, for an intermediate destination. This treats the original headers as if they were part of the "data" bit stream. At the intermediate destination, the new headers/trailers are stripped off, and the original ones emerge. Multiple "envelopes" can be used for routing to a number of nodes. Since the control and data fields are firmly separated and the control code standardized across all products, multiple device types can share a leased line.

Because protocols are added to the message to be transmitted and then stripped away as the data reaches its destination, they are completely transparent to the end user. Protocols are one of the important compatibility considerations, as we shall see later.

• Attachment Mode: Data communications support in existing facilities can be classified according to the type of information exchange supported. Older batch terminal systems, such as the IBM 2780/3780, were designed to upload/download large files after the file had been created off-line on punched cards or data entry systems. Keyboard-oriented interactive terminals, such as the Digital VT100, IBM 3270, or IBM 5250, were designed to work on files that remained on the mainframe by sending or receiving data in smaller amounts, usually a screen at a time, in conversational mode, with some optional printing capabilities. PCs are far more likely to emulate existing interactive terminals and add batch file transfer capabilities by software extensions.

• Attachment Method: The actual attachment hardware consists of a plugged-in circuit board with a cable connection either directly to the computer or to a modem. The most common interface for serial devices and communications is an RS-232-C plug with only a subset of the pins implemented (4 to 7 pins for asynchronous communications, 9 to 12 pins for synchronous communications).

Boards for terminal cluster device emulation expose other interfaces and require the appropriate cabling. In the case of 3278 emulation, a coaxial cable connects the PC to the communications cluster controller or an integrated controller on a low-end mainframe. In the case of 5251 emulation, a twinaxial cable connects the PC to the cluster controller or to an integrated controller on a System/36 or System/38.

PCs that are connected to local mainframes and do not need to interface to communications networks outside of their building do not require modems, so their cabling can be a little different. If the computer is nearby (it must be within 50 feet to use the RS-232-C interfaces), asynchronous terminals can use a null modem cable for attachment. Synchronous terminals, however, need the clocking signals from the modem for proper transmission. They must use a different device with a clock, called a modem eliminator. A local device that is farther away, say on another floor, perhaps can be reached by means of a limited-distance/short-haul modem.

These basic types of connections also apply to departmental systems and LANs. See Figure 1 for an illustration of the different ways a PC can connect to a mainframe or mini.

• Facility Layout: PCs are rarely used close to the data center, so consideration must be given to the impact of the relative locations of the equipment. This is particularly important where attachment other than via conventional phone/modem means is contemplated. RS-232-C cable has a nominal limit of 50 feet, and even the extended- ▷

Integrating PCs in the Mainframe Environment

distance cable is rarely usable beyond 250 feet. While other interface methods such as RS-449 support greater distances, these may not be offered either at the PC or on the data center equipment. The use of multiplexers and concentrators can solve some of these problems and reduce the wiring load. Use of existing wiring can save money, but walls and ceilings filled with undocumented cables can also be difficult to sort out. Installing a cabling system, with coaxial or optical fiber backbone cables between floors, may therefore be more cost effective.

- Speed and CPU Port Capacity: The most popular PC interfaces are 1200 bps asynchronous interfaces, but there are a growing number of higher speed synchronous interfaces as well. Since front-end processors are designed to handle a variety of data rates, it is rarely a problem to interface a line of the right speed to the mainframe. However, since many PCs are occasional mainframe users, it may be quite cost effective to investigate multiplexers, concentrators, and/or departmental systems that allow a higher speed line on the mainframe. This would be particularly true if the number of spare hardware ports on the mainframe was limited, or if adding new ports required expensive configuration expansions.

TERMINAL EMULATION VERSUS INTEGRATED LINKS

As we have seen, the networks on the mainframe host are often so large and complex that changes must be carefully designed. This network characteristic provides the first limit to the choices available to the PC. Most users find that the easiest way to connect their PCs to the data center is to have the PC emulate the dumb terminal that is already supported by the application(s) they want to access and, hence, is already integrated into the data center network. This seems straightforward enough, but in reality, there are a number of qualifications that can have repercussions if the user wants to expand the system's capabilities beyond the basic query and data entry of dumb terminals, or if more than one computer in incompatible networks must be accessed.

The evolution of the PC link beyond mere terminal emulation has proceeded cautiously. The first step was extending emulation so that entire files could be downloaded, rather than printing them and then rekeying into the PC if the PC user wanted to work on them locally. This did not directly affect the mainframe much, but certain activities, such as uploading files, generating queries that extract only portions of a file to be downloaded, storing "virtual diskettes" (files formatted in PC formats on the host), and reformatting files so that they can be directly loaded into PC applications, move the PC more and more toward integrated cooperative processing with the host.

Terminal Emulation

The key questions for basic applications are the type of terminal to emulate and the configuration of the connection.

IBM's System/36 and System/38, which compete with Digital for the departmental computer market, attach the 5250 synchronous terminal series. Digital systems operate best with terminals emulating the asynchronous VT52 or VT100 terminals or their descendants. IBM S/370-compatible mainframes and superminis, which encompass three quarters of the large mainframe market, are almost always served by the interactive display terminals of the synchronous 3270 family. In a few cases it is important not to overlook the "almost," because IBM mainframes (including the 4300 and 9370 supermini versions) can operate under several different operating systems, and not everyone participates fully in SNA. For example, IBM's IX/370 UNIX system, even though it runs on a mainframe under VM, supports only asynchronous ASCII terminals such as the 3101 and, thus, must be connected to an auxiliary Series/1 as a networking front end. Some IBM users may also find that products that emulate the batch workstations, such as the 2780 and 3780, suit their operating environment, but such devices are less common than the interactive terminals.

After defining the type of terminal or identifying a range of acceptable devices, the issue of connection mode can be considered. A surprising variety of choices exist. Using as an example the emulation of a 3270 clustered system (3274 communications controller attaching up to thirty-two 3278 local displays) on a standard IBM PC, we find that the user would adopt one of six basic attachment methods.

- Emulate only the 3278 and attach the PC to the 3274 as if it were one of the displays. This involves adding a board and any necessary software to the PC, cabling the board to the 3274 with a coaxial cable, and reconfiguring the 37XX front end and 3274 addressing and control microcode (as is usual when a terminal is added). This is one of the simplest methods because it essentially consists of cabling the PC into an existing communications system. The method is also less expensive, since there is no modem, and a higher speed communications line is usually shared by a number of terminals.

- Emulate both the 3278 and the 3274 with a board that emulates the combined logic of both the terminal and controller. In its most common and basic form, this method involves adding a board and its associated software to the PC, cabling the board to a synchronous modem, interfacing the modem to the appropriate data communications lines, and adjusting the software on the remote host so that it recognizes that a new remote 3270 system has been added to the network.

- Emulate both the 3278 and the 3274 as in the second method, but this time attach the PC to the front end on a host at the same site, so there is no transmission over a communications line. Again, the host must be adjusted to recognize that a new 3270 system has been added to the network. Since the 3270 board utilizes BSC or SDLC protocols that require a clock (located in the modem) for synchronization, locally attached systems must be cabled to either a modem eliminator cable (for short distances) or a

Integrating PCs in the Mainframe Environment

▷ limited-distance/short-haul modem (for longer distances, between floors, etc.). Existing telephone wiring can handle everything, but some users prefer coaxial cable or optical fiber between floors in a large building for performance reasons.

- Emulate a totally different terminal (an asynchronous terminal, for example) and allow all adjustments of code, protocol, syntax, etc. to be made by a special set of interfacing programs on both the PC and host.

- Have the PC attached to a local "departmental computer" that is, in turn, attached to the front end. In this case the departmental system acts both as a file server and communications processor for local PCs. The PCs use emulation boards consistent with the departmental system (asynchronous VT100 for VAX or synchronous 5250 for IBM System/36, for example), and then the departmental system takes care of communicating compatibly with the mainframe. Departmental systems range widely in size and support complex wide area networks (WANs) and local area networks (LANs) in their own right, so they are not discussed at length in this report.

- The PC may be attached to a LAN, and the LAN can in turn be attached to the mainframe (or to a departmental system). There are a number of LANs on the market, including Digital's Ethernet and IBM's Token-Ring, and PC Networks. Ethernet users may find that attachment to the Digital host is an attractive option, providing that DECnet support is available in the data center. In cases where Ethernet is already used or where a large number of PCs will be emulating Digital terminals, Ethernet may be an economical connection option. Several vendors supply PC links to Ethernet, and these products support high data rates. Since Ethernet attachment is not as common as the more traditional RS-232-C or modem attachment, product selection based on features will be restricted.

So far, we have been considering PC-to-host communications only in terms of basic terminal emulation. Before extending this basic interaction into full-fledged file transfers and comparative processing, a few more items must be discussed. The PC user is likely to assume that because the PC is intelligent and the emulated terminal is not, the terminal's capabilities are only a subset of what the PC can do. Actually, terminal emulator products rarely emulate *every* aspect of the target terminal. Keyboard layout is seldom flexible on PCs, so emulators usually do no more than approximate the actual device. This may result in only small adjustment factors for operators, but sometimes terminals have a bank of function keys that cannot all be duplicated on the PC. Loss of certain keys may affect the operation of some applications. Screen display characteristics, particularly in graphics mode, can also differ, making the emulator unsuitable for some specialized functions. If the target terminal has a status line, it must be emulated in an understandable form. It is important to review operator interface factors and application-dependent factors as well as technical features in selecting a terminal emulator product.

File Upload/Download, Virtual Diskettes, and Other Extensions

As the PC-to-mainframe evolved, users were offered independent packages with a variety of features in various combinations. Some merely expanded communications flexibility, but many added processing flexibility as well. The most important broad categories were:

- Data/File Manipulation—data search and extraction with conditional retrieval, data compression, data format restructuring, and automatic query generation;

- Virtual Diskettes—in addition to providing easy-access data extracts, as mentioned above, these allow the PC to use the mainframe as secondary storage, as backup, and as a file server by uploading files in PC formats instead of translating them into mainframe formats. Sometimes provision is made for mainframe access of the data as ▷
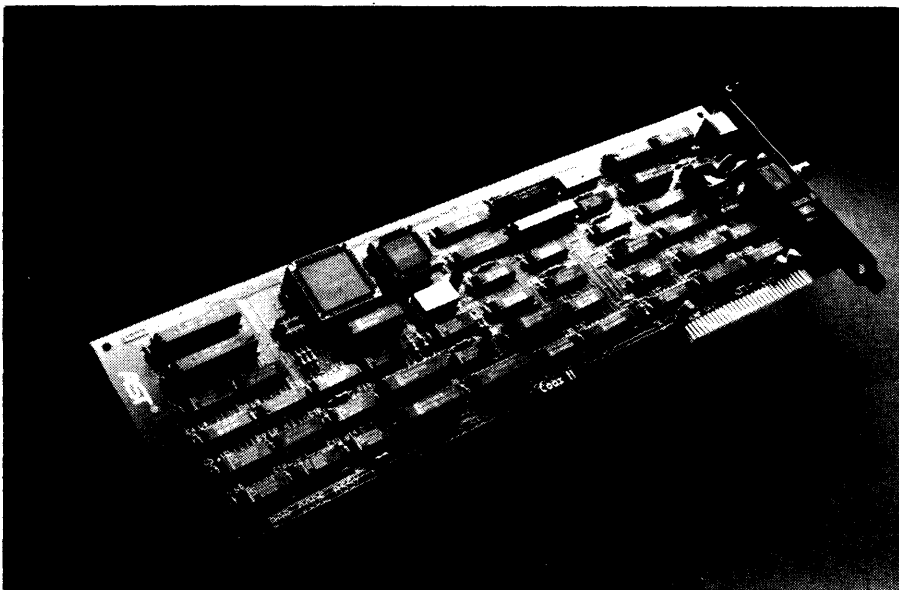
AST's 3270-Coax II is designed for AST Premium and IBM PC/ XT/AT computers. The product is both IBM and IRMA compatible at the hardware level and also includes microcomputer software.

Integrating PCs in the Mainframe Environment
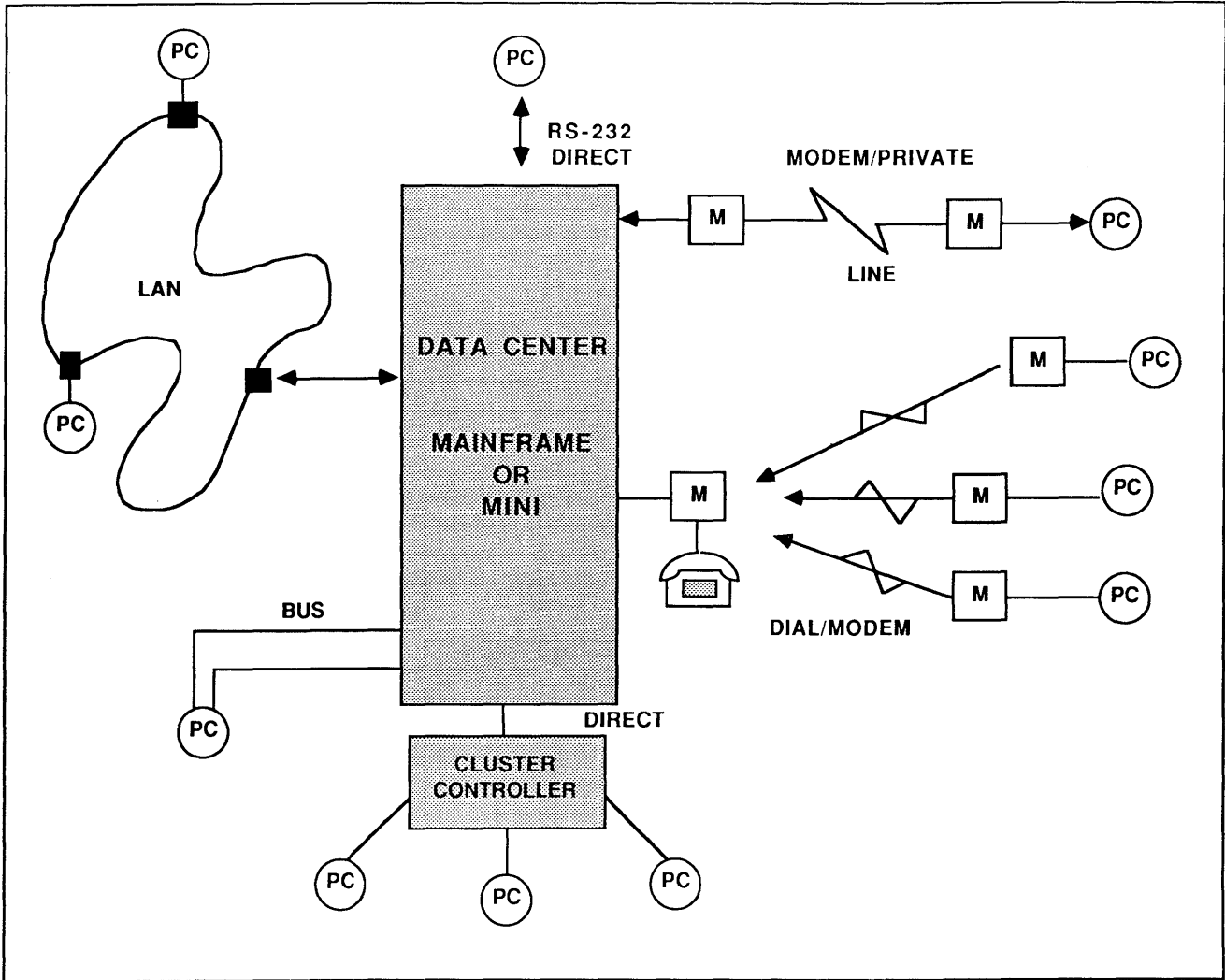
Figure 1. Hardware connection options.

well. This capability is frequently combined with transparent file sharing, with the mainframe acting as a file server for the PCs;

- Communications Extensions—auto dial, auto logon, unattended operations, transparent access to network resources, data compression, multiple sessions, emulation of a variety of terminals on one board, remote operation of other PCs, and remote troubleshooting;

- Ease of Interface—menu-driven interfaces, on-line help, macros, and prompts;

- Electronic Mail; and

- Script Processing and Security Features.

Integrated Processing

PC software was developed for a simple, single-user environment—one easily adapted to integrate with main-

frame software. Some progressive vendors are already producing integrated systems, and others are working to reconcile the two computer environments by modifying existing software. The market trend seems to be clearly taking the direction of the integrated application.

Integrated processing can be seen from two points of view: the recognition and use of the PC's unique characteristics and the integration of PC-link software with host software so that they operate as more of a unit.

Some of the impediments to more integrated processing come from the PC's very nature. PC systems that support a continuously active communications function and "coresident" communications programs may permit the operator to switch keying and display between local programs and emulation of a data center terminal. This allows the operator to interlace local and remote functions, but only by acting as a common element in two dialogs—one with the local application on the PC and the other with the

Integrating PCs in the Mainframe Environment

▷ data center application. Software can be added to the PC to provide these capabilities, but the 640K-byte memory ceiling can present a problem.

In order for the PC's processing and disk storage capabilities to be recognized directly by the mainframe, terminal emulation has to be abandoned because interactive terminals typically have printers but not disks or user-programmable controllers. Instead, the PC has to be addressed as a processor or a node. This is what makes the advent of LU6.2 protocols for Type 2.1 units so exciting to IBM SNA network users, because the Type 2.1 specification is for a programmable terminal that can participate in a peer-to-peer network.

Packages for integrated processing vary according to the degree to which the PC and host software are tied together. In a tightly integrated package, the PC user makes requests without knowing where the data or resources needed to carry them out actually reside. This type of application limits the ability of the PC user to operate with nonintegrated software and prevents the integrated files from being used with any other software package. Loosely integrated applications generally provide only a facility to download data from the host, translate it into a usable format for local processing with many different software packages, and upload it to the host to replace or update the database. Highly integrated packages are easier for users to handle because they present a consistent, request-oriented operating environment; however, such packages are almost always functionally limited. Choosing a level of integration involves measuring the degree to which the package corresponds with the ideal model of user interaction developed in the previous phase. This must then be balanced against any loss of functionality or compatibility with existing software that is associated with the package. Figures 2 and 3 illustrate these differences.

While the processing elements of the applications in the host and in the PC may be generally similar between the two architectures, those of the integrated application must be designed to operate on requests that are generated internally by the software and not through the action of a terminal operator. In other words, they are automatic, not manual. Each element in an integrated application must be modular in structure because it may perform only a small part of a total task that may span several structures.

In general, but not always, the systems with the best chance of having a wide range of compatible integrated applications are those where the PC vendor itself has provided proper technical facilities for mainframe communications. Software vendors, given a consistent and preferred hardware environment, tend to build to it. The IBM PC is a good example; IBM's own host communications support is the preferred attachment method for many of the PC's third-party integrated application software. Vendors also get together and make agreements for complementary packages.

Data validation and control in an integrated environment may be totally within the package's capability, making data handling at the PC as safe as or safer than the same process at a mainframe terminal. The potential for this level of validation exists with integrated packages, but the promise may not be realized in practice. As the level of integration decreases, from the ideal tight coupling shown in Figure 2 to the looser structure shown in Figure 3, so does the capability of the application to manage the data flow and to ensure that proper validation rules are applied at each update.

One area of concern is the ability to perform local data manipulations on data resident in the PC, either as a normal practice for loosely integrated applications or in tightly integrated applications when the communications link is down. This may be a useful feature from the standpoint of immediate production requirements, but its availability opens the door to divergence of the local and central databases. Tightly integrated applications that provide almost transparent host access and full distribution of files and computer resources are likely to be restricted to a single application, but they offer the highest level of control over the information resources of the company. Loose structures may be applied to more PC and mainframe software so the processing flexibility provided is high, but the potential for data corruption through poor control on the PC is significantly greater. Users must evaluate the benefit of wide application flexibility against the potential loss of control.

OPERATIONAL ISSUES IN PC-TO-MAINFRAME LINKS

User Interface

The user interface, which comprises the instructions and procedures that a user is expected to understand in order to use a piece of software, is notorious for its lack of standardization in the PC world. As mentioned before, vendors have at least attempted to make these various interfaces "user friendly," usually by means of menu-driven interactions.

A PC acting as a mainframe terminal, however, is normally governed by logic that emulates the functioning of the terminal's less friendly user interface, as well as its technical characteristics. This may involve more than one set of operating rules that have to be memorized, if there are no menus or props as guides, and each set of rules can differ if more than one application or more than one mainframe is accessed.

DATA INTEGRITY

First-generation PCs are single-user systems and can function quite readily with simple file handling and security procedures. This simplicity is part of the reason for their cost-effectiveness. When two or more users of separate free-standing systems want to work on the same file, or if mul- ▷

Integrating PCs in the Mainframe Environment
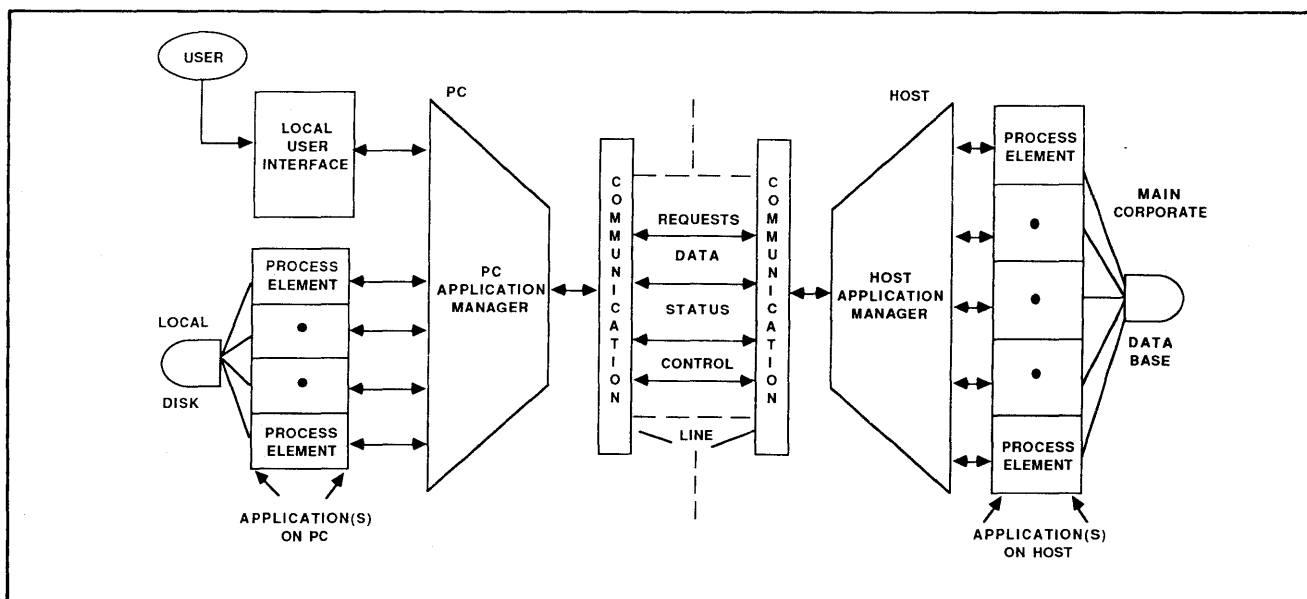
Figure 2. A tightly coupled integrated application.

tiple copies of the same file are to be distributed around a network, there can be significant difficulties in maintaining file integrity.

Local Data Integrity Problems

User departments and workgroups normally lack the DP department's editing and control expertise. Therefore, they may be unaware of the proper procedures to ensure data reliability and consistency. Their primary orientation is toward the end-user task, not toward data processing techniques. It may be perfectly obvious to local department supervisors that an expense report date cannot be in the future, but it may not occur to them to incorporate the necessary coding into the programs to properly handle this data in the file. As a result, reports that display expense data in current-month form may fail to show the item at all, and such an item is very likely to be in the wrong place when it eventually does appear.

Lack of a properly organized central collection point for data that is used by a number of different freestanding systems results in multiple "versions" of information in the PC files of several departments, or even in several systems in the same department. This is no problem with what-if or other isolated applications, but it causes complications if a merged update is needed. For example, this can be disastrous if attempts are made to collect and use the information to update mainframe files at a later date.

PC Links and Mainframe Data Integrity

At first it would seem that linking PCs to the mainframe (or to a departmental system) would solve this problem, since all the PCs would be working on centralized files as if they were the mainframe's own terminals. However, since PCs are distributed systems and are rarely scheduled and con-

trolled in the same way that the mainframe's own terminals are, they do not end up working the same way. In fact, the most significant problems in the use of terminal emulators may be in the area of data control, at least in the beginning.

When a PC is used to capture a segment of a mainframe database and move it to local storage, that data becomes subject to manipulation outside the application framework which was intended to validate it. In many cases, the movement of data to a PC, its editing, and its return to the host will bypass host editing or validation functions. Even if the data is sent to the PC by an application program and returned by that same program, there is a good chance that some of the changes made while the data was "remote" will not be fully edited on its return. The host database is thus gradually polluted with questionable information.

The problem is magnified if several PCs are allowed access to the same information. A major insurance company had an application where file segments were sent to PCs via a batch terminal emulator and processed locally. There was no protection against several PC users concurrently calling for the *same file segment*, and when the data was returned to the file later, each user's version was written over the previous version. Consequently, only the last user's changes to the original file were reflected, and all the other changes were lost.

Data Integrity in Distributed Databases

Ideally, corporations would like PCs and data center equipment to relate to each other in a way that would make the exact location of the data and the processing power being harnessed for any particular user task to be transparent to the user. This implies distributed databases, distribution of function, and cataloging of where everything is. The key element, the catalog, is envisioned as existing on all proces-

Integrating PCs in the Mainframe Environment

▷ sors in the network in some schemes, and only on some processors (departmental systems, mainframes) in other schemes. Either method might be workable on small networks, but current catalog types would grow to an unmanageable size on large networks, resulting in performance problems and enormous overhead.

Data integrity problems can be very complex when databases are distributed around different parts of a network, especially when transactions require that data be transferred among several computers. Integrity is another reason for the slow development of this type of fledgling database. A commonly cited example of a potential data integrity problem is a user with bank accounts in several cities. He/she might want to use a terminal in Philadelphia to transfer funds from a Boston account to a New York account and then authorize multiple payments from the New York account. A data integrity problem would develop if the networked system debited the Boston account but failed to credit the New York account. The situation would then be further complicated by the second level of transactions, which might appear to be against insufficient funds.

Reducing the Risks

There are some steps that can be taken to reduce the risk of corrupting data center files through the use of PCs emulating terminals.

- Limit "out of data center" updates. If PC copies of files are used only for read access, there is no danger of poor edit control producing bad data.

- Require that update applications be reviewed by the data processing organization to certify that the data quality assurance measures taken by the data center system are also applied at the PC.

- Provide a "staging" area where PC files that have been updated are returned for review and validation, prior to being accepted into the main database.

- Initiate a form of access control on data that can be loaded into PCs to prevent multiple users from requesting the same data elements at the same time.

A PC-to-host link complicates mainframe data integrity problems, but it is also a very practical answer to local data integrity and consistency problems and addresses the need for corporate information access, management, and control; the link does not function properly unless such considerations are addressed and resolved.

THE ACQUISITION PROCESS

As stated earlier, some of the major difficulties in implementing a PC-to-mainframe link are that it involves expertise from several areas, overlaps responsibilities from several managers, and implies changes in the corporate

data flow. For these reasons, it is almost mandatory for such a link to be designed by a committee. Despite the wisdom embodied in the adage about a camel being a horse designed by a committee, in this case it is more likely that without a committee the horse will end up with humps on its back and sand up its nose. If a committee is unworkable for any reason, it is still mandatory to somehow get the data center management involved, regardless of how elementary the connection is going to be. They should provide the information on the current data center configuration, hardware, software support, application programs, and data security measures.

It is a good idea to evaluate an application in terms of both terminal emulation and integrated application. One way to do this is to "walk through" the interactions associated with the application to get an idea of what the PC user will experience. Potential users will most likely need the input of the data center professionals to help with the way in which the terminal emulator will interact with the data center equipment. It is beneficial to do three walkthroughs: one for interactive terminal emulation, one for batch terminal emulation, and one for integrated applications. The purpose here is not to try and get too specific to any package, but to see whether the general interaction is acceptable to both the PC users and the data center.

Cost Justifying an Acquisition

It is increasingly apparent that most corporations with reasonably large networks must eventually address the issues of integration and standardization if PCs are to be properly used. The potential offered by widespread data exchange between the small computers and the data center in terms of productivity must be balanced against the possible effects of such an exchange on the quality of the corporate information base (a resource that is increasingly recognized as one of the principal assets of any business).

Cost justification of communicating PCs can be a single-step process, where both the PC and its communications features are being considered as a single package for an application that requires communications. Because of the size of the current installed base, however, it is more common for communications to be added to an existing system as the second step in a two-step procurement process.

Most PCs used in businesses today were originally installed to support applications that had nothing to do with mainframe communications. Today's business environment is increasingly dependent on the productivity of its high-level professional, technical, and managerial personnel. While automation in support of these individuals is not a recent development, the advent of PCs made it possible to provide technical people, middle and upper management, professionals, and other key people with a level of computational power equivalent to an entire data center of 20 years ago, right on their desks. This power, used in support of planning and operational decisions, can reduce costs, increase profits, and free decision makers to concen- ▷

Integrating PCs in the Mainframe Environment

▷ trate on other projects in support of corporate goals. The explosive growth of PC usage by various levels of key corporate personnel can be attributed to these advantages. Even more important in many markets is the greatly improved speed with which data can be amassed and reduced to a usable form.

In some types of applications, studies have shown that there is an inexplicable leap in user productivity when a system can provide subsecond terminal response time. The gains are more than those accounted for by the increase in machine speed and have led to conjectures about the nature of attention, memory, and mental functioning in creative design tasks. Subsecond response time is more commonly obtained from dedicated PCs or from terminals attached to local computers than from terminals attached to mainframes. These increases and decreases in productivity should also be factored into cost comparisons for some applications.

Thus, the justification for obtaining PCs for high-level management is rarely based on simple cost savings at a local site or relevant to a particular application. This is not a serious problem because there are not as many PCs involved with high-level managers as there are with middle management, data entry, programming, and other jobs that require frequent use of the PC.

As PC use travels down the corporate hierarchy, cost justification is more and more important, because the numbers involved are so much greater. Justification for the PC is likely to be expressed in two basic ways. The PC will be automating a particular, relatively controlled set of applications (sometimes called the mainframe's "hidden" backlog) that were previously done manually and were unlikely to ever have been done on the mainframe. Or the PC will automate a needed function that would normally have been done on the mainframe, but is assumed by the PC instead. Usually the former is cost justified in terms of local needs and manual processing costs, while the latter is cost justified in terms of a comparison of equipment processing and operating costs.

Depending on the flexibility of the terminal, the PC configuration being compared, and the manufacturer, PCs based on current microprocessor technologies can be comparable to, or even less expensive than, traditional dumb terminals for data center mainframe applications. This is a constantly shifting relationship due to the effect of price wars in both segments of the marketplace. It is especially true of applications that could be shifted entirely to the PC. When the costs of communicating with and processing on the mainframe are calculated into the price of the dumb terminal, there is no question that the cost of mainframe processing is considerably greater than performing the same task on a PC. The trade-offs are not nearly so clear cut when the terminals are attached to a local departmental mini or supermini, however, because these systems tend to be terminal oriented and cost effective.

Cost justification of communications equipment can bring into play the same range of factors as the justification for the original PCs, but since the local financial outlay for adding communications boards and supporting software is less than the cost of the original system, the hidden financial implications of the addition are more likely to be overlooked. The "Pandora's box" effect of linking PCs and mainframes without sufficient controls has already been intimated by the discussion of data integrity. The cost of those controls is highly dependent on the application. One new user of LANs stated that the first year's increase in local management costs was three times that of the cost of the LAN hardware itself; certainly numbers like these would be likely for new cooperative processing applications where data integrity disciplines need to be established where there were none before.

A few basic questions will highlight some of the cost issues. First, what are the costs for the mainframe, how will they be levied, and how are they offset? Second, what are the hidden costs in types of information management needs that were not previously needed at the remote site? Third, what are the hidden costs in management at the mainframe site?

LIMITATIONS OF JUSTIFICATION BY COST ALONE

The clarity of locally defined price/performance benefits over previously existing solutions and the "free" power increase can be a deceptive cloud covering the more slippery issues of great importance to the competitive/financial performance of the company as a whole. One price for the productivity gains of PCs is often paid in the area of information resource management. A corporation's operating information base is itself a significant asset, and management information systems rely on proper maintenance of the basic operating data to provide summaries of current activities and to project future trends. Freestanding PCs can "shortstop" vital information before it reaches the data center, making it unavailable to corporate MIS, upper management, or other areas of the organization that need it to operate more competitively.

On the other hand, local managers frequently find that localizing computer power provides them with greater potential to make their own operations more efficient, because there is less need to conform to standards that reflect irrelevant applications. Furthermore, they have more power over what is processed and the time frame in which it is processed; they can thus fine-tune their own operations better and avoid irritating delays that they were previously powerless to resolve.

Here the question of the relationship of the parts to the whole becomes tricky. A department may maintain its own budget more efficiently on a local PC, but is that gain in efficiency worth the loss of the information to the business as a whole? A PC that is linked to a mainframe so that key operations are performed cooperatively usually implies mainframe access to the PC data, at least to some extent. This is a key argument that should not be lost when consid- ▷

Integrating PCs in the Mainframe Environment
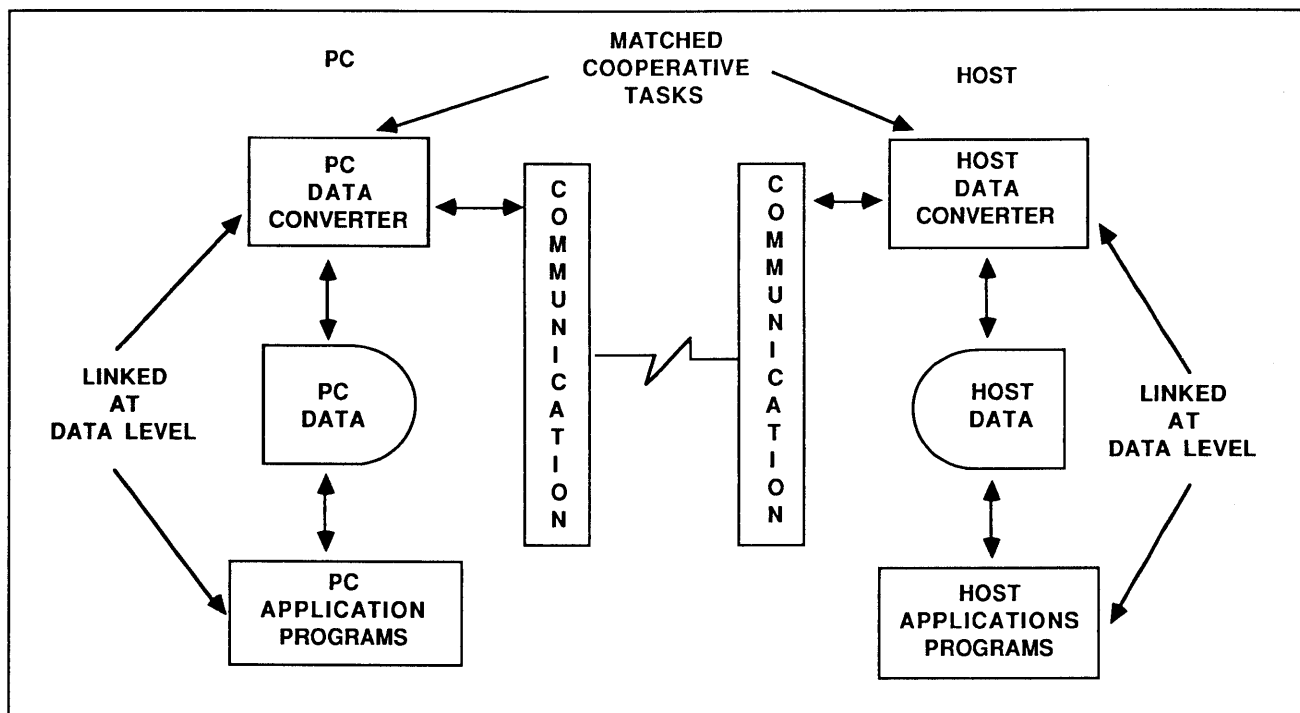
Figure 3. A loosely coupled integrated application.

ering price and the probable negative impact of improperly controlled PCs on mainframe data integrity.

A CHECKLIST OF CONCERNS

As management meets to plan for new PC-to-mainframe links, it is helpful to compile a checklist of questions from several different points of view to make sure that nothing important has been overlooked. The following issues provide a springboard for expanded checklists, which should be tailored to the company's individual situation.

Basic Choices

A user faced with linking PCs to the data center is confronted by choices in several areas:

- Operating strategy. The PC can emulate a terminal to an existing application on the mainframe, with or without support for direct transfer of files. It can also link with the mainframe in a joint application supported by custom software in both places.

- Mode of attachment. The PC can connect directly via data cables (usually an RS-232-C interface), through a modem, via coaxial cable to a cluster controller, over a local area network, directly to the computer bus, or in other mutually supportable ways.

- Product source. The equipment and software needed can be acquired from a single source or multiple sources, and

those sources can be computer vendors, modem vendors, third-party hardware or software suppliers, or system integrators.

- Information management and control. Figure 4 shows some of the forms of PC data interaction that can take place and the impact on data center files.

Terminal Emulation

Questions important to consider when selecting any terminal emulator are as follows:

- Does the product emulate a terminal type and protocol that are already supported at the data center or that can be supported easily?

- Will the method of attaching the product to the data center equipment be satisfactory, given the location of the systems and the types of wiring, etc. which are available?

- Is the product compatible with any special hardware or software that is already in use on the system?

- Is the product's mode of operation suitable for the current PC operator's level and for the type of work which it is expected to do?

- Are the operating procedures so different from those associated with the PC's local operation that they will be difficult to complete properly?

Integrating PCs in the Mainframe Environment

Network Software Associates' AdaptSNA Gateway, a purely software product, is designed for IBM Token-Ring LANs. The gateway enables LAN-attached PCs and PS/2s to communicate using SNA protocols.

▷ • Can the combined environment created by the product between the PC and the host be controlled from the viewpoint of access security, data integrity, and information resource management?

• How much memory does the communications board require? The more complex the operation, the greater the amount of memory needed. On first-generation IBM PCs, with their 640K-byte memory ceiling, packages requiring 150K bytes are more likely to prevent a large application from running than one requiring 80K bytes. This problem will be resolved with OS/2 and the new PS/2 systems, but we are talking here about millions of existing PCs.

Integrated Applications

Evaluating an integrated application can be approached in phases.

• During the first phase, the user identifies "target applications" for such systems and indicates the host and PC software (if any) which are already in place in the application areas.

• The second phase requires the construction of an "ideal access" scenario, where the system's operation is described as the user would like to see it work. These phases provide the user with an idea of the current environment for the task, the investment in it, and the way in which the task should operate (economic constraints aside).

• The third phase of evaluation is the actual investigation of integrated application alternatives. These alternatives

may be identified based on competitive survey publications, advertising, or contact with software vendors.

Technical communications support selection with integrated application software is usually a matter of following the supplier's requirements. Most of these packages will *not* support wide varieties of communications protocols, modems, or custom interface boards, so selection of hardware in advance of selecting the integrated package could create a problem. There is also a danger that two separate integrated applications may require different hardware support. Users would be advised to prioritize their needs for such software and watch for incompatibilities in supporting hardware.

If Several Products Fill the Bill

If several products are generally available that meet the needs of the targeted applications, the following guidelines may help narrow the choice:

• Select products that pack several facilities onto one board, to conserve slot space inside the system unit and avoid the need to add an external box for more slots later. Some vendors supply both asynchronous and synchronous communications on the same board, for example.

• Select products that enhance the capabilities of the device emulated without requiring host support for those enhancements. Integral printing support for terminals that cannot normally drive a satellite printer is one example.

• Select communications products with an interface to an external modem over one with similar features but using an integral modem. Modem technology is changing very rapidly. Furthermore, the modularity gained allows both the PC and the modem to be swapped around as workgroup needs change.

• Always remember that your PC users will want to grow in unexpected directions and are not likely to remain at the level of the target applications. If the PC vendor supplies a package that meets your needs and your price requirements, give it preference over comparable products from third parties. The chances of the vendor's own product tracking future changes in the PC line are better than those of a third-party product.

• Avoid products that rely on the combination of third-party software from one vendor and hardware from another third-party vendor. How many support people do you really want to talk to?

• If a product contains an interface board that plugs into the PC directly, buy from a company that supplies many types of such boards over one that supplies only the board used in the product. Broad familiarity with the PC's bus architecture will translate into fewer compatibility problems with other board-level products. ▷

Integrating PCs in the Mainframe Environment

▷ • Check warranties. There can be some surprising differences.

Security, Data Integrity, and Management

Provision of a PC-to-mainframe connection affects security in a number of ways. Most host access techniques use terminal emulation, and this allows the user to take advantage of such standard host security as password protection and usage logs. Any security provisions that are used with terminal access may be used with microcomputer access, provided that only terminal emulation is permitted. Packages that allow unhindered uploading from the microcomputer to any host files will, of course, create genuine hazards, but this is a terminal control problem. The real threats lie in the dramatic proliferation of microcomputers. Terminal proliferation becomes a security problem in situations where limiting physical access to terminals has played a part in the security system. This situation is not too common, but it does happen. The cure is to provide adequate security through logons and passwords, thus placing security at the individual level rather than at the terminal.

Local PC storage presents a more serious problem. Highly confidential material, such as salary information, new product descriptions, and customer files, may be downloaded by authorized personnel. This information can later be tapped by unauthorized users if it is stored on disk. Disks may be stolen or copied, or the user may fail to end the local application, leaving part of the file resident in RAM. The only solution to this problem is adequate physical security for the PC or microcomputer, with a provision for secure storage of disks. Because this form of security is not at the host level and is not easily implemented in software, many organizations overlooked this area. With the PC-to-mainframe connection, the risk of PC vulnerability is magnified.

The use of PCs, and their growing familiarity within organizations, also poses a problem that is independent of the PC-to-host connection. Increased computer literacy leads, inevitably, to increased vulnerability of data processing centers. As more people know more about how to enter a system, the potential for abuse increases. Connections established through telecommunications must be carefully guarded, and any nonterminal connection should be examined to ensure that adequate security measures are afforded.

For evaluating the data integrity, security, and information resource management implications of the PC link, the following questions may prove helpful:

• Are requests for data made from the PC subject to satisfactory levels of access control, such as password control? PC access controls should be at least as strong as those controlling terminal access.

• Can similar control be provided at the PC for operator access to data once the data is downloaded? It is pointless to protect data in the data center and leave it available to all once it is loaded onto a PC.

• Is it possible for several copies of the data to be outstanding in different PCs at the same time? Can this be controlled in any way at the host end? Multiple copies of the same file are invitations to information corruption. If you cannot prevent a file from being accessed by several users at once, it may be better to require that the file remain in the data center and be accessed only for use and not for storage at the PC.

• Can the return of data to the mainframe result in the loss of any update controls? This may arise from a lack of control over the update process or from the inability to provide all the transaction editing at the PC due to lack of other key data files. In any case, a relaxation of the validation rules may result in a lowering of data quality standards, and this should be specifically understood and approved by management.

• How long will information be "out of file"—resident in a newer version on the PC—than in the main database? Long intervals when the data center does not have current data are highly undesirable, so if data is to be held on the PC for more than a day or so, the application should be reviewed. The data center should check the possible impact of "out-of-file" data on key reports that are run periodically for corporate management or external distribution; conflicts may indicate that PC production schedules will need adjustment for the period near the report cycle.

• How is the impact of new PC users on the mainframe to be controlled and budgeted? If, as PC users are added, overall system response time suddenly goes down, how can the data center locate problem areas? How are problems to be controlled? Is time on the mainframe charged to the local department?

• Who is responsible for what and to whom? If PC access to mainframe files does result in problems with data integrity, security, mainframe performance, etc., who is the person at the remote site responsible for remedying them? Does the reporting structure make it likely that he or she will favor local interests over central mainframe interests? Does that person have enough time to study problems and come up with solutions and enough power to enforce those solutions, which could involve restrictions on local users in middle and upper management?

COMPARISON COLUMNS

The comparison columns that follow the vendor list summarize the characteristics of 301 commercially available PC-to-host products from 94 vendors. The products all al-

Integrating PCs in the Mainframe Environment
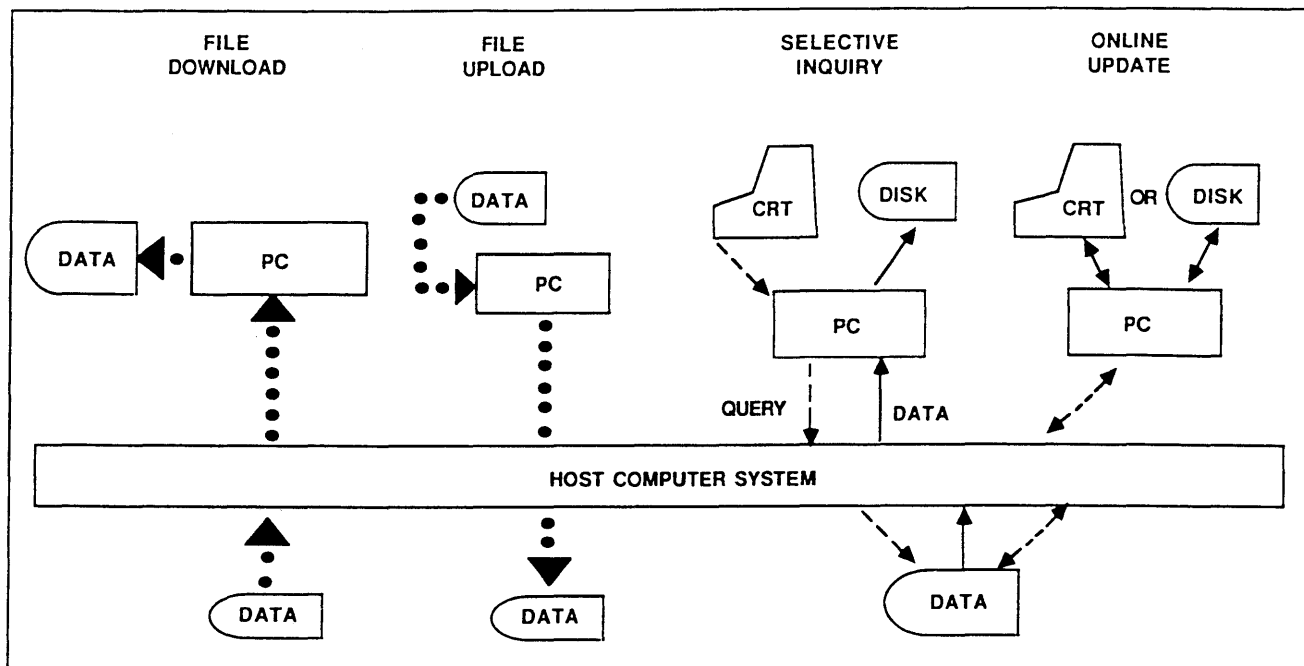
Figure 4. File interactions with remote PCs.

low PCs to communicate with a host mainframe or mini-computer. The information contained in these columns was supplied by the vendors.

Datapro sent requests for information to about 150 North American vendors known or believed to be in the PC-to-host link business. *The absence of any vendor from this report means that the company failed to respond to repeated requests for product information or has discontinued marketing PC-to-host links.*

There are many types of products currently marketed as PC-to-host links. Datapro has tried to be as flexible as possible when including products in the comparison column section of this report. Some products do not correspond well to the specifications listed in the columns, however. We (and the respective vendors) have tried to fit these products into the Datapro comparison column format so as to provide the reader with the most useful information possible. For additional product information or to clarify an entry in a column, we urge the reader to contact the appropriate vendor.

The column entries and their definitions are explained in the following paragraphs.

PRODUCT FUNCTION

This entry lists the product's function. Many products perform several of the functions listed. Choices include local terminal emulation, remote terminal emulation, network gateway, standalone protocol converter, host-application-specific link, and non-host-application-specific link. Some vendors wrote in the product function if the entries listed did not properly categorize what the product does.

USERS SUPPORTED

PC-to-host products will support single users or multiple users. If multiple users are supported, vendors were given the opportunity to write in the number supported.

COMPONENTS

PC-to-host products can contain different components, including PC software, PC hardware, standalone hardware, host software, and host hardware. The components for each product are listed.

COPY PROTECTED

Vendors indicated whether their software is copy protected.

MICROCOMPUTERS SUPPORTED

This entry indicates the microcomputer systems with which the product is compatible, including IBM PC/XT/AT, IBM PS/2 Micro Channel Architecture (MCA), IBM PS/2 Non-Micro Channel Architecture (Non-MCA), and Apple Macintosh. Vendors have also indicated any additional PCs that their products support.

MICROCOMPUTER OPERATING SYSTEMS SUPPORTED

This section lists the PC operating environments that the product supports, including Apple ProDOS, Apple Macin-

Integrating PCs in the Mainframe Environment

tosh Finder, CP/M-80/86, OS/2, MS-/PC-DOS, UNIX, and Xenix. Vendors have also written in additional operating systems supported.

LOCAL AREA NETWORK SUPPORT

For this entry, vendors indicated which LANs their products support. Choices we included are ARCNet, Ethernet, Token-Ring, AppleTalk, and Starlan. Many vendors also wrote in that their products are compatible with NETBIOS LANs. No answer is indicated by "Vendor did not specify."

MINIMUM MEMORY REQUIRED

Vendors were asked to indicate, in kilobytes, the minimum RAM memory required for the proper function of their products. Some vendors also wrote in the recommended memory.

HOST INTERFACE

Systems Supported. Most of the products included in the columns are for use with IBM mainframes, e.g., the 43XX or 30XX Series. In addition, some products are designed to operate with IBM System/36/38, IBM AS/400, Data General Systems, Digital VAX or DECsystems, Honeywell Bull Systems, Hewlett-Packard (HP) Systems, Unisys, or Systems based on UNIX. Vendors have also listed other host systems with which their products can run.

Software Environment. Vendors indicated the host operating system environment that supports the PC-to-host link listed. Possible choices are IBM DOS, OS/VS, MS, VM, TSO, CMS, IMS, CICS, SSP, OS/400; Digital VAX/VMS; Data General (DG) AOS; Honeywell Bull GCOS; UNIX System V; and Berkeley 4.X BSD. Vendors have also listed other host operating systems supported.

Protocols. The communications protocols used to control the link are listed. Protocols include BSC (bisync), SNA, HDLC, SDLC, HASP, and TCP/IP. Vendors have also indicated if any other protocols apply.

Applications Supported. This section lists the host applications that the PC link is designed to support, for example, virtual drives on the host and access to host-resident applications.

EMULATION

Terminals/Controllers Emulated. This section lists the types of terminals the product emulates, including TTY; IBM 327X/317X DFT, 327X/317X CUT, and 5250 and 2780/3780 Series; Data General; Hewlett-Packard; Digital VT52/100 and VT200 and VT300 Series; and Unisys.

Terminal Functions Supported. Vendors checked off which of the following terminal function features their products

support: color display, graphics display, function keys, character attributes, windowing, user-defined keyboard mapping, host printer emulation, and print to disk.

Number of Concurrent Sessions. This category details the number of concurrent sessions that the product supports.

DOS Access During Session. This section indicates if the product supports DOS access during a host session.

File Transfer. The vendor indicated if the product is capable of transferring files.

File Formats. This section indicates which file formats are supported: ASCII and/or binary.

File Conversion. This entry indicates if the product supports file conversion.

COMMUNICATIONS CHARACTERISTICS

Physical Connection. The type of connection supported by the product—coaxial cable, twinaxial cable, RS-232-C cable, etc.—is listed.

Transmission Mode. This category refers to the type of synchronization of data transfer employed between the sending and receiving device. Normally, data is sent in a serial-bit, *asynchronous* mode or *synchronous* mode.

Transmission Speed. This entry lists, in bits per second, the rates of data transmission that the package supports.

Communications Features. Communications between the PC and host are made easier with features like dialing directories and support for auto dial/redial, auto answer, macros, and unattended execution. Vendors indicated which of these features their products support and have also written in additional features.

USER INTERFACE

Users often call a program "easy to use" or "difficult to work with" based on the type of user interface. Vendors have indicated which of the following features are supported to make the user interface friendlier: install program, on-line Help facility, mouse support, command driven, on-line tutorial, graphics icons, menu driven, pop-up windows, and diagnostics.

PROGRAMMING FEATURES

Programmability. Vendors indicated whether their products support script languages and unattended operation, which is commonly referred to as the programmability of a package.

API Compatibility. The Applications Program Interface (API) allows PC programs to access the functions of the ▷

Integrating PCs in the Mainframe Environment

▷ terminal emulation card without interrupting the application. This entry lists the APIs with which the product is compatible, including IBM API, DCA IRMA API, IBM LU6.2 API, and proprietary APIs.

MICROCOMPUTER SECURITY

Security is a critical issue when a PC user is permitted to access a corporate database. The entry and organization of data in any system involves a tremendous effort, but this effort can be exerted in vain if there is not an appreciable level of data security. For this reason, it is desirable for a program to control access through a variety of schemes, including the use of single or multilevel passwords, interface to host control software, file encryption, and transmission encryption. Vendors also indicated what other security measures their product supports.

PRICING/AVAILABILITY

Microcomputer Software/Hardware. Shown here, in dollars, is the list price for products dealing with the PC side. If the product comprises both PC software and hardware, which can be purchased separately, we have indicated the price for each with (s) or (h) after the product. If the product is sold with the PC software and hardware bundled, we have indicated that price. Some products consist only of PC software or only of PC hardware. In that case, a single price is listed; readers should refer to the **Components** category to see what component the pricing is for.

Standalone Hardware. Shown, in dollars, is the list price of the standalone hardware.

Host Software/Hardware. Shown, in dollars, is the list price for products meant for the host side. If the product comprises both software and hardware, which can be purchased separately, we have indicated the price for each with (s) or (h) after the product. If the product is sold with the host software and hardware bundled, we have indicated that price. Some products consist only of host software or only of host hardware. In that case, a single price is listed; readers should refer to the **Components** category to see what component the pricing is for.

Date of First Delivery. This entry lists the date on which the vendor first commercially delivered the product.

Number Installed to Date. Many vendors regard installed-base information as proprietary. This entry lists, where available, the number of products currently installed. If the vendor did not answer, we have written, "Vendor did not specify."

Warranty. Today, users are not only interested in functionality and pricing, but also in the servicing of the products. This entry lists the length of time the product is warranted.

Distribution. This section describes the method of distribution that the vendor uses, including direct, through distributors/dealers/retail chains, mail order, OEMs, and VARs.

COMMENTS

This entry includes space for any features, functions, or products not covered by the entries above. □

PC-to-Mainframe Link Product Vendors

For your convenience in obtaining additional information, following is a complete list of names, addresses, and telephone numbers of the vendors whose products are listed in the comparison columns that follow.

Andrew Corp. (Local Data, Inc.)
2771 Plaza Del Amo
Torrance, CA 90503 (213) 320-7126

ANNATEK Systems, Inc.
4760 Walnut Street, Suite 105
Boulder, CO 80301 (303) 444-6675

Answer Systems, Inc., Div. of Sterling Software
21050 Vanowen Street
Canoga Park, CA 91304 (818) 716-1616

Applied Information Systems, Inc.
500 Eastowne Drive
Chapel Hill, NC 27514 (919) 942-7801

Aspen Research, Inc.
475 Roblar Avenue
Hillsborough, CA 94010 (415) 340-1588

AST Research, Inc.
2121 Alton Avenue
Irvine, CA 92714 (714) 863-1333

Attachmate Corp.
13231 SE 36th Street
Bellevue, WA 98006 (206) 644-4010

Avatar Corp.
65 South Street
Hopkinton, MA 01748 (508) 435-6872

Barr Systems, Inc.
2830 NW 41st Street
Gainesville, FL 32606 (904) 371-3050

Cambridge Computer Corp.
80 Mt. Sanford Road
Mt. Carmel, CT 06518 (203) 288-6004

Carleton Corp.
8 New England Executive Park
Burlington, MA 01803 (617) 272-4310

CQ Computer Communications, Inc.
4695 N. Monroe Street
Tallahassee, FL 32303 (904) 562-4255

cfSoftware, Inc.
2454 E. Dempster, #201
Des Plaines, IL 60016 (312) 824-7180

Cincom Systems, Inc.
2300 Montana Avenue
Cincinnati, OH 45211 (513) 662-2300

Computer Associates International, Inc.
Route 206 and Orchard Road
Princeton, NJ 08648 (201) 874-9000

Control Data Business Management Services
500 W. Putnam Avenue
Greenwich, CT 06830 (203) 622-2227

Core Technology Corp.
7335 Westshire Drive
Lansing, MI 48917 (517) 627-1521

Data Interface Systems Corp.
P.O. Box 4189
Austin, TX 78765 (512) 346-5641

Data Race, Inc.
12758 Cimarron Path
San Antonio, TX 78249 (512) 692-3909

Datability Software Systems, Inc.
322 Eighth Avenue
New York, NY 10001 (212) 807-7800

DataEase International, Inc.
7 Cambridge Drive
Trumbull, CT 06611 (203) 374-8000

Datalex, Inc.
100 Pine Street, Suite 2400
San Francisco, CA 94111 (415) 362-4466

Digital Communications Associates, Inc. (DCA)
1000 Alderman Drive
Alpharetta, GA 30201 (404) 442-4000

Direct Aid, Inc.
31332 Via Colinas #102
Westlake Village, CA 91362 (818) 889-1013

Diversified Computer Systems, Inc.
3775 Iris Avenue, Suite 1B
Boulder, CO 80301 (303) 447-9251

DTSS, Inc.
Buck Road, P.O. Box 70
Hanover, NH 03755 (603) 643-6600

Eastham and Associates, Inc.
6198 W. Butler Pike, Suite 140
Blue Bell, PA 19422 (215) 641-2655

Eicon Technology
2196 32nd Avenue
Lachine, PQ, Canada H8T 3H7 (514) 631-2592

Emerald Technology, Inc.
18912 N. Creek Parkway
Bothell, WA 98011 (206) 485-8200

Emulex Corp.
3545 Harbor Boulevard
Costa Mesa, CA 92626 (714) 662-5600

ESI
3200 Commonwealth Boulevard
Tallahassee, FL 32303 (904) 575-0179

FTG Data Systems
10801 Dale Street, Suite J-2
Stanton, CA 90680 (714) 995-3900

PC-to-Mainframe Link Product Vendors

▷ **Gateway Communications, Inc.**
2941 Alton Avenue
Irvine, CA 92714 (714) 553-1555

General Micro Systems
P.O. Box 5330
Hopkins, MN 55343 (612) 937-1442

Hawkeye Grafix, Inc.
P.O. Box 1400
Oldsmar, FL 34677 (813) 855-5846

ICOT Network Systems Div.
One Apple Hill
Natick, MA 01760 (800) SNA-3270

Information Builders, Inc.
1250 Broadway
New York, NY 10001 (212) 736-4433

Innovative Electronics, Inc.
10110 USA Today Way
Miramar, FL 33025 (305) 432-0300

Intelligent Technologies
240 Lincoln Centre Drive
Foster City, CA 94022 (415) 345-6666

Intercomputer Communications Corp. (ICC)
8230 Montgomery Road
Cincinatti, OH 45244 (513) 745-0500

International Business Machines Corp. (IBM)
Old Orchard Road
Armonk, NY 10504
Contact your local IBM representative.

JDS MicroProcessing
22661 Lambert Street, Suite 206
El Toro, CA 92630 (714) 770-2263

KEA Systems Ltd.
2150 W. Broadway, Suite 412
Vancouver, BC, Canada V6K 4L9 (800) 663-8702

KMW Systems Corp.
6034 W. Courtyard Drive
Austin, TX 78730 (512) 338-3000

Laguna Laboratories, Inc.
17192 Gillette Avenue
Irvine, CA 92714 (714) 724-0500

Mackensen Corp.
3000 Ocean Park Boulevard
Santa Monica, CA 90405 (213) 452-5520

Management Science America, Inc.
3445 Peachtree Road, NE
Atlanta, GA 30326 (404) 239-2000

McCormack & Dodge
1225 Worcester Road
Natick, MA 01760 (508) 655-8200

McDonnell Douglas ISC
2560 N. First Street
San Jose, CA 95161 (800) 872-7654

Micom Communications Corp.
4100 Los Angeles Avenue
Simi Valley, CA 93063 (805) 583-8600

Micro DecisionWare, Inc.
2995 Wilderness Place
Boulder, CO 80301 (303) 443-2706

Micro Innovative Technology, Inc.
840 Greenbrier Circle, Suite 204
Chesapeake, VA 23320 (804) 424-9677

Micro Tempus Inc.
440 Dorchester Boulevard West, #300
Montreal, PQ, Canada H2Z 1V7 (514) 397-9512

MicroGate Corp.
9501 Capital of Texas Highway
Austin, TX 78759 (512) 345-7791

MicroPlot
1897 Red Fern Drive
Columbus, OH 43229 (614) 882-4786

Modems Plus, Inc.
3180 A Presidential Drive
Atlanta, GA 30340 (404) 458-2232

Multi-Tech Systems
82 Second Avenue SE
New Brighton, MN 55112 (612) 631-3550

Multi Soft, Inc.
123 Franklin Corner Road
Lawrenceville, NJ 08648 (609) 896-4100

Network Research Corp.
2380 N. Rose Avenue
Oxnard, CA 93030 (805) 485-2700

Network Software Associates, Inc. (NSA)
22982 Mill Creek
Laguna Hills, CA 92653 (714) 768-4013

Novell, Inc., Communications Products Div.
890 Ross Drive
Sunnyvale, CA 94089 (408) 747-4000

OBS Software
115 Sansome Street
San Francisco, CA 94104 (415) 391-9555

On-Line Software International, Inc.
Two Executive Drive
Fort Lee, NJ 07024 (201) 592-0009

Pacer Software, Inc.
7911 Herschel Avenue, Suite 402
La Jolla, CA 92037 (619) 544-0565

Packaged Solutions, Inc.
One Huntington Quadrangle, Suite 2C14
Melville, NY 11747 (516) 752-1640

Packet/PC Inc.
270 Farmington Avenue
Farmington, CT 06032 (203) 678-1961

Pansophic Systems, Inc.
2400 Cabot Drive
Lisle, IL 60532 (312) 505-6000   ▷

PC-to-Mainframe Link Product Vendors

Performance Software, Inc.
575 S. Lake Boulevard
Richmond, VA 23236 (804) 794-1012

Persoft, Inc.
465 Science Drive
Madison, WI 53711 (608) 273-6000

POINT 4 Data Corp.
15442 Del Amo
Tustin, CA 92680 (714) 259-0777

Quadram, Corp.
One Quad Way
Norcross, GA 30093 (404) 923-6666

Rabbit Software Corp.
7 Great Valley Parkway
Malvern, PA 19355 (215) 647-0440

Relay Communications Inc.
41 Kenosia Avenue
Danbury, CT 06810 (203) 798-3800

The Santa Cruz Operation, Inc.
400 Encinal Street
Santa Cruz, CA 95061 (408) 425-7222

Scientific & Business Systems, Inc.
Two Park Avenue
New York, NY 10016 (212) 481-1310

Simware Inc.
20 Colonnade Road
Ottawa, ON, Canada K2E 7M6 (613) 727-1779

Softel Inc.
Shedd Hill Road
Stoddard, NH 03464

Software Clearing House, Inc.
895 Central Avenue
Cincinatti, OH 45202 (513) 579-0455

Software Corp. of America
800 Summer Street
Stamford, CT 06901 (203) 359-2773

Software Synergy, Inc.
230 Park Avenue, Suite 539
New York, NY 10169 (212) 697-0360

Sterling Software, Systems Software Div.
11050 White Rock Road #100
Rancho Cordova, CA 95670 (916) 635-5535

Structured Software Solutions Inc.
4031 W. Plano Parkway, Suite 205
Plano, TX 75093 (214) 985-9901

Synex Systems Corp.
800-1176 W. Georgia Street
Vancouver, BC, Canada V6E 4A2 (604) 688-8271

Tangram Systems Corp.
188 MacKenan Drive
Cary, NC 27511 (919) 481-4444

TDT Group Inc.
#902, 444 Brickell Avenue
Miami, FL 33131 (305) 372-9332

Techland BlueLynx
112 Main Street
Newmarket, NH 03857 (603) 659-6035

Teknigraphics, Inc.
4635 SW Freeway, #510
Houston, TX 77027 (713) 623-0089

Universal Data Systems
5000 Bradford Drive
Huntsville, AL 35805 (205) 721-8000

URGEO Software, Inc.
P.O. Box 305
Cheney, WA 99004 (509) 838-6058

Walker Richer & Quinn, Inc.
2825 Eastlake Avenue East
Seattle, WA 98102 (206) 324-0350

Wall Data Inc.
17769 NE 78th Place
Redmond, WA 98052 (206) 883-4777

Waterloo Microsystems, Inc.
3597 Parkway Lane, Suite 300
Norcross, GA 30092 (404) 441-9252

White Crane Systems, Inc.
6889 Peachtree Industrial Boulevard, Suite 151
Norcross, GA 30092 (404) 394-3119

Winterhalter, Inc.
3796 Plaza Drive
Ann Arbor, MI 48108 (800) 666-3270 □

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Andrew Corp. (Local Data)	Andrew Corp. (Local Data)	Andrew Corp. (Local Data)	ANNATEK Systems
PRODUCT NAME	FileLynx/5251	TruLynx/3270	TruLynx/5251	Network Navigator Autopilot
PRODUCT FUNCTION	Loc/rem terminal emulation	Loc/rem terminal emulation	Loc/rem terminal emulation	Vendor did not specify
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software	PC software	PC software	PC software
COPY PROTECTED	No	No	No	Yes
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	Vendor did not specify	Token-Ring, STARLAN, Novell, 3Com
MINIMUM MEMORY REQUIRED (KB)	64	256	256	200
HOST INTERFACE Systems Supported	IBM System/36/38	IBM 43XX/30XX	IBM System/36/38	Vendor did not specify
Software Environment	IBM SSP	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM SSP	Vendor did not specify
Protocols	Vendor did not specify	BSC, SNA, SDLC	Vendor did not specify	Vendor did not specify
Applications Supported	Vendor did not specify	Access to host-resident programs, IND$FILE	Host virtual disk, access to host-resident programs, virtual print	Vendor did not specify
EMULATION Terminals/Controllers Emulated	IBM 5250 Series	IBM 327X/317X CUT	IBM 5250 Series	TTY, IBM 327X/317X CUT and 3101, TV I925, DEC VT52/100
Terminal Functions Supported	Color display, function keys, host printer emulation, print to disk	Color display, function keys, user-def. keyboard mapping, host printer emulation	Color display, function keys, user-def. keyboard mapping, host printer emulation	Color display
Number of Concurrent Sessions	Vendor did not specify	2	2	Vendor did not specify
DOS Access During Session	No	Yes	Yes	No
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII	ASCII, binary	ASCII, binary	Vendor did not specify
File Conversion	No	Yes	Vendor did not specify	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	Coax
Transmission Mode	Asynchronous	Asynchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	300, 1200, 2400, 4800, 9600	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 1200, 2400, 4800, 9600, 19.2K, 38.4K	300, 1200, 2400, 4800, 9600, 19.2K
Communications Features	Vendor did not specify	Dialing directory, auto dial/redial, auto answer	Dialing directory, auto dial/redial, auto answer, unattended execution	Unattended execution
USER INTERFACE	Command driven, menu driven	Command driven, menu driven	Install, command driven, menu driven	Install program, diagnostics
PROGRAMMING FEATURES Programmability	No	Yes	Yes	Yes
API Compatibility	Vendor did not specify	IBM API, proprietary	Proprietary	IBM API, DCA IRMA API, proprietary
MICROCOMPUTER SECURITY	Vendor did not specify	Vendor did not specify	Vendor did not specify	Single level password, interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	150	195	150	95
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	90 days	90 days	90 days	Vendor did not specify
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Vendor did not specify
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	ANNATEK Systems	ANNATEK Systems	ANNATEK Systems	Answer Systems, Inc.
PRODUCT NAME	Network Navigator CoPilot	Network Navigator Developer	Network Navigator Transfer	Micro Answer II
PRODUCT FUNCTION	Remote terminal emulation	Loc/rem terminal emulation	Loc/rem terminal emulation	Non-host app. spfc. link
USERS SUPPORTED	Single user	Single user	Single user, multiuser	Single user
COMPONENTS	PC software	PC software, host software	PC software, host software	PC software, host software
COPY PROTECTED	Yes	Yes	Yes	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Token-Ring, STARLAN, Novell, 3Com	Token-Ring, STARLAN, Novell, 3Com	IBM Token-Ring
MINIMUM MEMORY REQUIRED (KB)	190	200	200	384
HOST INTERFACE Systems Supported	Vendor did not specify	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	Vendor did not specify	IBM OS/VS, MVS, VM, TSO, VTAM	IBM OS/VS, MVS, VM, TSO, CMS, VTAM	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	Vendor did not specify	BSC, SNA, SDLC	BSC, SNA, SDLC	BSC, SNA, SDLC
Applications Supported	Vendor did not specify	Vendor did not specify	Vendor did not specify	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	TTY, IBM 327X/317X CUT and 3101, DEC VT52/100, TV I925	TTY, IBM 327X/317X DFT, 327X/317X CUT, and 3101, DEC VT52/100, TV I925	TTY, IBM 327X/317X DFT, 327X/317X CUT, and 3101, DEC VT52/100, TVI925	IBM 327X/317X DFT, 327X/317X CUT
Terminal Functions Supported	Color display, function keys, character attributes, user-def. keyboard mapping, print to disk	Color display, graphics display, function keys, char. attributes, user-defined keybrd. mapping, host printer emulation, print to disk	Color display, graphics display, function keys, char. attributes, user-def. keyboard mapping, host printer emul., print to disk	Not applicable
Number of Concurrent Sessions	Vendor did not specify	Vendor did not specify	Up to 4	Vendor did not specify
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII
File Conversion	Vendor did not specify	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax, RS-232-C, via async PC-to-PC connections	Coax, RS-232-C	Coax, RS-232-C	Coax, RS-232-C
Transmission Mode Transmission Speed (bps)	Asynchronous 300, 600, 1200, 2400, 4800, 9600, 19.2K	Asynchronous 300, 1200, 2400, 4800, 9600, 19.2K	Asynchronous, synchronous 300, 1200, 2400, 4800, 9600, 19.2K	Synchronous 2400 to 19.2k
Communications Features	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, unattended execution	Auto dial/redial, auto answer, unattend. execution, auto logon/off via script	Macros, unattend. exec.
USER INTERFACE	Install, on-line help, command driven, menu driven, diagnostics	Install, on-line help, command driven, on-line tutorial, menu driven, windows, diagnostics	Install, on-line help, command driven, on-line tutotial, menu driven, diagnostics	Install, on-line help, menu driven, diag.
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	No
API Compatibility	Vendor did not specify	IBM API, DCA IRMA API, proprietary	IBM API, DCA IRMA API, proprietary	IBM API, DCA IRMA API, ITT, Attachmate
MICROCOMPUTER SECURITY	Single level password	Single lev. password, interface to host software	Single level password, interface to host software	Multilev. password, interf. to host soft.
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	95	Contact vendor	195 per PC	385 to 550
Standalone Hardware ($) Host Software/Hardware ($)	Not applicable Not applicable	Not applicable Contact vendor	Not applicable 30,000	Not applicable 13,500 to 37,500
Date of First Delivery Number Installed to Date Warranty Distribution	Vendor did not specify Vendor did not specify 90 days Vendor did not specify	Vendor did not specify Vendor did not specify 90 days Direct	Vendor did not specify Vendor did not specify 90 days Direct	January 1986 362 sites 1 year Direct, dist., dlrs, retail, VARs
COMMENTS	PC-to-PC file transfer and PC remote-access/control system	Micro-mainframe custom application development tools, provides customizing for user interfaces	Store-and-forward micro-mainframe file transfer system	Product performs automatic conversion to dBase, Lotus, and Multiplan formats

AUGUST 1989

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Applied Information Systems	Aspen Research	AST Research	AST Research
PRODUCT NAME	Burcom	Mozart	AST 5250 Gateway Option	AST-3270/CoaxII-CUT, AST-3270/CoaxIIA-CUT
PRODUCT FUNCTION	Remote terminal emulation, network gateway	Non-host-application specific link	Network gateway	Local terminal emulation
USERS SUPPORTED	Multiuser, unlimited	Multiuser	Multiuser, unlimited	Single user
COMPONENTS	PC software, host software	PC software	PC software	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	Vendor did not specify	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	VAX/VMS	OS/2, MS-/PC-DOS	MS-/PC-DOS	OS/2, MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Ethernet	Vendor did not specify	ARCnet, Ethernet, Token-Ring, any NETBIOS-compatible LAN	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	Any MicroVAX or VAX	250	146 (server), 126 (node)	256
HOST INTERFACE Systems Supported	Vendor did not specify	IBM 43XX/30XX, System/36/38, AS/400	IBM System/36/38	IBM 43XX/30XX
Software Environment	Vendor did not specify	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM SSP, OS/400, IBM CPF	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	Unisys Poll-select	Vendor did not specify	Vendor did not specify	BSC, SNA, SDLC
Applications Supported	Access to host-resident programs	Access to host-resident programs	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs
EMULATION Terminals/Controllers Emulated	Unisys	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series	IBM 5250 Series	IBM 327X/317X CUT
Terminal Functions Supported	Function keys, character attributes, host printer emulation, print to disk	Color display, function keys, character attributes, windows, user-defined keyboard mapping	Color display, function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, function keys, character attributes, user-def. keyboard mapping, host printer emulation
Number of Concurrent Sessions	Over 100	Emulator dependent	7	1
DOS Access During Session	Not applicable	Yes	Yes	Yes
File Transfer	Yes	No	Yes	Yes
File Formats	ASCII	Vendor did not specify	ASCII, binary	ASCII, binary
File Conversion	Yes	Vendor did not specify	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	Vendor did not specify	Twinax, RS-232-C	Coax, twisted pair
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Vendor did not specify	Synchronous
Transmission Speed (bps)	300 to 19.2k	Vendor did not specify	Vendor did not specify	2.4M
Communications Features	Dialing directory, auto dial/redial, auto answer, macros, unattended execution	Vendor did not specify	Vendor did not specify	Vendor did not specify
USER INTERFACE	Install, on-line help, command driven, menu driven, diagnostics	Install, on-line help, mouse, on-line tutorial, menu driven, windows	Command driven, menu driven	Install, on-line help, menu driven, diagnostics
PROGRAMMING FEATURES Programmability	Yes	Yes	Vendor did not specify	Yes
API Compatibility	Proprietary	Vendor did not specify	IBM API, proprietary	IBM API, DCA IRMA API, EEHLLAPI
MICROCOMPUTER SECURITY	Interface to host software	Vendor did not specify	Multilevel password	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	2,500 to 15,000	500 per workstation	995	895
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Included	Not applicable	Not applicable	Not applicable
Date of First Delivery	1984	June 1986	Vendor did not specify	October 1987
Number Installed to Date	Over 500	500	Vendor did not specify	Vendor did not specify
Warranty	Vendor did not specify	90 days	Two Years	Two years
Distribution	Direct, dist., dealers, retail, mail, OEMs	Direct, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	Also available for IBM System/34	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	AST Research	AST Research	AST Research	AST Research
PRODUCT NAME	AST-3270/DFT Option, AST-3270/Graphics Option	AST-3270/SNA Gate II	AST-3270/SNA II, AST-3270/SNA IIA	AST-5251/11 Enhanced Plus, AST-5251/11A Enhanced Plus
PRODUCT FUNCTION	Local terminal emulation	Remote terminal emulation, network gateway	Remote terminal emulation	Local terminal emulation
USERS SUPPORTED	Single user	Multiuser	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	OS/2, MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Ethernet, Token-Ring	Ethernet, Token-Ring	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	512	512	256	84 to 100
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX	IBM System/36/38, AS/400
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM SSP, OS/400, CPF
Protocols	BSC, SNA, SDLC	SNA, SDLC	SNA, SDLC	Twinax
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Virtual disk drives on host, access to host-res. programs
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT	IBM 327X/317X DFT	IBM 327X/317X DFT	IBM 5250 Series, 3180 Model 2
Terminal Functions Supported	Color display, graphics disp., function keys, char. attributes, windows, user-defined keyboard mapping, host printer emulation	Color display, graphics display, function keys, char. attributes, windows, user-defined keyboard mapping, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, function keys, char. attributes, windowing, user-def. keyboard mapping, host printer emulation
Number of Concurrent Sessions	5	5 per PC on LAN	5	7
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax, twisted pair	RS-232-C	RS-232-C	Twinax
Transmission Mode	Synchronous	Synchronous	Synchronous	Vendor did not specify
Transmission Speed (bps)	2.4M	300, 1200, 2400, 4800, 9600, 19.2K	300, 1200, 2400, 4800, 9600, 19.2K	1M
Communications Features	Vendor did not specify	Vendor did not specify	Dialing directory, auto dial/redial, macros	Macros
USER INTERFACE	Install, on-line help, menu driven, diagnostics	Install, on-line help, menu driven	Install, on-line help, menu driven	Command driven, menu driven
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, DCA IRMA API, HLLAPI	IBM API, DCA IRMA API, HLLAPI	IBM API, DCA IRMA API, HLLAPI	IBM API, DCA IRMA API
MICROCOMPUTER SECURITY	Single level password, interface to host software, configuration/emulator security	Single level password, interface to host software, configuration/emulator security	Single lev. password, interface to host software, configuration/emulator security	Multilevel password
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	195 for DFT, 695 for graphics	1,295	895	995
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	May 1988	December 1985	December 1985	November 1984
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	Two years	Two years	Two years	2 years
Distribution	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	—	Price includes file transfer; upgradable to LAN gateway

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	AST Research	Attachmate	Avatar	Avatar
PRODUCT NAME	AST-5251/12, AST-5251/12A	EXTRA! Connectivity Software	MacMainFrame DX	MacMainFrame II
PRODUCT FUNCTION	Remote terminal emulation	Loc/rem terminal emulation, network gateway	Loc/rem terminal emulation, standalone protocol converter	Local terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software	PC software, standalone hardware, host software	PC software, PC hardware, host software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Macintosh	Macintosh
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	Macintosh Finder	Macintosh Finder
LOCAL AREA NETWORK SUPPORT	Ethernet, Token-Ring	ARCnet, Ethernet, Token-Ring, STARLAN, any NETBIOS-compatible LAN	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	120	100	Vendor did not specify	Vendor did not specify
HOST INTERFACE Systems Supported	IBM System/36/38, IBM CPF	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	IBM SSP, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM TSO, CMS, CICS	IBM TSO, CMS, CICS
Protocols	SNA, SDLC	BSC, SNA, SDLC	BSC, SNA	BSC, SNA
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk	IBM IND$FILE	Vendor did not specify
EMULATION Terminals/Controllers Emulated	IBM 5250 Series	IBM 327X/317X DFT, 327X/317X CUT	IBM 327X/317X CUT	IBM 327X/317X DFT, 327X/317X CUT
Terminal Functions Supported	Function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, graphics disp., function keys, char. attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, function keys, char. attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, function keys, char. attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk
Number of Concurrent Sessions	9	4	1	5
DOS Access During Session	Yes	Yes	No	No
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	Coax, RS-232-C, LAN	Coax	Coax, RS-232-C
Transmission Mode	Synchronous	Synchronous	Asynchronous, synchronous	Synchronous
Transmission Speed (bps)	9600	Dependent upon transmission media	300 to 2.4M	2.4M
Communications Features	Macros	Auto dial/redial, auto answer, macros, unattended execution	Vendor did not specify	Vendor did not specify
USER INTERFACE	Command driven, menu driven, diagnostics	Install, on-line help, menu driven, windows, diagnostics	On-line help, mouse, graphic icons, menu driven, windows, diagnostics	On-line help, mouse, graphic icons, menu driven, windows, diagnostics
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, proprietary	IBM API	Proprietary	Proprietary
MICROCOMPUTER SECURITY	Multilevel password	Interface to host software	Multilevel password	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	790	425	200 (optional)	995
Standalone Hardware ($)	Not applicable	Not applicable	1,195	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	500	500
Date of First Delivery	April 1984	December 1985	1984	June 1988
Number Installed to Date	Vendor did not specify	80,000	Vendor did not specify	Vendor did not specify
Warranty	Two years	1 year	1 year	1 year
Distribution	Dist., dealers, retail, OEMs, VARs	Direct	Dist., dealers, retail, OEMs	Dist., dealers, retail, OEMs
COMMENTS	Price includes file transfer; upgradable to LAN gateway	Mainframe graphic support option-$695; gateway support option-$50	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Avatar	Avatar	Avatar	Barr Systems
PRODUCT NAME	MacMainFrame SE	PA1000G	PA100G	BARR/HASP
PRODUCT FUNCTION	Local terminal emulation	Loc/rem terminal emulation, standalone protocol converter	Local terminal emulation	Remote terminal emulation, network gateway, standalone protocol converter, host application specific link
USERS SUPPORTED	Single user	Vendor did not specify	Single user	Single user
COMPONENTS	PC software, PC hardware, host software	PC software, standalone hardware, host software	PC software, PC hardware, host software	PC software, PC hardware
COPY PROTECTED	No	Vendor did not specify	Vendor did not specify	No
MICROCOMPUTERS SUPPORTED	Macintosh	IBM PC/XT/AT & compatibles	IBM PC/XT/AT & compatibles	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	Macintosh Finder	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	Vendor did not specify	IBM Token-Ring
MINIMUM MEMORY REQUIRED (KB)	Vendor did not specify	Vendor did not specify	Vendor did not specify	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX, CDC Cyber, Cray
Software Environment	IBM TSO, CMS, CICS	IBM TSO, CMS, CICS	IBM TSO, CMS, CICS	IBM OS/VS, MVS, VM, CDC/NOS
Protocols	BSC, SNA	BSC, SNA	BSC, SNA, SDLC	HASP
Applications Supported	IBM IND$FILE	Vendor did not specify	Vendor did not specify	Communications
EMULATION Terminals/Controllers Emulated	IBM 327X/317X CUT	IBM 327X/317X CUT	IBM 327X/317X CUT	IBM 3777-2
Terminal Functions Supported	Color display, function keys, char. attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display	Color display, function keys, user-defined keyboard mapping	Color display, function keys, host printer emulation, print to disk
Number of Concurrent Sessions	1	1	1	1
DOS Access During Session	No	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax	Coax, RS-232-C	Coax	RS-232-C, V.35
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Synchronous	Synchronous
Transmission Speed (bps)	2.4M	300 to 2.4M	2.4M	2400 to 2.4M
Communications Features	Vendor did not specify	Vendor did not specify	Macros	Auto answer, unattended execution, auto dial/redial with internal modems from Barr
USER INTERFACE	On-line help, mouse, command driven, on-line tutorial, graphic icons, menu driven, windows, diagnostics	On-line help, menu driven	On-line help, menu driven	Install, on-line help, command driven, menu driven, diagnostics
PROGRAMMING FEATURES Programmability	Yes	No	No	No
API Compatibility	Proprietary	Vendor did not specify	IBM API	Proprietary
MICROCOMPUTER SECURITY	Vendor did not specify	Multilevel password	Vendor did not specify	Single level password, interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	795	200 (optional)	100 to 200 (s), 479 (h)	1,290
Standalone Hardware ($)	Not applicable	995	Not applicable	Not applicable
Host Software/Hardware ($)	500	500	500	Not applicable
Date of First Delivery	1987	1984	1984	August 1983
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	7,000
Warranty	1 year	1 year	1 year	1 year, extended avail.
Distribution	Dist., dealers, retail, OEMs	Dist., dealers, retail, OEMs	Dist., dealer, retail, OEMs	Direct, OEMs
COMMENTS	—	—	—	PC-SYNC internal sync modems support 2400, 4800, 9600 bps dial-up

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Barr Systems	Cambridge Computer Corp.	Cambridge Computer Corp.	Cambridge Computer Corp.
PRODUCT NAME	BARR/SNA RJE	Mac 73/78	PC 73/78	PC 77/78
PRODUCT FUNCTION	Remote terminal emulation, network gateway, standalone protocol converter, host application specific link	Loc/rem terminal emulation	Loc/rem terminal emulation	Loc/rem terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software	PC software	PC software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Macintosh	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	Macintosh Finder	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Token-Ring	Not applicable	Not applicable	Not applicable
MINIMUM MEMORY REQUIRED (KB)	320	512	256	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX	Honeywell Bull systems	Honeywell Bull systems	Honeywell Bull systems
Software Environment	IBM DOS, OS/VS, MVS, VM, OS/400	Honeywell Bull GCOS	Honeywell Bull GCOS	Honeywell Bull GCOS
Protocols	SNA	Not applicable	Vendor did not specify	VIP sync
Applications Supported	Communications	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 3777-3, PU2, LU1	TTY; Honeywell Bull, VIP7200/VIP7300/VIP7800 series	TTY; Honeywell Bull, VIP7200/VIP7300/VIP7800 async terminals	Honeywell Bull, VIP 7700/VIP 7800 Series sync terminals
Terminal Functions Supported	Color display, function keys, host printer emulation, print to disk	Color display, graphics disp., function keys, char. attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, function keys, char. attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, function keys, char. attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk
Number of Concurrent Sessions	16 multiple LUs	1	1	2
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C, V.35	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Asynchronous	Asynchronous	Synchronous
Transmission Speed (bps)	2800 to 2.4M	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K	2400, 4800, 9600, 19.2K
Communications Features	Auto answer, unattend. exec-ution, auto dial/redial with internal modems from Barr	Dialing directory, auto dial/redial, auto answer, macros, unattended execution	Dialing directory, auto dial/redial, auto answer, macros, unattended execution	Macros, unattended execution script processing
USER INTERFACE	Install, on-line help, command driven, menu driven, diagnostics	Install, on-line help, mouse, command driven, graphic icons, menu driven, windows	Install, on-line help, command driven, menu driven, windows	Install, on-line help, command driven, menu driven, windows
PROGRAMMING FEATURES Programmability	No	Yes	Yes	Yes
API Compatibility	Proprietary	Not applicable	Not applicable	Cambridge
MICROCOMPUTER SECURITY	Single level password, interface to host software	Interface to host software	Interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	1,590	295	295	350
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	August 1987	August 1988	May 1984	February 1984
Number Installed to Date	1,000	250	6,000	8,000
Warranty	1 year, extended avail.	1 year	1 year	1 year
Distribution	Direct, OEMs	Direct	Direct	Direct
COMMENTS	PC-SYNC internal sync modems avail. to support 2400, 4800, 9600 bps dial-up communications	Supports kermit, Xmodem file transfer	Supports kermit, Xmodem file transfer	Features cooperative transaction processing; file transfer emulates DPS6 minicomputer

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Cambridge Computer Corp.	Carleton	CQ Computer Communications	CQ Computer Communications
PRODUCT NAME	VX*Connect	CQS-Linkware	CQ 3270 LAN	CQ 3270R
PRODUCT FUNCTION	Loc/rem terminal emulation	Non-host application specific link	Remote terminal emulation	Loc/rem terminal emulation
USERS SUPPORTED	Single user	Multiuser, unlimited	Multiuser, 32	Single user
COMPONENTS	PC software	PC software, host software	PC software	PC software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Macintosh, IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	Macintosh Finder, MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Not applicable	Ethernet, Token-Ring, AppleTalk, STARLAN	Token-Ring, any NETBIOS-compatible LAN	Not applicable
MINIMUM MEMORY REQUIRED (KB)	512	256	256	256
HOST INTERFACE Systems Supported	DEC VAX, DECsystem	IBM 43XX/30XX	IBM 43XX/30XX, any system supporting IBM's 3270	IBM 43XX/30XX, any host system supporting IBM's 3270
Software Environment	VAX/VMS; Berkeley 4.X BSD	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	Vendor did not specify	BSC, SNA, SDLC, TCP/IP	SNA, SDLC	SNA, SDLC
Applications Supported	Access to host-resident programs	Access to host-resident programs	JES, Power, RES	JES, Power, RES, 3770 support
EMULATION Terminals/Controllers Emulated	TTY, DEC VT52/100, VT200 Series, VT300 Series	TTY, IBM 327X/317X DFT, 327X/317X CUT	IBM 327X/317X DFT, 327X/317X CUT, 3191,3194, 3180	IBM 327X/317X DFT, 327X/317X CUT, 3191, 3194, 3180
Terminal Functions Supported	Color display, graphics disp., function keys, char. attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, function keys, character attributes, print to disk	Color display, function keys, character attributes, user-def. keyboard mapping, host printer emulation, print to disk	Color display, function keys, character attributes, user-def. keyboard mapping, host printer emulation, print to disk
Number of Concurrent Sessions	Up to 2	1	8	8
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	No	No
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	Coax, RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Asynchronous	Asynchronous	Asynchronous, synchronous	Asynchronous, synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K	1200, 2400, 4800, 9600, 14.4K, 19.2K	1200 to 2.4M
Communications Features	Dialing directory, auto dial/redial, auto answer, macros, unattend. execution	Auto dial/redial, auto answer, macros, unattended execution	Dialing directory, auto dial/redial, auto answer macros, unattend. execution	Auto dial/redial, auto answer, macros, unattended execution, concurrent hosts
USER INTERFACE	Install, on-line help, mouse, command driven, graphic icons, menu driven, windows	Install, on-line help, command driven, menu driven, diagnostics	Install, on-line help, mouse, menu driven, windows, diagnostics	Install, on-line help, menu driven, windows, diagnostics
PROGRAMMING FEATURES Programmability	Yes	Yes	Vendor did not specify	No
API Compatibility	Not applicable	IBM API, proprietary	IBM API	IBM API
MICROCOMPUTER SECURITY	Interface to host software	Interface to host software	File encryption, dial-back security	Multilevel password, transmission/file encryption, dial-back security
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	295	Starts at 100	2,395 to 4,995	395 to 595
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	June 1988	June 1985	November 1988	April 1986
Number Installed to Date	500	50	Vendor did not specify	Vendor did not specify
Warranty	1 year	90 days	Not applicable	Not applicable
Distribution	Direct	Direct	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs
COMMENTS	50 percent discount to educational institutions	Supports data retrieval and report generation	Supports any mix of hosts and sessions to a given user, requires card for for each port	Requires communications interface card

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	CQ Computer Communications	CQ Computer Communications	CQ Computer Communications	CQ Computer Communications
PRODUCT NAME	CQ 3770	CQ 3780	CQ 5250	CQ A/Synchronizer
PRODUCT FUNCTION	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation	Non-host application specific link
USERS SUPPORTED	Single user	Single user	Single user	Multiuser, 10
COMPONENTS	PC software	PC software	PC software	PC software, standalone hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, Concurrent and MS-DOS	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	CP/M-80, CP/M-86, MS-/PC-DOS	CP/M-80, CP/M-86, MS-/PC-DOS	MS-/PC-DOS	CP/M-80, CP/M-86, MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Not applicable	None	Not applicable	Not applicable
MINIMUM MEMORY REQUIRED (KB)	96	64	256	Not applicable
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX, System/36/38	IBM 43XX/30XX, System/36/38	Not applicable
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, IMS	IBM DOS, OS/VS	IBM OS/VS, IBM System 34/36/38 DOS	Not applicable
Protocols	SNA, SDLC	BSC	SNA, HASP	BSC, SNA, SDLC, HASP
Applications Supported	JES, Power, RES	JES, BTAM, TCAM, QTAM, RJE	Host virtual disk, JES, Power, RES	Not applicable
EMULATION Terminals/Controllers Emulated	IBM 3770	IBM 2780/3780	IBM 5250 Series	Not applicable ...
Terminal Functions Supported	Host printer emulation, print to disk	Host printer emulation, print to disk, card-reader emulation	Color display, function keys, char. attributes, user-defined keyboard mapping, host printer emulation, print to disk	Not applicable
Number of Concurrent Sessions	6	Not applicable	8	Not applicable
DOS Access During Session	No	No	Yes	Not applicable
File Transfer	Yes	Yes	Yes	Not applicable
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	Not applicable
File Conversion	No	No	No	Not applicable
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous
Transmission Speed (bps)	1200 to 19.2K	1200 to 19.2K	1200 to 19.2K	300, 600, 1200, 2400, 4800, 14.4K, 19.2K
Communications Features	Macros	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Not applicable
USER INTERFACE	Install, on-line help, menu driven, diagnostics	Install, on-line help, menu driven, diagnostics	Install, on-line help, menu driven, windows, diagnostics	Not applicable
PROGRAMMING FEATURES Programmability	No	No	No	No
API Compatibility	None	Proprietary	IBM API	Not applicable
MICROCOMPUTER SECURITY	Single level password	Single level password	Multilevel password, transmission/file encryption, auto dial-back	Transmission encryption
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	495 to 695	295 to 495	395 to 795	Contact vendor
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	2,495 to 4,495
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	July 1984	March 1984	December 1988	September 1986
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	Not applicable	Not applicable	Not applicable	1 year
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs
COMMENTS	Requires communications interface card	Requires communications interface card	Requires communications interface card	Model 1 provides sync transmission over async link; Model 2-8 provides SDLC transmission over async link

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	CQ Computer Communications, Inc.	cfSoftware	cfSoftware	Cincom Systems
PRODUCT NAME	CQ Haste	Across the Boards	pcMAINFRAME	PC Contact
PRODUCT FUNCTION	Remote terminal emulation	API	Host application specific link	Host application specific link
USERS SUPPORTED	Single user	Multiuser, unlimited	Multiuser, 10 (more are optional)	Multiuser
COMPONENTS	PC software	PC software, host software	PC software, host software	PC software, host software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	CP/M-80, CP/M-86, MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Not applicable	Ethernet, Token-Ring, STARLAN, NETBIOS-compat. LANs, NetWare	Ethernet, STARLAN	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	64	50	128	128
HOST INTERFACE Systems Supported	IBM 43XX/30XX, System/36/38	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	IBM DOS, OS/VS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, mainframe environments that function with 3270 terminals	IBM DOS, OS/VS, MVS, CICS, SSP	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	BSC, HASP	BSC, SNA, SDLC	BSC, SNA, SDLC	BSC
Applications Supported	JES, BTAM, TCAM, QTAM, RJE	Vendor did not specify	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 2780/3780, IBM 3777-2	IBM 327X/317X DFT, 327X/317X CUT, DEC VT52/100	IBM 327X/317X DFT and 3101, DEC VT52/100	IBM 327X/317X DFT, 327X/317X CUT
Terminal Functions Supported	Color display, host printer emulation, print to disk, card-reader emulation	Vendor did not specify	Vendor did not specify	Function keys
Number of Concurrent Sessions	4	Vendor did not specify	10 or more	Host dependent
DOS Access During Session	No	Yes	No	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII
File Conversion	No	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	Coax	Coax	Coax
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous	Synchronous
Transmission Speed (bps)	1200 to 19.2K	1200, 2400, 4800, 9600, 19.2K, 2.4M	1200, 2400, 4800, 9600, 19.2K, 2.4M	Hardware dependent
Communications Features	Auto dial/redial, auto answer, unattended execution	Vendor did not specify	Auto dial/redial, auto answer	Unattended execution
USER INTERFACE	Install, on-line help, menu driven, diagnostics	Command driven	Menu driven	Menu driven, windows
PROGRAMMING FEATURES Programmability	No	Yes	Yes	No
API Compatibility	Proprietary	IBM API, DCA IRMA API, proprietary, Novell	IBM API	DCA IRMA API
MICROCOMPUTER SECURITY	Single level password	Vendor did not specify	Multilevel password	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	750	2,500 (single site lic.), 5,000 (developer license)	See comments	500
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	See comments	20,000 to 38,000
Date of First Delivery	March 1984	September 1983	September 1983	June 1985
Number Installed to Date	Vendor did not specify	Over 1,000	520	250
Warranty	Not applicable	1 year	1 year	Inclusive w/license
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Direct	Direct, VARs	Vendor did not specify
COMMENTS	Requires communications interface card	Standard API allows users to support communications drivers and transfer data	DOS/VSE with 10 concurrent sessions-$7,500; OS/MVS with 10 sessions-$10,000	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Computer Associates	Computer Associates	Computer Associates	Control Data Business Management Services
PRODUCT NAME	CA-PC Datacom	PC eMAIL File Transfer	PC Link	Orchestrator
PRODUCT FUNCTION	Network gateway, host app. specific link, non-host app. specific link	Loc/rem terminal emulation, network gateway, host application specific link	Network gateway, host app. specific link, non-host app. specific link	Non-host application specific link
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software, host software	PC software, host software	PC software, host software	PC software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PS/2 MCA, PS/2 non-MCA, Zenith laptop, IBM PC/XT/AT	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, IBM clones	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	OS/2, MS-/PC-DOS	OS/2, MS-/PC-DOS	OS/2, MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Token-Ring, PC Net, NETBIOS-compat. LANs	Token-Ring	Token-Ring	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	512	512	58	512
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX	Not applicable
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, CICS	IBM TSO	Not applicable
Protocols	SNA, SDLC	SNA, SDLC	SNA, SDLC	Not applicable
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	None
EMULATION Terminals/Controllers Emulated	TTY, IBM 327X/317X DFT, 327X/317X CUT, DEC VT52/100	TTY, IBM 327X/317X DFT	TTY, IBM 327X/317X DFT, 327X/317X CUT, DEC VT52/100	Not applicable
Terminal Functions Supported	Color display, graphics display, function keys, print to disk	Color display, print to disk	Vendor did not specify	Not applicable
Number of Concurrent Sessions	Vendor did not specify	1	1	Not applicable
DOS Access During Session	Yes	Yes	Vendor did not specify	No
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax, RS-232-C	Coax, RS-232-C	Coax, RS-232-C	Modem access to CDSN (no physical connection)
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K	1200, 2400
Communications Features	Vendor did not specify	Auto dial/redial	Vendor did not specify	Menu-driven proprietary software
USER INTERFACE	Install, on-line help, command driven, menu driven, windows, diagnostics	Install, on-line help, command driven, menu driven, windows, diagnostics	Install, on-line help, command driven, diagnostics	Menu driven, windows
PROGRAMMING FEATURES Programmability	Yes	No	Yes	No
API Compatibility	IBM API, DCA IRMA API, IBM LU 6.2, proprietary	IBM API, DCA IRMA API	IBM API, DCA IRMA API, IBM LU 6.2, proprietary	Vendor did not specify
MICROCOMPUTER SECURITY	Single level password, interface to host software	Interface to host software	Interface to host software	Transmission encryption, master user-controlled application access
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	Contact vendor	2,500 (gateway) + 195 per copy	Incl. w/PC Datacom, PC File Transfer	3,000 (Premier), 750 (level 1)
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Contact vendor	21,500 to 37,000 (CA-eMail)	Not applicable	Not applicable
Date of First Delivery	June 1984	November 1986	January 1983	Vendor did not specify
Number Installed to Date	Over 5,000	Information not available	Over 10,000	Approx. 4,500
Warranty	Vendor did not specify	Maintenance available	Vendor did not specify	Vendor did not specify
Distribution	Direct	Direct	Direct	Direct
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Core Technology	Data Interface Systems	Data Race	Data Race
PRODUCT NAME	CTCBridge	DI3270	Action 24+	PC Race 24/28
PRODUCT FUNCTION	Loc/rem terminal emulation, network gateway	Loc/rem terminal emulation, network gateway	Remote terminal emulation, internal protocol converter/modem	Remote terminal emulation, internal protocol converter/ modem
USERS SUPPORTED	Single user, multiuser, 100	Multiuser, 254	Vendor did not specify	Single user
COMPONENTS	PC software	PC software, host software	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	Yes	Yes
MICROCOMPUTERS SUPPORTED	Macintosh, IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	Macintosh Finder, MS-/PC-DOS, Apple Macintosh	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	ARCnet, Ethernet, Token-Ring, STARLAN, NETBIOS-compat. LANs	Novell	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	512 (Macintosh), 256 (IBM)	69	256	256
HOST INTERFACE Systems Supported	Vendor did not specify	IBM 43XX/30XX	IBM 43XX/30XX, System/36/38, AS/400; Data General Systems; DEC VAX, DECsystem; UNIX-based systems	IBM 43XX/30XX, System/36/38, AS/400; Data General Systems; Honeywell Bull Systems; DEC VAX, DECsystem; UNIX-systems
Software Environment	Not applicable	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400; VAX/VMS; DG AOS; UNIX System 5; Berkeley 4.X BSD	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, OS/400; VAX/VMS; DG AOS; UNIX System 5; Berkeley 4.X BSD
Protocols	Burroughs Poll/Select, Poll/Contention	BSC, SNA, SDLC, DFT	Vendor did not specify	BSC, SNA, SDLC, async HP ENQ/ACK
Applications Supported	Not applicable	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	Unisys, TD830, T27, MT983, ET1100	IBM 327X/317X DFT, 327X/317X CUT	TTY, IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780, DEC VT52/100, VT200 Series, VT300 Series; DG; HP; Honeywell Bull	TTY, IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780, DEC, VT200 Series; DG; HP
Terminal Functions Supported	Color display, function keys, character attributes, user-def. keyboard mapping, print to disk	Color display, function keys, user-def. keyboard mapping, host printer emulation, print to disk	Color display, function keys, character attributes, user-def. keyboard mapping, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk
Number of Concurrent Sessions	16 (includes 1 printer address)	254 per gateway	Vendor did not specify	Up to 8
DOS Access During Session	Yes	Yes	Vendor did not specify	Vendor did not specify
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII
File Conversion	Yes	Vendor did not specify	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C, TDI	Coax, RS-232-C, modem, modem eliminator	RS-232-C	PC-bus
Transmission Mode	Asynchronous, synchronous	Synchronous	Asynchronous, synchronous	Asynchronous, synchronous
Transmission Speed (bps)	300 to 19.2K	Remote to 56K, coax to 1.5M	300, 1200, 2400	1200, 2400, 4800, 9600, 19.2K
Communications Features	Dialing directory, auto dial/redial, auto answer, macros	Vendor did not specify	Dialing directory, auto dial/redial, auto answer	Dialing dir., auto dial/redial, auto answer
USER INTERFACE	Install, on-line help, mouse, command driven, graphic icons, menu driven	Install, on-line help, menu driven, diagnostics	Install, command driven	Install, command driven
PROGRAMMING FEATURES Programmability	Vendor did not specify	Yes	Vendor did not specify	Vendor did not specify
API Compatibility	CTC Userhooks	IBM API, IBM LU 6.2, proprietary	IBM API	IBM API
MICROCOMPUTER SECURITY	Single level password	Single/multilevel password, interface to host software	Vendor did not specify	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	395	575 and up (s), 240(h)	Contact vendor	Contact vendor
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Software included in price	Not applicable	Not applicable
Date of First Delivery	September 1981	September 1985	Vendor did not specify	Vendor did not specify
Number Installed to Date	8,000	Over 100	Vendor did not specify	Vendor did not specify
Warranty	90 days, then $150/yr.	Vendor did not specify	1 year	Vendor did not specify
Distribution	Direct, dist., dealers, retail, VARs	Direct, dist., dealers, retail, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs
COMMENTS	Compatible with Core Technology's Underneath software	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Data Race	Data Race	Datability Software Systems	DataEase International
PRODUCT NAME	PC Race 24/96	Race-OCS 24	RAF Remote Access Facility	DataEase Connect
PRODUCT FUNCTION	Remote terminal emulation, standalone protocol converter, internal protocol converter/modem	Standalone protocol converter/modem	Local terminal emulation	Non-host application specific link
USERS SUPPORTED	Single user	Single user	Multiuser	Single user
COMPONENTS	PC software, PC hardware	Standalone hardware	PC software, host software	PC software, host software
COPY PROTECTED	Yes	Yes	Yes	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	OS/2, MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	Ethernet	Token-Ring
MINIMUM MEMORY REQUIRED (KB)	256	256	70/async, 90-120/Ethernet	640
HOST INTERFACE Systems Supported	IBM 43XX/30XX, System/36/38, AS/400; Data General Systems; DEC VAX, DECsystem; UNIX-based systems	IBM 43XX/30XX, System/36/38, AS/400; Data General Systems; DEC VAX; UNIX-based systems	DEC VAX	IBM 43XX/30XX
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400; VAX/VMS; DG AOS; UNIX System 5; Berkeley 4.X BSD	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400; VAX/VMS; DG AOS; UNIX System 5; Berkeley 4.X BSD	VAX/VMS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	BSC, SNA, SDLC, async HP ENQ/ACK	BSC, SNA, SDLC, async HP ENQ/ACK	LAT, proprietary protocol	BSC, SNA, SDLC
Applications Supported	Access to host-resident programs	Access to host-resident programs	Host virtual disk, access to host-resident programs	Access to host databases
EMULATION Terminals/Controllers Emulated	TTY, IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780, DEC VT52/100, VT200 Series, VT300 Series; DG; HP	TTY, IBM 327X/317X DFT, 5250 Series, 2780/3780, DEC VT200 Series; DG; HP	DEC VT52/100, VT200 Series	IBM 327X/317X CUT, 5250 Series
Terminal Functions Supported	Color display, function keys, character attributes, user-def. keyboard mappig, host printer emulation, print to disk	Color display, function keys, character attributes, user-def. keyboard mapping, host printer emulation, print to disk	User-defined keyboard mapping	Color display, character attributes
Number of Concurrent Sessions	Up to 8	Up to 8	Limit is determined by Vax	1
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII	ASCII	ASCII, binary	ASCII
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	PC-bus	Vendor did not specify	Coax, RS-232-C	Coax, RS-232-C
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous	Synchronous
Transmission Speed (bps)	1200, 2400, 4800, 9600, 19.2K	1200, 2400, 4800, 9600, 19.2K	9600, up to 100K over Telenet	2400, 4800, 9600, 14.4K, 19.2K, 38.4K
Communications Features	Dialing directory, auto dial/redial, auto answer	Dialing directory, auto dial/redial, auto answer	Not applicable	Macros, unattended execution, auto script execution
USER INTERFACE	Install, command driven	Install, command driven	Install, menu driven	Install, on-line help, graphic icons, menu driven, windows, diagnostics
PROGRAMMING FEATURES Programmability	Vendor did not specify	Vendor did not specify	No	Yes
API Compatibility	IBM API	IBM API	Proprietary	IBM API, DCA IRMA API, ITT, Attachmate
MICROCOMPUTER SECURITY	Vendor did not specify	Vendor did not specify	Single level password	Multilevel password, interface to host software, file encryption
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	Contact vendor	Not applicable	395	995
Standalone Hardware ($)	Not applicable	Contact vendor	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	395	13,00 to 37,500, depending on CPU site
Date of First Delivery	Vendor did not specify	Vendor did not specify	March 1985	November 1987
Number Installed to Date	Vendor did not specify	Vendor did not specify	7,000	Vendor did not specify
Warranty	1 year	Vendor did not specify	90 days	30 days
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, VARs	Direct, OEMs, VARs
COMMENTS	—	—	—	Permits transparent access to mainframe data without jeopardizing the security of host databases

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Datalex	Digital Communications Associates (DCA)	Digital Communications Associates (DCA)	Digital Communications Associates (DCA)
PRODUCT NAME	Passport	IRMA 3279 Graphics	IRMACOM2 BSC	IRMALAN 802.2 Gateway
PRODUCT FUNCTION	Non-host application specific link	Local terminal emulation	Remote terminal emulation	Network gateway
USERS SUPPORTED	Single user	Single user	Single user	Multiuser, 64
COMPONENTS	PC software, host software	PC software, PC hardware	PC software, PC hardware	PC software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Ethernet, Token-Ring, STARLAN, Novell, Banyan systems	Vendor did not specify	Vendor did not specify	Ethernet, Token-Ring, NETBIOS-compat. LANs
MINIMUM MEMORY REQUIRED (KB)	640	60	384	320
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX	IBM FEP or 3174 supp. direct connect technology
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, MVS, VM, TSO, CMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, Any host with VTAM
Protocols	VTAM link-supports	BSC, SNA, SDLC	BSC	SNA, SDLC
Applications Supported	None	Vendor did not specify	None	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	Vendor did not specify	IBM 327X/317X CUT	IBM 327X/317X DFT	IBM 327X/317X DFT
Terminal Functions Supported	Color display, function keys, character attributes, user-defined keyboard mapping	Color display, graphics disp., character attributes, user-defined keyboard mapping	Color display, function keys, character attributes, user-def. keyboard mapping, host printer emulation	Color display, character attributes, host printer emulation
Number of Concurrent Sessions	Vendor did not specify	Vendor did not specify	5	64
DOS Access During Session	Vendor did not specify	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	Binary	ASCII, binary
File Conversion	Yes	Yes	No	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	Coax	RS-232-C	Any NETBIOS-compat. LAN cabling system
Transmission Mode	Asynchronous	Synchronous	Synchronous	Vendor did not specify
Transmission Speed (bps)	1200, 2400	2.4M	9600	Dependent on cabling system
Communications Features	Auto dial/redial, macros	Not applicable	Vendor did not specify	Gateway monitor
USER INTERFACE	Install, on-line help, command driven, on-line tutorial, menu driven, windows	Install, command driven, menu driven, diagnostics	Install, on-line help, menu driven, diagnostics	Install, command driven, menu driven, diagnostics
PROGRAMMING FEATURES Programmability	Yes	Yes	No	Vendor did not specify
API Compatibility	Vendor did not specify	IBM API, DCA IRMA API	IBM API, DCA IRMA API	IBM API, DCA IRMA API
MICROCOMPUTER SECURITY	Single level password	Vendor did not specify	Vendor did not specify	Single level password, LAN board ID
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	Contact vendor	1,995	895	595
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Contact vendor	Not applicable	Not applicable	Not applicable
Date of First Delivery	Vendor did not specify	June 1986	December 1986	Summer 1988
Number Installed to Date	Vendor did not specify	3,000	Vendor did not specify	Vendor did not specify
Warranty	30 days	1 year	1 year	90 days
Distribution	Vendor did not specify	Dist., dealers, retail, VARs	Dist., dealers, retail, VARs	Dist., dealers, retail
COMMENTS	—	—	—	—

AUGUST 1989

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Digital Communications Associates (DCA)	Digital Communications Associates (DCA)	Digital Communications Associates (DCA)	Digital Communications Associates (DCA) (DCA)
PRODUCT NAME	IRMALAN DFT Gateway 2	IRMALAN SDLC Gateway 2	IRMALAN SNA Workstation	IRMARemote for Hayes AutoSync
PRODUCT FUNCTION	Network gateway	Network gateway	Loc/rem terminal emulation	Remote terminal emulation
USERS SUPPORTED	Multiuser	Multiuser, 64	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software	PC software
COPY PROTECTED	No	No	Vendor did not specify	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Ethernet, Token-Ring, NETBIOS-compat. LANs	Ethernet, Token-Ring, NETBIOS-compat. LANs	Ethernet, Token-Ring, NETBIOS-compat. LANs	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	320	320	384	310
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, any IBM host with VTAM	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, Any IBM host with VTAM	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM DOS, MVS, VM, TSO, CMS, CICS
Protocols	SNA, SDLC	SNA, SDLC	SNA, SDLC	SNA, SDLC
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	None
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT	IBM 327X/317X DFT	IBM 327X/317X DFT	IBM 327X/317X DFT
Terminal Functions Supported	Color display, character attributes, host printer emulation, print to disk	Color display, character attributes, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, user-def. keyboard mapping, host printer emul., print to disk	Color display, graphics disp., function keys, character attributes, user-def. keyboard mapping, host printer emul. print to disk
Number of Concurrent Sessions	5 per board, 4 boards/gateway	64	5	5
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	Binary
File Conversion	Yes	Yes	Yes	No
COMMUNICATIONS CHAR. Physical Connection	Coax	RS-232-C, V.35	Via LAN to gateway through NETBIOS	RS-232-C
Transmission Mode	Vendor did not specify	Synchronous	Vendor did not specify	Synchronous
Transmission Speed (bps)	Coax	Up to 72K	Dependent on LAN	19.2K
Communications Features	Gateway monitor	Gateway monitor	Network utility to monitor activity	Auto dial/redial
USER INTERFACE	Install, command driven, menu driven, diagnostics	Install, command driven, menu driven, diagnostics	Install, command driven, menu driven	Install, on-line help, menu driven
PROGRAMMING FEATURES Programmability	Vendor did not specify	Vendor did not specify	Vendor did not specify	No
API Compatibility	IBM API, DCA IRMA API	IBM API, DCA IRMA API	IBM API, DCA IRMA API	IBM API, DCA IRMA API
MICROCOMPUTER SECURITY	Single level password, LAN board ID	Single/multilevel password, LAN board ID	Vendor did not specify	Support for dial-back security devices
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	1,195 to 1,195	1,195 to 1,995	395	595
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	Fall 1986	Fall 1988	Fall 1986	March 1988
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	1 year	90 days	1 year
Distribution	Dist., dealers, retail	Dist., dealers, retail	Dist., dealers, retail	Dist., dealers, retail, VARs
COMMENTS	Starter kit includes gateway and support for five SNA workstations	Starter kit includes gateway and support for five SNA workstations	Software with gateway starter kit-$1,995; convenience kit (5 workstations)-$1,395	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Digital Communications Associates (DCA)	Digital Communications Associates (DCA)	Digital Communications Associates (DCA)	Digital Communications Associates (DCA)
PRODUCT NAME	IRMARemote SNA	IRMAX DFT	IRMAX Multisessions	MacIRMA
PRODUCT FUNCTION	Remote terminal emulation	Local terminal emulation	Local terminal emulation	Loc/rem terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Macintosh
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	Macintosh Finder
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Not applicable	Not applicable	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	384	175	272	512
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	IBM DOS, MVS, VM, TSO, CMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, CICS, SSP	MVS, VM, TSO, CMS, CICS
Protocols	SNA	BSC, SNA	BSC, SNA, HDLC, SDLC	Vendor did not specify
Applications Supported	None	Access to host-resident programs	Host virtual disk, access to host-resident programs	Vendor did not specify
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT	IBM 327X/317X DFT	IBM 3270 PC	IBM 327X/317X CUT
Terminal Functions Supported	Color display, graphics disp., function keys, character attributes, user-def. keyboard mapping, host printer emul., print to disk	Color display, graphics disp., function keys, character attributes, user-def. keyboard mapping, host printer emul., print to disk	Color display, function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, windows, user-defined keyboard mapping
Number of Concurrent Sessions	5	5	4 host and 1 DOS	1
DOS Access During Session	Yes	Yes	Yes	No
File Transfer	Yes	Yes	Yes	Yes
File Formats	Binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	No	No	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	Coax	Coax	Coax
Transmission Mode	Synchronous	Not applicable	Synchronous	Synchronous
Transmission Speed (bps)	19.2K	Not applicable	Dependent on mainframe	2.4M
Communications Features	Vendor did not specify	Not applicable	Not applicable	Vendor did not specify
USER INTERFACE	Install, on-line help, menu driven, diagnostics	Install, mouse, command driven, diagnostics	Install, on-line help, mouse, command driven, menu driven, windows, diagnostics	Mouse, graphic icons, menu driven, windows, diagnostics
PROGRAMMING FEATURES Programmability	No	Vendor did not specify	Yes	Yes
API Compatibility	IBM API, DCA IRMA API	IBM API, DCA IRMA API, proprietary	IBM API, DCA IRMA API, IBM HLLAPI	IBM API, DCA IRMA API
MICROCOMPUTER SECURITY	Vendor did not specify	Not applicable	Not applicable	Single level password
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	895	395 (s), 1,195 (h/s)	1,595	1,195
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	November 1988	September 1988	1985	November 1987
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	90 days, 1 year	1 year	Vendor did not specify
Distribution	Dist., dealers, retail, VARs	Dist., dealers, retail	Dist., dealers, retail, VARs	Dist., dealers, retail
COMMENTS	Replaces IRMACOM 2 SNA product	Supports LIM EMS, background file transfer; APA graphics support available	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Direct Aid	Diversified Computer Systems	Diversified Computer Systems	Diversified Computer Systems
PRODUCT NAME	The Impersonator	EM220	EM4010	EM4105
PRODUCT FUNCTION	Loc/rem terminal emulation, network gateway	Local terminal emulation	Local terminal emulation	Local terminal emulation
USERS SUPPORTED	Single user, multiuser, as many as LAN suports	Single user	Single user	Single user
COMPONENTS	PC software	PC software	PC software	PC software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	ARCnet, Ethernet, Token-Ring, Novell	Ethernet, Token-Ring	Ethernet, Token-Ring	Ethernet, Token-Ring
MINIMUM MEMORY REQUIRED (KB)	256	256	350	385
HOST INTERFACE Systems Supported	Suports any machine type	IBM 43XX/30XX; DEC VAX, DECsystem; UNIX-based systems	IBM 43XX/30XX; DEC VAX, DECsystem; UNIX-based systems	IBM 43XX/30XX; DEC VAX, DECsystem; UNIX-based systems
Software Environment	Support any host soft. environment	IBM MVS, VM, CMS, IMS, SSP, OS/400; VAX/VMS; UNIX System 5	IBM VM, CMS, IMS, SSP, OS/400; VAX/VMS; UNIX System 5	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400; VAX/VMS; UNIX System 5
Protocols	Supports any host protocols	TCP/IP	TCP/IP	TCP/IP
Applications Supported	Access to host-resident programs	None	None	None
EMULATION Terminals/Controllers Emulated	TTY, DEC VT52/100, VT200 Series, VT300 Series; Unisys, emulates over 16 async terminals	TTY, DEC VT52/100, VT200 Series	TTY, DEC VT52/100, VT200 Series, Tektronix 4010/4014	TTY, DEC VT52/100, VT200 Series, VT300 Series, Tekronix 4105
Terminal Functions Supported	Color display, graphics disp., function keys, character attributes, windows, user-defined keyboard mapping, host printer emulation, print to disk	Color display, function keys, character attributes, user-def. keyboard mapping, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, user-def. keyboard mapping, host printer emul., print to disk	Color display, graphics disp., function keys, character attributes, user-def. keyboard mapping, host printer emul., print to disk
Number of Concurrent Sessions	One	2	2	Vendor did not specify
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII	ASCII
File Conversion	Yes	No	No	No
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C, Ethernet	Ethernet	RS-232-C, Ethernet
Transmission Mode	Asynchronous	Asynchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	300 to 9600	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K
Communications Features	Dialing directory, auto dial/redial, auto answer macros, unattended execution	Dialing directory, auto dial/redial, auto answer, macros, unattended execution	Dialing directory, auto dial/redial, auto answer, macros, unattended execution	Dialing directory, auto dial/redial, auto answer, macros, unattended execution
USER INTERFACE	Install, on-line help, command. driven, on-line tutorial, menu driven, windows, diagnostics	On-line help, mouse, command driven, menu driven	On-line help, mouse, command driven, menu driven	Install, on-line help, mouse, command driven, on-line tutorial, menu driven
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	Vendor did not specify	DCA IRMA API	DCA IRMA API, IBM LU 6.2	DCA IRMA API
MICROCOMPUTER SECURITY	Interface to host software, optional password, key disk security	Vendor did not specify	Vendor did not specify	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	245	169	249	349
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	January 1982	May 1983	June 1985	March 1988
Number Installed to Date	Over 10,000	15,000	6,000	1,000
Warranty	30 days	90 days	90 days	90 days
Distribution	Direct, dist., dealers, retail, mail, OEMs, VARs	Direct, dist., dealers, retail, mail	Direct, dist., dealers, retail, mail	Direct, dist., dealers, retail, mail
COMMENTS	Supports Xmodem file transfer built-in language allows customized emulation	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	DTSS	Eastham and Associates	Eicon Technology	Eicon Technology
PRODUCT NAME	DataPass	PC Companion	Access/QLLC (3270 and 5250)	Access/QLLC (3270)
PRODUCT FUNCTION	Loc/rem terminal emulation, host application specific link	Loc/rem terminal emulation	Remote terminal emulation, network gateway	Remote terminal emulation, network gateway
USERS SUPPORTED	Multiuser, no limit	Single user, multiuser, 32	Single user, multiuser, up to 254	Single user, multiuser, up to 254
COMPONENTS	PC software, host software	PC software, PC hardware, host software	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, Wang PC, Zenith	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	OS/2, MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Ethernet, Token-Ring	Novell (gateway)	ARCnet, Ethernet, Token-Ring, STARLAN, NETBIOS-compat. LANs	ARCnet, Ethernet, Token-Ring, STARLAN, NETBIOS-compatible LANs
MINIMUM MEMORY REQUIRED (KB)	256	128	256	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX; Honeywell Bull systems; DEC VAX; UNIX-based systems, Harris VDS	Unisys Poll Select	IBM 43XX/30XX, System/36/38; DEC VAX	IBM 43XX/30XX; Data General Systems; DEC VAX, public databases
Software Environment	IBM VM, CMS, OS/400; VAX/VMS; Honeywell Bull GCOS; UNIX System 5, Honeywell MOD 400	Unisys Poll Select	Not applicable	Not applicable
Protocols	SNA, proprietary	Unisys Poll Select	SNA, HDLC, SDLC, X.25	SNA, HDLC, SDLC, X.25
Applications Supported	Vendor did not specify	Vendor did not specify	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	TTY, DEC VT52/100, Honeywell Bull	Unisys	TTY, IBM 327X/317X DFT, 5250 Series, DEC VT52/100, VT200 Series	TTY, IBM 327X/317X DFT, DEC VT52/100, VT200 Series
Terminal Functions Supported	Color display, function keys, character attributes, user-def. keyboard mapping, host printer emulation, print to disk	Color display, function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, graphics display, function keys, user-defined keyboard mapping	Color display, function keys, user-defined keyboard mapping
Number of Concurrent Sessions	2	2	Vendor did not specify	254
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	No	No
COMMUNICATIONS CHAR. Physical Connection	Coax, RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Asynchronous	Asynchronous, synchronous	Synchronous	Synchronous
Transmission Speed (bps)	300 to 9600	300 to 19.2K	64K	64K
Communications Features	Auto dial/redial, auto answer, macros, unattended execution, auto file transfer	Dialing directory, auto dial/redial, auto answer, macros, unattended execution	Dialing directory, auto dial/redial, auto answer, unattended execution	Dialing directory, auto dial/redial, auto answer, unattended execution
USER INTERFACE	Install, on-line help, menu driven, windows	Install, on-line help, command. driven, menu driven, diagnostics	Install, command driven, menu driven	Install, command driven, menu driven
PROGRAMMING FEATURES Programmability	No	Yes	Yes	Yes
API Compatibility	IBM API, DCA IRMA API, IBM LU 6.2, proprietary	Proprietary	IBM API, IBM LU 6.2, proprietary	IBM API, IBM LU 6.2, proprietary
MICROCOMPUTER SECURITY	Interface to host software, transmission encryption	Vendor did not specify	Single level password	Single level password
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	295	495	1,595 standalone*	1,295 standalone*
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	2,995 to 4,995	Price includes host software	Not applicable	Not applicable
Date of First Delivery	June 1985	January 1986	Vendor did not specify	1984
Number Installed to Date	3,000	300	Over 50	Over 1,000
Warranty	90 days	90 days	1 year	1 year
Distribution	Direct, dist., dealers, retail	Direct, dist., dealers, retail	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs
COMMENTS	—	Connects an IBM PC and compatibles to a Unisys mainframe	* 3,695 for 8 users; $4,695 for 254 users	* 2,495 for 8 users; $3,495 for 254 users

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Eicon Technology	Eicon Technology	Eicon Technology	Eicon Technology
PRODUCT NAME	Access/QLLC (5250)	Access/SDLC (3270)	Access/SDLC (5250)	Access/X.25
PRODUCT FUNCTION	Remote terminal emulation, network gateway	Remote terminal emulation, network gateway	Remote terminal emulation, network gateway	Remote terminal emulation, network gateway
USERS SUPPORTED	Single user, multiuser, up to 254	Single user, multiuser, up to 254	Single user, multiuser, up to 254	Single user, multiuser, up to 254
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	OS/2, MS-/PC-DOS	MS-/PC-DOS	OS/2, MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	ARCnet, Ethernet, Token-Ring, STARLAN, NETBIOS-compatible LANs	ARCnet, Ethernet, Token-Ring, STARLAN, NETBIOS-compatible LANs	ARCnet, Ethernet, Token-Ring, STARLAN, NETBIOS-compat. LANs	ARCnet, Ethernet, Token-Ring, STARLAN, NETBIOS-compat. LANs
MINIMUM MEMORY REQUIRED (KB)	256	256	256	256
HOST INTERFACE Systems Supported	IBM System/36/38; DEC VAX	IBM 43XX/30XX	IBM System/36/38	DEC VAX, public databases
Software Environment	Not applicable	Not applicable	Not applicable	Not applicable
Protocols	SNA, SDLC, X.25/QLLC	SNA, SDLC	SNA, SDLC	HDLC, X.25
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	TTY, IBM 5250 Series, DEC VT52/100, VT200 Series	IBM 327X/317X DFT	IBM 5250 Series	TTY, DEC VT52/100, VT200 Series
Terminal Functions Supported	Color display, function keys, user-defined keyboard mapping	Color display, graphics display, function keys, user-defined keyboard mapping	Color display, function keys, user-defined keyboard mapping	Color display, function keys, user-defined keyboard mapping
Number of Concurrent Sessions	Vendor did not specify	254	254	254
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	No	No	No	No
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	64K	64K	64K	64K
Communications Features	Dialing directory, auto dial/redial, auto answer, unattended execution	Dialing directory, auto dial/redial, auto answer, unattended execution	Dialing directory, auto dial/redial, auto answer, unattended execution	Dialing directory, auto dial/redial, auto answer, unattended execution
USER INTERFACE	Install, command driven, menu driven	Install, command driven, menu driven	Install, command driven, menu driven	Install, command driven, menu driven
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, IBM LU 6.2, proprietary	IBM API, IBM LU 6.2, proprietary	IBM API, IBM LU 6.2, proprietary	IBM API, IBM LU 6.2, proprietary
MICROCOMPUTER SECURITY	Single level password	Single level password	Single level password	Single level password
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	1,295 standalone*	995 standalone*	995 standalone*	995 standalone*
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	1987	1984	Vendor did not specify	1984
Number Installed to Date	Over 100	Over 1,000	Over 250	Over 1,000
Warranty	1 year	1 year	1 year	1 year
Distribution	Dist., dealers, retail, OEMs, VARs	Dist., dlrs, retail, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs
COMMENTS	* 2,495 for 8 users; $3,495 for 254 users	* 2,195 for 8 users; $3,195 for 254 users	* 2,195 for 8 users; $3,195 for 254 users	* 1,695 for 8 users; $2,695 for 254 users

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Emerald Technology	Emerald Technology	Emerald Technology	Emerald Technology
PRODUCT NAME	3X Mate	3X Mate/2	3X Plus	3X Plus/2
PRODUCT FUNCTION	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles	IBM PS/2 MCA	IBM PC/XT/AT & compatibles	IBM PS/2 MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	256	256	256	256
HOST INTERFACE Systems Supported	IBM System/36/38, AS/400	IBM System/36/38, AS/400	IBM System/36/38, AS/400	IBM System/36/38, AS/400
Software Environment	IBM SSP, OS/400	IBM SSP, OS/400	IBM SSP, OS/400	IBM SSP, OS/400
Protocols	SDLC	SDLC	SDLC	SDLC
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 5250 Series	IBM 5250 Series	IBM 5250 Series	IBM 5250 Series
Terminal Functions Supported	Color display, character attributes, host printer emulation	Color display, character attributes, host printer emulation	Color display, function keys, character attributes, user-defined keyboard mapping, host printer emulation	Color display, function keys, character attributes, user-defined keyboard mapping, host printer emulation
Number of Concurrent Sessions	7	7	7	7
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	No	Vendor did not specify	No	No
File Formats	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
File Conversion	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
COMMUNICATIONS CHAR. Physical Connection	Phone line	Phone line	RS-232-C	RS-232-C
Transmission Mode	Asynchronous, synchronous	Asynchronous	Synchronous	Synchronous
Transmission Speed (bps)	2400 to 9600	2400, 4800	2400 to 19.2K	4800, 9600, 19.2K
Communications Features	Auto dial/redial, auto answer, macros, unattended execution	Macros	Vendor did not specify	Vendor did not specify
USER INTERFACE	Menu driven	Menu driven	Menu driven	Menu driven
PROGRAMMING FEATURES Programmability	No	Vendor did not specify	No	No
API Compatibility	IBM API, IBM LU 6.2	IBM API, IBM LU 6.2	IBM API, IBM LU 6.2	IBM API, IBM LU 6.2
MICROCOMPUTER SECURITY	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	1,195 to 1,995, depending on speed	1,195 to 1,995, depending on speed	750	750
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	1985	1988	1982	1982
Number Installed to Date	6,000	Less than 1,000	8,000	1,000
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Emerald Technology	Emerald Technology	Emulex	ESI
PRODUCT NAME	3X Twin	3X Twin/2	DCP-88/186/286	Micropulse
PRODUCT FUNCTION	Local terminal emulation	Local terminal emulation	Non-host application specific link	Loc/rem terminal emulation
USERS SUPPORTED	Single user	Single user	Multiuser, up to 8	Single user, multiuser
COMPONENTS	PC software, PC hardware, standalone hardware	PC software, PC hardware, standalone hardware	PC hardware	PC software, PC hardware, host software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles	IBM PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, B20s under BTOS
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS, Xenix	MS-/PC-DOS, BTOS for BT20s (Unisys)
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	Nove	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	256	256	256	640
HOST INTERFACE Systems Supported	IBM System/36/38, AS/400	IBM System/36/38, AS/400	Programmable	Vendor did not specify
Software Environment	IBM SSP, OS/400	IBM SSP, OS/400	Programmable	Unisys small, medium, V-Series, and large
Protocols	IBM Twinax protocol	IBM Twinax protocol	BSC, SNA, HDLC, SDLC, HASP	COMMS, GEMCOS, SMCS
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Access to host-resident programs	Host virtual disk
EMULATION Terminals/Controllers Emulated	Vendor did not specify	IBM 5250 Series	Programmable	TTY; Unisys
Terminal Functions Supported	Color display, function keys, character attributes, user-defined keyboard mapping, host printer emulation	Color display, function keys, character attributes, user-defined keyboard mapping, host printer emulation	Vendor did not specify	Color display, function keys, windows, print to disk
Number of Concurrent Sessions DOS Access During Session File Transfer File Formats File Conversion	7 Yes No Vendor did not specify No	7 Yes No Vendor did not specify No	Software dependent Yes No ASCII, binary No	Vendor did not specify Yes Yes ASCII, any format Yes
COMMUNICATIONS CHAR. Physical Connection	Vendor did not specify	Twinax	RS-232-C	RS-232-C
Transmission Mode Transmission Speed (bps)	Synchronous 1M	Synchronous 1M	Asynchronous, synchronous 300, 600, 1200, 2400, 4800, 9600, 19.2K	Asynchronous, synchronous 300 to 19.2K
Communications Features	Vendor did not specify	Vendor did not specify	None	Dialing directories, macros, unattended execution
USER INTERFACE	Menu driven	Menu driven	Diagnostics	Install, on-line help, command driven, menu driven, windows
PROGRAMMING FEATURES Programmability API Compatibility	No IBM API	No IBM API, IBM LU 6.2	Yes Programmable	Yes Unisys API for A and V Series and medium systems
MICROCOMPUTER SECURITY	Vendor did not specify	Vendor did not specify	None	Multilevel password
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	895	895	975 to 1,700	6,000 to 30,000, depending on system siz
Standalone Hardware ($) Host Software/Hardware ($)	Included in package Not applicable	Included in package Not applicable	Not applicable Not applicable	Not applicable Included in package
Date of First Delivery Number Installed to Date Warranty Distribution	1986 10,000 1 year Direct, dist., dealers, retail, OEMs, VARs	1987 3,000 1 year Direct, dist., dealers, retail, OEMs, VARs	1983 Over 40,000 Two years Direct, dist., dealers, retail, OEMs, VARs	June 1984 Over 500 30 days Direct
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	FTG Data Systems	FTG Data Systems	FTG Data Systems	FTG Data Systems
PRODUCT NAME	EMU-TEK Five Plus	EMU-TEK Level 1	EMU-TEK Level 2	EMU-TEK Seven Plus
PRODUCT FUNCTION	Loc/rem terminal emulation	Loc/rem terminal emulation	Loc/rem terminal emulation	Loc/rem terminal emulation
USERS SUPPORTED	Single user	Single user	Vendor did not specify	Single user
COMPONENTS	PC software	PC software	PC software	PC software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	•	Vendor did not specify	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	512	256	256	512
HOST INTERFACE Systems Supported	IBM 43XX/30XX, System/36/38, AS/400; Data General Systems; Honeywell Bull Systems; DEC VAX, DECsystem; UNIX systems	IBM 43XX/30XX, System/36/38, AS/400; Data General Systems; Honeywell Bull Systems; DEC VAX, DECsystem; UNIX systems	IBM 43XX/30XX, System/36/38, AS/400; Data General Systems; Honeywell Bull Systems; DEC VAX, DECsystem; UNIX systems	IBM 43XX/30XX, System/36/38, AS/400; Data General Systems; Honeywell Bull Systems; DEC VAX, DECsystem; UNIX systems
Software Environment	•	•	•	•
Protocols	•	•	•	•
Applications Supported	•	•	•	•
EMULATION Terminals/Controllers Emulated	DEC VT52/100, Tektronix 4010, 4105, 4014	DEC VT52/100, Tektronix 4010	DEC VT52/100, VT640, Tektronix 4010, 4014	DEC VT52/100, Tektronix 4010, 4105, 4014, 4107
Terminal Functions Supported	Color display, graphics display, function keys, character attributes, windows, user-def. keyboard mapping, print to disk	Graphics display, function keys, print to disk	Graphics display, function keys, print to disk	Color display, graphics disp., function keys, character attributes, windows, user-def. keyboard mapping, print to disk
Number of Concurrent Sessions DOS Access During Session File Transfer File Formats File Conversion	1 No Yes ASCII, binary No	1 No Yes ASCII, binary No	1 No Yes ASCII, binary No	1 No Yes ASCII, binary No
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode Transmission Speed (bps)	Asynchronous 300 to 19.2K	Asynchronous 300 to 19.2K	Asynchronous 300 to 19.2K	Asynchronous 300 to 19.2K
Communications Features	Macros	Macros	Macros	Macros
USER INTERFACE	On-line help, command driven, menu driven, windows, diagnostics	Mouse, command driven, windows	Mouse, command driven, windows	On-line help, command driven, menu driven, windows, diagnostics
PROGRAMMING FEATURES Programmability API Compatibility	Vendor did not specify Tektronix protocol	No Tektronix protocol	No Tektronix protocol	Vendor did not specify Tektronix protocol
MICROCOMPUTER SECURITY	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	495	95	295	695
Standalone Hardware ($) Host Software/Hardware ($)	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable
Date of First Delivery Number Installed to Date Warranty Distribution	June 1985 1,000 1 year Direct, dist., dealers, retail, mail	March 1983 1,000 1 year Direct, dist., dealers, retail, mail	March 1983 Over 2,000 1 year Direct, dist., dealers, retail, mail	September 1987 700 1 year Direct, dist., dealers, retail, mail
COMMENTS	* Compatible with all host-based systems supporting Tektronix graphics	* Compatible with host-based systems supporting Tektronix graphics	* Compatible with host-based systems supporting Tektronix graphics	* Compatible with host-based systems supporting Tektronix graphics

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Gateway Communications	Gateway Communications	Gateway Communications	Gateway Communications
PRODUCT NAME	G/Async Gateway	G/SNA Gateway	G/X25 Gateway	G/X25 PC
PRODUCT FUNCTION	Network gateway	Remote terminal emulation, network gateway	Remote terminal emulation, network gateway, non-host application specific link	Remote terminal emulation, network gateway, non-host application specific link
USERS SUPPORTED	Multiuser, 16	Multiuser, 8, 16, or 32 LUs	Multiuser, 64	Single user
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware, standalone hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA workstations, PS/2 non-MCA	IBM PC/XT/AT & compat.; PS/2 non-MCA; PS/2 MCA workstation emulators	IBM PC/XT/AT & compatibles, PS/2 MCA workstations, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	ARCnet, Ethernet, Token-Ring, STARLAN, topology independent	ARCnet, Ethernet, Token-Ring, STARLAN, NETBIOS LANs	ARCnet, Ethernet, Token-Ring, STARLAN, NEBIOS-compat. LANs	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	256	384/gateway, 512/wkstation.	512/gateway, 384/wrkstation.	384
HOST INTERFACE Systems Supported	Data General, Honeywell systems; DEC VAX, DECsystem; UNIX-based systems; any host with async terminal support	IBM 43XX/30XX	Data General, Honeywell; Bull systems; DEC VAX, DECsystem; UNIX-based systems, any host w/X.25 support; VAX/VMS; DG AOS; Honeywell GCOS; UNIX System 5	Data General, Honeywell Bull systems; DEC VAX, DECsystem; UNIX-based systems, any host w/X.25 support; VAX/VMS; DG AOS Honeywell Bull GCOS; UNIX System 5
Software Environment	DEC VAX/VMS; DG AOS; Honneywell Bull GCOS; UNIX System 5; any host w/async terminal support	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS		
Protocols	Async	SNA, SDLC	X.25	X.25
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	TTY, DEC VT52/100, VT200 Series, asynchronous terminals	IBM 327X/317X DFT, 327X/317X CUT	TTY; DEC VT52/100, VT200 Series; DG; HP; Honeywell Bull; IBM 3101; ADDS, Datapoint, Tandem, TeleVideo, Zenith, Hazeltine	TTY; DEC VT52/100, VT200 Series; DG; HP; Honeywell Bull
Terminal Functions Supported	Color display, graphics disp., character attributes, print to disk	Color display, function keys, character attributes, user-def. keyboard mapping, print to disk	Color display, graphics disp., character attributes, print to disk	Color display, graphics disp., character attributes, print to disk
Number of Concurrent Sessions	4 per LAN	8, 16, or 32 sessions	64 (4 per workstation)	4
DOS Access During Session	No	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C, V.35	RS-232-C, via X.25: dial-up, direct, packet	RS-232-C, via X.25: dial-up, direct, packet
Transmission Mode	Asynchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	Up to 19.2K, modem dependent	Up to 56K, modem dependent	Up to 19.2K, modem dependent	Up to 19.2K, modem dependent
Communications Features	Dialing directory, auto dial/redial, auto answer, macros	Macros	Macros, unattended execution	Auto answer, macros, unattended execution
USER INTERFACE	Install, on-line help, command driven, menu driven	Install, on-line help, command driven, menu driven, windows	Install, command driven, menu driven	Install, command driven, menu driven
PROGRAMMING FEATURES Programmability	Vendor did not specify	Yes	No	No
API Compatibility	Vendor did not specify	Proprietary	Vendor did not specify	Vendor did not specify
MICROCOMPUTER SECURITY	Interface to host software	Interface to host software	Interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	1,440	2,580 (8 LUs), 3,580 (16), 4,580 (32)	1,695	Contact vendor
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Contact vendor
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	April 1987	November 1985	October 1985	October 1985
Number Installed to Date	200	21,000	Over 1,000	500
Warranty	1 year	1 year	1 year	1 year
Distribution	Dist., dealers, retail, VARs	Dist., dealers, retail, VARs	Dist., dealers, retail, VARs	Dist., dealers, retail, VARs
COMMENTS	Uses NetWare V2.xx LAN system software	Supports NetWare v2.xx LAN system software	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	General Micro Systems	Hawkeye Grafix	ICOT Network Systems Division	ICOT Network Systems Division
PRODUCT NAME	PC 220	COMMX	COAX Gate	COAX pc
PRODUCT FUNCTION	Loc/rem terminal emulation	Local terminal emulation, non-host application specific link	Network gateway	Local terminal emulation
USERS SUPPORTED	Single user	Single user or multiuser, 2	Multiuser, 5, 20, 40	Single user
COMPONENTS	PC software	PC software, host software optional	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	Vendor did not specify	No	No	No
MICROCOMPUTERS SUPPORTED	Vendor did not specify	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, most CA/M80	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	Vendor did not specify	CP/M-80, CP/M-86, MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Ethernet	ARCnet, Ethernet, Token-Ring, STARLAN, Vines	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	128	256	256	256
HOST INTERFACE Systems Supported	DEC VAX	IBM 43XX/30XX; DEC VAX, DECsystem, Prime	IBM 43XX/30XX, AS/400	IBM 43XX/30XX, AS/400
Software Environment	IBM DOS, OS/VS; VAX/VMS; UNIX System 5; Berkeley 4.X BSD, any host supporting ANSI terminals	IBM DOS, MVS, VM; VAX/VMS; Primos, TOPS 10, TOPS 20	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400
Protocols	Kermit	Kermit, Xmodem, Commx/Mainframe	SNA	SNA
Applications Supported	Host virtual disk	Access to host-resident programs, Hawkeye email	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	TTY, DEC VT52/100, VT200 Series, Tektronix 4010, 4012 (Graphics)	TTY, IBM DEC VT52/100; DG; HP, Wyse 50, TeleVideo 950, ADDS Regent 60	IBM 327X/317X DFT	IBM 327X/317X DFT
Terminal Functions Supported	Color display, graphics disp., function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, windows, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk
Number of Concurrent Sessions	1	2	5, 20, 40	5
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	No	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	Coax	Coax
Transmission Moc Transmission Speed (bps)	Asynchronous 300, 600, 1200, 2400, 4800, 9600, 19.2K	Asynchronous 300, 1200, 2400, 9600, 19.2K	Synchronous 2.4M	Synchronous 2.4M
Communications Features	Dialing directory, auto dial/redial, auto answer, macros, unattended execution	Dialing directory, auto dial/redial, auto answer, macros, unattended execution	Not applicable	Not applicable
USER INTERFACE	Install, on-line help, command driven, on-line tutorial, menu driven	Install, menu driven	Install, command driven	Install, command driven
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	Kermit	Vendor did not specify	IBM API, proprietary	IBM API, proprietary
MICROCOMPUTER SECURITY	Interface to host software	Single level password, interface to host software; transmission/file encryption	Interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	169	99	1,595 (5 LUs), 2,595 (20 LUs), 3,595 (40	995
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	1,500	Not applicable	Not applicable
Date of First Delivery	February 1982	November 1978	October 1987	October 1988
Number Installed to Date	15,000	Over 100,000	Vendor did not specify	Vendor did not specify
Warranty	30 days, 1 free BBS support	30 days	1 year	1 year
Distribution	Vendor did not specify	Direct, dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs
COMMENTS	—	Used for e-mail betw. PCs (or PCs and hosts) by the US Postal Service and jet propulsion labs	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	ICOT Network Systems Division	ICOT Network Systems Division	ICOT Network Systems Division	ICOT Network Systems Division
PRODUCT NAME	netPATH RJE 3770	netPATH SDLC	netPATH X.25 SNA	netPATH/SDLC LOOP Gateway
PRODUCT FUNCTION	Network gateway	Network gateway	Network gateway	Network gateway
USERS SUPPORTED	Multiuser, 6	Multiuser, 8 to 128	Multiuser, 8 to 32	Multiuser, 8 to 32
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	ARCnet, Ethernet, Token-Ring, STARLAN, Vines	ARCnet, Ethernet, Token-Ring, STARLAN, Vines	ARCnet, Ethernet, Token-Ring, STARLAN, Vines	ARCnet, Ethernet, Token-Ring, STARLAN, Vines
MINIMUM MEMORY REQUIRED (KB)	256	256 to 512	Vendor did not specify	128 (8 LUs), 256 (32 LUs)
HOST INTERFACE Systems Supported	IBM 43XX/30XX, AS/400	IBM 43XX/30XX, AS/400	IBM 43XX/30XX, System/36/38, AS/400	IBM 8100
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM DPPX/DPCX
Protocols	RJE	SNA, SDLC	SNA, HDLC, X.25	SDLC, Token loop
Applications Supported	Host virtual disk	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 3770	IBM 327X/317X CUT	IBM 327X/317X CUT	IBM 327X/317X CUT
Terminal Functions Supported	Color display, function keys, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, user-def. keyboard mapping, host printer emulation, print to disk	Color display, function keys, character attributes, user-def. keyboard mapping, host printer emulation, print to disk
Number of Concurrent Sessions	6	8 to 128 LUs	8 to 32	8, 16, 32
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	9600	9600, 19.2K, 56K	19.2K	19.2K, 38.4
Communications Features	Auto dial/redial	Auto dial/redial	Vendor did not specify	Macros
USER INTERFACE	Install, menu driven	Install, menu driven	Install, on-line help, menu driven	Install, on-line help, menu driven
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, proprietary	IBM API, proprietary	IBM API, proprietary	IBM API, proprietary
MICROCOMPUTER SECURITY	Interface to host software	Interface to host software	Interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	1,595	1,595 (8 LUs), 6,595 (128 LUs)	1,595 (8 LUs), 3,595 (32 LUs)	3,595 (8 LUs), 4,295 (16 LUs), 5,595 (32 LUs)
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	June 1986	August 1986	July 1987	October 1985
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	1 year	1 year	1 year
Distribution	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	ICOT Network Systems Division	ICOT Network Systems Division	ICOT Network Systems Division	ICOT Network Systems Division
PRODUCT NAME	pcPATH 3270 Bisynch	pcPATH 3270	pcPATH 5250	pcPATH RJE 2780/3780
PRODUCT FUNCTION	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation	Loc/rem terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	Vendor did not specify	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	256	128 to 256	256	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX, AS/400	IBM 43XX/30XX	IBM System/36-38, AS/400	IBM 43XX/30XX, AS/400
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM TSO, 36/38 SP/CP	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400
Protocols	BSC	SNA, SDLC	Vendor did not specify	RJE
Applications Supported	Access to host-resident programs	Access to host-resident programs	Vendor did not specify	Vendor did not specify
EMULATION Terminals/Controllers Emulated	IBM 327X/317X CUT	IBM 327X/317X CUT	IBM 5250 Series	IBM 2780/3780
Terminal Functions Supported	Color display, graphics disp., function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, function keys, character attributes, user-def. keyboard mapping, host printer emulation
Number of Concurrent Sessions	5	3 to 5	5	1
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	9600	19.2K	9600	9600
Communications Features	Auto dial/redial	Auto dial/redial	Auto dial/redial	Auto dial/redial
USER INTERFACE	Install, menu driven	Install, on-line help, menu driven	Install, menu driven	Install, menu driven
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, proprietary	IBM API, proprietary	IBM API, proprietary	IBM API, proprietary
MICROCOMPUTER SECURITY	Interface to host software	Interface to host software	Interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	750	750 to 890	695	595
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	October 1983	October 1983	November 1983	October 1983
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	1 year	1 year	1 year
Distribution	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	ICOT Network Systems Division	ICOT Network Systems Division	ICOT Network Systems Division	ICOT Network Systems Division
PRODUCT NAME	pcPATH RJE 3770	pcPATH X.25 OSI	pcPATH X.25 SNA	pcPATH/SDLC LOOP Adapter
PRODUCT FUNCTION	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation	Local terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Not applicable	Not applicable	Not applicable
MINIMUM MEMORY REQUIRED (KB)	256	128	128	128
HOST INTERFACE Systems Supported	IBM 43XX/30XX, AS/400	Any X.25	IBM 43XX/30XX, System/36/38, AS/400	IBM 8100
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	Not applicable	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM DPPX/DPCX
Protocols	RJE	X.25	SNA, HDLC, X.25	SDLC, Token loop
Applications Supported	Host virtual disk	Application specific	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 3770	Application specific	IBM 327X/317X CUT	IBM 327X/317X CUT
Terminal Functions Supported	Color display, function keys, host printer emulation	Color display, function keys, character attributes, user-def. keyboard mapping, host printer emulation, print to disk	Color display, function keys, user-def. keyboard mapping, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, user-def. kybd. map, host printer emulation, print to disk
Number of Concurrent Sessions	6	Vendor did not specify	3	3
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	9600	19.2K	19.2K	19.2K, 38.4
Communications Features	Auto dial/redial	Auto dial/redial	Auto dial/redial	Macros
USER INTERFACE	Install, menu driven	Vendor did not specify	Install, on-line help, menu driven	Install, on-line help, menu driven
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, proprietary	IBM API, proprietary	IBM API, proprietary	IBM API, proprietary
MICROCOMPUTER SECURITY	Interface to host software	Interface to host software	Interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	890	595	850	1,275
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	October 1983	March 1988	March 1985	March 1984
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	1 year	1 year	1 year
Distribution	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	ICOT Network Systems Division	ICOT Network Systems Division	ICOT Network Systems Division	Information Builders
PRODUCT NAME	ShortCUT	ShortCUT/DFT Gateway	ShortCUT/DFT	PC Focus
PRODUCT FUNCTION	Local terminal emulation	Network gateway	Local terminal emulation	Loc/rem terminal emulation, host application specific link
USERS SUPPORTED	Single user	Multiuser, 5	Single user	Single user, multiuser
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software
COPY PROTECTED	No	No	No	Yes
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	OS/2, MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Not applicable	ARCnet, Ethernet, Token-Ring, STARLAN, Vines	Not applicable	Ethernet, Token-Ring, 3Com, Banyan Vines, Novell, PC-NET
MINIMUM MEMORY REQUIRED (KB)	128	256	256	640
HOST INTERFACE Systems Supported	IBM 43XX/30XX, AS/400	IBM 43XX/30XX, AS/400	IBM 43XX/30XX, AS/400	IBM 43XX/30XX; DEC VAX; UNIX-based systems
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM MVS, VM, TSO, CMS, IMS, CICS; VAX/VMS; UNIX System 5
Protocols	SNA	SNA	SNA	BSC, SNA, SDLC
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 327X/317X CUT	IBM 327X/317X DFT	IBM 327X/317X DFT	IBM 327X/317X CUT, DEC VT52/100, VT200 Series, VT300 Series
Terminal Functions Supported	Color display, graphics disp., function keys, character attributes, windows, user-def. keyboard mapping	Color display, graphics disp., function keys, character attributes, windows, user-def. keyboard mapping, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, windows, user def. keyboard mapping, host printer emulation, print to disk	Color display, graphics disp., function keys, character attributes, windows, user-defined keyboard mapping
Number of Concurrent Sessions	1	5	5	1
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax	Coax	Coax	Coax, RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Asynchronous, synchronous
Transmission Speed (bps)	2.4M	2.4M	2.4M	300, 600, 1200, 2400, 4800, 9600
Communications Features	Not applicable	Not applicable	Not applicable	Dialing directory, auto dial/redial, auto answer, macros, unattended execution
USER INTERFACE	Install, on-line help, command driven, on-line tutorial, menu driven	Install, on-line help, menu driven	Install, on-line help, command driven, menu driven	Install, on-line help, mouse, command driven, on-line tutorial, graphic icons, windows, diagnostics
PROGRAMMING FEATURES Programmability	Vendor did not specify	Yes	Yes	Yes
API Compatibility	IBM API, DCA IRMA API, Software dependent	IBM API, proprietary	IBM API, proprietary	Proprietary
MICROCOMPUTER SECURITY	Not applicable	Interface to host software	Not applicable	Multilevel password, file encryption
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	300 (s), 595 (h)	1,495	895	795 to 1,295
Standalone Hardware ($)	795 for standalone package	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	August 1988	November 1988	September 1988	Vendor did not specify
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	90,000
Warranty	1 year	1 year	1 year	90 days
Distribution	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, VARs
COMMENTS	Runs IBM and IRMA E78 terminal emulation and ICOT CUT-mode software	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Innovative Electronics	Intelligent Technologies	Intelligent Technologies	Intelligent Technologies
PRODUCT NAME	Netmaster System	Bisync 3780 Exchange	Gateway Exchange	Modem Exchange
PRODUCT FUNCTION	Host application specific link	Remote terminal emulation	Network gateway	Remote terminal emulation
USERS SUPPORTED	Multiuser, 4	Single user	Multiuser, 64	Single user
COMPONENTS	PC software, PC hardware, host software	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	Yes	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS, UNIX	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	STARLAN	Vendor did not specify	ARCnet, Ethernet, STARLAN, any NETBIOS compatible network	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	Vendor did not specify	256	256/server, 128/wkstation.	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX, System/36/38	IBM 43XX/30XX; Data General Systems; DEC VAX, DECsystem, Any system supporting 2780/37280 applications	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	IBM MVS, CICS; UNIX System 5	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP; DG AOS, JES II/III	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	SNA	BSC	SNA, SDLC	SNA, SDLC
Applications Supported	Vendor did not specify	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs
EMULATION Terminals/Controllers Emulated	Vendor did not specify	IBM 2780/3780	IBM 327X/317X DFT	IBM 327X/317X DFT
Terminal Functions Supported	Color display, graphics disp., function keys, windows, user-def. keyboard mapping, host printer emul., print to disk	Color display, function keys, user-def. keyboard mapping, host printer emulation	Color display, character attributes, host printer emulation	Color display, function keys, character attributes, user-def. keyboard mapping, host printer emulation, print to disk
Number of Concurrent Sessions	Vendor did not specify	1	64	8
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	No	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Asynchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	9600	300 to 56K	2400, 4800, 9600, 14.4K, 19.2K	4800, 9600
Communications Features	Auto dial/redial	Auto dial/redial, auto answer, macros, unattended execution	Dialing directory, auto dial/redial, auto answer, macros	Dialing directory, auto dial/redial, auto answer, macros
USER INTERFACE	Menu driven	Install, command driven, menu driven	Install, command driven, menu driven, diagnostics	Install, command driven, menu driven, diagnostics
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	Proprietary	Proprietary	IBM API	Proprietary
MICROCOMPUTER SECURITY	Multilevel password	Interface to host software	Interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	10,500 (s) 5,000 (h)	695 for PC/AT version, 795 for PS/2 MCA version	1,995 for PC/AT version, 2,495 for PS/2 MCA	Contact Vendor
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	108,000	Not applicable	Not applicable	Not applicable
Date of First Delivery	August 1983	January 1984	August 1987	August 1985
Number Installed to Date	20	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	90 days	90 days	90 days
Distribution	Direct	Direct, OEMs, VARs	Direct, OEMs, VARs	Direct, OEMs, VARs
COMMENTS	For retail industry; in-store processing and point-of-sale processing	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Intelligent Technologies	Intercomputer Communications Corp. (ICC)	Intercomputer Communications Corp. (ICC)	International Business Machines Corp. (IBM)
PRODUCT NAME	SNA Exchange	ICC/Intercom 102	ICC/Intercom 500	3270 Workstation Program (1.1)
PRODUCT FUNCTION	Remote terminal emulation	Loc/rem terminal emulation	Loc/rem terminal emulation	Local terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software	PC software, PC hardware	PC software
COPY PROTECTED	No	Yes	Yes	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS, UNIX	MS-/PC-DOS, UNIX	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	ARCnet, Ethernet, STARLAN	Token-Ring, STARLAN, 3Com, Novell	Token-Ring, STARLAN, 3Com, Novell	Token-Ring, IBM PC Network
MINIMUM MEMORY REQUIRED (KB)	256	256	256	384 to 640
HOST INTERFACE Systems Supported	IBM 43XX/30XX	Vendor did not specify	Vendor did not specify	IBM 43XX/30XX
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	Unisys	Unisys	IBM MVS, VM, TSO, CMS, CICS
Protocols	BSC, SNA, SDLC	Unisys Poll Select	Unisys	SNA
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Vendor did not specify	Host virtual disk, ECF
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT	Unisys	Unisys	IBM 327X/317X DFT, 327X/317X CUT
Terminal Functions Supported	Color display, function keys, character attributes, host printer emulation, print to disk	Color display, graphics disp., function keys, user-def. keyboard mapping, print to disk	Color display, graphics disp., function keys, user-def. keyboard mapping, print to disk	Color display, graphics disp., function keys, windows, user-defined keyboard mapping
Number of Concurrent Sessions	8	Vendor did not specify	Vendor did not specify	6 PC, 4 host
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C, TDI	RS-232-C	Coax, Token-ring, PC Net
Transmission Mode	Synchronous	Asynchronous, synchronous	Synchronous	Asynchronous
Transmission Speed (bps)	1200, 2400, 4800, 9600, 14.4K, 19.2K	2400, 4800, 9600, 19.2K, up to 38.4	300, 1200, 2400, 4800, 9600, 19.2K	Vendor did not specify
Communications Features	Dialing directory, auto dial/redial, auto answer, macros	Vendor did not specify	Vendor did not specify	Vendor did not specify
USER INTERFACE	Install, command driven, menu driven, diagnostics	Install, on-line help, command driven, menu driven, diagnostics	Install, on-line help, menu driven, diagnostics	Install, mouse, command driven, on-line tutorial, menu driven, windows
PROGRAMMING FEATURES Programmability	Yes	No	No	Yes
API Compatibility	IBM API	IPIF	IPIF	IBM API, IBM LU 6.2, IBM HLLAPI
MICROCOMPUTER SECURITY	Interface to host software	Single level password	Single level password	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	895 for PC/AT version, 995 for PS/2 MC	Starts at 295	295 (s), 295 (h)	495
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	May 1985	1983	Vendor did not specify	December 1987
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	90 days	30 days	30 days	90 days
Distribution	Direct, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail
COMMENTS	—	—	—	Product number 75x1088

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	International Business Machines (IBM)	International Business Machines (IBM)	International Business Machines (IBM)	International Business Machines (IBM)
PRODUCT NAME	AS/400 PC Support	Enhanced 5250 Display Station Emulation Adapter Kit	Enhanced 5250 Emulation Program (2.12)	FTTERM PC/Host File Transfer Program, V2
PRODUCT FUNCTION	Loc/rem terminal emulation	Local terminal emulation	Local/remote terminal emulation	Local/remote terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software, host software	PC software, PC hardware	PC software	PC software
COPY PROTECTED	No	No	Vendor did not specify	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA,; IBM Rolm CBXs
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Token-Ring	Vendor did not specify	Token-Ring	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	512 (640 recommended)	256	256, less than 70 res. req.	256
HOST INTERFACE Systems Supported	IBM System/36/38, AS/400	IBM System/36/38, AS/400	IBM System/36/38, AS/400	IBM 43XX/30XX; DEC: VAX, Any ASCII host supporting DEC VT 100/220, IBM 3101
Software Environment	IBM OS/400	OS/400, CPF, SCP	IBM OS/400, System/36 SCP, System/38 CPF	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS; VAX/VMS, IBM VSE; ASCII hosts supporting DEC (VT), IBM 3101
Protocols	SNA, SDLC, T1P1	Twinax protocol	T1P1 (twinax)	SNA, (Async to ASCII host and PC-to-PC)
Applications Supported	Host virtual disk, shared folders	Access to host-resident programs, host virtual disk host software	Access to host-resident programs, virtual disk drives on host	IBM 3270 File Transfer, host programs (IND$FILE)
EMULATION Terminals/Controllers Emulated	IBM 5250 Series	IBM 5250 Series	IBM 5250 Series	TTY, IBM 327X/317X CUT, DEC VT52/100, VT200 Series, IBM 3101
Terminal Functions Supported	Color display, graphics display, function keys, user-defined keyboard map, host printer emulation	Color display, graphics display, function keys, user-defined keyboard map, host printer emulation, windowing w/Session Manager PRPQ	Graphics display, function keys user-defined keyboard map, host printer emulation, windowing w/Session Manager PRPQ	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	5	2 PUs; 5 LUs on AS/400	2	1 host and 1 DOS (concurr.)
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Twinax, RS-232-C, Token-ring	Twinax, twisted pair, ECL	Twinax	RS-232-C, RS-422 via 3708
Transmission Mode	Synchronous	Synchronous	Synchronous	Asynchronous
Transmission Speed (bps)	19.2K, 4M LAN	1M	1M	300 to 19.2K
Communications Features	Auto dial/redial	Unattended execution, direct connection	Unattended execution	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.
USER INTERFACE	Install, on-line help, command driven, menu driven, windows	Install, command driven, menu driven, diagnostics	Install, command driven, menu driven, diagnostics	On-line help, command driven, menu driven, windows
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Vendor did not specify
API Compatibility	IBM LU 6.2, proprietary	IBM API, IBM LU 6.2, proprietary	IBM API, proprietary	IBM API, HLLAPI (built into product)
MICROCOMPUTER SECURITY	1 level password, interface to host software, transmission encryption	Interface to host software	Interface to host software	Multilevel password, protocol converter and host password security
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	Contact vendor	595 (card, diagnostics, manual)	160	145 (quantity), 108 (addl. licenses)
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Contact vendor	Not applicable	Not applicable	Not applicable
Date of First Delivery	Vendor did not specify	April 1985	April 1985	July 1988
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	Vendor did not specify	1 year	Vendor did not specify	90 days, media and program
Distribution	Direct, dist., dealers, retail, VARs	Direct, dist., dealers, retail, VARs	Direct, dist., dealers, retail, VARs	Direct, dist., dealers, retail, VARs
COMMENTS	Prod. #9406 for high end; prod. #9404 for low-end version	Prod. #2911; part of Convenience Kit #2910	Product #2912; part of Convenience Kit #2910	Product # 75X3-286; supports all IBM 3270 protocol converters

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	International Business Machines (IBM)	International Business Machines (IBM)	International Business Machines (IBM)	International Business Machines (IBM)
PRODUCT NAME	IBM Enhanced 5250 Emulation Convenience Kit	IBM PC 3270 Emulation Program (3.0)	IBM PC 3270 Emulation Program, Entry Level (1.2)	System 36/38 Workstation Emulation Adapter
PRODUCT FUNCTION	Local terminal emulation	Local/remote terminal emulation, network gateway	Local terminal emulation	Local terminal emulation
USERS SUPPORTED	Single user	Single user; multiuser, 32 (gateway)	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software	PC software	PC hardware
COPY PROTECTED	Vendor did not specify	No	No	Not applicable
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PS/2 MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	PC-DOS	PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	IBM Token-Ring, IBM PC Network	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	256, less than 70 res. req.	256	128	384, less than 100 res. req.
HOST INTERFACE Systems Supported	IBM System/36/38, AS/400	IBM 43XX/30XX	IBM 43XX/30XX	IBM System/36/38
Software Environment	IBM OS/400, System/36 SCP, System/38 CPF	IBM MVS, VM, TSO, CMS, CICS	IBM MVS, VM, TSO, CMS, CICS	IBM OS/400, System/36 SCP, System/38 CPF
Protocols	T1P1 (twinax)	SNA, SDLC, BSC*	BSC, SNA, SDLC, 3X74 controller dep., SLHA	T1P1 (twinax)
Applications Supported	Access to host-resident programs, virtual disk drives on host	Host virtual disk, IBM ECF	Host virtual disk, access to host-resident programs, ECF	Access to host-resident programs, virtual disk drives on host
EMULATION Terminals/Controllers Emulated	IBM 5250 Series	IBM 327X/317X DFT, 3x74 SDLC, Token-Ring, PC Network	IBM 327X/317X CUT	IBM 5250 Series
Terminal Functions Supported	Color display, graphics display, function keys, user-defined keyboard. map, host printer emulation, windowing w/Session Manager PRPQ	Color display, graphics display, function keys, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, user-defined keyboard map	Color display, graphics display, function keys, user-defined keyboard map, host printer emulation, windowing w/Session Manager PRPQ
Number of Concurrent Sessions	2	1 PC, 2 host	1 PC, 1 host	4 PUs, 5 LUs w/ AS/400
DOS Access During Session	Vendor did not specify	Yes	Yes	Vendor did not specify
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Twinax, twisted pair, ECL	Coax, SDLC, Token-Ring, PC Network	Coax	Twinax, twisted pair, ECL
Transmission Mode	Synchronous	Synchronous	Vendor did not specify	Synchronous
Transmission Speed (bps)	1M	2400 to 19.2K (SDLC), IBM Token-Ring & PC Network	Coax	1M
Communications Features	Unattended execution	Auto answer	Vendor did not specify	Unattended execution
USER INTERFACE	Install, command driven, menu driven, diagnostics	Install, command driven, menu driven, diagnostics	Install, command driven, menu driven	Install, command driven, menu driven, diagnostics
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, IBM LU 6.2, proprietary	IBM API, SRPI (IBM ECF)	IBM HLLAPI	IBM API, IBM LU 6.2, proprietary
MICROCOMPUTER SECURITY	Interface to host software	Interface to host software	Interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	845	495	325	620
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	April 1985	January 1987	September 1987	December 1987
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	90 days	90 days	1 year
Distribution	Direct, dist., dealers, retail, VARs	Direct, dist., dealers, retail	Direct, dist., dealers, retail	Direct, dist., dealers, retail, VARs
COMMENTS	Product #2910	Product number 59X9969; *BSC support if linked to a 3X74 using BSC	Product number 75x1085	Prod. #69x6-279; Convenience Kit hardware & software # 69x6-287

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	International Business Machines (IBM)	JDS MicroProcessing	KEA Systems	KEA Systems
PRODUCT NAME	System/36 PC Support/36	HYDRA	PowerStation 220	PowerStation 240
PRODUCT FUNCTION	Local/remote terminal emulation	Local terminal emulation, standalone protocol converter, host application specific link	Local/remote terminal emulation	Local/remote terminal emulation
USERS SUPPORTED	Single user	Multiuser, up to 64	Single user	Single user
COMPONENTS	PC software, host software	Standalone hardware	PC software	PC software
COPY PROTECTED	No	Yes	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, PC Portable	Macintosh, IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	Vendor did not specify	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Token-Ring	All providing HYDRA receive data in ASCII format from the LAN	Ethernet, Token-Ring	Token-Ring
MINIMUM MEMORY REQUIRED (KB)	512 (640 recommended)	Vendor did not specify	256	360
HOST INTERFACE Systems Supported	IBM System/36/38	IBM 43XX/30XX, AS/400, IBM 9370	DEC VAX, DECsystem; UNIX-based systems, any with async terminal interface	DEC VAX; UNIX-based systems, Any with async terminal interface
Software Environment	System/36 SSP	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	VAX/VMS; UNIX System 5; Berkeley 4.X BSD, Any wuth async terminals	VAX/VMS; UNIX System 5; Berkeley 4.X BSD, any using async terminals
Protocols	SNA, SDLC, T1P1	BSC, SNA	TCP/IP, DEC LAT	TCP/IP, DEC LAT
Applications Supported	Host virtual disk, shared folders	Not applicable	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 5250 Series	IBM 327X/317X DFT	TTY, DEC VT52/100, VT200 Series, VT300 Series, IBM 3101 Mod 1	TTY, DEC VT52/100, VT200 Series, VT300 Series
Terminal Functions Supported	Color display, graphics display, function keys, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, character attributes, windows, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	5 (1 printer)	1	2	4
DOS Access During Session	Yes	No	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	No	No
COMMUNICATIONS CHAR. Physical Connection	Twinax, RS-232-C, Token-Ring	RS-232-C, twisted pair	Coax, RS-232-C	Coax
Transmission Mode	Synchronous	Asynchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	19.2K, 4M LAN	300, 1200, 2400, 4800, 9600, 38.4K	300, 600, 1200, 2400, 4800, 9600, Up to 115	Up to 115
Communications Features	Auto dial/redial	Dialing directory, auto dial/redial, macros	Dialing directory, auto dial/redial, auto answer, macros	Dialing directory, auto dial/redial, auto answer, macros
USER INTERFACE	Install, on-line help, command driven, menu driven, windows	Menu driven, diagnostics	On-line help, command driven, menu driven	On-line help
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM LU 6.2, proprietary	Vendor did not specify	DEC PSCA, UB Net/One, Bridge, BAPI	DEC, PCSA, UB Net/One, Bridge, BAPI
MICROCOMPUTER SECURITY	1 level password, interface to host software, transmission encryption	Multilevel password, interface to host software, call-back security, positive logoff security	Not applicable	Not applicable
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	Contact vendor	Not applicable	Standard 289, Gold Model 319	Standard 435, Gold Model 465
Standalone Hardware ($)	Not applicable	Starts at 4,900	Not applicable	Not applicable
Host Software/Hardware ($)	Contact vendor	Not applicable	Not applicable	Not applicable
Date of First Delivery	Vendor did not specify	April 1983	August 1987	November 1987
Number Installed to Date	Vendor did not specify	1,500	2,200	2,000
Warranty	Vendor did not specify	90 days	90 days	90 days
Distribution	Direct, dist., dealers, retail, VARs	Dist., dealers, retail, OEMs	Direct	Direct
COMMENTS	Product number 5727-WS1	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	KEA Systems	KEA Systems	KEA Systems	KEA Systems
PRODUCT NAME	ZSTEM 100	ZSTEM 220	ZSTEM 240	ZSTEM 4014
PRODUCT FUNCTION	Local/remote terminal emulation	Local/remote terminal emulation	Local/remote terminal emulation	Local/remote terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software	PC software	PC software	PC software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Ethernet	Ethernet	Token-Ring	Ethernet
MINIMUM MEMORY REQUIRED (KB)	192	256	360	192
HOST INTERFACE Systems Supported	DEC VAX; UNIX-based systems, any with async terminal interface	DEC VAX; UNIX-based systems, any with async terminal interface	DEC VAX; UNIX-based systems, Any with async terminal interface	Vendor did not specify
Software Environment	VAX/VMS; UNIX System 5; Berkeley 4.X BSD, Any using async terminals	VAX/VMS; UNIX System 5; Berkeley 4.X BSD, Any using async terminals	VAX/VMS; UNIX System 5; Berkeley 4.X BSD, any using async terminals	VAX/VMS; UNIX System 5; Berkeley 4.X BSD, Any using async terminals
Protocols	TCP/IP, DEC LAT	TCP/IP, DEC LAT	TCP/IP, DEC LAT	TCP/IP, DEC LAT
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	TTY, DEC VT52/100	TTY, DEC VT52/100, VT200 Series, VT300 Series, IBM 3101 Mod 1	TTY, DEC VT52/100, VT200 Series, VT300 Series	TTY, Tektonix 4014, 4010
Terminal Functions Supported	Color display, graphics display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	1	2	4	1
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	Vendor did not specify
File Conversion	No	No	No	No
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	Coax	Coax	RS-232-C
Transmission Mode	Asynchronous	Asynchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	Up to 115	Up to 115	Up to 115	300, 600, 1200, 2400, 4800, 9600, 19.2K, 2.4M
Communications Features	Dialing directory, auto dial/redial, auto answer, macros	Dialing directory, auto dial/redial, auto answer, macros	Dialing directory, auto dial/redial, auto answer, macros	Not applicable
USER INTERFACE	On-line help	On-line help	On-line help	On-line help
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	No
API Compatibility	Not applicable	DEC, PCSA, UB Net/One, Bridge, BAPI	DEC, PCSA, UB Net/One, Bridge, BAPI	Not applicable
MICROCOMPUTER SECURITY	Not applicable	Not applicable	Not applicable	Not applicable
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	99	Contact vendor	295	99
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	August 1984	November 1986	November 1987	January 1986
Number Installed to Date	34,376	15,278	9,453	5,000
Warranty	30 days	30 days	Vendor did not specify	30 days
Distribution	Direct	Direct	Direct	Direct
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	KEA Systems	KMW Systems	Laguna Laboratories	Laguna Laboratories
PRODUCT NAME	ZSTEM D400	Series II Twinax	123/X	DBA/36
PRODUCT FUNCTION	Local/remote terminal emulation	Standalone protocol converter	File transfer system	Database access package
USERS SUPPORTED	Single user	Multiuser, 7	Single user	Multiuser, host CPU
COMPONENTS	PC software	PC software, standalone hardware	PC software, host software	PC software, host software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Macintosh, IBM PC/XT/AT & compatibles	Vendor did not specify	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	Not applicable	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Token-Ring	Vendor did not specify	ARCnet, Ethernet, Token-Ring, STARLAN	Not applicable
MINIMUM MEMORY REQUIRED (KB)	256	Not applicable	80	80
HOST INTERFACE Systems Supported	DEC VAX; UNIX-based systems, any with async terminal interface	IBM System/36/38, AS/400	IBM System/36/38, AS/400	IBM System/36/38
Software Environment	VAX/VMS; UNIX System 5; Berkeley 4.X BSD, Any using async terminals	IBM MVS, VM, IMS, OS/400	IBM SSP, OS/400	IBM DOS
Protocols	TCP/IP, DEC LAT	SNA	Not applicable	Not applicable
Applications Supported	Access to host-resident programs	Access to host-resident programs	Not applicable	Not applicable
EMULATION Terminals/Controllers Emulated	DG	IBM 5250 Series	Not applicable	Not applicable
Terminal Functions Supported	Graphics display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk	Character attributes, host printer emulation	Not applicable	Not applicable
Number of Concurrent Sessions	1	Up to 7	Not applicable	Not applicable
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII	ASCII	ASCII, binary
File Conversion	No	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax	Twinax, RS-232-C, parallel	Not applicable	Not applicable
Transmission Mode	Asynchronous	Asynchronous	Not applicable	Not applicable
Transmission Speed (bps)	Up to 115	19.2K	Not applicable	Not applicable
Communications Features	Dialing directory, auto dial/redial, auto answer, macros	Vendor did not specify	Not applicable	Not applicable
USER INTERFACE	On-line help	Diagnostics	Install, on-line help, command driven, on-line tutorial, menu driven, windows	Install, on-line help, command driven, on-line tutorial, menu driven, windows
PROGRAMMING FEATURES Programmability	Yes	Yes	No	No
API Compatibility	UB Net/One	IBM API	IBM API	IBM API
MICROCOMPUTER SECURITY	Not applicable	Interface to host software	1 level password	Multilevel password, transmission encryption
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	160	Included with purchase	250	Not applicable
Standalone Hardware ($)	Not applicable	1,495 to 3,595	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	1,195
Date of First Delivery	April 1988	1986	Vendor did not specify	November 1987
Number Installed to Date	9,453	Vendor did not specify	75,000	75,000
Warranty	Vendor did not specify	90 days	30 days	30 days
Distribution	Direct	Direct, dist., dealers, retail	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	Allows transfer of data between the S/3X-ACS/400 and Lotus Symphony	Database access system for System/36-to-PC data integration

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Laguna Laboratories	Mackensen	Management Science America	McCormack & Dodge
PRODUCT NAME	Hands Off!	File Transfer System	ExpertLink	PC Link 3.0
PRODUCT FUNCTION	File transfer automation pkg	Network gateway, host application specific link, non-host application specific link	Local/remote terminal emulation, host application specific link	Host application specific link
USERS SUPPORTED	Single user	Single user, multiuser, up to mainframe capacity	Single user	Multiuser, (can run on gateway)
COMPONENTS	PC software	PC software, host software	PC software, host software	PC software, host software
COPY PROTECTED	No	No	Yes	Yes
MICROCOMPUTERS SUPPORTED	Vendor did not specify	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	OS/2, MS-/PC-DOS	Vendor did not specify	OS/2, MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Not applicable	Ethernet, Token-Ring, NETBIOS-compatible LANs	Token-Ring	NETBIOS-compat. LANs
MINIMUM MEMORY REQUIRED (KB)	50	192	256	Vendor did not specify
HOST INTERFACE Systems Supported	IBM System/36/38, AS/400	IBM 43XX/30XX	Vendor did not specify	IBM 43XX/30XX
Software Environment	IBM DOS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, CMS, CICS	IBM DOS, MVS, CICS
Protocols	Vendor did not specify	BSC, SNA, SDLC	SNA	SNA, SDLC
Applications Supported	Unattended file transfers	Access to host-resident programs, custom user API	Vendor did not specify	Vendor did not specify
EMULATION Terminals/Controllers Emulated	Not applicable	Not applicable	Vendor did not specify	IBM 327X/317X DFT, 327X/317X CUT
Terminal Functions Supported	Not applicable	Not applicable	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, windows, user-defined keyboard map
Number of Concurrent Sessions	Not applicable	Not applicable	Vendor did not specify	5
DOS Access During Session	Yes	Vendor did not specify	Vendor did not specify	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII	ASCII
File Conversion	Yes	No	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Not applicable	Coax, any connection supported by hardware	Coax	Coax
Transmission Mode	Vendor did not specify	Synchronous	Asynchronous, synchronous	Asynchronous
Transmission Speed (bps)	Not applicable	Any speed supported by hardware	300 to 9600	1200, 2400
Communications Features	Not applicable	Macros, unattended execution, scripting facility, host-command passthrough	Dialing directory, auto dial/redial	Delayed script
USER INTERFACE	Install, command driven	Command driven, menu driven, windows, diagnostics	Install, on-line help, menu driven, windows	Install, on-line help, menu driven, windows
PROGRAMMING FEATURES Programmability	No	Yes	No	Yes
API Compatibility	IBM API	IBM API, DCA IRMA API, IBM LU 6.2, proprietary	IBM API, DCA IRMA API	IBM API, DCA IRMA API, Novell (CXI), Renex
MICROCOMPUTER SECURITY	Interface to host software	Interface to host software	Vendor did not specify	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	250	150	Contact vendor	1,100 (90,000 per site license)
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	20,00 to 85,000	Contact vendor	35,000
Date of First Delivery	Vendor did not specify	June 1983	Vendor did not specify	1983
Number Installed to Date	75,000	85,614	2,000	Over 7,000
Warranty	30 days	1 year	Vendor did not specify	Contract-based
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Direct, OEMs, VARs	Direct	Direct
COMMENTS	Automates file transfer between a System/3X and a PC	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	McDonnell Douglas ISC	Micom Communications	Micro DecisionWare	Micro Innovative Technology
PRODUCT NAME	Async-to-3270 XE	MB3 Series	PC/SQL-link	7705 ES
PRODUCT FUNCTION	Network-resident protocol translation w/PC terminal emulation	Local/remote terminal, emulation, standalone protocol converter	Non-host application specific link	Local/remote terminal emulation
USERS SUPPORTED	Multiuser	Multiuser, 4, 10, 16	Single user	Single user, multiuser, unlimited
COMPONENTS	PC software, network software	Standalone hardware	PC software, host software	PC software, host software
COPY PROTECTED	Vendor did not specify	Vendor did not specify	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA	Macintosh, IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Macintosh, IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	OS/2	Not applicable	Macintosh Finder, MS-/PC-DOS	OS/2, MS-/PC-DOS, UNIX, Xenix
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	Ethernet, Token-Ring	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	Vendor did not specify	Vendor did not specify	320	128
HOST INTERFACE Systems Supported	IBM 43XX/30XX, System/36/38, AS/400	IBM 43XX/30XX, AS/400	IBM 43XX/30XX; Honeywell Bull Systems; DEC VAX, Tandem, Teradata, Britton-Lee	Honeywell Bull Systems
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, OS/400	IBM OS/VS, MVS, VM, TSO, CMS, CICS	IBM MVS, VM, TSO, CMS, CICS; VAX/VMS; Honeywell GCOS	Honeywell GCOS
Protocols	BSC, SNA, SDLC	BSC, SNA, HDLC, SDLC	BSC, SDLC, TCP/IP	Honeywell VIP
Applications Supported	Host virtual disk, access to host-resident programs	Vendor did not specify	Not applicable	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	TTY, IBM 327X/317X CUT, DEC VT52/100, VT200 Series	TTY, IBM 327X/317X DFT, DEC VT52/100, VT200 Series, VT300 Series; DG; HP; Honeywell Bull; Unisys	IBM 327X/317X DFT, 327X/317X CUT; Honeywell Bull	Honeywell Bull, VIP 7700/7705
Terminal Functions Supported	Color display, function keys, windows, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation	Color display, windows	Color display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	4	Vendor did not specify	Vendor did not specify	1
DOS Access During Session	Yes	Vendor did not specify	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary, IXF	ASCII, binary
File Conversion	Yes	No	Yes	No
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	Any physical connection	RS-232-C
Transmission Mode	Asynchronous	Asynchronous, synchronous	Asynchronous, synchronous	Synchronous
Transmission Speed (bps)	300, 1200, 2400, 9600	300, 600, 1200, 2400, 4800, 9600, 19.2K	Not applicable	300 to 19.2K
Communications Features	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.	Auto dial/redial	Auto dial/redial, Script language	Macros, unattended execution, background file transfer
USER INTERFACE	Install, on-line help, on-line tutorial, menu driven, windows, diagnostics	On-line help	Install, on-line help, command driven, menu driven, windows	On-line help, mouse, command driven, menu driven, windows
PROGRAMMING FEATURES Programmability	Yes	No	Vendor did not specify	No
API Compatibility	Proprietary	Not applicable	IBM API, DCA IRMA API, IBM LU 6.2	None
MICROCOMPUTER SECURITY	Multilevel password, interface to host software	Not applicable	1 level password, interface to host software, file encryption	None
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	See comments	Not applicable	300 to 500	295 (MS/PC-DOS), 495 (UNIX, 5 users)
Standalone Hardware ($)	Not applicable	Contact vendor	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	5,000 to 33,000	695 (unlimited users)
Date of First Delivery	March 1989	1985	February 1985	December 1988
Number Installed to Date	Not applicable	5,000	80	40
Warranty	Nine-month extended	1 year	90 days, Contract avail.	1 year
Distribution	Direct	Dist., dealers, retail, OEMs, VARs	Direct, OEMs	Direct, mail, OEMs
COMMENTS	300/month; anticipated release date March 1989	BSC and SNA X.25 PADs, BSC and SNA protocol converters, or mix in a single box	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Micro Innovative Technology	Micro Innovative Technology	Micro Innovative Technology	Micro Innovative Technology
PRODUCT NAME	7800 ES	7809 ES	7809/7705 ES	8685 ES
PRODUCT FUNCTION	Local/remote terminal emulation, network gateway	Local/remote terminal emulation, network gateway	Local/remote terminal emulation, network gateway	Local/remote terminal emulation
USERS SUPPORTED	Single user, multiuser, unlimited	Single user, multiuser, unlimited	Single user, multiuser, unlimited	Single user
COMPONENTS	PC software, host software	PC software, host software	PC software, host software	PC software, host software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	OS/2, MS-/PC-DOS, UNIX, Xenix	OS/2, MS-/PC-DOS, UNIX, Xenix	OS/2, MS-/PC-DOS, UNIX, Xenix	OS/2, MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Ethernet, NETBIOS, Novell NetWare, 3Com	Ethernet, NETBIOS LANs, NetWare, 3Com	Ethernet, NETBIOS LANs, NetWare, 3Com	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	192	192	192	128
HOST INTERFACE Systems Supported	Honeywell Bull Systems; DEC VAX, DECsystem; UNIX-based systems	Honeywell Bull Systems; DEC VAX, DECsystem; UNIX-based systems	Honeywell Bull Systems; DEC VAX, DECsystem; UNIX-based systems	DEC VAX, DECsystem, Harris
Software Environment	Honeywell GCOS; UNIX System 5; Berkeley 4.X BSD	VAX/VMS; Honeywell GCOS; UNIX System 5; Berkeley 4.X BSD	VAX/VMS; Honeywell GCOS; UNIX System 5; Berkeley 4.X BSD	UNIX System 5; Berkeley 4.X BSD, Harris VOS
Protocols	Honeywell VIP protocol	Honeywell VIP protocol	Honeywell VIP	None
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	TTY; Honeywell Bull, VIP 7700/7705/7800	TTY; Honeywell Bull, VIP 7809	TTY; Honeywell Bull, VIP 7705/7809	TTY, Harris 8685, Beehive DM-5 family
Terminal Functions Supported	Color display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	1	1	1	1
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	No	No	No	No
COMMUNICATIONS CHAR. Physical Connection	RS-232-C, RS-422, current loop	RS-232-C, RS-422, current loop	RS-232-C, RS-422, current loop	RS-232-C, RS-422, current loop
Transmission Mode	Asynchronous, synchronous	Asynchronous	Asynchronous, synchronous	Asynchronous
Transmission Speed (bps)	300 to 9600	300 to 9600	300 to 9600	300 to 19.2K
Communications Features	Macros, unattended execution, background file transfer	Macros, unattended execution, background file transfer	Macros, unattended execution, background file transfer	Macros, unattended execution, background file transfer
USER INTERFACE	On-line help, mouse, command driven, menu driven, windows	On-line help, mouse, command driven, menu driven, windows	On-line help, mouse, command driven, menu driven, windows	On-line help, mouse, command driven, menu driven, windows
PROGRAMMING FEATURES Programmability	No	No	No	No
API Compatibility	None	Not applicable	None	None
MICROCOMPUTER SECURITY	None	None	None	None
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	395 MS-DOS, 595 UNIX (5 users)	295 (MS/PC-DOS), 495 (UNIX, 5 users)	395 (MS/PC-DOS), 645 (UNIX, 5 users)	395
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	695 (unlimited users)	695 (unlimited users)	695 (unlimited users)	695
Date of First Delivery	December 1988	May 1987	May 1987	May 1987
Number Installed to Date	50	1,400	1,000	1,400
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, mail, OEMs	Direct, mail, OEMs	Direct, mail, OEMs	Direct, mail, OEMs
COMMENTS	Full OAS, color field, and Zenith COM3 support; available on GSA schedule	—	Full OAS, color field, & Zenith Com3 support; on GSA schedule	Mouse & Zenith Com3 support; on GSA schedule; demo disk available

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Micro Innovative Technology	Micro Tempus	Micro Tempus	Micro Tempus
PRODUCT NAME	KATE	Tempus-Access	Tempus-Link	Tempus-Share
PRODUCT FUNCTION	Local/remote terminal emulation	Host application specific link	Host application specific link	Host application specific link
USERS SUPPORTED	Single user, multiuser, unlimited	Multiuser	Multiuser	Multiuser
COMPONENTS	PC software	PC software, host software	PC software, host software	PC software, host software
COPY PROTECTED	No	Yes	Yes (host), no (PC)	Yes
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA
MICROCOMPUTER OP. SYS. SUPPT.	OS/2, MS-/PC-DOS, UNIX, Xenix	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	ARCnet, Token-Ring, NETBIOS and SMB LANs, NetWare, 3Com	ARCnet, Token-Ring, NETBIOS and SMB LANs, NetWare, 3Com	ARCnet, Token-Ring, NETBIOS and SMB LANs, NetWare, 3Com
MINIMUM MEMORY REQUIRED (KB)	192	78	78	78
HOST INTERFACE Systems Supported	IBM 43XX/30XX, System/36/38; Honeywell Bull Systems; DEC VAX, DECsystem; UNIX-based systems	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	IBM DOS, OS/VS, MVS, VM, CMS; VAX/VMS; Honeywell GCOS; UNIX System 5; Berkeley 4.X BSD	IBM DOS, MVS, TSO, CICS	IBM DOS, MVS, VM, TSO, CMS, IMS, CICS; Honeywell GCOS	IBM MVS, TSO
Protocols	Vendor did not specify	BSC, SNA, SDLC	BSC, SNA, SDLC	BSC, SNA, SDLC
Applications Supported	Access to host-resident programs	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs
EMULATION Terminals/Controllers Emulated	TTY, DEC VT52/100; Honeywell Bull, IBM 3101, Lear Siegler ADM 3, TeleVideo 925/950, Wang VS 2110, ANSI	TTY, IBM 327X/317X DFT, 327X/317X CUT, IBM 3101	TTY, IBM 327X/317X DFT, 327X/317X CUT, IBM 3101	TTY, IBM 327X/317X DFT, 327X/317X CUT
Terminal Functions Supported	Color display, function keys, character attributes, windows, user-defined keyboard map, print to disk	Color display, function keys	Color display, function keys	Color display, function keys
Number of Concurrent Sessions	4	Depends on host software	Depends on host software	Depends on host software
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	No	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	Coax, RS-232-C	Coax, RS-232-C	Coax, RS-232-C
Transmission Mode	Asynchronous	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous
Transmission Speed (bps)	300 to 19.2K	300 to 19.2K	300 to 19.2K	300 to 19.2K
Communications Features	Dialing directory, auto dial/redial, auto answer, macros, unattended execution	Vendor did not specify	Vendor did not specify	Vendor did not specify
USER INTERFACE	Install, on-line help, mouse, command driven, on-line tutorial, menu driven, windows	Vendor did not specify	Install, command driven, menu driven, diagnostics	Install, command driven, menu driven, diagnostics
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	Vendor did not specify	IBM API, DCA IRMA API, proprietary, MTI-HAPI	IBM API, DCA IRMA API, IBM LU 6.2, prop., MTI-HAPI	IBM API, DCA IRMA API, IBM LU 6.2, prop., MTI-HAPI
MICROCOMPUTER SECURITY	Multilevel password, transmission/file encryption	Multilevel password	Multilevel password	Multilevel password
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	159	Included in package	Included in package	Included in package
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	11,100 to 37,500	9,800 to 60,000	22,300 to 39,600
Date of First Delivery	March 1985	August 1986	December 1982	July 1987
Number Installed to Date	2,500	10 to 20	Over 2,000	60
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dealers, retail, mail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	Uses virtual disk on mainframe to expand PC functions	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Micro Tempus	MicroGate	MicroGate	MicroGate
PRODUCT NAME	Tempus-Transfer	MicroGate 2780/3780	MicroGate 3270/BSC	MicroGate 3270/SNA
PRODUCT FUNCTION	Host application specific link	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation
USERS SUPPORTED	Multiuser	Vendor did not specify	Vendor did not specify	Vendor did not specify
COMPONENTS	PC software, host software	PC software	PC software, PC hardware	PC software
COPY PROTECTED	Yes	Vendor did not specify	Vendor did not specify	Vendor did not specify
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	ARCnet, Token-Ring, NETBIOS and SMB LANs, NetWare, 3Com	Vendor did not specify	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	78	256	256	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX, System/36/38; Data General Systems; Honeywell Bull Systems; DEC VAX	Vendor did not specify	IBM 43XX/30XX
Software Environment	IBM MVS, TSO, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	BSC, SNA, SDLC	BSC, SDLC	SNA, SDLC	SNA, SDLC
Applications Supported	Host virtual disk, access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	TTY, IBM 327X/317X DFT, 327X/317X CUT, IBM 3101	IBM 2780/3780	IBM 327X/317X CUT	IBM 327X/317X CUT
Terminal Functions Supported	Color display, function keys	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	Depends on host software	2	4	5
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	No	No	No
COMMUNICATIONS CHAR. Physical Connection	Coax, RS-232-C	RS-232-C, SyncLink modem card	RS-232-C, SyncLink modem card	RS-232-C, SyncLink modem card
Transmission Mode	Asynchronous, synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	300 to 19.2K	1200 to 9600 bps	1200 to 9600 bps	1200 to 9600 bps
Communications Features	Vendor did not specify	Auto dial/redial, auto answer	Auto dial/redial, auto answer	Auto dial/redial, auto answer
USER INTERFACE	Install, command driven, menu driven, diagnostics	On-line help, command driven	On-line help, command driven	On-line help, command driven
PROGRAMMING FEATURES Programmability	Yes	Vendor did not specify	Vendor did not specify	Vendor did not specify
API Compatibility	IBM API, DCA IRMA API, proprietary, MTI-HAPI	Proprietary	Proprietary	Proprietary
MICROCOMPUTER SECURITY	Multilevel password	Interface to host software	Interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	Included in package	395 (s), 495 to 995 (h)	395 (s), 495 to 995 (h)	395 (s), 495 to 995 (h)
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	8,300 to 20,600	Not applicable	Not applicable	Not applicable
Date of First Delivery	July 1987	1987	1987	1987
Number Installed to Date	60	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Direct, OEMs, VARs	Direct, OEMs, VARs	Direct, OEMs, VARs
COMMENTS	File transfer tool allows file transfer without using virtual disks	—	Models compatible with AT&T 201, 208 and CCITT V.22, V.26, V.29, and V.32 standards	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	MicroPlot Systems	Modems Plus	Modems Plus	Modems Plus
PRODUCT NAME	PC-Plot-IV Plus	BRITE III/SAC II	BRITE TD	Micro SNAP
PRODUCT FUNCTION	Local terminal emulation	Standalone protocol converter	Standalone protocol converter	Remote terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software	Standalone hardware	Standalone hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Macintosh, IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, any ASCII device	Macintosh, IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, any ASCII device	IBM PC/XT/AT & compatibles, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	Vendor did not specify	Vendor did not specify	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Ethernet	Vendor did not specify	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	256	Vendor did not specify	Vendor did not specify	128
HOST INTERFACE Systems Supported	Vendor did not specify	Burroughs	Burroughs	Any SNA or BSC host
Software Environment	Vendor did not specify	Burroughs	Vendor did not specify	Any IBM 3270, 2780/3780, 3770
Protocols	Vendor did not specify	Burroughs Poll Select	Burroughs Poll Select	BSC, SNA, SDLC
Applications Supported	None	Vendor did not specify	Vendor did not specify	None
EMULATION Terminals/Controllers Emulated	TTY, DEC VT52/100, VT200 Series, VT300 Series	Unisys, Burroughs	Unisys, Burroughs Poll Select	IBM 327X/317X DFT, 2780/3780
Terminal Functions Supported	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	User-defined keyboard map	User-defined keyboard map	Function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	1	1	1	2 LUs
DOS Access During Session	Yes	Vendor did not specify	Vendor did not specify	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII	ASCII	Binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax, RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Asynchronous	Asynchronous, synchronous	Asynchronous, synchronous	Synchronous
Transmission Speed (bps)	300 to 9600K, 19.2K	300 to 19.2K	300 to 19.2K	2400, 4800, 9600, 19.2K
Communications Features	Dialing directory, auto dial/redial, auto answer, macros, script files	Unattended execution	Unattended execution	Unattended execution
USER INTERFACE	Install, on-line help, mouse, command driven, menu driven, diagnostics	Menu driven	Menu driven	On-line help, menu driven, diagnostics
PROGRAMMING FEATURES Programmability	Vendor did not specify	No	No	No
API Compatibility	IBM API	Vendor did not specify	Vendor did not specify	Vendor did not specify
MICROCOMPUTER SECURITY	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	195	Not applicable	Not applicable	995
Standalone Hardware ($)	Not applicable	875	1,470	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	March 1985	1980	1986	June 1987
Number Installed to Date	22,000	Thousands	Hundreds	Hundreds
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dealers, retail, mail	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs
COMMENTS	—	Connects ASCII devices to Burroughs Poll/Select host	Supports formatted Burroughs TD830 screen data on any ASCII CRT devices	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Modems Plus	Modems Plus	Multi-Tech Systems	Multi Soft
PRODUCT NAME	SNAP BSC	SNAP II	MultiCom 3270plus	INFRONT/API
PRODUCT FUNCTION	Standalone protocol converter	Standalone protocol converter	Local terminal emulation	Local/remote terminal emulation, network gateway, non-host application specific link
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	Standalone hardware	Standalone hardware	PC software	PC software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	Any BSC 2780/3780 device	Macintosh, IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, any ASCII device	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	Vendor did not specify	Vendor did not specify	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	Vendor did not specify	ARCnet, Ethernet, Token-Ring, STARLAN
MINIMUM MEMORY REQUIRED (KB)	Vendor did not specify	Vendor did not specify	128	640
HOST INTERFACE Systems Supported	37x5 FEP	37x5 FEP	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	JES 2, JES 3, Power	Any IBM 3270, 3770, 2780/3780	IBM DOS, MVS, VM, TSO, CMS, IBM VSE	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS; VAX/VMS
Protocols	BSC, SNA, SDLC, SNA/SDLC 3770	BSC, SNA, SDLC	BSC, SNA	BSC, SNA, SDLC
Applications Supported	RJE	Any IBM interactive or RJE	Vendor did not specify	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 2780/3780	IBM 327X/317X DFT, 327X/317X CUT, 2780/3780, 3770 RJE	TTY, IBM 327X/317X CUT	Vendor did not specify
Terminal Functions Supported	Vendor did not specify	Function keys, user-defined keyboard map, host printer emulation, print to disk	Function keys, user-defined keyboard map	Color display, function keys, character attributes, user-defined keyboard map
Number of Concurrent Sessions	2 LUs	2 LUs	1	1
DOS Access During Session	Vendor did not specify	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	No
File Formats	Binary	Binary	ASCII, binary	Vendor did not specify
File Conversion	Yes	Yes	Vendor did not specify	No
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	Coax	Coax, RS-232-C
Transmission Mode	Synchronous	Synchronous	Not applicable	Synchronous
Transmission Speed (bps)	1200, 2400, 4800, 9600, 19.2K	2400, 4800, 9600, 19.2K	Not applicable	Vendor did not specify
Communications Features	Unattended execution	Unattended execution	Not applicable	Vendor did not specify
USER INTERFACE	Menu driven	Menu driven, diagnostics	On-line help, menu driven, windows	On-line help, menu driven, windows
PROGRAMMING FEATURES Programmability	No	Vendor did not specify	Yes	Yes
API Compatibility	Vendor did not specify	Vendor did not specify	IBM API	IBM API, DCA IRMA API, ITT, Forte
MICROCOMPUTER SECURITY	Vendor did not specify	Vendor did not specify	1 level password	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	Not applicable	Not applicable	699	100 to 500
Standalone Hardware ($)	1,625	1,395	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	10,000 to 25,000
Date of First Delivery	June 1984	August 1984	September 1987	Vendor did not specify
Number Installed to Date	Thousands	Thousands	500	1,000
Warranty	1 year	1 year	Two years	30 days
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, VARs	Direct, OEMs, VARs
COMMENTS	Converts BSC 2780/3780 into SNA/SDLC 3776	Allows ASCII access to IBM via interactive 3270, RJE 3770, or BSC 2780/3780	—	Supports development of PC-based front-ends for host programs

PC-to-Mainframe Link
Product Comparison Columns

	Multi Soft	Multi Soft	Multi Soft	Network Research
VENDOR NAME	Multi Soft	Multi Soft	Multi Soft	Network Research
PRODUCT NAME	INFRONT/BCF	INFRONT/HPO	SDF	Fusion Network Software
PRODUCT FUNCTION	Non-host application specific link	Non-host application specific link	Non-host application specific link	Local/remote terminal emulation, network gateway, host/non-host application specific link
USERS SUPPORTED	Single user	Single user	Single user	Multiuser
COMPONENTS	PC software, host software	PC software, host software	PC software	PC software, host software
COPY PROTECTED	Not applicable	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS, Xenix
LOCAL AREA NETWORK SUPPORT	ARCnet, Ethernet, Token-Ring, STARLAN	ARCnet, Ethernet, Token-Ring, STARLAN	ARCnet, Ethernet, Token-Ring, STARLAN	Ethernet, Token-Ring, STARLAN
MINIMUM MEMORY REQUIRED (KB)	512	640	640	512
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX; DEC VAX	IBM 43XX/30XX; DEC VAX	Data General Systems; DEC VAX; UNIX-based systems
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS; VAX/VMS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS; VAX/VMS	VAX/VMS; UNIX System 5; Berkeley 4.X BSD
Protocols	BSC, SNA, SDLC	BSC, SNA, SDLC	BSC, SNA	TCP/IP, XNS
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Host virtual disk
EMULATION Terminals/Controllers Emulated	Vendor did not specify	Vendor did not specify	Vendor did not specify	DEC VT52/100
Terminal Functions Supported	Vendor did not specify	Vendor did not specify	Vendor did not specify	Windows
Number of Concurrent Sessions	1	1	1	Vendor did not specify
DOS Access During Session	Yes	Yes	Yes	No
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	No	No	No	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax, RS-232-C	Coax, RS-232-C	Coax, RS-232-C	Coax
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous
Transmission Speed (bps)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Not applicable
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
USER INTERFACE	Command driven	On-line help, command driven, menu driven, windows	On-line help, command driven, menu driven, windows	Install, on-line help, command driven, menu driven
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	Vendor did not specify	IBM API, DCA IRMA API, ITT, Forte	IBM API, DCA IRMA API, ITT, Forte	Vendor did not specify
MICROCOMPUTER SECURITY	Interface to host software	Interface to host software	Interface to host software	1 level password
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	50 to 100	100 to 500	50 to 100	300 to 500
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	4,000 to 15,000	10,000 to 25,000	5,000 to 9,000	450 to 15,000
Date of First Delivery	June 1986	June 1986	September 1987	1982
Number Installed to Date	Vendor did not specify	20	20	Over 10,000
Warranty	30 days	30 days	30 days	90 days
Distribution	Direct, OEMs, VARs	Direct, OEMs, VARs	Direct, OEMs, VARs	Direct, dist., dealers, retail, OEMs
COMMENTS	Supports background communications under program control by PC or PS/2 running MS-DOS	Supports development of peer-to-peer cooperative processing applications	Supports the automated distribution of PC software	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Network Software Associates (NSA)	Network Software Associates (NSA)	Network Software Associates (NSA)	Network Software Associates (NSA)
PRODUCT NAME	Adapt SNA 3270	Adapt SNA APPC	Adapt SNA LU0	Adapt SNA RJE
PRODUCT FUNCTION	Local/remote terminal emulation, network gateway	Local/remote terminal emulation, network gateway	Local/remote terminal emulation, network gateway	Local/remote terminal emulation, network gateway
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software	PC software	PC software	PC software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	OS/2, MS-/PC-DOS	OS/2, MS-/PC-DOS	OS/2, MS-/PC-DOS	OS/2, MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Token-Ring, NETBIOS-compat. LANs	Token-Ring, NETBIOS-compat. LANs	Token-Ring, NETBIOS-compat. LANs	Token-Ring, NETBIOS-compat. LANs
MINIMUM MEMORY REQUIRED (KB)	256	256	256	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX, NAS, Amdahl	IBM 43XX/30XX, NAS Amdahl	IBM 43XX/30XX	IBM 43XX/30XX, NAS, Amdahl
Software Environment	IBM DOS, OS/VS, MVS, VM, CMS, IMS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM OS/VS, MVS, VM, CMS	IBM DOS, OS/VS, MVS, VM, CMS, IMS
Protocols	SNA, SDLC, async	SNA, SDLC, async	SNA, SDLC	SNA, SDLC, async
Applications Supported	Host virtual disk	None, access to host-resident programs	Access to host-resident programs	None
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT	IBM 327X/317X DFT	IBM 327X/317X DFT	IBM 327X/317X DFT
Terminal Functions Supported	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Not applicable	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	4	1	Not applicable	5
DOS Access During Session	Yes	Yes	Not applicable	Yes
File Transfer	Yes	Yes	Not applicable	Yes
File Formats	ASCII, binary	ASCII, binary	Not applicable	ASCII, binary
File Conversion	Yes	Yes	Not applicable	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax, RS-232-C	Coax, RS-232-C	RS-232-C	Coax, RS-232-C
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Not applicable	Asynchronous, synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	Not applicable	300 to 19.2K
Communications Features	Auto dial/redial, auto answer, unattended exec., background file transfer	Auto dial/redial, auto answer, unattended exec., background file transfer	Not applicable	Auto dial/redial, auto answer, unattended exec., background file transfer
USER INTERFACE	Install, on-line help, command driven, diagnostics	Install, on-line help, command driven, diagnostics	Not applicable	Install, on-line help, command driven, diagnostics
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, proprietary	IBM API, proprietary	Not applicable	Proprietary
MICROCOMPUTER SECURITY	Multilevel password, interface to host software, file encryption	Multilevel password, interface to host software, file encryption	Not applicable	Multilevel password, interface to host software, file encryption
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	245 (s), 245 to 1,795 (h)	285 (s), 245 to 1,795 (h)	585 (s), 245 to 1,795 (h)	785 (s), 245 to 1,795 (h)
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	1983	1986	1986	1984
Number Installed to Date	Information not available	Information not available	Information not available	Information not available
Warranty	90 days	90 days	90 days	90 days
Distribution	Direct	Direct	Direct	Direct
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Novell Communications Products Division	Novell Communications Products Division	Novell Communications Products Division	Novell Communications Products Division
PRODUCT NAME	NetWare 3270 LAN Workstation	NetWare 3270 Send-Receive	NetWare 3270 TR Workstation	NetWare Async Comm Server
PRODUCT FUNCTION	Local/remote terminal emulation	File transfer package	Local/remote terminal emulation	Network gateway
USERS SUPPORTED	Multiuser, 96	Vendor did not specify	Single user	Multiuser, 16
COMPONENTS	PC software	PC software	PC software	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	ARCnet, Ethernet, Token-Ring, STARLAN, NETBIOS LANs, NetWare	Vendor did not specify	ARCnet, Ethernet, Token-Ring, STARLAN, NETBIOS LANs, NetWare	ARCnet, Ethernet, Token-Ring, STARLAN
MINIMUM MEMORY REQUIRED (KB)	Vendor did not specify	Vendor did not specify	Vendor did not specify	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX, AS/400; Data General Systems; Honeywell Bull Systems; DEC VAX, DECsystem; UNIX-based systems
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM TSO, CMS, CICS	IBM DOS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400; VAX/VMS; DG AOS; Honeywell GCOS; UNIX System 5; Berkeley 4.X BSD
Protocols	SNA, SDLC	SNA	Vendor did not specify	Async
Applications Supported	Access to host-resident programs	Vendor did not specify	Vendor did not specify	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT	Vendor did not specify	IBM 327X/317X DFT	TTY, DEC VT52/100, VT200 Series, VT300 Series; DG; HP, In conjunction with emulation software (separate)
Terminal Functions Supported	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation	Vendor did not specify	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation	Color display, graphics display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	5 per user	Vendor did not specify	5	16
DOS Access During Session	Yes	Vendor did not specify	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	LAN Transport layer to gateway	Vendor did not specify	Token-ring cabling	RS-232-C
Transmission Mode	Vendor did not specify	Vendor did not specify	Vendor did not specify	Asynchronous
Transmission Speed (bps)	Not applicable	Vendor did not specify	4M	300 to 19.2K
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Dialing directory, auto dial/redial, auto ans., macros, unattended exec.
USER INTERFACE	Install, menu driven	Command driven	Install, menu driven	Install, command driven, menu driven
PROGRAMMING FEATURES Programmability	Vendor did not specify	Vendor did not specify	Vendor did not specify	Yes
API Compatibility	IBM API, DCA IRMA API, IBM LU 6.2, proprietary	Vendor did not specify	IBM API, DCA IRMA API, proprietary	Async API
MICROCOMPUTER SECURITY	Interface to host software	Vendor did not specify	Interface to host software	1 level password, multilevel password
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	995 (licensed up to 96 workstations per)	100	395	1,495 (s), 895 (h)
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	December 1988	Vendor did not specify	December 1988	March 1987
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	Vendor did not specify	Vendor did not specify	90 days
Distribution	Dist., dealers, retail	Dist., dealers, retail	Dist., dealers, retail, VARs	Dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Novell Communications Products Division	Novell Communications Products Division	Novell Communications Products Division	Novell Communications Products Division
PRODUCT NAME	NetWare SNA Gateway ELS	NetWare SNA Gateway	NetWare X.25 Extended Gateway	NetWare X.25 Gateway
PRODUCT FUNCTION	Network gateway	Network gateway	Remote terminal emulation	Remote terminal emulation
USERS SUPPORTED	Multiuser, 16	Multiuser, 128 sessions/96 workstations	Multiuser, 97	Multiuser, 8
COMPONENTS	PC software	PC software	PC software	PC software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	ARCnet, Ethernet, Token-Ring, STARLAN, NETBIOS LANs, NetWare	ARCnet, Ethernet, Token-Ring, STARLAN, NETBIOS LANs, NetWare	ARCnet, Ethernet, Token-Ring, STARLAN	ARCnet, Ethernet, Token-Ring, STARLAN
MINIMUM MEMORY REQUIRED (KB)	232 (coax), 238 (remote)	Vendor did not specify	256	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	Data General Systems; Honeywell Bull Systems; DEC VAX	Data General Systems; Honeywell Bull Systems; DEC VAX
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, MVS, VM, TSO, CMS, IMS, CICS	VAX/VMS; DG AOS; Honeywell GCOS	VAX/VMS; DG AOS; Honeywell GCOS
Protocols	SNA, SDLC	SNA, SDLC	X.25	X.25
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT	IBM 327X/317X DFT	TTY, 3rd party emulation	TTY, third party emulation
Terminal Functions Supported	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation	Vendor did not specify	Vendor did not specify
Number of Concurrent Sessions	16	128	8	8
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Vendor did not specify	Vendor did not specify
File Formats	ASCII, binary	ASCII, binary	Vendor did not specify	Vendor did not specify
File Conversion	Yes	Yes	Vendor did not specify	Vendor did not specify
COMMUNICATIONS CHAR. Physical Connection	Coax	Coax, RS-232-C, token-ring interface	Vendor did not specify	Vendor did not specify
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	19.2K to 2.4M (coax); 1200 to 19.2K (remote)	2.4M (coax); 1200 to 56K (remote)	Up to 64K	Up to 64K
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
USER INTERFACE	Install, on-line help, menu driven, windows, diagnostics	Install, on-line help, menu driven, windows, diagnostics	Menu driven	Menu driven
PROGRAMMING FEATURES Programmability	No	Vendor did not specify	Vendor did not specify	Vendor did not specify
API Compatibility	IBM API, DCA IRMA API, IBM LU 6.2, proprietary	IBM API, DCA IRMA API	Proprietary	Interrupt 14
MICROCOMPUTER SECURITY	Interface to host software	Vendor did not specify	Vendor did not specify	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	595	2,995	1,150	550
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	December 1988	December 1988	June 1988	June 1988
Number Installed to Date	Vendor did not specify	Vendor did not specify	Confidential	Vendor did not specify
Warranty	Vendor did not specify	Vendor did not specify	1 year	1 year
Distribution	Dist., dealers, retail	Dist., dealers, retail, VARs	Dist., dlrs, retail	Dist., dealers, retail
COMMENTS	—	—	Requires Novell X.25 Extended Adapter for PC	Requires Novell X.25 Adapter

AUGUST 1989

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Novell Communications Products Division	Novell Communications Products Division	Novell Communications Products Division	Novell Communications Products Division
PRODUCT NAME	Novell Coax Adapter (Models for PC and PS/2)	Novell Coax Mux Adapter for PC	Novell Synchronous Adapter	Novell Synchronous/HS Adapter for PC
PRODUCT FUNCTION	Vendor did not specify	Network gateway	Remote terminal emulation, network gateway	Network gateway
USERS SUPPORTED	Vendor did not specify	Multiuser	Single user, multiuser	Multiuser
COMPONENTS	PC hardware	PC hardware	PC hardware	PC hardware
COPY PROTECTED	Not applicable	Not applicable	Not applicable	Not applicable
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	ARCnet, Ethernet, Token-Ring, STARLAN	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	IBM DOS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	SNA	SNA	BSC, SNA, SDLC	SNA, SDLC
Applications Supported	Vendor did not specify	None	None	Vendor did not specify
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT, 327X/317X CUT	IBM 327X/317X DFT	IBM 327X/317X DFT	IBM 327X/317X DFT
Terminal Functions Supported	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation	Vendor did not specify	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation
Number of Concurrent Sessions	5	40	Vendor did not specify	Vendor did not specify
DOS Access During Session	Yes	Vendor did not specify	Vendor did not specify	Vendor did not specify
File Transfer	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
File Formats	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
File Conversion	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
COMMUNICATIONS CHAR. Physical Connection	Coax	Coax	RS-232-C	RS-232-C
Transmission Mode	Vendor did not specify	Vendor did not specify	Synchronous	Vendor did not specify
Transmission Speed (bps)	Not applicable	Vendor did not specify	1200 to 56K	2400 to 56K
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
USER INTERFACE	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
PROGRAMMING FEATURES Programmability	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
API Compatibility	Vendor did not specify	Vendor did not specify	Vendor did not specify	IBM LU 6.2
MICROCOMPUTER SECURITY	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	545	1,100	395	1,000
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	Vendor did not specify	July 1987	Vendor did not specify	1986
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	1 year	1 year	1 year
Distribution	Dist., dealers, retail	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs
COMMENTS	Supports both single-user and gateway products in coax environment	Supports a 40-user coax gateway (connected to multiplexer port on a 3X74)	Supports single-user and gateway products in a 3270 remote SDLC (or BSC single-user) environment	Board supports a high-speed remote SDLC gateway

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Novell Communications Products Division	Novell Communications Products Division	Novell Communications Products Division	Novell Communications Products Division
PRODUCT NAME	Novell X.25 Adapter for PC	Novell X.25 Adapter for PS/2	Novell X.25 Extended Adapter	PCOX/3270 SR-M
PRODUCT FUNCTION	Vendor did not specify	Vendor did not specify	Vendor did not specify	File transfer package
USERS SUPPORTED	Vendor did not specify	Vendor did not specify	Vendor did not specify	Single user
COMPONENTS	PC hardware	PC hardware	PC hardware	PC software
COPY PROTECTED	Vendor did not specify	Vendor did not specify	Vendor did not specify	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	Macintosh
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	Vendor did not specify	MS-/PC-DOS	Macintosh Finder
LOCAL AREA NETWORK SUPPORT	ARCnet, Ethernet, Token-Ring, STARLAN	ARCnet, Ethernet, Token-Ring, STARLAN	ARCnet, Ethernet, Token-Ring, STARLAN	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
HOST INTERFACE Systems Supported	Data General Systems; Honeywell Bull Systems; DEC VAX, DECsystem	Data General Systems; Honeywell Bull Systems; DEC VAX, DECsystem	Data General Systems; Honeywell Bull Systems; DEC VAX, DECsystem	IBM 43XX/30XX
Software Environment	VAX/VMS; DG AOS; Honeywell GCOS	VAX/VMS; DG AOS; Honeywell GCOS	VAX/VMS; DG AOS; Honeywell GCOS	IBM TSO, CMS, CICS
Protocols	X.25	X.25	X.25	SNA
Applications Supported	Access to host-resident programs	Access to host-resident programs	Vendor did not specify	Vendor did not specify
EMULATION Terminals/Controllers Emulated	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Terminal Functions Supported	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Number of Concurrent Sessions	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
DOS Access During Session	Vendor did not specify	Vendor did not specify	Yes	Vendor did not specify
File Transfer	Vendor did not specify	Vendor did not specify	Vendor did not specify	Yes
File Formats	Vendor did not specify	Vendor did not specify	Vendor did not specify	ASCII, binary
File Conversion	Vendor did not specify	Vendor did not specify	Vendor did not specify	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	Vendor did not specify
Transmission Mode	Synchronous	Synchronous	Synchronous	Vendor did not specify
Transmission Speed (bps)	Up to 64K	Up to 64K	Up to 64K	Vendor did not specify
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
USER INTERFACE	Vendor did not specify	Vendor did not specify	Vendor did not specify	Command driven
PROGRAMMING FEATURES Programmability	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
API Compatibility	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
MICROCOMPUTER SECURITY	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	Not applicable	Not applicable	Not applicable	100
Standalone Hardware ($)	1,245	1,245	1,645	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	January 1988	January 1988	June 1988	Vendor did not specify
Number Installed to Date	Confidential	Confidential	Confidential	Vendor did not specify
Warranty	1 year	1 year	1 year	Vendor did not specify
Distribution	Dist., dealers, retail	Dist., dealers, retail	Dist., dealers, retail	Dist., dealers, retail
COMMENTS	For use with NetWare X.25 software products	For use with NetWare X.25 software products	For use with NetWare X.25 software products	—

AUGUST 1989

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Novell Communications Products Division	Novell Communications Products Division	Novell Communications Products Division	Novell Communications Products Division
PRODUCT NAME	PCOX/5250 FT	PCOX/5250 LAN	PCOX/5250 SDLC	PCOX/5250 Twinax
PRODUCT FUNCTION	Vendor did not specify	Remote terminal emulation	Remote terminal emulation	Local terminal emulation
USERS SUPPORTED	Single user	Single user	Multiuser, 9	Multiuser, 7
COMPONENTS	PC software	PC software	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Any NETBIOS-compat. LAN	Any NETBIOS-compat. LAN	Any NETBIOS-compat. LAN	Any NETBIOS-compat. LAN
MINIMUM MEMORY REQUIRED (KB)	70	158	158	64
HOST INTERFACE Systems Supported	IBM System/36/38	IBM System/36/38	IBM System/36/38	IBM System/36/38
Software Environment	IBM SSP, IBM CPF	IBM SSP, IBM CPF	IBM SSP, IBM CPF	IBM DOS, SSP, IBM CPF
Protocols	SNA	SNA	SDLC	Twinax
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM, 5250 Series	IBM 5250 Series	IBM 5250 Series	IBM 5250 Series
Terminal Functions Supported	Color display, host printer emulation	Color display, function keys, host printer emulation	Color display, function keys, host printer emulation	Color display, function keys, host printer emulation
Number of Concurrent Sessions	Vendor did not specify	7	Vendor did not specify	7
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII	ASCII	ASCII	ASCII
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Vendor did not specify	Any LAN media	Twinax, RS-232-C into modem and out on twisted pair	Twinax
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	Depends on configuration	LAN speed	9600	1M
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
USER INTERFACE	Windows	On-line help, windows	On-line help, windows	On-line help, windows
PROGRAMMING FEATURES Programmability	No	No	No	No
API Compatibility	IBM API	IBM API	IBM API	IBM API
MICROCOMPUTER SECURITY	Vendor did not specify	Keyboard lock feature	Keyboard lock feature	Keyboard lock feature
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	150	200	250	250
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Number Installed to Date	Confidential	Confidential	Confidential	Confidential
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dealers, retail	Direct, dist., dealers, retail	Direct, dist., dealers, retail	Direct, dist., dealers, retail
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Novell Communications Products Division	Novell Communications Products Division	Novell Communications Products Division	Novell Communications Products Division
PRODUCT NAME	PCOX/Coax-M Board	PCOX/GW-5250	PCOX/Multi	PCOX/Multi-M
PRODUCT FUNCTION	Local terminal emulation	Network gateway	Local/remote terminal emulation	Local terminal emulation
USERS SUPPORTED	Single user	Multiuser, 9	Single user	Single user
COMPONENTS	PC hardware	PC software	PC software	PC software
COPY PROTECTED	Not applicable	No	No	No
MICROCOMPUTERS SUPPORTED	Macintosh, PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Macintosh
MICROCOMPUTER OP. SYS. SUPPT.	Macintosh Finder, MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	Macintosh Finder
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Any NETBIOS-compat. LAN	ARCnet, Ethernet, Token-Ring, STARLAN	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	Vendor did not specify	160	160K to 270K	Vendor did not specify
HOST INTERFACE Systems Supported	Vendor did not specify	IBM System/36/38	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	Vendor did not specify	IBM SSP, IBM CPF	IBM DOS, MVS, VM, TSO, CMS, IMS, CICS	IBM MVS, VM, TSO, IMS, CICS
Protocols	Vendor did not specify	SNA	BSC, SNA, SDLC, Non-SNA	SNA
Applications Supported	Vendor did not specify	Host virtual disk, access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	Vendor did not specify	IBM 5250 Series	IBM 327X/317X DFT	IBM 327X/317X DFT
Terminal Functions Supported	Vendor did not specify	Color display, function keys, host printer emulation	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation
Number of Concurrent Sessions	Vendor did not specify	9	5	Vendor did not specify
DOS Access During Session	Vendor did not specify	Yes	Yes	Vendor did not specify
File Transfer	Vendor did not specify	Yes	Yes	Yes
File Formats	Vendor did not specify	ASCII	ASCII, binary	ASCII, binary
File Conversion	Vendor did not specify	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax	RS-232-C to modem	Coax, RS-232-C	Coax
Transmission Mode	Vendor did not specify	Asynchronous	Synchronous	Vendor did not specify
Transmission Speed (bps)	2.4M	9600	600 to 19.2K	Vendor did not specify
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
USER INTERFACE	Vendor did not specify	On-line help, windows	Install, menu driven	Command driven
PROGRAMMING FEATURES Programmability	Vendor did not specify	Vendor did not specify	Vendor did not specify	No
API Compatibility	Vendor did not specify	IBM API	IBM API, DCA IRMA API, proprietary	Vendor did not specify
MICROCOMPUTER SECURITY	Vendor did not specify	Keyboard lock feature	Interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	545	550	475	675
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	Vendor did not specify	Vendor did not specify	Vendor did not specify	October 1987
Number Installed to Date	Vendor did not specify	Confidential	Vendor did not specify	Vendor did not specify
Warranty	1 year	1 year	1 year	1 year
Distribution	Dist., dealers, retail	Direct, dist., dealers, retail	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail
COMMENTS	Supports DFT single-user terminal emulation on a Macintosh II (coax attachment)	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Novell Communications Products Division	Novell Communications Products Division	OBS Software	On-Line Software International
PRODUCT NAME	PCOX/One	PCOX/Twinax Board	OBS Excellink/Host-V	Omnilink & Omnilink/36
PRODUCT FUNCTION	Local terminal emulation	Vendor did not specify	Local terminal emulation, host application specific link	Non-host application specific link
USERS SUPPORTED	Single user	Single user	Multiuser	Multiuser, limited by hardware
COMPONENTS	PC software	PC hardware	PC software, host software	PC software, host software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	ARCnet, Ethernet, Token-Ring, STARLAN	Any NETBIOS-compat. LAN	Ethernet, Token-Ring, Novell, 3Com, Banyan VINES	Token-Ring
MINIMUM MEMORY REQUIRED (KB)	95	160	128 KB	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM System/36/38	IBM 43XX/30XX	IBM 43XX/30XX, System/36/38, AS/400
Software Environment	IBM DOS, MVS, VM, TSO, CMS, IMS, CICS	IBM SSP, IBM CPF	IBM VM, TSO, VTAM ACCESS	IBM DOS, OS/VS, MVS
Protocols	SNA, Non-SNA	Twinax	SNA, SDLC	BSC, SNA, SDLC
Applications Supported	Access to host-resident programs	Host virtual disk, access to host-resident programs	Access to host-resident programs, VTAM	Host virtual disk
EMULATION Terminals/Controllers Emulated	IBM 327X/317X CUT	IBM 5250 Series	TTY, IBM 327X/317X DFT, 327X/317X CUT	IBM 327X/317X DFT, 327X/317X CUT, DEC VT52/100
Terminal Functions Supported	Color display, function keys, character attributes, user-defined keyboard map	Color display, host printer emulation	Color display, graphics display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk	Color display, user-defined keyboard map
Number of Concurrent Sessions	1	1	Over 250	Vendor did not specify
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Vendor did not specify	Yes	Yes
File Formats	ASCII, binary	Vendor did not specify	ASCII, binary	ASCII, binary
File Conversion	Yes	Vendor did not specify	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax	Twinax	Coax, RS-232-C	Coax, RS-232-C
Transmission Mode	Vendor did not specify	Synchronous	Asynchronous, synchronous	Asynchronous, synchronous
Transmission Speed (bps)	Not applicable	19.2K	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 2.4M	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 2.4M
Communications Features	Vendor did not specify	Vendor did not specify	Macros, Comm Features: supports packet switches	Vendor did not specify
USER INTERFACE	Install, menu driven	Vendor did not specify	Install, on-line help, command driven, on-line tutorial, menu driven	Install, on-line help, on-line tutorial, menu driven
PROGRAMMING FEATURES Programmability	Vendor did not specify	Vendor did not specify	Yes	Yes
API Compatibility	IBM API, DCA IRMA API, proprietary	Vendor did not specify	IBM API, DCA IRMA API, CXI, Lee Data, Forte Courier	IBM API, DCA IRMA API, CXI, ITT, AST, Forte
MICROCOMPUTER SECURITY	Interface to host software	Vendor did not specify	1 level password, multilevel password, interface to host software, file encryption	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	350	545	5,000 for 25 PC copies	Included in package
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	10,000 site license	1,000 to 20,000*
Date of First Delivery	Vendor did not specify	Vendor did not specify	Vendor did not specify	1983
Number Installed to Date	Vendor did not specify	Confidential	Over 100	Over 1,000
Warranty	1 year	1 year	Vendor did not specify	On-line soft Guaran. pro.
Distribution	Dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail	Direct	Direct, dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	Provides processing on PC and host, security to RACF, ACF2 and Top Secret, audit trail	*20,000 includes unlimited PC copies

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	On-Line Software International	Pacer Software	Packaged Solutions	Packaged Solutions
PRODUCT NAME	RAMIS/PC Workstation (RAMLINK)	PacerLink	BiComm-3700	SNAcomm-3270 Local
PRODUCT FUNCTION	Local/remote terminal emulation, network gateway, standalone protocol converter, host app. specific link	Local/remote terminal emulation, non-host application specific link	Remote terminal emulation	Local terminal emulation
USERS SUPPORTED	Single user, multiuser, limited by hardware	Multiuser, up to 500	Single user	Single user
COMPONENTS	PC software, host software	PC software, host software	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	Yes (host), no (PC)	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 non-MCA	Macintosh, IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Toshiba laptops (1100+, 1200, 1600, 3100/20, 5200)
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	Macintosh Finder, MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Token-Ring, NETBIOS-compat. LANs	Ethernet	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	640	512 (MAC), 256 (IBM PC)	64	540
HOST INTERFACE Systems Supported	IBM 43XX/30XX	Data General Systems; UNIX-based systems	IBM 43XX/30XX, System/36/38	IBM 43XX/30XX
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, CICS	VAX/VMS; UNIX System 5; Berkeley 4.X BSD	IBM DOS, OS/VS, MVS, VM	IBM DOS, OS/VS, MVS, VM, TSO, CMS, CICS
Protocols	BSC, SNA, SDLC	Vendor did not specify	BSC	Vendor did not specify
Applications Supported	Access to host-resident programs	Host virtual disk, access to host-resident programs	Vendor did not specify	None
EMULATION Terminals/Controllers Emulated	TTY, IBM 327X/317X DFT, 327X/317X CUT	DEC VT52/100, VT200 Series; DG	IBM 2780/3780	IBM 327X/317X DFT, 327X/317X CUT
Terminal Functions Supported	Color display, function keys, character attributes, user-defined keyboard map	Color display, graphics display, function keys, character attributes, windows, user-defined keyboard map	Function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	4	5 to 500	1	1
DOS Access During Session	Yes	Yes	No	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax, RS-232-C, sync modem connection	Coax, RS-232-C, twisted pair (Localtalk)	RS-232-C	Coax
Transmission Mode	Asynchronous, synchronous	Asynchronous	Synchronous	Vendor did not specify
Transmission Speed (bps)	300, 1200, 2400, 4800, 9600, 19.2K	1200, 2400, 4800, 9600, 19.2K	300 to 9600	Not applicable
Communications Features	Auto dial/redial, auto answer, macros, unattended execution, script capability	Dialing directory, auto dial/redial, macros, unattended execution	Auto dial/redial, auto answer, unattended execution	Vendor did not specify
USER INTERFACE	Install, on-line help, mouse, command driven, menu driven, windows, diagnostics	Install, on-line help, command driven, graphic icons, menu driven, windows	Command driven, menu driven	Menu driven, windows
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Vendor did not specify
API Compatibility	IBM API, DCA IRMA API	Vendor did not specify	Clip module	Vendor did not specify
MICROCOMPUTER SECURITY	Multilevel password, file encryption	Vendor did not specify	Vendor did not specify	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	495 per PC package	Not applicable	995 and up	995
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	49,000 to 126,000 (RAMIS Info. System)	2,800 (5 users) to 37,500 (500 users)	Not applicable	Not applicable
Date of First Delivery	February 1986	November 1984	August 1984	August 1988
Number Installed to Date	Over 3,000	Proprietary information	2,000	Vendor did not specify
Warranty	On-line soft Guaran. pro.	60 days	30 days	30 days
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Direct	Direct, OEMs	Direct, OEMs
COMMENTS	—	—	Has interactive and command mode; available with internal 2400 or 4800 bps modem	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Packaged Solutions	Packaged Solutions	Packaged Solutions	Packet/PC
PRODUCT NAME	SNAcomm-3270 Remote	SNAcomm-5250 Local	SNAcomm-5250 Remote	Packet/3270 & Packet/74
PRODUCT FUNCTION	Remote terminal emulation	Local terminal emulation	Remote terminal emulation	Local/remote terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user, multiuser
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, standalone hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	Toshiba laptops (1100+, 1200, 1600, 3100/20, 5200)	Toshiba laptops (1100+, 1200, 1600, 3100/20, 5200)	Toshiba laptops (1100+, 1200, 1600, 3100/20, 5200)	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS, Xenix
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	Vendor did not specify	Token-Ring, NETBIOS-compatible LANs
MINIMUM MEMORY REQUIRED (KB)	256	540	256	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM System/36/38, AS/400	IBM System/36/38, AS/400	IBM 43XX/30XX, System/36/38
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, CICS	IBM OS/400	IBM OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	SNA, SDLC	Vendor did not specify	SNA, SDLC	SNA, HDLC, SDLC, X.25
Applications Supported	None	None	Vendor did not specify	Access to host-resident programs, Tempus-Share, Omni-Link
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT, 327X/317X CUT	IBM 5250 Series	IBM 5250 Series	TTY, IBM 327X/317X DFT
Terminal Functions Supported	Color display, function keys	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, character attributes, host printer emulation
Number of Concurrent Sessions	6	7	4	64 with 1 LU1 and 1 LU2
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	No	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	Twinax	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Vendor did not specify	Synchronous	Asynchronous
Transmission Speed (bps)	300 to 9600	Vendor did not specify	300 to 9600	300, 1200, 2400, 4800, 9600
Communications Features	Auto dial/redial	Vendor did not specify	Auto dial/redial	Auto dial/redial, macros
USER INTERFACE	Install	Install, menu driven	Install, menu driven	On-line help, menu driven, diagnostics
PROGRAMMING FEATURES Programmability	Vendor did not specify	No	No	Yes
API Compatibility	Vendor did not specify	Vendor did not specify	Vendor did not specify	IBM API, proprietary
MICROCOMPUTER SECURITY	Vendor did not specify	Vendor did not specify	Vendor did not specify	1 level password, multilevel password, trans. encryption
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	995	1,295	995	110 to 295, dep. on quantity
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	8,000
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	January 1988	August 1988	April 1988	January 1985
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	OVER 50,000
Warranty	30 days	30 days	30 days	1 year
Distribution	Direct, OEMs	Direct, OEMs	Direct, OEMs	Direct, distributors
COMMENTS	—	—	—	Packet/74 is standalone hardware installed at the data center

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Packet/PC	Pansophic Systems	Performance Software	Persoft
PRODUCT NAME	Packet/3270 & Packet/Main	The Corporate Tie	MasterLink	SmarTerm 220
PRODUCT FUNCTION	Remote terminal emulation	Non-host application specific link	Local/remote terminal emulation, file transfer	Local terminal emulation
USERS SUPPORTED	Single user, multiuser	Multiuser	Multiuser	Single user
COMPONENTS	PC software, host software	PC software, host software	PC software, host hardware	PC software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Macintosh, IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS, Xenix	MS-/PC-DOS	Macintosh Finder, MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	NETBIOS-compat. LANs	Token-Ring	Token-Ring	Ethernet, Token-Ring, Novell NetWare VMS
MINIMUM MEMORY REQUIRED (KB)	256	256	256	384
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX	DEC: VAX, DECsystem
Software Environment	IBM OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, CICS	IBM DOS, OS/VS, MVS, CICS	VAX/VMS
Protocols	SNA, HDLC, SDLC, X.25	BSC, SNA, SDLC	BSC, SNA, SDLC	Not applicable
Applications Supported	Access to host-resident programs, Tempus-Share, Omni-Link	Host virtual disk, access to host-resident programs	Access to host-resident programs	Not applicable
EMULATION Terminals/Controllers Emulated	TTY, IBM 327X/317X DFT	IBM 327X/317X DFT, 327X/317X CUT	IBM 327X/317X DFT	TTY, DEC VT52/100, VT200 Series
Terminal Functions Supported	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Not applicable	Color display, graphics display, function keys, character attributes, windows, user-defined keyboard map	Color disp., funct. keys, char. attributes, user-def. kybd. map, host printer emul.
Number of Concurrent Sessions	Unlimited	Not applicable	4	1
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	No
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	Coax, RS-232-C	Coax, RS-232-C	RS-232-C
Transmission Mode	Asynchronous	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous
Transmission Speed (bps)	300, 1200, 2400, 4800, 9600	1200 to 19.2K	300 to 19.2K	75 to 19.2K
Communications Features	Auto dial/redial, macros	Dialing directory, auto dial/redial, auto answer, unattended execution	Dialing directory, auto dial/redial, unattended execution	Macros
USER INTERFACE	On-line help, menu driven, diagnostics	Install, command driven, menu driven, windows, diagnostics	Install, on-line help, mouse, command driven, on-line tutorial, graphic icons, windows, diagnostics	Install, on-line help
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	No
API Compatibility	IBM API, proprietary	Proprietary	IBM API, DCA IRMA API	Not applicable
MICROCOMPUTER SECURITY	1 level password, multilevel password, interface to host software, transmission encryption	Multilevel password, interface to host software, file encryption	1 level password, multilevel password, interface to host software	Not applicable
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	110 to 295, dep. on quantity	Contact vendor	Contact vendor	195
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	8,500 to 10,000, dep. on quantity	Contact vendor	Contact vendor	Not applicable
Date of First Delivery	January 1987	March 1987	August 1984	April 1985
Number Installed to Date	Over 50,000	125	500	22,797
Warranty	1 year	Vendor did not specify	1 year	90 days
Distribution	Direct, distributors	Direct, OEMs	Direct	Direct, dist., dlrs, retail, mail
COMMENTS	Packet/Main supports an unlimited amount of users	—	Transfers files between UNISYS or IBM mainframes and a microcomputer	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Persoft	Persoft	Persoft	Persoft
PRODUCT NAME	SmarTerm 2392	SmarTerm 240	SmarTerm 400	SmarTerm 4014
PRODUCT FUNCTION	Local terminal emulation	Local terminal emulation	Local terminal emulation	Local terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software	PC software	PC software	PC software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Ethernet, Token-Ring, Novell NetWare VMS	Ethernet, Token-Ring, Novell NetWare VMS	Ethernet, Token-Ring	Not applicable
MINIMUM MEMORY REQUIRED (KB)	320	512	320	384
HOST INTERFACE Systems Supported	Vendor did not specify	DEC VAX, DECsystem	DEC VAX, DECsystem	Tektronix
Software Environment	MPE HP-UX RTE	VAX/VMS	DG AOS, DG AOS/VS	Vendor did not specify
Protocols	Not applicable	Not applicable	Not applicable	Not applicable
Applications Supported	Not applicable	Not applicable	Not applicable	Not applicable
EMULATION Terminals/Controllers Emulated	DEC VT52/100	TTY, DEC VT52/100, VT200 Series, Tektronix 4014, VT340 Color ReGIS	DG Dasher	DEC VT52/100, Tektronix 4010, 4012
Terminal Functions Supported	Color disp., user-def. kybd. map, host printer emul.	Color display, graphics display, funct. keys, char. attributes, user-def. kybd. map, host printer emulation	Color display, funct. keys, char. attributes, user-def. keyboard map, host printer emulation, print to disk	Graphics display, funct. keys, user-def. keyboard map, host printer emulation
Number of Concurrent Sessions DOS Access During Session File Transfer File Formats File Conversion	1 Yes Yes ASCII, binary No	1 Yes Yes ASCII, binary No	1 Yes Yes ASCII, binary No	Vendor did not specify Yes Vendor did not specify ASCII, binary No
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode Transmission Speed (bps)	Asynchronous 75 to 19.2K	Asynchronous 75 to 19.2K	Asynchronous Up to 19.2K	Asynchronous 75 to 9600
Communications Features	Macros	Auto dial/redial, macros	Macros	Macros
USER INTERFACE	Install, on-line help	Install, on-line help	Install, on-line help	Install, on-line help
PROGRAMMING FEATURES Programmability API Compatibility	No Not applicable	No Not applicable	Vendor did not specify Not applicable	Vendor did not specify Not applicable
MICROCOMPUTER SECURITY	Not applicable	Not applicable	Not applicable	Not applicable
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	225	345	175	225
Standalone Hardware ($) Host Software/Hardware ($)	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable
Date of First Delivery Number Installed to Date Warranty Distribution	December 1988 Information not available 90 days Direct, dist., dlrs, retail, mail	January 1986 43,318 90 days Direct, dist., dealers, retail, mail	July 1985 21,740 90 days Direct, dist., dealers, retail, mail	Vendor did not specify Vendor did not specify 90 days Direct, dist., dealers, retail, mail
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Persoft	POINT 4 Data Corp.	Quadram	Quadram
PRODUCT NAME	SmartMove	PC Answer	MainLink DFT	MainLink DFTGW5
PRODUCT FUNCTION	Local terminal emulation	Remote terminal emulation, host application specific link	Non-host application specific link	Network gateway, non-host application specific link
USERS SUPPORTED	Single user	Multiuser	Single user	Multiuser, 5 per gateway
COMPONENTS	PC software	PC software, host software	PC software	PC software
COPY PROTECTED	No	Yes	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Ethernet, Token-Ring	Vendor did not specify	Vendor did not specify	ARCnet, Ethernet, Token-Ring, STARLAN
MINIMUM MEMORY REQUIRED (KB)	256	256	Vendor did not specify	Vendor did not specify
HOST INTERFACE Systems Supported	DEC VAX, DECsystem	Proprietary, MARK Series	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	VAX/VMS	IRIS operating system	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP
Protocols	Not applicable	Async, ASCII	SNA	SNA
Applications Supported	Not applicable	Access to host-resident programs	IND$FILE	Vendor did not specify
EMULATION Terminals/Controllers Emulated	TTY, DEC VT52/100	TTY, IBM 2780/3780, DEC VT52/100, DG, Wyse, TeleVideo	IBM 327X/317X DFT	IBM 327X/317X DFT, 327X/317X CUT
Terminal Functions Supported	Function keys, user-def. keyboard map, host printer emulation	Color display, graphics disp., funct. keys, char. attributes, user-def. kybd. map, host printer emulation	Color display, funct. keys, char. attributes, user-def. keyboard map, host printer emulation, print to disk	Color display, funct. keys, char. attributes, user-def. keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	Dual sessions	System dependent	5	5 per gateway
DOS Access During Session	Yes	Vendor did not specify	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	No	Yes	No	No
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	Coax	Coax to controller, LAN
Transmission Mode	Asynchronous	Asynchronous	Synchronous	Synchronous
Transmission Speed (bps)	19.2K	300 to 9600, 19.2K	2.4M	2.4M
Communications Features	Dial. dir., auto dial/redial, macros, unattended execution	Vendor did not specify	Vendor did not specify	Vendor did not specify
USER INTERFACE	On-line help	Install, on-line help, menu driven	Install, on-line help, command driven, menu driven, windows	Install, on-line help, command driven, menu driven, windows, diagnostics
PROGRAMMING FEATURES Programmability	No	No	Yes	Vendor did not specify
API Compatibility	Not applicable	Proprietary	Proprietary	Proprietary
MICROCOMPUTER SECURITY	Not applicable	1 level password, interface to host software	1 level password	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	149	290	345	595
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	1900	Not applicable	Not applicable
Date of First Delivery	April 1985	December 1986	December 1988	December 1988
Number Installed to Date	2,532	Over 200	New product	New
Warranty	90 days	Vendor did not specify	1 year	1 year
Distribution	Direct, dist., dealers, retail, mail	Dist., dealers, retail, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs
COMMENTS	—	—	DFT-mode software for MainLink II and IIm	DFT gateway software for MainLink II and IIm

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Quadram	Quadram	Quadram	Quadram
PRODUCT NAME	MainLink e	MainLink II	MainLink IIe	MainLink IIm
PRODUCT FUNCTION	Non-host application specific link	Local terminal emulation, non-host application specific link	Non-host application specific link	Local terminal emulation, non-host application specific link
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software	PC hardware	PC software, PC hardware	PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PS/2 MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS, OS/2
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Not applicable	Not applicable	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM DOS, OS/VS, MVS, VM, TSO, CMS, CICS, SSP; Honeywell GCOS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP
Protocols	BSC, SNA, HDLC, SDLC	BSC, SDLC	BSC, SNA, HDLC, SDLC	BSC, SDLC
Applications Supported	IND$FILE	Vendor did not specify	IND$FILE	Vendor did not specify
EMULATION Terminals/Controllers Emulated	IBM 327X/317X CUT	IBM 327X/317X DFT, 327X/317X CUT	IBM 327X/317X CUT	IBM 327X/317X DFT, 327X/317X CUT
Terminal Functions Supported	Color display, funct. keys, char. attributes, user-defined keyboard map	Color display, character attributes	Color display, funct. keys, character attributes, user-defined keyboard map	Color display, character attributes
Number of Concurrent Sessions	Vendor did not specify	Vendor did not specify	1 CUT session	Vendor did not specify
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Vendor did not specify	Yes	Vendor did not specify
File Formats	ASCII, binary	Vendor did not specify	ASCII, binary	Vendor did not specify
File Conversion	No	Vendor did not specify	No	Vendor did not specify
COMMUNICATIONS CHAR. Physical Connection	Coax	Coax	Coax	Coax
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	2.4M	2.4M	2.4M	2.4M
Communications Features	Vendor did not specify	Vendor did not specify	Not applicable	Vendor did not specify
USER INTERFACE	Install, on-line help, command driven, menu driven, windows	Install, diagnostics	Install, on-line help, command driven, menu driven, windows	Install, on-line help, on-line tutorial, diagnostics
PROGRAMMING FEATURES Programmability	Yes	Vendor did not specify	Yes	Vendor did not specify
API Compatibility	Vendor did not specify	IBM API, DCA IRMA API	Vendor did not specify	IBM API, DCA IRMA API
MICROCOMPUTER SECURITY	Multilevel password	Vendor did not specify	Multilevel password	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	195	395	545	495
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	April 1988	December 1987	Vendor did not specify	Vendor did not specify
Number Installed to Date	Over 5,000	Over 5,000	Over 5,000	Vendor did not specify
Warranty	1 year	1 year	1 year	Vendor did not specify
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs	Dist., dealers, retail, OEMs	Vendor did not specify
COMMENTS	CUT-mode software for MainLink II and IIm products	IRMA and IBM compatible; fits in standard PC bus	Includes hardware and CUT software for a standard PC bus	IBM and IRMA compatible

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Quadram	Rabbit Software	Rabbit Software	Rabbit Software
PRODUCT NAME	MainLink IIme	RabbitGATE BSC	RabbitGATE DFT	RabbitGATE SNA
PRODUCT FUNCTION	Local terminal emulation, non-host application specific link	Remote terminal emulation, network gateway	Remote terminal emulation, network gateway	Remote terminal emulation, network gateway
USERS SUPPORTED	Single user	Single user, multiuser, 32	Single user, multiuser, 5	Single user, multiuser, 64
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS, OS/2	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	ARCnet, Ethernet, Token-Ring, STARLAN	ARCnet, Ethernet, Token-Ring, STARLAN	ARCnet, Ethernet, Token-Ring, STARLAN
MINIMUM MEMORY REQUIRED (KB)	Vendor did not specify	130	Vendor did not specify	130
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX, AS/400	IBM 43XX/30XX, AS/400	IBM 43XX/30XX, AS/400
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM MVS, TSO, CMS, IMS, CICS	IBM MVS, VM, TSO, CMS, CICS	IBM MVS, VM, TSO, CMS, IMS, CICS
Protocols	BSC, SNA, HDLC, SDLC	BSC	DFT	SNA, SDLC
Applications Supported	IND$FILE	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 327X/317X CUT	IBM 327X/317X DFT	IBM 327X/317X DFT	IBM 327X/317X DFT
Terminal Functions Supported	Color display, funct. keys, character attributes, user-defined keyboard map	Color display, graphics display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, windows, user-def. keyboard map, host to printer emulation, print to disk	Color display, graphics display, function keys, character attributes, windows user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	Vendor did not specify	8/workstation, 512/LAN	8/workstation, 80/LAN	8/workstation, 1,024/LAN
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	No	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax	RS-232-C	Coax	RS-232-C
Transmission Mode	Synchronous	Bisynchronous	Vendor did not specify	Synchronous
Transmission Speed (bps)	2.4M	19.2K	2.4M	64k
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Macros
USER INTERFACE	Install, on-line help, command driven, on-line tutorial, menu driven, windows, diagnostics	Install, on-line help, menu driven, windows, diagnostics	On-line help, windows	Install, on-line help, menu driven, windows, diagnostics
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	Vendor did not specify	IBM API, proprietary	IBM API, proprietary	IBM API, proprietary
MICROCOMPUTER SECURITY	Multilevel password	Vendor did not specify	Vendor did not specify	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	645	Contact vendor	Contact vendor	Contact vendor
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	April 1988	Vendor did not specify	Vendor did not specify	Vendor did not specify
Number Installed to Date	Over 5,000	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	1 year	1 year	1 year
Distribution	Dist., dealers, retail, OEMs	Dist., dealers, retail, VARs	Dist., dealers, retail, VARs	Dist., dealers, retail, OEMs, VARs
COMMENTS	Hardware and CUT software for MicroChannel	Toll-free number 1-800-RabbitC	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Rabbit Software	Rabbit Software	Rabbit Software	Rabbit Software
PRODUCT NAME	RabbitGATE X.25/PAD	RabbitPLUS 386 3270-BSC	RabbitPLUS 386 3270-SNA	RabbitSTATION Coax
PRODUCT FUNCTION	Remote terminal emulation, network gateway	Remote terminal emulation	Remote terminal emulation	Loc/rem terminal emulation, non-host application specific link
USERS SUPPORTED	Single user, multiuser, 64	Multiuser	Multiuser	Single user
COMPONENTS	PC software, PC hardware	PC software	PC software	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	Xenix	Xenix	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	ARCnet, Ethernet, Token-Ring, STARLAN	Vendor did not specify	Vendor did not specify	Not applicable
MINIMUM MEMORY REQUIRED (KB)	130	Vendor did not specify	Vendor did not specify	19
HOST INTERFACE Systems Supported	IBM 43XX/30XX, AS/400	IBM 43XX/30XX	IBM 43XX/30XX, AS/400	IBM 43XX/30XX
Software Environment	IBM MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	HDLC	BSC	SNA, SDLC	BSC, SNA
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Host virtual disk, access to host-resident programs
EMULATION Terminals/Controllers Emulated	TTY, DEC VT52/100, QLT102	IBM 327X/317X DFT, 327X/317X CUT, 327X controller and devices	IBM 327X/317X CUT, 317X/327X controller and devices	IBM 327X/317X CUT
Terminal Functions Supported	Color display, function keys, character attributes, windows	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, user-defined keyboard map, print to disk
Number of Concurrent Sessions	8/workstation, 1,024/LAN	32	32	1 host session, 1 DOS
DOS Access During Session	Yes	Not applicable	Not applicable	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	No	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	Coax
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	64K	Up to 19.2K	Up to 38.4K	2.4M
Communications Features	Dialing directory, auto answer	Auto answer	Auto answer	Macros, unattended execution
USER INTERFACE	Install, on-line help, menu driven, windows	Install, on-line help, command driven, on-line tutorial, menu driven, diagnostics	Install, on-line help, command driven, on-line tutorial, menu driven, diagnostics	Install, on-line help, command driven, graphic icons, menu driven, windows
PROGRAMMING FEATURES Programmability	No	Yes	Yes	Yes
API Compatibility	Proprietary	Proprietary	Proprietary	IBM API, proprietary
MICROCOMPUTER SECURITY	Vendor did not specify	1 level password, interface to host software	1 level password, interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	Contact vendor	695 to 1,695	695 to 1,695	1,095
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	Vendor did not specify	Vendor did not specify	Vendor did not specify	1983
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	Vendor did not specify	Vendor did not specify	1 year
Distribution	Dist., dealers, retail, VARs	Vendor did not specify	Vendor did not specify	Dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Rabbit Software	Rabbit Software	Relay Communications	Relay Communications
PRODUCT NAME	RabbitSTATION DFT	RabbitSTATION Remote	Relay Gold (PC Product)	Relay/3270 (Mainframe Software)
PRODUCT FUNCTION	Local/remote terminal emulation, non-host application specific link	Remote terminal emulation, non-host application specific link	Local/remote terminal emulation, non-host application specific link	Loc/rem terminal emulation, standalone protocol converter, host app. specific/ non-host app. specific link
USERS SUPPORTED	Single user	Single user	Single user, multiuser, 250 w/Relay Gold Network model	Single user, multiuser, 250 w/Relay Gold Network Model
COMPONENTS	PC software, PC hardware, host software	PC software, PC hardware	PC software	Host software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles	IBM PC/XT/AT & compatibles
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Not applicable	Not applicable	Token-Ring, NETBIOS-compatible LANS	Token-Ring, NETBIOS-compatible LANS
MINIMUM MEMORY REQUIRED (KB)	150	150	192	192
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM MVS, VM, CMS	IBM MVS, VM, TSO, CMS, VM/VTAM, MVS/VTAM
Protocols	BSC, SNA, SDLC	BSC, SNA	BSC, SNA, Relay protocol	Any protocol
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Access to host-resident programs	Vendor did not specify
EMULATION Terminals/Controllers Emulated	IBM 327X/317X CUT	IBM 327X/317X DFT	TTY, IBM 327X/317X DFT, 327X/317X CUT, DEC VT52/100, VT200 Series, VT300 Series, IBM 3101 models 10 and 20	IBM 327X/317X DFT, 327X/317X CUT
Terminal Functions Supported	Color display, graphics display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, print to disk	Color display, graphics display, function keys, character attributes, user-defined keyboard map, print to disk
Number of Concurrent Sessions	5 host, 1 DOS, 1 notepad	8 host, 1 DOS, 1 notepad	15	15
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax	Coax	Coax, RS-232-C	Coax, RS-232-C
Transmission Mode	Synchronous	Synchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	2.4M	9600 to 64K	Up to 38.4K	Up to 38.4K
Communications Features	Macros, unattend. exec.	Macros, unattended execution	Dialing directory, auto dial/redial, auto answer, macros, unattended execution	Dialing directory, auto dial/redial, auto answer, macros, unattended execution
USER INTERFACE	Install, on-line help, command driven, graphic icons, menu driven, windows, diagnostics	Install, on-line help, command driven, graphic icons, menu driven, windows, diagnostics	Install, on-line help, command driven, on-line tutorial, menu driven, diagnostics	Install, on-line help, command driven, on-line tutorial, menu driven, diagnostics
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, proprietary	IBM API, proprietary	Proprietary	Proprietary
MICROCOMPUTER SECURITY	Interface to host software	Interface to host software	1 level password, multilevel password, interface to host software, trans. encryption	1 level password, multilevel password, interface to host software, trans. encryption
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	1,295	595 to 1,395	295	295
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	5,500 to 14,5000	5,500 to 14,500
Date of First Delivery	Vendor did not specify	1983	April 1982	March 1984
Number Installed to Date	Vendor did not specify	Vendor did not specify	70,000	200
Warranty	1 year	1 year	90 days	90 days
Distribution	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Direct	Direct
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Relay Communications	Relay Communications	The Santa Cruz Operation	Scientific & Business Systems
PRODUCT NAME	Relay/TSO (Mainframe Software)	Relay/VM (Mainframe Software)	SCO uniPATH SNA-3270	Streamline
PRODUCT FUNCTION	Non-host application specific link	Non-host application specific link	Remote terminal emulation	Non-host application specific link
USERS SUPPORTED	Single user, multiuser, 250 w/Relay Gold Network model	Single user, multiuser, 250 w/Relay Gold Network model	Multiuser, up to 16	Multiuser, open
COMPONENTS	Host software	Host software	PC software, PC hardware	PC software, host software
COPY PROTECTED	No	No	No	Yes
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	Xenix	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Token-Ring, NETBIOS-compatible LANS	Token-Ring, NETBIOS-compatible LANS	Ethernet	DSA
MINIMUM MEMORY REQUIRED (KB)	192	192	1	Vendor did not specify
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	IBM 43XX/30XX	Honeywell Bull Systems, Honeywell DPS8
Software Environment	IBM MVS, TSO	IBM VM, CMS	IBM OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	Honeywell GCOS
Protocols	BSC, SNA, Relay protocol	BSC, SNA, Relay protocol	SNA, SDLC	SNA
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs, Ind$File	None
EMULATION Terminals/Controllers Emulated	TTY, IBM 327X/317X DFT, 327X/317X CUT, DEC VT52/100, VT200 Series, VT300 Series, IBM 3101 models 10 and 20	TTY, IBM 327X/317X DFT, 327X/317X CUT, DEC VT52/100, VT200 Series, VT300 Series, IBM 3101 models 10 and 20	IBM 327X/317X CUT	TTY; Honeywell Bull
Terminal Functions Supported	Color display, graphics display, function keys, character attributes, user-defined keyboard map, print to disk	Color display, function keys, character attributes, user-defined keyboard map, print to disk	Function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, windows
Number of Concurrent Sessions	15	15	32	Open
DOS Access During Session	Yes	Yes	Yes	No
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax, RS-232-C	Coax, RS-232-C	RS-232-C	Not applicable
Transmission Mode	Asynchronous	Asynchronous	Synchronous	Asynchronous, synchronous
Transmission Speed (bps)	Up to 38.4K	Up to 38.4K	2400 to 9600	2400, 4800
Communications Features	Dialing directory, auto dial/redial, auto answer, macros, unattended execution	Dialing directory, auto dial/redial, auto answer, macros, unattended execution	Dialing directory, auto dial/redial, macros, unattended execution	Not applicable
USER INTERFACE	Install, on-line help, command driven, on-line tutorial, menu driven, diagnostics	Install, on-line help, command driven, on-line tutorial, menu driven, diagnostics	Install, on-line help, command driven, menu driven, diagnostics	On-line help, on-line tutorial, windows
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	No
API Compatibility	Proprietary	Proprietary	Proprietary	Proprietary
MICROCOMPUTER SECURITY	1 level password, multilevel password, interface to host software, trans. encryption	1 level password, multilevel password, interface to host software, trans. encryption	1 level password	Multilevel password
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	295	295	695 to 2095 (s), 395 (h)	Contact vendor
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	9,500 (7,500 when bought with Relay/3270)	6,500 (4,500 when bought with Relay/3270	Not applicable	Contact vendor
Date of First Delivery	October 1985	April 1982	June 1986	August 1986
Number Installed to Date	100	300	3,000	25
Warranty	90 days	90 days	30 days	Vendor did not specify
Distribution	Direct	Direct	Direct, dist., dealers, retail, mail, VARs	Direct
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Simware	Softel	Software Clearing House	Software Corp. of America
PRODUCT NAME	SIM 3278/SIM PC Master	PC 52	Microlink	Gateway PC
PRODUCT FUNCTION	Local/remote terminal emulation, host application specific link	Remote terminal emulation	Remote terminal emulation	Local/remote terminal emulation, standalone protocol converter, non-host application specific link
USERS SUPPORTED	Multiuser, limit is CPU dependent	Multiuser, UNIX, up to hardware limit	Single user	Single user, multiuser, through APIs
COMPONENTS	PC software, host software	PC software	PC software, host software	PC software, host software
COPY PROTECTED	Yes	No	No	No
MICROCOMPUTERS SUPPORTED	Macintosh, IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles	IBM PC/XT/AT & compatibles	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	Macintosh Finder, MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS, UNIX	OS/2, MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	AppleTalk, most non-hardware specific LANs	X.25	Vendor did not specify	Ethernet, Token-Ring, STARLAN, all with IBM compatible API, HLLAPI
MINIMUM MEMORY REQUIRED (KB)	350	128	512	320
HOST INTERFACE Systems Supported	IBM 43XX/30XX, NAS, Amdahl	UNIX-based systems	NCR VRX, IRX/ITX	IBM 43XX/30XX
Software Environment	IBM MVS, VM, CMS	UNIX System 5	NCR IRX, ITX, VRX, UNIX	IBM VM, TSO, CICS; VAX/VMS
Protocols	BSC, SNA, SDLC, proprietary	X.25	Async	SNA, SDLC
Applications Supported	Any 3270 application	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	TTY, IBM 327X/317X DFT, 327X/317X CUT, DEC VT52/100	DEC VT52/100	NCR 796-101, 301, 401, 7900,7901; ADDS Viewpoint, 2020	TTY, IBM 327X/317X DFT, 327X/317X CUT, DEC VT52/100, VT200 Series, X.PC TYMNET78
Terminal Functions Supported	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, user-defined keyboard map, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, print to disk
Number of Concurrent Sessions DOS Access During Session File Transfer File Formats File Conversion	12 Yes Yes ASCII, binary Yes	UNIX, up to hardware limit Yes Yes ASCII No	Up to 4 Yes Yes ASCII, binary Yes	Vendor did not specify Yes Yes ASCII, binary Yes
COMMUNICATIONS CHAR. Physical Connection	Coax, RS-232-C	RS-232-C, T1LL X.25 board	RS-232-C	Coax, RS-232-C
Transmission Mode Transmission Speed (bps)	Asynchronous, synchronous 300 to 19.2K	Asynchronous Up to 56K	Asynchronous 19.2K	Asynchronous, synchronous 300 to 19.2K
Communications Features	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.	Remote command execution	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, macros, unattended execution
USER INTERFACE	On-line help, mouse, command driven, graphic icons, menu driven, windows, diagnostics	Vendor did not specify	Install, on-line help, menu driven, windows, diagnostics	Install, on-line help, command driven, menu driven, diagnostics
PROGRAMMING FEATURES Programmability API Compatibility	Yes IBM API, proprietary	No Vendor did not specify	No Proprietary	Yes IBM API, DCA IRMA API
MICROCOMPUTER SECURITY	1 level password, interface to host software	Provided by minicomputer	1 level password, interface to host software	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	58 to 250	149	Contact vendor	350
Standalone Hardware ($) Host Software/Hardware ($)	Not applicable 5,000 to 22,000	Not applicable Not applicable	Not applicable Contact vendor	Not applicable 9,000
Date of First Delivery Number Installed to Date Warranty Distribution	June 1982 Over 1,000 sites 90 days (s), one year (h) Direct, dist., dealers, retail, VARs	September 1985 Over 15,000 1 year OEMs	Vendor did not specify Over 1,000 30 days Direct	May 1985 Over 20,000 Damaged products replaced OEMs, VARs
COMMENTS	4 versions: SIM3278/VM, SIM3278/VTAM, SIM3278/-GCS, SIM3278/TCP/IP	DOS-to-UNIX terminal emulator	30-day free-trial optional maintenance plan	Development language allows PC users to transparently access mainframes

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Software Synergy	Software Synergy	Sterling Software, Systems Software Division	Sterling Software, Systems Software Division
PRODUCT NAME	Respond/Async	Respond/Sync	PC-Tracs	SuperTracs
PRODUCT FUNCTION	Remote terminal emulation	Remote terminal emulation, network gateway	Remote terminal emulation	Remote terminal emulation
USERS SUPPORTED	Single user	Single user, multiuser, Up to 32	Single user	Multiuser, 32
COMPONENTS	PC software	PC software, PC hardware	PC software, PC hardware	Host software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	Vendor did not specify
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	Vendor did not specify
LOCAL AREA NETWORK SUPPORT	Not applicable	Ethernet, Token-Ring	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	256	256	64	Vendor did not specify
HOST INTERFACE Systems Supported	Not applicable	IBM 43XX/30XX, System/36/38, AS/400	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	Not applicable	Not applicable	IBM DOS, OS/VS, MVS	IBM DOS, OS/VS, MVS
Protocols	Not applicable	BSC, SNA, SDLC	BSC, SNA	BSC, SNA
Applications Supported	Not applicable	IND$FILE	Vendor did not specify	Vendor did not specify
EMULATION Terminals/Controllers Emulated	TTY, DEC VT52/100, HP, IBM 3101	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780	2780/3780, 3770	IBM 2780/3780, 3770
Terminal Functions Supported	Color display, function keys, character attributes, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Function keys, host printer emulation, print to disk	Vendor did not specify
Number of Concurrent Sessions	1	8	1	32
DOS Access During Session	Yes	Yes	Yes	Vendor did not specify
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	Vendor did not specify
File Conversion	No	Yes	Yes	Vendor did not specify
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode Transmission Speed (bps)	Asynchronous 300, 1200, 2400, 4800, 9600, 19.2K	Synchronous 2400 to 9600	Vendor did not specify 1200, 2400, 4800, 9600, 14.4K, 19.2K	Synchronous 1200, 2400, 4800, 9600, 14.4K, 19.2K, 2.4M
Communications Features	Dialing directory, auto dial/redial, auto answer, macros, unattended exec.	Dialing directory, auto dial/redial	Auto dial/redial, unattended execution	Auto dial/redial, auto answer, unattended execution
USER INTERFACE	On-line help, menu driven	Install, on-line help, menu driven	On-line help, command driven, menu driven	Install
PROGRAMMING FEATURES Programmability	Yes	Yes	Vendor did not specify	Yes
API Compatibility	Not applicable	IBM API	Vendor did not specify	Vendor did not specify
MICROCOMPUTER SECURITY	Optional transmission encryption	Not applicable	Vendor did not specify	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	129	795 to 1,995	850 to 2,600	Not applicable
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	BSC 27,500 to 40,000; SNA 35,000 to 50,000
Date of First Delivery	November 1985	July 1987	October 1982	November 1984
Number Installed to Date	Information not available	Information not available	Not applicable	350
Warranty	1 year	1 year	90 days	1 year
Distribution	Direct	Direct	Direct, OEMs, VARs	Direct
COMMENTS	Real-time DES encryption of transmission available	Single and multiuser support for X.25 available	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Sterling Software, Systems Software Division	Structured Software Solutions	Synex Systems	Synex Systems
PRODUCT NAME	Tracs	Facet/PC	PC Harmony	PK Harmony
PRODUCT FUNCTION	Remote terminal emulation	Local/remote terminal emulation	Local/remote terminal emulation	Local/remote terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	Host software	PC software, host software	PC software, host software	PC software, host software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	Vendor did not specify	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	Vendor did not specify	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	PCI	Not currently supported	Not currently supported
MINIMUM MEMORY REQUIRED (KB)	Vendor did not specify	256	320	320
HOST INTERFACE Systems Supported	IBM 43XX/30XX	UNIX-based systems	Business BASIC based systems	PICK-based system
Software Environment	IBM DOS, OS/VS, MVS	UNIX System 5	Business BASIC	PICK
Protocols	BSC, SNA	Vendor did not specify	Proprietary	Proprietary
Applications Supported	Vendor did not specify	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 2780/3780	DEC VT52/100	TTY, DEC VT52/100, Wyse 50, TeleVideo 950	TTY, DEC VT52/100, Wyse 50, ADDS Viewpoint, most PICK terminals
Terminal Functions Supported	Vendor did not specify	Color display, function keys, character attributes, windows, user-defined keyboard map, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	Vendor did not specify	10	1	2
DOS Access During Session	Vendor did not specify	Yes	Yes	Yes
File Transfer	Yes	Yes	No	No
File Formats	Vendor did not specify	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Vendor did not specify	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	Locus PC-Interface	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Asynchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	1200, 2400, 4800, 9600, 14.4K, 19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K, 38.4K
Communications Features	Auto dial/redial, auto answer, unattended execution	Multiple host sessions	Dialing directory, unattended execution, auto-dial	Dialing directory, unattended execution, auto-dial, script file support
USER INTERFACE	Install	Install, command driven, menu driven, windows	On-line help, menu driven	On-line help, menu driven
PROGRAMMING FEATURES Programmability	No	Yes	No	No
API Compatibility	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
MICROCOMPUTER SECURITY	Vendor did not specify	Vendor did not specify	1 level password, interface to host software	1 level password, interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	Not applicable	250	595	595
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	BSC 10,000 to 13,000; SNA 14,000 to 18,0	100	Host software included in price	Host software included in price
Date of First Delivery	November 1981	January 1986	January 1985	December 1986
Number Installed to Date	720	500	700	2,000
Warranty	1 year	Vendor did not specify	30 days	30 days
Distribution	Direct	Direct, dist., dealers, retail, VARs	Direct, dist., dealers, retail	Direct, dist., dealers, retail
COMMENTS	—	Unix sessions in PC windows	PICK operating system supported	PICK operating system supported

AUGUST 1989

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Synex Systems Corp.	Tangram Systems	Tangram Systems	TDT Group
PRODUCT NAME	PK Term	Arbiter	Arbiter Peer Services	Honey Bunch
PRODUCT FUNCTION	Local/remote terminal emulation	Local/remote terminal emulation	Tool kit for APPC app. writing	Local/remote terminal emulation, network gateway
USERS SUPPORTED	Single user	Multiuser, depends on host CPU size	Multiuser, depends on host CPU size	Single user, multiuser, 256
COMPONENTS	PC software	PC software, host software	PC software, host software	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Not currently supported	Ethernet, Token-Ring, all NETBIOS compatible LANs	Ethernet, Token-Ring, all NETBIOS compatible LANs	Token-Ring, NETBIOS-compatible
MINIMUM MEMORY REQUIRED (KB)	320	512	512	200
HOST INTERFACE Systems Supported	PICK-based system	IBM 43XX/30XX	IBM 43XX/30XX	Honeywell Bull Systems
Software Environment	PICK	IBM MVS, VM	IBM MVS, CMS	Honeywell GCOS
Protocols	Vendor did not specify	SNA, SDLC	BSC, SNA, SDLC, async	BSC, HDLC, Manchester, X.25
Applications Supported	Access to host-resident programs	Host virtual disk	Access to host-resident programs, LU 6.2	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	TTY, DEC, VT52/100, Wyse 50, ADDS Viewpoint, most PICK terminals	IBM 327X/317X DFT, 327X/317X CUT, DEC VT52/100	Vendor did not specify	Honeywell Bull
Terminal Functions Supported	Vendor did not specify	Color display, host printer emulation	Vendor did not specify	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	1	1	Vendor did not specify	256
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	No	Yes	Yes	Yes
File Formats	Not applicable	ASCII, binary	Vendor did not specify	ASCII, binary
File Conversion	No	Yes	Vendor did not specify	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	Coax, RS-232-C	Coax, RS-232-C	RS-232-C
Transmission Mode	Asynchronous	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 19.2K, 2.4M, 38.4K	300 to 2.4M	300 to 2.4M	300, 2.4M
Communications Features	Dialing directory, unattended execution, auto-dial, script file support	Unattended execution, scripting	Unattended execution	Auto dial/redial
USER INTERFACE	On-line help, menu driven	Install, on-line help, command driven, menu driven, hot-key to DOS	Install	Install, on-line help, on-line tutorial
PROGRAMMING FEATURES Programmability	No	Yes	Yes	Yes
API Compatibility	Vendor did not specify	Proprietary	IBM LU 6.2, PC API SAA compatible (early 1989)	Proprietary
MICROCOMPUTER SECURITY	1 level password, interface to host software	Interface to host software	Interface to host software	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	149	Included in package	Included in package	499 (289 per slave)
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	20,000 to 60,000	20,000 to 60,000	Not applicable
Date of First Delivery	February 1987	Vendor did not specify	Vendor did not specify	December 1981
Number Installed to Date	300	Over 90	Over 10	Approx. 15,000
Warranty	30 days	30-day trial	30-day trial	1 year
Distribution	Direct, dist., dlrs, retail	Direct	Direct	Direct, dist., dealers, retail, mail, OEMs, VARs
COMMENTS	PICK operating system supported	Interfaces to SAS, Focus, and dB2 data VTAM subsystem on host; backup option	Tool kit for LU 6.2 application building	Remarketed by Honeywell Bull in Europe

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	TDT Group	TDT Group	Techland BlueLynx	Techland BlueLynx
PRODUCT NAME	SIX/25	Transfile (3780)	BlueLynx 3270 Gateway	BlueLynx 3270 Remote Autosync
PRODUCT FUNCTION	Remote terminal emulation, network gateway	Local/remote terminal emulation	Remote terminal emulation, network gateway	Remote terminal emulation
USERS SUPPORTED	Multiuser, 32	Single user	Multiuser, 8	Single user
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Token-Ring, NETBIOS-compatible	Vendor did not specify	NETBIOS-compatible LANS	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	360	130	256	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX, System/36/38, AS/400; Data General Systems; Honeywell Bull Systems; DEC VAX, DECsystem; UNIXsystems	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, QLLC	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400; VAX/VMS; DG OAS; UNIX System 5; Berkeley 4.X BSD	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	HDLC, QLLC X.25	BSC	SNA, SDLC	SNA, SDLC
Applications Supported	Access to host-resident programs	None, access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT, 327X/317X CUT	IBM 5250 Series	IBM 327X/317X DFT, 327X/317X CUT	IBM 327X/317X DFT, 327X/317X CUT
Terminal Functions Supported	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Function keys, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	6 per workstation	1	8	8
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	Vendor did not specify
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C, X.25 sync connection	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Asynchronous, synchronous
Transmission Speed (bps)	1200, 9600, 2.4M	300, 19.2K	300 to 9600, depending on environment	300 to 9600
Communications Features	Auto dial/redial	Auto dial/redial, auto answer, unattended execution	Unattended execution	Unattended execution
USER INTERFACE	Install, on-line tutorial	Install, on-line help	Install, on-line help, menu driven, diagnostics	Install, on-line help, menu driven, diagnostics
PROGRAMMING FEATURES Programmability	Yes	Yes	No	No
API Compatibility	Proprietary, 3 levels of API	Proprietary	IBM API	IBM API
MICROCOMPUTER SECURITY	Vendor did not specify	Vendor did not specify	1 level password	1 level password
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	789 to 288 (slaves)	499	1,995	895
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	December 1986	January 1981	Vendor did not specify	Vendor did not specify
Number Installed to Date	Approx. 1,000	Approx. 15,000	Vendor did not specify	Vendor did not specify
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Direc dist., dealers, retail, mail, OEMs, VARs	Direct, dist., dealers, retail, OEMs	Direct, dist., dealers, retail, OEMs
COMMENTS	Remarketed by IBM in France	—	—	Supports AutoSync feature of high-speed Hayes modems

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Techland BlueLynx	Techland BlueLynx	Techland BlueLynx	Techland BlueLynx
PRODUCT NAME	BlueLynx 3270 Remote	BlueLynx 3780 RJE	BlueLynx 5250 Redirector	BlueLynx 5250-12 (Remote 5250)
PRODUCT FUNCTION	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation, network gateway	Remote terminal emulation
USERS SUPPORTED	Single user	Single user	Multiuser, 9	Single user
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	NETBIOS-compatible LANS	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	256	128	69 (Local),58 (Remote)	158
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX	IBM System/36/38, AS/400	IBM System/36/38, AS/400
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	Vendor did not specify	IBM SSP	IBM SSP, OS/400
Protocols	SNA, SDLC	BSC	SNA	SNA, SDLC
Applications Supported	Access to host-resident programs	None	Access to host-resident programs	Host virtual disk, access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT, 327X/317X CUT	IBM 2780/3780	IBM 5250 Series, 3180	IBM 5250 Series, 3180
Terminal Functions Supported	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Not applicable	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation
Number of Concurrent Sessions DOS Access During Session File Transfer File Formats File Conversion	8 Yes Yes Vendor did not specify Yes	1 No Yes ASCII, binary Yes	9 Yes Yes ASCII, binary Yes	9 Yes Yes ASCII, binary Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode Transmission Speed (bps)	Asynchronous, synchronous 300 to 9600	Synchronous 300 to 9600	Asynchronous 300 to 19.2	Synchronous 300 to 9600
Communications Features	Unattended execution	Unattended execution	Unattended execution	Vendor did not specify
USER INTERFACE	Install, on-line help, menu driven, diagnostics	Install, on-line help, menu driven, diagnostics	On-line help, menu driven	Install, on-line help, menu driven, diagnostics
PROGRAMMING FEATURES Programmability API Compatibility	No IBM API	No Not applicable	No IBM API	No IBM API
MICROCOMPUTER SECURITY	1 level password	1 level password	1 level password	1 level password
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	895	895	495	795
Standalone Hardware ($) Host Software/Hardware ($)	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable
Date of First Delivery Number Installed to Date Warranty Distribution	Vendor did not specify Vendor did not specify 1 year Direct, dist., dealers, retail, OEMs	Vendor did not specify Vendor did not specify 1 year Direct, dist., dealers, retail, OEMs	Vendor did not specify Vendor did not specify 1 year Direct, dist., dealers, retail, OEMs	Vendor did not specify Vendor did not specify 1 year Direct, dist., dealers, retail, OEMs
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Techland BlueLynx	Techland BlueLynx	Techland BlueLynx	Techland BlueLynx
PRODUCT NAME	BlueLynx 5250-12 Cluster	BlueLynx 5250-12 Gateway	BlueLynx 5250-12 Remote Autosync	BlueLynx 5251-11
PRODUCT FUNCTION	Remote terminal emulation	Remote terminal emulation, network gateway	Remote terminal emulation	Local terminal emulation
USERS SUPPORTED	Multiuser, 9	Multiuser, 9	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	NETBIOS-compatible LANS	NETBIOS-compatible LANS	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	168 (Cluster)	70 (Gateway), 135 (PC node)	158	64
HOST INTERFACE Systems Supported	IBM System/36/38, AS/400	IBM System/36/38, AS/400	IBM System/36/38, AS/400	IBM System/36/38
Software Environment	IBM SSP, OS/400	IBM SSP, OS/400	IBM SSP, OS/400	IBM SSP, OS/400
Protocols	SNA, SDLC	SNA, SDLC	SNA, SDLC	SNA
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 5250 Series, 3180	IBM 5250 Series	IBM 327X/317X DFT, 327X/317X CUT, 3180	3180
Terminal Functions Supported	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation
Number of Concurrent Sessions	Vendor did not specify	9	9	7
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	Twinax
Transmission Mode	Asynchronous	Synchronous	Asynchronous	Vendor did not specify
Transmission Speed (bps)	300 to 9600	Equal to environment	300 to 9600	300 to 9600
Communications Features	Unattended execution	Unattended execution	Unattended execution	Unattended execution
USER INTERFACE	Install, on-line help, menu driven, diagnostics	Install, on-line help, menu driven, diagnostics	Install, on-line help, menu driven, diagnostics	Install, on-line help, menu driven
PROGRAMMING FEATURES Programmability	No	No	No	No
API Compatibility	IBM API	IBM API	IBM API	IBM API
MICROCOMPUTER SECURITY	1 level password	1 level password	1 level password	1 level password
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	1,995	1,995	595	895
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dealers, retail, OEMs	Direct, dist., dealers, retail, OEMs	Direct, dist., dealers, retail, OEMs	Vendor did not specify
COMMENTS	—	—	Supports AutoSync feature of high-speed Hayes modems	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Techland BlueLynx	Techland BlueLynx	Techland BlueLynx	Techland BlueLynx
PRODUCT NAME	BlueLynx 5251-11 Cluster	BlueLynx 5251-11 Gateway	BlueLynx COAXXSYS	BlueLynx DFT-3270
PRODUCT FUNCTION	Local terminal emulation	Local terminal emulation, network gateway	Local terminal emulation	Local terminal emulation
USERS SUPPORTED	Multiuser, 7	Multiuser, 7	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	NETBIOS-compatible LANS	NETBIOS-compatible LANS	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	120 (Cluster), 97 (PC node)	60 (Gateway), 91 (PC node)	135	256
HOST INTERFACE Systems Supported	IBM System/36/38, AS/400	IBM System/36/38, AS/400	IBM 43XX/30XX	IBM 43XX/30XX
Software Environment	IBM SSP, OS/400	IBM SSP, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	SNA, SDLC	SNA, SDLC	BSC, SNA, Channel	BSC, SNA, Channel
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	Access to host-resident programs	Access to host-resident programs
EMULATION Terminals/Controllers Emulated	IBM 5250 Series, 3180	IBM 5250 Series, 3180	IBM 327X/317X DFT	IBM 327X/317X CUT
Terminal Functions Supported	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	7	7	1	5
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Twinax	Twinax	Coax	Coax
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	300 to 9600	Equal to environment	300 to 9600, depending on environment	Relative to environment
Communications Features	Unattended execution	Unattended execution	Unattended execution	Unattended execution
USER INTERFACE	On-line help, menu driven	Install, on-line help, menu driven	Install, on-line help, menu driven	Install, on-line help, menu driven
PROGRAMMING FEATURES Programmability	No	No	No	No
API Compatibility	IBM API	IBM API	IBM API	IBM API
MICROCOMPUTER SECURITY	1 level password	1 level password	1 level password	1 level password
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	1,995	1,995	895	1,095
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dealers, retail, OEMs	Direct, dist., dealers, retail, OEMs	Direct, dist., dealers, retail, OEMs	Direct, dist., dealers, retail, OEMs
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Teknigraphics	Universal Data Systems	Universal Data Systems	Universal Data Systems
PRODUCT NAME	Graph-TEK APA	Sync-Up 2/201	Sync-Up 2/201/12	Sync-Up 2/208/201
PRODUCT FUNCTION	Local/remote terminal emulation	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	Yes	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PS/2 MCA	IBM PS/2 MCA	IBM PS/2 MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	Vendor did not specify	OS/2	OS/2
LOCAL AREA NETWORK SUPPORT	Token-Ring (during 1989)	Vendor did not specify	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	256	256	256	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX	IBM 43XX/30XX, System/36/38	IBM 43XX/30XX, System/36/38, AS/400	IBM 43XX/30XX, System/36/38, AS/400
Software Environment	IBM MVS, VM, TSO, CMS, MVS/XA	IBM DOS, OS/VS, MVS, VM, TSO, CICS, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CICS, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CICS, OS/400
Protocols	BSC, SNA, SDLC	BSC, SNA, SDLC	BSC, SNA, SDLC	BSC, SNA, SDLC
Applications Supported	GDDM, SAS/Graph, Tellagraph, other host graphic	Vendor did not specify	Vendor did not specify	Vendor did not specify
EMULATION Terminals/Controllers Emulated	IBM 327X/317X CUT, 3179g, 3192G, 3270 Models 2-5	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780
Terminal Functions Supported	Color display, graphics display, function keys, character attributes, user-defined keyboard map, print to disk	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	1	Multiple LUs	Multiple LUs	Vendor did not specify
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	Coax	MCA bus to PC, twisted pair to host	MCA bus to PC, twisted pair to host	MCA bus to PC, twisted pair to host
Transmission Mode	Synchronous	Synchronous	Asynchronous, synchronous	Synchronous
Transmission Speed (bps,	56K, 3M	2400	300, 1200, 2400	2400, 4800
Communications Features	Graphics file capture from mainframe to PC disk	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.
USER INTERFACE	Install, mouse, menu driven, diagnostics	Command driven, menu driven, diagnostics	Command driven, menu driven, diagnostics	Command driven, menu driven, diagnostics
PROGRAMMING FEATURES Programmability	Yes	No	No	No
API Compatibility	IBM API	IBM API	IBM API	IBM API
MICROCOMPUTER SECURITY	Vendor did not specify	Interface to host software	Interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	595	325 to 525 (s), 625 (h)	325 to 525 (s), 840 (h)	325 to 525 (s), 1,140 (h)
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	May 1988	October 1988	October 1988	October 1988
Number Installed to Date	Vendor did not specify	25,000	25,000	25,000
Warranty	30 days	1 year	1 year	1 year
Distribution	Direct, dist., dealers, retail, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs
COMMENTS	Graphics output to HP plotters, laser printers; converts IBM GDDM PIF files into ANSI standard files	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Universal Data Systems	Universal Data Systems	Universal Data Systems	Universal Data Systems
PRODUCT NAME	Sync-Up 2/V.22 bis	Sync-Up 2/V.32	Sync-Up 201C	Sync-Up 201C/212A
PRODUCT FUNCTION	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PS/2 MCA	IBM PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	OS/2	OS/2	OS/2	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	256	256	256	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX, System/36/38, AS/400	IBM 43XX/30XX, System/36/38	IBM 43XX/30XX, System/36/38, AS/400	IBM 43XX/30XX, System/36/38, AS/400
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CICS, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CICS, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CICS, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CICS, OS/400
Protocols	BSC, SNA, SDLC	BSC, SNA, SDLC	BSC, SNA, SDLC	BSC, SNA, SDLC
Applications Supported	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780
Terminal Functions Supported	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	Multiple LUs	Multiple LUs	Multiple LUs	Multiple LUs
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR. Physical Connection	MCA bus to PC, twisted pair to host	MCA bus to PC, twisted pair to host	PC bus, twisted pair to host	PC bus, twisted pair to host
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Synchronous	Asynchronous, synchronous
Transmission Speed (bps)	300, 1200, 2400	4800, 9600	2400	300, 1200, 2400
Communications Features	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.
USER INTERFACE	Command driven, menu driven, diagnostics	Command driven, menu driven, diagnostics	Command driven, menu driven, diagnostics	Command driven, menu driven, diagnostics
PROGRAMMING FEATURES Programmability	No	No	No	No
API Compatibility	IBM API	IBM API	IBM API	IBM API
MICROCOMPUTER SECURITY	Interface to host software	Interface to host software	Interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	325 to 525 (s), 575 (h)	325 to 525 (s), 1,295 (h)	325 to 525 (s), 625 (h)	325 to 525 (s), 840 (h)
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Date of First Delivery	October 1988	October 1988	January 1986	January 1988
Number Installed to Date	25,000	25,000	25,000	25,000
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs	Direct, dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Universal Data Systems	Universal Data Systems	Universal Data Systems	Universal Data Systems
PRODUCT NAME	Sync-Up 208 A/B	Sync-Up T.9628B	Sync-Up V.22 bis	Sync-Up V.26
PRODUCT FUNCTION	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Single user
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	256	256	256	256
HOST INTERFACE Systems Supported	IBM 43XX/30XX, System/36/38	IBM 43XX/30XX, System/36/38, AS/400	IBM 43XX/30XX, System/36/38, AS/400	IBM 43XX/30XX, System/36/38
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CICS, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CICS, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CICS, OS/400	IBM DOS, OS/VS, MVS, VM, TSO, CICS, OS/400
Protocols	BSC, SNA, SDLC	BSC, SNA, SDLC	BSC, SNA, SDLC	BSC, SNA, SDLC
Applications Supported	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780
Terminal Functions Supported	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions DOS Access During Session File Transfer File Formats File Conversion	Multiple LUs Yes Yes ASCII, binary Yes	Multiple LUs Yes Yes ASCII, binary Yes	Multiple LUs Yes Yes ASCII, binary Yes	Multiple LUs Yes Yes ASCII, binary Yes
COMMUNICATIONS CHAR. Physical Connection Transmission Mode Transmission Speed (bps)	PC bus, twisted pair to host Synchronous 4800	PC bus, twisted pair to host Synchronous 4800, 9600, 4800, 7200, 9600	PC bus, twisted pair to host Asynchronous, synchronous 300, 1200, 2400	PC bus, twisted pair to host Synchronous 2400
Communications Features	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.	Auto dial/redial, auto answer, macros, unattended execution	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.
USER INTERFACE	Command driven, menu driven, diagnostics	Command driven, menu driven, diagnostics	Command driven, menu driven, diagnostics	Command driven, menu driven, diagnostics
PROGRAMMING FEATURES Programmability API Compatibility	No IBM API	No IBM API	No IBM API	No IBM API
MICROCOMPUTER SECURITY	Interface to host software	Interface to host software	Interface to host software	Interface to host software
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	325 to 525 (s), 1,140 (h)	325 to 525 (s), 1,540 (h)	325 to 525 (s), 575 (h)	325 to 525 (s), 625 (h)
Standalone Hardware ($) Host Software/Hardware ($)	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable
Date of First Delivery Number Installed to Date Warranty Distribution	January 1986 25,000 1 year Direct, dist., dealers, retail, OEMs, VARs	January 1986 25,000 1 year Direct, dist., dealers, retail, OEMs, VARs	January 1986 25,000 1 year Direct, dist., dealers, retail, OEMs, VARs	January 1986 25,000 1 year Direct, dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	—	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Universal Data Systems	URGEO Software	Walker Richer & Quinn	Wall Data
PRODUCT NAME	Sync-Up V.32	USI-Bisync	Reflection Series Software	Datagate/LAN
PRODUCT FUNCTION	Remote terminal emulation	Remote terminal emulation	Local/remote terminal emulation	Network gateway
USERS SUPPORTED	Single user	Single user	Single user	Multiuser
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, host software	PC software, PC hardware, host software
COPY PROTECTED	No	Vendor did not specify	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 non-MCA	PS/2 MCA, Apple IIe	Macintosh, IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Macintosh, IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	Apple ProDOS, Apple DOS	Macintosh Finder, MS-/PC-DOS	Macintosh Finder, MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	Ethernet, Token-Ring, AppleTalk, STARLAN	ARCnet, Ethernet, Token-Ring, STARLAN, NETBIOS-compatible
MINIMUM MEMORY REQUIRED (KB)	256	32	132	512
HOST INTERFACE				
Systems Supported	IBM 43XX/30XX, System/36/38, AS/400	IBM 43XX/30XX, System/36/38; Data General Systems; Honeywell Bull Systems; DEC VAX; UNIX-based systems	DEC VAX; UNIX-based systems	IBM 43XX/30XX, System/36/38, AS/400
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CICS, OS/400	IBM DOS, OS/VS, MVS, VM; VAX/VMS; Honeywell GCOS	VAX/VMS, Hewlett-Packard MPE	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, OS/400
Protocols	BSC, SNA, SDLC	Vendor did not specify	SNA, TCP/IP	BSC, SNA
Applications Supported	Vendor did not specify	Vendor did not specify	Access to host-resident programs	Host virtual disk, access to host-resident programs
EMULATION				
Terminals/Controllers Emulated	IBM 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780	Vendor did not specify	IBM 327X/317X DFT, 327X/317X CUT, DEC VT52/100, VT200 Series, VT300 Series; DG; HP	IBM 327X/317X CUT, 5250 Series
Terminal Functions Supported	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Vendor did not specify	Color display, graphics display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk
Number of Concurrent Sessions	Multiple LUs	Vendor did not specify	Up to 8 on a LAN	IBM 370-64, IBM S/3X-32
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
COMMUNICATIONS CHAR.				
Physical Connection	PC bus, twisted pair to host	RS-232-C	Twinax, coax, RS-232-C, Ethernet LAN	RS-232-C
Transmission Mode	Asynchronous, synchronous	Synchronous	Asynchronous	Asynchronous, synchronous
Transmission Speed (bps)	4800, 9600	2400 to 9600	300, 600, 1200, 2400, 4800, 9600, 19.2K	300 to 19.2K
Communications Features	Dialing directory, auto dial/redial, auto answer, macros, unattend. exec.	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution
USER INTERFACE	Command driven, menu driven, diagnostics	On-line help, command driven, menu driven	Install, on-line help, mouse, command driven, menu driven, windows	Install, on-line help, menu driven, windows, diagnostics
PROGRAMMING FEATURES				
Programmability	No	No	Yes	Yes
API Compatibility	IBM API	Vendor did not specify	Vendor did not specify	IBM API, proprietary
MICROCOMPUTER SECURITY	Interface to host software	Interface to host software	File encryption	Multilevel password
PRICING/AVAILABILITY				
Microcomputer Softw./Hardw. ($)	325 to 525 (s), 1,295 (h)	450	149 to 449	1,995 to 4,995
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Not applicable	Not applicable	No charge	Contact vendor
Date of First Delivery	January 1986	Vendor did not specify	October 1983	1987
Number Installed to Date	25,000	Over 500	200,000	Vendor did not specify
Warranty	1 year	1 year	Vendor did not specify	1 year
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Direct	Direct, dist., dealers, retail	Direct, dist., dealers, retail, OEMs, VARs
COMMENTS	—	—	—	Software options: IBM S/3X host file transfer, MAC file transfer

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Wall Data	Waterloo Microsystems	Waterloo Microsystems	White Crane Systems
PRODUCT NAME	Datagate/PC	PORT host CUT Gateway	PORT host SDLC Gateway	Brooklyn Bridge 2.0
PRODUCT FUNCTION	Standalone protocol converter	Local/remote terminal emulation, network gateway, non-host application specific link	Local/remote terminal emulation, network gateway, host application specific link	Host application specific link
USERS SUPPORTED	Multiuser, 5 PUs, 10 LUs	Single user	Multiuser, 32 per server	Single user
COMPONENTS	PC software, PC hardware, host software	PC software	PC software, PC hardware	PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	Macintosh, IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	Macintosh Finder, MS-/PC-DOS	Waterloo PORT	Waterloo PORT	MS-/PC-DOS
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	ARCnet, Token-Ring	ARCnet, Token-Ring	Novell
MINIMUM MEMORY REQUIRED (KB)	512	Vendor did not specify	Vendor did not specify	Under 5 (resident)
HOST INTERFACE Systems Supported	IBM 43XX/30XX, System/36/38, AS/400, async host passthrough	IBM 43XX/30XX	IBM 43XX/30XX, System/36/38	Vendor did not specify
Software Environment	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, OS/400	IBM DOS, MVS, VM, TSO, CMS, IMS, CICS, IBM VTAM required, NCP required	IBM DOS, MVS, VM, TSO, CMS, IMS, CICS, IBM VTAM required, NCP required	IBM DOS
Protocols	BSC, SNA, SDLC	BSC, SNA, SDLC	SNA, SDLC	Vendor did not specify
Applications Supported	Host virtual disk, access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Vendor did not specify
EMULATION Terminals/Controllers Emulated	TTY, IBM 327X/317X CUT, 5250 Series, DEC VT52/100, VT200 Series, DG, HP, Honeywell Bull, TeleVideo	TTY, DEC VT52/100	TTY, IBM 327X/317X CUT, DEC VT52/100	Vendor did not specify
Terminal Functions Supported	Color display, function keys, character attributes, windows, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, windows, user-defined keyboard map, print to disk	Color display, function keys, windows, user-defined keyboard map, host printer emulation, print to disk	Vendor did not specify
Number of Concurrent Sessions	IBM 370-10, IBM S/3X-7	1	Up to 32	1
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	No	No	Yes
File Formats	ASCII, binary	Not applicable	Not applicable	ASCII, binary
File Conversion	Yes	Not applicable	Not applicable	Yes
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	Coax	RS-232-C	RS-232-C
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous
Transmission Speed (bps)	300 to 19.2K	Function of control unit	300 to 19.2K	115.2 K
Communications Features	Auto dial/redial, auto answer, macros, unattended execution	Not applicable	Dialing directory, direct connect, dial-up connect	Vendor did not specify
USER INTERFACE	Install, on-line help, menu driven, windows, diagnostics	Install, on-line help, mouse, command driven, graphic icons, menu driven	Install, on-line help, mouse, command driven, graphic icons, menu driven	Install, on-line help, command driven, menu driven, diagnostics
PROGRAMMING FEATURES Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, proprietary	Proprietary	DCA IRMA API, proprietary	Vendor did not specify
MICROCOMPUTER SECURITY	Multilevel password	1 level password	1 level password	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	195 to 295 (s), 1,195 to 1,995 (h)	1,195	3,100 for 8 LUs	140
Standalone Hardware ($)	Not applicable	Not applicable	Not applicable	Not applicable
Host Software/Hardware ($)	Contact vendor	Not applicable	Not applicable	Not applicable
Date of First Delivery	1985	Vendor did not specify	Vendor did not specify	July 1986
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	750,000
Warranty	1 year	90 days	90 days	30 days
Distribution	Direct, dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, OEMs, VARs	Dist., dealers, retail, VARs	Direct, dist., dealers, retail, OEMs,
COMMENTS	Options: IBM S/3X host file transfer, MAC file transfer, user-programmable devices	DCA IRMA or IRMA/2 board required	Additional pricing: $4,300 for 16 LUs, $5,500 for 32 LUs	—

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Winterhalter	Winterhalter	Winterhalter	Winterhalter
PRODUCT NAME	Data Sync 3270	Data Sync 3780	Data Talker 3270	Data Talker 3270 U/X
PRODUCT FUNCTION	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation
USERS SUPPORTED	Single user	Single user	Single user	Multiuser, 32
COMPONENTS	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware	PC software, PC hardware
COPY PROTECTED	No	No	No	No
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS	MS-/PC-DOS, UNIX, Xenix	MS-/PC-DOS, UNIX, Xenix	UNIX, Xenix
LOCAL AREA NETWORK SUPPORT	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
MINIMUM MEMORY REQUIRED (KB)	128	128	128	128
HOST INTERFACE Systems Supported	IBM 43XX/30XX, AS/400	Any IBM host with 3780/2780 support	IBM 43XX/30XX, AS/400	IBM 43XX/30XX, AS/400
Software Environment	Any IBM environment	Vendor did not specify	IBM DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, OS/400	Any IBM environment
Protocols	BSC, SNA	BSC	BSC, SNA	BSC, SNA
Applications Supported	IND$FILE	Vendor did not specify	IND$FILE	IND$FILE
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT, 327X/317X CUT	IBM 2780/3780	IBM 327X/317X DFT, 327X/317X CUT	2780/3780, Any supporting UNIX, TTY
Terminal Functions Supported	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Host printer emulation	Color display, function keys, character attributes, user-defined keyboard map, host printer emulation, print to disk	Color display, function keys, character attributes, host printer emulation, print to disk
Number of Concurrent Sessions DOS Access During Session File Transfer File Formats File Conversion	12 Yes Yes ASCII Yes	Not relevant to 3780 Yes Yes ASCII, binary Vendor did not specify	32 Yes Yes ASCII, binary No	32 Not applicable Yes ASCII, binary Vendor did not specify
COMMUNICATIONS CHAR. Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode Transmission Speed (bps)	Synchronous 2400, 4800	Synchronous 2400 to 9600	Synchronous 2400 to 19.2K	Synchronous 2400 to 19.2K
Communications Features	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer	Auto dial/redial, auto answer	Auto answer
USER INTERFACE	On-line help, on-line tutorial	Install, on-line help, command driven, menu driven	Install, on-line help, menu driven	Install, on-line help, menu driven
PROGRAMMING FEATURES Programmability API Compatibility	Yes Proprietary	Vendor did not specify Proprietary	Yes IBM API, proprietary	Yes Proprietary, IBM HLLAPI 3.0
MICROCOMPUTER SECURITY	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	1,395	1,095	1,295 to 1,595	2,195
Standalone Hardware ($) Host Software/Hardware ($)	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable	Not applicable Not applicable
Date of First Delivery Number Installed to Date Warranty Distribution	January 1986 1,100 1 year Direct, OEMs, VARs	March 1986 2,000 1 year Direct, OEMs, VARs	June 1985 5,000 1 year Direct, OEMs, VARs	June 1988 400 1 year Direct, OEMs, VARs
COMMENTS	—	Combines modem board and emulation software; BATCH command language and API available	—	Includes Co-Processor, which handles all 3270 protocol processing

PC-to-Mainframe Link
Product Comparison Columns

VENDOR NAME	Winterhalter			
PRODUCT NAME	Data Talker Cluster			
PRODUCT FUNCTION	Remote terminal emulation			
USERS SUPPORTED	Multiuser, 8 PCs			
COMPONENTS	PC software, PC hardware			
COPY PROTECTED	No			
MICROCOMPUTERS SUPPORTED	IBM PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA			
MICROCOMPUTER OP. SYS. SUPPT.	MS-/PC-DOS			
LOCAL AREA NETWORK SUPPORT	Vendor did not specify			
MINIMUM MEMORY REQUIRED (KB)	128			
HOST INTERFACE Systems Supported	IBM 43XX/30XX, AS/400			
Software Environment	Any IBM environment			
Protocols	BSC, SNA			
Applications Supported	IND$FILE			
EMULATION Terminals/Controllers Emulated	IBM 327X/317X DFT, 327X/317X CUT			
Terminal Functions Supported	Color display, function keys, character attributes, host printer emulation, print to disk			
Number of Concurrent Sessions DOS Access During Session File Transfer File Formats File Conversion	20 Yes Yes ASCII, binary No			
COMMUNICATIONS CHAR. Physical Connection	RS-232-C			
Transmission Mode Transmission Speed (bps)	Synchronous 2400 to 19.2K			
Communications Features	Auto answer			
USER INTERFACE	Install, on-line help, menu driven			
PROGRAMMING FEATURES Programmability API Compatibility	Yes IBM API, proprietary			
MICROCOMPUTER SECURITY	Vendor did not specify			
PRICING/AVAILABILITY Microcomputer Softw./Hardw. ($)	2,395			
Standalone Hardware ($) Host Software/Hardware ($)	Not applicable Not applicable			
Date of First Delivery Number Installed to Date Warranty Distribution	July 1985 500 1 year Direct, OEMs, VARs			
COMMENTS	Connects 8 PCs to mainframe without a controller or coax cards			