
PC-to-Host Communications Products: Market Overview

Synopsis

Editor's Note

This report looks at the current state of the microcomputer-to-host communications market. For information on the technologies behind these products, see the Technology Overview (Report 511-201). In the comparison columns (Report 511-301), we list, in detail, products available from PC-to-host communications vendors.

Market Highlights

Though not as active as it once was, the PC-to-host communications marketplace is still important to the growing number of companies that want access to information and applications residing on mainframes or minicomputers. This report examines the state of today's market, including a look at some of the major vendors and the roles they have played in the market's growth.

In the past, companies such as DCA, Novell, and AST Research found themselves at the forefront as the PC-to-host marketplace enjoyed tremendous growth and expansion. These companies, particularly DCA, led the way with products ranging from simple 3270 terminal emulation products to remote emulation products to LAN gateways.

Recently, though, the market has slowed somewhat. The dynamic growth of previous years has been replaced by a market now saturated with a wide variety of vendors and products. Many companies, unable to compete with the extensive product lines of vendors such as DCA and Novell, have found a home in niche markets such as micro-to-minicomputer links or Macintosh-to-host connectivity products.

Analysis

Market Leaders

The Top Competitors

Digital Communications Associates (DCA), a pioneer in the PC-to-host market, quickly established itself as the dominant vendor (claiming an installed base of over 500,000 users and approximately 50 percent of the market). The company established its reputation with the IRMA board, a hardware-based, add-in terminal emulation board acquired from Technical Analysis Corporation (TAC). IRMA was the first product to offer a coax interface to an IBM mainframe by emulating the IBM 3278 family of terminals.

IRMA soon became the emulation board that all other boards were measured against. In a clever strategy, DCA provided source code to third-party vendors, widening the use of the IRMA board even more. DCA also offers products that provide remote terminal emulation, connectivity with IBM System/3X minicomputers, and local area network (LAN) gateway products.

Although the PC-to-host market is based on IBM products, IBM is not generally recognized as one of the leaders in this market. Many other companies followed DCA's lead before IBM released its first PC-to-host product. IBM and IRMA are, however, accepted as the de facto standards with which products must comply.

Other major PC-to-host vendors include AST Research, Novell Communications Division, National Semiconductor (Quadram Products Group), and BlueLynx. With the exception of National Semiconductor, these companies provide both 3270 and 5250 environment solutions. AST's strength lies in System/36, System/38, and RJE terminal emulation, while Novell's strength is gateway communications. National Semiconductor concentrates solely on 3270 emulation and offers board products that are both IBM and IRMA register-level compatible. National Semiconductor

sells its products with and without terminal emulation software, so that users can purchase only an IRMA-like board if PC-to-host communications are already in place. BlueLynx offers 3270 and 5250 emulation products that function in local, remote, or cluster configurations.

Marketing Strategies

Although the products' purpose is identical—providing a PC communications link to a mainframe—vendors' technical approaches and sales 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, users choose from a menu of products, choosing the type of connection, the type of software, and options such as graphics capabilities. Other companies, such as BlueLynx, 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 have 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.

Trends and Issues

There was a time when PC users did not understand the need to connect to a mainframe; 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-host links, and purchasing policies for PCs, 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-host products, larger corporations are increasingly developing a company-wide strategy of including both mainframes and PCs within their overall computing capability.

DCA was the first to respond to the need for mainframe connectivity, with the introduction of IRMA—the first PC-to-IBM mainframe terminal emulation board. IRMA's initial success opened the industry floodgates, and soon a wave of vendors was introducing micro-to-mainframe connectivity products. For years the PC-to-host marketplace was one of the most volatile in the computer industry. Vendors began to expand their product lines' capabilities in offering such products as Digital Equipment Corporation emulation for accessing VAX minicomputers; 5250 emulation for communications with IBM minis; and even software-only products that eliminated the need for add-in emulation boards.

Users have long been calling the tune in the PC-to-host market. Accustomed to the friendliness of microcomputers, they demanded that packages be equally easy to install, access, and use. The users also wanted transparent access to the host so that they could work on host applications using the capabilities of the PC. Both users and vendors strive for pure peer-to-peer communications, but the PC is still distinctly different from the host, and access is not truly transparent.

Vendors have improved basic PC-to-host capabilities by adding several features that make their products 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. Multiple sessions, hot keys to DOS, pop-up windows, multiple windows, and printer emulation are other features that add to the value and ease of use of a package.

Recently, however, market growth has slowed. The marketplace is now saturated with a variety of connectivity options, and new vendors would seem hard pressed to make any serious inroads in this heavily populated area. In addition, with the increasing popularity of the LAN in the corporate environment, more customers are looking toward LAN gateway products as a means of gaining mainframe access. How much impact this will have on the more traditional PC-to-host products remains to be seen, but it is apparent that the products are not likely to be as much in demand as in previous years. ■

PC-to-Host Communications Products: Technology Overview

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Synopsis**Editor's Note**

This report examines the technologies that drive the PC-to-host marketplace. For a detailed list of available microcomputer-to-host products and their capabilities, see the Comparison Columns (Report 511-301). For a better idea of the current marketplace, see the Market Overview (Report 511-101).

Technology Highlights

The first section of this report, Technology Basics, outlines the technology behind microcomputer-to-host communications. This section looks at important topics such as the actual hardware and software involved in establishing a host link; communications protocols; communications networks; and codes and character sets.

The Products section provides a general overview of the products needed to establish a PC-to-host link. For the most part, these requirements can be broken down into the add-in boards for the microcomputers and the microcomputer/host software components, which provide terminal emulation and file transfer functions along with a host of other possible enhancements.

The report's final section, Selection Guidelines, addresses issues and concerns likely to arise while implementing a microcomputer-to-host link. These factors include cost justification for purchasing a PC-to-host link, important questions in selecting a terminal emulator, integrated applications, and security and data integrity issues.

Analysis

Technology Basics

PC-to-mainframe communications can be viewed as merely the substitution of 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. To determine the best PC-to-host link for a particular situation, 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 controlling a variety of concurrent tasks, whereas most of the 20 million 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.

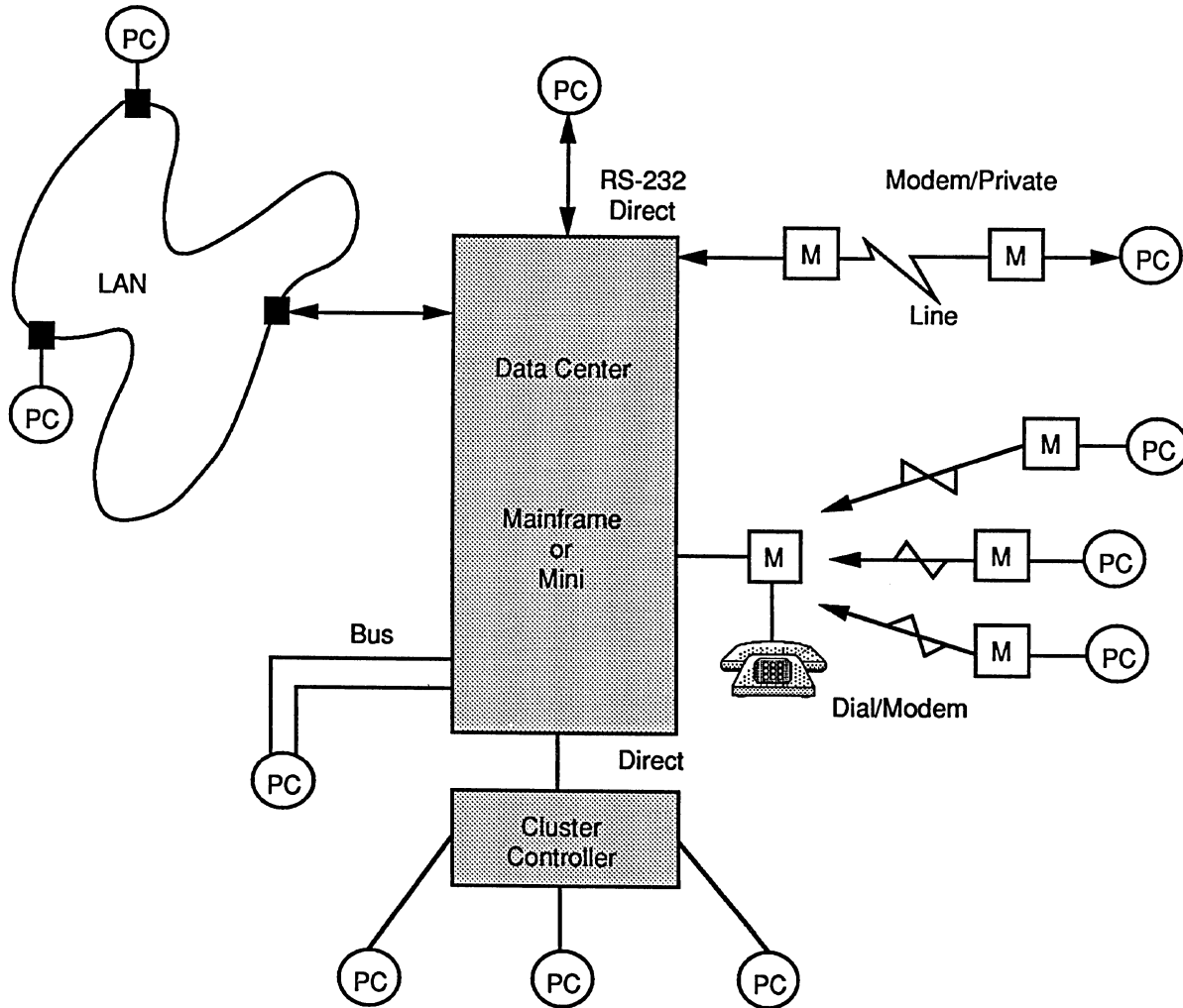
Communications on a mainframe are usually handled by a separate, freestanding front-end processor (FEP) attached to an I/O channel. Small mainframes and most superminis substitute an integrated communications adapter capable of handling fewer lines. In IBM systems, the front end is tightly bound to the 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.

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.

These hardware elements form the backbone of the communications systems, but the real definition and management of the network reside in the software. Communications software on big systems

Figure 1.
Hardware Connection Options



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 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 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. The limitations of single tasking, however, 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 have to save his/her work, exit the word processor, and enter the spreadsheet program.

Communications interactions are quite different from the characteristically serial 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 serial 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 most 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 with a mainframe soon discovers that he or she must interface to a separate networking world that requires a much more intimate knowledge of hardware. 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 code, which uses six-, seven-, or eight-bit characters plus a parity bit, or EBCDIC, which uses eight-bit characters. 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 and superminis (3080, 3090, 4300, and 9370 product lines) all use EBCDIC. This means, ironically, that an IBM PC communicating with an IBM mini or mainframe requires code translation, whereas an IBM PC communicating with a Digital supermini does 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

General Definition: A protocol is a set of rules for formatting the transmission control codes and data; as such, it is the key 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. 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 an important compatibility consideration.

Asynchronous Protocols: 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 shows there are various methods to get around this. Digital's VT52 and VT100, IBM's 3101 and 3160 series, and Teletype terminals all use asynchronous protocols with the ASCII code.

Synchronous Protocols: 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.

Byte-Oriented Protocols: 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.

Bit-Oriented Protocols: Most bit-oriented protocols, such as 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 graphic material. It also provides great routing flexibility, since a new address, or any other new information, can be added by just attaching new 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.

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). The IBM first-generation PC is standardized on this interface, but wide variations are permitted by this "standard." The wire leading from the board is connected to a modem, and the wire leading from the modem is connected to the telephone system.

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 connected to local mainframes do not require modems; their cabling, therefore, 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—on another floor, perhaps—can be reached by a limited-distance/short-haul modem.

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 the attachment will not use a conventional phone/modem connection. RS-232-C cable has a nominal limit of 50 feet and, even the extended-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. 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 unidentified cables can also be difficult to sort out. Installing a cabling system, with coaxial or optical fiber backbone cables between floors, may therefore be cost effective.

Speed and CPU Port Capacity

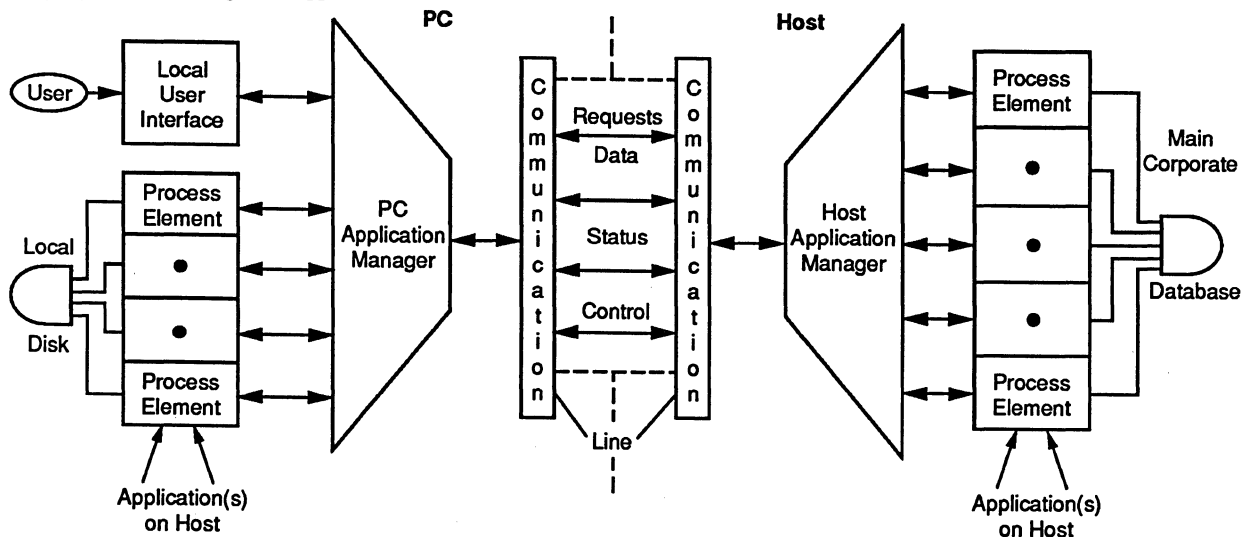
The most popular PC interfaces are 1200 bps asynchronous interfaces, but there are a growing number of higher speed synchronous interfaces as well. Since front-end processors handle a variety of data rates, it is rarely a problem to interface a line of the right speed to the mainframe. Since many PCs are occasional mainframe users, however, 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 is limited, or if adding new ports requires 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 architected. This network characteristic provides the first limit to the choices available to the PC. Most users find 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 functions 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, instead of having them printed out and then rekeyed into the PC if the PC user wanted to work on them locally. This did not have a direct effect on the mainframe, 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.

Figure 2.
A Tightly Coupled Integrated Application



Terminal Emulation

The key questions for basic applications are the type of terminal to emulate and the configuration of the connection. IBM's System/3X and AS/400, 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 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.

Once the type of terminal has been defined, or a range of acceptable devices has been identified, the issue of connection mode can be considered. A surprising variety of choices exists. 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.

Terminal Emulation Only: Emulate only the 3278/3279 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.

Terminal and Controller Emulation: Emulate both the 3278/3279 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.

Attach to Front-End Processor: 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 uses 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 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.

Interfacing Programs: 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.

Departmental System: 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.

Attach to LAN: 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. 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.

File Upload/Download, Virtual Diskettes, and Other Extensions

The first IBM PC was delivered in 1981; the first terminal emulation board, in 1982; and the first file transfer to the PC product using interactive terminal emulation, in 1983. The market for interactive terminal emulation blossomed immediately, and its primary limitations (from the PC user's point of view) were felt at once. The user not only wanted to query a file and view the data but also needed to retain whole files and manipulate them at the PC site.

This was a problem for systems using 3270 or ASCII terminal emulation, because these terminals were screen oriented; data was transferred in screen-sized blocks, usually 1,920 characters at a time. It was a step forward just to initiate a program allowing the host to download a fill-in-the-blank screen format that could be stored locally and receive back only the new entry records. The 3270 procedure was to download the screen format again for every new screen to be filled out and then strip it of incoming records—thus nearly doubling the total traffic, as well as the size of upload record.

The answer for 3270 emulators was to provide a set of packages that divided files into 1,920-character segments, allowing the file to be downloaded to the PC or uploaded to the host. Very few "pure" emulators presently exist; most also have file download capabilities as well.

It shortly became obvious that simply dumping an enormous mainframe file into a PC created a lot of work, although it was still better than rekeying from a printout. The mainframe file

needed to be structured, edited, and reformatted before the PC could use it, and if the data were to be used by two different programs (Lotus 1-2-3 and dBASE, for example), more than data format was needed. In some cases, users wanted to upload files as well as download them. Flexibility was needed in interfacing to different mainframe file formats and different databases, for automatic generation of JCL code and queries in the right format, and so on. One popular approach pioneered by Micro-Tempus' Tempus-Link was to create separate file extracts in PC formats (virtual diskettes) for PC users during the overnight batch updates.

As the market continued to evolve, a variety of features were offered to users in independent packages, in various combinations. Some merely expanded communications flexibility, but many added to processing flexibility as well. The following are some of the most important broad categories.

Data/File Manipulation: Included in this category are 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 previously mentioned, virtual diskettes 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 well. This capability is frequently combined with transparent file sharing, with the mainframe acting as a file server for the PCs.

Communications Extensions: Features in this category include 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 includes menu-driven interfaces, on-line help, macros, and prompts.

Script Processing and Security Features includes single/multilevel passwords, transmission encryption, and script languages for programmability.

Integrated Processing

Integrated processing can be viewed from two perspectives: 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 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 must be abandoned because interactive terminals typically have printers but not disks or user-programmable controllers. Instead, the PC must 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 linked. 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, the systems with the widest range of compatible integrated applications are those where the PC vendor provides proper technical facilities for mainframe communications. Software vendors, given a consistent and preferred hardware environment, tend to build to it. The IBM host communications support, for example, is the preferred attachment method for many of the PC's third-party integrated application software. Vendors also agree on 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-Host 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 previously mentioned, 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.

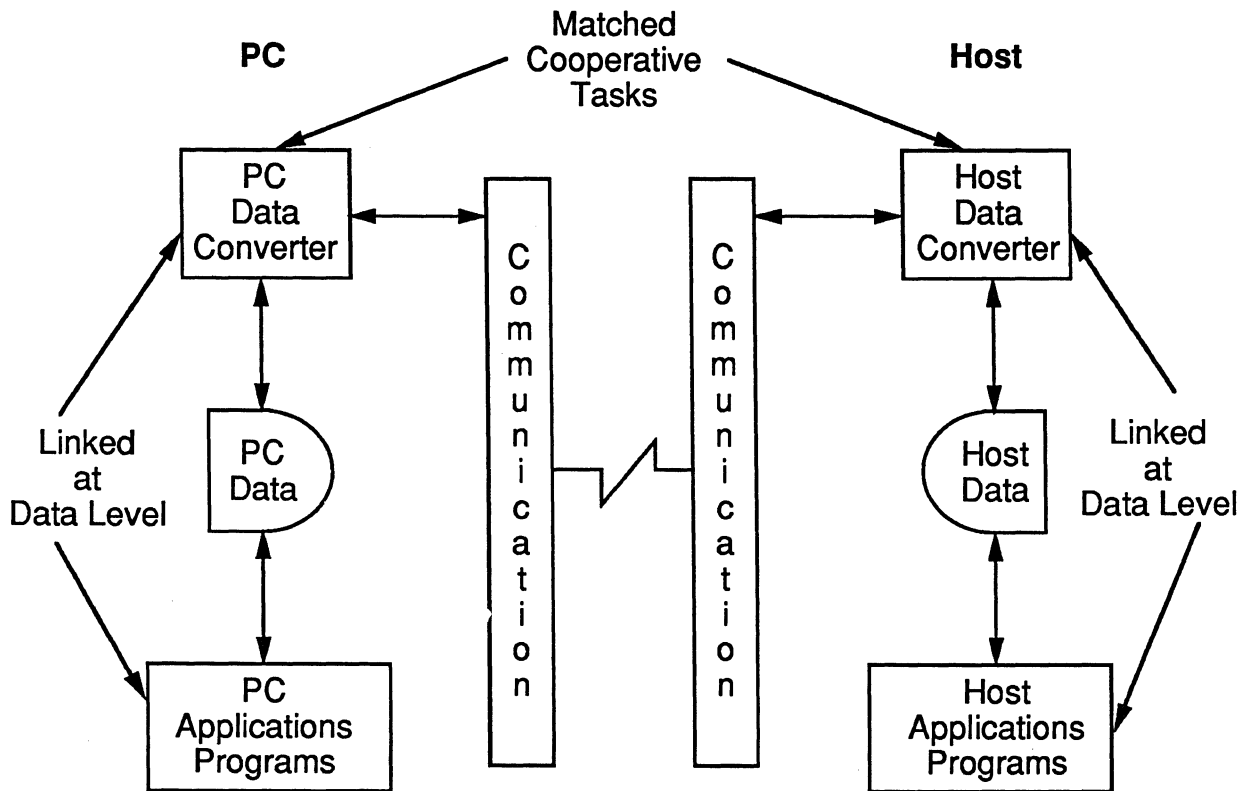
This may involve more than one set of operating rules that must be memorized, if there are no menus or prompts as guides, and each set of rules can differ if more than one application or more than one mainframe is accessed. A New York bank PC operator, switching between 3270 emulation to an IBM host and a local spreadsheet package, was heard to remark, on sitting down at the computer after a break, "Let's see . . . who am I now?"

Local Data Integrity Problems

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 freestanding systems want to work on the same file, or if multiple copies of the same file are to be distributed around a network, there can be significant difficulties in maintaining file integrity.

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

Figure 3.
 A Loosely Coupled Integrated Application



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 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, it 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 of the PCs would be working on centralized files as if they were the mainframe's own terminals. Since PCs are distributed systems and are rarely scheduled and controlled in the same way that the mainframe's own terminals are, however, they do not work 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 initially.

When a PC captures a segment of a mainframe database and moves it to local storage, that data becomes subject to manipulation outside the application framework intended to validate it. In many cases, the movement of data to a PC—its editing and 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 computed.

The problem is magnified if several PCs access 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 wrote over the previous version.

Data Integrity in Distributed Databases

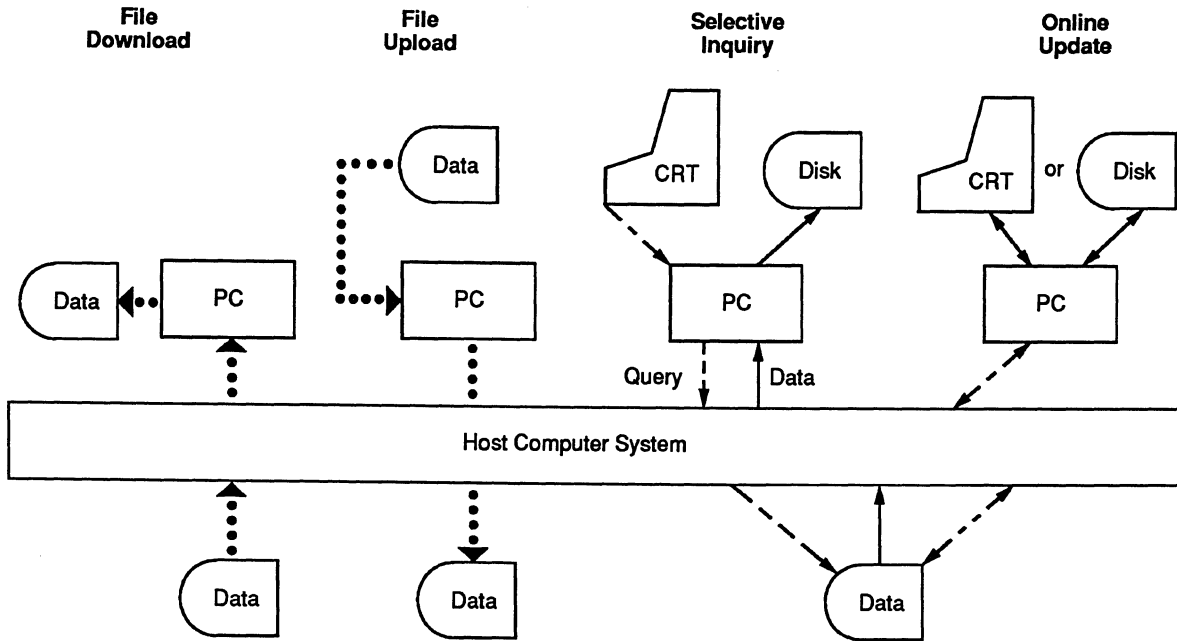
Ideally, corporations would like PCs and data center equipment to relate to each other in a way that would make the exact location of the data and the processing power being harnessed for any particular user task to be transparent to the user. This implies distributed databases, distribution of function, and cataloging of locations. The key element, the catalog, exists on all processors 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 several transactions require that data be transferred between several computers. This requirement has also slowed the development of this type of database, which is still in its infancy.

A commonly cited example of the potential data integrity problems that everyone can relate to is that of a user who has bank accounts in several cities. The user 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 to designated companies. It would cause a data integrity problem if the networked system debited the Boston account but failed to credit the New York account. The second level of transactions, which might appear to have been authorized against insufficient funds, compounds the complication.

To carry the example further into a multiuser situation, if this were a joint account the user shared with a spouse, the other person could initiate the same set of transactions. This time the transfer could be performed successfully, but if the amount transferred is more than enough to cover the first set of transactions but not enough to pay double for all the transactions, the result now could

Figure 4.
File Interactions with Remote PCs



be two debits against the Boston account, one credit to the New York account, some payments made twice, some payments made once, and some payments authorized against insufficient funds. If the data integrity error had not occurred, the mistake would have been easy to recognize, but the result of the error is quite confusing.

Reducing the Risks

Some steps 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.
- Review update applications to ensure that the data quality measures taken by the data center system are also applied to 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.

Products

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-host 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 host is the oldest and remains the most common method in place, although remote and LAN connections are now preferred.

Add-In Boards: DCA’s IRMA board was the first add-in board to offer a coaxial connection to IBM mainframes, and it quickly established itself as the product against which all emulation boards would be measured. The boards plug into expansion slots in the microcomputer and provide a coaxial (and in some cases a twinaxial) connection to controllers, mainframes, or minicomputers. This segment

of the market has shown limited growth recently, although DCA has begun marketing the IRMA 3 Convertible emulation board—the most recent version of its original IRMA product—which is the only board that can be configured by the user to function with both the traditional Personal Computer Architecture (PCA), as well as the newer Micro Channel Architecture (MCA).

Software: In their most basic form, PC-to-host software packages will provide terminal emulation and file transfer capabilities (though most go considerably beyond this point). Generally, the software is used in conjunction with an emulation board, as with the IRMA products or Novell's NetWare 5250 line. One development enjoying increased popularity is that of software-only links such as PACKET/PC's line of software-based products. These links consist of microcomputer and host software components, thus eliminating the need for emulation boards for each connected PC.

Selection Guidelines

Implementing a PC-to-mainframe link is difficult because 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 that such a link be designed by a committee. If a committee is unworkable for any reason, data center management must still get involved, regardless of how elementary the connection will be. The data center should provide information on the current configuration, hardware, software support, application programs, and security measures.

It is advisable 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 discover 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 a good idea to do three walk-throughs: one for interactive terminal emulation, one for batch terminal emulation, and one for integrated applications. The purpose is not to be 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

PC Justification

Cost justification can be a single-step process, where both the PC and its communications features are 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.

In some types of applications, studies have shown 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 fewer PCs involved with high-level managers than 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; 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 amenable to 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.

Office automation, for example, using special-purpose word processors and/or data entry, was already under way before the general-purpose

PC began to proliferate in the business environment. It was already becoming clear that secretarial productivity could be increased by providing local screen formatting and data entry functions on terminals attached to either a mainframe or a local special-purpose system (or by using local special-purpose terminals). The flexibility, improved response time, and greater accuracy of an automated system can tip the scales in favor of automation even if costs are only at a break-even point. One of the alternatives was a terminal attached to a mainframe, but since the mainframe software was developing very slowly, this application could be considered part of the mainframe's "hidden backlog" of potential applications that were constantly being set aside as impractical because of the importance of more familiar types of work.

PCs versus Terminals

The PC has particularly altered the price/performance relationships on which the decisions for clerical automation have been based. When general-purpose PCs with word processing packages are compared with special-purpose word processors, the comparable costs and greater flexibility of the ubiquitous PCs have inclined most users to choose this solution over office systems based on dedicated specialized equipment. Economies of scale have meant that a PC with a word processing package can successfully compete with word processing equipment specifically developed for the office automation market. Packaged PC software of all kinds can be purchased from a retail store and modified if necessary, rather than developed at considerable time and expense by corporate data processing organizations.

Depending on the terminal's flexibility, the PC configuration being compared, and the manufacturer, the price of PCs based on current micro-processor 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 of linking PCs and mainframes without sufficient controls has already been intimated by the discussion of data integrity. The cost of those controls depends highly 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 none existed before.

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 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 trap 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 greater potential to increase efficiency, because there is less need to conform to standards that reflect irrelevant applications. Furthermore, they have more power over what is processed when; 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 considering 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 ensure nothing has been overlooked. The following core questions 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 necessary equipment and software can be acquired from a single source or multiple sources; 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:

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

Attachment: 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?

Hardware/Software Compatibility: Is the product compatible with any special hardware or software that is already in use on the system?

Operational Mode: Is the mode of operation of the product suitable for the current PC operator's level and for the type of work which is expected to be done with the product?

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

Environment: 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?

Memory Requirements: 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.

Integrated Applications

Evaluating an integrated application can be approached in phases.

Phase One: 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.

Phase Two: 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 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).

Phase Three: 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 should 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:

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

Enhancement: 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 an example of this.

Modem Interface: 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.

Expansion: 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 individual needs and 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.

Vendor Support: Avoid products that rely on the combination of third-party software from one vendor and hardware from another third-party vendor.

Interface Boards: 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.

Warranties: Check the warranties; there can be some surprising differences.

Security, Data Integrity, and Management

Provision of a microcomputer-to-host connection affects security in a number of ways. Most host access techniques use terminal emulation, allowing the user to take advantage of such standard host security as password protection and usage logs. Any security provisions 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 rather

uncommon, but it does happen. The cure is adequate security via logons and passwords, thus placing security at the individual, rather than the terminal, level.

Local microcomputer 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 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 overlook it. With the microcomputer-to-host connection, the risk of microcomputer vulnerability is magnified.

The use of microcomputers, and their growing familiarity within organizations, also poses a problem independent of the microcomputer-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 non-terminal connection should be examined to ensure that security measures are adequate.

The following are some questions to help in evaluating the data integrity, security, and information resource management implications of a PC link.

Access Control: 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.

PC 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 the world once it is loaded onto a PC.

Outstanding Data: Can several copies of the data 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 a file cannot be protected from access 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.

Update Controls: Can the return of data to the mainframe result in the loss of any update controls? This situation 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, relaxing the validation rules may result in a lowering of data quality standards, and this should be specifically understood and approved by management.

Out-of-File Data: 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.

New Users: 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?

Responsibility: 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 this? 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? ■

PC-to-Host Communications Products: Comparison Columns

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Synopsis

Editor's Note

This report provides a detailed list of microcomputer-to-host products, as well as a listing of product specifications and pricing. For information on the recent trends and history of this market, see the Market Overview (Report 511-101). Further details on the technologies behind these products can be found in the Technology Overview (Report 511-101).

Comparison Column Highlights

The following comparison columns summarize the characteristics of 307 commercially available PC-to-host products from 80 vendors. The products all allow PCs to communicate with a host mainframe or minicomputer. For the most part, vendors supplied Datapro with this information in December 1989; their cooperation is greatly appreciated.

Datapro sent requests for information to approximately 120 North American vendors known or believed to be in the PC-to-host 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. Those PC-to-host vendors not listed here but wish to be in future updates, are urged to contact the editorial staff of *Datapro Reports on Microcomputers*.

Many types of products are marketed as PC-to-host links. Datapro has tried to be as flexible as possible when including products in the comparison columns. Therefore, some products may not directly correspond to the specification headings listed in the columns. We have tried to fit in these products to provide the most useful information possible. For additional product information, or to clarify a column entry, please contact the appropriate vendor.

Vendors

Adacom

8871 Bond Street
Overland Park, KS 66214 (913) 888-4999

Agile

825 Alfred Nobel Drive
Hercules, CA 94547-1899 (415) 724-1600

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

AST Research, Inc.

16215 Alton Parkway
Irvine, CA 92713-9568 (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.

4131 NW 28 Lane
Gainesville, FL 32606 (904) 371-3050

BlueLynx

101 Winston Street
Cumberland, MD 21502 (301) 777-3307

Cambridge Computer Corp.

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

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

CLEO Communications

3796 Plaza Drive
Ann Arbor, MI 48108 (313) 662-2002

Commtext Inc.

1655 Crofton Boulevard, Suite 300
Crofton, MD 21114 (301) 721-3666

Computer Associates International, Inc.

711 Stewart Avenue
Garden City, NY 11530 (516) 227-3300

Computer Corp. of America

4 Cambridge Center
Cambridge, MA 02142 (617) 492-8860

Computer Logics, Ltd.

75 International Boulevard
Rexdale, ON, Canada M9W 6L9 (416) 674-1111

Core Technology Corp.

7335 Westshire Drive
Lansing, MI 48917 (517) 627-1521

CQ Computer Communications, Inc.

4695 N. Monroe Street
Tallahassee, FL 32303 (904) 562-4255

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

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

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, P.O. Box 6725
Costa Mesa, CA 92626 (714) 662-5600

FEL Computing

10 Main Street, P.O. Box 72
Williamsville, VT 05362 (802) 348-7171, (800) 728-6829

FTG Data Systems

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

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
3801 Zanker Road, P.O. Box 5143
Natick, MA 01760 (800) SNA-3270

IDEAssociates, Inc.

29 Dunham Road
Billerica, MA 01821 (617) 663-6878

Information Technologies, Inc.

14505 N. Hayden Road
Scottsdale, AZ 85260 (602) 998-1033

Innovative Electronics, Inc.

10110 USA Today Way
Miramar, FL 33025 (305) 624-1644

International Business Machines (IBM)

Old Orchard Road
Armonk, NJ 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

Management Science America, Inc.

3445 Peachtree Road, NE
Atlanta, GA 30326 (404) 239-2000

McCormack & Dodge

1225 Worcester Road
Natick, MA 01760 (617) 655-8200

Micro Decisionware, Inc.

2995 Wilderness Place
Boulder, CO 80301 (303) 443-2706

Micro Tempus Inc.

440 Dorchester Boulevard W., #300
Montreal, PQ, Canada H2Z 1V7 (514) 397-9512

Microcom Software Div.

55 Federal Road
Danbury, CT 06810 (203) 798-3800

MicroGate Corp.

9501 Capital of Texas Highway, #105
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 Soft, Inc.

123 Franklin Corner Road
Lawrenceville, NJ 08648 (609) 896-4100

Multi-Tech Systems

2205 Woodale Drive East
New Brighton, MN 55112 (612) 631-3550

National Semiconductor

Quadram Products Group
One Quad Way
Norcross, GA 30093 (404) 923-6666

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

Packet/PC Inc.

270 Farmington Avenue
Farmington, CT 06032 (203) 678-1961

Pansophic Systems, Inc.

2400 Cabot Drive
Lisle, IL 60532 (312) 505-6000

Passport Communications

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

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

Rabbit Software Corp.

7 Great Valley Parkway
Malvern, PA 19355 (215) 647-0440

The Santa Cruz Operation, Inc.

400 Encinal Street
Santa Cruz, CA 95061 (408) 425-7222

Simware Inc.

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

Softel Inc.

Shedd Hill Road
Stoddard, NH 03464 (408) 432-6000

Software Clearing House, Inc.

895 Central Avenue
Cincinnati, OH 45202 (513) 579-0455

Software Corporation 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

Tymnet/McDonnell Douglas

2710 Orchard Parkway
San Jose, CA 95134 (408) 435-7744

511-304

PC-to-Mainframe

**PC-to-Host Communications
Products:
Comparison Columns**

Datapro Reports on
PC Communications

Universal Data Systems

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

Walker Richer & Quinn, Inc.

2825 Eastlake Avenue E.
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

PC-to-Host Communications Products Comparison Column Entry Descriptions

Specifications

Product Function. This entry lists the function of the product. 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 indicated that the entries listed did not properly categorize what the product does.

Users Supported. PC-to-host products support single or multiple users. If multiple users are supported, vendors were asked to write how many.

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 here.

Copy Protected. Vendors stated whether their software is copy protected.

Microcomputers Supported. This entry indicates which microcomputer systems the product is compatible with, 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 also wrote in any additional PCs that their products support.

Operating Systems Supported. This section lists the PC operating environments that the product supports, including Apple ProDOS, Apple Macintosh Finder, CP/M-80/86, OS/2, MS-/PC-DOS, UNIX, and Xenix. Vendors also wrote in additional operating systems supported.

Local Area Network Support. For this entry, vendors have indicated which LANs their products support. Choices we included are ARCnet, Ethernet, Token-Ring, AppleTalk, and Starlan. Many vendors added that their products are compatible with NETBIOS LANs. No answer is indicated by "Vendor did not specify."

Minimum Memory Required (bytes). Vendors were asked to indicate the minimum RAM memory required in order for their products to function properly. Some vendors also wrote in the recommended memory. All responses are in kilobytes (K) or megabytes (M).

Terminals/Controllers Emulated. This section lists the types of terminals that 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.

User Interface. Users often call a program easy or difficult to work with based on the presentation of the package, also known as the user interface. Vendors indicated which of the following features are supported to make the user interface friendlier: installation program, on-line Help facility, mouse support, command driven, on-line tutorial, graphic icons, menu driven, pop-up windows, and diagnostics.

Programmability. Vendors reported 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 allows PC programs to access the functions of the terminal emulation card without interrupting the application. The APIs with which the product is compatible are listed, including IBM API, DCA IRMA API, IBM LU6.2 API, and proprietary APIs.

Microcomputer Security. Security is critical when PC users access a corporate database. Much effort is involved in entering

and organizing data in any system, but this effort can be wasted without proper security. A program can 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.

Number of Concurrent Sessions. The number of concurrent sessions that the product supports is detailed here.

DOS Access During Session. If the product supports DOS access during a host session, the vendor indicated it here.

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

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

File Conversion. If the product supports file conversion, it is indicated here.

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, Bull (Honeywell) systems, Hewlett-Packard (HP) Systems, Unisys, or systems based on UNIX. Vendors 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; Bull GCOS; UNIX System V; and Berkeley 4.X BSD. Vendors 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 also indicated if any other protocols are supported.

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

Communications Characteristics

Physical Connection. The type of connection supported by the product, such as coaxial cable, twinaxial cable, or RS-232-C cable, is listed here.

Transmission Mode. This 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 (bps). 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 such as dialing directories and support for auto dial/redial, auto answer, macros, and unattended execution. Vendors indicated which of these features their products support and additional features, where applicable.

Pricing and Availability
Microcomputer Software/Hardware (\$). Shown here 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 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 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 for the corresponding component.

Host Software/Hardware (\$). Shown here is the list price for products meant for the host side. 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 for the corresponding component.

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 wrote "Vendor did not specify."

Warranty. Today, users are not only interested in product functionality and pricing, but also in product servicing. 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.

Vendor	Adacom Corp.	Adacom Corp.	Agile	Agile
Product	ADAFILE	ADAGATE	3278/79 Emulation with File Transfer	6287 Ultra
Specifications				
Product Function	Local terminal emulation	Vendor did not specify	Local terminal emulation	Standalone protocol converter
Users Supported	Single user	Multiuser; 16	Single user	Multiuser; up to 3
Components	Microcomputer software	Standalone hardware	Microcomputer hardware & software	Standalone hardware
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	Macintosh, IBM, any ASCII PC
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	Vendor did not specify	Not applicable
Local Area Network Support	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	256K	Vendor did not specify	Vendor did not specify	Vendor did not specify
Terminals/Controllers Emulated	IBM, 327X/317X CUT	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X CUT	Vendor did not specify
User Interface	Install program, pop-up windows	Vendor did not specify	Install program, on-line help	Vendor did not specify
Programmability	No	No	No	Yes
API Compatibility	IBM API	Vendor did not specify	IBM LU 6.2	Not applicable
Microcomputer Security	Password protection	Password protection	Optional	Vendor did not specify
Number of Concurrent Sessions	Vendor did not specify	Up to 80	Vendor did not specify	1
DOS Access During Session	No	Vendor did not specify	Vendor did not specify	Vendor did not specify
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	Binary
File Conversion	Yes	Yes	Yes	Yes
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, OS/VS, TSO, CMS, CICS	Vendor did not specify
Protocols	RS-232 async	IBM 3270 type A	BSC	BSC, SDLC
Applications Supported	Access to host-resident programs	Access to host-resident programs	Vendor did not specify	Vendor did not specify
Communications Characteristics				
Physical Connection	RS-232-C	Coax	Coax	Coax
Transmission Mode	Asynchronous	Asynchronous, synchronous	Vendor did not specify	Vendor did not specify
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600	300, 600, 1200, 2400, 4800, 9600, 19.2K	Vendor did not specify	Vendor did not specify
Communications Features	Dial directory, auto dial/redial	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	300	Vendor did not specify	295 software, 425 hardware	Vendor did not specify
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	July 1989	June 1986	January 1986	1987
Number Installed to Date	250	400	Vendor did not specify	Over 10,000
Warranty	90 days	1 year	Two years	Two years
Distribution	Dist., dlrs, retail	Dist., dlrs, retail	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	—

Vendor	Agile	Andrew Corp.	Andrew Corp.	Andrew Corp.
Product	62871C	ComLynx/5251	ComLynx/5294	DataLynx/5294
Specifications				
Product Function	Standalone protocol converter	Local terminal emulation	Remote terminal emulation	Standalone protocol converter
Users Supported	Multuser; up to 3	Single user	Single user	Multuser; 32
Components	Standalone hardware	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer software
Copy Protected Microcomputers Supported	Yes Macintosh, IBM, any ASCII PC	No IBM, PC/XT/AT & compatibles, PS/2 MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No Macintosh, IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	Not applicable	MS-/PC-DOS	MS-/PC-DOS	Apple ProDOS, Macintosh Finder, CP/M-80, CP/M-86, OS/2, MS-/PC-DOS, UNIX, Xenix Ethernet
Local Area Network Support	Vendor did not specify	Vendor did not specify	Vendor did not specify	
Minimum Memory Required (bytes)	Vendor did not specify	90K	182K	100K
Terminals/Controllers Emulated	Vendor did not specify	IBM, 5250 Series	IBM, 5250 Series	TTY, IBM, 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780, DEC, VT52/100, VT200 Series, VT300 Series DG; HP; Honeywell Bull Unisys
User Interface	Vendor did not specify	Install program, on-line help, pop-up windows	Install program, on-line help, pop-up windows, diagnostics	Install program, on-line help, diagnostics
Programmability API Compatibility	Yes Not applicable	Yes IBM API	Yes IBM API	Yes IBM API
Microcomputer Security	Vendor did not specify	Vendor did not specify	Vendor did not specify	Password protection
Number of Concurrent Sessions	1	7	Up to 9	32
DOS Access During Session File Transfer File Formats File Conversion	Vendor did not specify Yes Binary Yes	Yes Yes ASCII Yes	Yes Yes ASCII Yes	Yes Yes ASCII, binary Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, System/36/38, AS/400	IBM, System/36/38, AS/400	IBM, System/36/38, AS/400
Software Environment	Vendor did not specify	IBM, SSP, OS/400	IBM, SSP, OS/400	Vendor did not specify
Protocols	BSC, SDLC	5250	SDLC	SNA
Applications Supported	Vendor did not specify	Host virtual disk, access to host-resident programs, file transfer	Host virtual disk, access to host-resident programs, file transfer	Host virtual disk, access to host-resident programs
Communications Characteristics				
Physical Connection	Coax	Twinax, Balun	RS-232-C	RS-232-C
Transmission Mode Transmission Speed (bps)	Vendor did not specify Vendor did not specify	Vendor did not specify Up to 1M	Synchronous 19.2K	Asynchronous, synchronous 300 to 38.4K
Communications Features	Vendor did not specify	Vendor did not specify	Auto dial/redial, unattended execution	Dial directory, auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	Vendor did not specify	895 both	795	150
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery Number Installed to Date Warranty	1987 Over 10,000 Two years	January 1990 Vendor did not specify 1 year	March 1990 Vendor did not specify 1 year	Vendor did not specify Vendor did not specify Vendor did not specify
Distribution	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, VARs	Direct, dist., dlrs, retail, VARs	Direct, dist., dlrs, retail, VARs
Comments	—	—	—	—

Vendor	Andrew Corp.	Andrew Corp.	Andrew Corp.	Andrew Corp.
Product	InterLynx/400	InterLynx/5251	NetLynx/5251	NetLynx/5294
Specifications				
Product Function	Standalone protocol converter	Standalone protocol converter	Local terminal emulation, network gateway	Remote terminal emulation, network gateway
Users Supported	Multuser; up to 7	Multuser; up to 7	Multuser; up to 224	Multuser; up to 9
Components	Microcomputer software, standalone hardware	Microcomputer software, standalone hardware	Microcomputer hardware & software	Microcomputer hardware & software
Copy Protected	No	No	No	No
Microcomputers Supported	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	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	Apple ProDOS, Macintosh Finder, CP/M-80, CP/M-86, OS/2, MS-/PC-DOS, UNIX, Xenix	Apple ProDOS, Macintosh Finder, OS/2, MS-/PC-DOS, UNIX, Xenix	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Ethernet	Ethernet	ARCnet, Ethernet, IBM Token-Ring, STARLAN	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NetBIOS compatible
Minimum Memory Required (bytes)	100K	Vendor did not specify	66K for server, 100K per node	90K server, 160K per node
Terminals/Controllers Emulated	TTY, IBM, 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780, DEC, VT52/100, VT200 Series, VT300 Series DG; HP; Honeywell Bull Unisys	TTY, IBM, 327X/317X DFT, 327X/317X CUT, 5250 Series, DEC, VT52/100, VT200 Series, VT300 Series; DG HP	5250 Series	IBM, 5250 Series
User Interface	Install program, diagnostics	Diagnostics	Install program, on-line help, pop-up windows, diagnostics	Install program, on-line help, pop-up windows, diagnostics
Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API	IBM API	IBM API	IBM API
Microcomputer Security	Password protection	Password protection	Vendor did not specify	Vendor did not specify
Number of Concurrent Sessions	Vendor did not specify	7	7	Up to 9
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	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, AS/400	IBM, System/36/38, AS/400	IBM, System/36/38, AS/400	IBM, System/36/38, AS/400
Software Environment	IBM, OS/400	SSP, OS/400, CPF	IBM, SSP, OS/400	IBM, SSP, OS/400
Protocols	Twinax	Twinax	5250	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, file transfer	Host virtual disk, access to host-resident programs, file transfer
Communications Characteristics				
Physical Connection	Twinax	Twinax, RS-232-C	Twinax	RS-232-C
Transmission Mode	Asynchronous	Asynchronous	Vendor did not specify	Synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, up to 38.4K	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	Up to 1M	19.2K
Communications Features	Dial directory, auto dial/redial, auto answer, macros, unattended execution	Dial directory, auto dial/redial, auto answer, macros, unattended execution	Vendor did not specify	Auto dial/redial, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	150 software	150	1,995 both	1,995 both
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	Vendor did not specify	Vendor did not specify	December 1989	March 1990
Number Installed to Date	Vendor did not specify	6,000	Vendor did not specify	Vendor did not specify
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dlrs, retail, mail, OEMs, VARs	Direct, dist., dlrs, retail, mail, OEMs, VARs	Direct, dist., dlrs, retail, VARs	Direct, dist., dlrs, retail, VARs
Comments	—	—	—	—

Vendor	ANNATEK Systems, Inc.	AST Research, Inc.	AST Research, Inc.	AST Research, Inc.
Product	Network Navigator Dispatcher	AST 3270 Gateway Option	AST 5250 Gateway Option	AST-3270/CoaxII-CUT
Specifications				
Product Function	Local/remote terminal emulation	Local terminal emulation	Network gateway	Local terminal emulation
Users Supported	Single user	Single user	Multiuser; unlimited	Single user
Components	Microcomputer software, host software	Microcomputer hardware & software	Microcomputer software	Microcomputer hardware & software
Copy Protected	Yes	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
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	OS/2, MS-/PC-DOS
Local Area Network Support	IBM Token-Ring, STARLAN, 3COM	Ethernet, IBM Token-Ring	ARCnet, Ethernet, IBM Token-Ring, NetBios	Did not specify
Minimum Memory Required (bytes)	200K	512K	146K (server), 126K (node)	256K
Terminals/Controllers Emulated	TTY, 327X/317X CUT, DEC, VT52/100, VT200 Series, VT300 Series, TVI925, IBM 3101	IBM, 327X/317X DFT	IBM, 5250 Series	327X/317X CUT
User Interface	Install program, on-line help, diagnostics	Install program, on-line help	Vendor did not specify	Install program, on-line help, diagnostics
Programmability API Compatibility	Yes IBM API, DCA IRMA API, proprietary	Yes IBM API, DCA IRMA API, HLLAPI	Vendor did not specify IBM API, proprietary	Yes IBM API, DCA IRMA API, EEHLLAPI
Microcomputer Security	Password protection, interface to host software, user ID, password encrypt.	Password protection, interface to host software, Config. emulator security	Password protection	Interface to host software
Number of Concurrent Sessions	Up to 4	Five per PC	7	One
DOS Access During Session	Vendor did not specify	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
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, System/36/38	IBM, 43XX/30XX
Software Environment	IBM, OS/VS, MVS, VM, TSO, IBM MVS VTAM	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM, OS/400, IBM CPF	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	BSC, SNA, SDLC	SNA, SDLC	Vendor did not specify	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
Communications Characteristics				
Physical Connection	Coax, RS-232-C	RS-232-C	Twinax, RS-232-C	Coax
Transmission Mode	Asynchronous, synchronous	Synchronous	Ven. did not specify	Synchronous
Transmission Speed (bps)	300, 1200, 2400, 4800, 9600, 19.2K	300-19.K	Vendor did not specify	2.4M
Communications Features	Dial directory, auto dial/redial, auto answer, macros, unattended exec., logon/off w/ script	Did not specify	Vendor did not specify	Did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	195 software	995	995	895
Host Software/Hardware (\$)	30,000 host software	Vendor did not specify	N/A	Vendor did not specify
Date of First Delivery	Vendor did not specify	December 1985	Vendor did not specify	October 1987
Number Installed to Date	Vendor did not specify	Did not specify	Vendor did not specify	Did not specify
Warranty	90 days	Two years	Two years	Two years
Distribution	Direct	Dist., dirs, retail, OEMs, VARs	Dist., dirs, retail, OEMs, VARs	Dist., dirs, retail, OEMs, VARs
Comments	Dispatcher is an IBM micro-mainframe, store and forward network file transfer system	—	Also available for IBM System/34	—

Vendor	AST Research, Inc.	AST Research, Inc.	AST Research, Inc.	AST Research, Inc.
Product	AST-3270/DFT Option	AST-3270/SNA II	AST-5251/12	Enhanced AST-5251/11 Plus
Specifications				
Product Function	Local terminal emulation	Remote terminal emulation	Remote terminal emulation	Local terminal emulation
Users Supported	Single user	Single user	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & 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
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	OS/2, MS-/PC-DOS
Local Area Network Support	Did not specify	Ethernet, IBM Token-Ring	Ethernet, IBM Token-Ring	Did not specify
Minimum Memory Required (bytes)	512K	256K	120K	84-100K
Terminals/Controllers Emulated	IBM, 327X/317X DFT	IBM, 327X/317X DFT	5250 Series	IBM, 5250 Series, IBM 3180 Model 2
User Interface	Install program, on-line help, diagnostics	Install program, on-line help	Diagnostics	Vendor did not specify
Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, DCA IRMA API, HLLAPI	IBM API, DCA IRMA API, HLLAPI	IBM API, proprietary	IBM API, DCA IRMA API
Microcomputer Security	Password protection, interface to host software, Config.emulator security	Password protection, interface to host software, config. emulator security	Password protection	Password protection
Number of Concurrent Sessions	Five	Five	9	Seven
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
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, System/36/38	Vendor did not specify
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	OS/400, IBM CPF	IBM, OS/400, IBM 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	Host virtual disk, access to host-resident programs
Communications Characteristics				
Physical Connection	Coax, twisted pair	RS-232-C	Vendor did not specify	Twinax
Transmission Mode	Synchronous	Synchronous	Synchronous	Vendor did not specify
Transmission Speed (bps)	2.4M	300-19.K	9600	1M
Communications Features	Did not specify	Dial directory, auto dial/redial, macros	Macros	Macros
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	195	895	790	895
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	N/A	Vendor did not specify
Date of First Delivery	May 1988	December 1985	April 1984	November 1984
Number Installed to Date	Did not specify	Vendor did not specify	Vendor did not specify	Did not specify
Warranty	Two years	Two years	Two years	Two years
Distribution	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	Upgradable to LAN gateway

Vendor	Attachmate Corp.	Avatar Corp.	Avatar Corp.	Avatar Corp.
Product	EXTRA! Connectivity Software	MacMainFrame DX	MacMainFrame II	MacMainFrame II/DFT
Specifications				
Product Function	Local/remote terminal emulation, network gateway	Local/remote terminal emulation, standalone protocol converter	Local terminal emulation	Local terminal emulation
Users Supported	Single user	Single user	Single user	Single user
Components	Microcomputer software	Microcomputer hardware & software, host software	Microcomputer hardware & software, host software	Microcomputer hardware & software, host software
Copy Protected	No	No	No	No
Microcomputers Supported	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Macintosh	Macintosh	Macintosh
Operating Systems Supported	MS-/PC-DOS	Macintosh Finder	Macintosh Finder	Macintosh Finder
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NetBIOS compatible	AppleTalk	AppleTalk	AppleTalk
Minimum Memory Required (bytes)	44K	400K	400K	700K
Terminals/Controllers Emulated	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X CUT	IBM, 327X/317X CUT	IBM, 327X/317X DFT
User Interface	Install program, on-line help, mouse, graphic icons, pop-up windows	Install program, mouse, graphic icons, pop-up windows, diagnostics	Install program, mouse, graphic icons, pop-up windows, diagnostics	Install program, mouse, graphic icons, pop-up windows, diagnostics
Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API	Proprietary	Proprietary	Proprietary
Microcomputer Security	Interface to host software	Document locking	Document locking	Document locking
Number of Concurrent Sessions	4	1	1	5
DOS Access During Session	Yes	Not applicable	Not applicable	Not applicable
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	No	No	No
Host Interface				
Systems Supported	IBM, 43XX/30XX, AS/400	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, 43XX/30XX
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, OS/400	IBM, MVS, VM, TSO, CMS, CICS	IBM, MVS, VM, TSO, CMS, CICS	IBM, MVS, VM, TSO, CMS, CICS
Protocols	BSC, SNA, SDLC	SNA, 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
Communications Characteristics				
Physical Connection	Coax, RS-232-C, token ring	Coax, RS-232-C	Coax	Coax
Transmission Mode	Synchronous	Synchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 56K	19.2K	2400	2400
Communications Features	Auto dial/redial, auto answer, unattended execution	Vendor did not specify	Dial directory	Dial directory
Pricing and Availability				
Microcomputer Software/Hardware (\$)	475 software	1195 (bundled)	995 (bundled)	1295 (bundled)
Host Software/Hardware (\$)	Vendor did not specify	500 (host file transfer program)	500 (host file transfer program)	500 (host file transfer program)
Date of First Delivery	June 1987	1985	June 1988	May 1989
Number Installed to Date	Over 150,000	Not available	Vendor did not specify	Vendor did not specify
Warranty	90 days	One year limited	One year limited	One year limited
Distribution	Direct, dist., dlrs, retail	Dist., dlrs, retail	Dist., dlrs, retail	Dist., dlrs, retail
Comments	—	MacMainFrame DX provides remote and local Macintosh-to-IBM mainframe comm. for Macintosh	—	495 as software upgrade to Mac MainFrame II; for entire Macintosh II family of computers

Vendor	Avatar Corp.	Avatar Corp.	Avatar Corp.	Avatar Corp.
Product	MacMainFrame SE	MacMainFrame SE/30	MacMainFrame SE/30/DFT	MacMainFrame SE/DFT
Specifications				
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	Microcomputer hardware & software, host software	Microcomputer hardware & software, host software	Microcomputer hardware & software, host software	Microcomputer hardware & software, host software
Copy Protected	No	No	No	No
Microcomputers Supported	Macintosh	Macintosh	Macintosh	Macintosh
Operating Systems Supported	Macintosh Finder	Macintosh Finder	Macintosh Finder	Macintosh Finder
Local Area Network Support	AppleTalk	AppleTalk	AppleTalk	AppleTalk
Minimum Memory Required (bytes)	400K	400K	700K	700K
Terminals/Controllers Emulated	IBM, 327X/317X CUT	IBM, 327X/317X CUT	IBM, 327X/317X DFT	IBM, 327X/317X DFT
User Interface	Install program, mouse, graphic icons, pop-up windows, diagnostics	Install program, mouse, graphic icons, pop-up windows, diagnostics	Install program, mouse, graphic icons, pop-up windows, diagnostics	Install program, mouse, graphic icons, pop-up windows, diagnostics
Programmability	Yes	Yes	Yes	Yes
API Compatibility	Proprietary	Proprietary	Proprietary	Proprietary
Microcomputer Security	Document locking	Document locking	Document locking	Document locking
Number of Concurrent Sessions	1	1	5	5
DOS Access During Session	Not applicable	Not applicable	Not applicable	Not applicable
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	No	No	No	No
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, 43XX/30XX
Software Environment	IBM, MVS, VM, TSO, CMS, CICS	IBM, MVS, VM, TSO, CMS, CICS	IBM, MVS, VM, TSO, CMS, CICS	IBM, MVS, VM, TSO, 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	Access to host-resident programs
Communications Characteristics				
Physical Connection	Coax	Coax	Coax	Coax
Transmission Mode	Vendor did not specify	Asynchronous	Asynchronous	Vendor did not specify
Transmission Speed (bps)	Vendor did not specify	2400	2400	Vendor did not specify
Communications Features	Vendor did not specify	Dial directory	Dial directory	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	795 (bundled price)	995 (bundled price)	1295 (bundled)	495
Host Software/Hardware (\$)	500 (host file transfer program)	500 (host file transfer program)	500 (host file transfer program)	500 (host file transfer program)
Date of First Delivery	July 1987	May 1989	4th quarter 1989	4th quarter 1989
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	Limited one year	One year limited	One year limited	One year limited
Distribution	Dist., dlrs, retail	Dist., dlrs, retail	Dist., dlrs, retail	Dist., dlrs, retail
Comments	For use on the Macintosh SE computer	Available for Macintosh SE/30	495 as upgrade to Macintosh SE II; available for Macintosh SE/30	—

Vendor	Barr Systems, Inc.	Barr Systems, Inc.	Barr Systems, Inc.	Barr Systems, Inc.
Product	BARR/3780	BARR/HASP	BARR/SNA RJE (TRN)	BARR/SNA RJE
Specifications				
Product Function	Remote terminal emulation, network gateway, standalone protocol converter, host app. spfc. link	Remote terminal emulation, network gateway, standalone protocol converter, host app. spfc. link	Remote terminal emulation, network gateway, standalone protocol converter, host app. spfc. link	Remote terminal emulation, network gateway, standalone protocol converter, host app. spfc. link
Users Supported	Single user	Single user	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer software	Microcomputer hardware & software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, any DOS-based LAN	ARCnet, Ethernet, IBM Token-Ring, any DOS-based LAN	IBM Token-Ring	Any DOS-based LAN
Minimum Memory Required (bytes)	256K	256K	320K	320K
Terminals/Controllers Emulated	IBM, 2780/3780	IBM 3777-2	IBM 3777-3, PU2, LU1	IBM 3777-3, PU2, LU1
User Interface	Install program, on-line help, diagnostics	Install program, on-line help, diagnostics	Install program, on-line help, diagnostics	Install program, on-line help, diagnostics
Programmability API Compatibility	No Proprietary	No Proprietary	No Proprietary	No Proprietary
Microcomputer Security	Password protection, interface to host software	Password protection, interface to host software	Password protection, interface to host software	Password protection, interface to host software
Number of Concurrent Sessions	1	12	16 multiple LUs	16 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
Host Interface				
Systems Supported	IBM, 43XX/30XX, System/36/38, AS/400; Data General; Honeywell Bull DEC/VAX, DECsystem; HP Unisys; UNIX-based systems	IBM, 43XX/30XX, any machine w/supported protocol, CDC Cyber, Cray	IBM, 43XX/30XX, any machine with supported protocol	IBM, 43XX/30XX, any machine with supported protocol
Software Environment	IBM, DOS, OS/VS, MVS, VM, SSP; VAX/VMS; DG OAS Honeywell GCOS	IBM, OS/VS, MVS, VM, CEDC/NOS	IBM, DOS, OS/VS, MVS, VM	IBM, DOS, OS/VS, MVS, VM
Protocols	BSC, HASP, 3780, 2780, 3740	BSC, HASP, HASP BSC Multileaving	SNA, SNA RJE	SNA, SDLC
Applications Supported	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Communications Characteristics				
Physical Connection	RS-232-C, V.35	RS-232-C, V.35	Token ring	RS-232-C, V.35
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	2,400 to 64K bps	2,400 to 64K bps	4M or 16M	2,400 to 256K bps
Communications Features	Dial directory, auto dial/redial, auto answer, unattended execution, simulated remote console	Dial directory, auto dial/redial, auto answer, unattended execution	Dial directory, auto dial/redial, auto answer, unattended execution	Dial directory, auto dial/redial, auto answer, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	1,290	1,290	1,590	1,590
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	March 1989	August 1983	March 1989	August 1987
Number Installed to Date	100	6,000	100	3,000
Warranty	Vendor did not specify	1 year	Vendor did not specify	Vendor did not specify
Distribution	Direct, mail, OEMs	Direct, OEMs	Direct, OEMs	Direct, OEMs
Comments	Extension products for nine-track tape support and advanced file transfer available	Extension products for nine-track tape support and advanced file transfer available	Extension products for nine-track tape support and advanced file transfer available	Extension products for nine-track tape support and advanced file transfer available

Vendor	Barr Systems, Inc.	BlueLynx	BlueLynx	BlueLynx
Product	RJE +3270	BlueLynx/3270 Auto Sync	BlueLynx/3270 Remote Bisync	BlueLynx/3270 Remote Gateway
Specifications				
Product Function	Remote terminal emulation, network gateway, standalone protocol converter, host app. spfc. link	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation
Users Supported	Single user	Single user	Single user	Multuser; 32
Components	Microcomputer hardware & software	Microcomputer software	Microcomputer hardware & software	Microcomputer hardware & software
Copy Protected	No	No	No	No
Microcomputers Supported	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	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, any DOS-based LAN	Vendor did not specify	Vendor did not specify	IBM Token-Ring
Minimum Memory Required (bytes)	320K	276K	89K	173K
Terminals/Controllers Emulated	IBM 3777-3, PU2, LU1	327X/317X CUT	327X/317X CUT	Vendor did not specify
User Interface	Install program, on-line help, diagnostics	On-line help, pop-up windows, diagnostics	Diagnostics	On-line help, pop-up windows, diagnostics
Programmability	No	No	No	No
API Compatibility	Proprietary	IBM API	Vendor did not specify	IBM API
Microcomputer Security	Password protection, interface to host software	Password protection	Vendor did not specify	Password protection
Number of Concurrent Sessions	16 multiple LUs, 5 3270 sessions	8	1	32
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	No	Yes
File Formats	ASCII, binary	ASCII, binary	Not applicable	ASCII, binary
File Conversion	Yes	Yes	Not applicable	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX, any machine with supported protocol	IBM, 43XX/30XX, IBM 370 Series	IBM, 43XX/30XX, IBM 370 Series	IBM, 43XX/30XX, IBM 370 Series
Software Environment	IBM, DOS, OS/VS, MVS, VM	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP
Protocols	SNA, SDLC	SNA, SDLC	BSC	SNA, SDLC
Applications Supported	Vendor did not specify	IRMA compatible host file transfer	None	IRMA-compatible, host file transfer
Communications Characteristics				
Physical Connection	RS-232-C, V.35, token ring	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	2,400 to 256K bps	9600	9600	9600
Communications Features	Dial directory, auto dial/redial, auto answer, unattended execution	Auto dial/redial, macros, unattended execution	Macros, unattended execution	Macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	1,990	595	895	1,995
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	Vendor did not specify	Vendor did not specify	January 1987	May 1988
Number Installed to Date	100	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	Vendor did not specify	1 year, lifetime on software	1 year, lifetime on software	1 year, lifetime on software
Distribution	Direct, OEMs	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail
Comments	Extension products for nine-track support and advanced file transfer available	—	—	—

Vendor	BlueLynx	BlueLynx	BlueLynx	BlueLynx
Product	BlueLynx/3270 Remote SNA	BlueLynx/3780 RJE Remote	BlueLynx/5250-12 Auto Sync	BlueLynx/5250-12 Remote
Specifications				
Product Function	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation, non-host app. spfc. link
Users Supported	Single user	Single user	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer software	Microcomputer hardware & 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
Operating Systems Supported	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 (bytes)	239K	128K	182K	182K
Terminals/Controllers Emulated	327X/317X DFT	2780/3780	5250 Series	IBM, 5250 Series
User Interface	On-line help, pop-up windows, diagnostics	Diagnostics	Vendor did not specify	On-line help, pop-up windows
Programmability API Compatibility	No IBM API	No Vendor did not specify	No IBM API	No IBM API
Microcomputer Security	Password protection	Vendor did not specify	Keyboard lock	Keyboard lock
Number of Concurrent Sessions	8	1	9	Nine
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	Vendor did not specify	No
Host Interface				
Systems Supported	IBM, 43XX/30XX, IBM 370 Series	IBM, 43XX/30XX, IBM 370 Series	System/36/38, AS/400	IBM, System/36/38, AS/400
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, CMS, 3780 batch communications	Vendor did not specify	IBM, OS/400
Protocols	SNA, SDLC	BSC	SNA, SDLC	SNA, SDLC
Applications Supported	IRMA compatible host file transfer	None	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Asynchronous	Synchronous
Transmission Speed (bps)	9600	9600	300, 600, 1200, 2400, 4800, 9600	300, 600, 1200, 2400, 4800, 9600
Communications Features	Macros, unattended execution	Vendor did not specify	Auto dial/redial	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	895	895	595	795
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	July 1987	January 1987	Vendor did not specify	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, lifetime on software	1 year, lifetime on software	1 year, lifetime on software	1 year, lifetime on software
Distribution	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail
Comments	—	—	—	—

Vendor	BlueLynx	BlueLynx	BlueLynx	BlueLynx
Product	BlueLynx/5250-12 Remote Gateway	BlueLynx/5251-11 Local	BlueLynx/5251-11 Local Gateway	BlueLynx/AS/400 PC Support Auto Sync Adapter Handler
Specifications				
Product Function	Network gateway	Local terminal emulation, non-host app. spfc. link	Network gateway, non-host app. spfc. link	Host app. spfc. link
Users Supported	Multuser; 9	Single user	Multuser	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, STARLAN	Vendor did not specify
Minimum Memory Required (bytes)	90K for Gateway, 160K for PC	88K	65K for Gateway/ 104K for PC	14K memory in addition to PC support requirements
Terminals/Controllers Emulated	5250 Series	5250 Series	IBM, 5250 Series	IBM, 5250 Series
User Interface	On-line help, pop-up windows	On-line help, pop-up windows	On-line help, pop-up windows	Vendor did not specify
Programmability API Compatibility	No IBM API	No IBM API	No IBM API	No IBM API, IBM LU 6.2
Microcomputer Security	Keyboard lock	Keyboard lock	Keyboard lock	Vendor did not specify
Number of Concurrent Sessions	9	Seven	Seven	Five
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	Yes
Host Interface				
Systems Supported	System/36/38, AS/400	IBM, System/36/38, AS/400	IBM, System/36/38, AS/400	IBM, AS/400
Software Environment	OS/400	IBM, OS/400	IBM, OS/400	IBM, OS/400
Protocols	SNA, SDLC	TDLC	TDLC	SNA, 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
Communications Characteristics				
Physical Connection	RS-232-C	Twinax	Twinax	RS-232-C
Transmission Mode	Synchronous	Asynchronous	Asynchronous	Synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600	1M	1M	300, 600, 1200, 2400, 4800, 9600
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	1,995	895	1,995	595
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	October 1987	April 1987	May 1988	November 1989
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year, lifetime on software	1 year, Lifetime on software	1 year, Lifetime on software	1 year, Lifetime on software
Distribution	Direct, dist., dirs, retail	Direct, dist., dirs, retail	Direct, dist., dirs, retail	Vendor did not specify
Comments	—	—	—	—

Vendor	BlueLynx	BlueLynx	BlueLynx	BlueLynx
Product	BlueLynx/AS/400 PC Support AutoSync Adapter Handler	BlueLynx/AS/400 PC Support Local Adapter Handler	BlueLynx/COAXSYS Local	BlueLynx/DFT/Local
Specifications				
Product Function	Host app. spfc. link	Host app. spfc. link	Local terminal emulation	Local terminal emulation
Users Supported	Single user	Single user	Single user	Single user
Components	Microcomputer software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	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 (bytes)	145K memory in addition to PC support requirements	5K in addition to PC support requirements	100K	224K
Terminals/Controllers Emulated	IBM, 5250 Series	IBM, 5250 Series	327X/317X CUT	327X/317X DFT
User Interface	Vendor did not specify	Vendor did not specify	On-line help, pop-up windows, diagnostics	On-line help, pop-up windows, diagnostics
Programmability API Compatibility	No IBM API, IBM LU 6.2	No IBM API, IBM LU 6.2	No IBM API	No IBM API
Microcomputer Security	Vendor did not specify	Vendor did not specify	Password protection	Password protection
Number of Concurrent Sessions	Five	Five	1	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	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, AS/400	IBM, AS/400	43XX/30XX, IBM 370 Series	IBM, 43XX/30XX, IBM 370 Series
Software Environment	IBM, OS/400	IBM, OS/400	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP
Protocols	SNA, SDLC	TDLCL	BSC, SNA, SDLC, channel attached	BSC, SNA, SDLC, channel attached
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	IRMA compatible host file transfer	IRMA compatible host file transfer
Communications Characteristics				
Physical Connection	RS-232-C	Twinax	Coax	Coax
Transmission Mode	Asynchronous	Asynchronous	Synchronous	Synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600	1M	Up to controller specifications	Up to controller specifications
Communications Features	Auto dial/redial	Vendor did not specify	Macros, unattended execution	Macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	395	695	895	1,095
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	Novmeber 1989	August 1989	January 1987	June 1987
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year, Lifetime on software	1 year, Lifetime on software	1 year, lifetime on software	1 year, lifetime on software
Distribution	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail	Vendor did not specify	Direct, dist., dlrs, retail
Comments	—	—	—	—

Vendor	BlueLynx	Cambridge Computer Corp.	Cambridge Computer Corp.	Cambridge Computer Corp.
Product	Transfer 3270	Mac 73/78	PC 73/78	PC 77/78
Specifications				
Product Function	Host app. spfc. link	Local/remote terminal emulation	Local/remote terminal emulation	Local/remote terminal emulation
Users Supported	Single user	Multuser	Multuser; dependent upon memory	Single user
Components	Microcomputer hardware & software, host software	Microcomputer software	Microcomputer software	Microcomputer software
Copy Protected Microcomputers Supported	No PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No Macintosh	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, Zenith Z100
Operating Systems Supported	MS-/PC-DOS	Macintosh Finder	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, STARLAN	Vendor did not specify
Minimum Memory Required (bytes)	164K	1M	256K	256K
Terminals/Controllers Emulated	N/a	DEC, VT52/100, VT200 Series, VT300 Series, ANSI 3.64, Tektronics 4010/4014	Honeywell Bull	Honeywell Bull
User Interface	On-line help, pop-up windows	Install program, on-line help, mouse, graphic icons, pop-up windows, diagnostics	Install program, on-line help, pop-up windows	Install program, on-line help, pop-up windows, diagnostics
Programmability API Compatibility	No N/a	Yes Vendor did not specify	Yes Vendor did not specify	Yes Cambridge
Microcomputer Security	N/a	Interface to host software	File encryption, interface to host software	File encryption, interface to host software
Number of Concurrent Sessions	1	Memory dependent	Vendor did not specify	Vendor did not specify
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
Host Interface				
Systems Supported	43XX/30XX, IBM 370 Series	Honeywell Bull; DECVAX, DECsystem; UNIX-based systems	Honeywell Bull	Honeywell Bull
Software Environment	TSO, CMS, CICS	VAX/VMS; Honeywell GCOS UNIX System 5; Berkeley 4.X, Pick	Honeywell GCOS	Honeywell GCOS
Protocols	SNA, SDLC	VIP	VIP	VIP
Applications Supported	IRMA-compatible host file transfer	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	Coax, RS-232-C	RS-232-C	RS-232-C, RS-422	RS-232-C
Transmission Mode	Synchronous	Asynchronous	Asynchronous	Synchronous
Transmission Speed (bps)	Dependent upon emulator specifications	56K	19.2K	38.4K
Communications Features	Unattended execution	Dial directory, auto dial/radial, auto answer, macros	Dial directory, auto dial/radial, auto answer, macros, unattended execution	Macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	195	295	295	350
Host Software/Hardware (\$)	295	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	August 1989	November 1988	February 1984	December 1983
Number Installed to Date	Vendor did not specify	500	5,000	8,000
Warranty	1 year, lifetime on software	1 year	1 year	1 year
Distribution	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail, mail	Direct	Direct, mail
Comments	—	—	Product can operate under Desqview multitasking system	Product can operate in a Desqview multitasking environment

Vendor	Cambridge Computer Corp.	cfSoftware, Inc.	cfSoftware, Inc.	Cincom Systems
Product	VX*Connect	Across the Boards	PcMAINFRAME	PC Contact
Specifications				
Product Function	Local/remote terminal emulation	Host app. spfc. link, non-host app. spfc. link	Host app. spfc. link	Host app. spfc. link
Users Supported	Single user	Multiuuser	Multiuuser	No limit
Components	Microcomputer software	Microcomputer software, host software	Microcomputer software, host software	Microcomputer software, host software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles	Yes IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, STARLAN	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	512K	50K	128K	Vendor did not specify
Terminals/Controllers Emulated	DEC, VT52/100, VT200 Series, VT300 Series	TTY, IBM, 327X/317X DFT, 327X/317X CUT, DEC, VT52/100, IBM 361	TTY, IBM, 327X/317X DFT, 327X/317X CUT, DEC, VT52/100, IBM 3101	IBM, 327X/317X DFT, 327X/317X CUT
User Interface	Install program, on-line help, mouse, pop-up windows	Vendor did not specify	Diagnostics	On-line help
Programmability API Compatibility	Yes Vendor did not specify	Yes IBM API, DCA IRMA API, proprietary, Novell API	Yes IBM API, DCA IRMA API, proprietary	Yes DCA IRMA API
Microcomputer Security	Interface to host software	Interface to host software	Password protection, interface to host software	Vendor did not specify
Number of Concurrent Sessions	Vendor did not specify	Unlimited	Unlimited	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
File Conversion	Yes	No	Yes	No
Host Interface				
Systems Supported	DECVAX, DECsystem	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, 43XX/30XX
Software Environment	VAX/VMS	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM, DOS, MVS, VM, CICS	IBM, DOS, OS/VS, MVS, VM, IMS, CICS
Protocols	Vendor did not specify	BSC, SNA, SDLC	BSC, SNA, SDLC	BSC
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs, CICS	Host access to PC files
Communications Characteristics				
Physical Connection	RS-232-C	Twinax, coax, RS-232-C	Coax, RS-232-C	Coax
Transmission Mode	Asynchronous	Asynchronous, synchronous	Asynchronous, synchronous	Synchronous
Transmission Speed (bps)	19.2K	300, 1200, 2400, 4800, 9600, 19.2K	300, 1200, 2400, 4800, 9600, 19.2K	Vendor did not specify
Communications Features	Dial directory, auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	245	2,500 to 65,000	1,000	Vendor did not specify
Host Software/Hardware (\$)	Vendor did not specify	1,250 to 2,500 software	7,500	Vendor did not specify
Date of First Delivery	Vendor did not specify	February 1987	November 1983	1984
Number Installed to Date	1,000	Over 25,000	550	500
Warranty	1 year	1 year	1 year	Vendor did not specify
Distribution	Direct	Direct, mail	Direct, dist., dirs, retail, mail	Direct
Comments	—	—	—	—

Vendor	CLEO Communications	CLEO Communications	CLEO Communications	Commtext Inc.
Product	3780 Plus	Data Taker 3270	Data Taker 3270/UX	CX-80 Data Exchange
Specifications				
Product Function	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation	Network gateway, standalone protocol converter
Users Supported	Single user	Multuser; 32	Multuser; 9	Multuser; up to 50
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Standalone hardware
Copy Protected	Yes	Yes	Yes	Vendor did not specify
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 MCA, PS/2 non-MCA	Macintosh, IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, any ASCII or Type A coax device
Operating Systems Supported	MS-/PC-DOS, UNIX, Xenix	MS-/PC-DOS, UNIX, Xenix	UNIX, Xenix	All
Local Area Network Support	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	128K	128K	128K	Vendor did not specify
Terminals/Controllers Emulated	IBM, 2780/3780	IBM 3278/79	IBM 3278/79	IBM, 327X/317X CUT
User Interface	Install program, on-line help	Install program	Install program, on-line help	On-line help
Programmability	Yes	Yes	Yes	No
API Compatibility	Proprietary, Cleo's API	IBM API, proprietary	IBM API, proprietary	Vendor did not specify
Microcomputer Security	Vendor did not specify	Vendor did not specify	Vendor did not specify	Password protection
Number of Concurrent Sessions	Vendor did not specify	32	32	Up to 5
DOS Access During Session	Yes	Yes	No	Vendor did not specify
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	Vendor did not specify
File Conversion	Yes	Vendor did not specify	No	Vendor did not specify
Host Interface				
Systems Supported	Any system	IBM, 43XX/30XX, AS/400	Any SNA or BSC host	IBM, 43XX/30XX; Data General; DECVAX; HP UNIX-based systems
Software Environment	Vendor did not specify	Any 3270	Any SNA or BSC host	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS VAX/VMS; DG OAS; UNIX System 5; Berkeley 4.X
Protocols	BSC	BSC, SNA, SDLC	BSC, SNA, SDLC	BSC, SNA, HDLC, SDLC
Applications Supported	Vendor did not specify	IND\$ FILE file transfer	IND\$ FILE file transfer	Vendor did not specify
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	RS-232-C	Coax, RS-232-C, RS-422, current loop
Transmission Mode	Synchronous	Synchronous	Synchronous	Asynchronous
Transmission Speed (bps)	1200, 2400, 4800, 9600, 14.4K, 19.2K	2400, 4800, 9600, 14.4K, 19.2K	300, 600, 1200, 2400, 4800, 9600	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 38.4K
Communications Features	Dial directory, auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	695 to 2195	995 to 2895	2195 to 2895	Vendor did not specify
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	October 1980	June 1982	June 1987	Vendor did not specify
Number Installed to Date	35,000	10,000	1,000	6,000
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dlrs, retail, OEMs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	—

Vendor	Computer Associates International, Inc.	Computer Corp. of America	Computer Logics, Ltd.	Core Technology Corp.
Product	CA-Link	PC/204	PEP for UNIX	CTC/Bridge IBM
Specifications				
Product Function	Local/remote terminal, emulation, host app. spfc. link, non-host app. spfc. link	Local/remote terminal emulation, host app. spfc. link, non-host app. spfc. link	Local/remote terminal emulation	Local/remote terminal emulation
Users Supported	Single user	Single user, multiuser	Multiuser; 32	Single user
Components	Microcomputer software, host software	Microcomputer software, host software	Microcomputer software, standalone hardware	Microcomputer 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, EISA bus	IBM, PC/XT/AT & compatibles	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	UNIX	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	Vendor did not specify	Vendor did not specify	ARCnet
Minimum Memory Required (bytes)	56K	512K	Vendor did not specify	256K
Terminals/Controllers Emulated	TTY, IBM, 327X/317X CUT, DEC, VT52/100	TTY, IBM, 327X/317X CUT	Unisys	Unisys
User Interface	Install program, on-line help, on-line tutor.	On-line help, pop-up windows	Install program, on-line help, diagnostics	Install program, on-line help, pop-up windows
Programmability	Yes	No	Yes	Yes
API Compatibility	Proprietary	Proprietary, IBM HLLAPI	Proprietary	Proprietary
Microcomputer Security	Interface to host software	Vendor did not specify	Password protection	Password protection
Number of Concurrent Sessions	1	Multiple	32	99
DOS Access During Session	No	Yes	No	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	No	No	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	Unisys	Unisys
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, CICS	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	UNIX System 5	Unisys A-Series, V-Series, and B-Series
Protocols	SNA, SDLC	BSC, SNA, RS-232	Unisys uniscope	Burroughs Poll/Select
Applications Supported	Access to host-resident programs	Host virtual disk, access to host-resident programs, access to Model 204 RDBMS	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	Coax, RS-232-C, SDLC sync modem	Coax, RS-232-C	RS-232-C	Unisys TDI
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Synchronous	Asynchronous, synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600	2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K, 2.4M
Communications Features	Dial directory, auto dial/redial, auto answer	Dial directory, auto dial/redial, macros	Unattended execution	Auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	11,500 to 12,500, additional PC kits \$425	500 hardware	500-800	395
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	600
Date of First Delivery	January 1983	Vendor did not specify	June 1986	Vendor did not specify
Number Installed to Date	Over 5,000	Vendor did not specify	1,600	Vendor did not specify
Warranty	Vendor did not specify	1 year	90 days	90 days
Distribution	Direct	Direct	Direct, dist., dlrs, retail, OEMs	Direct, dist., dlrs, retail, mail, VARs
Comments	—	—	PEP can also be used with MS-DOS, most NetBios LANs, IBM OS/2, and MS-Windows	—

Vendor	Core Technology Corp.	Core Technology Corp.	Core Technology Corp.	CQ Computer Communications, Inc.
Product	CTCBridge IBM Gateway	CTCBridge Mac	CTCBridge Mac Gateway	CQ-3270
Specifications				
Product Function	Local/remote terminal emulation, network gateway	Local/remote terminal emulation	Local/remote terminal emulation, network gateway	Remote terminal emulation
Users Supported	Multiuser; 100	Single user	Multiuser; 100	Single user
Components	Microcomputer software, host software	Microcomputer software, host software	Microcomputer software, host software	Microcomputer software
Copy Protected	No	No	No	No
Microcomputers Supported	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Macintosh	Macintosh	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	Macintosh Finder	Macintosh Finder	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NetBIOS-compatible	Vendor did not specify	AppleTalk	All DOS V3.x compatible
Minimum Memory Required (bytes)	512K	512K	512K	368K
Terminals/Controllers Emulated	Unisys	Unisys, both Burroughs and Sperry	Both Burroughs and Sperry	IBM, 327X/317X DFT, 5250 Series
User Interface	Install program, on-line help, diagnostics	Install program, on-line help, mouse, graphic icons, pop-up windows, diagnostics	Install program, on-line help, mouse, graphic icons, pop-up windows, diagnostics	Install program, on-line help, mouse, pop-up windows
Programmability	Yes	Yes	Yes	Yes
API Compatibility	Proprietary	Proprietary	Proprietary	IBM API, HLLAPI
Microcomputer Security	Password protection	Password protection	Password protection	Transmission/file encrypt. password protection, interface to host software
Number of Concurrent Sessions	100	99	100	8
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	Binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
Host Interface				
Systems Supported	Unisys	Unisys	Unisys	IBM, 43XX/30XX, System/36/38
Software Environment	Unisys A-Series, V-Series, and B-Series	Unisys	Unisys	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400
Protocols	Burroughs Poll/Select	Burroughs Poll/Select, Sperry Uniscope	Burroughs Poll/Select, Sperry Uniscope	SNA, SDLC
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C, Unisys TDI	RS-232-C, Unisys TDI	RS-232-C, Unisys TDI	RS-232-C
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, up to 64K bps
Communications Features	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	895	395	895	495-795/295
Host Software/Hardware (\$)	600	600	600	Vendor did not specify
Date of First Delivery	Vendor did not specify	Vendor did not specify	Vendor did not specify	1986
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	N/A
Warranty	90 days	90 days	90 days	Hardware one year
Distribution	Direct, dist., dlrs, retail, mail, VARs	Direct, dist., dlrs, retail, mail, VARs	Direct, dist., dlrs, retail, mail, VARs	Direct, dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	—

Vendor	CQ Computer Communications, Inc.	CQ Computer Communications, Inc.	CQ Computer Communications, Inc.	CQ Computer Communications, Inc.
Product	CQ-3270 LAN	CQ-3770	CQ-3770 LAN	CQ-3780
Specifications				
Product Function	Remote terminal emulation, network gateway	Vendor did not specify	Remote terminal emulation	Remote terminal emulation
Users Supported	Multiuser; 128	Single user	Multiuser; 128	Single user
Components	Microcomputer software	Microcomputer software	Microcomputer software	Microcomputer software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 non-MCA	No Vendor did not specify	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	Vendor did not specify	CP/M-80, CP/M-86, MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN, all NetBios and Novell-compatible	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, NetBios and Novell	Vendor did not specify
Minimum Memory Required (bytes)	368K	256K	256K	256K
Terminals/Controllers Emulated	IBM, 327X/317X DFT, 5250 Series	IBM 377X	IBM 377X	IBM, 2780/3780
User Interface	Install program, on-line help, mouse, pop-up windows	Install program, on-line help, diagnostics	Install program, on-line help	Install program, on-line help
Programmability API Compatibility	Yes IBM API	Yes Vendor did not specify	Yes Vendor did not specify	No IBM API, proprietary
Microcomputer Security	Transmission/file encryption, password protection	Transmission/file encrypt. password protection, interface to host software	Transmission encryption, password protection	Password protection
Number of Concurrent Sessions	8	6	6	Vendor did not specify
DOS Access During Session	Yes	No	Vendor did not specify	No
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX, System/36/38, AS/400	Vendor did not specify	IBM, 43XX/30XX	IBM, 43XX/30XX, System/36/38, any that supports IBM 3780
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	JES, Power	JES, Power	JES, Power
Protocols	SNA, SDLC	SNA, SDLC	SNA, SDLC	BSC
Applications Supported	Access to host-resident programs	Vendor did not specify	RJE	RJE
Communications Characteristics				
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)	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, up to 64K bps	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, up to 64K bps	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, up to 64K bps	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, up to 64K bps
Communications Features	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	2,395/295	595-795/295	4,995/295	495/295
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	1987	1985	October 1989	1985
Number Installed to Date	N/A	N/A	N/A	N/A
Warranty	Hardware one year	Hardware one year	Hardware one year	Hardware one year
Distribution	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Vendor did not specify	Direct, dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	—

Vendor	CQ Computer Communications, Inc.	CQ Computer Communications, Inc.	CQ Computer Communications, Inc.	Data Interface Systems Corp.
Product	CQ-5250	CQ-5250 LAN	CQ-Haste	DI3270
Specifications				
Product Function	Remote terminal emulation	Network gateway	Remote terminal emulation	Local/remote terminal emulation, network gateway
Users Supported	Single user	Multuser; 128	Single user	Single user, multuser; 253
Components	Microcomputer software	Microcomputer software	Microcomputer software	Microcomputer hardware & software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Yes IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	CP/M-80, CP/M-86, MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NetBios and Novell	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, STARLAN, any NetBios
Minimum Memory Required (bytes)	368K	368K	256K	73K
Terminals/Controllers Emulated	IBM, 5250 Series	IBM, 5250 Series	Vendor did not specify	IBM, 327X/317X DFT
User Interface	Install program, on-line help, mouse, pop-up windows, diagnostics	Install program, on-line help, mouse, pop-up windows, diagnostics	On-line help, diagnostics	Install program, on-line tutor., diagnostics
Programmability API Compatibility	No IBM API	No IBM API	No IBM API, proprietary	Vendor did not specify IBM API, proprietary
Microcomputer Security	Transmission/file encrypt., password protection, interface to host software	Transmission/file encrypt., password protection, interface to host software	Password protection	Password protection, physical node restriction
Number of Concurrent Sessions	8	1024	Vendor did not specify	Up to 253
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	No	No	Yes	Yes
File Formats	Vendor did not specify	Vendor did not specify	ASCII	ASCII, binary
File Conversion	Vendor did not specify	Vendor did not specify	No	Yes
Host Interface				
Systems Supported	IBM, System/36/38, AS/400	IBM, System/36/38, AS/400	IBM, 43XX/30XX, System/36/38; Data General Honeywell Bull; DECVAX, DECsystem; HP; UNIX-based systems, any that support HASP	IBM, 43XX/30XX
Software Environment	IBM, DOS, OS/VS, VM, OS/400	IBM, DOS, OS/VS, VM, OS/400	N/A	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	SNA, SDLC	SNA, SDLC	HASP	BSC, SNA, SDLC
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	RJE	Access to host-resident programs, index file
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	RS-232-C	Coax, RS-232-C, token ring gateway
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Synchronous	Synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, up to 64K bps	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, up to 64K bps	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	9600, 56K bps, 64K bps
Communications Features	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	495-595/295	2,395/295	750/295	1,095-4,495/240-995
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	1988	1988	1984	December 1986
Number Installed to Date	N/A	N/A	N/A	1,000
Warranty	Hardware one year	Hardware one year	Hardware one year	Unltd. free software sup.
Distribution	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct	Direct, VARs
Comments	—	—	—	—

Vendor	Data Race, Inc.	Datability Software Systems, Inc.	Digital Communications Associates, Inc. (DCA)	Digital Communications Associates, Inc. (DCA)
Product	Action 24/32, Race OCS and PC Race	RAF Remote Access Facility	3270 APA Graphics	E78 Plus
Specifications				
Product Function	Local/remote terminal emulation	Local/remote terminal emulation, host app. spfc. link	Local terminal emulation	Local terminal emulation
Users Supported	Single user	Multuser; unlimited	Single user	Single user
Components	Microcomputer hardware & software, standalone hw/dw. Yes	Microcomputer software, host software Yes	Microcomputer software	Microcomputer software
Copy Protected Microcomputers Supported	IBM, PC/XT/AT & compatibles, PS/2 non-MCA	Macintosh, IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	Apple ProDOS, OS/2, MS-/PC-DOS, UNIX, Xenix	Macintosh Finder, MS-/PC-DOS	MS-/PC-DOS	OS/2, MS-/PC-DOS
Local Area Network Support	ARCnet, IBM Token-Ring	Ethernet, AppleTalk	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	Vendor did not specify	70K	180K	62K with E78 Lite
Terminals/Controllers Emulated	TTY, IBM, 327X/317X DFT, 327X/317X CUT, 5250 Series, 2780/3780, DEC, VT52/100, VT200 Series, VT300 Series DG, HP; Honeywell Bull Unisys	DEC, VT52/100, VT200 Series	IBM, 327X/317X CUT	IBM, 327X/317X CUT
User Interface	Vendor did not specify	Install program, diagnostics	Install program, mouse, diagnostics	Install program, mouse, diagnostics
Programmability API Compatibility	Yes IBM API, DCA IRMA API	No Proprietary	Yes IBM API, DCA IRMA API	Yes IBM API, DCA IRMA API
Microcomputer Security	Vendor did not specify	Interface to host software	Interface to host software	Interface to host software
Number of Concurrent Sessions	Vendor did not specify	Unlimited	5	1
DOS Access During Session	Vendor did not specify	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Vendor did not specify	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX, System/36/38, AS/400; Data General; Honeywell Bull DECVAX, DECsystem; HP Unisys; UNIX-based systems	DECVAX	IBM, 43XX/30XX	IBM, 43XX/30XX
Software Environment	IBM, DOS, OS/VS, VM, OS/400; VAX/VMS; DG OAS UNIX System 5	VAX/VMS	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	BSC, SNA, HDLC, SDLC	Proprietary	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
Communications Characteristics				
Physical Connection	Vendor did not specify	Coax, RS-232-C, Ethernet thin wire	Coax	Coax, twisted pair
Transmission Mode	Asynchronous, synchronous	Asynchronous	Synchronous	Synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	38.4K	2.4M	2.4M
Communications Features	Dial directory, auto dial/redial, auto answer, unattended execution	Dial directory, auto dial/redial, macros, unattended execution	Macros, unattended execution	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	Vendor did not specify	495 software	495	395
Host Software/Hardware (\$)	Vendor did not specify	299 hardware	Vendor did not specify	Vendor did not specify
Date of First Delivery	June 1988	March 1986	Vendor did not specify	Vendor did not specify
Number Installed to Date	1,000	7,000	Vendor did not specify	Vendor did not specify
Warranty	1 year	90 days	90 days	90 days
Distribution	Dist., dlrs, retail, VARs	Direct, dist., dlrs, retail, VARs	Dist., dlrs, retail, OEMs	Dist., dlrs, retail, OEMs
Comments	—	Free 30 day trial available	—	—

Vendor	Digital Communications Associates, Inc. (DCA)	Digital Communications Associates, Inc. (DCA)	Digital Communications Associates, Inc. (DCA)	Digital Communications Associates, Inc. (DCA)
Product	IRMA 3 Convertible	IRMA 3279 Graphics	IRMAremote for Hayes AutoSync	IRMAremote SNA
Specifications				
Product Function	Local terminal emulation	Local terminal emulation	Remote terminal emulation	Remote terminal emulation
Users Supported	Single user	Single user	Single user	Single user
Components	Microcomputer hardware	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Vendor did not specify IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	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 (bytes)	Vendor did not specify	Vendor did not specify	250K	250K
Terminals/Controllers Emulated	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X CUT	IBM, 327X/317X DFT	IBM, 327X/317X DFT
User Interface	Diagnostics	Install program, mouse, diagnostics	Install program, diagnostics	Install program, diagnostics
Programmability API Compatibility	Vendor did not specify IBM API, DCA IRMA API	Yes IBM API, DCA IRMA API	Yes IBM API, DCA IRMA API	Yes IBM API, DCA IRMA API
Microcomputer Security	Interface to host software	Interface to host software	Interface to host software	Interface to host software
Number of Concurrent Sessions	5	1	5	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
Host Interface				
Systems Supported	Vendor did not specify	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, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	SNA	BSC, SNA, SDLC	BSC, SNA, SDLC	SNA, 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
Communications Characteristics				
Physical Connection	Coax	Coax	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	2.4M	2.4M	9600	9600
Communications Features	Vendor did not specify	Macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	645	1,995	595	895
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
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	90 days
Distribution	Vendor did not specify	Dist., dlrs, retail, OEMs	Dist., dlrs, retail	Dist., dlrs, retail
Comments	—	—	—	—

Vendor	Digital Communications Associates, Inc. (DCA)	Digital Communications Associates, Inc. (DCA)	Digital Communications Associates, Inc. (DCA)	Digital Communications Associates, Inc. (DCA)
Product	IRMAX DFT	IRMAX Multisessions	MacIrma Graphics	MacIRMA
Specifications				
Product Function	Local terminal emulation	Local terminal emulation	Local terminal emulation, host app. spfc. link, graphics terminal emulation	Local/remote terminal emulation
Users Supported	Single user	Single user	Single user	Single user
Components	Microcomputer software	Microcomputer software	Microcomputer hardware & software, Macintosh swre.	Microcomputer hardware & software
Copy Protected	Vendor did not specify	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
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	Macintosh Finder, version 6.0 or later; Multifinder version 1.0 or later	Macintosh Finder
Local Area Network Support	Vendor did not specify	Vendor did not specify	Vendor did not specify	AppleTalk
Minimum Memory Required (bytes)	256K	384K	1M under Finder; 2M under Multifinder	512K
Terminals/Controllers Emulated	IBM, 327X/317X DFT	IBM, 327X/317X DFT	327X/317X CUT, PCLK terminal; APA graphics terminal	327X/317X CUT
User Interface	Install program	Install program	Mouse, graphic icons, pop-up windows, diagnostics	Mouse, graphic icons, pop-up windows, diagnostics
Programmability API Compatibility	Yes IBM API, DCA IRMA API	Yes IBM API, DCA IRMA API	Vendor did not specify IBM API, DCA IRMA API	Yes IBM API, DCA IRMA API
Microcomputer Security	Interface to host software	Interface to host software	Configuration lock	Password protection
Number of Concurrent Sessions	5	5 hosts, 1 DOS, 2 notepads	1 text; 1 graphics	Vendor did not specify
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
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, 43XX/30XX, compatibles	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, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, GDMM 6.1.1 or later; PCLK/F required	IBM, MVS, VM, TSO, CMS, CICS
Protocols	BSC, SNA, SDLC	BSC, SNA, SDLC	SNA, SDLC	Vendor did not specify
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	SAS/Graph	None
Communications Characteristics				
Physical Connection	Coax	Coax	Coax	Coax
Transmission Mode	Synchronous	Synchronous	Sync remote control unit	Synchronous
Transmission Speed (bps)	2.4M	2.4M	Not applicable	2.4M
Communications Features	Macros, unattended execution	Macros, unattended execution	Not applicable	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	395	495	95 upgrade; 1,295 bundled w/MacIrma hardware	1,195
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	Vendor did not specify	Vendor did not specify	September 1989	November 1987
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	Dist., dlrs, retail, OEMs	Dist., dlrs, retail, OEMs	Dist., dlrs, retail, VARs	Dist., dlrs, retail
Comments	—	—	Currently only mainframe graphics solution available for Mac	—

Vendor	Digital Communications Associates, Inc. (DCA)	Digital Communications Associates, Inc. (DCA)	Direct Aid	Diversified Computer Systems, Inc.
Product	MacIrma Workstation	Windowlink for IRMA	The Impersonator	EM220
Specifications				
Product Function	Local terminal emulation	Local terminal emulation	Local/remote terminal emulation, network gateway	Local terminal emulation
Users Supported	Single user	Single user	Multiuser; dependent on LAN	Single user
Components	Microcomputer hardware & software	Microcomputer software	Microcomputer software	Microcomputer software
Copy Protected Microcomputers Supported	No Macintosh	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	Macintosh Finder, Multifinder version 6.0 or later	MS-/PC-DOS, Microsoft Windows	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, Novell	Ethernet, many
Minimum Memory Required (bytes)	1M	Vendor did not specify	256K	256K
Terminals/Controllers Emulated	IBM, 327X/317X CUT	IBM, 327X/317X CUT	TTY, DEC, VT52/100, VT200 Series, VT300 Series Unisys, emulates over 16 async terminals	DEC, VT52/100, VT200 Series, VT300 Series
User Interface	Mouse, graphic icons, pop-up windows, diagnostics	Install program, mouse, graphic icons, pop-up windows Yes	Install program, on-line help, on-line tutor., pop-up windows, diagnostics Yes	Install program, on-line help No
Programmability API Compatibility	Vendor did not specify IBM API, DCA IRMA API	IBM API, DCA IRMA API	Vendor did not specify	N/A
Microcomputer Security	Configuration lock	Interface to host software	Interface to host software, optional password, key disk security 1	Password protection
Number of Concurrent Sessions	Up to 5, one of which can be for printer emulation	Vendor did not specify		Up to 2
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	Vendor did not specify
Host Interface				
Systems Supported	IBM, 43XX/30XX, compatibles	IBM, 43XX/30XX	Supports any machine type	IBM, 43XX/30XX, System/36/38, AS/400; Data General; Honeywell Bull DEC/VAX, DECsystem; HP Unisys; 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	Supports any host software environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400; VAX/VMS; DG OAS Honeywell GCOS; UNIX System 5; Berkeley 4.X N/A
Protocols	SNA, SDLC	BSC, SNA, SDLC	Supports any host protocol	N/A
Applications Supported	Vendor did not specify	Host virtual disk, access to host-resident programs	Access to host-resident programs	Host virtual disk, access to host-resident programs
Communications Characteristics				
Physical Connection	Coax	Coax	RS-232-C	RS-232-C, Ethernet
Transmission Mode	Sync remote control unit	Synchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	Not applicable	2.4M	30 to 9600	300, 600, 1200, 2400, 4800, 9600, 19.2K
Communications Features	Not applicable	Macros, unattended execution	Dial directory, auto dial/redial, auto answer, macros, unattended execution	Dial directory, auto dial/redial, auto answer, macros
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	295; 1,395 w/MacIrma hardware	395	245	189
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	N/A	Vendor did not specify
Date of First Delivery	December 1989	Vendor did not specify	January 1982	1984
Number Installed to Date	Vendor did not specify	Vendor did not specify	Over 10,000	10,000
Warranty	90 days	90 days	30 days	30 days
Distribution	Dist., dlrs, retail, VARs	Dist., dlrs, retail, OEMs	Direct, dist., dlrs, retail, mail, OEMs, VARs	Direct, dist., dlrs, retail
Comments	—	—	Supports Xmodem file transfer; built-in language allows customized emulation	—

Vendor	Diversified Computer Systems, Inc.	Diversified Computer Systems, Inc.	DTSS, Inc.	Eicon Technology
Product	EM4010	EM4105	DataPass	Access/QLLC (3270 and 5250)
Specifications				
Product Function	Local terminal emulation	Local terminal emulation	Vendor did not specify	Remote terminal emulation, network gateway
Users Supported	Single user	Single user	Single user	Single user, multiuser unlimited
Components	Microcomputer software	Microcomputer software	Microcomputer software, host software	Microcomputer hardware & 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, Zenith	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Ethernet, many	Ethernet, many	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, STARLAN, any NetWare or NetBios
Minimum Memory Required (bytes)	360K	380K	256K	640K
Terminals/Controllers Emulated	DEC, VT52/100, VT200 Series, VT300 Series	DEC, VT52/100, VT200 Series, VT300 Series	TTY, DEC, VT52/100 Honeywell Bull	TTY, IBM, 327X/317X DFT, 5250 Series, DEC, VT52/100
User Interface	Install program, on-line help	Install program, on-line help	Install program, on-line help, diagnostics	Install program, diagnostics
Programmability API Compatibility	No N/A	No N/A	Yes Proprietary	Yes IBM API, IBM LU 6.2, proprietary
Microcomputer Security	Password protection	Password protection	Vendor did not specify	Password protection
Number of Concurrent Sessions	Up to 2	Up to 2	2	254 per gateway, 9 per workstation
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	Vendor did not specify	Vendor did not specify	Yes	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX, System/36/38, AS/400; Data General; Honeywell Bull DEC/VAX, DECsystem; HP Unisys; UNIX-based systems	IBM, 43XX/30XX, System/36/38, AS/400; Data General; Honeywell Bull DEC/VAX, DECsystem; HP Unisys; UNIX-based systems	IBM, 43XX/30XX; Honeywell Bull; DEC/VAX; UNIX-based systems	IBM, 43XX/30XX, System/36/38, AS/400 DEC/VAX, any ASCII host
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400; VAX/VMS; DG OAS Honeywell GCOS; UNIX System 5; Berkeley 4.X	IBM, DOS, OS/VS, MVS, VM, CMS, IMS, CICS, SSP, OS/400; VAX/VMS; DG OAS Honeywell GCOS; UNIX System 5; Berkeley 4.X	IBM, VM; VAX/VMS; Honeywell GCOS; UNIX System 5 Berkeley 4.X, Harris VOS Bull HN MOD400	IBM, MVS, VM, TSO, CMS, CICS, SSP, IBM CPF
Protocols	N/A	N/A	SNA, HDLC	SNA, SDLC, X.25
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, access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C, Ethernet	RS-232-C, Ethernet	RS-232-C	RS-232-C
Transmission Mode	Asynchronous	Asynchronous	Asynchronous	Synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600	Up to 128 kbps
Communications Features	Dial directory, auto dial/redial, auto answer, macros	Dial directory, auto dial/redial, auto answer, macros	Auto dial/redial, macros, unattended execution	Dial directory, auto dial/redial, auto answer, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	249	359	295	3,950/1,145
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	1988	1988	October 1988	January 1988
Number Installed to Date	10,000	3,000	5,000	Vendor did not specify
Warranty	30 days	30 days	90 days	90 days, 1 year
Distribution	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail	Dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	—

Vendor	Elcon Technology	Elcon Technology	Elcon Technology	Elcon Technology
Product	Access/QLLC (3270)	Access/QLLC (5250)	Access/SDLC (3270)	Access/SDLC (5250)
Specifications				
Product Function	Remote terminal emulation, network gateway	Remote terminal emulation, network gateway	Remote terminal emulation, network gateway	Remote terminal emulation
Users Supported	Single user, multiuser unlimited	Single user, multiuser unlimited	Single user, multiuser unlimited	Single user, multiuser unlimited
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & 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
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN, any NetWare or NetBios compatible	ARCnet, Ethernet, IBM Token-Ring, STARLAN, any NetWare or NetBios compatible	ARCnet, Ethernet, IBM Token-Ring, STARLAN, any NetWare or NetBios compatible	ARCnet, Ethernet, IBM Token-Ring, STARLAN, any NetWare or NetBios compatible
Minimum Memory Required (bytes)	640K	640K	640K	640K
Terminals/Controllers Emulated	TTY, IBM, 327X/317X DFT, DEC, VT52/100	TTY, IBM, 5250 Series, DEC, VT52/100	IBM, 327X/317X DFT	IBM, 5250 Series
User Interface	Install program, diagnostics	Install program, diagnostics	Install program, diagnostics	Install program, diagnostics
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	Password protection	Password protection	Password protection	Password protection
Number of Concurrent Sessions	254 per gateway, 9 per workstation	254 per gateway, 9 per workstation	254 per gateway, 9 per workstation	254/Gateway, 9/Workstation
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
Host Interface				
Systems Supported	IBM, 43XX/30XX; DECVAX, any ASCII host	IBM, System/36/38, AS/400 DECVAX, any ASCII host	IBM, 43XX/30XX	System/36/38, AS/400
Software Environment	IBM, MVS, VM, TSO, CMS, CICS, SSP; VAX/VMS	IBM, SSP, OS/400, IBM CPF	IBM, MVS, VM, TSO, CMS, CICS, SSP	SSP, OS/400, IBM CPF
Protocols	SNA, SDLC, X.25	SNA, SDLC, X.25	SNA, SDLC	SNA, HDLC, SDLC
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, access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	Up to 128 kbps	Up to 128 kbps	Up to 128 kbps	128K
Communications Features	Dial directory, auto dial/redial, auto answer, unattended execution	Dial directory, auto dial/redial, auto answer, unattended execution	Dial directory, auto dial/redial, auto answer, unattended execution	Dial directory, auto dial/redial, auto answer, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	2,750/1,145	2,750/1,145	2,050/1,145	2,050 software, 1,145 hardware
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	January 1987	November 1987	October 1985	November 1987
Number Installed to Date	5,000	1,000	10,000	1,000
Warranty	90 days, 1 year	90 days, 1 year	90 days, 1 year	1 year
Distribution	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	—

Vendor	Eicon Technology	Emerald Technology	Emerald Technology	Emerald Technology
Product	Access/X.25	3XMate	3XPlus	3XTwin
Specifications				
Product Function	Remote terminal emulation, network gateway	Remote terminal emulation	Remote terminal emulation	Local terminal emulation
Users Supported	Single user, multiuser unlimited	Single user	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & 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
Operating Systems Supported	MS-/PC-DOS, UNIX, Xenix	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NetWare, NetBios compatible	Vendor did not specify	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	640K	256K	128K	128K
Terminals/Controllers Emulated	TTY, DEC, VT52/100; DG; HP Unisys	IBM, 5250 Series	IBM, 5250 Series	IBM, 5250 Series
User Interface	Install program, diagnostics	Install program	Install program	Install program
Programmability	Yes	No	No	Vendor did not specify
API Compatibility	IBM LU 6.2, proprietary	IBM API	IBM API	IBM API
Microcomputer Security	Password protection	Vendor did not specify	Vendor did not specify	Vendor did not specify
Number of Concurrent Sessions	254	7	7	7
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII	ASCII	ASCII
File Conversion	Yes	Yes	Yes	Yes
Host Interface				
Systems Supported	DECVAX, any ASCII host	IBM, System/36/38, AS/400	IBM, System/36/38, AS/400	IBM, System/36/38, AS/400 UNIX-based systems
Software Environment	Dependent on host	IBM, SSP, OS/400	IBM, SSP, OS/400	IBM, SSP, OS/400
Protocols	X.25	Vendor did not specify	Vendor did not specify	Vendor did not specify
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C	Phone	Twisted pair	Twinax
Transmission Mode	Synchronous	Asynchronous, synchronous	Asynchronous, synchronous	Vendor did not specify
Transmission Speed (bps)	Up to 128 kbps	2400, 4800, 9600	Vendor did not specify	Vendor did not specify
Communications Features	Dial directory, auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer, macros	Auto answer, macros	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	1,550/1,145	995 to 1,995	750 hardware	795
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	January 1985	Vendor did not specify	Vendor did not specify	Vendor did not specify
Number Installed to Date	10,000	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	90 days, 1 year	1 year	1 year	1 year
Distribution	Dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs	Direct, dist., dlrs, retail, OEMs	Direct, dist., dlrs, retail, OEMs
Comments	—	—	—	—

Vendor	Emerald Technology	Emerald Technology	Emulex Corp.	FEL Computing
Product	Handshake-Emulation	Multi-Twin	DCP-88/-186/-286	Mobius
Specifications				
Product Function	Local/remote terminal emulation	Local terminal emulation	Non-host app. spfc. link	Local/remote terminal emulation
Users Supported	Single user	Single user	Multiuser; up to 8	Single user, multiuser unlimited
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware	Microcomputer software, host software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	UNIX, Xenix	MS-/PC-DOS	MS-/PC-DOS, Xenix	Apple ProDOS, MS-/PC-DOS
Local Area Network Support	Vendor did not specify	Vendor did not specify	Software dependent	Ethernet
Minimum Memory Required (bytes)	128K	256K	256K	125K
Terminals/Controllers Emulated	5250 Series	IBM, 5250 Series	Programmable	TTY, DEC, VT52/100, VT200 Series, VT300 Series
User Interface	Vendor did not specify	Install program	Diagnostics	Install program, on-line help
Programmability API Compatibility	Vendor did not specify IBM API	No IBM API	Yes N/A	Yes Vendor did not specify
Microcomputer Security	Vendor did not specify	Vendor did not specify	N/A	Interface to host software
Number of Concurrent Sessions	16	7	2	Vendor did not specify
DOS Access During Session	Yes	Yes	Yes	Vendor did not specify
File Transfer	Yes	Yes	No	Yes
File Formats	ASCII	ASCII	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	No	No
Host Interface				
Systems Supported	System/36/38, AS/400	IBM, System/36/38, AS/400	Programmable	DEC VAX, DECsystem
Software Environment	SSP, OS/400	IBM, DOS, SSP, OS/400	Programmable	VAX/VMS, DEC Tops 10/20
Protocols	SDLC	Vendor did not specify	BSC, SNA, HDLC, SDLC, HASP	XNS
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, virtual file system
Communications Characteristics				
Physical Connection	Twinax	Twinax	RS-232-C	Vendor did not specify
Transmission Mode	Vendor did not specify	Vendor did not specify	Asynchronous, synchronous	Asynchronous
Transmission Speed (bps)	Vendor did not specify	Vendor did not specify	300, 600, 1200, 2400, 4800, 9600, 19.2K	Vendor did not specify
Communications Features	Vendor did not specify	Auto answer	None	Dial directory, auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	800-995; 2,340-6,900	495 software, 1,195 to 2,995 hardware	720-1,695 hardware	250-375
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	3,500
Date of First Delivery	Vendor did not specify	Vendor did not specify	1983	March 1984
Number Installed to Date	Vendor did not specify	Vendor did not specify	740,000	1,000+ sites
Warranty	1 year	1 year	Two years	90 days
Distribution	Direct, dist., dlrs, retail, OEMs	Direct, dist., dlrs, retail, OEMs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, OEMs, VARs
Comments	—	—	—	—

Vendor	FTG Data Systems	FTG Data Systems	FTG Data Systems	FTG Data Systems
Product	EMU-TEK 4200 Plus	EMU-TEK Five Plus	EMU-TEK Level 1	EMU-TEK Level 2
Specifications				
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	Microcomputer software	Microcomputer software	Microcomputer software	Microcomputer software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Ethernet, IBM Token-Ring, STARLAN	Ethernet, IBM Token-Ring, STARLAN	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	640K	640K	256K	256K
Terminals/Controllers Emulated	VT52/100, Tektronix 4010, 4014, 4105	DEC, VT52/100, Tektronix 4010, 4014, 4105, 4107	DEC, VT52/100, Tektronix 4010, 4014, VT-640	DEC, VT52/100, Tektronix 4010, 4014, VT-640
User Interface	Install program, on-line help, mouse, pop-up windows	Install program, on-line help, mouse, pop-up windows, diagnostics	Install program, mouse, pop-up windows	Install program, mouse, pop-up windows
Programmability API Compatibility	No Vendor did not specify	No Vendor did not specify	No Vendor did not specify	No Vendor did not specify
Microcomputer Security	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Number of Concurrent Sessions	4	Vendor did not specify	1	1
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	No	No	No	No
Host Interface				
Systems Supported	1	Any supporting Tektronix 4010, 4014, or 4105	Any supporting Tektronix 4010 or 4014	Any supporting Tektronix 4010 or 4014
Software Environment	1	Any supporting Tektronix 4010, 4014, or 4105	Any supporting Tektronix 4010 or 4014	Any supporting Tektronix 4010 or 4014
Protocols	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Applications Supported	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Asynchronous	Asynchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 38.4	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, up to 38.4K	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K
Communications Features	Vendor did not specify	Macros	Macros	Macros
Pricing and Availability				
Microcomputer Software/Hardware (\$)	495	695 for software	95/295	95/295
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	August 1985	August 1986	August 1983	August 1983
Number Installed to Date	2000	3,500	3,500	3,500
Warranty	30 days	90 days	90 days	90 days
Distribution	Direct, dist., dirs, retail, mail	Direct, dist., dirs, retail, mail	Direct, dist., dirs, retail, mail	Direct, dist., dirs, retail, mail
Comments	¹ Any system supporting Tektronix 4010, 4014, 4105, 4107, and 4200 Series terminals	Free warranty updates for one year	Free warranty updates for one year	Free warranty updates for one year

Vendor	FTG Data Systems	Gateway Communications, Inc.	Gateway Communications, Inc.	Gateway Communications, Inc.
Product	EMU-TEK Seven Plus	G/Async Gateway	G/Async II Gateway	G/SNA Gateway
Specifications				
Product Function	Local terminal emulation	Network gateway	Network gateway	Network gateway
Users Supported	Single user	Multuser; unlimited	Multuser; unlimited	Multuser; 32
Components	Microcomputer software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & 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 MCA, PS/2 non-MCA	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, STARLAN, Novell NetWare	ARCnet, Ethernet, IBM Token-Ring, STARLAN, Novell NetWare	ARCnet, Ethernet, IBM Token-Ring, STARLAN, IPX (Netware) or NetBIOS
Minimum Memory Required (bytes)	640K	256K	Vendor did not specify	256K
Terminals/Controllers Emulated	DEC, VT52/100, VT200 Series, Tektronix 4010, 4014, 4105, 4107, 4208	TTY, DEC, VT52/100, VT200 Series; DG; HP; Honeywell Bull	TTY, DEC, VT52/100, VT200 Series; DG HP; Honeywell Bull	IBM, 327X/317X DFT, 327X/317X CUT, IBM 3770 RJE, IBM 3274-51C
User Interface	Install program, on-line help, mouse, pop-up windows	Install program, on-line help	Install program	Install program, on-line help, diagnostics
Programmability API Compatibility	No Vendor did not specify	Vendor did not specify Vendor did not specify	Vendor did not specify Vendor did not specify	Yes Proprietary
Microcomputer Security	Vendor did not specify	Vendor did not specify	N/A	Vendor did not specify
Number of Concurrent Sessions	4	4	4	32
DOS Access During Session	Yes	Vendor did not specify	No	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	No	Yes	Yes	Yes
Host Interface				
Systems Supported	Any supporting Tektronix 4010, 4014, 4105, or 4107	Data General; Honeywell Bull; DEC/VAX, DECsystem HP; UNIX-based systems, any host with async terminal support	Data General; Honeywell Bull; DEC/VAX, DECsystem HP; UNIX-based systems, any host with async terminal support	IBM, 43XX/30XX
Software Environment	Any supporting Tektronix 4010, 4014, 4105, or 4107	VAX/VMS; DG OAS; Honeywell GCOS; UNIX System 5 Berkeley 4.X	VAX/VMS; DG OAS; Honeywell GCOS; UNIX System 5 Berkeley 4.X	IBM, TSO, CICS
Protocols	Vendor did not specify	Async	Asynch	SNA, SDLC
Applications Supported	Vendor did not specify	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C, network	RS-232-C	RS-232-C	RS-232-C, V.35
Transmission Mode	Asynchronous	Asynchronous	Asynchronous	Synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 2.4M, up to 38.4K	19.2K	19.2K	Up to 56K
Communications Features	Macros	Dial directory, auto dial/redial, auto answer, macros	N/A	Macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	950 for software	1,440	1,895	2,580 to 4,580
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	December 1989	1986	Vendor did not specify	1986
Number Installed to Date	100	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	90 days	1 year	1 year	1 year
Distribution	Direct, dist., dlrs, retail, mail	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs
Comments	Free warranty for up to 1 year	—	—	—

Vendor	Gateway Communications, Inc.	Gateway Communications, Inc.	General Micro Systems	Hawkeye Grafix, Inc.
Product	G/X25 Gateway 64	G/X25 Gateway	PC 220	COMMX
Specifications				
Product Function	Network gateway	Network gateway	Local/remote terminal emulation	Local/remote terminal emulation, non-host app. spfc. link
Users Supported	Multuser; 254	Multuser; 64	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer software	Microcomputer software, host software
Copy Protected	No	No	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	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, any CP/M 80 computer
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS, UNIX	CP/M-80, CP/M-86, MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NETBIOS	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NETBIOS	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	256K	256K	96K	256K
Terminals/Controllers Emulated	TTY, DEC, VT52/100, VT200 Series, VT300 Series; DG HP; Honeywell Bull; Unisys	TTY, DEC, VT52/100, VT200 Series, VT300 Series; DG HP; Honeywell Bull; Unisys	TTY, DEC, VT52/100, VT200 Series, Tektronix 4010/14 graphics	TTY, DEC, VT52/100; DG; HP
User Interface	Install program	Install program	Install program, on-line help, pop-up windows	Install program, pop-up windows
Programmability	Yes	Yes	Yes	Yes
API Compatibility	Proprietary	Proprietary	Vendor did not specify	Vendor did not specify
Microcomputer Security	Vendor did not specify	Vendor did not specify	Vendor did not specify	Transmission/file encrypt. password protection, interface to host software
Number of Concurrent Sessions	254	64	1	1 marker
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
Host Interface				
Systems Supported	Data General; Honeywell Bull; DECVAX, DECsystem HP; UNIX-based systems, any host with X.25 terminal support	Data General; Honeywell Bull; DECVAX, DECsystem HP; UNIX-based systems, any host with X.25 terminal support	Data General	IBM; DECVAX, DECsystem; HP, PRIME
Software Environment	VAX/VMS; DG OAS; Honeywell GCOS; UNIX System 5	VAX/VMS; DG OAS; Honeywell GCOS; UNIX System 5	VAX/VMS; UNIX System 5 Berkeley 4.X	IBM, MVS, VM, TSO; VAX/VMS, Primos
Protocols	X.25	X.25	Vendor did not specify	Proprietary
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	File transfer, electronic mail
Communications Characteristics				
Physical Connection	RS-232-C, V.35	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	19.2K, 64K	19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K, 38.4K	300, 1200, 2400, 4800, 9600, 19.2K
Communications Features	Dial directory, macros	Dial directory, macros	Dial directory, auto dial/redial	Dial directory, auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	3,445 hardware	1,895 software	159	99
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Optional 1500
Date of First Delivery	1984	1984	February 1983	October 1978
Number Installed to Date	Vendor did not specify	Vendor did not specify	Over 10,000	Over 60,000
Warranty	1 year	1 year	30 days	30 days
Distribution	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, mail, OEMs, VARs	Direct, dist., dlrs, retail, mail
Comments	Over 25 emulators bundled with products	Over 25 emulators bundled with products	BBS service available to registered users	—

Vendor	ICOT	ICOT	ICOT	ICOT
Product	NetPATH 3770 RJE Gateway	NetPATH Ksaver SDLC Gateway	NetPATH Ksaver X.25 Gateway	NetPATH/SDLC LOOP Gateway
Specifications				
Product Function	Remote terminal emulation, network gateway	Network gateway	Network gateway	Local/remote terminal emulation
Users Supported	Multuser	Multuser; 32	Multuser; 32	Multuser
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software
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	IBM, PC/XT/AT & compatibles, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NetBios-compatible	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NetBios-compatible	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NETBIOS compatible
Minimum Memory Required (bytes)	256K	70K gateway, 40K workstations	Vendor did not specify	128K
Terminals/Controllers Emulated	RJE	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X DFT, 327X/317X CUT
User Interface	Install program	Install program, on-line help	Install program, on-line help	Install program, on-line help
Programmability	Yes	Yes	Yes	Yes
API Compatibility	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
Number of Concurrent Sessions	6	Up to 32 per gateway; 3 per workstation	32 max.	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
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM 8100
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM DPPX, DPRX
Protocols	SNA, RJE	SNA, SDLC	SNA, X.25	SNA
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
Communications Characteristics				
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	9600, 38.4K
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	1,595	3,595	3,595	3,585 to 5,595
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	Vendor did not specify	July 1987	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	Vendor did not specify	1 year	1 year	1 year
Distribution	Vendor did not specify	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs
Comments	—	Optional 53G graphic workstation software available	Optional 53G graphic workstation software available	—

Vendor	ICOT	ICOT	ICOT	ICOT
Product	OmniPATH DFT/Gateway	OmniPATH DFT/PC	OmniPATH SDLC/Gateway	OmniPATH SDLC/PC
Specifications				
Product Function	Network gateway	Local terminal emulation	Network gateway	Remote terminal emulation
Users Supported	Multuser; 40	Single user	Multuser; 64	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software
Copy Protected	No	No	No	No
Microcomputers Supported	Macintosh, IBM, PC/XT/AT & compatibles, PS/2 MCA	Macintosh, IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM, PC/XT/AT & compatibles, PS/2 MCA	Macintosh, IBM, PC/XT/AT & compatibles, PS/2 MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NetBios-compatible	N/A	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NetBios-compatible	N/A
Minimum Memory Required (bytes)	256K	256K	256K	256K
Terminals/Controllers Emulated	IBM, 327X/317X DFT	IBM, 327X/317X DFT	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X DFT, 327X/317X CUT
User Interface	Install program, on-line help, pop-up windows, diagnostics	Install program, on-line help, pop-up windows	Install program, on-line help, diagnostics	Install program, on-line help, diagnostics
Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, proprietary	IBM API, proprietary	IBM API, proprietary	IBM API, proprietary
Microcomputer Security	Transmission/file encryption, interface to host software	Transmission/file encryption, interface to host software	Transmission/file encryption, interface to host software	Transmission/file encryption, interface to host software
Number of Concurrent Sessions	40	5	5 per workstation; 128 per gateway	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	Yes	Yes	Yes
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, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP
Protocols	SNA	SNA	SNA, SDLC	SNA, 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
Communications Characteristics				
Physical Connection	Coax	Coax	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	2.4M	2.4M	Up to 56K bps	9600
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Auto dial/redial, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	1,695-3,995 package pricing	1,095 package price	2,995-7,495 package pricing	995
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	October 1989	October 1989	September 1989	August 1989
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., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs
Comments	Software upgradable for 5, 20, or 40 LUs; optional 53G and APA graphics software available	Optional 53G and APA graphics software available; upgradable to 5, 20, or 40 LUs DFT Gateway	Optional 53G and APA workstation software available	Software options support 53G and APA graphics

Vendor	ICOT	ICOT	ICOT	ICOT
Product	pcPATH 2780/3780 RJE	pcPATH 3770	pcPATH Bisynch 3270	pcPATH Keaver SDLC
Specifications				
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	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software
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 non-MCA	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	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	N/A
Minimum Memory Required (bytes)	256K	256K	256K	70K
Terminals/Controllers Emulated	IBM, 2780/3780	IBM 3770	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X DFT, 327X/317X CUT
User Interface	Install program, diagnostics	Install program, on-line help, diagnostics	Install program, on-line help, diagnostics	Install program, on-line help
Programmability	Yes	Yes	Yes	Yes
API Compatibility	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
Number of Concurrent Sessions	1	6	5	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
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, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP
Protocols	BSC, RJE	SNA	BSC	SNA, SDLC
Applications Supported	Vendor did not specify	Vendor did not specify	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Bisynch	Synchronous	Bisynch	Synchronous
Transmission Speed (bps)	9600	9600	9600	19.2K
Communications Features	Vendor did not specify	Unattended execution	Vendor did not specify	Auto dial/redial
Pricing and Availability				
Microcomputer Software/Hardware (\$)	595	890 package pricing	750	750
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	October 1983	October 1983	October 1983	March 1985
Number Installed to Date	Vendor did not specify	Vendor did not specify	Vendor did not specify	20,000
Warranty	1 year	1 year	1 year	1 year
Distribution	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	Optional 53G graphics software available

Vendor	ICOT	ICOT	ICOT	ICOT
Product	pcPATH Ksaver X.25	pcPATH/SDLC LOOP	ShortCUT	ShortCUT/DFT
Specifications				
Product Function	Remote terminal emulation	Local/remote terminal emulation	Local terminal emulation	Local terminal emulation
Users Supported	Single user	Single user	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & 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 MCA, PS/2 non-MCA	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	OS/2, MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet	Vendor did not specify	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	70K	70K	128K	256K
Terminals/Controllers Emulated	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X CUT	IBM, 327X/317X DFT
User Interface	Install program, on-line help	Install program, on-line help	Install program, on-line help, on-line tutor., pop-up windows, diagnostics	Install program, on-line help, pop-up windows, diagnostics
Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, proprietary	IBM API, proprietary	IBM API	IBM API, proprietary
Microcomputer Security	Interface to host software	Interface to host software	Interface to host software	Interface to host software
Number of Concurrent Sessions	3	3	1	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	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM 8100	IBM, 43XX/30XX	IBM, 43XX/30XX
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM DPPX or DPCX	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP
Protocols	SNA	SNA	BSC, SNA, SDLC	SNA, DFT
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
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	Coax	Coax
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	19.2K	38.4K	2.4M	2.4M
Communications Features	Auto dial/redial	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	850 package price	1,275	200	795 to 895
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	July 1985	March 1984	September 1988	September 1988
Number Installed to Date	Vendor did not specify	30,000	1,000	Vendor did not specify
Warranty	1 year	1 year	1 year	1 year
Distribution	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs
Comments	Optional 53G graphics software available	—	CUT mode emulation standard; software upgradable to DFT	—

Vendor	IDEAssociates, Inc.	IDEAssociates, Inc.	IDEAssociates, Inc.	IDEAssociates, Inc.
Product	IDEAcomm 3270/BSC	IDEAcomm 3270/SDLC Gateway	IDEAcomm 3270/SDLC MC Version	IDEAcomm 3270/SDLC PC Version
Specifications				
Product Function	Remote terminal emulation	Network gateway	Remote terminal emulation	Remote terminal emulation
Users Supported	Single user	Multuser; 32	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & 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 MCA, PS/2 non-MCA	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NETBIOS compatible	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	64K	93K to 290K	170K to 235K	170K to 235K
Terminals/Controllers Emulated	IBM 3272-2, 3278, 3275-2, 3276	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X DFT, 327X/317X CUT
User Interface	Install program	Install program, diagnostics	Install program, diagnostics	Install program, diagnostics
Programmability	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
API Compatibility	Vendor did not specify	IBM API, SRPI	IBM API, SRPI	IBM API, SRPI
Microcomputer Security	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Number of Concurrent Sessions	2	8128 sessions per LAN	8	8
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	No	Yes	Yes	Yes
File Formats	Vendor did not specify	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Vendor did not specify	Yes	Yes	Yes
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, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	BSC	SNA, SDLC	SNA, SDLC	SNA, SDLC
Applications Supported	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	19.2K	19.2K	19.2K	19.2K
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	895	1,995	895	795
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
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	OEMs, VARs	OEMs, VARs	OEMs, VARs	OEMs, VARs
Comments	—	—	—	—

Vendor	IDEAssociates, Inc.	IDEAssociates, Inc.	IDEAssociates, Inc.	IDEAssociates, Inc.
Product	IDEAcomm 3278	IDEAcomm 3278/DFT Gateway	IDEAcomm 3278/DFT	IDEAcomm 3770/SNA
Specifications				
Product Function	Local terminal emulation	Local terminal emulation, network gateway	Local terminal emulation	Remote terminal emulation
Users Supported	Single user	Multuser	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software
Copy Protected	No	No	Vendor did not specify	Vendor did not specify
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
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NETBIOS compatible	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	68K	52K to 250K	223K	64K
Terminals/Controllers Emulated	IBM, 327X/317X CUT	IBM, 327X/317X DFT	IBM, 327X/317X DFT	IBM 3771-I, 3774-PI, 3775-PI, 3776-I, 3776-2
User Interface	Install program, diagnostics	Install program, diagnostics	Install program, diagnostics	Install program, diagnostics
Programmability API Compatibility	Vendor did not specify IBM API, DCA IRMA API, proprietary	Vendor did not specify Proprietary, SRPI	Vendor did not specify IBM API, SRPI	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
Number of Concurrent Sessions	1	1270 maximum per LAN	5	1
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
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, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM, DOS
Protocols	BSC, SNA, SDLC	SNA, SDLC	SNA, SDLC	SNA
Applications Supported	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Communications Characteristics				
Physical Connection	Coax	Coax	Coax	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	Vendor did not specify	Vendor did not specify	Vendor did not specify	19.2K
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	995	1595	1095	895
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
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	OEMs, VARs	OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	OEMs, VARs
Comments	—	—	—	—

Vendor	IDEAssociates, Inc.	IDEAssociates, Inc.	IDEAssociates, Inc.	IDEAssociates, Inc.
Product	IDEAcomm 3780/BSC	IDEAcomm 5051/OS	IDEAcomm 5250/Remote Gateway MC Version	IDEAcomm 5250/Remote Gateway PC Version
Specifications				
Product Function	Remote terminal emulation	Local terminal emulation	Network gateway	Network gateway
Users Supported	Single user	Single user	Multuser; 36	Multuser; 36
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & 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 286 machines	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	OS/2	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	Vendor did not specify	Ethernet, IBM Token-Ring, any NetBios compatible LAN	Ethernet, IBM Token-Ring, any NetBios compatible LAN
Minimum Memory Required (bytes)	64K	2K	256K	128K
Terminals/Controllers Emulated	IBM, 2780/3780	IBM, 5250 Series, IBM 3180, 3196	IBM, 5250 Series, IBM 3180	IBM, 5250 Series, IBM 3180
User Interface	Install program, diagnostics	Install program, on-line help, mouse, on-line tutor., graphic icons, windows diagnostics	On-line help, mouse, on-line tutor., pop-up windows, diagnostics	On-line help, mouse, on-line tutor., pop-up windows, diagnostics
Programmability API Compatibility	Vendor did not specify	Yes IBM API	Yes IBM API	Yes IBM API
Microcomputer Security	Vendor did not specify	Interface to host software	Interface to host software	Interface to host software
Number of Concurrent Sessions	1	7	36 maximum per LAN	36 maximum per LAN
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
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, System/36/38, AS/400	IBM, System/36/38, AS/400	IBM, System/36/38, AS/400
Software Environment	IBM, DOS, OS/VS	IBM, SSP, OS/400, IBM CPF	IBM, SSP, OS/400, IBM CPF	IBM, SSP, OS/400, IBM CPF
Protocols	BSC	Twinax	SNA	SNA
Applications Supported	Vendor did not specify	Access to host-resident programs	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C	Twinax	Twinax	Twinax
Transmission Mode	Synchronous	Vendor did not specify	Synchronous	Synchronous
Transmission Speed (bps)	19.2K	1M	19.2K, 1M	19.2K, 1M
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	895	495 software, 675 hardware	1,295 software, 395 Hardware	1,295 software, 295 Hardware
Host Software/Hardware (\$)	Vendor did not specify	Included in price	Included in price	Included in price
Date of First Delivery	Vendor did not specify	1989	1987	1987
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	OEMs, VARs	OEMs, VARs	OEMs, VARs	OEMs, VARs
Comments	—	—	—	—

Vendor	IDEAssociates, Inc.	IDEAssociates, Inc.	IDEAssociates, Inc.	IDEAssociates, Inc.
Product	IDEAcomm 5250/Remote MC Version	IDEAcomm 5250/Remote PC Version	IDEAcomm 5250/Remote Share MC Version	IDEAcomm 5250/Remote Share PC Version
Specifications				
Product Function	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation
Users Supported	Single user	Single user	Multuser; 4	Multuser; 4
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & 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
Operating Systems Supported	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 (bytes)	256K	128K	256K	128K
Terminals/Controllers Emulated	IBM, 5250 Series, IBM 3180	IBM, 5250 Series, IBM 3180	IBM, 5250 Series, IBM 3180	IBM, 5250 Series, IBM 3180
User Interface				
On-line help, pop-up windows, diagnostics	On-line help, pop-up windows, diagnostics	On-line help, pop-up windows, diagnostics	On-line help, on-line tutor., pop-up windows, diagnostics	On-line help, on-line tutor., pop-up windows, diagnostics
Programmability	Yes	Yes	Yes	Yes
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
Number of Concurrent Sessions	9	9	9	9
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
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 CPF	IBM, SSP, OS/400, IBM CPF	IBM, SSP, OS/400, IBM CPF	IBM, SSP, OS/400, IBM CPF
Protocols	SNA, SDLC	SNA, SDLC	SNA, SDLC	SNA, SDLC
Applications Supported	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Communications Characteristics				
Physical Connection	Twinax	Twinax	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Asynchronous, synchronous	Asynchronous, synchronous
Transmission Speed (bps)	19.2K	19.2K	19.2K	19.2K
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	395 software, 395 Hardware	395 software, 295 Hardware	495 software, 395 Hardware	495 software, 295 Hardware
Host Software/Hardware (\$)	Included in price	Included in price	Included in price	Included in price
Date of First Delivery	1985	1985	1987	1987
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	OEMs, VARs	OEMs, VARs	OEMs, VARs	OEMs, VARs
Comments	--	--	--	--

Vendor	IDEAssociates, Inc.	IDEAssociates, Inc.	IDEAssociates, Inc.	IDEAssociates, Inc.
Product	IDEAcomm 5251/Plus MC Version	IDEAcomm 5251/Plus PC Version	IDEAcomm 5251/Remote Gateway Plus MC Version	IDEAcomm 5251/Remote Gateway Plus PC Version
Specifications				
Product Function	Local terminal emulation	Local terminal emulation	Network gateway	Network gateway
Users Supported	Single user	Single user	Multiuser; 210	Multiuser; 210
Components	Microcomputer hardware & software, host software	Microcomputer hardware & software, host software	Vendor did not specify	Vendor did not specify
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	Vendor did not specify	Ethernet, IBM Token-Ring, any NetBios compatible LAN	Ethernet, IBM Token-Ring, any NetBios compatible LAN
Minimum Memory Required (bytes)	256K	128K	256K	128K
Terminals/Controllers Emulated	IBM, 5250 Series, IBM 3180, 3196	IBM, 5250 Series, IBM 3180, 3196	IBM, 5250 Series	IBM, 5250 Series
User Interface	Install program, on-line help, pop-up windows, diagnostics	Install program, on-line help, pop-up windows, diagnostics	Install program, diagnostics	Install program, diagnostics
Programmability API Compatibility	Yes IBM API	Yes IBM API	Yes IBM API	Yes IBM API
Microcomputer Security	Interface to host software	Interface to host software	Password protection, interface to host software	Password protection, interface to host software
Number of Concurrent Sessions	7	7	70 maximum per LAN	70 maximum per LAN
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	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
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 CPF	IBM, SSP, OS/400, IBM CPF	IBM, SSP, OS/400, IBM CPF	IBM, SSP, OS/400, IBM CPF
Protocols	Twinax	Twinax	Vendor did not specify	Vendor did not specify
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
Communications Characteristics				
Physical Connection	Twinax	Twinax	Twinax	Twinax
Transmission Mode	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Transmission Speed (bps)	1M	1M	1M	1M
Communications Features	Vendor did not specify	Vendor did not specify	Auto answer	Auto answer
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	150 software, 675 hardware	150 software, 645 hardware	1,295 software, 675 Hardware	1,295 software, 645 Hardware
Host Software/Hardware (\$)	Software included in price	Software included in price	Included in price	Included in price
Date of First Delivery	1984	1984	1987	1987
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	OEMs, VARs	OEMs, VARs	OEMs, VARs	OEMs, VARs
Comments	—	—	—	—

Vendor	IDEAssociates, Inc.	IDEAssociates, Inc.	Information Technologies, Inc.	Information Technologies, Inc.
Product	IDEAcomm Mac Mac II Version	IDEAcomm Mac Mac SE Version	LinkUp 3270 Coax UniSession	LinkUp 3270 Coax WorkStation
Specifications				
Product Function	Local/remote terminal emulation	Local/remote terminal emulation	Local terminal emulation	Local terminal emulation
Users Supported	Single user	Single user	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer software	Microcomputer hardware & software
Copy Protected Microcomputers Supported	Vendor did not specify Macintosh	Vendor did not specify Macintosh	Yes IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Yes IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	Macintosh Finder, Apple Macintosh Multifinder	Macintosh Finder, Apple Macintosh Multifinder	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 (bytes)	2M to 4M	1M	36K	165K
Terminals/Controllers Emulated	Vendor did not specify	Vendor did not specify	IBM, 327X/317X CUT	IBM, 327X/317X DFT, 327X/317X CUT
User Interface	On-line help, mouse, on-line tutor., graphic icons, pop-up windows, diags., menus	On-line help, mouse, on-line tutor., graphic icons, pop-up windows, diags., windows	Install program, on-line help, mouse, diagnostics	Install program, on-line help, mouse, pop-up windows, diagnostics
Programmability API Compatibility	Vendor did not specify HyperCard	Vendor did not specify HyperCard	Yes IBM API	Yes IBM API
Microcomputer Security	Vendor did not specify	Vendor did not specify	Password protection	Password protection
Number of Concurrent Sessions	4	4	1	5
DOS Access During Session	Vendor did not specify	Vendor did not specify	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII	ASCII	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
Host Interface				
Systems Supported	System/36/38, AS/400	System/36/38, AS/400	IBM, 43XX/30XX, System/36/38	IBM, 43XX/30XX, System/36/38, AS/400
Software Environment	Vendor did not specify	Vendor did not specify	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	Vendor did not specify	Vendor did not specify	BSC, SNA, SDLC, non-SNA (channel)	BSC, SNA, SDLC, non-SNA (channel)
Applications Supported	Vendor did not specify	Vendor did not specify	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	Twinax	Twinax	Coax	Coax
Transmission Mode	Synchronous	Synchronous	Vendor did not specify	Vendor did not specify
Transmission Speed (bps)	1M	1M	N/A	Vendor did not specify
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	1195	995	149 software only	650
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	February 1989	February 1989	December 1983	May 1985
Number Installed to Date	Vendor did not specify	Vendor did not specify	75,000	75,000
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs
Comments	Full Macintosh interface with pull down and pop-up menus	Full Macintosh interface with pull down and pop-up menus	—	—

Vendor	Information Technologies, Inc.	Information Technologies, Inc.	Information Technologies, Inc.	Information Technologies, Inc.
Product	LinkUp 3270 Coax WorkStation Plus	LinkUp 3270 Remote WorkStation	LinkUp 3270 Remote/10 Gatestation	LinkUp 3270 SDLC Workstation
Specifications				
Product Function	Network gateway	Remote terminal emulation	Network gateway	Remote terminal emulation
Users Supported	Multiuser; 5	Single user	Multiuser; 10	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software
Copy Protected	Yes	Yes	Yes	Yes
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 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, STARLAN	Vendor did not specify
Minimum Memory Required (bytes)	230K gateway; 90K nodes	165K	230K gateway; 90K nodes	165K
Terminals/Controllers Emulated	IBM, 327X/317X DFT, 327X/317X CUT, 5250 Series	IBM 3278/79	3278/79	IBM 3278/79
User Interface	Install program	On-line help, mouse, graphic icons, pop-up windows, diagnostics	On-line help, mouse, diagnostics	Mouse, diagnostics
Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API	IBM API	IBM API	Vendor did not specify
Microcomputer Security	Password protection	Password protection	Password protection	Password protection
Number of Concurrent Sessions	5	32	32	5
DOS Access During Session	Yes	Yes	Yes	Vendor did not specify
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX, System/36/38, AS/400	IBM, 43XX/30XX, System/36/38, AS/400	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, 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, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400
Protocols	BSC, SNA, SDLC, non-SNA (channel)	BSC, SNA, SDLC	BSC, SNA, SDLC	BSC, SNA, SDLC
Applications Supported	Access to host-resident programs	Access to host-resident programs	Vendor did not specify	Access to host-resident programs
Communications Characteristics				
Physical Connection	Coax	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Vendor did not specify	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	N/A	300, 600, 1200, 2400, 4800, 9600	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	Vendor did not specify
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	895	795	1,545	Vendor did not specify
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	May 1988	May 1986	March 1986	May 1986
Number Installed to Date	2,000	10,000	Vendor did not specify	10,000
Warranty	1 year	1 year	1 year	1 year
Distribution	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	—

Vendor	Information Technologies, Inc.	Information Technologies, Inc.	Information Technologies, Inc.	Information Technologies, Inc.
Product	LinkUp 3270 SDLC WorkStation	LinkUp 3299 Coax Gatestation	LinkUp 3780 Remote/32 Gatestation	LinkUp 3780 RJE Workstation
Specifications				
Product Function	Remote terminal emulation	Network gateway	Network gateway	Remote terminal emulation
Users Supported	Single user	Multuser; 40	Multuser; 32	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software
Copy Protected	Yes	Yes	Vendor did not specify	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 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, STARLAN	ARCnet, Ethernet, IBM Token-Ring, STARLAN	Vendor did not specify
Minimum Memory Required (bytes)	165K	230K gateway; 90K nodes	230K gateway; 90K nodes	150K
Terminals/Controllers Emulated	IBM 3278/79	IBM, 327X/317X DFT, 327X/317X CUT	IBM 3278/79	IBM, 2780/3780
User Interface	On-line help, mouse, graphic icons, pop-up windows, diagnostics	On-line help, mouse, diagnostics	On-line help, diagnostics	Diagnostics
Programmability API Compatibility	Yes IBM API	Yes IBM API	Yes IBM API	Vendor did not specify Proprietary
Microcomputer Security	Password protection	Password protection	Password protection	Password protection
Number of Concurrent Sessions	5	40	32	Vendor did not specify
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	No
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	Binary
File Conversion	Yes	Yes	Yes	Yes
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, 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, 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	BSC, SNA, SDLC	BSC, SNA, SDLC, non-SNA (channel attach)	SNA	Vendor did not specify
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C	Coax	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Vendor did not specify	Synchronous	Synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600	N/A	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	9600
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Auto dial/redial, unattended execution
Pricing and Availability				
Microcomputer Sftware/Hdwre (\$)	595	2,995	2,995	795
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	May 1986	May 1988	May 1986	May 1984
Number Installed to Date	10,000	1,000	Vendor did not specify	Vendor did not specify
Warranty	1 year	1 year	Vendor did not specify	1 year
Distribution	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	—

Vendor	Information Technologies, Inc.	Innovative Electronics, Inc.	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)
Product	LinkUp M/Remote Platform	Netmaster System	3270 Workstation Program	AS/400 PC Support
Specifications				
Product Function	Remote terminal emulation	Remote terminal emulation, host app. spfc. link	Local terminal emulation	Local terminal emulation
Users Supported	Single user	100	Single user	Single user
Components	Vendor did not specify	Microcomputer hardware & software	Microcomputer software	Microcomputer software, host software
Copy Protected Microcomputers Supported	Yes IBM, PS/2 MCA	Yes IBM, PC/XT/AT & compatibles	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS, UNIX	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	STARLAN	IBM Token-Ring, IBM PC Network	IBM Token-Ring
Minimum Memory Required (bytes)	35K	Vendor did not specify	384K to 640K	512K
Terminals/Controllers Emulated	DEC, VT52/100, VT200 Series, VT300 Series Honeywell Bull; Unisys	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X DFT, 327X/317X CUT	5250 Series
User Interface	Vendor did not specify	Vendor did not specify	Install program, mouse, on-line tutor., pop-up windows	Install program, on-line help
Programmability API Compatibility	Vendor did not specify Software determined	Yes Proprietary	Yes IBM API, IBM HLLAPI	Yes IBM LU 6.2, proprietary
Microcomputer Security	N/A	Password protection	Interface to host software	Transmission encryption, password protection, interface to host software
Number of Concurrent Sessions	N/A	Multiple	6 PC, 4 host	5
DOS Access During Session	Vendor did not specify	Yes	Yes	Yes
File Transfer	Not applicable	Yes	Yes	Yes
File Formats	Not applicable	ASCII	ASCII, binary	ASCII, binary
File Conversion	Not applicable	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX, System/36/38, AS/400	IBM, 43XX/30XX, System/36/38; UNIX-based systems	IBM, 43XX/30XX	Vendor did not specify
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM, CICS; UNIX System 5	IBM, MVS, VM, TSO, CMS, CICS	IBM, OS/400
Protocols	BSC, SNA, HDLC, SDLC	BSC, SNA	SNA	SNA, SDLC, T1P1
Applications Supported	Access to host-resident programs	Vendor did not specify	Host virtual disk, ECF	Host virtual disk, shared folders
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	Coax, token-ring, PC Net	Twinax, RS-232-C, token-ring
Transmission Mode	Synchronous	Synchronous	Asynchronous	Synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600	9600	Vendor did not specify	19.2K, 4M Lan
Communications Features	N/A	Auto dial/redial, unattended execution	Vendor did not specify	Auto dial/redial
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	400 hardware	Vendor did not specify	495	Contact vendor
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	N/A	Contact vendor
Date of First Delivery	July 1989	December 1984	December 1987	Vendor did not specify
Number Installed to Date	500	Vendor did not specify	Vendor did not specify	Did not specify
Warranty	90 days	1 year	90 days	Did not specify
Distribution	Dist., dlrs, retail, OEMs, VARs	Direct	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail, VARs
Comments	—	—	Product #75X1088	Product # 9406 for high end; product # 9404 for low end version

Vendor	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)
Product	Enhanced 5250 Display Station Emulation Adapt. Kit	Enhanced 5250 Emulation Program	FTTERM PC/Host File Transfer Program	IBM Enhanced 5250 Emulation Convenience Kit
Specifications				
Product Function	Local terminal emulation	Local/remote terminal emulation	Local/remote terminal emulation	Local terminal emulation
Users Supported	Single user	Single user	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer software	Microcomputer software	Microcomputer hardware & software
Copy Protected Microcomputers Supported	No, not applicable IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Vendor did not specify PC/XT/AT & compatibles, PS/2 non-MCA	No IBM Rolm CBXs	Vendor did not specify IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Did not specify	IBM Token-Ring	Vendor did not specify	Did not specify
Minimum Memory Required (bytes)	256K	256K	256K	256K
Terminals/Controllers Emulated	5250 Series	5250 Series	TTY, IBM, 327X/317X CUT, DEC, VT52/100, VT200 Series	5250 Series
User Interface	Install program, diagnostics	Install program, diagnostics	On-line help, pop-up windows	Install program, diagnostics
Programmability API Compatibility	Yes IBM API, IBM LU 6.2	Yes IBM API, proprietary	Vendor did not specify IBM API, HLLAPI	Yes IBM API, IBM LU 6.2, proprietary
Microcomputer Security	Interface to host software	Interface to host software	Protocol converter and host password security	Interface to host software
Number of Concurrent Sessions	2 PU's; 5 LU's; on AS/400	2	1 host and 1 DOS	2
DOS Access During Session	Yes	Yes	Yes	Vendor did not specify
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
Host Interface				
Systems Supported	System/36/38	System/36/38, AS/400	IBM, 43XX/30XX; DECVAX, any ASCII host supporting DEC VT 100/220, IBM 3101	System/36/38, AS/400
Software Environment	OS/400, IBM CPF, SCP	OS/400, System/36 SCP, System/38 CPF	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, IBM VSE	OS/400, System/36 SCP, System/38 CPF
Protocols	Twinax	T1P1 (Twinax)	SNA	T1P1 (Twinax)
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs	IBM 3270 file transfer, host programs (IND\$FILE)	Host virtual disk, access to host-resident programs
Communications Characteristics				
Physical Connection	Twinax, twisted pair, ECL	Twinax	RS-422 via 3708	Twinax, twisted pair, ECL
Transmission Mode	Synchronous	Synchronous	Asynchronous	Synchronous
Transmission Speed (bps)	1M	1M	300 to 19.2K	1M
Communications Features	Unattended execution, direct connection	Unattended execution	Dial directory, auto dial/redial, auto answer, macros, unattended execution	Unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	595 (card, diagnostics, manual)	160	145 (quantity)/108 (addl. licenses)	845
Host Software/Hardware (\$)	Na	Vendor did not specify	N/A	Na
Date of First Delivery	April 1985	April 1985	July 1988	April 1985
Number Installed to Date	Did not specify	Did not specify	Vendor did not specify	Did not specify
Warranty	1 year	Did not specify	90 days, media and program	1 year
Distribution	Direct, dist., dirs, retail, VARs	Direct, dist., dirs, retail, VARs	Direct, dist., dirs, retail, VARs	Direct, dist., dirs, retail, VARs
Comments	Product # 2911; part of convenience kit # 2910	Product # 2912; part of convenience kit # 2910	Product #75X3-286; supports all IBM 3270 protocol converters	Product # 2910

Vendor	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)
Product	IBM PC 3270 Emulation Program Entry Level	IBM PC 3270 Emulation Program	System 36/38 Workstation Emulation Adapter	System/36 PC Support/36
Specifications				
Product Function	Local terminal emulation	Local/remote terminal emulation, network gateway	Local terminal emulation	Local/remote terminal emulation
Users Supported	Single user	Single user, multiuser; 32 (gateway)	Single user	Single user
Components	Microcomputer software	Microcomputer software	Microcomputer hardware	Microcomputer software, host software
Copy Protected	No	No	Not applicable	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	PS/2 MCA	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, PC portable
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	IBM Token-Ring, IBM PC Network	Did not specify	IBM Token-Ring
Minimum Memory Required (bytes)	128K	256K	384K	512K
Terminals/Controllers Emulated	IBM, 327X/317X CUT	IBM, 327X/317X DFT, 3X74 SDLC, token-ring, PC Network	5250 Series	5250 Series
User Interface	Install program	Install program, diagnostics	Install program, diagnostics	Install program, on-line help, pop-up windows
Programmability API Compatibility	Yes IBM HLLAPI	Yes IBM API, SRPI (IBM ECF)	Yes IBM API, IBM LU 6.2, proprietary	Yes IBM LU 6.2, proprietary
Microcomputer Security	Interface to host software	Interface to host software	Interface to host software	Transmission encryption, password protection, interface to host software
Number of Concurrent Sessions	1 PC, 1 host	1PC, 2 host	4PU's, 5LU's with AS/400	5
DOS Access During Session	Yes	Yes	Vendor did not specify	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	System/36/38	System/36/38
Software Environment	IBM, MVS, VM, TSO, CMS, CICS	IBM, MVS, VM, TSO, CMS, CICS	IBM, OS/400, System/36 SCP, System/38 CPF	System 36 SSP
Protocols	BSC, SNA, SDLC, 3X74 controller dep., SLHA	BSC, SNA, SDLC	T1P1 (Twinax)	SNA, SDLC, T1P1
Applications Supported	Host virtual disk, access to host-resident programs, ECF	Host virtual disk, IBM ECF	Host virtual disk, access to host-resident programs	Host virtual disk, shared folders
Communications Characteristics				
Physical Connection	Coax	Coax, SDLC, token-ring, PC Network	Twinax, Twisted pair, ECL	Twinax, RS-232-C, token-ring
Transmission Mode	Vendor did not specify	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	Coax	2400 to 19.2K	1M	19.2K, 4M Lan
Communications Features	Vendor did not specify	Auto answer	Unattended execution	Auto dial/redial
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	325	495	620	Contact vendor
Host Software/Hardware (\$)	N/A	N/A	Na	Contact vendor
Date of First Delivery	September 1987	January 1987	December 1987	Vendor did not specify
Number Installed to Date	Vendor did not specify	Vendor did not specify	Did not specify	Did not specify
Warranty	90 days	90 days	1 year	Did not specify
Distribution	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail, VARs	Direct, dist., dlrs, retail, VARs
Comments	Product #75X1085	Product #59X9969; BSC support if linked to a 3X74 using BSC	Product # 69X6-279 convenience kit hardware and software # 69X6-287	Product # 5727-WS1

Vendor	JDS MicroProcessing	JDS MicroProcessing	KEA Systems, Ltd.	KEA Systems, Ltd.
Product	HYDRA II	HYDRA SNA	ZSTEM 220	ZSTEM 240
Specifications				
Product Function	Local/remote terminal emulation, standalone protocol converter, host app. spfc. link	Local/remote terminal emulation, standalone protocol converter, host app. spfc. link	Local terminal emulation	Local/remote terminal emulation
Users Supported	Multuser; up to 64	Multuser; 64	Single user	Single user
Components	Standalone hardware	Standalone hardware	Microcomputer software	Microcomputer software
Copy Protected Microcomputers Supported	Yes Macintosh, IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Yes Macintosh, IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	Vendor did not specify	Vendor did not specify	MS-/PC-DOS	MS-/PC-DOS, UNIX
Local Area Network Support	Vendor did not specify	Vendor did not specify	Ethernet	Ethernet
Minimum Memory Required (bytes)	Vendor did not specify	Vendor did not specify	200K	240K
Terminals/Controllers Emulated	IBM, 327X/317X DFT	IBM, 327X/317X DFT	TTY, DEC, VT52/100, VT200 Series, VT300 Series	TTY, DEC, VT52/100, VT200 Series, VT300 Series
User Interface	Diagnostics	Diagnostics	Install program, on-line help, mouse	Install program, on-line help, mouse
Programmability API Compatibility	Yes Vendor did not specify	Yes Vendor did not specify	Yes Vendor did not specify	Yes Vendor did not specify
Microcomputer Security	Password protection, call back security, positive log off security	Call back security	Password protection	Password protection
Number of Concurrent Sessions	1 per port	1 per port	4	8
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII	ASCII, binary	ASCII, binary
File Conversion	Yes	Vendor did not specify	No	No
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX, 9370	DEC/VAX, DECsystem UNIX-based systems	DEC/VAX, DECsystem; HP UNIX-based systems
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	VAX/VMS; UNIX System 5	VAX/VMS; DG OAS; UNIX System 5
Protocols	Mainframe channel	SNA, mainframe 360 channel	TCP/IP, LAT, CTERM	TCP/IP, LAT, CTERM
Applications Supported	Vendor did not specify	Vendor did not specify	None	None
Communications Characteristics				
Physical Connection	RS-232-C, twisted pair	RS-232-C, twisted pair	Coax, RS-232-C	Coax, RS-232-C
Transmission Mode	Asynchronous	Asynchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	Up to 38.4K bps	Up to 38.4K bps	300, 600, 1200, 2400, 4800, 9600, 19.2K, 38.4K bps, 57.6K bps	300, 600, 1200, 2400, 4800, 9600, 19.2K, 38.4K bps, 57.6K bps
Communications Features	Dial directory	Dial directory	Dial directory, auto dial/redial, auto answer, macros, unattended execution	Dial directory, auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	Vendor did not specify	Vendor did not specify	150	295
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	March 1983	June 1988	November 1986	November 1987
Number Installed to Date	1,500 units	50 units	21,000	18,500
Warranty	90 days	90 days	30 days	30 days
Distribution	Dist., dlrs, retail	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail, mail, OEMs, VARs	Direct, dist., dlrs, retail, mail, OEMs, VARs
Comments	Demonstrations available through distributors/dealers	Demonstrations available through distributors/dealers	VT220 layout keyboard for the PC is available	Available to military and many civil agencies on SMSCRC; VT240 keyboard for the PC is available

Vendor	KMW Systems Corp.	KMW Systems Corp.	KMW Systems Corp.	Management Science America
Product	TwinAccessTwinax Series II	TwinAccessTwinax Series III	TwinAccess for the Mac II	ExpertLink
Specifications				
Product Function	Local/remote terminal emulation, standalone protocol converter	Local/remote terminal emulation, standalone protocol converter	Local terminal emulation, network gateway	Local terminal emulation, host app. spfc. link
Users Supported	Multuser; up to 7	Single user	Multuser; up to 7	Single user
Components	Microcomputer hardware & software, host software	Microcomputer hardware & software, host software	Microcomputer hardware & software, host software	Microcomputer software, host software
Copy Protected	Yes	Yes	No	No
Microcomputers Supported	Macintosh, IBM, PC/XT/AT & compatibles, PS/2 non-MCA	Macintosh, IBM, PC/XT/AT & compatibles, PS/2 non-MCA	Macintosh	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	Macintosh Finder, MS-/PC-DOS	Macintosh Finder, MS-/PC-DOS	Macintosh Finder	MS-/PC-DOS
Local Area Network Support	AppleTalk	AppleTalk	AppleTalk	IBM Token-Ring
Minimum Memory Required (bytes)	1M, 640K for PCs	1M for Macs, 640K for PCs	1M	256K
Terminals/Controllers Emulated	TTY, IBM, 5250 Series, DEC, VT52/100, VT200 Series	TTY, IBM, 5250 Series, DEC, VT52/100, VT200 Series	IBM, 5250 Series	IBM, 327X/317X DFT, 327X/317X CUT
User Interface	Install program, mouse, diagnostics	Install program, mouse, diagnostics	Install program, mouse, graphic icons, pop-up windows, diagnostics	Install program, on-line help
Programmability	No	No	Yes	Yes
API Compatibility	IBM API	IBM API	Vendor did not specify	IBM API, DCA IRMA API
Microcomputer Security	Password protection	Password protection	Password protection	Password protection, interface to host software
Number of Concurrent Sessions	Up to 7	1	Up to 7	1
DOS Access During Session	Yes	Yes	Not applicable	No
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII	ASCII	Vendor did not specify	ASCII
File Conversion	Yes	Yes	Vendor did not specify	Yes
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
Software Environment	IBM, DOS, OS/400	IBM, DOS, OS/400	IBM, OS/400	IBM, DOS, OS/VS, MVS, VM, CICS
Protocols	Twinax	Twinax	Twinax	BSC
Applications Supported	All IBM midrange applications	All IBM midrange applications	All IBM midrange applications	MSA host applications
Communications Characteristics				
Physical Connection	Twinax, RS-232-C, parallel	Twinax, RS-232-C, parallel	Twinax	Coax, modem
Transmission Mode	Asynchronous	Asynchronous	Synchronous	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	Twinax speeds	9600, 2.4M
Communications Features	Dial directory	Dial directory	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftware/Hdwre (\$)	150 software	No charge for software with purchase of unit	1,095 hardware	Vendor did not specify
Host Software/Hardware (\$)	400 to 950 host software	400 to 950 host software	400 to 950 software	Vendor did not specify
Date of First Delivery	March 1985	September 1986	November 1989	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	1 year	Vendor did not specify
Distribution	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct
Comments	—	—	—	—

Vendor	McCormack & Dodge	Micro Decisionware, Inc.	Micro Tempus, Inc.	Micro Tempus, Inc.
Product	PC Link	PC/SQL-link	Tempus-Link	Tempus-Share
Specifications				
Product Function	Local/remote terminal emulation, network gateway, host app. spfc. link	Non-host app. spfc. link	Host app. spfc. link	Host app. spfc. link, mainframem server
Users Supported	Single user	Single user	Multuser; unlimited	Multuser; unlimited
Components	Microcomputer software, host software	Microcomputer software, host software	Microcomputer software, host software	Host software
Copy Protected	Yes	No	Yes	Yes
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
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	OS/2, MS-/PC-DOS	OS/2, MS-/PC-DOS
Local Area Network Support	Ethernet, IBM Token-Ring, NET BIOS	Ethernet, IBM Token-Ring	Ethernet, IBM Token-Ring	Ethernet, IBM Token-Ring
Minimum Memory Required (bytes)	256K	320K	Vendor did not specify	Vendor did not specify
Terminals/Controllers Emulated	IBM, 327X/317X DFT, 327X/317X CUT, DEC, VT200 Series	TTY, IBM, 327X/317X DFT, 327X/317X CUT, DEC, VT52/100; Honeywell Bull	TTY, IBM, 327X/317X DFT, 327X/317X CUT, 5250 Series, DEC, VT52/100; Honeywell Bull	TTY, IBM, 327X/317X DFT, 327X/317X CUT, 5250 Series, DEC, VT52/100; Honeywell Bull
User Interface	Install program, on-line help, pop-up windows	Install program, on-line help, pop-up windows	On-line help, mouse, pop-up windows	On-line help, mouse, pop-up windows
Programmability	Yes	Vendor did not specify	Yes	Yes
API Compatibility	IBM API, DCA IRMA API, Novell (CXI)	IBM API, DCA IRMA API, IBM LU 6.2, Novell/LXI API	Vendor did not specify	Vendor did not specify
Microcomputer Security	Interface to host software	File encryption, interface to host software	Password protection, interface to host software	Password protection, interface to host software
Number of Concurrent Sessions	Vendor did not specify	Vendor did not specify	Vendor did not specify	Unlimited
DOS Access During Session	Yes	Vendor did not specify	Yes	Yes
File Transfer	Yes	No	Yes	Yes
File Formats	ASCII	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX; DECVAX	IBM, 43XX/30XX; Honeywell Bull, Tandem	IBM, 43XX/30XX	IBM, 43XX/30XX
Software Environment	CICS; VAX/VMS	IBM, MVS, VM, TSO, CMS, CICS; Honeywell GCOS	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM, MVS, TSO, MVS/VTAM
Protocols	BSC, SNA	BSC, SNA	BSC, SNA, HDLC, SDLC	BSC, SNA, HDLC, 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
Communications Characteristics				
Physical Connection	Coax, RS-232-C	Coax, RS-232-C	Vendor did not specify	Vendor did not specify
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous
Transmission Speed (bps)	19.2K	Vendor did not specify	Vendor did not specify	Vendor did not specify
Communications Features	Macros, unattended execution	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	1,100-8,000	300 to 600	Free	Free
Host Software/Hardware (\$)	35,000	Software 5,000 to 45,000	Based on processor group	Based on processor group
Date of First Delivery	1983	June 1985	September 1982	August 1987
Number Installed to Date	10,000	120	Not available	Not available
Warranty	1 year	Varies with purchase plan	Renewable	Renewable
Distribution	Direct	Direct, OEMs	Direct, dist., dlrs, retail, OEMs	Direct, dist., dlrs, retail, OEMs
Comments	Maintenance contract available	—	—	—

Vendor	Micro Tempus, Inc.	Microcom Software Div.	MicroGate Corp.	MicroGate Corp.
Product	Tempus-Transfer	Relay Gold 4.0	MicroGate 3270/API	MicroGate 3270/BSC
Specifications				
Product Function	Host app. spfc. link	Local/remote terminal, net gateway, standalone protocol converter, host application link	Remote terminal emulation, host app. spfc. link	Remote terminal emulation
Users Supported	Multuser; unlimited	Single user, multuser; up to 250	Single user	Single user
Components	Microcomputer software, host software	Microcomputer software, host software	Microcomputer software	Microcomputer software
Copy Protected	Yes	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	IBM, PC/XT/AT & compatibles, PS/2 MCA
Operating Systems Supported	OS/2, MS-/PC-DOS	Macintosh Finder, MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Ethernet, IBM Token-Ring	Ethernet, IBM Token-Ring, STARLAN, Ungermann Bass and NetBios-compatible	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	Vendor did not specify	192K or 128K with EMS	512K	512K
Terminals/Controllers Emulated	TTY, IBM, 327X/317X CUT, 5250 Series, VT52/100, VT200 Series	TTY, IBM, 327X/317X DFT, 327X/317X CUT, DEC, VT52/100, VT200 Series	IBM, 327X/317X CUT	IBM, 327X/317X CUT
User Interface	On-line help, mouse, pop-up windows, diagnostics	Install program, on-line help, on-line tutor., pop-up windows, diagnostics	Vendor did not specify	On-line help, diagnostics
Programmability	Yes	Yes	Yes	No
API Compatibility	Vendor did not specify	Proprietary	IBM API	Vendor did not specify
Microcomputer Security	Password protection, interface to host software	Transmission/file encryption, interface to host software	Interface to host software	Interface to host software
Number of Concurrent Sessions	Vendor did not specify	15	5	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	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, 43XX/30XX
Software Environment	IBM, MVS, TSO, MVS/VTAM	IBM, MVS, VM, TSO, CMS, IMS, CICS	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, SNA, SDLC	SNA, SDLC	BSC
Applications Supported	Host virtual disk, access to host-resident programs, any mainframe application	Access to host-resident programs	Access to host-resident programs	Vendor did not specify
Communications Characteristics				
Physical Connection	Vendor did not specify	Coax, RS-232-C, LAN gateways	RS-232-C	RS-232-C
Transmission Mode	Asynchronous, synchronous	Asynchronous	Synchronous	Synchronous
Transmission Speed (bps)	Vendor did not specify	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, supports speeds up to 56.4K bps	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K
Communications Features	Vendor did not specify	Dial directory, auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer	Auto dial/redial, auto answer
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	Free	299	900	300
Host Software/Hardware (\$)	Based on processor group	6,500-14,500	Vendor did not specify	Vendor did not specify
Date of First Delivery	January 1989	1983	1988	1985
Number Installed to Date	Not available	100,000	Vendor did not specify	Vendor did not specify
Warranty	1 year, renewable	90 days	30 days	30 days
Distribution	Direct, dist., dlrs, retail, OEMs	Direct, dist., dlrs, retail, mail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	—

Vendor	MicroGate Corp.	MicroGate Corp.	MicroGate Corp.	MicroGate Corp.
Product	MicroGate 3270/SNA	MicroGate 3780	MicroGate 3780/API	MicroGate 6530
Specifications				
Product Function	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation, host app. spfc. link	Remote terminal emulation, host app. spfc. link
Users Supported	Single user	Single user	Single user	Single user
Components	Microcomputer software	Microcomputer software	Microcomputer software	Microcomputer hardware & software, host software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA
Operating Systems Supported	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 (bytes)	512K	512K	512K	512K
Terminals/Concurrent Users Emulated	IBM, 327X/317X CUT	IBM, 2780/3780	IBM, 2780/3780	Tandem 6530
User Interface	On-line help, diagnostics	On-line help, diagnostics	Vendor did not specify	Vendor did not specify
Programmability API Compatibility	Yes IBM API	Yes Proprietary	Yes Proprietary	Yes Proprietary
Microcomputer Security	Interface to host software	Interface to host software	Interface to host software	Interface to host software
Number of Concurrent Sessions	5	2	Vendor did not specify	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	Vendor did not specify
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, 43XX/30XX	Tandem
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	Tandem Guardian, Pathway
Protocols	SNA, SDLC	BSC	BSC	Async
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C	Vendor did not specify	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	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, 14.4K	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K
Communications Features	Vendor did not specify	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer, unattended execution
Pricing and Availability				
Microcomputer Software/Hardware (\$)	300	300	900	150/225
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	1986	1983	1983	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	30 days	30 days	30 days	30 days
Distribution	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct
Comments	—	Supports unattended sessions, background file transfer	—	—

Vendor	MicroGate Corp.	MicroGate Corp.	MicroGate Corp.	MicroGate Corp.
Product	SLAM/208	SLAM/32	SyncLink 2400	SyncLink 2400/2
Specifications				
Product Function	Local/remote terminal emulation	Remote terminal emulation, network gateway	Remote terminal emulation	Remote terminal emulation
Users Supported	Vendor did not specify	Vendor did not specify	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware	Microcomputer hardware
Copy Protected	No	No	Vendor did not specify	Vendor did not specify
Microcomputers Supported	IBM, PS/2 MCA	IBM, PS/2 MCA	IBM, PC/XT/AT & compatibles	IBM, PS/2 MCA
Operating Systems Supported	OS/2, MS-/PC-DOS	OS/2, MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	IBM Token-Ring	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	Vendor did not specify	Vendor did not specify	512K	512K
Terminals/Controllers Emulated	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X DFT, 327X/317X CUT, 2780/3780	IBM, 327X/317X DFT, 327X/317X CUT, 2780/3780
User Interface	Install program, on-line help, mouse, on-line tutor, graphic icons, windows, diagnostics	Install program, on-line help/tutor, mouse, graphic icons, pop-up windows, diagnostics	On-line help, diagnostics	On-line help, diagnostics
Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, IBM LU 6.2	IBM API, IBM LU 6.2	IBM API	IBM API
Microcomputer Security	Interface to host software	Interface to host software	Interface to host software	Interface to host software
Number of Concurrent Sessions	8	8	5	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	Yes	Yes	Yes
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, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP
Protocols	SNA, HDLC, SDLC	SNA, HDLC, SDLC	BSC, SNA, HDLC, SDLC	BSC, SNA, HDLC, SDLC
Applications Supported	Vendor did not specify	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	Twisted pair	Twisted pair	Twisted pair	Twisted pair
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	2400, 4800	300, 600, 1200, 2400, 4800, 9600, 12000 bps	Vendor did not specify	2400
Communications Features	Dial directory, auto dial/redial, auto answer, unattended execution	Dial directory, auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	1,295 hardware	1,595 hardware	795 hardware	845 hardware
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	Vendor did not specify	September 1989	1988	1987
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., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs
Comments	Combines a SDLC adapter, a Bell 208-compatible modem, and a Bell 201-compatible modem	Combines an SDLC adapter and a CCITT V.32 modem on a half-size board	Combines a sync adapter and Bell 201-compatible modem on one board	Combines a sync adapter and Bell 201-compatible modem on one board

Vendor	MicroGate Corp.	MicroGate Corp.	MicroGate Corp.	MicroGate Corp.
Product	SyncLink 2422	SyncLink 4822	SyncLink 4824	SyncLink 4824/2
Specifications				
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	Microcomputer hardware	Microcomputer hardware	Microcomputer hardware	Microcomputer hardware
Copy Protected Microcomputers Supported	Vendor did not specify IBM, PC/XT/AT & compatibles	Vendor did not specify IBM, PC/XT/AT & compatibles	Vendor did not specify IBM, PC/XT/AT & compatibles	Vendor did not specify IBM, PS/2 MCA
Operating Systems Supported	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 (bytes)	512K	512K	512K	512K
Terminals/Controllers Emulated	IBM, 327X/317X DFT, 327X/317X CUT, 2780/3780	IBM, 327X/317X DFT, 327X/317X CUT, 2780/3780	IBM, 327X/317X DFT, 327X/317X CUT, 2780/3780	IBM, 327X/317X DFT, 327X/317X CUT, 2780/3780
User Interface	On-line help, diagnostics	On-line help, diagnostics	On-line help, diagnostics	On-line help, diagnostics
Programmability API Compatibility	Vendor did not specify IBM API	Vendor did not specify IBM API	Yes IBM API	Yes IBM API
Microcomputer Security	Interface to host software	Interface to host software	Interface to host software	Interface to host software
Number of Concurrent Sessions	5	5	5	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	Yes	Yes	Yes
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, IMS, CICS, SSP	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, SNA, HDLC, SDLC	BSC, SNA, HDLC, SDLC	BSC, SNA, HDLC, SDLC
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	Twisted pair	Twisted pair	Twisted pair	Twisted pair
Transmission Mode	Asynchronous, synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	300, 600, 1200, 2400	300, 600, 1200, 2400, 4800	2400, 4800	300, 600, 1200, 2400, 4800
Communications Features	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	925 hardware	1,175 hardware	1,040 hardware	1,085 hardware
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	1988	1988	1988	1987
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., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs
Comments	Combines a sync adapter, Bell 201-compatible modem, and CCITT V.22 bis modem on one board	Combines a sync adapter, Bell 208-compatible modem, Bell 201-compatible modem, and CCITT V.22 bis modem	Combines a sync adapter, Bell 208-compatible modem, and Bell 201-compatible modem on one board	Combines a sync adapter, Bell 201-compatible modem, and Bell 208-compatible modem on one board

Vendor	MicroGate Corp.	MicroPlot Systems, Inc.	Modems Plus, Inc.	Multi-Tech Systems
Product	SynkLink Communications Card	PC-PLOT	Micro SNAP	MultiCom 3270
Specifications				
Product Function	Local/remote terminal emulation	Local/remote terminal emulation	Local/remote terminal emulation, network gateway, standalone protocol converter, host app. spfc. link	Local terminal emulation
Users Supported	Single user	Single user	Single user	Vendor did not specify
Components	Microcomputer hardware & software	Microcomputer software	Microcomputer hardware & software, standalone hdwre.	Microcomputer hardware & software
Copy Protected	Vendor did not specify	No	Yes	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 non-MCA	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-PC-DOS	MS-PC-DOS	MS-PC-DOS	MS-PC-DOS
Local Area Network Support	Vendor did not specify	Ethernet	Ethernet	Vendor did not specify
Minimum Memory Required (bytes)	512K	256K	75K	256K
Terminals/Controllers Emulated	IBM, 327X/317X DFT, 327X/317X CUT, 2780/3780	TTY, DEC, VT52/100, VT200 Series, VT300 Series, Tektronix 4010/4014/4027/4105	TTY, IBM, 327X/317X DFT, 2780/3780, DEC, VT52/100	IBM, 327X/317X DFT, 327X/317X CUT
User Interface	On-line help, diagnostics	Install program, on-line help, mouse, pop-up windows	Install program	On-line help, pop-up windows
Programmability API Compatibility	Yes IBM API	Vendor did not specify Proprietary	Yes IBM API	No IBM API
Microcomputer Security	Interface to host software	Vendor did not specify	Password protection, interface to host software	Password protection
Number of Concurrent Sessions	5	Vendor did not specify	5	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	Vendor did not specify	Yes	No
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX, System/36/38; Data General DECVAX; HP; UNIX-based systems	IBM, 43XX/30XX; Unisys	Vendor did not specify
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, DOS, OS/VS, VM, TSO VAX/VMS; UNIX System 5 Berkeley 4.X	IBM, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	IBM, MVS, VM, TSO, CMS, CICS
Protocols	BSC, SNA, HDLC, SDLC	TCP/IP	BSC, SNA, SDLC	BSC, SNA, SDLC
Applications Supported	Access to host-resident programs	None	Access to host-resident programs	Vendor did not specify
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	RS-232-C	Coax
Transmission Mode	Synchronous	Asynchronous	Asynchronous, synchronous	Synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	2.4M
Communications Features	Auto dial/redial, auto answer, unattended execution	Dial directory, auto dial/redial, auto answer, macros, script file	Auto answer, unattended execution	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	245-295 hardware	195	995 hardware	150-250/399-499
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	1983	March 1986	June 1985	March 1987
Number Installed to Date	Vendor did not specify	11,000	5,000	Vendor did not specify
Warranty	1 year	Vendor did not specify	90 days	Two years
Distribution	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, mail	Direct, dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, VARs
Comments	—	—	—	Supports both CUT and DFT applications

Vendor	Multi Soft, Inc.	National Semiconductor	Network Research Corp.	Network Software Associates, Inc.
Product	INFRONT	MainLink II	Fusion Network Software	AdaptAsync
Specifications				
Product Function	Host app. spfc. link	Local terminal emulation	Local/remote terminal emulation, host app. spfc. link	Vendor did not specify
Users Supported	Single user	Single user	Multiuser	Multiuser; 32
Components	Microcomputer software	Microcomputer hardware & software	Microcomputer hardware & software, host software	Microcomputer hardware & 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
Operating Systems Supported	OS/2, MS-/PC-DOS	OS/2, MS-/PC-DOS	MS-/PC-DOS, Xenix	MS-/PC-DOS
Local Area Network Support	Ethernet, IBM Token-Ring	Vendor did not specify	Ethernet	IBM Token-Ring
Minimum Memory Required (bytes)	640K	85K	256K	Vendor did not specify
Terminals/Controllers Emulated	Vendor did not specify	IBM, 327X/317X DFT, 327X/317X CUT	DEC, VT52/100, VT200 Series; HP	Vendor did not specify
User Interface	On-line help, on-line tutor., graphic icons, pop-up windows	Install program, on-line help, diagnostics	Install program, on-line help	Vendor did not specify
Programmability	Yes	No	Yes	Yes
API Compatibility	IBM API, DCA IRMA API, IBM LU 6.2	Proprietary	Vendor did not specify	Vendor did not specify
Microcomputer Security	Interface to host software	Password protection	Password protection	Password protection, interface to host software, serial # check, SMDR Up to 128
Number of Concurrent Sessions	1	5	Vendor did not specify	
DOS Access During Session	Yes	No	No	Yes
File Transfer	Yes	Yes	Yes	Vendor did not specify
File Formats	ASCII	ASCII, binary	ASCII, binary	Vendor did not specify
File Conversion	No	Yes	Yes	Vendor did not specify
Host Interface				
Systems Supported	IBM, 43XX/30XX; DEC/VAX	IBM, 43XX/30XX, AS/400	DEC/VAX; HP	IBM, 43XX/30XX
Software Environment	IBM, DOS, MVS, VM, TSO, CMS, CICS; VAX/VMS, MVS-TDMS/DC	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	VAX/VMS; UNIX System 5 Berkeley 4.X	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, OS/400
Protocols	SNA, SDLC	SNA, SDLC	TCP/IP, XNS, NFS	SNA, SDLC
Applications Supported	Access to host-resident programs	None	Access to host-resident programs	Host virtual disk, access to host-resident programs
Communications Characteristics				
Physical Connection	N/A	Coax, RS-232-C	Coax, Cheapernet	RS-232-C, token ring
Transmission Mode	Vendor did not specify	Vendor did not specify	Asynchronous, synchronous	Asynchronous, synchronous
Transmission Speed (bps)	Vendor did not specify	2.3587 MHz	Depends on network	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 2.4M, 4M bps
Communications Features	Vendor did not specify	Vendor did not specify	Unattended execution	Auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Software/Hardware (\$)	Vendor did not specify	225-345/395	300-500	795/1,295
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	750-15,000	Vendor did not specify
Date of First Delivery	October 1987	Vendor did not specify	January 1983	January 1988
Number Installed to Date	Vendor did not specify	25,000	10,000	Not available
Warranty	Vendor did not specify	1 year	90 days	90 days, 1 year
Distribution	Direct, dist., dlrs, retail, mail, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, OEMs
Comments				Used in conjunction with other AdaptSNA software for providing SNA comm. over asynchronous lines

Vendor	Network Software Associates, Inc.	Network Software Associates, Inc.	Network Software Associates, Inc.	Network Software Associates, Inc.
Product	AdaptSNA 3270	AdaptSNA APPC	AdaptSNA APPC+3270	AdaptSNA LAN Gateway
Specifications				
Product Function	Local/remote terminal emulation	Host app. spfc. link	Local/remote terminal emulation, host app. spfc. link	Network gateway
Users Supported	Single user	Single user	Single user	Multuser; 128
Components	Microcomputer software	Microcomputer software	Microcomputer software	Microcomputer software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, laptops	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, laptops	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, laptops	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	OS/2, MS-/PC-DOS	OS/2, MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NetBios-compatible	ARCnet, Ethernet, IBM Token-Ring, NetBios-compatible	ARCnet, Ethernet, IBM Token-Ring, NetBios-compatible	ARCnet, Ethernet, IBM Token-Ring, NetBios-compatible
Minimum Memory Required (bytes)	210K	155K	230K	Vendor did not specify
Terminals/Controllers Emulated	IBM, 327X/317X DFT	Vendor did not specify	IBM, 327X/317X DFT	IBM, 327X/317X DFT, IBM 3770
User Interface	On-line help, on-line tutor., diagnostics	Vendor did not specify	On-line help, on-line tutor., diagnostics	On-line help, on-line tutor., diagnostics
Programmability API Compatibility	Yes IBM API, proprietary	Yes IBM LU 6.2	Yes IBM LU 6.2	Yes IBM API, proprietary
Microcomputer Security	Vendor did not specify	Vendor did not specify	Vendor did not specify	Password protection, interface to host software, SMDR 128 per gateway
Number of Concurrent Sessions	4	1	3	
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Vendor did not specify	Yes
File Formats	ASCII, binary	ASCII, binary	Vendor did not specify	ASCII, binary
File Conversion	Yes	Yes	Vendor did not specify	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX, AS/400	IBM, 43XX/30XX, System/36/38, AS/400 DEC/VAX, IBM APPC systems	IBM, 43XX/30XX, System/36/38, AS/400	IBM, 43XX/30XX
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM, DOS, OS/VS, MVS, VM, IMS, CICS, OS/400	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, OS/400	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, OS/400
Protocols	SNA, SDLC	SNA, SDLC	SNA, SDLC, APPL/LU6.2	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
Communications Characteristics				
Physical Connection	Coax, RS-232-C, token ring	Coax, RS-232-C, token ring	Coax, RS-232-C	RS-232-C, token ring
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous, synchronous	Synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 2.4M, 4M bps	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 2.4M, 4M bps	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 2.4M, 4M bps	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 2.4M, 4M bps
Communications Features	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	245	285	495	995-5,995
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	1983	October 1985	June 1989	December 1988
Number Installed to Date	Not available	Not available	Not available	Not available
Warranty	90 days	90 days	90 days	90 days
Distribution	Direct, OEMs	Direct, OEMs	Direct, OEMs	Direct, OEMs
Comments	—	—	—	—

Vendor	Network Software Associates, Inc.	Network Software Associates, Inc.	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division
Product	AdaptSNA LU0	AdaptSNA RJE	NetLine 5250	NetWare 3270 CUT Workstation
Specifications				
Product Function	Vendor did not specify	Local/remote terminal emulation, host app. spfc. link	Vendor did not specify	Local terminal emulation
Users Supported	Single user	Single user	Single user, multiuser	Single user
Components	Microcomputer software	Microcomputer software	Microcomputer software, host software	Microcomputer software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, laptops	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, laptops	No IBM, PC/XT/AT & compatibles, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	OS/2, MS-/PC-DOS	OS/2, MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, NetBios-compatible	ARCnet, Ethernet, IBM Token-Ring, NetBios-compatible	NetBIOS-compatible	ARCnet, Ethernet, IBM Token-Ring, STARLAN
Minimum Memory Required (bytes)	180K	200K	70K	95K
Terminals/Controllers Emulated	Vendor did not specify	IBM 3770	IBM, 5250 Series	IBM, 327X/317X CUT
User Interface	Vendor did not specify	On-line help, on-line tutor., diagnostics	Windows	Install program
Programmability API Compatibility	Yes LU0	Yes IBM API, proprietary	No IBM API	Vendor did not specify IBM API, DCA IRMA API, proprietary
Microcomputer Security	Vendor did not specify	Vendor did not specify	Vendor did not specify	Interface to host software
Number of Concurrent Sessions	16	5	Vendor did not specify	1
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, System/36/38, AS/400	IBM, 43XX/30XX
Software Environment	IBM, DOS, OS/VS, MVS, VM	IBM, DOS, OS/VS, MVS, VM	IBM, SSP, OS/400, IBM CPF	IBM, DOS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	SNA, SDLC	SNA, SDLC, HASP	Vendor did not specify	SNA, non-SNA
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk	Vendor did not specify	Access to host-resident programs
Communications Characteristics				
Physical Connection	Coax, RS-232-C	Coax, RS-232-C, token ring	Hardware dependent	Coax
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Vendor did not specify	Vendor did not specify
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 2.4M, 4M bps	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 2.4M, 4M bps	Depends on configuration	Vendor did not specify
Communications Features	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	585	785	150 software	350 software
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	August 1987	1984	March 1986	January 1987
Number Installed to Date	No available	Not available	Vendor did not specify	Vendor did not specify
Warranty	90 days	90 days	1 year	Vendor did not specify
Distribution	Direct, OEMs	Direct, OEMs	Direct, dist., dlrs, retail	Dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	—

Vendor	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division
Product	NetWare 3270 LAN Workstation	NetWare 3270 Multi Workstation	NetWare 3270 Multi Workstation	NetWare 3270 Send-Receive
Specifications				
Product Function	Local/remote terminal emulation	Local/remote terminal emulation	Local/remote terminal emulation	File transfer package
Users Supported	Multuser; 96	Single user	Single user	Vendor did not specify
Components	Microcomputer software	Microcomputer software	Microcomputer software	Microcomputer software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NetBIOS-compatible, NetWare	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, STARLAN	Vendor did not specify
Minimum Memory Required (bytes)	106K	145K	160K to 270K	Vendor did not specify
Terminals/Controllers Emulated	IBM, 327X/317X DFT	IBM, 327X/317X DFT	IBM, 327X/317X DFT	Vendor did not specify
User Interface	Install program	Install program	Install program	Vendor did not specify
Programmability API Compatibility	Vendor did not specify IBM API, DCA IRMA API, IBM LU 6.2, proprietary	Vendor did not specify IBM API, DCA IRMA API, proprietary	Vendor did not specify IBM API, DCA IRMA API, proprietary	Vendor did not specify Vendor did not specify
Microcomputer Security	Interface to host software	Interface to host software	Interface to host software	Vendor did not specify
Number of Concurrent Sessions	5 per user	5	5	Vendor did not specify
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	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
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, MVS, VM, TSO, CMS, IMS, CICS	IBM, DOS, MVS, VM, TSO, CMS, IMS, CICS	IBM, TSO, CMS, CICS
Protocols	Novell SPX	SNA, SDLC, token-ring, non-SNA	BSC, SNA, SDLC, non-SNA	SNA
Applications Supported	Vendor did not specify	Access to host-resident programs	Access to host-resident programs	IBM IND\$FILE file transfer
Communications Characteristics				
Physical Connection	LAN transport layer to gateway	Coax, token-ring	Coax, RS-232-C	Vendor did not specify
Transmission Mode	Vendor did not specify	Vendor did not specify	Synchronous	Vendor did not specify
Transmission Speed (bps)	Vendor did not specify	64K to 16M	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
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	995 software (licensed up to 96 workstations)	395 to 545	475 software	100 software
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	December 1988	December 1988	January 1987	October 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., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	—

Vendor	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division
Product	NetWare 5250 Gateway	NetWare 5250 LAN Workstation	NetWare 5250 SDLC Workstation	NetWare 5250 Twinax Workstation
Specifications				
Product Function	Network gateway	Remote terminal emulation	Remote terminal emulation	Local terminal emulation
Users Supported	Multuser; 9	Multuser; 9	Single user	Multuser; 7
Components	Microcomputer hardware & software	Microcomputer software	Microcomputer hardware & software	Microcomputer hardware & software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	NetBIOS-compatible	NetBIOS-compatible	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	150K	200K	220K	64K
Terminals/Controllers Emulated	IBM, 5250 Series	IBM, 5250 Series	IBM, 5250 Series	IBM, 5250 Series
User Interface	On-line help, pop-up windows	On-line help	On-line help	On-line help
Programmability API Compatibility	Vendor did not specify IBM API	No IBM API	No IBM API	No IBM API
Microcomputer Security	Keyboard lock feature	Keyboard lock feature	Keyboard lock feature	Keyboard lock feature
Number of Concurrent Sessions	9	9	9	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
Host Interface				
Systems Supported	IBM, System/36/38	IBM, System/36/38	IBM, System/36/38	IBM, System/36/38, AS/400
Software Environment	IBM CPF	IBM CPF	IBM CPF	IBM, DOS, OS/400, 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
Communications Characteristics				
Physical Connection	RS-232-C	Any LAN media	Twinax, RS-232-C, twisted pair	Twinax
Transmission Mode	Asynchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	9600	LAN speed	19.2K	1M
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	550 software, 395 hardware	200	250 software, 395 hardware	200 software, 545 hardware
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	January 1987	May 1989	April 1989	January 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	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail
Comments	—	—	—	—

Vendor	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division
Product	NetWare SNA Gateway	NetWare SNA Gateway ELS	NetWare X.25 Extended Gateway	NetWare X.25 Gateway
Specifications				
Product Function	Network gateway	Network gateway	Local/remote terminal emulation, network gateway	Local/remote terminal emulation, network gateway
Users Supported	Multuser; 96 workstations	Multuser; 16	Multuser; 97	Multuser; 8
Components	Microcomputer software	Microcomputer software	Microcomputer software	Microcomputer software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NetBIOS-compatible, NetWare	ARCnet, Ethernet, IBM Token-Ring, NetBIOS-compatible, NetWare	ARCnet, Ethernet, IBM Token-Ring, STARLAN	ARCnet, Ethernet, IBM Token-Ring, STARLAN
Minimum Memory Required (bytes)	Vendor did not specify	232K (coax), 238K (remote)	256K	256K
Terminals/Controllers Emulated	IBM, 327X/317X DFT	IBM, 327X/317X DFT	TTY, third party emulation	TTY, third party emulation
User Interface	Install program, on-line help, diagnostics, windows	Install program, on-line help, diagnostics, windows	Vendor did not specify	Vendor did not specify
Programmability API Compatibility	Vendor did not specify IBM API, DCA IRMA API	No IBM API, DCA IRMA API, IBM LU 6.2, proprietary	Vendor did not specify Interrupt 14	Vendor did not specify Interrupt 14
Microcomputer Security	Interface to host software	Interface to host software	Vendor did not specify	Vendor did not specify
Number of Concurrent Sessions	128	16	8	8
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	Vendor did not specify	Vendor did not specify
File Conversion	Yes	Yes	No	No
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	Data General; Honeywell Bull; DECVAX; HP, X.29 hosts	Data General; Honeywell Bull; DECVAX; HP, X.29 hosts
Software Environment	IBM, DOS, MVS, VM, TSO, CMS, IMS, CICS	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	VAX/VMS; DG OAS; Honeywell GCOS	VAX/VMS; DG OAS; Honeywell GCOS
Protocols	SNA, SDLC, token-ring	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
Communications Characteristics				
Physical Connection	Coax, RS-232-C, token-ring interface	Coax	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	2.4M (coax), 1200 to 64K (remote)	19.2K to 2.4M (coax), 1200 to 19.2K (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
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	2,995 software	595 software	1,150 software	550 software
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	December 1988	December 1988	June 1988	June 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	Vendor did not specify	1 year	1 year
Distribution	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail, OEMs, VARs	Dist., dlrs, retail
Comments	—	—	Requires Novell X.25 extended adapter for PC	Requires Novell X.25 adapter

Vendor	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division
Product	Novell Coax Adapter	Novell Coax Mux Adapter for PC	Novell Synchronous Adapter for PC	Novell Synchronous Adapter
Specifications				
Product Function	Network gateway	Network gateway	Network gateway	Remote terminal emulation, network gateway
Users Supported	Multuser; up to 5	Multuser; up to 40	Multuser	Single user, multuser
Components	Microcomputer hardware	Microcomputer hardware	Microcomputer hardware	Microcomputer hardware
Copy Protected Microcomputers Supported	Vendor did not specify IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	Vendor did not specify IBM, PC/XT/AT & compatibles, PS/2 non-MCA	Not applicable IBM, PC/XT/AT & compatibles	Vendor did not specify IBM, PC/XT/AT & compatibles, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN	ARCnet, Ethernet, IBM Token-Ring, STARLAN	ARCnet, Ethernet, IBM Token-Ring, STARLAN	ARCnet, Ethernet, IBM Token-Ring, STARLAN
Minimum Memory Required (bytes)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Terminals/Controllers Emulated	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 327X/317X DFT	IBM, 327X/317X DFT	IBM, 327X/317X DFT
User Interface	Vendor did not specify	Vendor did not specify	Not applicable	Vendor did not specify
Programmability API Compatibility	Vendor did not specify Vendor did not specify	Vendor did not specify Vendor did not specify	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
Number of Concurrent Sessions	5	40	128	128
DOS Access During Session	Yes	Vendor did not specify	Vendor did not specify	Vendor did not specify
File Transfer	Vendor did not specify	Not applicable	Not applicable	Vendor did not specify
File Formats	Vendor did not specify	Not applicable	Not applicable	Vendor did not specify
File Conversion	Vendor did not specify	Not applicable	Not applicable	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, non-SNA	SNA	SNA, SDLC	SNA, SDLC
Applications Supported	Vendor did not specify	None	Vendor did not specify	Vendor did not specify
Communications Characteristics				
Physical Connection	Coax	Coax	RS-232-C	RS-232-C
Transmission Mode	Vendor did not specify	Vendor did not specify	Vendor did not specify	Synchronous
Transmission Speed (bps)	2.35M	2.35M	2400 to 56K	1200 to 56K
Communications Features	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	545 software	1,100 software	1,000 software	395 software
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	June 1983	July 1987	1986	January 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	Vendor did not specify	Vendor did not specify
Distribution	Dist., dirs, retail	Dist., dirs, retail, OEMs, VARs	Dist., dirs, retail, OEMs, VARs	Dist., dirs, 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 3 x 74)	Board supports a high-speed remote SDLC gateway	Supports single user and gateway products in a 3270 remote SDLC (or BSC single-user) environment

Vendor	Novell, Inc., Communications Products Division	Novell, Inc., Communications Products Division	OBS Software	On-Line Software International, Inc.
Product	Novell Twinax Adapter	PCOX/Multi-M	EXCELLINK	RAMIS/PC
Specifications				
Product Function	Vendor did not specify	Local terminal emulation	Local/remote terminal emulation	Local/remote terminal emulation, network gateway, standalone protocol converter, host, application link
Users Supported	Single user	Single user	Multuser; unlimited	Single user, multiuser
Components	Microcomputer hardware	Microcomputer software	Microcomputer software, host software	Microcomputer software, host software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 non-MCA	No Macintosh	No IBM, PC/XT/AT & compatibles, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	Macintosh Finder	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	NetBIOS-compatible	Vendor did not specify	Ethernet, IBM Token-Ring	IBM Token-Ring, Novell
Minimum Memory Required (bytes)	160K	Vendor did not specify	124K	640K
Terminals/Controllers Emulated	IBM, 5250 Series	IBM, 327X/317X DFT	TTY, IBM, 327X/317X DFT, 327X/317X CUT, 2780/3780	TTY, IBM, 327X/317X DFT, 327X/317X CUT, IBM 3101
User Interface	Vendor did not specify	Vendor did not specify	On-line help	Install program, on-line help, mouse, pop-up windows
Programmability API Compatibility	Vendor did not specify Vendor did not specify	No Vendor did not specify	Yes IBM API, DCA IRMA API, proprietary	Yes Proprietary
Microcomputer Security	Vendor did not specify	Interface to host software	Interface to host software	Interface to host software
Number of Concurrent Sessions	1	Vendor did not specify	1	4
DOS Access During Session	Yes	Vendor did not specify	No	Yes
File Transfer	Vendor did not specify	Yes	Yes	Yes
File Formats	Vendor did not specify	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Vendor did not specify	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, System/36/38	IBM, 43XX/30XX	IBM, 43XX/30XX, AS/400	IBM, 43XX/30XX
Software Environment	IBM, SSP, IBM CPF	IBM, MVS, VM, TSO, IMS, CICS	IBM, MVS, VM, TSO, CMS	IBM, TSO, CMS, CICS
Protocols	Twinax	SNA	BSC, SNA, HDLC, SDLC	BSC, 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
Communications Characteristics				
Physical Connection	Twinax	Coax	Coax, RS-232-C	Coax, modem
Transmission Mode	Synchronous	Vendor did not specify	Asynchronous, synchronous	Asynchronous, synchronous
Transmission Speed (bps)	19.2K	Vendor did not specify	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	300, 600, 1200, 2400, 4800, 9600
Communications Features	Vendor did not specify	Vendor did not specify	Macros, unattended execution	Macros, unattended execution
Pricing and Availability				
Microcomputer Sftware/Hdwre (\$)	545	675 software	Vendor did not specify	595
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	19,000-126,000
Date of First Delivery	October 1986	October 1987	January 1986	January 1986
Number Installed to Date	Vendor did not specify	Vendor did not specify	Over 100	20,000 PC/1,440 IBM Host
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dlrs, retail	Dist., dlrs, retail	Direct	Direct, dist., dlrs, retail
Comments	—	—	—	Includes hot-line support

Vendor	Packet/PC Inc.	Packet/PC Inc.	Packet/PC Inc.	Packet/PC Inc.
Product	COMmpress	EPD (Electronic Program Distribution)	Packet/3270 Mac	Packet/3270
Specifications				
Product Function	Host app. spfc. link	Host app. spfc. link	Remote terminal emulation	Remote terminal emulation, network gateway
Users Supported	Vendor did not specify	Multuser	Single user	Single user, multiuser; 254 with LAN version
Components	Microcomputer software, host software	Microcomputer software, host software	Microcomputer software, host software, host hwre.	Microcomputer software, host software, host hwre.
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, IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	Macintosh Finder	MS-/PC-DOS, OS2
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, 3Com	ARCnet, IBM Token-Ring, 3Com and NetBios-compatible	Vendor did not specify	ARCnet, IBM Token-Ring, 3Com and NetBios-compatible
Minimum Memory Required (bytes)	256K	640K	384K	384K
Terminals/Controllers Emulated	Vendor did not specify	IBM, 327X/317X DFT	IBM, 327X/317X DFT	TTY, IBM, 327X/317X DFT
User Interface	Vendor did not specify	On-line help, diagnostics	On-line help, mouse, graphic icons, pop-up windows, diagnostics	On-line help, diagnostics
Programmability	No	Yes	No	Yes
API Compatibility	Vendor did not specify	IBM API, DCA IRMA API, proprietary	Vendor did not specify	IBM API, proprietary, IBM HLL API
Microcomputer Security	Vendor did not specify	Password protection, interface to host software	Password protection, interface to host software	Password protection, interface to host software
Number of Concurrent Sessions	N/A	2	2	2
DOS Access During Session	Vendor did not specify	No	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, 43XX/30XX, System/36/38, AS/400	IBM, 43XX/30XX, System/36/38, AS/400
Software Environment	IBM, TSO, CMS, CICS	IBM, MVS, CICS	IBM, DOS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM, DOS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400
Protocols	BSC, SNA, HDLC, SDLC	SNA, SDLC	SNA, SDLC	SNA, SDLC
Applications Supported	None	Access to host-resident programs	Vendor did not specify	Vendor did not specify
Communications Characteristics				
Physical Connection	RS-232-C	Coax, RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Asynchronous, synchronous	Asynchronous, synchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 2.4M	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 2.4M	300, 600, 1200, 2400, 4800, 9600	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K
Communications Features	Vendor did not specify	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	Vendor did not specify	495-195	295-110	295-110
Host Software/Hardware (\$)	5,000	30,000 software	10,000-8,500/8,000-6,400	10,000-8,500/8,000-6,400
Date of First Delivery	January 1987	November 1989	October 1989	December 1985
Number Installed to Date	Vendor did not specify	2	Vendor did not specify	100,000
Warranty	1 year	1 year	1 year	1 year
Distribution	Direct, dist., dlrs, retail	Direct	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail
Comments	—	—	Requires either host software or hardware, not both	Requires either host software or hardware, not both

Vendor	Packet/PC Inc.	Packet/PC Inc.	Pansophic Systems	Passport Communications, Inc.
Product	Packet/5250	PC/400	The Corporate Tie	Bisync Exchange
Specifications				
Product Function	Remote terminal emulation	Remote terminal emulation	Non-host app. spfc. link	Remote terminal emulation
Users Supported	Single user	Single user	Multuser; unlimited	Single user
Components	Microcomputer software, host hardware	Microcomputer software, host hardware	Microcomputer software, host software	Microcomputer hardware & 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 non-MCA
Operating Systems Supported	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, IBM Token-Ring, STARLAN	Vendor did not specify
Minimum Memory Required (bytes)	512K	512K	256K	256K
Terminals/Controllers Emulated	IBM, 5250 Series	IBM, 5250 Series, APPC, LU6.2, 802.2	TTY, IBM, 327X/317X DFT, 327X/317X CUT, IBM 4702	IBM, 2780/3780
User Interface	On-line help, diagnostics	On-line help, diagnostics	Install program, pop-up windows, diagnostics	Install program
Programmability	Yes	Yes	Yes	No
API Compatibility	IBM API	IBM LU 6.2	IBM API, DCA IRMA API	Proprietary
Microcomputer Security	Password protection	Password protection	Transmission encryption, password protection, interface to host software	Interface to host software
Number of Concurrent Sessions	7	Vendor did not specify	1	1
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	No	Yes
Host Interface				
Systems Supported	IBM, System/36/38, AS/400	IBM, AS/400	IBM, 43XX/30XX	IBM, 43XX/30XX, System/36/38; Data General Honeywell BullVAX, DECsystem; HP
Software Environment	IBM, SSP, OS/400	IBM, OS/400	IBM, DOS, MVS, CICS, IBM VTAM (MVS)	Any BSC Fep
Protocols	SNA, SDLC	Token ring	BSC, SNA, SDLC	BSC
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, network spool file	None
Communications Characteristics				
Physical Connection	Vendor did not specify	RS-232-C	Coax, RS-232-C	RS-232-C
Transmission Mode	Asynchronous	Asynchronous	Asynchronous, synchronous	Synchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600	300, 600, 1200, 2400, 4800, 9600	300, 1200, 2400	300, 1200, 2400, 4800, 9600, 19.2K
Communications Features	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, unattended execution	Auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	295-195	295-110	Vendor did not specify	795
Host Software/Hardware (\$)	8,000-6,400	8,000-6,400	Vendor did not specify	Vendor did not specify
Date of First Delivery	May 1989	November 1989	March 1987	June 1983
Number Installed to Date	250	Two	300	Over 2,000
Warranty	1 year	1 year	Vendor did not specify	90 days
Distribution	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail	Direct	Direct, OEMs, VARs
Comments	—	Supports IBM's office and PC Support 400 over a public data network	—	Supports PC-to-PC Bisync 3780 communications

Vendor	Passport Communications, Inc.	Passport Communications, Inc.	Passport Communications, Inc.	Passport Communications, Inc.
Product	Bisync Exchange/II	Gateway Exchange	Gateway Exchange/II	Modem Exchange
Specifications				
Product Function	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation
Users Supported	Single user	Multuser	Multuser	Single user
Components	Microcomputer hardware & software	Vendor did not specify	Microcomputer hardware & software	Microcomputer hardware & software
Copy Protected Microcomputers Supported	No IBM, PS/2 MCA	No IBM, PC/XT/AT & compatibles, PS/2 non-MCA	No IBM, PS/2 MCA	No IBM, PC/XT/AT & compatibles, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	ARCnet, STARLAN, NetBios-compatible	ARCnet, STARLAN, NetBios-compatible	Vendor did not specify
Minimum Memory Required (bytes)	256K	128K at server, 256K at workstation	128K at server, 256K at workstation	256K
Terminals/Controllers Emulated	IBM, 2780/3780	IBM, 327X/317X DFT, RJE 3770	IBM, 327X/317X DFT, RJE 3777-1	IBM, 327X/317X DFT, IBM 3777-1
User Interface	Install program	Install program, diagnostics	Install program, diagnostics	Install program, diagnostics
Programmability API Compatibility	No Proprietary	No Proprietary	No Proprietary	No Proprietary
Microcomputer Security	Interface to host software	Interface to host software	Interface to host software	Interface to host software
Number of Concurrent Sessions	1	64	64	8
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
Host Interface				
Systems Supported	IBM, 43XX/30XX, System/36/38; Data General Honeywell Bull; DECVAX; HP Unisys	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, 43XX/30XX
Software Environment	Any BSC Fep	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	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, SDLC	SNA, SDLC	SNA, SDLC, RJE 3770
Applications Supported	None	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	300, 1200, 2400, 4800, 9600, 19.2K	1200, 2400, 4800, 9600, 14.4K, 19.2K	1200, 2400, 4800, 9600, 14.4K, 19.2K	4800
Communications Features	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros	Auto dial/redial, auto answer, macros	Dial directory, auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Software/Hdwre (\$)	895	1,995	2,495	1,595
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	December 1987	July 1987	December 1987	December 1987
Number Installed to Date	Vendor did not specify	Over 300	Over 50	Over 100
Warranty	90 days	90 days	90 days	90 days
Distribution	Direct, OEMs, VARs	Direct, OEMs	Direct, OEMs, VARs	Direct, OEMs, VARs
Comments	Supports PC-to-PC Bisync 3780 connectivity	—	—	Product includes both 3270 and 3770 RJE emulation

Vendor	Passport Communications, Inc.	Passport Communications, Inc.	Passport Communications, Inc.	Passport Communications, Inc.
Product	Modem Exchange/II BSC 3780	Modem Exchange/II	SNA Exchange	SNA Exchange/II
Specifications				
Product Function	Remote terminal emulation	Remote terminal emulation	Remote terminal emulation, non-host app. spfc. link	Remote terminal emulation, non-host app. spfc. link
Users Supported	Single user	Single user	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software
Copy Protected	No	No	No	No
Microcomputers Supported	IBM, PS/2 MCA	IBM, PS/2 MCA	IBM, PC/XT/AT & compatibles, PS/2 non-MCA	IBM, PS/2 MCA
Operating Systems Supported	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 (bytes)	256K	256K	256K	256K
Terminals/Controllers Emulated	IBM, 2780/3780	IBM, 327X/317X DFT, IBM 3777-1	IBM, 327X/317X DFT, IBM 3777-1	IBM, 327X/317X DFT, IBM 3777-1
User Interface	Install program	Install program, diagnostics	Install program, diagnostics	Install program, diagnostics
Programmability	No	No	No	No
API Compatibility	Proprietary	Proprietary	Proprietary	Proprietary
Microcomputer Security	Interface to host software	Interface to host software	Interface to host software	Interface to host software
Number of Concurrent Sessions	1	8	8	8
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
Host Interface				
Systems Supported	IBM, 43XX/30XX, System/36/38; Data General Honeywell Bull; DECVAX; HP Unisys	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, 43XX/30XX
Software Environment	Any SBC Fep	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP	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, SDLC, RJE 3770	SNA, SDLC, RJE 3770	SNA, SDLC, RJE 3770
Applications Supported	None	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	4800	4800	1200, 2400, 4800, 9600, 14.4K, 19.2K	1200, 2400, 4800, 9600, 14.4K, 19.2K
Communications Features	Auto dial/redial, auto answer, unattended execution	Dial directory, auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	1,795	1,995	895/395	995
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	February 1988	December 1987	May 1984	August 1987
Number Installed to Date	Over 50	Over 100	Over 5,000	Unknown
Warranty	90 days	90 days	90 days	90 days
Distribution	Direct, OEMs, VARs	Direct, OEMs, VARs	Direct, OEMs, VARs	Direct, OEMs, VARs
Comments	Supports PC-to-PC Bisync 3780 connectivity	Product includes both 3270 and 3770 RJE emulation	This product provides both 3270 emulation and 3770 RJE emulation	Product includes both 3270 and 3770 RJE emulation

Vendor	Performance Software Inc.	Persoft, Inc.	Persoft, Inc.	Persoft, Inc.
Product	MasterLink	SmarTerm 240	SmartMove	SmartTerm 320
Specifications				
Product Function	Non-host app. spfc. link	Local terminal emulation	Local terminal emulation	Local terminal emulation
Users Supported	Multiuser; unlimited	Single user, multiuser; 5	Single user	Single user, multiuser
Components	Microcomputer software, host software	Microcomputer software	Microcomputer software	Microcomputer software
Copy Protected Microcomputers Supported	No Macintosh, IBM, PC/XT/AT & compatibles, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	Macintosh Finder, MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, AppleTalk, STARLAN	Ethernet, IBM Token-Ring, STARLAN	Ethernet, IBM Token-Ring, STARLAN	Ethernet, IBM Token-Ring, STARLAN
Minimum Memory Required (bytes)	256K	400K	320K	256K
Terminals/Controllers Emulated	Vendor did not specify	TTY, DEC, VT52/100, VT200 Series, VT300 Series	TTY, DEC, VT52/100	TTY, DEC, VT52/100, VT200 Series, VT300 Series
User Interface	Install program, on-line help/tutor, mouse, graphic icons pop-up windows, diagnostics	Install program, on-line help, pop-up windows	On-line help, pop-up windows	Install program, on-line help, pop-up windows
Programmability API Compatibility	Yes IBM API, DCA IRMA API	Yes Vendor did not specify	Yes Vendor did not specify	Yes Vendor did not specify
Microcomputer Security	Password protection, interface to host software	Interface to host software	Vendor did not specify	Interface to host software
Number of Concurrent Sessions	Vendor did not specify	Four	One	Four
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII	ASCII, binary
File Conversion	Yes	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX; Unisys	Vendor did not specify	Vendor did not specify	Vendor did not specify
Software Environment	IBM, DOS, OS/VS, MVS	Vendor did not specify	Vendor did not specify	Vendor did not specify
Protocols	BSC, SNA, SDLC, TCP/IP	Vendor did not specify	Vendor did not specify	Vendor did not specify
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	Coax, RS-232-C	Twinax, coax, RS-232-C	Twinax, coax, RS-232-C	Twinax, coax, RS-232-C
Transmission Mode	Asynchronous, synchronous	Asynchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	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
Communications Features	Dial directory, auto dial/redial, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros, unattended execution	Auto dial/redial, auto answer, macros
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	Contact vendor	345-1495	149	195-825
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	January 1985	January 1986	October 1987	September 1989
Number Installed to Date	500	Vendor did not specify	Vendor did not specify	Vendor did not specify
Warranty	1 year	30 days	30 days	30 days
Distribution	Direct	Direct, dist., dlrs, retail, mail, OEMs, VARs	Direct, dist., dlrs, retail, mail, OEMs, VARs	Direct, dist., dlrs, retail, mail, OEMs, VARs
Comments	—	—	—	—

Vendor	Persoft, Inc.	Persoft, Inc.	POINT 4 Data Corp.	Rabbit Software Corp.
Product	SmartTerm 400	SmartTerm 470	PC Answer	RabbitGATE II BSC
Specifications				
Product Function	Local terminal emulation	Local terminal emulation	Local terminal emulation, host app. spfc. link	Remote terminal emulation, network gateway
Users Supported	Single user	Single user	Multuser; up to 128	Single user, multuser; 32
Components	Microcomputer software, host software	Microcomputer software, host software	Microcomputer software	Microcomputer hardware & 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	IBM, PC/XT/AT & compatibles	IBM, PC/XT/AT & compatibles, PS/2 non-MCA
Operating Systems Supported	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	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NETBIOS or Novell IPX
Minimum Memory Required (bytes)	320K	384K	256K	Gateway 52K, workstation 126K
Terminals/Controllers Emulated	TTY; DG	TTY; DG	DEC, VT52/100, VT200 Series, VT300 Series	IBM, 327X/317X DFT
User Interface	Install program, on-line help	Install program, on-line help	Install program, on-line help, on-line tutor.	Install program, on-line help, pop-up windows, diags., line/gateway monitor
Programmability	Vendor did not specify	Vendor did not specify	Yes	Yes
API Compatibility	Vendor did not specify	Vendor did not specify	Proprietary	IBM API, proprietary
Microcomputer Security	Vendor did not specify	Vendor did not specify	Password protection, interface to host software	Vendor did not specify
Number of Concurrent Sessions	One	Vendor did not specify	Vendor did not specify	8 per workstation, 512 per LAN
DOS Access During Session	Yes	Yes	No	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII	ASCII, binary
File Conversion	No	No	Yes	Yes
Host Interface				
Systems Supported	Data General	Data General MV series	Point 4 Iris System	IBM, 43XX/30XX, System/36/38, AS/400
Software Environment	DG OAS, AOS/VS, RDCS	AOS/VS, RDCS	Iris	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	Vendor did not specify	Vendor did not specify	Vendor did not specify	BSC
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Asynchronous	Asynchronous	Asynchronous	Synchronous
Transmission Speed (bps)	300, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800	19.2K
Communications Features	Dial directory, macros, unattended execution	Dial directory, auto dial/redial, macros, unattended execution	Vendor did not specify	Macros
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	175	295	1,800 software	Contact vendor
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	January 1983	June 1989	June 1986	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	30 days	30 days	90 days	1 year
Distribution	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail	Dist., dlrs, retail, VARs	Direct, dist., dlrs, retail, mail, OEMs, VARs
Comments	—	—	—	Toll free number 1 (800) RABBITC

Vendor	Rabbit Software Corp.	Rabbit Software Corp.	Rabbit Software Corp.	Rabbit Software Corp.
Product	RabbitGATE II DFT	RabbitGATE II DFT 3299	RabbitGATE II SNA	RabbitGATE Token-Ring
Specifications				
Product Function	Remote terminal emulation, network gateway	Remote terminal emulation, network gateway	Remote terminal emulation, network gateway	Remote terminal emulation
Users Supported	Single user, multiuser; 5	Single user, multiuser; 40	Single user, multiuser; 64	Single user, multiuser; 128
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer 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
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NETBIOS or Novell IPX	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NETBIOS or Novell IPX	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NETBIOS or Novell IPX	ARCnet, Ethernet, IBM Token-Ring, STARLAN, NETBIOS or Novell IPX
Minimum Memory Required (bytes)	Gateway 94K, workstation 126K	126K	Gateway 52K, workstation 126K	256K
Terminals/Controllers Emulated	IBM, 327X/317X DFT	IBM, 327X/317X DFT	IBM, 327X/317X DFT	IBM, 327X/317X DFT
User Interface	Install program, on-line help, help, pop-up windows, diags., line/gateway monitor	Install program, on-line help, pop-up windows	Install program, on-line help, pop-up windows, diags., line/gateway monitor	Install program, on-line help/tutor., mouse, graphic icons, pop-up windows, diags.
Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, proprietary	IBM API, proprietary	IBM API, proprietary	IBM API
Microcomputer Security	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Number of Concurrent Sessions	8 per workstation, 80 per LAN	8 per workstation, 640 per LAN	8 per workstation, 1,024 per LAN	8 per workstation; 2,048 per 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	Yes	Yes	Yes	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX, System/36/38, AS/400	IBM, 43XX/30XX	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, 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, DFT (SNA)	SNA, DFT-3299 (SNA)	SNA, SDLC	SNA, token ring (SNA)
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	Coax	Coax	RS-232-C	Token ring
Transmission Mode	Vendor did not specify	Vendor did not specify	Synchronous	Vendor did not specify
Transmission Speed (bps)	2.4M	2.4M	64K	4M, 16M
Communications Features	Vendor did not specify	Macros	Macros	Macros
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	Contact vendor	Contact vendor	Contact vendor	Contact vendor
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
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	Vendor did not specify
Distribution	Direct, dist., dirs, retail, OEMs, VARs	Direct, dist., dirs, retail, OEMs, VARs	Direct, dist., dirs, retail, OEMs, VARs	Direct, dist., dirs, retail, OEMs, VARs
Comments	—	Toll free number 1 (800) RABBITC	Toll free number 1 (800) RABBITC	Toll free number 1 (800) RABBITC

Vendor	Rabbit Software Corp.	Rabbit Software Corp.	Rabbit Software Corp.	Rabbit Software Corp.
Product	RabbitPLUS 3270 BSC	RabbitPLUS 3270 SNA	RabbitPLUS APPC	RabbitPLUS RJE BSC
Specifications				
Product Function	Non-host app. spfc. link	Non-host app. spfc. link	Vendor did not specify	Non-host app. spfc. link
Users Supported	Multuser; up to 32	Multuser; up to 32	Multuser; unlimited	Multuser; unlimited
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software
Copy Protected	No	No	No	No
Microcomputers Supported	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, any 386	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, any 386 based system	IBM, PS/2 MCA, PS/2 non-MCA, any 386	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, any 386
Operating Systems Supported	UNIX, AIX	Vendor did not specify	UNIX, Xenix, AIX	UNIX, Xenix, AIX
Local Area Network Support	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	1.5M	1.5M	1.5M	1.5M
Terminals/Controllers Emulated	IBM, 327X/317X DFT	IBM, 327X/317X DFT	Vendor did not specify	IBM, 2780/3780
User Interface	On-line help, pop-up windows, diagnostics	Install program, on-line help, diagnostics	Diagnostics	On-line help, diagnostics
Programmability	Yes	Yes	Yes	No
API Compatibility	IBM API, proprietary	IBM API, proprietary	IBM LU 6.2	Vendor did not specify
Microcomputer Security	Transmission encryption, password protection, interface to host software	Transmission encryption, password protection, interface to host software	Interface to host software	Vendor did not specify
Number of Concurrent Sessions	Up to 32	Up to 32	32	1
DOS Access During Session	Vendor did not specify	No	Vendor did not specify	Vendor did not specify
File Transfer	Yes	Yes	Vendor did not specify	Yes
File Formats	ASCII, binary	ASCII, binary	Vendor did not specify	ASCII, binary
File Conversion	Yes	Vendor did not specify	Vendor did not specify	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX, System/36/38, AS/400	IBM, 43XX/30XX, System/36/38, AS/400 UNIX-based systems, any machine supporting LU6.2	IBM, 43XX/30XX, any system supporting 2780/3780 protocols
Software Environment	IBM, DOS, MVS, VM, TSO, CMS, IMS, CICS	IBM, DOS, MVS, VM, TSO, CMS, IMS, CICS	CICS, any software supporting LU6.2	JES/2 power
Protocols	BSC	SNA, SDLC, QLLC (X.25)	SNA, SDLC, QLLC (X.25)	BSC
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Vendor did not specify
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Synchronous	Synchronous
Transmission Speed (bps)	4800, 9600, 19.2K	4800, 9600, 19.2K	4800, 9600, 19.2K	9600
Communications Features	Auto answer, unattended execution	Vendor did not specify	Auto answer	Auto answer
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	1,795 to 2,995 software 200 hardware	1,795 to 2,995 software 200 hardware	3,195 software; 200 hardware	1,095 software; 200 hardware
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
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	Vendor did not specify	1 year	1 year
Distribution	Direct, dist., dirs, retail, OEMs, VARs	Direct, dist., dirs, retail, OEMs, VARs	Direct, dist., dirs, retail, OEMs, VARs	Direct, dist., dirs, retail, OEMs, VARs
Comments	UNIX access supported; toll free number 1 (800) RABBITC	UNIX access during session toll-free phone number 1 (800) RABBITC	UNIX access supported; toll free number 1 (800) RABBITC	—

Vendor	Rabbit Software Corp.	Rabbit Software Corp.	Rabbit Software Corp.	Rabbit Software Corp.
Product	RabbitPLUS RJE SNA	RabbitSTATION DFT	RabbitSTATION Remote SNA/BSC	RabbitSTATION Token-Ring
Specifications				
Product Function	Vendor did not specify	Local/remote terminal emulation	Remote terminal emulation	Vendor did not specify
Users Supported	Multiuser; unlimited	Single user	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer hardware & software	Microcomputer software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA, any 386	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	UNIX, Xenix, AIX	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 (bytes)	1.5M	150K	82K	Vendor did not specify
Terminals/Controllers Emulated	3770	IBM, 327X/317X DFT	IBM, 327X/317X DFT	IBM, 327X/317X DFT
User Interface	On-line help, diagnostics	Install program, on-line help, graphic icons, pop-up windows, diagnostics	Install program, on-line help, graphic icons, pop-up windows, diagnostics	Install program, on-line help/tutor, mouse, graphic icons, pop-up windows, diagnostics
Programmability API Compatibility	Vendor did not specify Vendor did not specify	Yes IBM API, proprietary	Yes IBM API, proprietary	Yes IBM API, proprietary
Microcomputer Security	Vendor did not specify	Interface to host software	Interface to host software	Vendor did not specify
Number of Concurrent Sessions	6	5 host, 1 DOS, 1 notepad	8 host, 1 DOS, 1 notepad	8
DOS Access During Session	Vendor did not specify	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
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	IBM, 43XX/30XX, System/36/38, AS/400	IBM, 43XX/30XX, System/36/38, AS/400
Software Environment	JES and power	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, OS/400	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS
Protocols	SDLC, QLLC (SNA)	DFT (SNA)	BSC, SNA, SDLC	SNA, token ring (SNA)
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C	Coax	RS-232-C	Token ring
Transmission Mode	Synchronous	Vendor did not specify	Synchronous	Vendor did not specify
Transmission Speed (bps)	4800, 9600, 19.2K	Vendor did not specify	64K (SNA/SDLC), 19.2K (BSC)	4M, 16M
Communications Features	Auto answer	Macros, unattended execution	Macros, unattended execution	Macros
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	1,095 software; 200 hardware	Contact vendor	Contact vendor	Contact vendor
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
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	Vendor did not specify
Distribution	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, mail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs
Comments	UNIX access supported; toll free number 1 (800) RABBITC	Toll free number 1 (800) RABBITC	Toll free number 1 (800) RABBITC	—

Vendor	The Santa Cruz Operation, Inc.	Simware Inc.	Simware Inc.	Softel Inc.
Product	SCO uniPATH SNA-3270	SimMac	SimPC Master/SimPC	PC 52
Specifications				
Product Function	Remote terminal emulation, network gateway	Local/remote terminal emulation, standalone protocol converter, host app. spfc. link	Local/remote terminal emulation, standalone protocol converter, host app. spfc. link	Remote terminal emulation
Users Supported	Single user, multiuser; 32	Single user	Vendor did not specify	Multiuser; dependent on hardware
Components	Microcomputer hardware & software	Microcomputer software	Microcomputer software	Microcomputer software
Copy Protected Microcomputers Supported	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No Macintosh	No IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	No IBM
Operating Systems Supported	UNIX, Xenix	Macintosh Finder	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	AppleTalk	ARCnet, Ethernet, IBM Token-Ring, NETBIOS compatible	X.25
Minimum Memory Required (bytes)	20K	585K	384K	128K
Terminals/Controllers Emulated	IBM, 327X/317X CUT	TTY, IBM, 327X/317X CUT	TTY, IBM, 327X/317X CUT, DEC, VT52/100, 50 different terminal emulators and user definables	DEC, VT52/100
User Interface	Install program, on-line help, pop-up windows, diagnostics	Mouse, graphic icons, pop-up windows, diagnostics	Install program, on-line help, mouse, pop-up windows, diagnostics	Vendor did not specify
Programmability API Compatibility	Yes Proprietary	Yes Vendor did not specify	Yes IBM API, proprietary	No Vendor did not specify
Microcomputer Security	Password protection	Password protection, interface to host software	Password protection, interface to host software	Provided by minicomputer
Number of Concurrent Sessions	32	12	12	Dependent on hardware
DOS Access During Session	Yes	Not applicable	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII
File Conversion	Yes	Yes	Yes	No
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX, IBM 370 class	IBM, 43XX/30XX, IBM 370 class mainframes	UNIX-based systems
Software Environment	IBM, DOS, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400	IBM, MVS, VM, TSO, CMS, CICS	IBM, MVS, VM, TSO, CMS, CICS	UNIX System 5
Protocols	SNA, SDLC	BSC, SNA, SDLC, asynchronous	BSC, SNA, SDLC, TCP/IP, asynchronous or X.25	X.25
Applications Supported	IND\$FILE	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	RS-232-C	Twinax, coax, RS-232-C, asynchronous	Coax, RS-232-C, async	RS-232-C, TILL X.25 board
Transmission Mode	Synchronous	Asynchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	2400, 4800, 9600, 14.4K, 19.2K	300, 600, 1200, 2400, 4800, 9600	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	Up to 56K
Communications Features	Dial directory, auto dial/redial, auto answer, macros, unattended execution	Dial directory, auto dial/redial, auto answer, macros, unattended execution	Dial directory, auto dial/redial, auto answer, macros, unattended execution	Remote command execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	995 to 2,295 software, 495 hardware	Contact vendor	Contact vendor	149
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	N/A
Date of First Delivery	November 1986	January 1988	July 1984	September 1985
Number Installed to Date	2,500	15,000	400,000	Over 15,000
Warranty	30 days	1 year	1 year	1 year
Distribution	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail	OEMs
Comments	—	—	—	DOS-to-Unix terminal emulator

Vendor	Softel Inc.	Software Clearing House, Inc.	Software Corp. of America	Software Synergy, Inc.
Product	PC52 VI	Microlink	Gateway PC	Respond/Async
Specifications				
Product Function	Remote terminal emulation	Local/remote terminal emulation	Local/remote terminal emulation, non-host app. spfc. link	Remote terminal emulation
Users Supported	Multuser	Multuser; unlimited	Single user	Single user
Components	Microcomputer software	Microcomputer software, host software	Microcomputer software, host software	Microcomputer software
Copy Protected Microcomputers Supported	No IBM PC/XT/AT & compatibles	No IBM, PC/XT/AT & compatibles	No IBM, PC/XT/AT & compatibles, PS/2 non-MCA	No IBM, PC/XT/AT & compatibles
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	OS/2, MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	STARLAN	None	Ethernet, IBM Token-Ring, STARLAN, IBM compatibles	Vendor did not specify
Minimum Memory Required (bytes)	128K	512K	18K	256K
Terminals/Controllers Emulated	VT52/100	NCR	TTY, IBM, 327X/317X DFT, 327X/317X CUT, DEC, VT52/100, VT200 Series, Tymnet 78, 3101 block and char, X.25	TTY, DEC, VT52/100; HP, IBM 3101
User Interface	Vendor did not specify	Install program, on-line help, graphic icons, diagnostics	Install program, on-line help, pop-up windows, diagnostics	On-line help, on-line tutor.
Programmability API Compatibility	No Vendor did not specify	Yes Vendor did not specify	Yes IBM API	Yes Vendor did not specify
Microcomputer Security	Vendor did not specify	Password protection, interface to host software	File encryption, interface to host software	Vendor did not specify
Number of Concurrent Sessions	Limited only by UNIX	Unlimited	Vendor did not specify	1
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII	ASCII	ASCII, binary	ASCII, binary
File Conversion	Vendor did not specify	Vendor did not specify	Yes	Yes
Host Interface				
Systems Supported	AT&T 3B2 & 386	NCR ITX VRX	IBM, 43XX/30XX	Vendor did not specify
Software Environment	UNIX System 5	NCR ITX VRX	IBM, VM, CICS	Vendor did not specify
Protocols	Vendor did not specify	Vendor did not specify	SNA, SDLC	Vendor did not specify
Applications Supported	Access to host-resident programs	Vendor did not specify	Access to host-resident programs	None
Communications Characteristics				
Physical Connection	RS-232-C	RS-232-C	Coax	RS-232-C
Transmission Mode	Asynchronous	Asynchronous	Asynchronous, synchronous	Asynchronous
Transmission Speed (bps)	Up to 56K	19.2K	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K	300, 1200, 2400, 4800, 9600
Communications Features	Vendor did not specify	Dial directory, auto dial/redial, macros, unattended execution	Dial directory, auto dial/redial, macros, unattended execution	Dial directory, auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	99	1,600-6,400	350 per PC for software	129
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	9,000 for host software	Vendor did not specify
Date of First Delivery	December 1985	January 1983	May 1985	November 1985
Number Installed to Date	10,000	422	Over 100,000	3,000
Warranty	Vendor did not specify	30 days	30 days	90 days
Distribution	OEMs	Direct	Direct, dist., dlrs, retail, OEMs, VARs	Direct, mail, OEMs
Comments	—	—	Volume and LAN discounts available	—

Vendor	Sterling Software, Systems Software Division	Sterling Software, Systems Software Division	Structured Software Solutions Inc.	Synex Systems Corp.
Product	PC-Tracs 3770	PC-Tracs 3780	Facet/PC	PK Harmony
Specifications				
Product Function	Remote terminal emulation	Remote terminal emulation	Local/remote terminal emulation	Local/remote terminal emulation
Users Supported	Single user	Single user	Vendor did not specify	Single user, multiuser; Up to 15
Components	Microcomputer software	Microcomputer software	Microcomputer software, host software	Microcomputer software, host software
Copy Protected	No	No	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	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA	IBM, PC/XT/AT & compatibles, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS, UNIX, Xenix, Pick O/S
Local Area Network Support	Vendor did not specify	Vendor did not specify	Vendor did not specify	Ethernet, IBM Token-Ring, STARLAN, Novell
Minimum Memory Required (bytes)	200K plus DOS requirement	200K plus DOS requirement	250K	384K
Terminals/Controllers Emulated	IBM 377X	IBM 3780	DEC, VT200 Series	TTY, DEC, VT52/100, VT200 Series, VT300 Series, Wyse 50, Adds Viewpoint
User Interface	On-line help	Diagnostics	Pop-up windows	Install program, on-line help
Programmability	Yes	Vendor did not specify	Yes	Yes
API Compatibility	Proprietary	Vendor did not specify	Vendor did not specify	Proprietary
Microcomputer Security	Interface to host software	Interface to host software	Password protection, interface to host software	Password protection
Number of Concurrent Sessions	5	1	10	2
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	Vendor did not specify	Yes
Host Interface				
Systems Supported	IBM, 43XX/30XX	IBM, 43XX/30XX	UNIX-based systems	IBM, System/36/38 Honeywell Bull; UNIX-based systems
Software Environment	IBM, DOS, OS/VS, MVS, VM	IBM, DOS, OS/VS, MVS, VM	UNIX System 5	Pick O/S
Protocols	SNA, SDLC	BSC	TCP/IP	SNA, TCP/IP
Applications Supported	Access to host-resident programs	Access to host-resident programs	All Unix applications	Vendor did not specify
Communications Characteristics				
Physical Connection	RS-232-C, twisted pair	RS-232-C, twisted pair	RS-232-C	RS-232-C
Transmission Mode	Synchronous	Synchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	2400, 4800, 9600	2400, 4800, 9600	300, 600, 1200, 2400, 4800, 9600, 19.2K	300, 600, 1200, 2400, 4800, 9600
Communications Features	Dial directory, auto dial/redial, auto answer, unattended execution	Dial directory, auto dial/redial, auto answer, unattended execution	Vendor did not specify	Dial directory, auto dial/redial, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	1,000	1,000	150	595
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	895	Vendor did not specify
Date of First Delivery	June 1986	February 1983	January 1986	Vendor did not specify
Number Installed to Date	1,100	1,425	1,000	10,000
Warranty	90 days	90 days	90 days	30 days
Distribution	Direct, VARs	Direct, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, mail, VARs
Comments	—	—	—	—

Vendor	Synex Systems Corp.	Tangram Systems Corp.	Tymnet/McDonnell Douglas	Universal Data Systems
Product	PK Term	Arbiter	EZTym	Sync-Up BSC Software
Specifications				
Product Function	Remote terminal emulation, network gateway	Local/remote terminal emulation, host app. spfc. link	Remote terminal emulation	Remote terminal emulation
Users Supported	Single user, multiuser unlimited	Multiuser	Single user	Single user
Components	Microcomputer hardware & software	Microcomputer software, host software	Microcomputer software	Microcomputer 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	IBM, PC/XT/AT & compatibles, PS/2 MCA, PS/2 non-MCA
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	ARCnet, Ethernet, IBM Token-Ring, STARLAN, any NetWare or NetBios compatible	Ethernet, IBM Token-Ring	Vendor did not specify	Vendor did not specify
Minimum Memory Required (bytes)	640K	640K	Vendor did not specify	Vendor did not specify
Terminals/Controllers Emulated	IBM, 5250 Series	IBM, 327X/317X CUT, DEC, VT52/100	TTY, IBM, 327X/317X CUT, DEC, VT52/100, VT200 Series	IBM, 2780/3780
User Interface	Install program, diagnostics	Install program, on-line help	Install program, on-line help, on-line tutor.	Install program, on-line help
Programmability	Yes	Yes	Yes	Yes
API Compatibility	IBM API, IBM LU 6.2, proprietary	DCA IRMA API, IBM LU 6.2	IBM API	Vendor did not specify
Microcomputer Security	Password protection	Interface to host software	Vendor did not specify	Vendor did not specify
Number of Concurrent Sessions	254 per gateway, 9 per workstation	1	15	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
File Conversion	Yes	Yes	No	Vendor did not specify
Host Interface				
Systems Supported	IBM, System/36/38, AS/400	IBM, 43XX/30XX	IBM, 43XX/30XX, System/36/38, AS/400; Data General; DEC/VAX; HP; Unisys	Vendor did not specify
Software Environment	IBM, SSP, OS/400, IBM CPF	IBM, MVS, VM	IBM, OS/VS, MVS, VM, TSO, CMS, IMS, CICS, SSP, OS/400; VAX/VMS	Vendor did not specify
Protocols	SNA, HDLC, SDLC	BSC, SNA, SDLC	BSC, HDLC, SDLC	BSC
Applications Supported	Host virtual disk, access to host-resident programs	Host virtual disk, access to host-resident programs, file transfer	Vendor did not specify	Vendor did not specify
Communications Characteristics				
Physical Connection	RS-232-C	Coax, RS-232-C	RS-232-C	Vendor did not specify
Transmission Mode	Synchronous	Synchronous	Asynchronous	Synchronous
Transmission Speed (bps)	Up to 128 kbps	Depends on connection	300, 1200, 2400, 9600	Vendor did not specify
Communications Features	Dial directory, auto dial/redial, auto answer, unattended execution	Unattended execution	Dial directory	Dial directory, auto dial/redial, auto answer
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	2,050/1,145	Vendor did not specify	Vendor did not specify	325
Host Software/Hardware (\$)	Vendor did not specify	30,000 to 60,000 software	Vendor did not specify	Vendor did not specify
Date of First Delivery	November 1987	September 1986	May 1987	January 1985
Number Installed to Date	1,000	250	100,000	10,000
Warranty	90 days, 1 year	Vendor did not specify	90 days	1 year
Distribution	Dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs	Direct	Direct, dist., dlrs, retail, OEMs
Comments	—	—	—	—

Vendor	Universal Data Systems	Universal Data Systems	Walker Richer & Quinn, Inc.	Walker Richer & Quinn, Inc.
Product	Sync-Up SNA 3270 Software	Sync-Up SNA 5251 Software	Reflection 1 PLUS	Reflection 2 PLUS
Specifications				
Product Function	Remote terminal emulation	Remote terminal emulation	Local terminal emulation	Local terminal emulation
Users Supported	Single user	Single user	Single user	Single user, multiuser
Components	Microcomputer software	Microcomputer software	Microcomputer software, host software	Microcomputer software, host software
Copy Protected	Yes	Yes	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
Operating Systems Supported	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS	MS-/PC-DOS
Local Area Network Support	Vendor did not specify	Vendor did not specify	ARCnet, Ethernet, IBM Token-Ring, STARLAN	ARCnet, Ethernet, IBM Token-Ring, STARLAN
Minimum Memory Required (bytes)	Vendor did not specify	Vendor did not specify	150K	140K
Terminals/Controllers Emulated	IBM, 327X/317X DFT, 327X/317X CUT	IBM, 5250 Series	DEC, VT52/100, VT200 Series; HP	DEC, VT52/100, VT200 Series, VT300 Series, VT320, VT220, Tektronix 4014
User Interface	Install program, on-line help	Install program, on-line help	Install program, on-line help, diagnostics	Install program, on-line help
Programmability	Yes	Vendor did not specify	Yes	Yes
API Compatibility	Vendor did not specify	Vendor did not specify	Proprietary	Proprietary
Microcomputer Security	Vendor did not specify	Vendor did not specify	File encryption	File encryption, password protection
Number of Concurrent Sessions	Vendor did not specify	Vendor did not specify	Up to 8	Up to 8
DOS Access During Session	Yes	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes	Yes
File Formats	Binary	Binary	ASCII, binary	ASCII, binary
File Conversion	Vendor did not specify	Vendor did not specify	No	No
Host Interface				
Systems Supported	Vendor did not specify	Vendor did not specify	DEC/VAX; HP; UNIX-based systems	DEC/VAX; UNIX-based systems, UNIX, Ultrix
Software Environment	Vendor did not specify	Vendor did not specify	VAX/VMS; UNIX System 5 Berkeley 4.X, HP MPE, HP MPE-XL, SUN OS, HP-UX, Ultrix	VAX/VMS; UNIX System 5, UNIX, Ultrix, Xenix, SUN OS, HP-UX
Protocols	SNA, SDLC	SNA, SDLC	TCP/IP, DEC LAT	TCP/IP, LAT
Applications Supported	Vendor did not specify	Vendor did not specify	Access to host-resident programs	Access to host-resident programs
Communications Characteristics				
Physical Connection	Vendor did not specify	Vendor did not specify	Coax, RS-232-C	Coax, RS-232-C
Transmission Mode	Synchronous	Synchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	Vendor did not specify	Vendor did not specify	300, 1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 38.4K
Communications Features	Dial directory, auto dial/redial, auto answer	Dial directory, auto dial/redial, auto answer	Macros, unattended execution	Macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	525	525	349	249 (sgl. copy list), 199 Reflection 2 (non-PLUS)
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Software included with micro
Date of First Delivery	March 1985	January 1986	Vendor did not specify	March 1986
Number Installed to Date	10,000	5,000	250,000	153,000
Warranty	1 year	1 year	Vendor did not specify	90 days
Distribution	Direct, dist., dlrs, retail, OEMs	Direct, dist., dlrs, retail, OEMs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs
Comments	—	—	—	Related software packages available for further PC-to-VAX connectivity

Vendor	Walker Richer & Quinn, Inc.	Walker Richer & Quinn, Inc.	Walker Richer & Quinn, Inc.	Walker Richer & Quinn, Inc.
Product	Reflection 3 Macintosh	Reflection 4 PLUS	Reflection 7 PLUS	Reflection 1 Macintosh
Specifications				
Product Function	Local terminal emulation	Local terminal emulation	Local terminal emulation	Local terminal emulation
Users Supported	Single user, multiuser	Single user, multiuser	Single user, multiuser	Single user, multiuser
Components	Microcomputer software	Microcomputer software, host software	Microcomputer software, host software	Microcomputer software, host software
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, PS/2 non-MCA	Macintosh
Operating Systems Supported	Macintosh Finder	MS-/PC-DOS	MS-/PC-DOS	Macintosh Finder
Local Area Network Support	AppleTalk	Ethernet, IBM Token-Ring, STARLAN	ARCnet, Ethernet, IBM Token-Ring, STARLAN	AppleTalk
Minimum Memory Required (bytes)	350K	240K	289K	320K
Terminats/Controllers Emulated	TTY; HP	DEC, VT52/100, VT200 Series, VT300 Series, Tektronix 4014	DEC, VT52/100, VT200 Series, VT300 Series; HP	TTY; HP
User Interface	On-line help, mouse, graphic icons, pop-up windows, diagnostics	Install program, on-line help, mouse	Install program, on-line help, mouse, diagnostics	On-line help, mouse, graphic icons, pop-up windows, diagnostics
Programmability	Yes	Yes	Yes	Yes
API Compatibility	Vendor did not specify	DCA IRMA API, proprietary	Proprietary	Vendor did not specify
Microcomputer Security	Vendor did not specify	File encryption, password protection	File encryption, password protection	Vendor did not specify
Number of Concurrent Sessions	1	Up to 8	Up to 8	1
DOS Access During Session	No	Yes	Yes	Not applicable
File Transfer	Yes	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII, binary	ASCII, binary	ASCII, binary
File Conversion	No	No	No	No
Host Interface				
Systems Supported	DEC/VAX; HP; UNIX-based systems	DEC/VAX; UNIX-based systems	DEC/VAX; HP; UNIX-based systems	DEC/VAX; HP; UNIX-based systems
Software Environment	UNIX System 5; Berkeley 4.X, HP MPE, HP MPE-XL, Ultrix, SUN OS, HP-UX, Xenix	IBM, DOS; VAX/VMS; UNIX System 5; Berkeley 4.X, UNIX, Ultrix	VAX/VMS; UNIX System 5 Berkeley 4.X, HP MPE, HP MPE-XL, HP-UX	VAX/VMS; UNIX System 5 Berkeley 4.X, HP MPE, HP MPE-XL, Ultrix, SUN OS, HP-UX, Xenix
Protocols	Vendor did not specify	TCP/IP	DEC LAT	Vendor did not specify
Applications Supported	Access to host-resident programs	Access to host-resident programs	Access to host-resident programs	Vendor did not specify
Communications Characteristics				
Physical Connection	RS-232-C, AppleTalk	Coax, RS-232-C	Coax, RS-232-C	RS-232-C, AppleTalk
Transmission Mode	Asynchronous	Asynchronous	Asynchronous	Asynchronous
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K	300, 600, 1200, 2400, 4800, 9600, 14.4K, 19.2K, 38.4K	300, 600, 1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K	300, 600, 1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K
Communications Features	Macros, unattended execution	Macros, unattended execution	Macros, unattended execution	Macros, unattended execution
Pricing and Availability				
Microcomputer Sftwre/Hdwre (\$)	399	349	449	299, quality discounts available
Host Software/Hardware (\$)	Vendor did not specify	Software included with micro	Vendor did not specify	Vendor did not specify
Date of First Delivery	Vendor did not specify	May 1988	Vendor did not specify	Vendor did not specify
Number Installed to Date	25,000	153,000	25,000	250,000
Warranty	90 days	90 days	90 days, 1 year	90 days
Distribution	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail, OEMs, VARs	Direct, dist., dlrs, retail	Direct, dist., dlrs, retail, OEMs, VARs
Comments	—	Related software packages available for further PC-to-VAX connectivity	Volume discounts available	Volume discounts available

Vendor	Wall Data Inc.	Waterloo Microsystems Inc.	Waterloo Microsystems Inc.
Product	Rumba	Asynchronous Gateway/X.25 Server	Micropulse
Specifications			
Product Function	Local/remote terminal emulation	Local terminal emulation, network gateway	Host app. spfc. link
Users Supported	Single user	Multuser; 32	Multuser
Components	Microcomputer software	Microcomputer software	Microcomputer software, host software
Copy Protected	Yes	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, B25-B28 BTOS
Operating Systems Supported	Microsoft Windows	MS-/PC-DOS, Waterloo PORT	MS-/PC-DOS, BTOS
Local Area Network Support	NetBIOS	ARCnet, IBM Token-Ring	Vendor did not specify
Minimum Memory Required (bytes)	640K	384K	Vendor did not specify
Terminals/Controllers Emulated	IBM, 327X/317X DFT	TTY	Vendor did not specify
User Interface	Install program, on-line help, mouse, graphic icons, pop-up windows	Mouse	Install program, on-line help, mouse
Programmability	No	Yes	Yes
API Compatibility	Vendor did not specify	Proprietary	Vendor did not specify
Microcomputer Security	Interface to host software	Password protection	Password protection, interface to host software
Number of Concurrent Sessions	Unlimited	Up to 32	Vendor did not specify
DOS Access During Session	Yes	Yes	Yes
File Transfer	Yes	Yes	Yes
File Formats	ASCII, binary	ASCII	ASCII, binary
File Conversion	Vendor did not specify	Yes	Yes
Host Interface			
Systems Supported	IBM, 43XX/30XX	Any asynchronous host	Unisys
Software Environment	IBM, MVS, VM, TSO, CMS, IMS, CICS	Any asynchronous	Unisys MCP
Protocols	SNA, SDLC	Async, X.25	Unisys Poll Select
Applications Supported	Access to host-resident programs	None	Vendor did not specify
Communications Characteristics			
Physical Connection	Coax, RS-232-C	RS-232-C	RS-232-C
Transmission Mode	Asynchronous, synchronous	Asynchronous	Asynchronous, synchronous
Transmission Speed (bps)	1200, 2400, 4800, 9600	9600	19.2K
Communications Features	Macros, unattended execution	Dial directory, auto dial/redial	Auto dial/redial, auto answer, macros, unattended execution
Pricing and Availability			
Microcomputer Sftwre/Hdwre (\$)	595 software	Vendor did not specify	Vendor did not specify
Host Software/Hardware (\$)	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Delivery	October 1981	August 1987	1984
Number Installed to Date	Vendor did not specify	Async/200, X.25 server/20	Over 80
Warranty	90 days	Vendor did not specify	30 days
Distribution	Direct, OEMs	Dist., dlrs, retail, VARs	Direct
Comments	—	Asynchronous gateway and X.25 server provide WAN connections between Waterloo PORT and LANs	—

