NO MORE MISSING LINKS:

Combining the particular talents of Macintosh and IBM-style systems is a challenge for managers in organizations that use both machines. The problem used to be finding a product—any product—to link the two worlds, but now there are lots of alternatives. The sudden growth of Mac-to-PC connectivity is bound to leave managers wondering which approach to choose.

SERIAL COMMUNICATIONS Hooking together different kinds of computers through their serial ports is an effective and often overlooked solution to system incompatibilities. Laptops, Macs, and DOS systems have a common connection through their serial ports that isn't often available through network circuit boards. Northern Telecom is aggressively marketing this method of connecting dissimilar systems through its line of private branch exchange (PBX) telephone systems, particularly the Meridian SL-1.

Northern Telecom tested Macs running Palantir's *inTalk* software and Apple's *MacTerminal* on PBX systems. These programs worked well through the PBX and exchanged files with PCs running popular communications programs such as *Crosstalk* using the error-checking Xmodem public domain protocols.

Hayes Microcomputer Products markets both PC and Mac versions of its *Smartcom II* communications software, which accomplishes error-free file transfers with a proprietary protocol.

While Northern Telecom is concentrating on PBX systems, these software combinations should work through almost any voice/data PBX or smaller data PBX system. (See "Making Connections: Data PBXs," Volume 6 Numbers 13 and 14, for reviews of PBX systems.) Of course, serial printers, modems, and the services of minicomputers can be shared among dissimilar microcomputers in the same way. Even with all the Mac/PC interconnection products available, using dissimilar microcomputers as terminals on a minicomputer (perhaps through a PBX) remains the best way to give people DBMS access to the same data files simultaneously.

APPLE/IBM NETWORKING

New hardware and software

products let Macs and PCs communicate

on their own terms.

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COVER STORY FRANK J. DERFLER, JR.

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FILE CONVERSION Moving files between the Mac's *Finder* operating system and an MS-DOS machine doesn't necessarily make them usable at the receiving end. Files in standard formats like ASCII and .DIF can be used without translation, but other file formats must be translated into some form usable for applications in the receiving machine. Several file-format translation programs are now available; perhaps the best-known is *MacLink Plus* from DataViz. This program translates common PC file formats such as Lotus's *1-2-3*, *dBASE II* and *III*, *WordStar*, and *MultiMate*. *MacLink Plus* also translates Mac applications such as *Excel*, *Jazz*, and *MacWrite*.

Apple's own *File Exchange* software is scheduled for delivery in the third quarter of 1987, when it will be included in the system software of all new Macintosh computers.

RESOURCE SHARING Although printers, modems, and files can be shared among dissimilar computers through a PBX, the sharing activity isn't invisible, as it is on a good local area network using operating system redirection. In a typical microcomputer LAN, files and resources are

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shared through operating system commands that are redirected to the network for service. Because of the differences in operating systems and data-bus structures in Macs and PCs, it takes a special type of LAN to service both systems invisibly.

Since all Macintosh models and the Apple LaserWriter already contain an interface for the AppleTalk network, Mac-to-PC LAN developers usually concentrate on adapting the PC to AppleTalk. AppleTalk uses shielded twisted-pair wire on a simple 230-kilobit-per-second CSMA/CA network that is easy and inexpensive to install. Companies with PC-to-AppleTalk products include Apple, 3Com, Crescent Communications, and Centram Systems. Digital Equipment Corp. markets an AppleTalk-to-Ethernet (including DEC VAX) link. 3Com and Apple reverse the role and provide ways for Macs with slots to enter Ethernet.

Apple has announced several products to link PC standard systems and Macs. The EtherTalk Interface Card (scheduled for release before the end of this year) gives the Macintosh II a direct connection to Ethernet networks. *AppleShare* PC software (to be released in the first quarter of 1988) is Apple's way to let MS-DOS PCs share or gain information stored in the *AppleShare* file server. Several third-party vendors are already delivering good Mac-to-PC products as well.

Tangent Technologies markets PC MacBridge, an AppleTalk card for the PC and a series of software utilities that let the PC to use the resources of a Mac server and LaserWriter. Perhaps the company's most

FACT FILE

Crosstalk Mk.4
DCA Crosstalk
Communications Inc.
1000 Holcomb Woods Pkwy.
Roswell, GA 30076
(404) 998-7798
List Price: $195
Requires: 128K RAM, DOS 2.0 or later. Not copy protected.
CIRCLE **676** ON READER SERVICE CARD

EXOS LAN family
Excelan Inc.
2180 Fortune Dr.
San Jose, CA 95131
(408) 434-2300
List Price: $995 to $3,190, depending on installation design.
CIRCLE **670** ON READER SERVICE CARD

MacLink Plus
DataViz Inc.
16 Winfield St.
Norwalk, CT 06855
(203) 866-4944
List Price: $195
Requires: Apple Macintosh 512. Not copy protected.
CIRCLE **674** ON READER SERVICE CARD

Meridian SL-1
Northern Telecom Inc.
2305 Mission College Blvd.
Santa Clara, CA 95054
(408) 988-5550
Typical Installed Price: $85,000 for a system able to handle 50 simultaneous voice and data exchanges plus 15 voice trunks.
CIRCLE **677** ON READER SERVICE CARD

PC MacBridge
Tangent Technologies
5720 Peachtree Pkwy., #100
Norcross, GA 30092
(404) 662-0366
List Price: Board, $250; *PC MacBridge Plus* package including software, $375.
CIRCLE **673** ON READER SERVICE CARD

Smartcom II
Hayes Microcomputer Products Inc.
705 Westech Dr.
Norcross, GA 30092
(404) 449-8971
List Price: $149
Requires: 192K RAM, DOS 1.0 or later. Not copy protected.
CIRCLE **675** ON READER SERVICE CARD

3+Share
3Com Corp.
3165 Kifer Rd.
Santa Clara, CA 95052
(408) 562-6400
List Price: *3+Share* for PC servers (maximum five users), $895; for unlimited users, $1,790; *3+Share* software for 3Server3 (unlimited users), $1,790. Copy protected.
CIRCLE **671** ON READER SERVICE CARD

TOPS
Centram Systems West Inc.
2560 Ninth St.
Berkeley, CA 94710
(415) 644-8244
List Price: PC node, $389; Macintosh software, $149.
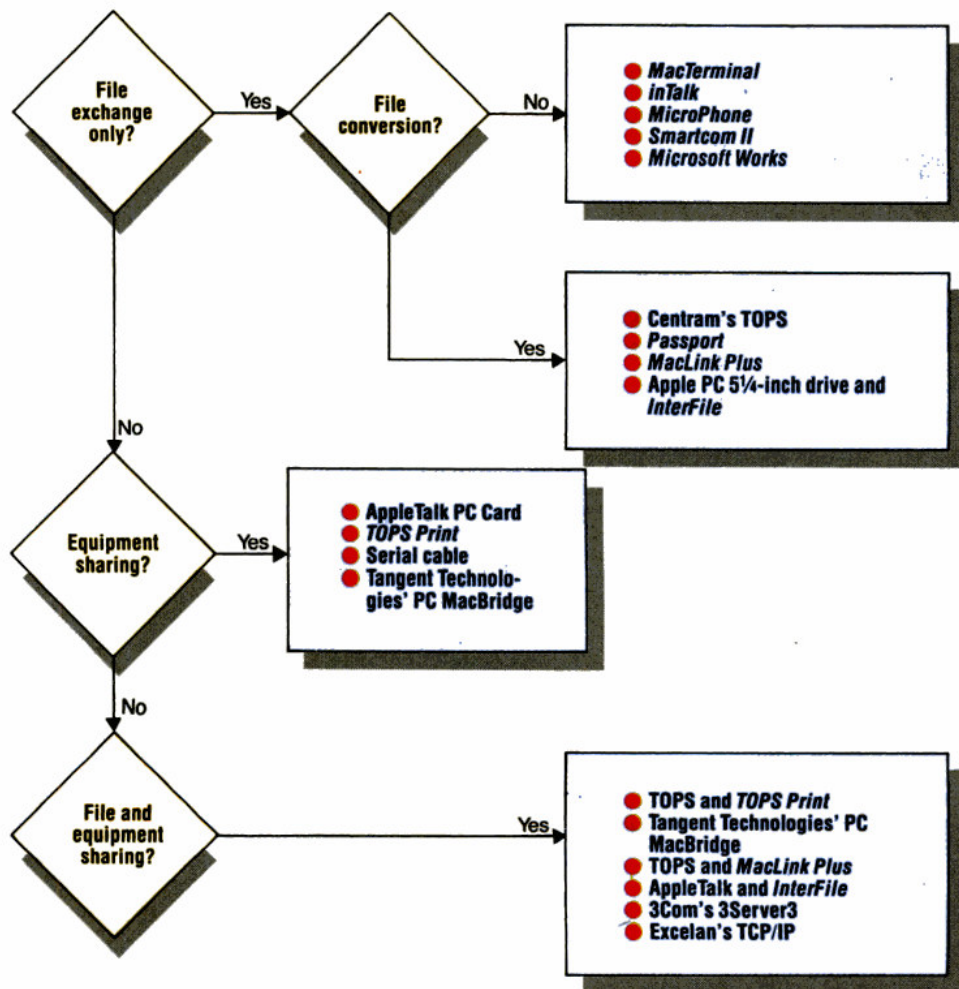CIRCLE **672** ON READER SERVICE CARD

The Apple Macintosh–to–IBM PS/2 Connectivity Decision Guide

Exchanging files between the IBM and Macintosh worlds can be a simple matter if you don't need to convert the files from one format to the other. A communications program such as Hayes's *Smartcom II* or Apple's own *MacTerminal* will do the job.

If, however, you want to convert file formats as you exchange files, you'll need to look into hardware-based solutions like Centram's TOPS networking card or Apple's own 5¼-inch disk drive.

Equipment sharing also requires hardware-based solutions, and if you need to achieve both file and equipment sharing in your setup, you'll have to look into true network-style arrangements such as 3Com's 3Server3, Excelan's TCP/IP protocol, or a full-fledged TOPS network.

File exchange only? — Yes → **File conversion?** — No →
- MacTerminal
- inTalk
- MicroPhone
- Smartcom II
- Microsoft Works

File conversion? — Yes →
- Centram's TOPS
- Passport
- MacLink Plus
- Apple PC 5¼-inch drive and InterFile

Equipment sharing? — Yes →
- AppleTalk PC Card
- TOPS Print
- Serial cable
- Tangent Technologies' PC MacBridge

File and equipment sharing? — Yes →
- TOPS and TOPS Print
- Tangent Technologies' PC MacBridge
- TOPS and MacLink Plus
- AppleTalk and InterFile
- 3Com's 3Server3
- Excelan's TCP/IP

interesting utility converts ASCII and other files to PostScript files for printing.

Centram Systems has made a special effort to link PCs and Macs through its TOPS products by including interface cards for PCs and software that allows PCs and Macs to share LaserWriter capabilities across the network. On a TOPS network, up to 32 computers (Macintoshes, UNIX-based computers, PCs, or any combination of the three) can share disk space, data files, and printers. Any machine on the network can act as a file server, including minicomputers running under UNIX. A TOPS node for the PC costs $389, and the software for the Mac's built-in port is $149.

On a more sophisticated level, Excelan provides wide-area and inter-network connections for both PCs and Macs through their Excelan and Kinetics product lines using the TCP/IP protocols. These protocols allow the interconnection of stations on huge networks like the Department of Defense's ARPA NET or Defense Data Network.

3Com Corp. shows its dedication to Mac-to-PC connections by including an AppleTalk port in every 3Server3. Its *3+Share* networking software is fully compatible with the *AppleShare* software that provides file server capabilities within a workgroup of Macs. In another interconnectivity approach, 3Com has announced

a line of Ethernet network adapters for the Mac SE and Mac II that will run under a version of *3+* on the Mac.

SYNERGY Linking the individual productivity tools on PCs and Macs can result in a synergy of computing capabilities for any organization. You can choose between relatively simple serial port connections and more complex but capable LAN functions. Each machine has its own strengths, but now both have several common ways to exchange and share files and resources.

Frank J. Derfler, Jr., is a contributing editor of PC Magazine.