Techland Systems Blue Lynx Series

MANAGEMENT SUMMARY

Techland was one of the first companies to recognize the need for products that enable PCs to connect to IBM mainframes. The independent company announced the Blue Lynx 3276 SNA/SDLC at the Info '82 trade show. The product was extremely successful; Techland passed the $2 million mark in sales in its first year. Since then, Techland has continued to specialize in hardware/software combination products that allow the IBM PC to communicate with IBM hosts.

This report focuses on two of Techland's hardware/software products: the Blue Lynx 3276 SNA/SDLC and the Blue Lynx 5251. Both comprise a half-size adapter card, a 5¼-inch emulation program diskette, documentation, and a keyboard map. Techland developed the Blue Lynx 5251 in conjunction with Software Systems, Inc. (Jefferson City, MO).

The 3276 SNA/SDLC allows a PC to connect to a 43XX, 303X, or 308X mainframe. With it, the PC emulates an IBM 3276 Model 12 display station operating under SNA/SDLC. The Blue Lynx 5251 allows a PC to connect to an IBM System/34, System/36, or System/38 host. With it, the PC emulates an IBM 5251 Model 12 remote workstation with an attached IBM 5256 Model 3 dot matrix printer.

The products connect directly to the host via synchronous modems or modem eliminators, without the need for external protocol conversion devices. Operation is transparent to the host; no operating system modifications are required. PCs configured with Blue Lynx may also coexist with other 3276 or 5251 terminal clusters in a communications network. $\triangleright$

Techland's Blue Lynx products are hardware-based micro-to-mainframe links for the IBM PC, PC XT, and compatibles. Together with included emulation software, they provide the capability to communicate with IBM hosts.

MODELS: Blue Lynx 3276 SNA/SDLC and Blue Lynx 5251.
CONVERSION: Asynchronous ASCII to SNA/SDLC.
TRANSMISSION RATES: 1200 to 9600 bps.
COMPETITION: AST Research, Attachmate, Persyst, and others.
PRICE: Techland's Blue Lynx 3276 SNA/SDLC and Blue Lynx 5251 are available for purchase only. Both sell for $690.

CHARACTERISTICS

VENDOR: Techland Systems, Inc., 25 Waterside Plaza, New York, NY 10010. Telephone (212) 684-7788. In Canada: Softsearch Corporation, 488 Wycroft Road, Oakville (Toronto) Ontario L6K 2G7. Telephone (416) 842-8240.

DATE OF FIRST ANNOUNCEMENT: Blue Lynx 3276 SNA/SDLC—October 1982; Blue Lynx 5251—February 1983.

DATE OF FIRST DELIVERY: Blue Lynx 3276 SNA/SDLC—April 1983; Blue Lynx 5251—April 1983.

NUMBER INSTALLED TO DATE: Approximately 5000 (both models).

SERVICED BY: Techland Systems.

The Techland Blue Lynx 5251 provides the IBM PC or PC XT with the capabilities of an IBM 5251 Model 12 display. With it, users can connect remotely to an IBM System/34, System/36, or System/38. The package consists of a half size expansion card, emulation software, a keyboard map, and documentation.

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▷ This report also describes several software support products for the Blue Lynx Series. These include: Emulator Transfer Utility (ETU), which provides a diskette access subsystem for the user while on-line with the host; XTU, a program that provides the ETU with several additional capabilities; Auto Lynx, a program for Blue Lynx 5251 that compiles text files into machine readable format and allows the PC to be configured for unattended file transfers; and Spreadlink, a program that formats files downloaded to the PC from the host for use with many popular PC applications programs.

Techland also markets the following products not covered in this report: a version of the Blue Lynx 3270 for bisynchronous (BSC) networks; VTERM, a DEC VT52/VT100 terminal emulation program; Multi Lynx, a communications expansion device for S/34, S/36, S/38, or 3705 networks; and Shoebox, a program available for several microcomputers for keeping track of appointments, expense recording, and other miscellaneous records.

Techland recently announced the Blue Lynx Gateway, a series of hardware/software packages that allow a local area network node device to access a host computer using an IBM PC as a gateway. Blue Lynx Gateway will be available later this year.

COMPETITIVE POSITION

Techland is in the thick of one of the fastest growing markets in microcomputers and data communications: micro-to-mainframe links. The company was one of the first to cash in on the PC users' desire and need to connect to IBM networks for downloading and processing host files.

The potential size of this market is staggering; suddenly, everyone wants to know how to hook PCs to mainframes. Not long ago there were very few companies in this market. Today, there are close to 100 vendors that claim to have the *solution* to linking PCs to hosts.

Integrating desktop micros into the networking environment is one of the most pressing dilemmas facing medium- and large-size companies today. Several sessions at this year's Interface data communications trade show held in March were devoted to this theme.

Scores of vendors feel that they have the answer to the problem of plugging PCs into mainframe environments. The variety of "solutions" available reflects several levels of product sophistication. Some vendors merely offer software based terminal emulators (e.g., DEC VT100 emulator programs). Some offer expensive but very functional micro- to minicomputer and mainframe systems that require program loading at the host end. Protocol converter vendors have chimed in with their version of the solution, which amounts to simply running an ASCII terminal emulator on a PC and hooking it to an external converter box.

Most of the micro-to-mainframe links offered today, however, are hardware/software combinations like those described in this report. This type of product is often ▷

▶ MODELS

Techland offers several products that enable microcomputers to connect to IBM hosts. This report focuses on the following two Blue Lynx hardware/software combination packages:

- The *Blue Lynx 3276 SNA/SDLC* allows a PC to connect to a 43XX, 303X, or 308X. It permits the PC to act as an IBM 3276 Model 12 operating with the SNA/SDLC networking protocol.

- The *Blue Lynx 5251* allows a PC to be connected to an IBM System/34, System/36, or System/38. It permits the PC to act as a direct replacement for an IBM 5251 Model 12 remote workstation with an attached IBM 5256 Model 3 dot matrix printer.

The products connect directly to the host using synchronous modems or modem eliminators, without the need for external protocol conversion devices. Operation is transparent to the host; no operating system modifications are required. PCs configured with Blue Lynx may also coexist with other 3276 or 5251 terminal clusters in a communications network.

Both Blue Lynx packages consist of an adapter card that fits into a half-size slot of an IBM PC or PC XT, a 5¼-inch diskette that contains the emulation program, documentation, and a keyboard map.

In addition to the Blue Lynx 3270 SNA/SDLC and 5251, Techland markets the following software support products:

- *Emulator Transfer Utility (ETU)*—a program for the S/34, S/36, or S/38 that provides a diskette access subsystem for the user while on-line with the host;

- *XTU*—a program for use with the ETU and S/34 or S/36, that provides enhanced capabilities such as host source libraries and the ability to print host system spool files on a remote printer while off-line;

- *Auto Lynx*—a program for use with the Blue Lynx 5251 that compiles text files into a machine readable format; and

- *Spreadlink*—a program for reformatting downloaded host files for use with several PC applications programs.

TRANSMISSION SPECIFICATIONS

Blue Lynx 3276 SNA/SDLC. The Blue Lynx 3276 SNA/SDLC can be locally or remotely attached to the following IBM mainframes: 43XX, 303X, or 308X. The Blue Lynx adapter card contains a male DB–25 connector that conforms to the EIA RS–232–C interface standard. Local connection is made via a modem eliminator. Remote connection to the host may require a modem eliminator for distances greater than 25 feet. Remote connection to the host can be either switched (dial-up) or nonswitched (leased, point-to-point or multipoint). The following speeds are supported: 1200, 2400, 3600, 4800, 6000, 7200, 8000, and 9600 bits per second (bps).

Blue Lynx 5251. The Blue Lynx 5251 can be locally or remotely attached to an IBM System/34, S/36, or S/38 host. The Blue Lynx adapter card contains a male DB–25 connector that conforms to the RS–232–C interface. Local connection to the host is via a modem eliminator and an RS–232–C cable. Remote connection can be over switched, or leased point-to-point or multipoint lines, at the following speeds, in bps: 1200, 2400, 3600, 4800, 6000, 7200, 8000, and 9600. ▶

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considered the most cost-effective solution, for several reasons:

- It is a simple matter to plug in the required expansion card into the PC, and load the control software;

- No programming is necessary at the host end, other than what is normally required to connect a terminal to the network; e.g., assigning a station address;

- It is often possible for a user to purchase the level of software support necessary for their application; e.g., software modules to add additional 3270 functions to those that are provided by the emulation control diskette.

Also, since there are several new vendors entering this market, this increased competition will invariably result in an overall drop in product prices. A few of Techland's competitors in this area are AST Research, DCA (Irma), Forte Data Systems, and Persyst.

It remains to be seen whether IBM will continue to enhance its 3270–PC and drop the price of its 3270–PC attachment. If so, IBM will definitely cut into the marketshare being fought for by the independent micro-to-mainframe vendors.

Expect to see a growing number of micro-to-mainframe products in the future. Minicomputer vendors will join the fray, with perhaps the best solution of all: proprietary software links between mainframes and connected micros. Those having the greatest impact will be the minicomputer vendors that already market microcomputers: Burroughs, Data General, DEC, Hewlett-Packard, and, of course, IBM. Closely tied to micro-to-mainframe links is another hot topic, integrated software. Now that the most popular applications programs have been identified, e.g., spreadsheeting, it is time for the minicomputer vendors to create a synergy between the mainframe and the mini- and microcomputer.

ADVANTAGES AND RESTRICTIONS

The advantages of being able to access a host database with a PC are obvious. The PC, since it is much more powerful than a synchronous editing terminal, can be used to access the host database, download files, and process them locally. It is very beneficial, especially in clustered environments, to replace an IBM terminal with a PC. The Blue Lynx models provide the majority of the functions found on 3270 and 5251 terminals.

With the Blue Lynx 3276 SNA/SDLC, the host system is able to download data files to the PC's disk as if it were a standard remote printer. Once captured on disk, the data will appear as lines of standard ASCII text. In this format, it is usable by PC applications software, for example, Lotus Development's 1-2-3, Ashton-Tate's dBase II, and most word-processing programs.

Techland's software options for the Blue Lynx Series add to the attractiveness of the product line. The Emulator Trans-

DEVICE CONTROL

The *Blue Lynx 3276 SNA/SDLC* requires an IBM PC configured with the following: 64K bytes (PC–DOS 1.1) or 96K bytes (PC–DOS 2.0 or later versions) RAM; a diskette adapter and at least one diskette drive; a monochrome or color/graphics adapter; an 80-column by 25-line monochrome or color display; and a parallel or serial printer adapter and printer (if a printer is desired). Also, the PC requires a synchronous modem or modem eliminator.

On the host side, the 43XX, 303X, or 308X requires a communications port, an RS–232–C cable, and a synchronous modem or modem eliminator.

The Blue Lynx 3276 SNA/SDLC provides most of the functions of an IBM 3276 Model 12 display station operating under SNA/SDLC. The configured PC appears to the host as a 3276 LU2 keyboard/display with attached LU1 and LU3 printers. Most normal functions are supported, including field and display attributes, and audible alarm. Blue Lynx provides an interface for bidirectional file transfers between the PC and the host.

The following 3276 functions are not supported: 3278 coaxial operation or clustering of multiple PCs; expanded functions feature, which includes support for a magnetic stripe reader or a light pen; programmed symbols (graphics) or encrypt/decrypt; structured fields; cursor blink on/off; and keyclick on/off. Options available from Techland include 3279 color terminal operation and screens larger than 80 columns by 24 lines (Model 3, 4, or 5).

The Blue Lynx 3276 SNA/SDLC conflicts with the following hardware: the IBM SNA/SDLC adapter; the AST Research SNA adapter; and most LAN expansion cards. Blue Lynx hardware is user configurable, to change IRQ or I/O addresses.

To operate the Blue Lynx 3276 SNA/SDLC, the user must first install the adapter card in any available expansion slot of the PC or XT. The adapter contains a set of dip switches; the switch settings are established at the factory. After the adapter card is installed, the system emulation software must be configured.

The program diskette contains the following programs: BLUELYNX.EXE, CONFIG.EXE, and 3270 IBM.HLP. The user must copy the programs onto a diskette containing the operating system that will be used to configure/initiate Blue Lynx.

To configure the program, the user loads the configuration diskette into the A drive, and enters CONFIG. A menu with the following choices appears:

1) Select a Configuration, to select a preconfigured file.
2) Create a Configuration, to create one or more configuration files, i.e., for communications with different hosts.
3) Edit a Configuration, to change a parameter in a configuration file.
4) Delete a Configuration, to delete a configuration file.
5) Exit to PC–DOS.

Each menu selection except item #5 prompts the user for the configuration file name.

To create a new configuration file, the user selects item #2 above, then is prompted to enter the following parameters:

- **Terminal ID.** If using a nonswitched line, establishment of this parameter is unnecessary, since the terminal ID automatically defaults to 018 followed by the serial number of the Blue Lynx card. If using switched facilities, the user must configure this ID to match all eight digits of the mainframe's VTAM gen.

▷ fer Utility (ETU) is designed to provide the necessary features to effectively use the PC's diskette drives in a host environment. With ETU, the transfer of text, program, or data files between the host and PC is possible. XTU extends the capabilities of the ETU; since it contains the capability to convert source library programs to text files and back, users can write source programs with the PC while off-line. The Auto Lynx program enables users to store defined logon procedures for establishing a session with the host. Spreadlink converts host files for use with several PC applications programs.

USER REACTION

Techland Systems did not supply us with a list of current users who had worked with the product for more than nine months. Therefore, we did not conduct a user reaction for the product. □

- **SDLC Station Address.** The station address must match the address specified in the mainframe's gen, from 01 to FE hexidecimal.

- **Non Return to Zero.** The user must select whether the line is NRZ or NRZI encoded.

- **Leased Line.** The system must be configured for the communications facility: leased (dedicated) or switched (dial-up) line.

- **Constant carrier or switched carrier must be specified.**

- **RTS Delay.** Three RTS (request to send) settings are available: the standard short setting for fast turnaround; or a longer setting, if certain brands of modem splitters (modem sharing units, or MSUs) are to be used.

- **Print Null Lines.** The user may specify whether null lines are to be printed.

- **Form feed after local print.**

- **INT Level.** To prevent hardware conflicts, the INT (interrupt) level must be configured. The default setting is 2. This level is preset, but the user can reset the jumpers for numbers higher than 2; the lowest level is 2, however, not 1. The hardware and software must both be configured with identical INT settings.

After the above settings are established, the user is met with another screen for linking the PC's peripheral devices, i.e., printers and diskette drive, to the unit types recognized by the host. The Blue Lynx automatically configures the PC's screen as a 3278 Model 2; however, it is up to the user to "link" the PC's disk and printer to the host. The configuration choices are listed by the program on the bottom of the screen. Techland's user manual points out that only Epson printers are fully supported (other printers can be used as long as the LPI settings are not used by the mainframe software), and only one download device can be specified.

To begin a session with the host system with the Blue Lynx 3276 SNA/SDLC, the emulator program is loaded, BLUE-LYNX is entered, and the user specifies the configuration file to be used. If switched facilities are to be used, the user must establish the dial-up connection with the host. If a dedicated link exists between the PC and the host, then the connection is automatic.

The PC at this point may be operated as an IBM 3276 SDLC terminal station. There are differences between the PC and 3276 keyboards; a keyboard map is provided as a guide to locating 3276 keys. The status line symbols are identical to those that appear on 3270 terminals. The Blue Lynx 3276 includes a Help facility that is called up by pressing the ALT and H keys. While on-line, a local screen dump to the printer can be initiated using the Print (F7) key. To end the session with the host, the user presses CTRL + BREAK.

Files can be uploaded or downloaded to the host from the PC disk file. ASCII to EBCDIC code format translations are performed automatically. Also, various text file translations occur during the upload/download procedure.

To upload a file, Techland suggests that users employ a mainframe line editor facility such as EDIT under TSO. A certain amount of alterations to the PC text file may be necessary before uploading for processing; for example, it may be necessary to convert blank lines within a file to ENTER, to facilitate host processing.

For downloading files, Blue Lynx allows a PC disk file to emulate a 3287 SCS mainframe printer as part of a 3276 cluster. The host system downloads the data files to the PC's disk, then, as if it were a standard remote printer. Once captured on disk, the data will appear as lines of standard ASCII text separated by CR LFs. In this format, it is usable by PC applications software, for example, Lotus Development's 1-2-3, Ashton-Tate's dBase II, and several popular word processing programs. Some applications programs such as VisiCalc require reformatting before they can be used; for this, Techland offers a program called Spreadlink, which reformats files downloaded from the host for use with several popular PC programs.

The *Blue Lynx 5251* requires an IBM PC configured with the following: 64K bytes RAM if using PC-DOS 1.1 (later releases may require more memory); a diskette adapter and at least one diskette drive; a monochrome or color/graphics adapter; an 80-column by 25-line monochrome or color display; and a parallel printer adapter and parallel printer (if a printer is desired). Also, the PC requires a synchronous modem or modem eliminator.

On the host side, the System/34, S/36, or S/38 requires a communications port, an RS-232-C cable, and a synchronous modem or modem eliminator.

The Blue Lynx 5251 provides most of the functions of an IBM 5251 display terminal with an 83-key EBCDIC keyboard and a 5256 printer attached. Supported functions include field and display attributes, audible alarm, and edge indicators. The Blue Lynx adds a few capabilities, including an audible keystroke error indicator and a typamatic Delete key. Also, the Blue Lynx provides an interface for bidirectional file transfers between a PC and the host, and the capability to define program macros to execute the session.

The following 5251 features are not supported: cluster feature and dual cluster feature; expanded functions feature, which includes support for a magnetic stripe reader and light pen; and keylock feature. The Blue Lynx 5251 only prints the 96-character ASCII set, and does not print some special characters. Also, the following functions are not supported: column separators and some display attributes combinations, the reverse screen image display mode, the hex key function, insert mode while in system request mode, and maintenance of an error log.

To operate the Blue Lynx 5251, the user must first install the adapter card into any available expansion slot of the PC or XT. The adapter contains a set of dip switches; the switch settings are established at the factory. After the adapter is installed, the system emulation software must be configured. ▶

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The program diskette contains the file BL5251.EXE. The user must copy this program to a diskette containing the operating system, that will be used to initiate Blue Lynx. The system is configured by creating a batch file and entering the following command: {d:}BL5251.EXE ss,b,n,{p},{t},{ksf}.

The variables within the program command represent the following:

• *d* is the diskette drive upon which the EXE program resides, if it is not the system default drive;

• *BL5251.EXE* is the name of the emulator program;

• *ss* is the SDLC station address, a hexadecimal value ranging from 01 to FE, that matches the host system configuration;

• *b* is the line speed, from 1200 to 9600 bps;

• *n* indicates whether NRZI encoding is used;

• *p* indicates the parallel printer port to be used;

• *t* indicates whether a trace should appear on the status display;

• *ksf* is the file specification for the previously defined keystrokes for automatically establishing a session.

To begin a session with the host system, the emulator program is loaded, and it is passed through the configuration parameters. This is done by entering the name of the batch file created. If the configuration parameters are correct, the user is met with the message, ESTABLISH CONNECTION IF NECESSARY. If a switched connection is being used, then the call must be placed to the host system. If the communications link is a dedicated line, either point-to-point or multipoint, then the connection will automatically be established.

The IBM PC keyboard contains the same number of keys in approximately the same position as the 5251. To aid users, a keyboard map is provided by Techland to locate the corresponding functions.

The diagnostic tools on the Blue Lynx 5251 include two types of screen traces, a buffer print function, and a data dump facility.

The SNA Buffer Trace displays received and transmitted information frames on the 25th (status) line of the display screen. The left side of the status line displays the low-order byte of the received frame length followed by the first nine bytes of received data. The right side similarly displays the transmitted frames. Only information frames are displayed. The displayed data is not an indicator of line activity, but a reflection of the interface between the SNA and SDLC components of the emulation software.

The SDLC Line Trace is a continuous update of communications adapter status and line activity. It also uses the bottom status line. On the left side are displayed the receive status and data up to 10 bytes in length. The right side similarly displays transmit status and data. Communications adapter status and SDLC station address are displayed. Errors detected while receiving data are displayed in reverse video until the terminal receives another flag and address sequence.

The SNA Buffer Print function displays the SDLC line trace as described above; if a printer is configured, it will print the contents of the SNA buffer.

The Data Area Dump requires a printer. It provides a printout of the status of dynamic data areas, in hexadecimal form. The printout can be initiated at any time, using the Shift keys and F5. When the data area dump is initiated, the emulator program ceases communicating with the host, and returns to PC–DOS.

SOFTWARE SUPPORT

Techland offers four software support products for use with the Blue Lynx series:

The *Emulator Transfer Utility (ETU)* is for use with the System/34, S/36, and S/38. It provides a diskette access subsystem for the user while on-line with the host. It is designed to provide the necessary features to effectively use the PC's diskette drives in a host environment. Diskette data is handled exactly as data to and from a display. With ETU, the transfer of text, program, or data files between the host and PC is possible. Other features include the capability to allocate, delete, rename, and test files on the PC diskette. The program provides all format conversions and character string substitution of up to nine characters. The translation tables are supplied and are able to be customized by the user. The ETU is supplied on an 8-inch diskette; documentation is included.

The *XTU* program is for use with the ETU and S/34 or S/36. It extends the capabilities of the ETU. Users are able to maintain host source libraries on the PC; it includes the capability to convert source library programs to text files and back. These files may be downloaded, modified, and uploaded to the host. It allows automatic downloading of print spool files and provides a utility for local printing on a PC printer off-line. The program is supplied on an 8-inch diskette; documentation is included.

The *Auto Lynx* program is for use with the Blue Lynx 5251. It is a utility for the PC that transfers text files into machine readable format. With Auto Lynx, files can be transferred to and from an unattended PC. Also, the Auto Lynx can compile files containing logon procedures. Auto Lynx is supplied on a 5¼-inch diskette; documentation is included.

The *Spreadlink* program is for use by the PC when downloading files from a host. Spreadlink formats the host file for use with several popular PC applications programs. Some PC programs, e.g., 1–2–3 and dBase II, are able to be used without Spreadlink.

PRICING

Techland Systems warrants the Blue Lynx hardware for a period of 90 days. A two-year warranty extension is available for $25. A telephone hotline for registered users of the Blue Lynx 3276 SNA/SDLC is maintained by Techland Systems, at (212) 684-7788 during business hours. A telephone hotline for registered users of the Blue Lynx 5251 is maintained by Software Systems, Inc., at (314) 635-5852 during business hours.

The Blue Lynx 3276 SNA/SDLC and the Blue Lynx 5251 sell for $690. Software prices are as follows: Emulator Transfer Utility (ETU) for the System/34 and System/36—$500; ETU for the System/38—$800; XTU—$99; Auto Lynx—$75; Spreadlink—$210. ■