# Telex 270 Information Display System

## MANAGEMENT SUMMARY

Telex has been, and continues to be, one of the most successful independent vendors of IBM 3270-compatible terminal systems. The company offers a full line of plug-compatible 3270 replacement controllers, displays, and printers. In fact, Telex beat IBM to the punch when it announced the 178 Display Station, a compact IBM 3278-2 replacement, in June 1982. IBM unveiled its 3178 Display Station in March 1983.

Currently, Telex offers replacements for the second generation of IBM 3270 products. Present members of the Telex 270 family include: the 174 Control Unit; the 276 Control Unit Display Station; the 476 Stand-alone Control Unit Display Station; the 278 and 178 Display Stations; the 279 Color Display Station; and the 281B, 286C, and 287C Printers. Telex also offers a 3270 Business Computer Attachment, called Proffit (Professional Office Terminal), which provides the 278 Display Station with personal computing capabilities.

The 278 Display Station features a 15-inch display screen with a 1,920-character capacity, arranged in 24 lines of 80 characters each. A wide variety of detachable keyboards are available for use with the 278. The 178 Display Station is a compact version of the 278, featuring a smaller footprnt size and a 12-inch screen. Both of these display models can be attached to the 174 Control Unit and the 276 Control Unit Display Station, as well as to the corresponding IBM equipment.

The 279 Color Display Station is a plug-compatible replacement for the IBM 3279 Model 2A color display. The 279 contains all of the features found on the 278, plus four-color (red, green, white, blue) display capability. Like the

**Plug-compatible replacements for the IBM 3270 Information Display System.**

**The 270 family consists of the following members: the 174 Controller; 276 and 476 Control Unit Display Stations; 278 and 178 Display Stations; 279 Color Display Station; and the 281, 286, and 287 Printers. The Telex controllers provide support for the attachment of IBM displays and printers; likewise, Telex displays and printers may be attached to IBM control units. Telex also offers Proffit, which provides the 278 Display Station with personal computing capabilities.**

**Purchase prices for the Telex displays range from $1,550 to $3,750. Controller prices range from $3,200 to $8,500. Lease arrangements and volume discounts are available.**

## CHARACTERISTICS

**VENDOR: Telex Computer Products, Inc., 6422 East 41st Street, Tulsa, Oklahoma 74135. Telephone (918) 627-1111. In Canada: Tulsa Computer Products, Ltd., 332 Consumers Road, Willowdale, Ontario, M2J 1P8. Telephone (716) 855-1871.**

**DATE OF ANNOUNCEMENT: 276 and 278—June 1979; 174—April 1982; 279—January 1982; 476—May 1982; 178—June 1982.**


*Telex introduced the 178 Display Station (left), a compact version of the 278 Display Station shown at the right, in June 1982—nine months before IBM unveiled the 3178. Both the 178 and 278 are plug compatible replacements for their IBM counterparts, the 3178 and 3278, respectively.*

# Telex 270 Information Display System

TABLE 1. 270 FAMILY COMPONENTS AND SUBSYSTEMS

| Controller Model | Mode | Protocol | Attachable Display Models | Attachable Printer Models | Max. Devices Attachable |
|---|---|---|---|---|---|
| 174 Model 1 | Remote | BSC/SDLC | 278/178/279 | 286/287 | 8 |
| 174 Model 2 | Remote | BSC/SDLC | 278/178/279 | 286/287 | 16 |
| 276 | Remote | BSC/SDLC | 278/178/279 | 281/286/287 | 8 |
| 476 | Remote/local | BSC/SDLC | — | 281 | 16 |

278 and 178, the 279 attaches to the 174, 276, and their corresponding IBM models.

The 276 Control Unit Display Station replaces the IBM 3276 Model 2. The 276 features an integrated 15-inch display with a 1,920-character capacity. The controller portion of the 276 provides for the attachment of seven additional devices, either display stations or printers, in any combination. Telex has also introduced a stand-alone control unit display station, the 476. The 476 is functionally similar to the 276, except that it does not provide for the attachment of additional devices. However, up to 16 Model 476s can be daisy-chained together, to a maximum distance of 5000 feet, utilizing the Telex 909 Modem Cluster Adapter.

The 174 Control Unit is an IBM 3276 replacement. Two models are available, providing 8 or 16 attachment ports. All Telex display stations and printers (except the 281), as well as corresponding IBM models, can be attached to the 174.

Three printer models are available for use with the Telex 270 Information Display System: the 281B Message Printer, 286C Impact Printer, and 287D Matrix Printer.

Telex' Proffit Business Computer Attachment provides the 278 Display Station with local processing capabilities. The Proffit option provides 128K of main memory (expandable to 640K); 160K of disk storage on a 5¼-inch single-sided diskette, or 320K of disk storage on a 5¼-inch double-sided diskette is also available, with a second drive optional. Software available for Proffit includes the CP/M-86 operating system, spreadsheet, word processing, program editing, and Basic; MS/DOS is optional.

## COMPETITIVE POSITION

Telex is a leader in the IBM 3270-compatible terminal market, competing with other independents such as Harris, ITT Courier, Lee Data, MDS Trivex, Memorex, Northern Telecom, Racal-Milgo, Raytheon, and Teletype, as well as with IBM. Telex' success in this market is indicated by their large installed base (over 125,000 display units). In addition, Telex was first among the independents to offer functional replacements for the IBM 3276 and 3278, and, as mentioned previously in this report, actually brought their 178 Display Station to market 9 months before IBM introduced the 3178.

## ADVANTAGES AND RESTRICTIONS

A significant strength for Telex is the depth of their 270 product line. Telex offers a replacement for virtually all of

**DATE OF FIRST DELIVERY: 276 and 278—August 1979; 174—June 1982; 279—1st Q 1982; 476—August 1982; 178—2nd Q 1982.**

**NUMBER DELIVERED: Over 125,000 display units.**

**SERVICED BY: Telex Service Co.**

## CONFIGURATION

**The Telex 270 Information Display System is a family of direct replacements for corresponding members of the IBM 3270 Information Display System. Both BSC and SDLC line protocols are supported; configurations include remote cluster and remote and local stand-alone.**

**The 174 Controller provides support for either 8 or 16 devices in a remote cluster configuration. The 174 supports the 178, 278, and 279 displays, the 286 and 287 printers, and corresponding IBM equipment (3278, 3287, etc.). The 276 Control Unit Display Station provides support for up to 8 displays and/or printers (including the integral display), either the 178, 278, 279 displays, or the 286 and 287 printers, as well as the corresponding IBM models. The 476 Control Unit Display Station operates in either a stand-alone or cluster environment, either locally or remote. For cluster configurations, up to sixteen 476s can be daisy-chained together, using the Telex 909 Modem Cluster Adapter.**

**Personal computing capabilities can be optionally to the 278 Display Station through the addition of the Proffit 3270 Business Computer Attachment.**

## TRANSMISSION SPECIFICATIONS

**Transmission is synchronous, in half-duplex mode, at operator-selectable speeds up to 9600 bits per second. Both the BSC and SDLC line protocols are supported. The 8-level ASCII (including parity) or EBCDIC transmission codes are used. An EIA RS-232-C interface provides for connection to a voice-grade line via a modem.**

## DEVICE CONTROL

**The 270 system operates under the control of the program stored at the computer and provides complete compatibility with the addressing sequence, command code structure, and line discipline employed by the IBM 3270 Information Display System. The 270 system responds to and executes the full repertoire of IBM 3270 commands via a hard-wired processor.**

**Cursor control is functionally the same as in the IBM 3270. The controls position the cursor up, down, left, or right, either step-by-step or repetitively (if the key is held down). The cursor can also be backspaced one character position, moved to the beginning of the next line or the next unprotected data field, tabbed to the beginning of the next unprotected data field, and backtabbed to the beginning of the previous unprotected data field. Cursor addressability is standard.**

# Telex 270 Information Display System

*The 279 Color Display Station is functionally compatible with IBM's 3279 Model 2A. The 279 features four-color capability—red, white, blue, and green.*

the most popular members of the 3270 family, including the personal computing attachment feature. The problem for Telex, as for all of the independent vendors in this market, is to maintain a price edge over IBM, despite IBM's recent price reductions that accompanied their new 3270 product announcements.

## USER REACTION

In Datapro's 1982 Terminal Users' Survey, responses were received from 20 users of the Telex 270 Information Display System. These users represented an installed base of 1,003 terminals, the majority of which were 278s. The users were asked to rate their Telex terminals in a variety of categories. The ratings given to the Telex equipment are summarized in the following table.

| | Excellent | Good | Fair | Poor | WA* |
|---|---|---|---|---|---|
| Overall performance | 4 | 14 | 2 | 0 | 3.1 |
| Ease of operation | 3 | 15 | 1 | 1 | 3.0 |
| Display clarity | 5 | 11 | 3 | 1 | 3.0 |
| Keyboard feel & usability | 1 | 14 | 4 | 1 | 2.9 |
| Hardware reliability | 4 | 11 | 5 | 0 | 3.0 |
| Maintenance service/ technical support | 1 | 17 | 1 | 1 | 2.9 |

*Weighted Average based on a scale of 4.0 for Excellent.

When asked whether they would recommend the Telex 270 terminals to other users, 16 of the respondents answered that they would, while only 2 stated that they would not.□

**Edit controls are the same as those for the IBM 3270 and include character insertion and deletion within a field, screen and field erasure, partial field erasure (specified by the cursor position), and duplication of data, which is specified by a unique code and displayed as an asterisk.**

**Structured data entry a la displayable formats is supported via attribute codes, which define protected fields, delimit data entry fields, and specify display parameters and tab stop positions. The use of the attribute codes is identical with the IBM 3270. Display parameters specify beam intensity (full or half) and beam blanking (for security purposes).**

**Program Function and Program Attention keys, standard features of the IBM 3270, are also standard in the 270 system. Each of these keys generates a unique code that is recognized by the controlling software as a specific program request or data identifier. Program Function codes accompany the display data as it is transmitted to the computer, while Program Attention codes are transmitted separately.**

**A light pen is available as an option for all display stations which functionally corresponds to IBM's Selector Pen, a 3270 option. Any one of several alphanumeric or numeric fields of fixed or variable formats can be selected by the pen, which transmits the address of the selected entry to the computer to initiate the programmed function. Other options include an audible alarm, a keyboard numeric lock that permits only numeric data to be entered, and a security lock that prevents unauthorized data entry.**

## COMPONENTS

**174 MODEL 1 & MODEL 2 CONTROLLERS: Provides control for up to 8 (Model 1) or up to 16 (Model 2) devices. Model 2 consists of two eight-port controllers; each eight-port configuration can independently support BSC or SDLC line protocols. Attachable devices include the 178, 278, and 279 displays, and the 286 and 287 printers; also supports the corresponding IBM models. The 174 is functionally compatible with the IBM 3276.**

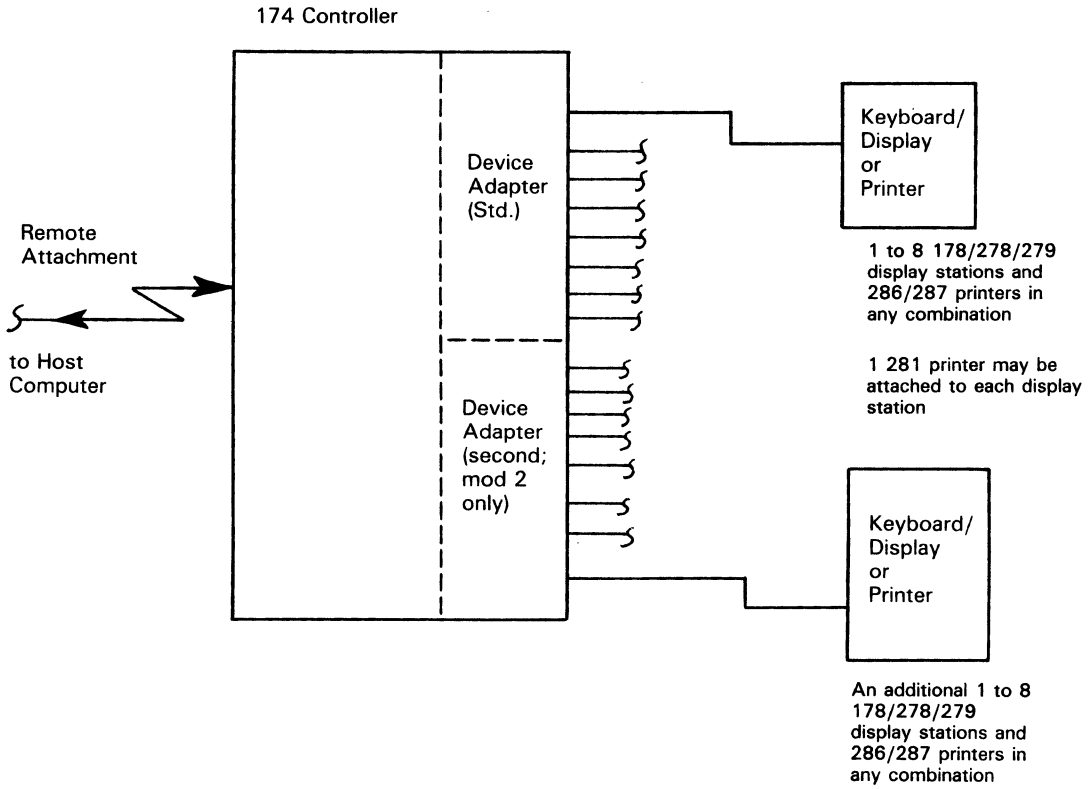
**276-2 CONTROL UNIT DISPLAY STATION: Provides an integral 278-2 display, plus support for seven attachable devices, which can be displays and/or printers. The integral display consists of a 15-inch screen, with a 1920-character display capacity arranged in 24 lines or 80 characters each (plus a 25th status line). Attachable devices include the 178, 278, and 279 displays, the 286, 287, and 281 printers, and the corresponding IBM models. The 276-2 is functionally compatible with the IBM 3276.**

**476 CONTROL UNIT DISPLAY STATION: Can be used as a stand-alone unit, or can be daisy-chained in a cluster of up to sixteen 476s via the Telex 909 Modem Cluster Adapter. The 476 can operate using BSC protocol (476B) or SNA/SDLC protocol (476S). A local version of the 476 (476L) is also available.**

**The 476's integral display consists of a 15-inch screen, with a 1920-character display arranged in 24 lines of 80 characters each (plus a 25th status line). An attachment is available to support the 281 printer. The 476 is functionally compatible with the IBM 3276.**

**278-2 DISPLAY STATION: Contains a 15-inch display screen, with a 1920-character capacity, arranged in 24 lines of 80 characters each. A 25th line for status information is standard. Characters are formed utilizing a 9-by-14 dot matrix, and are displayed in white or green phosphor. The 278-2 is a plug-compatible replacement for the IBM 3278 Model 2.**

# Telex 270 Information Display System




178 DISPLAY STATION: A compact (12-inch screen) version of the 278-2. The 178 supports the same screen capacity and display arrangement as the 278-2. Characters are formed utilizing an 8-by-8 dot matrix, and are displayed in green or white phosphor. The 178 is a plug-compatible replacement for the IBM 3178.

279 COLOR DISPLAY STATION: A four-color (red, white, blue, and green) display station. The 279 features a 15-inch screen with a 1920-character display capacity, arranged in 24 lines of 80 characters each. Characters are formed utilizing a 9-by-14 dot matrix. The 279 is a plug-compatible replacement for the IBM 3279 Model 2A.

KEYBOARDS: A choice of approximately 30 different keyboard layouts are available for all Telex displays and control unit display stations. All keyboards are detached (a narrow-width keyboard is available for the 178). Keyboards can be obtained with typewriter-style, data entry, or data entry with keypunch layouts. Also available are a numeric pad, function pad, and 12 or 24 program function (PF) keys. A single key clear feature is standard on all keyboards. Keyboard click is switch-selectable. All alphanumeric, special symbol, and cursor control keys are typamatic. Both EBCDIC and ASCII character sets are available.

281B MESSAGE PRINTER: Provides 80 or 132 print positions at a rated speed of 80 cps (bidirectional). The character set contains the full 96-character ASCII set plus 64 graphics symbols. Line spacing is 6 or 8 lines per inch; character spacing is 10 characters per inch using the 80 column format, and 16.5 cpi using the 132 column format. Characters are formed via a 9-by-7 dot matrix. The paper handling system features a friction-feed/pin-feed platen. Up to three part forms can be printed. A tear bar and paper roll are standard; a forms tractor is optional. The 281 can be directly attached to a 178, 278, or 279 display or a 276 or 476 control unit display.

286C-1/-2 IMPACT PRINTER: Equipped with a 1920-character buffer. The printer provides 132 print positions and operates at a rated speed of 40 cps. The character set includes 64 upper case or 96 upper and lower case symbols. Spacing is 10 characters per inch and 6 lines per inch or, optionally, 12 characters per inch and 8 lines per inch. Pin feed is standard; an optional forms tractor accommodated forms up to 15 inches wide. Model 1 provides a plastic print wheel, while Model 2 contains a metalized print wheel.

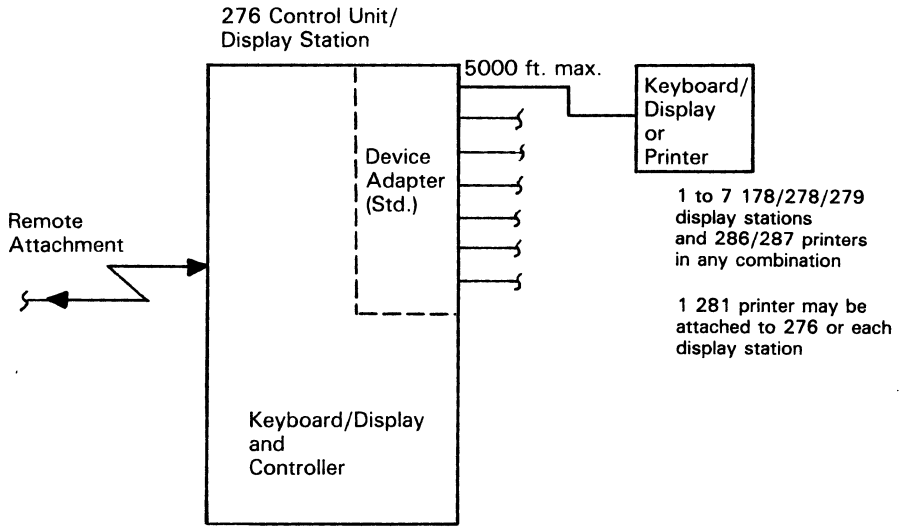
287D-1/-2 MATRIX PRINTER: Contains a 1920-character buffer and 132 print positions. A 480-character buffer is optional. The character set contains 64 upper case print symbols; each character is formed via a 7-by-9 dot matrix. Spacing is 10 characters/inch and 6 lines/inch. The 287 accommodates pin-fed, 6-part continuous forms from 4 to 14 ⅜ inches wide. Model 1 provides a rated print speed of 100 cps, while Model 2 prints at 150 cps.

270AP (PROFFIT) BUSINESS COMPUTER ATTACHMENT: Provides the 278-2 Display Station with personal computing capabilities. The Proffit feature comes with 128K of main memory (expandable to 640K). Disk storage consists of 160K bytes on a single-sided, double density 5¼-inch diskette, or 320K bytes on a double-sided, double density 5¼-inch diskette. A second diskette, either single- or double sided, is optional. Software for Proffit includes the CP/M-86 operating system (MS/DOS optional), Basic, Supercalc (spreadsheet), Select (word processing), and TX/SPF Editor (Cobol program editing).

## PRICING

The 270 system is available for purchase or on a two-, or three-year lease including prime-shift maintenance. Telex offers quantity discounts on some devices. There are no installation charges for the Telex equipment. Telex does not

# Telex 270 Information Display System

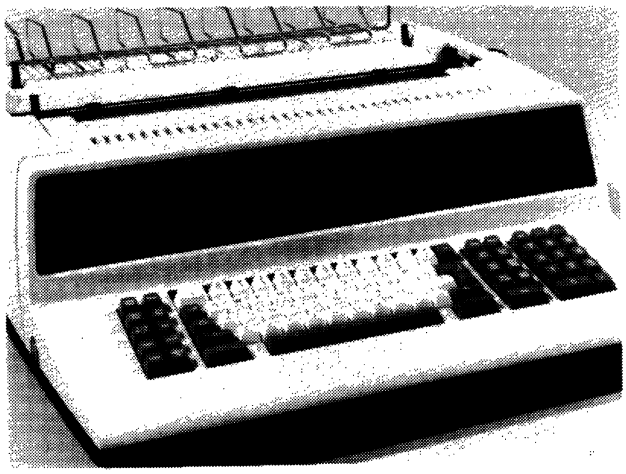



**schedule customer training; however, its field engineering personnel and customer representatives provide any necessary on-site training. Full service maintenance on a 24-hour-per-day, 7-day-per-week basis is available on negotiation.**

**Telex provided the following single-quantity purchase prices and maintenance charges. Contact Telex for lease prices. Volume discounts are also available; Telex may be contacted for these prices also.**

| | | Purchase Price | Monthly Maint. |
|---|---|---|---|
| 174 | Model 1 (8-port) Controller | $5,000 | $28 |
| 174 | Model 2 (16-port) Controller | 8,500 | 35 |
| 276-2 | Control Unit Display Station | 5,750 | 29 |
| 476 | Control Unit Display Station | 3,200 | 25 |
| 178 | Display Station | 1,550 | 144(yr.) |
| 278-2 | Display Station | 2,500 | 12 |
| 279-2 | Color Display Station | 3,750 | 25 |
| 281B | Printer | 900 | 22 |
| 286C | Model 1 Printer | 4,850 | 39 |
| 286C | Model 2 Printer | 5,150 | 39 |
| 287D | Model 1 Printer | 4,750 | 34 |
| 287D | Model 2 Printer | 5,000 | 40 |
| 270 | AP (Proffit) | 3,500 | — ■ |

# Telex 767 Keyboard/Printer Terminal



*The Telex 767 Keyboard/Printer Terminal is equipped with a console panel which includes LED indicators, a 3-digit display, and a touch pad. Model 2, pictured here, provides a metalized printwheel mechanism for letter quality printing.*

**A plug-compatible replacement for the IBM 3767.**

**The 767 is a tabletop unit featuring bi-directional daisywheel printing. The Telex "look ahead" feature increases print speed from the rated speed of 40 or 45 cps to 75 or 80 cps. Line widths of 132 or 158 characters can be accommodated. Also included is a typewriter-style keyboard with a numeric pad, and a console panel with a touch pad, LED indicators, and a 3-digit display.**

**Prices for the 767 range from $5,700 to $6,050.**

## MANAGEMENT SUMMARY

Telex introduced the 767 tabletop keyboard/printer as a plug-compatible replacement for the IBM 3767. The 767, designed for interactive operation, can transmit/receive data to/from IBM 370X, 4300, or 8100 host computers using 2740/2 or SNA/SDLC line protocols. The 767 effectively replaces the older Telex TC241 keyboard/printer terminal.

An important feature of the 767 is the console panel located just above the keyboard. The panel contains a total of 24 LED indicators, plus a 3-digit display, which provides the operator with error, column, and status information. Also contained on the console panel is a touch-pad panel, which allows the operator to choose the desired format options by simply touching a particular pad (in the same way that an operator would choose from a menu on a touch-sensitive display screen). The 767 keyboard has a typewriter-style layout, including a 12-key numeric pad and two control key clusters.

The 767 is available in two models. Model 1 utilizes a Diablo HyType II printer mechanism with a plastic daisy printwheel. Model 2 utilizes a Diablo HyType II WP 1355 printer mechanism with a metallic printwheel, for applications requiring letter-quality printing. Each model can be equipped with top or bottom paperfeed capability.

The rated print speed of the 767 ranges from 40 (Model 2) or 45 (Model 1) cps; however, the Telex "look ahead" feature raises the effective speed of the 767 to 75 (Model 2) or 80 (Model 1) cps. Bidirectional printing is standard, and the 767 can print 10 or 12 characters per inch, and six or eight lines per inch. Column width is 132 or 158 characters, depending on the character density. The 767 provides communications buffering of up to 8192 characters.

## CHARACTERISTICS

**VENDOR: Telex Computer Products, Inc., 6422 East 41st Street, Tulsa, Oklahoma 74135. Telephone (918) 627-1111.**

**DATE OF ANNOUNCEMENT: May 1981.**

**DATE OF FIRST DELIVERY: June 1981.**

**NUMBER DELIVERED TO DATE: Information not available.**

**SERVICED BY: Telex Service Co.**

### MODELS

**The 767 Keyboard/Printer Terminal is a tabletop, standalone unit compatible with the IBM 3767 and 2740 Model 2, and Telex TC241 printer terminals. Two models are available: Model 1 features a Diablo HyType II printer mechanism with a plastic daisy printwheel; Model 2 features a Diablo HyType II WP 1355 printer mechanism with a metallic printwheel, for letter-quality printing. Both Model 1 and Model 2 are available with top or bottom paperfeed mechanisms. Both models are also available with either a friction or pin-feed platen.**

### TRANSMISSION SPECIFICATIONS

**The 767 can transmit or receive data from the host using either 2740/2 or SNA/SDLC line protocol. Utilizing 2740/2 protocol, transmission is asynchronous at user-selectable transmission rates from 134.5 to 1800 bits per second. Using SNA/SDLC protocol, transmission is synchronous at speeds up to 4800 bps. A dual transmit and receive capability is provided. An RS-232-C interface is standard; an auxiliary port is optional. Communication is supported by an external modem, or by the following optional integral modems: Bell 202-compatible (up to 1800 bps), or IBM-compatible (1200 bps).**

### DEVICE CONTROL

**The 767 provides three format modes: two fixed, and one variable. The fixed formats are user-specified at time of order and are part of the stored microprogram. The variable format is established by keyed parameters or by the host.**

**A fixed format cannot be changed by the operator. Format parameters include left and right margins, tab stops, character**

# Telex 767 Keyboard/Printer Terminal

The user can select either a friction or pin-feed platen for use with the 767. A forms tractor is available as an option. Other options available for use with the 767 include a document insertion device, an auxiliary port, a security keylock, a 42-inch printer table, and a forms stand.

Telex introduced the 767 at the May 1981 National Computer Conference in Chicago.□

spacing, line spacing, spacing between lines, and form length. The fixed or variable formats are selected via the touch-pad panel on the console.

Editing features include character insert/delete and line insert/delete. The editing features are also selected through the touch-pad. Other format options selectable through the touch-pad panel include horizontal and vertical spacing, single/double space, form sense, local communications, alternate function, configuration, and test. Horizontal or vertical formatting parameters are stored in non-volatile memory. Error and column indicators, as well as status information, are provided by the LED indicators and 3-digit LED display, located on the console panel to the left of the touch-pad panel.

The 767 is equipped with a single buffer used for data transmission. Buffer sizes from 120 to 1024 characters can be selected as standard; buffer capacities of 2048, 4096, or 8192 characters can be selected when the 767 is configured with optional add-on memory increments. Dual transmit and receive buffer capability is also available as a customer-configurable option. Dual 512 character buffers can be selected on the standard model; dual buffers of up to 4096 characters each can be selected when the terminal is configured with the add-on RAM memory.

Telex's "look ahead" feature allows the terminal to ignore multiple new line and/or space characters, accumulate them, and execute them with one movement of the platen or carriage. This feature increases the effective print speed of the 767 to 75 or 80 cps (from 40 or 45 cps), depending upon operational system characteristics.

## COMPONENTS

PRINTER: A full-character bi-directional impact printer. Model 1 utilizes a Diablo HyType II printer mechanism with a plastic daisy printwheel. Model 2 utilizes a Diablo HyType II WP 1355 printer mechanism with a metallic daisy printwheel. The rated speeds of the printers are 40 to 45 cps; however, the Telex "look ahead" feature increases effective speeds to 75 or 80 cps. The 767 prints 132 columns at 10 characters per inch, and 158 columns at 12 characters per inch. Vertical spacing is 6 or 8 lines per inch. The character set consists of 96 EBCDIC characters.

A 15-inch friction or 14½-inch pin-feed platen may be selected. A tractor-feed mechanism capable of handling forms from 3 to 15 inches wide is optionally available. Top or bottom paperfeed capability may also be selected by the user. A paper-out sensor is standard. The printer utilizes a recirculating cloth ribbon.

Other optional devices available include a 6- or 7⅜-inch width document insertion device, a 42-inch printer table, and a forms stand. A security key lock is also optional.

KEYBOARD: An 80-key typewriter-style keyboard that can generate any of 96 EBCDIC characters. Control functions are provided by a 9-key cluster to the right of the main keygroup and a 10-key cluster to the left of the main keygroup. A 12-key numeric pad is also included.

A console panel is located above the keyboard. The panel contains a total of 24 LED indicators, plus a 3-digit LED display, which provides error, column, and status information. A touch-pad panel is located on the right side of the console panel. The touch sensitive pads activate the desired format options.

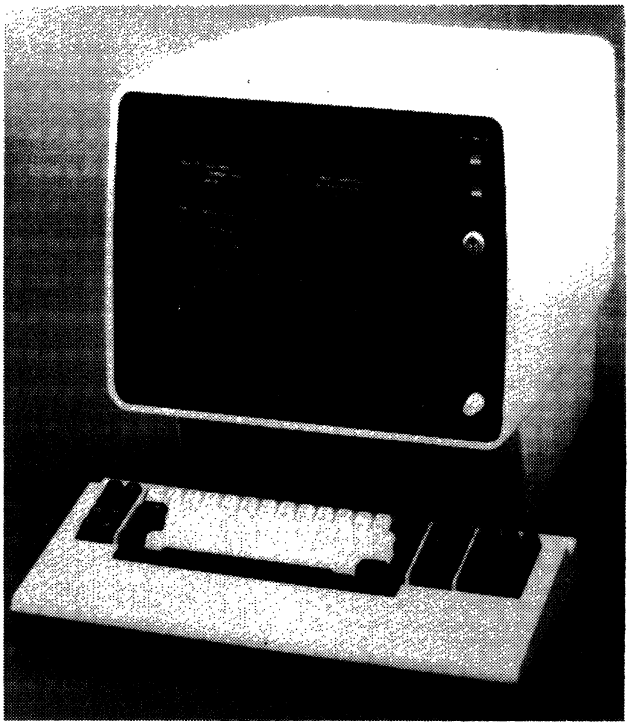
## PRICING

The 767 Keyboard/Printer Terminal is available for purchase, or on a two- or three-year lease.

| | Monthly Charge* | | | |
|---|---|---|---|---|
| | 2-Year Lease | 3-Year Lease | Purchase | Monthly Maint. |
| 767 Model 1 (top feed) | $170 | $155 | $5,700 | $39 |
| 767 Model 1 (bottom feed) | 180 | 165 | 5,850 | 39 |
| 767 Model 2 (top feed) | 185 | 170 | 5,900 | 39 |
| 767 Model 2 (bottom feed) | 195 | 185 | 6,050 | 39 |
| Pin-feed Platen | 8 | 6 | 160 | — |
| Bell 202-compatible modem (Integral) | 15 | 12 | 300 | — |
| IBM-compatible modem (Integral) | 15 | 12 | 300 | — |
| 1K add-on RAM | 5 | 4 | 100 | — |
| 2K add-on RAM | 10 | 8 | 200 | — |
| 4K add-on RAM | 20 | 16 | 400 | — |
| **Options** | | | | |
| Auxiliary Port | 5 | 4 | 100 | — |
| Forms Tractor | 12 | 9 | 270 | — |
| Security Keylock | 2.50 | 2.50 | 50 | — |
| Printer Table | — | — | 270 | — |
| Forms Stand | — | — | 75 | — |
| Document Insertion Device | 15 | 12 | 300 | — |

*Includes prime-shift maintenance.■

# Telex 270 Information Display System



Telex has added SDLC capability to the 276 Control Unit Display Station. The 276 offers control of up to eight devices, and is functionally compatible with the IBM 3276.

**A family of plug-compatible replacements for the IBM 3270 Information Display System.**

**A variety of displays, controllers, and printers are available for 3271/3272 and 3274/3276 emulation. The 270 system can be used in remote or local clusters of up to 32 devices, or in a stand-alone environment. The Telex components offer savings in space and price, while possessing features identical with those of their IBM counterparts.**

**Display stations with keyboards range in price from $1,900 to $4,110; control units from $3,500 to $7,400; and printers from $900 to $5,430. Two- and three-year leases are also available.**

## MANAGEMENT SUMMARY

Telex is a leader in the IBM 3270 plug-compatible replacement market. The company was the first independent vendor to offer functional replacements for the IBM 3276 Control Unit Display Station and the 3278 Display Station.

The 270 system is a plug-to-plug replacement for the BSC or SDLC version of the IBM 3270 right down to the cables and accommodates the same number (32) of display stations and printers (in any mix) as the IBM 3270. Furthermore, the 270 provides complete compatibility with the IBM 3270 with respect to line discipline, commands and command-code structure, and addressing seqeunce. The Telex terminals also provide all the features and functions that are currently available with the IBM 3270. Display screen capacities 1920, 2560, 3440, and 3564 characters are available. Also, Telex's remote and local control units can accommodate any mix of IBM 3277 and 277 or IBM 3278 and 278 display stations.

Telex offers a variety of controllers, display stations, and printers for use in the 270 system. The company has dropped many of it's older models (such as the 271/3-1, -2, -11, and -12 Remote Control Units, and the 277A, 277B, and 277C Display Stations), while adding additional models (such as the 281 Message Printer) and features (such as SDLC capability with the 276 Control Unit ➢

## CHARACTERISTICS

**VENDOR: Telex Computer Products, Inc., 6422 East 41st Street, Tulsa, Oklahoma 74135. Telephone (918) 627-1111.**

**DATE OF ANNOUNCEMENT: 277 and 275—January 1974; 276 and 278—June 1979.**

**DATE OF FIRST DELIVERY: 277—March 1974; 275—September 1974; 276 and 278—August 1979.**

**NUMBER DELIVERED: Over 60,000 display units.**

**SERVICED BY: Telex Service Co.**

### CONFIGURATION

**The 270 system is a direct replacement for the IBM 3270 Information Display System in a local or remote cluster or remote stand-alone environment. The standard cluster configurations accommodate up to 32 devices, including any mix of 277 or 278 CRT keyboard/display stations and printers. The control unit provides individual buffering for each device, which can be located up to 2000 cable-feet from the controller. An optional light pen and magnetic card reader are available for each 277 display station; the light pen is also optional for the 278 display station.**

**Two models of control units are available for the 277 display stations: Models 271/3 for remote operation and Model 272 for local operation. The local controller, Model 272, is an IBM 3272 controller that contains a channel interface for direct connection (up to 200 cable feet) to an IBM System/360 Models 25 through 195, IBM System/370 Models 115 through 195, IBM 303X Series processor, or compatible systems such as the Amdahl 470. Connection is via a Selector, Multiplexer, or Block Multiplexer channel. The data transfer rate can range from 10K to 650K characters per second. The remote controllers, Models 271/3 and 371, are attached to a communications facility via a modem. The maximum cable length between controller and modem is 40 feet.**

**The basic Model 271/3 or 272 control unit contains one device adapter that can accommodate up to four devices. Two additional devices can be accommodated via each subsequent device adapter, up to a total of 15 device adapters.** ➢

# Telex 270 Information Display System

## 270 FAMILY COMPONENTS AND SUBSYSTEMS

| Controller | Mode | Protocol | Buffer Size, chars. | Display Models | Printer Models | Max. Devices |
|---|---|---|---|---|---|---|
| **Standard clusters** | | | | | | |
| 271/3-B | Remote | BSC | 1920 | 277D | 286/287/289 | 32 |
| 271/3-12 | Remote | SDLC | 1920 | 277-2/-1 | 284/287/289 | 32 |
| 272-2 | Local | — | 1920 | 277-2 | 284/287/289 | 32 |
| 276 | Remote | BSC, SDLC | 1920 | 278 | 286/287/289 | 8 |
| **Stand-alone** | | | | | | |
| 275-2 | Remote | BSC | 1920 | Integral | 234, 281 | 2 |

Display Station). This activity has helped Telex maintain its leadership in the highly competitive 3270-replacement market.

### USER REACTION

In Datapro's 1981 survey of alphanumeric display terminal users, seven users reported on their experiences with Telex 270 system terminals. These users represented an installed base of 273 terminals, including one user who indicated his installation had 225 Model 277 displays in use. Two other users reported on the 277 displays, while the remaining four had 276 and 278 stations installed. The ratings given by these users are as follows:

| | Excellent | Good | Fair | Poor | WA* |
|---|---|---|---|---|---|
| Overall performance | 1 | 5 | 1 | 0 | 3.0 |
| Ease of operation | 2 | 5 | 0 | 0 | 3.3 |
| Display clarity | 4 | 2 | 1 | 0 | 3.4 |
| Keyboard feel & usability | 2 | 4 | 1 | 0 | 3.1 |
| Hardware reliability | 1 | 2 | 4 | 0 | 2.6 |
| Maintenance service | 1 | 5 | 1 | 0 | 3.0 |
| Technical support | 1 | 5 | 1 | 0 | 3.0 |

*Weighted Average based on a scale of 4.0 for Excellent.

Five of the users indicated use of the 270 system terminals in a cluster configuration, while the remaining two users reported stand-alone configurations. Data entry and program development were the most popular applications mentioned by the users (five each). Other applications indicated were text editing/word processing (two users), as a systems console (two), and for telecommunications purposes (one).□

**The Model 271/3 and 272 control units are available with a buffer capacity of 1920 characters. A control unit with a 1920-character buffer capacity can accommodate any mix of display stations and printers with 1920-character buffers.**

**The 276 Control Unit Display Station is a keyboard/display station with a built-in controller. The 276 supports up to seven devices, which can include 278 display stations and 286, 287, or 289 printers. The control unit has a 1920-character buffer.**

**The 275 display station is a remote stand-alone terminal with a 1920-character buffer. The 275 can accommodate an optional selector light pen and a 234 printer.**

### TRANSMISSION SPECIFICATIONS

**Transmission is synchronous in the half-duplex mode. Transmission rates for the 271/3 control unit are specified as 2400, 4800, 7200, or, optionally, 9600 bits/second. The 275 transmits at up to 4800 bits/second, and the 276 at up to 9600 bits/second. The 8-level ASCII (including parity) or EBCDIC transmission code and BSC or SDLC protocol are used. An EIA Standard RS-232-C interface provides for connection to a voice-grade line via a modem. Bell System modems that can be used include the Dataphone 2400, 4800, and 9600.**

### DEVICE CONTROL

**The 270 system operates under the control of the program stored at the computer and provides complete compatibility with the addressing sequence, command code structure, and line discipline employed by the IBM 3270 Information Display System. The 270 system responds to and executes the full repertoire of IBM 3270 commands via a hard-wired processor.**

**Cursor control is functionally the same as in the IBM 3270. The controls position the cursor up, down, left, or right, either step-by-step or repetitively (if the key is held down). The cursor can also be backspaced one character position, moved to the beginning of the next line or the next unprotected data field, tabbed to the beginning of the next unprotected data field, and backtabbed to the beginning of the previous unprotected data field. Cursor addressability is standard.**

**Edit controls are the same as those for the IBM 3270 and include character insertion and deletion within a field, screen and field erasure, partial field erasure (specified by the cursor position), and duplication of data, which is specified by a unique code and displayed as an asterisk.**

**Structured data entry a la displayable formats is supported via attribute codes, which define protected fields, delimit data entry fields, and specify display parameters and tab stop positions. The use of the attribute codes is identical with the IBM 3270. Display parameters specify beam intensity (full or half) and beam blanking (for security purposes).**

**Program Function and Program Attention keys, standard features of the IBM 3270, are also standard in the 270 system. Each of these keys generates a unique code that is recognized by the controlling software as a specific program request or data identifier. Program Function codes accompany the display data as it is transmitted to the computer, while Program Attention codes are transmitted separately.**

# Telex 270 Information Display System

A light pen is available as an option for all display stations which functionally corresponds to IBM's Selector Pen, a 3270 option. Any one of several alphanumeric or numeric fields of fixed or variable formats can be selected by the pen, which transmits the address of the selected entry to the computer to initiate the programmed function.

A response time indicator is optionally available for use with the 277 display. This feature allows for the display of the following data: the response time for the last transaction; average response time for all transactions; response time of the longest transaction; and the number of transactions in which the response time was greater than 15 seconds.

Other options include an audible alarm, a keyboard numeric lock that permits only numeric data to be entered, and a security lock that prevents unauthorized data entry. A magnetic stripe card reader is available as an option on the 275 and 277.

## COMPONENTS

271/3B & 271/3-12 REMOTE CLUSTER CONTROL UNITS: Provides control for up to 32 devices, including 277 displays, and 286C, 287C, and 289C printers, as well as the corresponding IBM equipment. Model 271/3B is the BSC version, while model 271/3-12 is the SDLC version.

272-2 LOCAL CLUSTER CONTROL UNIT: Provides control for up to 32 devices, including 277 displays, and 287C and 289C printers.

276 CONTROL UNIT DISPLAY STATION: Available in two models: the 276-2 (BSC) and 276-10 (SDLC). The 276 provides for control of up to seven devices, either 278 (or IBM 3278) display stations or 286C, 287C, (or IBM 3287) printers, in any mix. The unit also features a built-in 278 display, making the total number of stations available eight. A 15-inch diagonal, non-glare display screen is standard. Screen sizes available include: 24 lines by 80 characters (1920 characters); 32 lines by 80 characters (2560); 43 lines by 80 characters (3440); and 27 lines by 132 characters (3564). An operator status indicator appears on the 25th display line. Characters are formed utilizing a 9 x 14 dot matrix, and displayed in white or green phosphor. Upper case and upper/lower case characters are switch-selectable.

275-2 STAND-ALONE DISPLAY STATION: A CRT display unit featuring a 15-inch diagonal non-glare display screen. A screen format of 24 lines by 80 characters (1920 characters) is accommodated. Characters are formed utilizing a 7 x 8 or 7 x 9 dot matrix, and displayed in white or green (optional) phosphor. EBCDIC or ASCII character sets can be displayed. Upper case or upper/lower case characters are optional.

277D CLUSTER DISPLAY STATION: A CRT display unit featuring a 15-inch diagonal non-glare display screen. A screen format of 24 lines by 80 characters (1920 characters) is standard. A 25th line displays status indicators, response time indicator, and cursor row and column indicators. Characters are formed utilizing a 7 x 9 dot matrix (upper case only), or a 7 x 8 dot matrix (upper case only or upper/lower case), and displayed in white or green (optional) phosphor. Upper case and upper/lower case characters are switch-selectable.

278-2/-3/-4/-5 CLUSTER DISPLAY STATIONS: A 15-inch diagonal non-glare display screen is standard. Model 2 features a 24-line by 80-character screen format (1920 characters); Model 3 features a 32-line by 80-character format (2560); Model 4 features a 43-line by 80-character format (3440); and Model 5 features a 27-line by 132-character screen format (3564). Operator status indicators are displayed on the bottom line of the screen. Characters are formed utilizing a 9 x 14 dot matrix, and displayed in green or white phosphor for Model 2, and in green phosphor only for all other models. Upper case and upper/lower case characters are switch-selectable.

276 KEYBOARDS: A choice of five keyboards are available for the 276-2, and a choice of eleven keyboards are available for the 276-10. All keyboards are detached; EBCDIC/ASCII typewriter or EBCDIC data entry layout; and feature a variety of other options, including a numeric pad, function pad, 24 program function keys, and keypunch layout. Keyboard click is switch-selectable. Alphanumeric, special symbol, and cursor control keys are typamatic. Additional options include an audible alarm, selector light pen, security lock, and numeric lock.

275 KEYBOARDS: A choice of five keyboards are available. All keyboards are detached. Keyboards include EBCDIC data entry layout, data entry with keypunch, EBCDIC/ASCII typewriter with numeric pad, EBCDIC/ASCII typewriter with function pad, and operator console or check processing. Optional features include an audible alarm, selector light pen, security lock, and numeric lock.

277D KEYBOARDS: A choice of 11 keyboards are available. All keyboards are detached. Keyboards can be obtained with EBCDIC or ASCII code, typewriter, data entry, operator console, or check processing layouts, and with a numeric pad, function pad, or 12 program function keys. Keyboard click is switch-selectable. All alphanumeric, special symbol, and cursor control keys are typamatic. Options include an audible alarm, selector light pen, security lock, keyboard numeric lock, response time indicator, and magnetic stripe card reader.

278 KEYBOARDS: Several styles of keyboards are available for the four 278 display models. All keyboards are detached. Keyboards can be obtained with EBCDIC or ASCII code, typewriter, data entry, or data entry with keypunch layouts, and with a numeric pad, function pad, or 12 or 24 program function keys. A single key clear feature is also available with many keyboards. Keyboard click is switch-selectable. All alphanumeric, special symbol, and cursor control keys are typamatic. Options include an audible alarm, selector light pen, security keylock, numeric lock, and response time indicator.

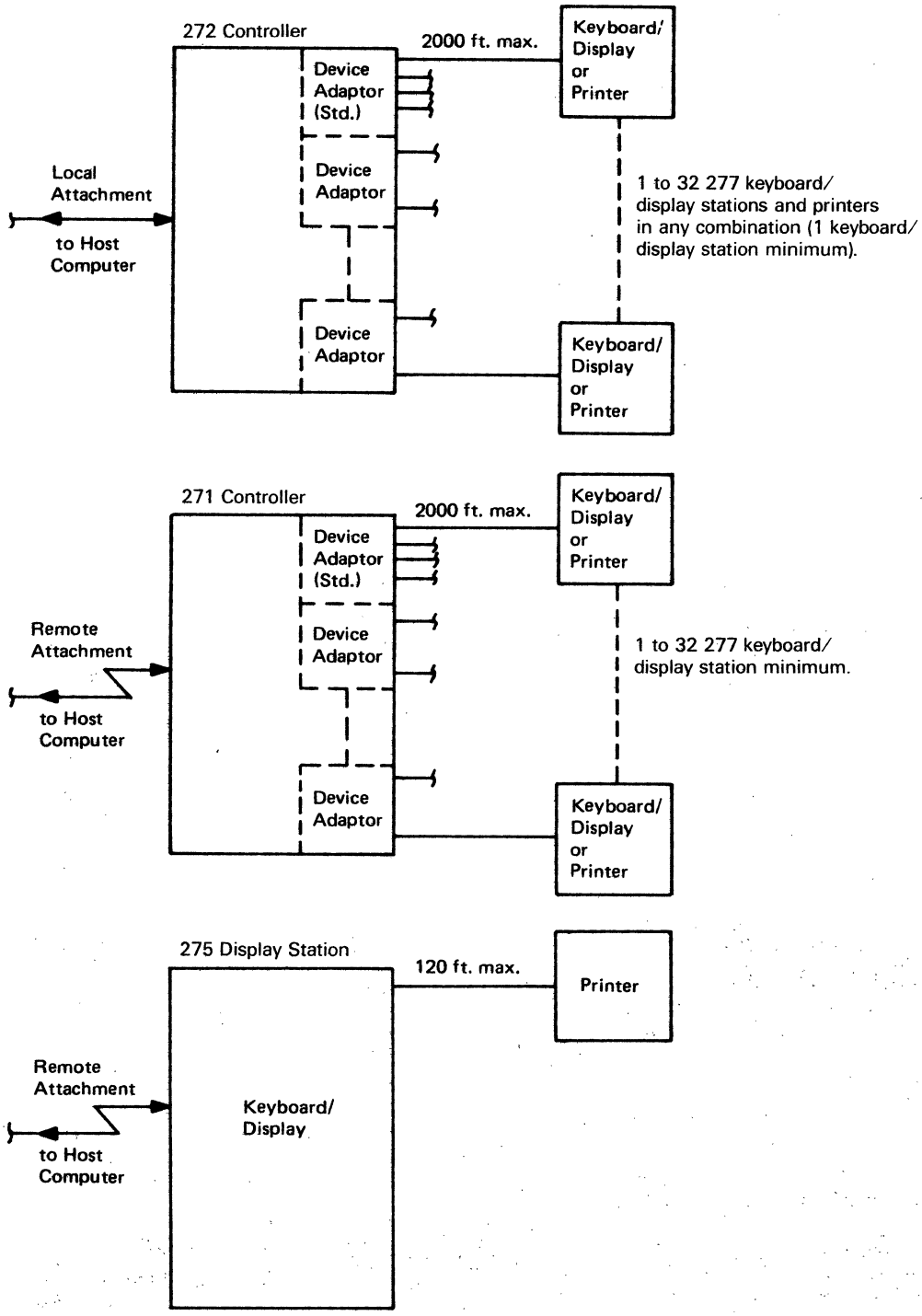
281 MESSAGE PRINTER: Provides 80 or 132 print positions at a rated speed of 80 cps (bidirectional). The character set contains the full 96-character ASCII set plus 64 graphics symbols. Line spacing is 6 or 8 lines per inch; character spacing is 10 characters per inch using the 80 column format, and 16.5 cpi using the 132 column format. Characters are formed via a 9 x 7 dot matrix. The paper handling system features a friction-feed/pin-feed platen. Up to three part forms can be printed. A tear bar and paper roll are standard; a forms tractor is optional. The 281 can be attached to a 277 or 278 display.

234 PRINTER: Equipped with a Diablo HyType I printer mechanism with 120, 126, or 132 print positions and a rated speed of 30 characters per second. The rated speed can be exceeded when passing over non-printer characters (Look Ahead feature) and can be as high as 60 characters per second. The impact printer features full-character printing via an interchangeable "daisy" wheel. EBCDIC, ASCII A, or ASCII B 64-character print sets can be specified. The basic printer features a friction feed platen; tractor feed is optional. Forms up to 15 inches (friction) or 14¾ inches (tractor) wide can be used. Pin feed platens can be specified as 13⅛, 14⅜, or 14½ inches wide. Form Feed control is a no-cost option.

286C IMPACT PRINTER: Equipped with a Diablo Hytype II printer mechanism and a 1920-character buffer. The printer provides 132 print positions and operates at a rated speed of 40 cps. The character set includes 64 upper case or 96 upper

# Telex 270 Information Display System

## Standard Configurations

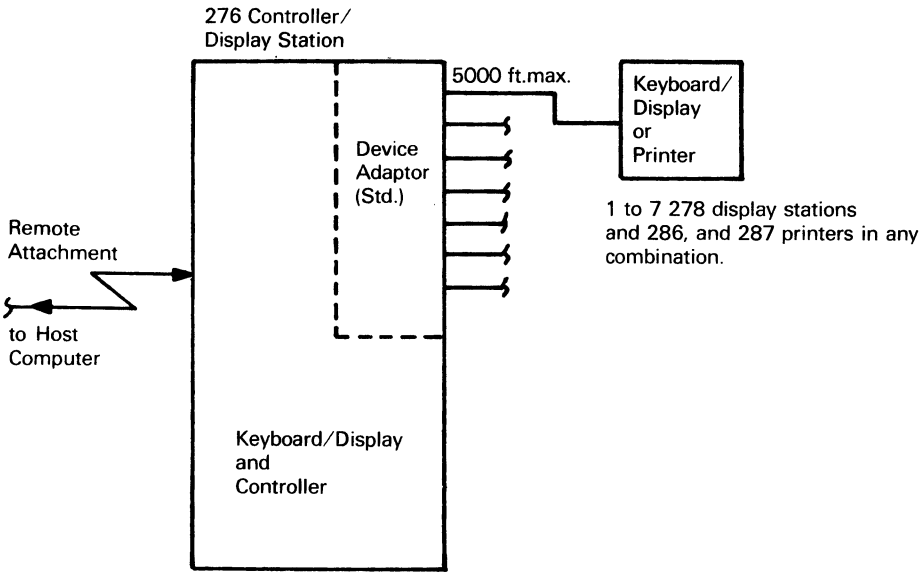



and lower case symbols. Spacing is 10 characters per inch and 6 lines per inch or, optionally, 12 characters per inch and 8 lines per inch. Pin feed is standard; an optional forms tractor accommodates forms up to 15 inches wide.

287C MATRIX PRINTER: Contains a 1920-character buffer and a Diablo 2300 bidirectional matrix printer mechanism with a rated speed of 180 cps and 132 print positions. A 480-character buffer is optional. The character set contains 64 upper case print symbols; each character is formed via a 7-by-9 dot matrix. Spacing is 10 characters/ inch and 6 lines/inch. The 287 accommodates pin-fed, 6-part continuous forms from 4 to 14⅞ inches wide.

289C LINE PRINTER: Contains a 1920-character buffer and a GE TermiNet 330 line printer mechanism with a rated speed of 340 lpm (with a 64-character belt) and 132 print positions. The character set is available with 64 upper case or 96 upper and lower case symbols. Spacing is 10 characters/ inch and 6 lines/inch. The 289 accommodates pin-feed, 6-part continuous forms from 3 to 15 inches wide.

# Telex 270 Information Display System




## PRICING

**The 270 system is available for purchase or on a two-, or three-year lease including prime-shift maintenance. Telex offers quantity discounts on some devices. There are no installation charges for the Telex equipment. Telex does not schedule customer training; however, its field engineering personnel and customer representatives provide any necessary on-site training. Full service maintenance on a 24-hour-per-day, 7-day-per-week basis is available on negotiation.**

| | Monthly Charge* | | | |
|---|---|---|---|---|
| | 2-Year Lease | 3-Year Lease | Purchase | Monthly Maint. |
| **Cluster Controllers** | | | | |
| 271/3-B Remote Control Unit (1920 chars.) | $134 | $119 | $3,500 | $24 |
| 271/3-12 Remote Control Unit (1920 chars.) | 259 | 241 | 4,750 | 35 |
| 272-2 Local Control Unit (1920 chars.) | 220 | 198 | 7,400 | 38 |
| **Controller/Display Stations** | | | | |
| 276-2 (1920 chars.) | 184 | 166 | 5,300 | 24 |
| 276-10 SDLC (1920 chars.) | 184 | 166 | 5,300 | 24 |
| Audible Alarm | 2 | 1.50 | 55 | — |
| Security Keylock | 30** | 30** | 30 | — |
| Selector Light Pen | 12 | 11 | 450 | 2 |
| Locking Plug | 6** | 6** | 6 | — |
| Device Adapter/Port 1 (276-2 only) | 6 | 5 | 260 | 1 |
| Device Adapter/Port 2 (276-2 only) | 5 | 4 | 260 | — |
| Device Adapter (276-10 only) | 11 | 9 | 500 | 1 |
| **Stand-Alone Display Stations** | | | | |
| 275-2 (1920 chars.) | 121 | 104 | 3,800 | 26 |
| Green Phosphor Characters | 4 | 3 | 50 | — |
| Audible Alarm | 5 | 4 | 150 | — |
| Security Keylock | 30** | 30** | 30 | — |
| Selector Light Pen | 22 | 19 | 500 | 2 |
| Locking Plug | 6** | 6** | 6 | — |
| Magnetic Stripe Card Reader | 26 | 21 | 600 | 1 |
| Slave Print Feature | 5 | 4 | 50 | 1 |
| SDLC Upgrade Kit | — | — | 1,500 | — |
| 281 Attachment Feature | 14 | 11 | 550 | — |
| **Cluster Display Stations** | | | | |
| 277D (1920 chars.) | 63 | 50 | 1,590 | 10 |
| Green Phosphor Characters | 4 | 3 | 50 | — |
| Audible Alarm | 4 | 3 | 125 | — |
| Security Keylock | 30* | 30** | 30 | — |
| Selector Light Pen | 22 | 19 | 500 | 2 |
| Magnetic Stripe Card Reader | 26 | 21 | 600 | 1 |

*Includes prime-shift maintenance.
**Single use charge.

# Telex 270 Information Display System

| | Monthly Charge* 2-Year Lease | 3-Year Lease | Purchase | Monthly Maint. |
|---|---|---|---|---|
| Response Time Indicator | $ 2.50 | $ 2 | $ 100 | — |
| Host Transmission Feature | 2.50 | 2 | 100 | — |
| 281 Attachment Feature | 14 | 11 | 550 | — |
| 278-2 (1920 chars.) | 55 | 49 | 2,100 | $ 7 |
| 278-3 (2560 chars.) | 67 | 61 | 2,300 | 8 |
| 278-4 (3440 chars.) | 69 | 63 | 2,500 | 9 |
| 278-5 (3564 chars.) | 82 | 75 | 2,800 | 10 |
| Audible Alarm | 3 | 2.50 | 55 | 1 |
| Security Keylock | 30** | 30** | 30 | — |
| Selector Light Pen | 12 | 11 | 450 | 2 |
| Locking Plug | 6** | 6** | 6 | — |
| Enhancement Board | 11 | 9 | 350 | — |
| 281 Attachment Feature | 9 | 7 | 300 | — |
| Response Time Indicator | 7 | 6 | 200 | — |
| **Keyboards** | | | | |
| For 276-2/276-10— | | | | |
| EBCDIC Typewriter w/24 PF Keys | 15 | 14 | 400 | 5 |
| EBCDIC Data Entry | 15 | 14 | 400 | 5 |
| EBCDIC Data Entry w/Keypunch Layout | 15 | 14 | 400 | 5 |
| EBCDIC Typewriter w/Numeric Pad | 19 | 18 | 550 | 5 |
| EBCDIC Typewriter w/Function Pad | 21 | 19 | 600 | 5 |
| For 275.2— | | | | |
| EBCDIC Data Entry | 12 | 11 | 310 | 6 |
| EBCDIC/ASCII w/Numeric Pad | 12 | 11 | 310 | 6 |
| EBCDIC Data Entry w/Keypunch Layout | 14 | 13 | 310 | 6 |
| EBCDIC/ASCII w/Function Pad | 18 | 16 | 310 | 5 |
| Operator Console or Check Processing | 19 | 16 | 310 | 5 |
| Upper/Lower Case Character Set | 6 | 5 | 150 | 1 |
| For 277D— | | | | |
| EBCDIC Data Entry | 17 | 15 | 310 | 6 |
| EBCDIC Data Entry w/Keypunch Layout | 17 | 15 | 310 | 6 |
| EBCDIC Typewriter w/Numeric Pad | 16 | 14 | 310 | 5 |
| EBCDIC Typewriter w/Numeric Pad and 12 PF Keys | 15 | 14 | 310 | 5 |
| EBCDIC Typewriter w/Program Function Keys | 15 | 14 | 310 | 5 |
| Operator Console or Check Processing | 16 | 14 | 310 | 5 |
| ASCII Typewriter w/Numeric Pad | 16 | 14 | 310 | 5 |
| ASCII Typewriter w/Function Pad | 16 | 14 | 310 | 5 |
| For 278-1/-2/-3/-4/-5— | | | | |
| EBCDIC Typewriter w/24 Program Function Keys | 15 | 14 | 400 | 5 |
| EBCDIC Typewriter w/12 Program Function Keys | 21 | 20 | 650 | 5 |
| EBCDIC Data Entry | 15 | 14 | 400 | 5 |
| EBCDIC Data Entry w/Keypunch Layout | 15 | 14 | 400 | 5 |
| EBCDIC Typewriter w/Numeric Pad | 19 | 18 | 600 | 5 |
| ASCII Typewriter w/12 Function Keys | 21 | 20 | 650 | 5 |
| ASCII Typewriter w/Numeric Pad | 19 | 18 | 550 | 5 |
| **Printers** | | | | |
| 281 | 56 | 48 | 900 | 22 |
| Paper Roll Holder | 2 | 2 | 50 | — |
| Forms Tractor | 7 | 6 | 150 | 2 |
| 234 (Bufferless) | 168.50 | 163.50 | 4,100 | 36 |
| Pin Feed Platen | 5.50 | 5 | 130 | 1 |
| Forms Tractor | 14 | 10 | 270 | 2 |
| 286C Model 1 | 190 | 177 | 4,850 | 34 |
| 286C Model 2 | 202 | 186 | 5,150 | 34 |
| Bottom Feed | 130** | 130** | 130 | — |
| Pin Feed Platen | 5.50 | 5 | 130 | 1 |
| Extended Print Buffer (2560/3440/3564 char.) | 4 | 3 | 105 | — |
| Forms Tractor | 14 | 10 | 270 | 2 |
| Locking Plug | 5** | 5** | 5 | — |

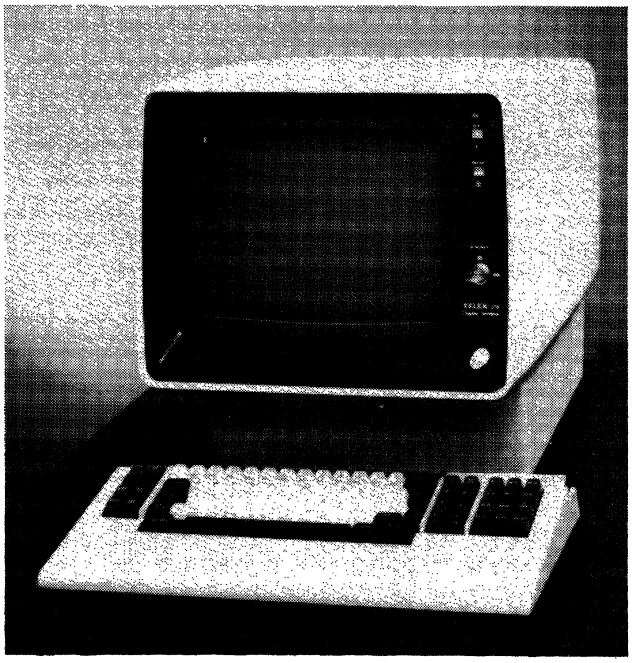
*Includes prime-shift maintenance.
**Single use charge

# Telex 270 Information Display System

| | Monthly Charge* | | | |
|---|---|---|---|---|
| | 2-Year Lease | 3-Year Lease | Purchase | Monthly Maint. |
| Single-Sheet Feeder | $ 55 | $ 51 | $1,950 | — |
| Forms Stand | 50** | 50** | 50 | — |
| Printer Stand (White) | 200** | 200** | 200 | — |
| Printer Stand (Beige) | 250** | 250** | 250 | — |
| 287C | 191 | 178 | 5,430 | $34 |
| Bottom Feed | 130** | 130** | 130 | — |
| Pin Feed Platen | 5.50 | 5 | 130 | 1 |
| Extended Print Buffer (2560/3440/3564 char.) | 4 | 3 | 105 | — |
| Forms Tractor | 14 | 10 | 270 | 2 |
| Locking Plug | 5** | 5** | 5 | — |
| High Resolution Print Feature | 10 | 9 | 300 | — |
| Forms Stand | 50** | 50** | 50 | — |
| Printer Stand (White) | 200** | 200** | 200 | — |
| Printer Stand (Beige) | 250** | 250** | 250 | — |
| 289C | 438 | 358 | 9,200 | 83 |
| Bottom Feed | 130** | 130** | 130 | — |
| Pin Feed Platen | 5.50 | 5 | 130 | 1 |
| Forms Tractor | 14 | 10 | 270 | 2 |

*Includes prime-shift maintenance.
**Single use charge.■

# Telex Terminal Communications 270 Information Display System



The TC 278, the newest model in the TC 270 family, features a 1920-character screen and a choice of four keyboard models. Up to seven TC 278's can be attached to a TC 276 or IBM 3276 control unit.

**A family of IBM 3270-compatible display terminals that can be used in a local or remote environment. Up to 32 display stations and printers, in any combination, are supported.**

**Features are identical with those of the IBM 3270 and existing IBM cables can be used. Enhancements include additional keyboard models, a control unit with local storage, and additional printer models rated at 180 cps and 340 lpm.**

**Display stations with keyboards range in price from $1,950 to $2,200; control units range from $3,500 to $9,200; and printers range from $4,100 to $8,750. One-, two-, three-, four-, and five-year leases are available. Quantity discounts are offered on some devices.**

## MANAGEMENT SUMMARY

Telex Terminal Communications, Inc., a division of Telex Computer Products, has addressed itself to the IBM terminal replacement market with replacements for the IBM 2260 and 2265 Display Stations, 2740 and 2741 Communication Terminals, and 3270 Information Display System.

The TC 270 system is a plug-to-plug replacement for the BSC or SDLC version of the IBM 3270 right down to the cables and accommodates the same number (32) of display stations and printers (in any mix) as the IBM 3270. Furthermore, the TC 270 provides complete compatibility with the IBM 3270 with respect to line discipline, commands and command-code structure, and addressing sequence. The TTCI terminals also provide all the features and functions that are currently available with the IBM 3270. Display screen capacities are also identical with those of existing IBM 3270 terminals, 480 and 1920 characters.

What's more, TTCI's remote and local control units can accommodate any mix of IBM 3277 and TC 277 or IBM 3278 and TC 278 display stations. TTCI's local control unit is actually an IBM 3272; however, its remote control units are its own.

TTCI offers a variety of models of display stations, control units, and printers. However, some of the older models, including the TC 277-1 and TC 277-2 display ➢

## CHARACTERISTICS

**VENDOR: Telex Terminal Communications, Inc., 3301 Terminal Drive, Raleigh, North Carolina 27611. Telephone (919) 834-5251.**

**DATE OF ANNOUNCEMENT: TC 277 and TC 275—January 1974; TC 276 and TC 278—June 1979.**

**DATE OF FIRST DELIVERY: TC 277—March 1974; TC 275—September 1974; TC 276 and TC 278—August 1979.**

**NUMBER DELIVERED: Over 20,000 display units.**

**SERVICED BY: Telex Terminal Communications, Inc.**

### CONFIGURATION

**The TC 270 system is a direct replacement for the IBM 3270 Information Display System in a local or remote cluster or remote stand-alone environment. The standard cluster configurations accommodate up to 32 devices, including any mix of TC 277 CRT keyboard/display stations and TTCI printers. The control unit provides individual buffering for each device, which can be located up to 2000 cable-feet from the controller. An optional light pen and magnetic card reader are available for each TC 277 display station.**

**Three models of control units are available for the TC 277 display stations: Models 271/3 and 371 for remote operation and Model 272 for local operation. The local controller, Model 272, is an IBM 3272 controller that contains a channel interface for direct connection (up to 200 cable feet) to an IBM System/360 Models 25 through 195, IBM System/370 Models 115 through 195, IBM 303X Series processor, or compatible systems such as the Amdahl 470. Connection is via a Selector, Multiplexer, or Block Multiplexer channel. The data transfer rate can range from 10K to 650K characters per second. The remote controllers, Models 271/3 and 371, are attached to a communications facility via a modem. The maximum cable length between controller and modem is 40 feet.** ➢

# Telex Terminal Communications 270 Information Display System

## TTCI 270 FAMILY COMPONENTS AND SUBSYSTEMS

| Controller | Mode | Protocol | Buffer Size, chars. | Display Models | Printer Models | Max. Devices |
|---|---|---|---|---|---|---|
| **Standard clusters** | | | | | | |
| TC 271/3-B, -C, -D | Remote | BSC | 1920 | TC 277 | TC 286/287/289 | 32 |
| TC 271/3-1 | Remote | BSC | 480 | TC 277-1 | TC 284-1 | 32 |
| TC 271/3-2 | Remote | BSC | 1920 | TC 277-2/-1 | TC 284/287/289 | 32 |
| TC 271/3-11 | Remote | SDLC | 480 | TC 277-1 | TC 284-1 | 32 |
| TC 271/3-12 | Remote | SDLC | 1920 | TC 277-2/-1 | TC 284/287/289 | 32 |
| TC 272-1 | Local | — | 480 | TC 277-1 | TC 284-1 | 32 |
| TC 272-2 | Local | — | 1920 | TC 277-2 | TC 284/287/289 | 32 |
| TC 276 | Remote | BSC | 1920 | TC 278 | TC 286/287/289 | 8 |
| TC 371 | Remote | BSC, SDLC | 1920 | TC 277 | TC 286/287/289 | 32 |
| **Stand-alone** | | | | | | |
| TC 275-1 | Remote | BSC | 480 | Integral | TC 234 | 2 |
| TC 275-2 | Remote | BSC | 1920 | Integral | TC 234 | 2 |
| TC 275-11 | Remote | SDLC | 480 | Integral | TC 234 | 2 |
| TC 275-12 | Remote | SDLC | 1920 | Integral | TC 234 | 2 |

stations and the TC 234 and TC 284 printers, are no longer being manufactured and are available for resale only. The TC 277/B and TC 277/C display stations are still available, but the vendor is actively marketing the newer TC 277/D.

The TC 371 Remote Cluster Control Unit, introduced in June 1978, is an enhanced version of the earlier TC 271/3 control unit series. The TC 371 includes diskette storage that provides capabilities for store and forward, local format storage, local printing, batch printing, and local editing, all without host computer intervention. The TC 276 Control Unit Display Station and the TC 278 keyboard/display station, introduced in June 1979, are the newest members of the TC 270 family.

### USER REACTION

In Datapro's 1979 survey of alphanumeric display terminal users, 17 users reported on their experience with 935 TC 270 display terminals. The users' ratings are summarized in the following table.

| | Excellent | Good | Fair | Poor | WA* |
|---|---|---|---|---|---|
| Overall performance | 9 | 8 | 0 | 0 | 3.5 |
| Ease of operation | 6 | 10 | 0 | 0 | 3.4 |
| Display clarity | 8 | 5 | 3 | 0 | 3.3 |
| Keyboard feel & usability | 10 | 5 | 1 | 0 | 3.6 |
| Hardware reliability | 6 | 8 | 2 | 0 | 3.2 |
| Maintenance service | 4 | 6 | 6 | 0 | 2.9 |
| Technical support | 2 | 5 | 8 | 0 | 2.6 |

*Weighted Average on a scale of 4.0 for Excellent.

These ratings indicate a high degree of user satisfaction with the TC 270 terminals, except in the area of maintenance and technical support. In most categories, the TC 270 earned slightly higher ratings in our 1979 alphanumeric display terminal survey than in our previous survey. One user commented that the newer model TC 277/B terminal was more reliable than earlier TC 277 models.

**The basic Model 271/3 or 272 control unit contains one device adapter that can accommodate up to four devices. Two additional devices can be accommodated via each subsequent device adapter, up to a total of 15 device adapters.**

**The Model 271/3 and 272 control units are available with a buffer capacity of 480 or 1920 characters. A control unit with a 480-character buffer capacity can accommodate only display stations and printers having a 480-character buffer (TC 277-1 displays and TC 284-1 printers). A control unit with a 1920-character buffer capacity can accommodate any mix of display stations and printers with 480- and 1920-character buffers.**

**The basic Model 371 control unit provides for the attachment of up to eight devices. Three additional device adapters, each accommodating up to eight devices, can be added. The Model 371 has a standard buffer size of 1920 characters, allowing any mix of 480- or 1920-character display terminals and printers.**

**The TC 276 Control Unit Display Station is a keyboard/display station with a built-in controller. The TC 276 supports up to seven devices, which can include TC 278 display stations and TC 286, TC 287, or TC 289 printers. The control unit has a 1920-character buffer.**

**The TC 275 display station is a remote stand-alone terminal available in two models: Model 1 contains a 480-character buffer; Model 2 contains a 1920-character buffer. The TC 275 can accommodate an optional selector light pen and a TC 234 printer. Up to 20 TC 275 display stations can be attached to a communications line via a TC 905 Shared Modem, which requires one TC 905 Attachment, a no-cost item.**

### TRANSMISSION SPECIFICATIONS

**Transmission is synchronous in the half-duplex mode. Transmission rates for the TC 271/3 control unit are specified as 2400, 4800, 7200, or, optionally, 9600 bits/second. Transmission rates for the TC 371 are 1200, 2000, 2400, 4800, 7200, or 9600 bits/second. The TC 275 transmits at up to 4800 bits/second, and the TC 276 at up to 9600 bits/second. The 8-level ASCII (including parity) or EBCDIC transmission code and BSC or SDLC protocol are used. BSC or SDLC protocol is switch-selectable on the TC 371. An EIA Standard RS-232C interface provides**

# Telex Terminal Communications
# 270 Information Display System

Low cost, mentioned by 13 users, was cited as the key advantage of the TC 270. Four users also mentioned size as an advantage, but four others considered the terminals' size a disadvantage.□

for connection to a voice-grade line via a modem. Bell System modems that can be used include the Dataphone 2400, 4800, and 9600.

## DEVICE CONTROL

The TC 270 system operates under the control of the program stored at the computer and provides complete compatibility with the addressing sequence, command code structure, and line discipline employed by the IBM 3270 Information Display System. The TC 270 system responds to and executes the full repertoire of IBM 3270 commands via a hard-wired processor.

Cursor control is functionally the same as in the IBM 3270. The controls position the cursor up, down, left, or right, either step-by-step or repetitively (if the key is held down). The cursor can also be backspaced one character position, moved to the beginning of the next line or the next unprotected data field, tabbed to the beginning of the next unprotected data field, and backtabbed to the beginning of the previous unprotected data field. Cursor addressability is standard.

Edit controls are the same as those for the IBM 3270 and include character insertion and deletion within a field, screen and field erasure, partial field erasure (specified by the cursor position), and duplication of data, which is specified by a unique code and displayed as an asterisk.

Structured data entry a la displayable formats is supported via attribute codes, which define protected fields, delimit data entry fields, and specify display parameters and tab stop positions. The use of the attribute codes is identical with the IBM 3270. Display parameters specify beam intensity (full or half) and beam blanking (for security purposes).

Program Function and Program Attention keys, standard features of the IBM 3270, are also standard in the TC 270 system. Each of these keys generates a unique code that is recognized by the controlling software as a specific program request or data identifier. Program Function codes accompany the display data as it is transmitted to the computer, while Program Attention codes are transmitted separately.

The TC 371 control unit, an enhanced version of the TC 271/3, includes additional memory and diskette storage to allow data to be stored by the control unit for subsequent transmission to the host computer or to a printer. Store and forward, local format storage, local printing, batch printing, and local editing capabilities are provided. The TC 276 also provides the capability for display-to-printer copy without host computer intervention.

A light pen is available as an option for all display stations which functionally corresponds to IBM's Selector Pen, a 3270 option. Any one of several alphanumeric or numeric fields of fixed or variable formats can be selected by the pen, which transmits the address of the selected entry to the computer to initiate the programmed function.

Other options include an audible alarm, a keyboard numeric lock that permits only numeric data to be entered, and a security lock that prevents unauthorized data entry. A magnetic stripe card reader is available as an option on the TC 275 and TC 277.

## COMPONENTS

DISPLAY STATION: A CRT display unit with a 15-inch (diagonal measurement), non-glare screen and detachable keyboard. A character set of 64 or 96 symbols including upper and lower case alphabetics, numerics, and special symbols is displayed in white or, optionally, in green. On the TC 275 and TC 277, each character is formed by a matrix of 7-by-8 or 7-by-9 dots. The TC 276 and TC 278 use a 9-by-14 dot matrix. All models except the TC 275-1 and the TC 277-1 display 24 lines of 80 characters each for a total display capacity of 1920 characters. The TC 275-1 and the TC 277-1 display 12 lines of 40 characters each, or a total of 480 characters. The cursor is displayed as a solid matrix in reverse video.

TTCI offers a choice of keyboards for each display terminal model. Three keyboard models are available for the TC 276: a data entry keyboard, a data entry keyboard with keypunch feature, and an EBCDIC typewriter-style keyboard with function keypad. Five keyboard models are offered for the TC 277: data entry, data entry with keypunch feature, operator console, check processing, and typewriter-style with a numeric or a function keypad. EBCDIC character coding is available on all five keyboards; ASCII character coding is available on the typewriter-style keyboard. For the TC 278, four keyboard models are available: data entry, data entry with keypunch feature, EBCDIC typewriter-style with function pad, and ASCII-B typewriter-style with function pad.

SERIAL PRINTERS: Five models are provided: the TC 234, a bufferless printer available for the TC 275 Display Station only; the TC 284-1 and TC 284-2 printers equipped with 480- and 1920-character buffers, respectively; the TC 286, equipped with a 1920-character buffer; and the TC 287 and the TC 289, both buffered printers equipped with a 1920-character buffer.

The TC 234 and TC 284 printers are equipped with a Diablo HyType I printer mechanism with 120, 126, or 132 print positions and a rated speed of 30 characters per second. The rated speed can be exceeded when passing over non-printer characters (Look Ahead feature) and can be as high as 60 characters per second. The impact printer features full-character printing via an interchangeable "daisy" wheel. EBCDIC, ASCII A, or ASCII B 64-character print sets can be specified. The basic printer features a friction feed platen; tractor feed is optional. Forms up to 15 inches (friction) or 14¾ inches (tractor) wide can be used. Pin feed platens can be specified as 13⅛, 14⅜, or 14½ inches wide. Form Feed control is a no-cost option.

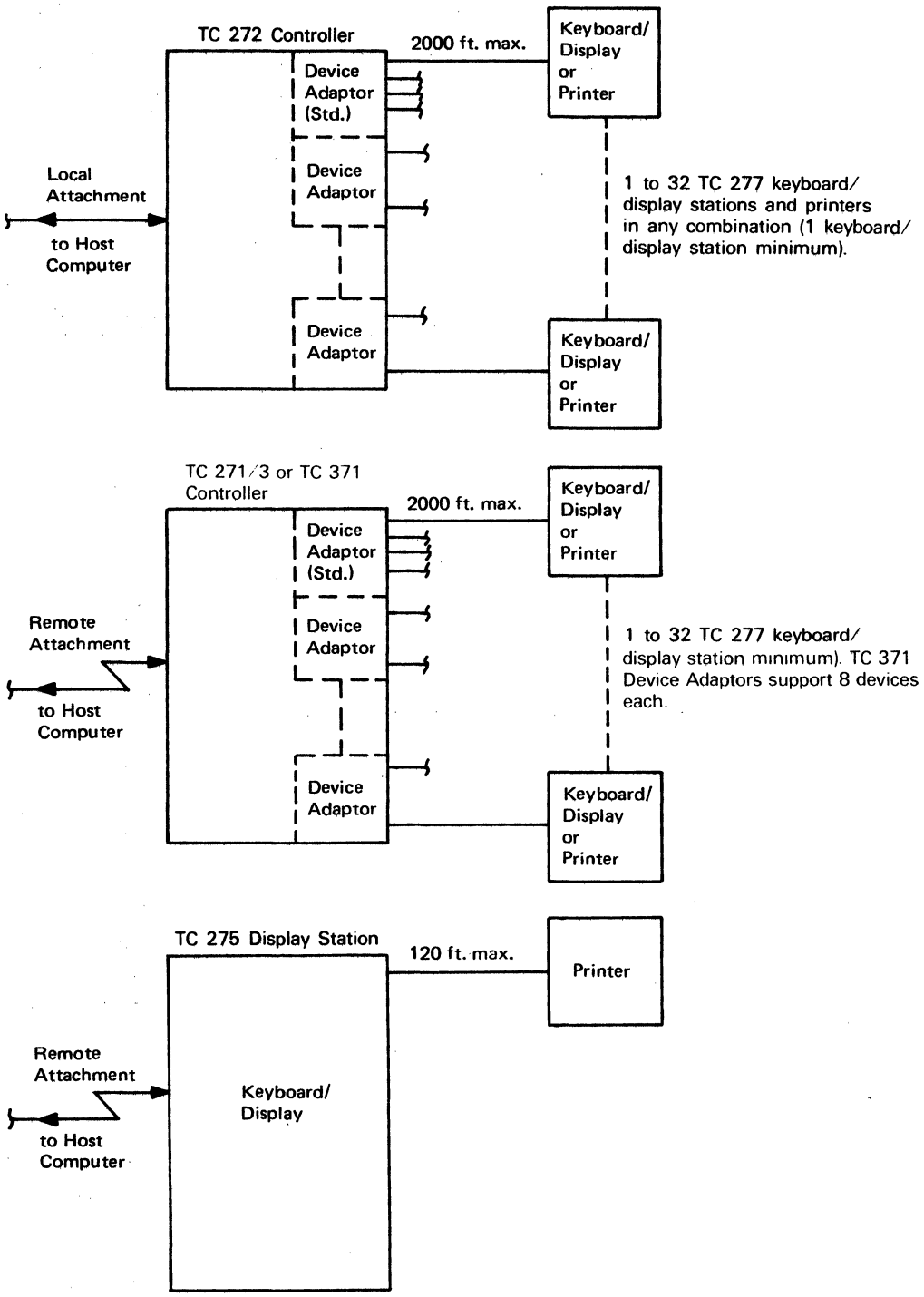
The TC 286 Printer is equipped with a Diablo Hytype II printer mechanism and a 1920-character buffer. The printer provides 132 print positions and operates at a rated speed of 40 cps. The character set includes 64 upper case or 96 upper and lower case symbols. Spacing is 10 characters per inch and 6 lines per inch or, optionally, 12 characters per inch and 8 lines per inch. Pin feed is standard; an optional forms tractor accommodates forms up to 15 inches wide.

The TC 287 Printer contains a 1920-character buffer and a Diablo 2300 bidirectional matrix printer mechanism with a rated speed of 180 cps and 132 print positions. A 480-character buffer is optional. The character set contains 64 upper case print symbols; each character is formed via a 7-by-9 dot matrix. Spacing is 10 characters/inch and 6 lines/inch. The TC 287 accommodates pin-fed, 6-part continuous forms from 4 to 14⅜ inches wide.

The TC 289 Printer contains a 1920-character buffer and a GE TermiNet 330 line printer mechanism with a rated speed of 340 lpm (with a 64-character belt) and 132 print positions. The character set is available with 64 upper case or 96 upper and lower case symbols. Spacing is 10 characters/inch and 6 lines/inch. The TC 289 accommodates pin-feed, 6-part continuous forms from 3 to 15 inches wide.

# Telex Terminal Communications
# 270 Information Display System

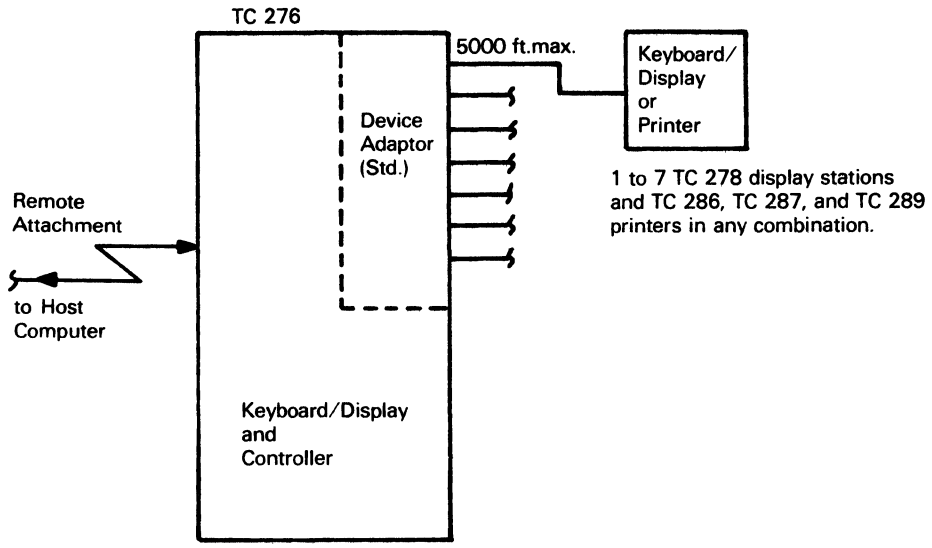
## Standard Configurations




## PRICING

The TC 270 system is available for purchase or on a one-, two-, three-, four-, for five-year lease including prime-shift maintenance. TTCI offers quantity discounts on some devices. There are no installation charges for the TTCI equipment. TTCI does not schedule customer training; however, its field engineering personnel and customer representatives provide any necessary on-site training. Full service maintenance on a 24-hour-per-day, 7-day-per-week basis is available on negotiation.

# Telex Terminal Communications
# 270 Information Display System



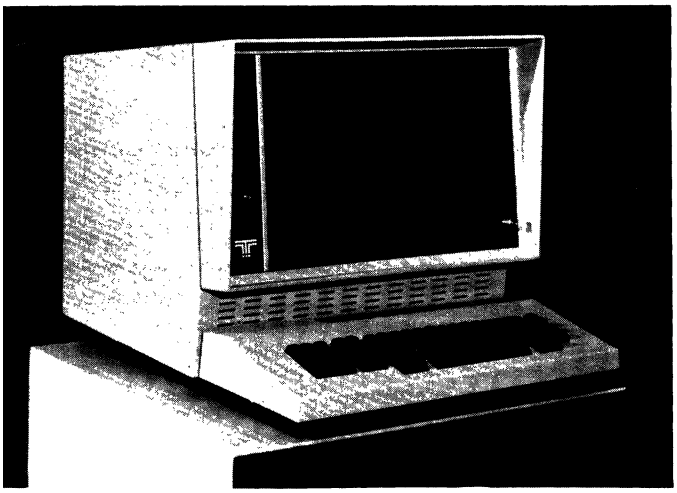

| | Monthly Charge* | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-Year Lease | 2-Year Lease | 3-Year Lease | 4-Year Lease | 5-Year Lease | Purchase | Monthly Maint. |
| **Standard Cluster Configurations** | | | | | | | |
| Display Station (with keyboard): | | | | | | | |
| TC 277/D | $ 89 | $ 64 | $ 50 | $ 39 | $ 35 | $2,200 | $18 |
| TC 278 | *** | 46 | 38 | Contact vendor | | 1,950 | 12 |
| Remote Control Unit: | | | | | | | |
| TC 271/3-B, -C, -D (1920 chars.) | 130 | 115 | 100 | 90 | 80 | 3,500 | 15 |
| TC 271/3-1 (480 chars.) | 130 | 115 | 100 | 90 | 80 | 3,500 | 15 |
| TC 271/3-2 (1920 chars.) | 130 | 115 | 100 | 90 | 80 | 3,500 | 15 |
| TC 271/3-11 (SDLC; 480 chars.) | 250 | 224 | 206 | 193 | 180 | 4,750 | 35 |
| TC 271/3-12 (SDLC; 1920 chars.) | 250 | 224 | 206 | 193 | 180 | 4,750 | 35 |
| TC 276 (1920 chars.; includes display station) | NA | 105 | 94 | *** | *** | 4,200 | 29 |
| TC 371 (BSC or SDLC; 1920 chars.) | NA | 237 | 205 | *** | *** | 9,200 | *** |
| Additional Diskette Drive (371 only) | NA | 33 | 28 | 24 | 21 | 950 | *** |
| Transmission Speed Option, 9600 bps (271/3 only) | 14.50 | 13.50 | 12.50 | 11.50 | 10.50 | 650 | 1 |
| Local Control Unit: | | | | | | | |
| TC 272-1 (480 chars.) | 209 | 209 | 209 | 209 | 209 | 7,650 | 15 |
| TC 272-2 (1920 chars.) | 229 | 229 | 229 | 229 | 229 | 8,360 | 32 |
| Device Adapter, Add'l.: | | | | | | | |
| TC 271/3-1 or -2 Remote Control Unit (14 max.) | 12 | 10 | 9 | 8 | 7.50 | 120 | 0.50 |
| TC 272-1/-2 Local Control Unit (14 max.) | 29 | 29 | 29 | 29 | 29 | 545 | 0.50 |
| TC 371 Control Unit (3 max.) | NA | 15 | 12 | 10 | 9 | 600 | *** |
| **Stand-Alone Configuration** | | | | | | | |
| TC 275-1 (480 chars.) | 111.50 | 98.50 | 79.50 | 73.50 | 68.50 | 3,800 | 14.50 |
| TC 275-2 (1920 chars.) | 111.50 | 98.50 | 79.50 | 73.50 | 68.50 | 3,800 | 14.50 |
| TC 275-11 (SDLC; 480 chars.) | 186.50 | 169.50 | 149.50 | 135.50 | 123.50 | 5,050 | 34.50 |
| TC 275-12 (SDLC; 1920 chars.) | 186.50 | 169.50 | 149.50 | 135.50 | 123.50 | 5,050 | 34.50 |
| **Display Station Options** | | | | | | | |
| Audible Alarm | 5 | 5 | 4 | 3.50 | 3 | 150 | 0.50 |
| Security Keylock | 30** | 30** | 30** | 30** | 30** | 30** | 0 |
| Keyboard Numeric Lock | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Selector Light Pen | 21 | 20 | 19 | 18 | 17 | 600 | 1.50 |
| Magnetic Stripe Card Reader | 20 | 19 | 18 | 17 | 16 | 490 | 1 |
| TC 905 Attachment (TC 275 only) | Contact vendor | | | | | | |
| Type 202 Modem Compatibility | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Check Processing Keyboard (for typewriter-style keyboards only) | 15 | 15 | 15 | 15 | 15 | 275 | 0 |

# Telex Terminal Communications
# 270 Information Display System

| | Monthly Charge* | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-Year Lease | 2-Year Lease | 3-Year Lease | 4-Year Lease | 5-Year Lease | Purchase | Monthly Maint. |
| **Printers** | | | | | | | |
| TC 234 (Bufferless) | *** | 132.50 | 127.50 | 122.50 | 117.50 | 4,100 | 24.50 |
| TC 284-1 (480-char. buffer) | 147.50 | 144.50 | 140.50 | 138.50 | 135.50 | 4,800 | 26.50 |
| TC 284-2 (1920-char. buffer) | 158 | 155 | 151 | 147 | 142 | 5,100 | 33 |
| TC 286 (1920-char. buffer) | NA | 142 | 114 | *** | *** | 5,400 | 35 |
| TC 287 (1920-char. buffer) | 230 | 195 | 180 | 160 | 140 | 6,250 | 40 |
| TC 289 (1920-char. buffer) | 460 | 325 | 295 | 270 | 250 | 8,750 | 70 |
| **Printer Options** | | | | | | | |
| Pin Feed Platen (non-std. sizes) | 115** | 115** | 115** | 115** | 115** | 115 | 0 |
| Forms Tractor (234, 284, 286, & 287) | 15 | 10 | 7 | 5 | 5 | 255 | T&M |
| Forms Stand (287 & 289 only) | 95** | 95** | 95** | 95** | 95** | 95** | 0 |
| Upper/Lower Case (234, 284, 286 only) | 6 | 5 | 4 | 3 | 3 | 200 | 0 |

*All lease prices include maintenance.
**Single use charge.
***Contact vendor.
T&M—Time and materials
NA—Not available.■

# Telex Terminal Communications 270 Information Display System



**Replaces the IBM 3270 Information Display System in a local or remote environment. Accommodates up to 32 display stations and printers in any combination.**

**Features are identical with those of the IBM 3270, plus additional keyboards are available and printed output performance is enhanced with a 180-cps matrix printer and 340-lpm line printer.**

**A typical 8-station remote terminal with 1920-character displays, but without printers, leases for $799 per month including maintenance on a 2-year lease.**

**Complete compatibility with the IBM 3270 is provided, and existing IBM cables can be used.**

## MANAGEMENT SUMMARY

Telex Terminal Communications announced the following major product line changes to its 270 Information Display System at the June 1977 NCC:

- Major lease and purchase price reductions.
- A remote mini-cluster terminal system competitive with the IBM 3276.
- Two printers that are price- and performance-competitive with IBM's new 3287 and 3289 printers.
- SDLC protocol compatibility.

Effective June 1, 1977, Telex chopped its lease and purchase prices on remote cluster and stand-alone terminals that employ BSC protocol. The Telex TC 271/3 remote controller prices were cut by an average of 35 percent for lease and 17 percent for purchase. The TC 277 Display Station with 76-key keyboard prices were cut by 20 percent for lease and 33 percent for purchase. And prices for the TC 275 stand-alone display terminal were cut by 23 percent for lease and 13 percent for purchase.

Telex also reduced the prices of its 480 and 1920 character displays in the same manner. The Telex price reductions offer substantial savings over *existing* IBM equipment. The Telex BSC remote cluster terminal provides savings of 17 to 22 percent on a 2-year lease and savings of 39 to 62 percent for purchase equipment over the equivalent IBM cluster configuration (BSC protocol only) under IBM's new 2-year lease and purchase prices, respectively. The Telex BSC stand-alone terminal provides savings of 13 percent on a two-year lease and 22 percent for purchased equipment over the IBM 3275 BSC version under IBM's new two-year lease and purchase prices, respectively. Telex equipment with SDLC protocol provides savings on purchased equipment only.

IBM's newly announced 3274 Controller and 3278 display station offer stiff price competition that Telex and ➢

## CHARACTERISTICS

**VENDOR: Telex Terminal Communications, Inc., 3301 Terminal Drive, Raleigh, North Carolina 27611. Telephone (919) 834-5251.**

**DATA OF ANNOUNCEMENT: TC 277 and TC 275 — January 1974; TC 277/4 Mini-Cluster — June 1977.**

**DATE OF FIRST DELIVERY: TC 277 — March 1974; TC 275 — September 1973; TC 277/4 — September 1977.**

**NUMBER DELIVERED: Over 10,000 display units.**

**SERVICED BY: Telex Terminal Communications, Inc.**

## CONFIGURATION

**The TTCI 270 system is a direct replacement for the IBM 3270 Information Display System in a local or remote cluster or remote stand-alone environment. The standard cluster configurations accommodate up to 32 devices, including any mix of TC 277 CRT keyboard/display stations and TTCI printers. The control unit provides individual buffering for each device, which can be located up to 2000 cable-feet from the controller. An optional light pen and magnetic card reader are available for each display station.**

**Two models of control units are available: Model 271/3 for remote operation and Model 272 for local operation. The local controller, Model 272, is an IBM 3272 controller that contains a channel interface for direct connection (up to 200 cable-feet) to an IBM System/360 Models 25 through 195 or to an IBM System/370 Models 115 through 195, via a Selector, Multiplexer, or Block Multiplexer channel. The data transfer rate can range from 10K to 650K characters per second. The remote controller, Model 271/3, is attached to a communications facility via a modem. The maximum cable length between controller and modem is 40 feet.**

**The basic Model 271/3 or 272 control unit contains one device adapter that can accommodate up to four devices.** ➢

# Telex Terminal Communications 270 Information Display System

## TTCI 270 FAMILY COMPONENTS AND SUBSYSTEMS

| Controller | Mode | Protocol | Buffer Size, chars. | Display Models | Printer Models | Max. Devices |
|---|---|---|---|---|---|---|
| **Standard clusters** | | | | | | |
| TC 271/3-1 | Remote | BSC | 480 | TC 277-1 | TC 284-1 | 32 |
| TC 271/3-2 | Remote | BSC | 1920 | TC 277-2/-1 | TC 284/287/289 | 32 |
| TC 271/3-11 | Remote | SDLC | 480 | TC 277-1 | TC 284-1 | 32 |
| TC 271/3-12 | Remote | SDLC | 1920 | TC 277-2/-1 | TC 284/287/289 | 32 |
| TC 272-1 | Local | — | 480 | TC 277-1 | TC 284-1 | 32 |
| TC 272-2 | Local | — | 1920 | TC 277-2 | TC 284/287/289 | 32 |
| TC 271/4-1 | Remote | BSC | 480 | TC 277/4-1 | TC 284-1 | 12 |
| TC 271/4-2 | Remote | BSC | 1920 | TC 277/4-2 | TC 284/287/289 | 12 |
| TC 271/4-11 | Remote | SDLC | 480 | TC 277/4-1 | TC 284-1 | 12 |
| TC 271/4-12 | Remote | SDLC | 1920 | TC 277/4-2 | TC 284/287/289 | 12 |
| **Mini-clusters** | | | | | | |
| TC 271/4-1/-2 | Remote | BSC | 480/1920 | TC 277/4-1/-2 | None | 8 |
| TC 271/4-11/-12 | Remote | SDLC | 480/1920 | TC 277/4-1/-2 | None | 8 |
| TC 271/4-1/-2 | Remote | BSC | 480/1920 | TC 277/4-1/-2, TC 277-1/-2 | TC 284/287/289 | 12* |
| TC 271/4-11/-12 | Remote | SDLC | 480/1920 | TC 277/4-1/-2, TC 277-1/-2 | TC 284/287/289 | 12* |
| **Stand-alone** | | | | | | |
| TC 275-1 | Remote | BSC | 480 | Integral | TC 234 | 2 |
| TC 275-2 | Remote | BSC | 1920 | Integral | TC 234 | 2 |
| TC 275-11 | Remote | SDLC | 480 | Integral | TC 234 | 2 |
| TC 275-12 | Remote | SDLC | 1920 | Integral | TC 234 | 2 |

*A Mini-cluster can include up to four new displays (TC 277/4), plus four additional new displays or old displays and printers (TC 277/284/287/289), plus four additional old displays and printers.

others will have to meet once the IBM equipment becomes available. The IBM equipment is scheduled for availability over the period ranging from February through August 1978.

Telex introduced a remote mini-cluster display terminal that can accommodate up to 12 devices including display stations and printers. The Telex mini-cluster was introduced to compete with IBM's new small remote cluster terminal composed of the 3276 controller and 3278 display. It is priced about the same as the IBM terminal but accommodates four more devices than the latter. However, IBM's small cluster terminal accommodates the new low-priced 3278 displays that provide display capacities of up to 3440 characters. Currently, the Telex mini-cluster, available for September 1977 deliveries, accommodates screen capacities of up to 1920 characters. Telex plans to introduce large-screen displays by the time the IBM 3276 is available for delivery (February to August 1978) in order to remain competitive.

Telex introduced two new printers: the TC 287 is a 180-cps impact matrix printer with 132 print positions, and the TC 289 is a 340-lpm full-character printer with 132 print positions. The TC 287 provides an improvement in rated speed of 50 percent over the IBM 3287 Model 2; the TC 289 provides an improvement in rated speed of 13 percent over the IBM 3289 Model 2. The Telex TC 287 replaces the IBM 3284, 3286, and the 3887 Model 1 and Model 2 and can be attached to Telex equipment as well

**Two additional devices can be accommodated via each subsequent device adapter, up to a total of 15 device adapters.**

**The control units are available with a buffer capacity of 480 or 1920 characters. A control unit with a 480-character buffer capacity can accommodate only display stations and printers having a 480-character buffer (TC 277-1 displays and TC 284-1 printers). A control unit with a 1920-character buffer capacity can accommodate any mix of display stations and printers with 480- and 1920-character buffers.**

**The Mini-Cluster system is a direct replacement for the IBM 3276 Information Display System in a remote cluster environment. The Mini-Cluster system accommodates up to 12 devices (four more than the IBM 3276). The basic Mini-Cluster system includes a Telex TC 271/4 Controller and one to four TC 277/4 Display Stations. The terminal can be expanded via one or two additional device adapters.**

**The TC 275 display station is a remote stand-alone terminal available in two models: Model 1 contains a 480-character buffer; Model 2 contains a 1920-character buffer. The TC 275 can accommodate an optional selector light pen and a TC 234 printer. Up to 20 TC 275 display stations can be attached to a communications line via a TC 905 Shared Modem, which requires one TC 905 Attachment, a no-cost item.**

## TRANSMISSION SPECIFICATIONS

**Transmission is half-duplex synchronous. Transmission rates for the TC 271/3 and TC 271/4. Remote Control Unit are specified as 2400, 4800, 7200, or 9600 (optional) bits/second. Transmission rates for the TC 275 are specified as**

# Telex Terminal Communications 270 Information Display System

as IBM. The Telex TC 287 can be directly attached to an IBM 3271 or 3272 controller without a special attachment feature.

The Telex TC 289 is also available for Telex as well as IBM terminal configuration and leases for 30 percent below IBM's new 2-year lease.

Founded in 1969, Terminal Communications has dedicated itself to the IBM terminal replacement market with replacements for the IBM 2260 and the 2265 Display Stations, 2740 and 2741 Communication Terminals, and more recently, the IBM 3270 Information Display System. Terminal Communications was acquired by Telex in December 1976 and is now Telex Terminal Communications, a Division of Telex Computer Products, Inc.

The TC 270 system is a plug-to-plug replacement for the BSC or SDLC version of the IBM 3270 right down to the cables and accommodates the same number (32) of display stations and printers (in any mix) as the IBM 3270. Furthermore, the TC 270 provides complete compatibility with the IBM 3270 with respect to line discipline, commands and command-code structure, and addressing sequence. The TTCI terminals also provide all the features and functions that are currently available with the IBM 3270. Display screen capacities are also identical with those of existing IBM 3270 terminals, 480 and 1920 characters.

What's more, TTCI's remote and local control units can accommodate any mix of IBM 3277 and TC 277 display stations. TTCI's local control unit is actually an IBM 3272; however, its remote control unit is its own.

## USER REACTION

In Datapro's 1977 survey of alphanumeric display terminal users, 19 users reported on their experience with a total of 575 TTCI 270 display terminals. Their ratings are presented in the following table.

| | Excellent | Good | Fair | Poor | WA* |
|---|---|---|---|---|---|
| Overall performance | 7 | 12 | 0 | 0 | 3.4 |
| Ease of operation | 9 | 10 | 0 | 0 | 3.5 |
| Display clarity | 4 | 13 | 2 | 0 | 3.1 |
| Keyboard feel & usability | 5 | 13 | 1 | 0 | 3.2 |
| Hardware reliability | 4 | 12 | 3 | 0 | 3.1 |
| Maintenance service | 4 | 9 | 6 | 0 | 2.9 |
| Technical support | 3 | 9 | 4 | 0 | 2.9 |

*Weighted Average on a scale of 4.0 for Excellent.

These high scores speak well of the 270 System. Low cost and reliability were cited as the key advantages of the TC 270 by the majority of the users. No specific disadvantages were cited, but some users feel the need for improved service and support.□

2000, 2400, or 4800 bits/second. The 8-level ASCII (including parity) or EBCDIC transmission code and BSC or SDLC protocol is used. An EIA Standard RS-232C interface provides for connection to a voice-grade line via a modem. Bell System modems that can be used include the Dataphone 2400, 4800, and 9600.

## DEVICE CONTROL

The TCI 270 system operates under the control of the program stored at the computer and provides complete compatibility with the addressing sequence, command code structure, and line discipline employed by the IBM 3270 Information Display System. The TC 270 system responds to and executes the full repertoire of IBM 3279 commands via a hard-wired processor.

Cursor control is functionally the same as in the IBM 3270. The controls position the cursor up, down, left, or right, either step-by-step or repetitively (if the key is held down). The cursor can also be backspaced one character position, moved to the beginning of the next line or the next unprotected data field, tabbed to the beginning of the next unprotected data field, and backtabbed to the beginning of the previous unprotected data field. Cursor addressability is standard.

Edit controls are the same as those for the IBM 3270 and include character insertion and deletion within a field, screen and field erasure, partial field erasure (specified by the cursor position), and duplication of data, which is specified by a unique code and displayed as an asterisk.

Structured data entry a la displayable formats is supported via attribute codes, which define protected fields, delimit data entry fields, and specify display parameters and tab stop positions. The use of the attribute codes is identical with the IBM 3270. Display parameters specify beam intensity (full or half) and beam blanking (for security purposes).

Program Function and Program Attention keys, standard features of the IBM 3270, are also standard in the TC 270 system. Each of these keys generates a unique code that is recognized by the controlling software as a specific program request or data identifier. Program Function codes accompany the display data as it is transmitted to the computer, while Program Attention codes are transmitted separately.

A light pen is available as an option for the TC 277 and TC 275 and functionally corresponds to IBM's Selector Pen, a 3270 option. Any one of several alphanumeric or numeric fields of fixed or variable formats can be selected by the pen, which transmits the address of the selected entry to the computer to initiate the programmed function.

A magnetic stripe card reader is also available as an option for the TC 277 and TC 275.

## COMPONENTS

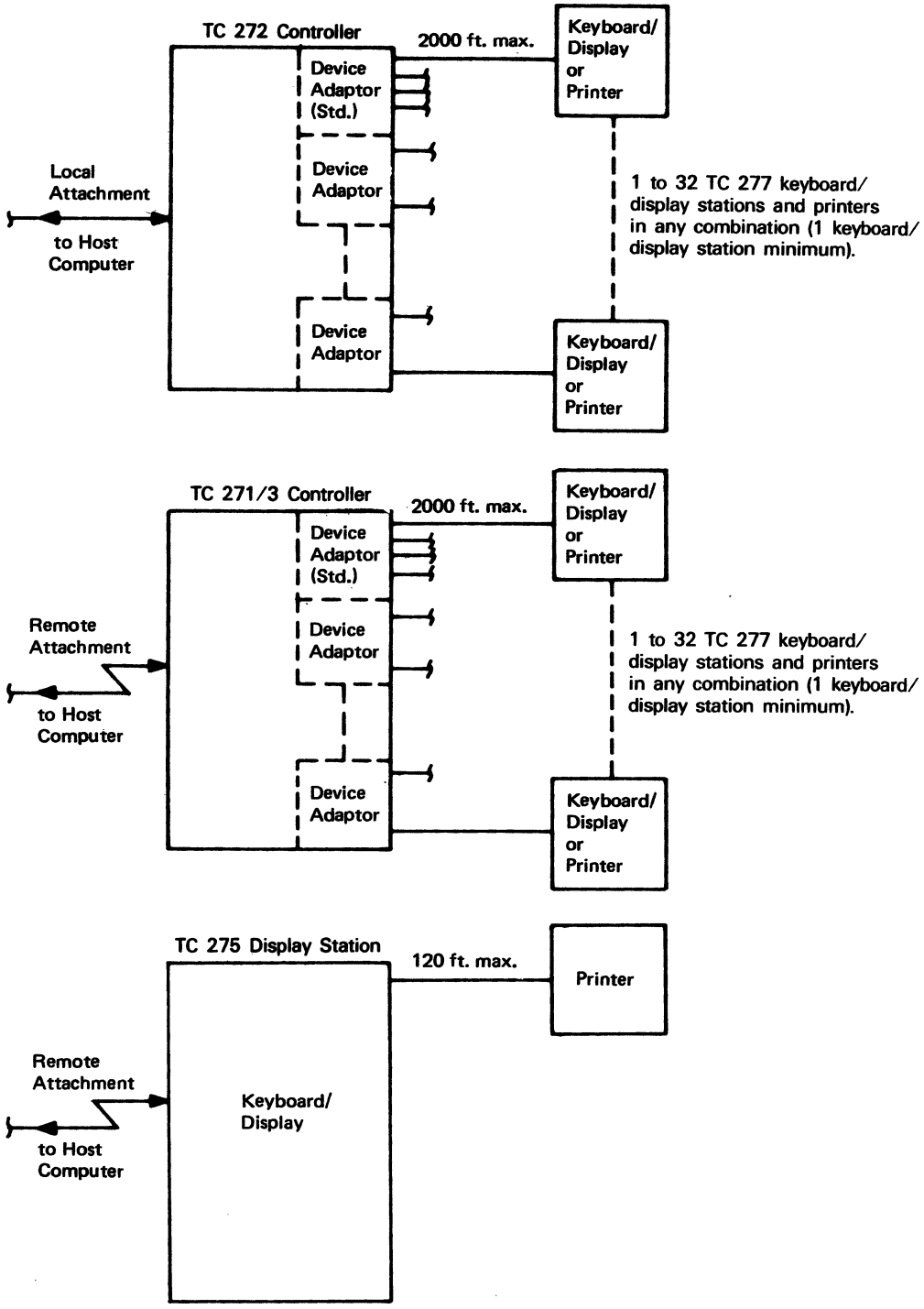
DISPLAY STATION: A CRT display unit with a 15-inch (diagonal measurement), non-glare screen and detachable keyboard. The display area measures 8 inches high by 10 inches wide. A character set of 64 or 96 (optional) symbols including upper and lower (optional) case alphabetics, numerics, and special symbols is displayed in white. Each character is formed by a matrix of 7-by-9 dots. Two models of display units offer different display arrangements. All -1 models display 12 lines of 40 characters for a total display capacity of 480 characters. All -2 models display 24 lines of 80 characters for a total display capacity of 1920 characters.

The cursor is displayed as a solid matrix in reverse video.

Seven keyboard models include five EBCDIC and two ASCII keyboards. The EBCDIC models include:

# Telex Terminal Communications 270
# Information Display System

## Standard Configurations




- 76-key data entry.
- 76-key data entry with keypunch layout.
- 76-key typewriter with numeric keypad.
- 78-key typewriter with function keypad.
- 78-key operator console.

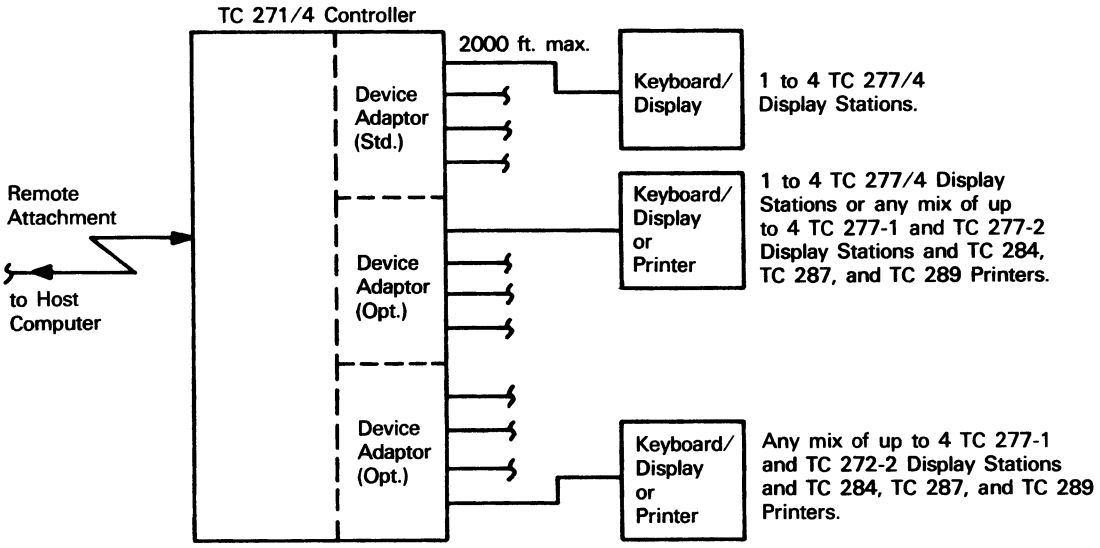
**The ASCII keyboard models include:**

- 76-key typewriter with numeric keypad.
- 78-key typewriter with function keypad.

**Either ASCII keyboard can be specified as ASCII A or B. ASCII A differs from the standard ASCII B character set by two characters only; these include the logic symbols "OR" and "NOT' which are substituted for ASCII B's exclamation marks and circumflex, respectively.**

# Telex Terminal Communications 270 Information Display System

## Mini-Cluster Configuration




**The function keypad includes 12 Program Function keys. Models without the function keypad include three Program Function keys. Up to three Program Attention keys are provided.**

**SERIAL PRINTERS: Four models are provided: the TC 234, a bufferless printer available for the TC 275 Display Station only; the TC 284-1 and TC 284-2 printers equipped with 480- and 1920-character buffers, respectively; the TC 287 and the TC 289, both buffered printers equipped with a 1920-character buffer.**

**The TC 234 and TC 284 printers are equipped with a Diablo HyType I printer mechanism with 120, 126, or 132 print positions and a rated speed of 30 characters per second. The rated speed can be exceeded when passing over non-printer characters (Look Ahead feature) and can be as high as 60 characters per second. The impact printer features full-character printing via an interchangeable "daisy" wheel. EBCDIC, ASCII A, or ASCII B 64-character print sets can be specified. The basic printer features a friction feed platen; tractor feed is optional. Forms up to 15 inches (friction) or 14¾ inches (tractor) wide can be used. Pin feed platens can be specified as 13⅛, 14⅜, or 14½ inches wide. Form Feed control is a no-cost option.**

**The TC 287 Printer contains a 1920-character buffer and a Diablo 2300 bidirectional matrix printer mechanism with a rated speed of 180 cps and 132 print positions. The character set contains 64 upper case print symbols; each character is formed via a 7-by-9 dot matrix. Spacing is 10 characters/inch and 6 lines/inch. The TC 287 accommodates pin-fed, 6-part continuous forms from 4 to 15-5/16 inches wide.**

**The TC 289 Printer contains a 1920-character buffer and a GE TermiNet 330 line printer mechanism with a rated speed of 340 lpm and 132 print positions. The character set is available with 64 upper case or 96 upper and lower case symbols. Spacing is 10 characters/inch and 6 lines/inch. The TC 289 accommodates pin-feed, 6-part continuous forms from 3 to 15 inches wide.**

## PRICING

**The TCI 270 system is available for purchase or on a one-, two-, three-, four-, or five-year lease including prime-shift maintenance. TCI offers quantity discounts on some devices. There are no installation charges for the TCI equipment. TCI does not schedule customer training; however, its field engineering personnel and customer representatives provide any necessary on-site training. Full service maintenance on a 24-hour-per-day, 7-day-per-week basis is available on negotiation.**

**Monthly Charge***

| | 1-Year Lease | 2-Year Lease | 3-Year Lease | 4-Year Lease | 5-Year Lease | Purchase | Monthly Maint. |
|---|---|---|---|---|---|---|---|
| **Mini-Cluster Configuration** | | | | | | | |
| Display Station (without keyboard): | | | | | | | |
| TC 277/4-1 (480 chars.) | *** | $ 57 | $ 53 | $ 50 | $ 47 | $1,590 | $10 |
| TC 277/4-2 (1920 chars.) | *** | 57 | 53 | 50 | 47 | 1,590 | 10 |
| Remote Control Unit: | | | | | | | |
| TC 271/4-1 (480 chars.) | *** | 99 | 91 | 84 | 77 | 3,000 | 15 |
| TC 271/4-2 (1920 chars.) | *** | 99 | 91 | 84 | 77 | 3,000 | 15 |
| TC 271/4-11 (SDLC; 480 chars.) | Contact vendor | | | | | | |
| TC 271/4-12 (SDLC; 1920 chars.) | Contact vendor | | | | | | |
| Device Adapter, Add'l. (2 max.) | *** | 10 | 9 | 8 | 7 | 120 | 0.50 |
| Transmission Speed Option, 9600 bps | *** | 13.50 | 12.50 | 11.50 | 10.50 | 650 | 1 |

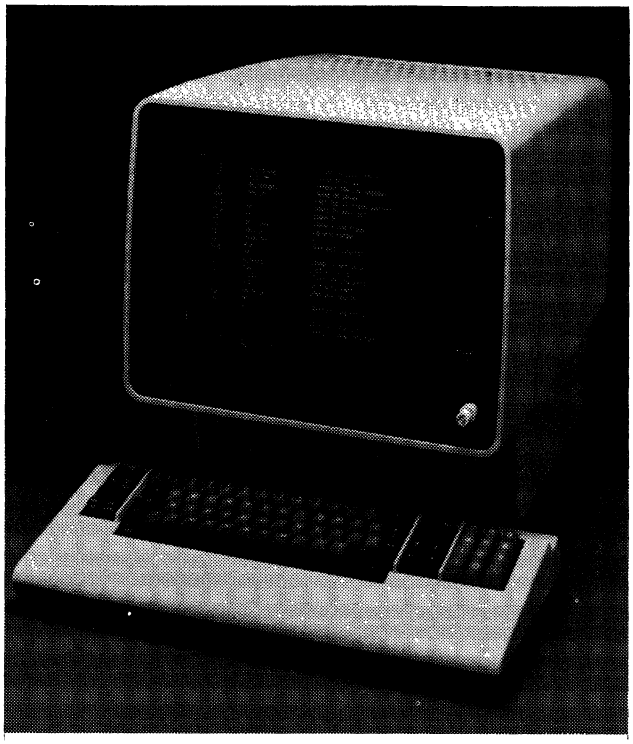
*All lease prices include maintenance.
**Single use charge.
***Not available on one-year lease
T&M — Time and materials

# Telex Terminal Communications 270 Information Display System

| | Monthly Charge* | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1-Year Lease | 2-Year Lease | 3-Year Lease | 4-Year Lease | 5-Year Lease | Purchase | Monthly Maint. |
| **Standard Cluster Configuration** | | | | | | | |
| Display Station (without keyboard): | | | | | | | |
| TC 277-1 (480 chars.) | 97 | 72 | 60 | 51 | 47 | 1,890 | 18 |
| TC 277-2 (1920 chars.) | 97 | 72 | 60 | 51 | 47 | 1,890 | 18 |
| Remote Control Unit: | | | | | | | |
| TC 271/3-1 (480 chars.) | 130 | 115 | 100 | 90 | 80 | 3,500 | 15 |
| TC 271/3-2 (1920 chars.) | 130 | 115 | 100 | 90 | 80 | 3,500 | 15 |
| TC 271/3-11 (SDLC; 480 chars.) | 250 | 224 | 206 | 193 | 180 | 4,750 | 35 |
| TC 271/3-12 (SDLC; 1920 chars.) | 250 | 224 | 206 | 193 | 180 | 4,750 | 35 |
| Transmission Speed Option, 9600 bps | 14.50 | 13.50 | 12.50 | 11.50 | 10.50 | 650 | 1 |
| Local Control Unit: | | | | | | | |
| TC 272-1 (480 chars.) | 209 | 209 | 209 | 209 | 209 | 7,650 | 15 |
| TC 272-2 (1920 chars.) | 229 | 229 | 229 | 229 | 229 | 8,360 | 32 |
| Device Adapter, Add'l. (14 max.): | | | | | | | |
| TC 271/3-1 or -2 Remote Control Unit | 12 | 10 | 9 | 8 | 7.50 | 120 | 0.50 |
| TC 272-1/-2 Local Control Unit | 29 | 29 | 29 | 29 | 29 | 545 | 0.50 |
| **Stand-Alone Configuration** | | | | | | | |
| TC 275-1 (480 chars.) | 111.50 | 98.50 | 79.50 | 73.50 | 68.50 | 3,800 | 14.50 |
| TC 275-2 (1920 chars.) | 111.50 | 98.50 | 79.50 | 73.50 | 68.50 | 3,800 | 14.50 |
| TC 275-11 (SDLC; 480 chars.) | 186.50 | 169.50 | 149.50 | 135.50 | 123.50 | 5,050 | 34.50 |
| TC 275-12 (SDLC; 1920 chars.) | 186.50 | 169.50 | 149.50 | 135.50 | 123.50 | 5,050 | 34.50 |
| **Keyboards (all display stations)** | | | | | | | |
| Typewriter: | | | | | | | |
| 76-Key EBCDIC with Numeric Pad | 12 | 11 | 10 | 9 | 8 | 310 | 5 |
| 78-Key EBCDIC with Function Pad | 20 | 18 | 16 | 14 | 13 | 310 | 5 |
| 76-Key ASCII (A or B) with Numeric Pad | 12 | 11 | 10 | 9 | 8 | 310 | 5 |
| 78-Key ASCII (A or B) with Function Pad | 20 | 18 | 16 | 14 | 13 | 310 | 5 |
| Data Entry: | | | | | | | |
| 76-Key Data Entry | 12 | 11 | 10 | 9 | 8 | 310 | 5 |
| 76-Key Data Entry Keypunch Layout | 14 | 13 | 12 | 11 | 10 | 310 | 5 |
| 78-Key Operator Console | 21 | 19 | 16 | 14 | 13 | 310 | 5 |
| **Display Station Options** | | | | | | | |
| Audible Alarm | 5 | 5 | 4 | 3.50 | 3 | 150 | 0.50 |
| Security Keylock | 30** | 30** | 30** | 30** | 30** | 30** | 0 |
| Keyboard Numeric Lock | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Selector Light Pen | 21 | 20 | 19 | 18 | 17 | 600 | 1.50 |
| Magnetic Stripe Card Reader | 20 | 19 | 18 | 17 | 16 | 490 | 1 |
| TC 905 Attachment (TC 275 only) | Contact vendor | | | | | | |
| Type 202 Modem Compatibility | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Check Processing Keyboard (for typewriter-style keyboards only) | 15 | 15 | 15 | 15 | 15 | 275 | 0 |
| **Printers** | | | | | | | |
| TC 234 (Bufferless) | *** | 132.50 | 127.50 | 122.50 | 117.50 | 4,100 | 24.50 |
| TC 284-1 (480-char. buffer) | 147.50 | 144.50 | 140.50 | 138.50 | 135.50 | 4,800 | 26.50 |
| TC 284-2 (1920-char. buffer) | 158 | 155 | 151 | 147 | 142 | 5,100 | 33 |
| TC 287 (1920-char. buffer) | 230 | 195 | 180 | 160 | 140 | 6,250 | 40 |
| TC 289 (1920-char. buffer) | 460 | 325 | 295 | 270 | 250 | 8,750 | 70 |
| **Printer Options** | | | | | | | |
| Pin Feed Platen (non-std. sizes) | 115** | 115** | 115** | 115** | 115** | 115 | 0 |
| Forms Tractor (234, 284, & 287) | 15 | 10 | 7 | 5 | 5 | 255 | T&M |
| Forms Stand (287 & 289 only) | 95** | 95** | 95** | 95** | 95** | 95** | 0 |
| Upper/Lower Case (234 & 284 only) | 6 | 5 | 4 | 3 | 3 | 200 | 0 |

* *All lease prices include maintenance.*
** *Single use charge.*
****Not available on one-year lease.*
*T & M—Time and materials.* ■

# Telex 310 ASCII Terminal



The 310 is Telex's first entry into the ASCII terminal market. Features include a 15-inch display screen, detachable keyboard, and character or block mode transmission.

**Telex's entry in the ASCII display terminal market.**

**Standard features include a 15-inch display screen, a 24-line by 80-character screen format, a detachable keyboard, and self-diagnostics. Other features include a 25th display line for status information, reverse video, selectable cursor blinking, program function keys, and a numeric pad. The Telex 311 Matrix Printer is available for use on the 310's optional RS-232 auxiliary port for applications requiring hard copy printout.**

**Purchase price for the Telex 310 is $1,250. Quantity discounts are available.**

## MANAGEMENT SUMMARY

Telex, the company which offered the first plug-compatible replacements for the IBM 3270 Display System, entered the ASCII terminal market in February 1980 with the introduction of the 310 ASCII terminal. The 310 is Telex's response to IBM's first ASCII display, the 3101.

The Telex 310 offers a larger display area (15" diagonal) than the IBM 3101 (12" diagonal). A standard display format of 24 lines by 80 columns is accommodated, and a 25th status line is provided. White or green phosphor characters can be selected, and are formed utilizing a 7 x 11 dot matrix. The 128 ASCII character set is displayable. Reverse video and cursor blinking are switch-selectable by the operator. Optional video features include programmable brightness levels and character/field blinking. Ergonomic features include a non-glare screen; a 60Hz/50Hz refresh rate to prevent screen flicker; and a vertical tilt adjustment of up to an inch on the monitor.

A typewriter-style detachable keyboard is standard. The keyboard includes a numeric pad and programmable function keys. Other standard features include an audible tone bell and typamatic repeating keys. Operator-friendly features such as a palm rest, deep-dished home keys, and a pencil holder have been incorporated into the keyboard.

## CHARACTERISTICS

**VENDOR: Telex Computer Products, Inc., 6422 East 41st Street, Tulsa, Oklahoma 74135. Telephone (918) 627-1111.**

**DATE OF ANNOUNCEMENT: February 1980.**

**DATE OF FIRST DELIVERY: May 1980.**

**NUMBER DELIVERED TO DATE: Over 500.**

**SERVICED BY: Telex Service Co. (Depot).**

### MODELS

**The Telex 310 comes in two versions: one version permits character mode transmission; the second version permits block mode transmission. Both versions are stand-alone, desk top display terminals featuring a display console and a detachable keyboard.**

### TRANSMISSION SPECIFICATIONS

**Transmission is asynchronous, in half- or full-duplex mode, at speeds from 110 to 9600 bps. The character mode version of the 310 provides an RS-232-C or 20mA current loop interface. The block mode version provides an RS-422 interface. The terminal uses the ASCII communications protocol.**

### DEVICE CONTROL

**On the character mode version of the 310, transmission is performed on a character-by-character basis as data is keyed. On the block mode version, data is stored in the terminal buffer as it is keyed, and transmitted at a later time in blocks. Block transmission permits the entry, accumulation, and editing of up to 1920 characters (a full screen) of data prior to transmission.**

**Cursor controls move the cursor up, down, left, right, home, and return. The cursor can be solid or blinking, and is addressable. The contents of the screen can be erased, as well as rolled up. Program function keys are provided for storage of user-defined program function sequences.**

**A single keystroke command activates the printer control on the 310. The Telex 311 or a comparable printer can be attached to the auxiliary RS-232-C port.**

# Telex 310 ASCII Terminal

The 310 is available in two versions, permitting transmission in either character or block mode. Transmission rates up to 9600 bits per second are accommodated. The character mode version of the 310 provides an RS-232-C/Current Loop interface; the block mode version provides an RS-422 interface.

An auxiliary RS-232 port is optionally available with the 310, to provide a hard copy printout of the information displayed. Telex supplies the 311 Matrix Printer for attachment to the 310. The 311 operates at 80 characters per second, and features program-selectable font selection, character spacing, and line spacing.

Another optional feature is composite video, which enables the user to install a large remote monitor for use in demonstrations and for instructional purposes.

The Telex 310 features a single printed circuit board design, with all of the terminal's electronics contained on one board, while another board controls the keyboard. A self-diagnostics feature is standard, to help the user isolate the cause in case of terminal failure. Failed components are mailed to Telex's repair depot. Telex also recommends that the user maintain a spare parts inventory in order to reduce down-time.□

## COMPONENTS

**CRT DISPLAY UNIT: A 15-inch diagonal non-glare display screen with a display format of 24 lines by 80 columns. A 25th line is available for the display of status information. White or green phosphor characters are available with the 310. Characters are formed utilizing a 7 x 11 dot matrix; a 60Hz/50Hz refresh rate helps prevent character flicker. Brightness and contrast controls are standard, and reverse video and cursor blinking are switch-selectable. Character/field blinking and programmable brightness levels are optionally available. The complete ASCII character code set (128 symbols) is displayable.**

**An additional ergonomic feature of the 310 is the vertical tilt ability (up to one inch) of the display screen.**

**KEYBOARD: An 87-key typewriter-style, detachable keyboard. Included are a 10-key numeric pad, as well as a set of programmable function keys. The keyboard also features typamatic character repeat keys, and an audible tone bell. Ergonomic features on the keyboard include a palm rest, deep dish home keys, and a pencil holder.**

**311 MATRIX PRINTER: An 80 cps dot matrix printer for use with the 310 ASCII terminal. The 311 utilizes a 9 x 7 dot matrix character formation technique. The unit prints lines 80 and 132 columns wide, with 5, 10, and 16.5 characters per inch at up to 80 cps. A 96-character ASCII set (upper- and lower-case) and 64-symbol graphics set are standard.**

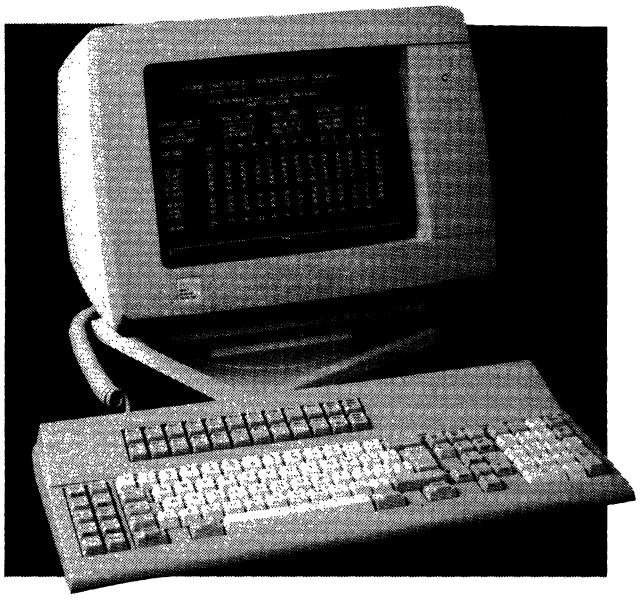
**The 311 features a typewriter-like platen. Variable length roll, sprocket, and cut-sheet paper can be accommodated in lengths up to 10 inches. Pin, tractor, and friction feeds are available, and up to three-part forms can be printed. The pin-feed and tractor feed are optional. The 311 has a seven-pin print head. The printer measures less than five inches high and weighs approximately 14 pounds.**

## PRICING

**The Telex 310 ASCII display terminal and 311 Matrix Printer are available for purchase only. Quantity discounts are available. Telex recommends that spare components be stocked at the customer site to reduce down-time. In the event of component failure, the customer must ship the faulty part to a Telex repair depot (Addison, TX) for service.**

| | Purchase Price |
|---|---|
| Telex 310 (Character mode) | $1,250 |
| Telex 310 (Block mode) | 1,400 |
| Auxiliary RS-232 port | 50 |
| Composite Video feature | 50 |
| Telex 311 | 1,200 |
| Forms Tractor | 125■ |

# Telex 270 Information Display System



*The 180-1 Display Terminal is a customer installable, ergonomically designed model featuring tilt/swivel display with four selectable screen sizes. Also featured is a low-profile, detached keyboard. The 180-1 is a plug compatible replacement for the IBM 3180 Model 1.*

**The Telex 270 Information Display System is a family of plug-compatible replacements for various members of the IBM 3270 Information Display System. Telex provides control units, display terminals, keyboards, and printers; personal computing capabilities can be added to the 270 system via the 1186, 1260, and 1280 Intelligent Workstations.**

**MODELS: 076 Eight Station Control Unit, 174 Remote Control Unit, 274C Remote Advanced Function Control Unit, 274-61C Sixteen Station Control Unit, 276 Remote Control Unit Display Station, 476 Control Unit Display Station, 479 Color Control Unit Display Station, 078 Display Terminal, 079 Color Display Terminal, 080 Display Terminal, 179 Color Display Terminal, 180-1 Display Terminal, 279-3A Color Graphics Display Terminal, 1186 Intelligent Workstation, 1260 Intelligent Workstation, 1280 Intelligent Workstation, 281B Display Printer, 286F Daisy Wheel Printer, 287D/2 Matrix Printer, and 387/387C Matrix Printers.**
**DISPLAY: The 078, 079, 1186, 1260, and 1280 contain 12-inch display screens; the 179 and 279-3A contain 14-inch screens; the 080 and 180-1 feature 15-inch screens. The 079, 179, 279-3A, and 479 are color displays; all other displays are monochrome (green or amber phosphor standard). The 1186, 1260, and 1280 workstations are available with a monochrome or color display. Tilt/swivel capability is standard on all models except the 279-3A color graphics display terminal.**
**KEYBOARD: The 078, 079, 080, 179, and 180-1 feature a low-profile keyboard with typewriter or data entry layouts. The 279-3A features a keyboard with typewriter or data entry layout. The 1186, 1260, and 1280 contain low-profile keyboards with IBM PC- or 3270-compatible layouts. All other display models feature a choice of over 35 keyboard layouts. All keyboards are detachable.**
**COMPETITION: IBM, ITT Courier, Lee Data, Memorex, AT&T, Harris, and several others.**
**PRICE: Purchase prices for the Telex displays begin at $1,550; purchase prices for the controllers begin at $5,000.**

## MANAGEMENT SUMMARY

*UPDATE: This report introduces the most recent additions to the Telex 270 System. Information on these and older models, as well as current pricing information is included.*

Since entering the IBM 3270-compatible equipment market in 1976, Telex has been a leader in this competitive field. In the early 1970s, Telex was involved in the manufacture of IBM-compatible peripherals, primarily disk drives. In 1976, the company purchased Terminal Communications, Inc., and entered the 3270-compatible terminals business. Today, Telex is one of the most successful of the independent 3270-compatible vendors.

Like all of the independent 3270 vendors, Telex has been forced to significantly upgrade its product line in response to recent moves by IBM. In August 1984, Telex unveiled the 078 and 079 Display Terminals, the first members of a new family of ergonomically designed displays. Since that time several more products have been introduced into the 270 Information Display System. These include display terminals, a color graphics terminal control unit, and two additional multifunction workstations with IBM Personal Computer capabilities. Telex's most significant action, however, did not involve a new product. In June 1984, Telex reached an agreement with Raytheon Corporation to purchase the installed base, receivables, and inventory of Raytheon Data Systems, a division that Raytheon had folded the month before after continuing heavy losses. Raytheon Data Systems had been the number one competitor of IBM in the 3270 market, with an installed base of ➤

## CHARACTERISTICS

**VENDOR: Telex Computer Products, Inc., 6422 East 41st Street, Tulsa, Oklahoma 74135. Telephone (918) 627-1111. In Canada: Tulsa Computer Products, Ltd., 332 Consumers** ➤

# Telex 270 Information Display System

**TABLE 1. 270 FAMILY COMPONENTS AND SUBSYSTEMS**

| Controller Model | Mode | Protocol | Attachable Display Models | Attachable Display Models | Max. Devices Attachable |
|---|---|---|---|---|---|
| 076 | Remote | BSC/SDLC | 078/089/178/278/279 080/179/180 | 286B/286C | 8 |
| 174 Model 1 | Remote | BSC/SDLC | 078/079/178/278/279 | 286F/287C/287D/287D2 387/387C | 8 |
| 174 Model 2 | Remote | BSC/SDLC | 078/079/178/278/279 | 286F/287D/289C/387 | 16 |
| 274C | Remote | BSC/SDLC | 078/079/178/278/279 | 286F/287D/289C/387 | 32 |
| 274-61C | Remote | BSC/SDLC | 078/079/178/278/279 179/180-1/080 | 286B/286C/286F/287C/ 287D/287D2/289C/387/ 387C | 16 |
| 276 | Remote | BSC/SDLC | 078/079/178/287/279 | 281B/286F/287D/289C/ 387 | 8 |
| 476 | Remote/local | BSC/SDLC | 476/479 (daisy-chain) | 281B/286F/287D/289C/ 387 | 16 |
| 479 | Remote/local | BSC/SDLC | 476/479 (daisy-chain) | 281B/286F/287D/289C/ 387 | 16 |

terminals numbering 200,000. This installed base now belongs to Telex.

The 270 Information Display System currently consists of various controllers, keyboards, displays, and printers. These components feature full plug compatibility with the corresponding IBM models—Telex displays and printers may be attached to IBM controllers, and vice versa.

Telex offers four IBM 3274-compatible controllers, the 076, 174, 274C, and 274-61C. The 076 control unit provides users an alternative for operating up to eight display stations or printers. The 174 is a control unit that is available in two configurations, providing control for up to 8 or 16 devices in a remote cluster. The 274C, also a remote unit, may be configured with up to 32 devices. The 274-61C is a sixteen station remote control unit comparable to the IBM 3274-61C operating under configuration "D". The 274C and 274-61C provide dual host attachment. Also available are three models that provide an integral display with the control unit. The 276 provides support for up to 8 additional devices in a remote cluster. The 476 and 479 are control unit display stations that can operate as standalone devices, or in daisy chains of up to 16 devices (476s or 479s only). The 476 contains a monochrome display, while the 479 features a color display.

All Telex displays except the 279-3A, feature the new ergonomic design with tilt/swivel base and more compact

**Road, Willowdale, Ontario, M2J 1P8. Telephone (716) 855-1871.**

**DATE OF ANNOUNCEMENT: 276—June 1979; 174—April 1982; 476—May 1982; 274C and 479—September 1983; 281B, 286F, and 287D(2)—1983; 1186—June 1984; 078 and 079—August 1984; 080 and 179—October 1984; 279-3A and 387—1984; 180-1—July 1985; 076 September 1985; 1260 and 1280—October 1985; 387C—1985.**

**DATE OF FIRST DELIVERY: 276—August 1979; 174—June 1982; 476—August 1982; 274C and 479—September 1983; 281B, 286F, and 287D(2)—1983; 1186—June 1984; 078 and 179—August 1984; 080 and 179—December 1984; 279-3A and 387—1984; 180-1—September 1985; 076, 1260, and 1280—October 1985; 387C—1985.**

**NUMBER DELIVERED: Over 197,000 display units (does not include Raytheon installed base).**

**SERVICED BY: Telex Service Co.**

## CONFIGURATION

**The Telex 270 Information Display System is a family of direct replacements for corresponding members of the IBM 3270 Information Display System. Both BSC and SDLC line protocols are supported; configurations include remote cluster and remote and local standalone. The Telex components can communicate with IBM host systems including the 30XX, 43XX, S/370, and equivalent computer systems.**

**The 076 Eight Station Control Unit attaches up to 8-"A" type coax devices. It supports the 178, 278, 279, 078, 079,**

# Telex 270 Information Display System

housing. The 078, 079, 1186, 1260, and 1280 feature 12-inch displays, the 179 and 279-3A feature 14-inch displays, and the 080 and 180-1 feature 15-inch displays. The 078, 080, and 180-1 are monochrome units, while the 079, 179, and 279-3A feature color displays.

A variety of printers are available for use with the 270 system, including both matrix and line printers. The 281B Display Printer is a matrix unit that may be directly attached to any Telex display terminal. The 286F Daisy Wheel Printer can accommodate both plastic and metallized daisy printwheels of either 127 or 96 characters. The 287D Matrix Printer prints up to 150 characters per second depending upon application and system configuration. Telex's 387 High-Speed Matrix Printer prints bidirectionally up to 400 characters per second depending upon application and system configuration.

The 1186, 1260, and 1280 Intelligent Workstations provide the 270 system with personal computing capabilities. These units support the MS-DOS operating system, which provides it with IBM Personal Computer software compatibility. Standard features of the 1186 include 128K bytes of RAM and a dual 5¼-inch diskettes. The 1260 features 256K bytes of RAM and dual diskette controller which supports up to two 360K byte dual-sided diskette drives. The 1280 offers as standard 512K bytes of RAM. All three Intelligent Workstations offer high-speed, 16-bit processing with optional on-line 3270 communications support

## COMPETITIVE POSITION

Telex continues to be the leading supplier of IBM 3270-compatible terminal equipment, competing with other independents such as ITT Courier, Lee Data, Memorex, and AT&T, as well as with IBM. Those vendors mentioned here have been the most active in responding to IBM's upgrade of the 3270 Information Display System product line. All have introduced new products, as well as adjusted prices to meet IBM's lower price structure.

Over the past eighteen months, Telex has introduced several new products and enhancements. That, along with the acquisition of the assets of Raytheon Data Systems in 1983, has proven to be most significant to the company gaining and maintaining its competitive edge as an independent supplier of IBM 3270 alternatives.

Telex, ITT Courier, Lee Data, Memorex, and AT&T are the leading independent 3270 equipment vendors. Other competitors in this market include Harris, NCR, Braegen, Paradyne, Phaze Information Machines, Computer Communications, and CIE Systems. Several other vendors offer standalone 3270 terminals, or ASCII terminals with 3270 keyboards that emulate a 3270 terminal when used with a protocol converter.

## ADVANTAGES AND RESTRICTIONS

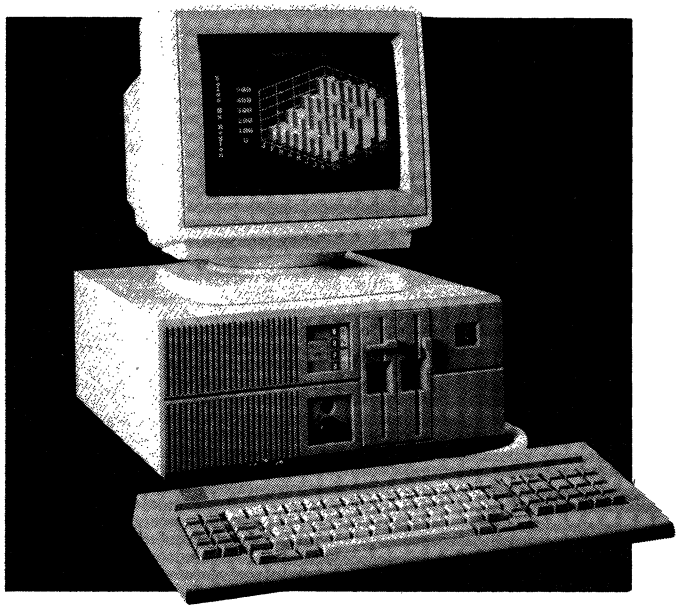
A major advantage (and one would assume a selling point) of the Telex 270 family is their plug compatibility with IBM

**080, 179, and 180 displays. Also the 281B, 286F, 287C, 287D, 287D(2), 387, and 387C printers. In addition, the 076 supports the IBM 3178, 3278, 3287, 3289, 3179-1, and 3180-1. The 174 Control Unit provides support for either 8 or 16 devices in a remote cluster configuration. The 174 supports the 078, 079, 080, 180-1, and 179 displays; the 286F, 287D, and 387 printers; and IBM 3274. The 274C Remote Control Unit supports the attachment of 8 devices in a remote cluster configuration. In addition, up to three device adapters may be optionally added, each of which supports the attachment of up to 8 additional devices, for a total cluster configuration of 32 devices. The 274C supports the 178, 278, and 279 displays; the 281B, 286F, 287C, and 287D printers; and the corresponding IBM devices. The 276 Control Unit Display Station provides support for the remote attachment of up to 8 displays and/or printers (including built-in 278), either the 079, 080, 178, 179, and 180-1 displays; or the 286F, 287D, and 387 printers, as well as the corresponding IBM models. The 476 Control Unit Display Station and 479 Color Control Unit Display Station operate in either a standalone or cluster environment, locally or remote. For cluster configurations, up to sixteen 476s and/or 479s can be daisy chained together, using the Telex 909 Modem Cluster Adapter. Telex also provides the 281B Display Printer, a station printer that can be directly attached to all Telex displays.**

**Personal computing capabilities may be added to the Telex 270 system with the 1186, 1260, and 1280 Intelligent Workstations. These units support a coax board interface for on-line communications with the host computer.**

## TRANSMISSION SPECIFICATIONS

**Transmission is synchronous, in half-duplex mode, at operator-selectable speeds up to 9600 bits per second; the 076 and 274C Remote Control Units support transmission speeds up to 19,200 bps using SNA/SDLC protocol over a single channel. Both the BSC and SNA/SDLC communications line protocols are supported; protocol configuration is switch selectable. The 8-level ASCII (including parity) or EBCDIC transmission codes are used. An EIA RS-232-C**



*The Telex 1280 Intelligent Workstation offers high-speed, 16-bit processing with optional on-line 3270 communications support. The 80286 microprocessor, 512k bytes standard internal memory, and the MS-DOS 3.1 operating system contribute to the 1280's performance.*

# Telex 270 Information Display System

components. All Telex displays and printers may be attached to IBM 3274 and 3276 controllers; likewise, the Telex 174, 274C, and 276 controllers support the attachment of IBM displays and printers. Of the four other chief 3270 competitors, only Memorex offers plug compatibility across their product line, with Lee Data and AT&T offering dual host controllers.

Like all of the independents who must compete with IBM, Telex offers a broad product line of competitive products at price levels somewhat below those of IBM. Several features and products have emerged as virtual prerequisites for competition in the 3270 market. One is a trend toward display terminals with lower prices and compact design, such as the IBM 3178 and 3179. Telex terminals conform to this trend. With desk space now at a premium, these terminals have formed the basis of a new family of displays which have replaced the larger units in Telex's product line. All of the vendors in this market, including IBM, are moving in this direction.

A second requirement seems to be the addition of some sort of personal computing capability on the 3270 system. IBM first provided for the integration of the IBM PC into its 3270 system, then followed that with the introduction of a version of the PC designed specifically for the 3270 environment, the 3270-PC. For personal computing capabilities, Telex introduced the 1186 Intelligent Workstation, and more recently, the 1260 and 1280 Intelligent Workstations. These are multifunction workstations that support the MS-DOS operating system, thus providing access to the vast library of software designed for the IBM PC. Telex does not support the attachment of the IBM PC on the 270 system (ITT Courier provides support for IBM PC attachment). This would appear to be somewhat of a disadvantage for Telex, given the sheer number (over 1½ million) of IBM PCs which have been sold.

This market being a competitive one, Telex along with other independents is likely to continue to produce new products. Look for Telex to maintain its competitive position as the leading supplier of IBM 3270 terminal equipment.□

**interface provides for connection to a voice grade line via a modem.**

**Dual host communications is supported on the 274C Remote Control Unit. Simultaneous communication between two host computers utilizing the same communications protocol is permitted. Under operator control, attached devices may be switched between the two hosts. During dual channel operation, each host channel will transmit at speeds up to 9600 bps.**
**Dual host as well as protocol communications is supported on the 274-61C Remote Control Unit. This unit allows the user to communicate simultaneously with two hosts using the same or different protocols.**

## DEVICE CONTROL

**The 270 System operates under the control of the program stored at the computer and provides complete compatibility with the addressing sequence, command code structure, and line discipline employed by the IBM 3270 Information Display System. The 270 system responds to and executes the full repertoire of IBM 3270 commands via a hard-wired processor.**

**Cursor control is functionally the same as in the IBM 3270. The controls position the cursor up, down, left, or right, either step by step or repetitively (if the key is held down). The cursor can also be backspaced one character position, moved to the beginning of the next line or the next unprotected data field, tabbed to the beginning of the next unprotected data field, and backtabbed to the beginning of the previous unprotected data field. Cursor addressability is standard.**

**Edit controls are the same as those for the IBM 3270 and include character insertion and deletion within a field, screen and field erasure, partial field erasure (specified by the cursor position), and duplication of data, which is specified by a unique code and displayed as an asterisk.**

**Structured data entry via displayable formats is supported through the use of attribute codes which define protected fields, delimit data entry fields, and specify display parameters and tab stop positions. The use of the attribute codes is identical with the IBM 3270. Display parameters specify beam intensity (full or half) and beam blanking (for security purposes).**

**Program Function and Program Attention keys, standard features of the IBM 3270, are also standard in the 270 system. Each of these keys generates a unique code that is recognized by the controlling software as a specific program request or data identifier. Program Function codes accompany the display data as it is transmitted to the computer, while Program Attention codes are transmitted separately.**

**A light pen is available, as an option for all display stations which functionally corresponds to IBM's Selector Pen, a 3270 option. Any one of several alphanumeric or numeric fields of fixed or variable formats can be selected by the pen, which transmits the address of the selected entry to the computer to initiate the programmed function. Other options include an audible alarm, a keyboard numeric lock that permits only numeric data to be entered, and a security lock that prevents unauthorized data entry.**

**Also available as an option on all Telex displays is the Response Time Indicator feature. The Telex RTI measures and records system response to keystrokes; measurements are displayed on the bottom of the screen.**

## COMPONENTS

**076 EIGHT STATION CONTROL UNIT: Provides control for up to 8-"A" type coax devices. The 076 can be configured to operate under synchronous data link control (SDLC) or binary synchronous communication (BSC) protocol. Attachable devices include the 178, 278, 279, 078, 079, 080, 179, and 180 displays; also the 286B, 286C, 286F, 287C, 287D, 287D(2), 289C, 387, and 387C printer models. The 076 also supports the attachment of the IBM 3178, 3278, 3287, 3289, 3179-1, and 3180-1.**

**174 CONTROL UNIT: Provides control for up to 8 (Model 1) or up to 16 (Model 2) devices. Model 2 consists of two eight-port controllers; each eight-port configuration can independently support BSC or SDLC line protocols. Attachable devices include the 078, 079, 080, 180-1, 178, 278, and 279 displays, and the 286F, 287D, 289C, and 387 printers; the 174 also supports the corresponding IBM display and printer models. The 174 is functionally compatible with the IBM 3276; no controller, software, or system changes are required to support IBM devices. The 174 is compatible with IBM's Network Problem Determination Application (NPDA) program product for SNA/SDLC network problem determination and isolation.**

# Telex 270 Information Display System

274C REMOTE CONTROL UNIT: Provides support for up to 8 devices as standard; up to 3 device adapters may be optionally added, each of which supports an additional 8 devices, for a total cluster configuration of 32 devices. The Dual Host Communications feature allows the 274C to communicate simultaneously with two hosts using the same communications protocol. Local print buffering and format storage and retrieval are also standard features. Attachable devices include the 078, 079, 080, 180-1, 178, 278, and 279 displays, and the 286F, 287D, 289C, and 387 printers; the 274C also supports the corresponding IBM display and printer models. The 274C is functionally compatible with the IBM 3274 Model 41C Control Unit. A set of diagnostic functions are provided; the 274C is also compatible with IBM's Network Problem Determination Application (NPDA) program product for SNA/SDLC network problem determination and isolation.

274-61C REMOTE CONTROL UNIT: Provides support for up to 16 devices. Either the normal category "A" type device support interface or the Telex 299 Multiplexer Device support interface can be supported. Support attachments include the 078, 079, 080, 178, 278, 279, 179, and 180-1 displays; also the 286B, 286C, 286F, 287C, 287D, 287D2, 289C, 387, and 387C printers. The corresponding IBM compatible displays and printers are also supported. Dual host/dual protocol communications allow the 274-61C to communicate simultaneously with two hosts using the same or different protocols. The attached devices can be switched between hosts under operator control. Each host channel can be configured independently to operate at line speeds up to 9600 bps.

276 CONTROL UNIT DISPLAY STATION: Provides an integral 278 display, plus support for seven attachable devices, which can be displays and/or printers. The integral display consists of a 15-inch screen, with a 1,920- (24 lines by 80 characters), 2,560- (32 by 80), 3,440- (43 by 80), or 3,564-character (27 by 132) display capacity, plus status indicator line. Green phosphor characters are standard on all models; white phosphor characters may be selected for the 1,920-character screen. Characters are formed using a 9-by-14 dot matrix. Attachable devices include the 078, 079, 080,180-1, 178, 278, and 279 displays; the 281B, 286F, 287D, 289C, and 387 printers; as well as the corresponding IBM models. The 276 is functionally compatible with the IBM 3276 Control Unit Display Station. Field formatting and local display-to-printer copy functions are standard features on the 276. A set of diagnostic functions are provided; the 276 is also compatible with IBM's Network Problem Determination Application (NPDA) program product for SNA/SDLC network problem determination and isolation.

476 CONTROL UNIT DISPLAY STATION: Can be used as a standalone unit, or can be daisy chained in a cluster of up to 16 476s and/or 479s via the Telex 909 Modem Cluster Adapter. The 476 can operate under BSC (476B) or SNA/SDLC (476S) communications protocols. The 476's integral display consists of a 15-inch screen with a 1,920-character display capacity, arranged in 24 lines of 80 characters each (plus a 25th status line). Green or white phosphor characters may be selected, and are displayed using an 8-by-15 dot matrix. The 281B Display Printer may be attached to the 476; in addition, a coax attachment is available to support the 286F, 287D, 289C, and 387 printers. The 476 is functionally compatible with the IBM 3276 Models 2 and 12; it does not support the attachment of additional display devices.

479 COLOR CONTROL UNIT DISPLAY STATION: A four-color version of the 476. The 479 can operate as a standalone unit, or can be daisy chained in a cluster of up to 16 479s and/or 476s via the Telex 909 Modem Cluster Adapter. The 479 can operate under BSC (479B) or SNA/SDLC (479S) communications protocols. The unit's integral display consists of a 15-inch screen with a 1,920-character display capacity, arranged in 24 lines of 80 characters each (plus a 25th status line). Four colors may be displayed: red, green, blue, and white. Characters are formed via an 8-by-15 dot matrix. The 281B Display Printer may be attached to the 479; in addition, a coax attachment is available to support the 286F, 287D, 289C, and 387 printers. The 479 is functionally compatible with the IBM 3276 Models 2 and 12; it does not support the attachment of additional display devices.

078 DISPLAY TERMINAL: Contains a 12-inch display screen with a 1,920-character screen capacity arranged in 24 lines by 80 characters. A 25th status line is available. Green or amber phosphor characters may be selected; characters are formed via a 9-by-12 dot matrix in a 9-by-16 block. The 078 contains an ergonomic enclosure design which includes a tilt/swivel display capability and a smaller footprint than that found on older Telex displays. The 078 supports the attachment of the 281B Display Printer. The 078 Display Terminal is a plug-compatible replacement for the IBM 3178 Display Station, and can be attached to an IBM 3274 or 3276 Control Unit, as well as to a Telex 076, 174, 274C, 274-61C, or 276 controller.

079 COLOR DISPLAY TERMINAL: Contains a 12-inch display screen with a 1,920-character screen capacity arranged in 24 lines of 80 characters each (plus a 25th status line). Four base colors (red, green, blue, white) plus three extended colors (yellow, turquoise, pink) may be displayed. Characters are formed via a 9-by-12 dot matrix in a 9-by-16 block. The 079 contains an ergonomic enclosure design which includes a tilt/swivel display and a smaller footprint than that found on older Telex displays. The 079 supports the attachment of the 281B Display Printer. The 079 Color Display Terminal is a plug-compatible replacement for the IBM 3179 Color Display Station, and can be attached to an IBM 3274 or 3276 Control Unit, as well as to a Telex 076, 174, 274C, 274-61C, or 276 controller.

080 DISPLAY TERMINAL: Contains 15-inch display screen, and is available in four character screen sizes. Model 2 features a 1,920-character screen capacity, arranged in 24 lines of 80 characters each. Model 3 features a 2,560-character screen capacity, arranged in 32 lines of 80 characters each. Model 4 features a 3,440-character screen capacity arranged in 43 lines of 80 characters each. Model 5 features a 3,564-character screen capacity, arranged in 27 lines of 132 characters each. Characters are formed using a 7-by-9 dot matrix, and are displayed in green or amber phosphor. The 080 attaches directly to an IBM 3274/3276 controller, an IBM Display/Printer Adapter of an 43XX, or a Telex 076, 174, 274C, 274-61C, or 276 control unit.

179 COLOR DISPLAY TERMINAL: A seven-color (red, green, blue, white, yellow, turquoise, pink) display station. The 179 features a 14-inch color monitor and is available in up to three character screen sizes. Model 2 features a 1,920-character screen capacity, arranged in 24 lines of 80 characters each. Model 3 features a 2,560-character screen capacity, arranged in 32 lines of 80 characters each. Model 4 features a 3,440-character screen capacity, arranged in 43 lines of 80 characters each. Characters are formed using a 7-by-9 dot matrix. The 179 is a plug-compatible alternative to the IBM 3179. The 179 attaches directly to an IBM 3274/3276 controller; an IBM Display/Printer Adapter; or a Telex 076, 174, 274C, 274-61C, or 276 control unit.

180-1 DISPLAY TERMINAL: The 180-1 offers four user selectable screen sizes on a 15-inch moniter. Model 2 features a 1,920-character screen capacity, arranged in 24 lines of 80 characters each. Model 3 features a 2,560-character screen capacity, arranged in 32 lines of 80 characters each. Model 4 features a 3,440-character screen capacity, arranged in 43 lines of 80 characters. Model 5 features a

# Telex 270 Information Display System

3,564-character screen capacity, arranged in 27 lines of 123 characters each. Characters for Model 2 are formed using a 8-by-12 dot matrix. Characters for models 3, 4, and 5 are formed using an 8-by-8 dot matrix. Characters are displayed in green or amber phospher. The 180-1 attaches to an IBM 3274/3276 controller, an IBM Display/Printer Adapter, or a Telex 076, 174, 274, or 276 control unit.

279-3A COLOR GRAPHICS DISPLAY TERMINAL: A seven-color (red, white, blue, green, yellow, turquoise, pink) display station. The 279-3A features a 14-inch screen with a 2,560-character display capacity, arranged in 32 lines of 80 characters each. Characters are formed via a 9-by-14 dot matrix. The 279-3A attaches to either an IBM 3274 or Telex 076, 174, 274C, 274-61C, or 276 control unit. This terminal is a plug-compatible replacement for the IBM 3279 S3G.

KEYBOARDS: Telex offers two primary keyboards. Both are detached and connected to the display monitor via a 6-foot length coiled cord. These tactile keyboards feature an adjustable typing angle design, with a layout that accommodates common data and word processing keys, separate typewriter and numeric keypads, and 10 programmable function keys. In addition, the 84 key IBM AT-style keyboard offers caps lock indicator light, numeric lock indicator light, scroll lock indicator light, enlarged SHIFT and ENTER keys, nonskid/mark foot pads, and ergonomic color and finish. The 88 key, 3278-style keyboard offers 24 programmable function keys, 3278 emulated keys, ENTER key, CLEAR, ATTN, SYS REQ, PA1 and PA2, adjustable height, blue coded PC keys, and black coded 3278 keys.

1186 INTELLIGENT WORKSTATION: A workstation that functions as a multifunction terminal with IBM Personal Computer compatibility, and is supported for 3270 network communications. The 1186 is based on an Intel 80186 microprocessor, and contains 128K bytes of RAM as standard (expandable to 512K bytes). Two 5¼-inch, double-sided, double-density diskette drives are standard, each of which contains 360K bytes of storage. A 10MB disk drive is optional. The 1186 supports the MS-DOS operating system, enabling it to run IBM PC-compatible software. A 12-inch monochrome (green or amber) or color display may be selected for use with the 1186. The display includes a tilt capability and a 2,000-character screen capacity (arranged in 25 lines of 80 characters each). A choice of IBM PC-compatible or 3270-type keyboards is available. Both keyboards are detachable and feature a low-profile design with tactile feedback. The 1186 contains one RS-232-C serial port, one RS-422 serial port, and one parallel port. A coax board interface is required for use in a 3270 system. The coax board is optional, and allows the 1186 to support online communications in a Telex or IBM 3270 network.

1260 INTELLIGENT WORKSTATION: This workstation offers high-speed 16-bit, processing with optional online 3270 communications support. Compatible with the IBM PCXT, Telex's 1260 is highly configurable and expandable with performance characteristics comparable to the PCAT. The 80186 microprocessor and the MS-DOS 3.1 operating system contribute to the 1260's advanced performance. The base system unit features high speed 8MHz clock rate, 256KB standard internal memory, and sockets for 640KB of RAM on system memory board. Also standard is a disk controller card which supports two 360KB diskette drives, one serial and one parallel interface, six available 8-bit expansion slots, and socket for 8087 numeric coprocessor. A 12-inch, monochrome/mono graphics monitor with tilt and swivel base may be selected for use with the 1260 or a 13-inch, 16-color graphics monitor. A choice of two keyboards is available. Both are detachable and feature low-profile design with tactile feedback. The Telex 181/182GP dot matrix graphic printer (80/132 column) and Telex 186 letter quality printer are also available.

1280 INTELLIGENT WORKSTATION: The 1280 workstation is IBM PCAT compatible with performance characteristics up to 30 percent faster than the PCAT. It's 80286 microprocessor, 512KB standard internal memory, and MS-DOS 3.1 operating system contribute to this unit's ability to perform standalone processing or sophisticated network applications. The Telex 1280 workstation offers 512KB of RAM and can be populated up to 2.1MB. An optional high-performance expansion memory board brings the total memory capacity up to 4.6MB. With the optional diskette/fixed disk controller, the 1280 can be configured with up to four internal storage devices. Media storage options include a choice of 360KB and 1.2MB diskette drives, and 10MB, 20MB, and 40MB fixed disk drives. One serial and one parallel port are available as well as six expansion slots. A 12-inch monochrome or color monitor display may be selected for use with the 1280.

281B DISPLAY PRINTER: A tabletop printer for hard copy output from an attached Telex display. Provides 80 or 132 print positions at a rated speed of 120 cps (bidirectional). The character set contains the full 96-character ASCII set plus 64 graphics symbols. Line spacing is 6 or 8 lines per inch; character spacing is 10 characters per inch using the 80-column format, and 16.5 cpi using the 132-column format. Characters are formed via a 9-by-7 dot matrix. The paper handling system features a friction-feed/pin-feed platen. Up to three-part forms can be printed. A tear bar and paper roll is standard; forms tractors are optional. The 281B can be directly attached to an 078, 079, 080, 180-1, 178, 179, 278X, or 279 display, or a 276, 476, or 479 control unit display.

286F DAISY WHEEL PRINTER: A bidirectional printer that can accommodate both plastic and metallized print wheels. The 286F operates at speeds up to 80 cps. Line spacing of 6 or 8 lpi and character spacing of 10 or 12 cpi are operator selectable; 132 print positions at 10 cpi and 158 print positions at 12 cpi are provided. Print wheels provide character sets of 96 and 127 characters. The 286F prints upper and lowercase; ASCII and EBCDIC character sets are supported. Logical buffer sizes range from 960 to 3,564 characters. Forms from 3 to 15 inches wide are accepted; up to 6 multipart copies may be printed. A friction feed platen is standard; options include unidirectional or bidirectional forms tractor, pin-feed platen, or single cut sheet feeder. The 286F is plug-compatible with the IBM 3287 Printer, and can be attached to an IBM 3274 or 3276 control unit, and IBM processors 4331 or 4341, as well as to a Telex 174, 274C, 274-61C, 276, or 476 controller.

287D(2) MATRIX PRINTER: A bidirectional matrix printer. The 287D(2) operates at speeds up to 150 cps. Line spacing of 6 or 8 lpi and character spacing of 10 or 16.7 cpi are operator selectable; 132 print positions at 10 cpi and 220 print positions at 16.7 cpi are provided. The 287D(2) prints upper and lowercase, and single or double space; ASCII and EBCDIC character sets are supported, and international character sets are configuration selectable. Characters are formed within an 8-by-7 dot matrix. A buffer size of 2K characters is standard, with an additional 2K optional. Forms from 3 to 15 inches wide are accepted; up to 6 multipart copies may be printed. A forms tractor is standard. The 287D(2) is plug-compatible with the IBM 3287 Printer, and can be attached to an IBM 3274 or 3276 Control Unit, and IBM processors 4331 or 4341, as well as to a Telex 174, 274C, 274-61C, 276, or 476 controller.

387/387C MATRIX PRINTERS: Bidirectional matrix printers with print speeds up to 400 cps. Line spacing is selectable at 3, 4, 6, or 8 lpi; character spacing is selectable at 10 (136 print positions), 12 (163 print positions), 15 (204 print positions), 16.7 (227 print positions), or 17.1 (233 print positions) cpi. The 387s print upper and lowercase, and ASCII, EBCDIC, or international character sets may be

# Telex 270 Information Display System

selected. Characters are formed within an 8-by-7 dot matrix in draft quality font, or within a 16-by-14 dot matrix in near letter quality font. A high density (bold) print mode is available for highlighting. Logical buffer sizes range from 960 to 3,564 characters. Forms from 3 to 16 inches wide, and up to 6 parts, are accepted. A forms tractor is standard. The 387 models are compatible with the IBM 3287 printer, and can be attached to an IBM 3274 or 3276 control unit, and IBM processors 4331 or 4341, as well as to a Telex 174, 274C, 274-61C, or 276 controller. Model 378C is available in 4-color display.

MONITORS: Telex offers a variety of high resolution monitor alternatives for the intelligent workstations. Its 12-inch (diagonally measured) monochrome/graphics monitor supports a number of user applications. A choice of green or amber displays is available. The Telex full color, 13-inch graphics monitor displays up to 16 colors. Both models offer as standard features tilt and swivel stands, separate brightness/contrast adjustments, nonglare screen, and IBM compatibility.

## PRICING

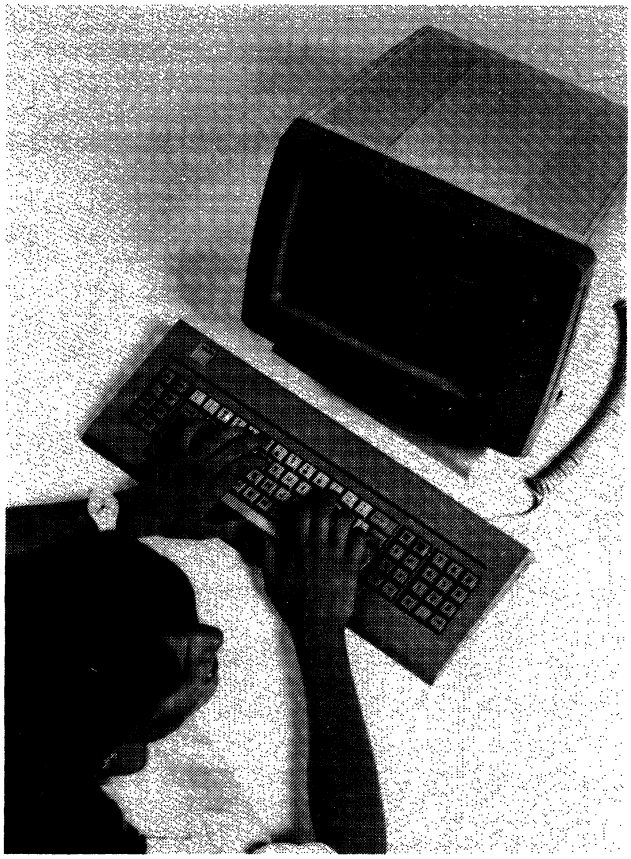
The 270 system is available for purchase, or on a two- or three-year lease including prime-shift maintenance. Telex offers quantity discounts on some devices. There are no installation charges for the Telex equipment. Telex does not schedule customer training; however, its field engineering personnel and customer representatives provide any necessary on-site training. Full service maintenance on a 24-hour-per-day, 7-day-per-week basis is available on negotiation.

Telex provides the following single-quantity purchase prices and maintenance charges for selected 270 system components. Contact Telex for more detailed pricing. Volume discounts are also available; Telex may be contacted for these prices also.

## Equipment Prices

| | | Purchase Price ($) |
|---|---|---|
| 078 | Keyboard Display | 1,550 |
| 079 | Keyboard Color Display | 2,095 |
| 080 | Keyboard Display | 2,195 |
| 179 | Keyboard Color Display | 2,295 |
| 180-1 | Display Terminal | 2,195 |
| 279-3A | Keyboard Color Display | 3,600 |
| 476 | Keyboard Display Control Unit | 2,800 |
| 479 | Keyboard Color Display Control Unit | 3,800 |
| 076 | Eight Station Control Unit | 4,500 |
| 276 | Remote Controller with Telex 278 Display | 5,350 |
| 174 | Remote Controller | 5,000 |
| 274C | Remote Advanced Function Controller | 10,000 |
| 274-61C | Sixteen Station Control Unit | 7,000 |
| 281B | Matrix Buffered Bidirectional Printer | 900 |
| 286F | Daisy Wheel, Bidirectional Tabletop Printer | 5,750 |
| 287D2 | Matrix Printer | 5,000 |
| 387 | Matrix, Bidirectional Tabletop Printer | 7,200 |
| 387C | Matrix, Bidirectional Tabletop Printer | 7,800 |
| 1186 | Intelligent Workstation | 4,165 |
| 1260 | Intelligent Workstation | 2,485 |
| 1280 | Intelligent Workstation | 2,990 |
| Keyboard | 3278 Style | — |
| Keyboard | AT Style | — |
| Monitor | Monochrome/Graphics | — |
| Monitor | Color Graphics | 405 |

# Telex 270 Information Display System



*The 078 Display Terminal, introduced in August 1984, is one of the first members of a new family of display products from Telex. The 078 features a 12-inch tilt/swivel display, detachable low-profile keyboard, and a compact enclosure design. The terminal is a plug-compatible replacement for the IBM 3178.*

**The Telex 270 Information Display System is a family of plug-compatible replacements for various members of the IBM 3270 Information Display System. Telex provides controllers, keyboard/displays, and printers; personal computing capabilities can be added to the 270 system via the new 1186 Intelligent Workstation. The newest members of the 270 system are the 078 and 079 Display Terminals, which contain Telex's new ergonomic display design.**

**MODELS: 174 Control Unit, 274C Remote Control Unit, 276 Control Unit Display Station, 476 Control Unit Display Station, 479 Color Control Unit Display Station, 078 Display Terminal, 079 Color Display Terminal, 178 Display Station, 278 Display Station, 279 Color Display Station, 1186 Intelligent Workstation, 281B Display Printer, 286F Daisy Wheel Printer, 287D Matrix Printer, 289C Line Printer, and 387 Matrix Printer.**
**DISPLAY: The 078, 079, 178, and 1186 contain 12-inch display screens; all other display models feature 15-inch screens. The 079, 279, and 479 are color displays; all other displays are monochrome (green phosphor standard). The 1186 is available with a monochrome or color display. Tilt/swivel capability is standard on the 078, 079, and 1186.**
**KEYBOARD: The 078 and 079 feature a low-profile keyboard with typewriter or data entry layouts. The 1186 contains a low-profile keyboard with an IBM PC- or 3270-compatible layout. All other display models feature a choice of over 35 keyboard layouts. All keyboards are detachable.**
**COMPETITION: IBM, ITT Courier, Lee Data, Memorex, AT&T Teletype, Harris, and several others.**
**PRICE: Purchase prices for the Telex displays begin at $1,550; purchase prices for the controllers begin at $5,000.**

## MANAGEMENT SUMMARY

Since entering the IBM 3270-compatible equipment market in 1976, Telex has been a leader in this competitive field. In the early 1970s, Telex was involved in the manufacture of IBM-compatible peripherals, primarily disk drives. In 1976, the company purchased Terminal Communications, Inc., and entered the 3270-compatible terminals business. Today, Telex is one of the most successful of the independent 3270-compatible vendors.

Like all of the independent 3270 vendors, Telex has been forced to significantly upgrade its product line in response to recent moves by IBM. In August 1984, Telex unveiled the 078 and 079 Display Terminals, the first members of an intended new family of ergonomically designed displays. Prior to that, Telex introduced the 1186 Intelligent Workstation, a multi-function workstation with IBM Personal Computer capability. Telex's most significant action, however, did not involve a new product. In June 1984, Telex reached an agreement with Raytheon Corporation to purchase the installed base, receivables, and inventory of

## CHARACTERISTICS

**VENDOR: Telex Computer Products, Inc., 6422 East 41st Street, Tulsa, Oklahoma 74135. Telephone (918) 627-1111. In Canada: Tulsa Computer Products, Ltd., 332 Consumers Road, Willowdale, Ontario, M2J 1P8. Telephone (716) 855-1871.**

**DATE OF ANNOUNCEMENT: 276 and 278—June 1979; 174—April 1982; 279—January 1982; 476—May 1982; 178—June 1982; 274C and 479—September 1983; 1186—June 1984; 078 and 079—August 1984.**

# Telex 270 Information Display System

**TABLE 1. 270 FAMILY COMPONENTS AND SUBSYSTEMS**

| Controller Model | Mode | Protocol | Attachable Display Models | Attachable Printer Models | Max. Devices Attachable |
|---|---|---|---|---|---|
| 174 Model 1 | Remote | BSC/SDLC | 078/079/178/278/279 | 286F/287D/289C/387 | 8 |
| 174 Model 2 | Remote | BSC/SDLC | 078/079/178/278/279 | 286F/287D/289C/387 | 16 |
| 274C | Remote | BSC/SDLC | 078/079/178/278/279 | 286F/287D/289C/387 | 32 |
| 276 | Remote | BSC/SDLC | 078/079/178/278/279 | 281B/286F/287D/289C/387 | 8 |
| 476 | Remote/local | BSC/SDLC | 476/479 (daisy-chain) | 281B/286F/287D/289C/387 | 16 |
| 479 | Remote/local | BSC/SDLC | 476/479 (daisy-chain) | 281B/286F/287D/289C/387 | 16 |

Raytheon Data Systems, a division that Raytheon had folded the month before after continuing heavy losses. Raytheon Data Systems had been the number one competitor of IBM in the 3270 market, with an installed base of terminals numbering 200,000. This installed base now belongs to Telex.

The 270 Information Display System currently consists of various controllers, displays, and printers. These components feature full plug-compatibility with the corresponding IBM models—Telex displays and printers may be attached to IBM controllers, and vice versa.

Telex offers two IBM 3274-compatible controllers, the 174 and 274C. The 174 is a control unit that is available in two configurations, providing control for up to 8 or 16 devices in a remote cluster. The 274C, also a remote unit, may be configured with up to 32 devices. Also available are three models that provide an integral display with the control unit. The 276 provides support for up to 7 additional devices in a remote cluster. The 476 and 479 are control unit display stations that can operate as standalone devices, or in daisy chains of up to 16 devices (476s or 479s only). The 476 contains a monochrome display, while the 479 features a color display.

The new 078 and 079 displays feature Telex's new ergonomic design, which boasts a 12-inch tilt/rotate base and a more compact housing. Both terminals also include a detachable keyboard with a new low-profile design. The 078 is a monochrome unit, while the 079 features a color display. The older Telex displays are the 178, 278, and 279. The 278 and 279 are monochrome and color units, respectively, that feature a 15-inch display. The 178 is a 12-inch display version of the 278. A choice of 35 keyboard layout styles is available for these displays.

A variety of printers are available for use with the 270 system, including both matrix and line printers. Telex also offers the 281B Display Printer, a matrix unit that may be directly attached to any Telex display terminal.

**DATE OF FIRST DELIVERY: 276 and 278—August 1979; 174—June 1982; 279—1st Q 1982; 476—August 1982; 178—2nd Q 1982; 274C and 479—September 1983; 1186—June 1984; 078 and 079—August 1984.**

**NUMBER DELIVERED: Over 185,000 display units (does not include Raytheon installed base).**

**SERVICED BY: Telex Service Co.**

## CONFIGURATION

**The Telex 270 Information Display System is a family of direct replacements for corresponding members of the IBM 3270 Information Display System. Both BSC and SDLC line protocols are supported; configurations include remote cluster and remote and local stand-alone. The Telex components can communicate with IBM host systems including the S/360, S/370, 43XX, 30XX, and equivalent computer systems.**

**The 174 Control Unit provides support for either 8 or 16 devices in a remote cluster configuration. The 174 supports the 078, 079, 178, 278, and 279 displays, the 286F, 287D, 289C, and 387 printers, and corresponding IBM equipment (3178, 3278, 3287, 3289). The 274C Remote Control Unit supports the attachment of 8 devices in a remote cluster configuration. In addition, up to three device adapters may be optionally added, each of which supports the attachment of up to 8 additional devices, for a total cluster configuration of 32 devices. The 274C supports the 078, 079, 178, 278, and 279 displays, the 286F, 287D, 289C, and 387 printers, and the corresponding IBM devices. The 276 Control Unit Display Station provides support for the remote attachment of up to 8 displays and/or printers (including the integral display), either the 078, 079, 178, 278, and 279 displays, or the 286F, 287D, 289C, and 387 printers, as well as the corresponding IBM models. The 476 Control Unit Display Station and 479 Color Control Unit Display Station operate in either a stand-alone or cluster environment, locally or remote. For cluster configurations, up to sixteen 476s and/or 479s can be daisy-chained together, using the Telex 909 Modem Cluster Adapter. Telex also provides the 281B Display Printer, a station printer that can be directly attached to all Telex displays.**

**Personal computing capabilities may be added to the Telex 270 system with the 1186 Intelligent Workstation. The 1186 supports a coax board interface for on-line communications with the host computer.**

# Telex 270 Information Display System

The 1186 Intelligent Workstation provides the 270 system with personal computing capabilities. The 1186 supports the MS-DOS operating system, which provides it with IBM Personal Computer software compatibility. Standard features of the 1186 include 128K bytes of RAM, dual 5¼-inch diskettes, monochrome or color display, and a detachable keyboard. The 1186 must be configured with a coax board interface for on-line 3270 host communications.

## COMPETITIVE POSITION

Telex continues to be a leader in the IBM 3270-compatible terminal market, competing with other independents such as ITT Courier, Lee Data, Memorex, and AT&T Teletype, as well as with IBM. Those vendors mentioned here have been the most active in responding to IBM's upgrade of the 3270 Information Display System product line. All have introduced several new products, as well as adjusting prices to meet IBM's lower price structure.

Telex was first among the independents to offer functional replacements for the IBM 3276 and 3278, and actually brought their 178 Display Station to market nine months before IBM introduced the 3178. It has lagged somewhat behind ITT Courier, Lee Data, and Memorex in some recent enhancements, particularly in the personal computing area. However, the company's acquisition of the assets of Raytheon Data Systems may prove to be the most significant action of all. Telex posted a record $325 million in revenues in 1983, and the addition of the Raytheon installed base and receivables (purchased for $200 million) figures to increase those numbers. In addition, Telex finds itself with Raytheon's 50 percent share of the airline reservations terminals business, a market in which Telex had not even competed previously (but now finds itself the leader). When you add Raytheon's 200,000 terminal base to Telex's already-significant installed base, Telex becomes the leader of the independents with nearly a 15% share of the 3270 market.

Telex, ITT Courier, Lee Data, Memorex, and Teletype are the leading independent 3270 equipment vendors. Other competitors in this market include Harris, Racal-Milgo, Northern Telecom, NCR, Braegen, Paradyne, Phaze Information Machines, and Computer Communications. Several other vendors offer stand-alone 3270 terminals, or ASCII terminals with 3270 keyboards that emulate a 3270 terminal when used with a protocol converter. IBM's aggressive new product introductions and lower price levels have caused Raytheon and MDS Trivex to exit this field in the past year. Others may follow shortly.

## ADVANTAGES AND RESTRICTIONS

A major advantage (and one would assume selling point) of the Telex 270 family is their plug-compatibility with IBM components. All Telex displays and printers may be attached to IBM 3274 and 3276 controllers; likewise, the Telex 174, 274C, and 276 controllers support the attachment of IBM displays and printers. Of the four other chief 3270 competitors, only Memorex offers plug-compatibility.

## TRANSMISSION SPECIFICATIONS

**Transmission is synchronous, in half-duplex mode, at operator-selectable speeds up to 9600 bits per second; the 274C Remote Control Unit also supports transmission speeds up to 19,200 bps using SNA/SDLC protocol over a single channel. Both the BSC and SNA/SDLC communications line protocols are supported; protocol configuration is switch selectable. The 8-level ASCII (including parity) or EBCDIC transmission codes are used. An EIA RS-232-C interface provides for connection to a voice-grade line via a modem.**

**Dual host communications is supported on the 274C Remote Control Unit. Simultaneous communication between two host computers utilizing the same communications protocol is permitted. Under operator control, attached devices may be switched between the two hosts. During dual channel operation, each host channel will transmit at speeds up to 9600 bps.**

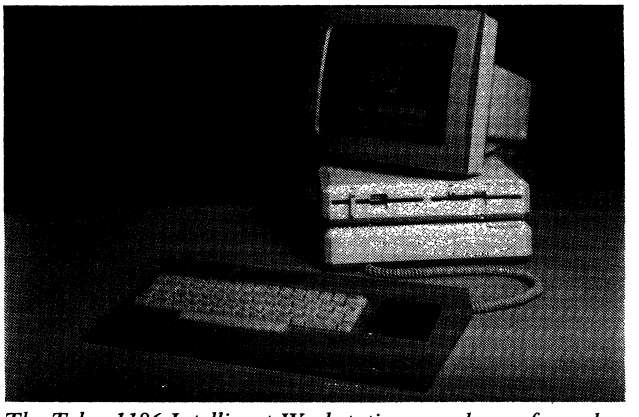
## DEVICE CONTROL

**The 270 system operates under the control of the program stored at the computer and provides complete compatibility with the addressing sequence, command code structure, and line discipline employed by the IBM 3270 Information Display System. The 270 system responds to and executes the full repertoire of IBM 3270 commands via a hard-wired processor.**

**Cursor control is functionally the same as in the IBM 3270. The controls position the cursor up, down, left, or right, either step-by-step or repetitively (if the key is held down). The cursor can also be backspaced one character position, moved to the beginning of the next line or the next unprotected data field, tabbed to the beginning of the next unprotected data field, and backtabbed to the beginning of the previous unprotected data field. Cursor addressability is standard.**

**Edit controls are the same as those for the IBM 3270 and include character insertion and deletion within a field, screen and field erasure, partial field erasure (specified by the cursor position), and duplication of data, which is specified by a unique code and displayed as an asterisk.**

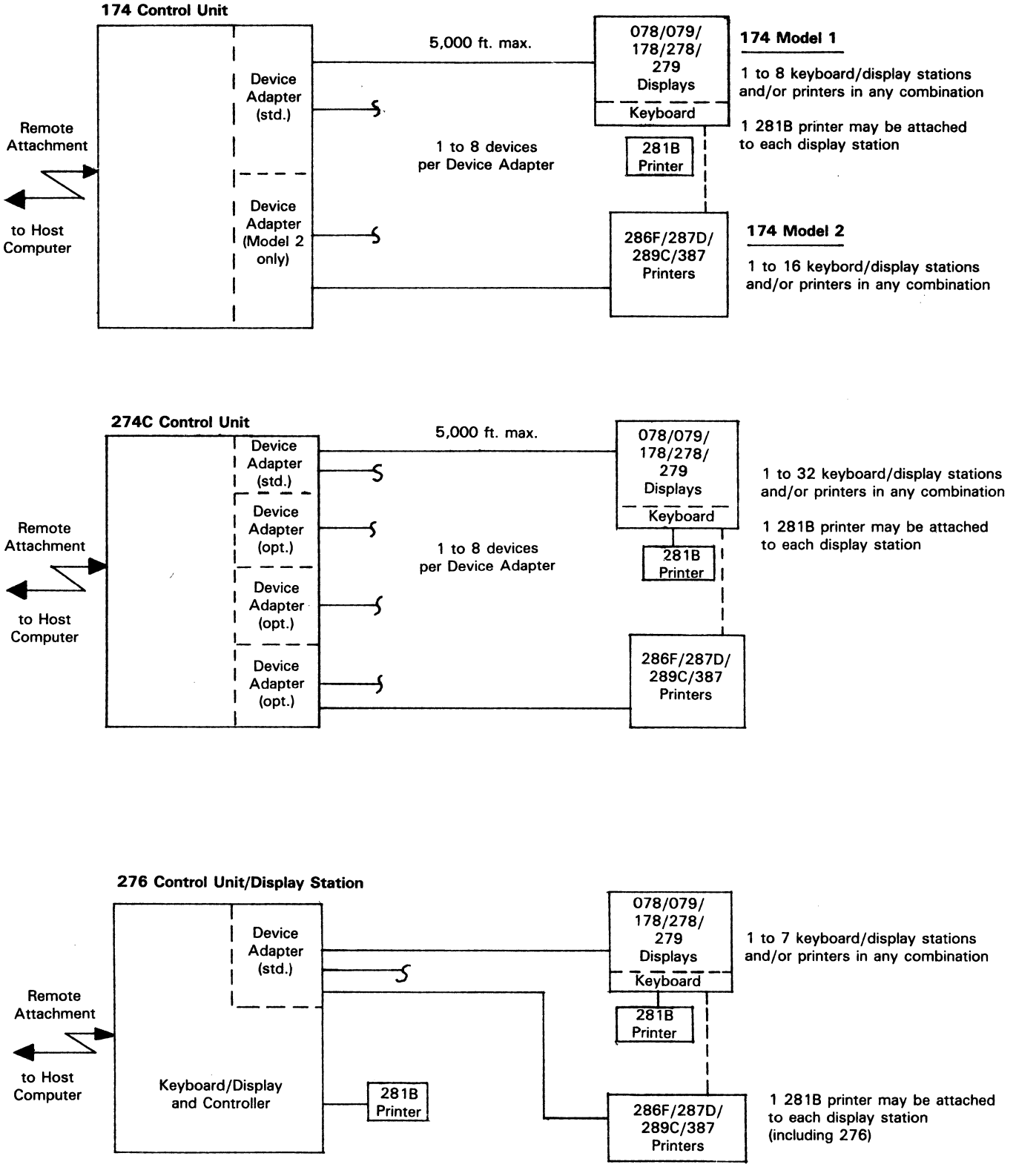
**Structured data entry via displayable formats is supported through the use of attribute codes, which define protected fields, delimit data entry fields, and specify display parameters and tab stop positions. The use of the attribute codes is identical with the IBM 3270. Display parameters specify beam intensity (full or half) and beam blanking (for security purposes).**



*The Telex 1186 Intelligent Workstation may be configured as part of a 3270 network via a coax interface board. The MS-DOS operating system is supported for IBM Personal Computer compatibility.*

# Telex 270 Information Display System

## TELEX 270 CONFIGURATIONS




*Note: Telex controllers support attachment of IBM displays and/or printers.*

# Telex 270 Information Display System

Like all of the independents who must compete with IBM, Telex offers a broad product line of competitive products at price levels somewhat below those of IBM. Several features and products have recently emerged as virtual prerequisties for competition in the 3270 market. One is a trend toward display terminals with lower prices and compact design, such as the IBM 3178 and 3179. Telex's new 078 and 079 terminals conform to this trend. With desk space now at a premium, these new terminals form the basis of a new family of displays which will eventually replace the larger units in Telex's product line. All of the vendors in this market, including IBM, are moving in this direction.

A second requirement seems to be the addition of some sort of personal computing capability on the 3270 system. IBM first provided for the integration of the IBM PC into its 3270 system, then followed that with the introduction of a version of the PC designed specifically for the 3270 environment, the 3270-PC. For personal computing capabilities, Telex has introduced the 1186 Intelligent Workstation, which it developed in a joint venture with MAD Computer, a Santa Clara-based microcomputer manufacturer. The 1186 is a multi-function workstation that supports the MS-DOS operating system, thus providing it with access to the vast library of software designed for the IBM PC. As of this time, Telex does not support the attachment of the IBM PC on the 270 system (ITT Courier and Memorex provide support for IBM PC attachment). This would appear to be somewhat of a disadvantage for Telex, given the sheer number (over 1½ million) of IBM PCs which have been sold.

This market is currently an extremely volatile one, and Telex, like all of the other independents, is likely to continue to introduce new products over the next several months. Look for Telex to cement its standing in this market, and prosper (along with ITT Courier, Lee Data, and Memorex) despite the competitive pressures. □

**Program Function and Program Attention keys, standard features of the IBM 3270, are also standard in the 270 system. Each of these keys generates a unique code that is recognized by the controlling software as a specific program request or data identifier. Program Function codes accompany the display data as it is transmitted to the computer, while Program Attention codes are transmitted separately.**

**A light pen is available as an option for all display stations which functionally corresponds to IBM's Selector Pen, a 3270 option. Any one of several alphanumeric or numeric fields of fixed or variable formats can be selected by the pen, which transmits the address of the selected entry to the computer to initiate the programmed function. Other options include an audible alarm, a keyboard numeric lock that permits only numeric data to be entered, and a security lock that prevents unauthorized data entry.**

**Also available as an option on all Telex displays is the Response Time Indicator feature. The Telex RTI measures and records system response to keystrokes; measurements are displayed on the bottom of the screen.**

## COMPONENTS

**174 CONTROL UNIT: Provides control for up to 8 (Model 1) or up to 16 (Model 2) devices. Model 2 consists of two eight-port controllers; each eight-port configuration can independently support BSC or SDLC line protocols. Attachable devices include the 078, 079, 178, 278, and 279 displays, and the 286F, 287D, 289C, and 387 printers; the 174 also supports the corresponding IBM display and printer models. The 174 is functionally compatible with the IBM 3276; no controller, software, or system changes are required to support IBM devices. The 174 is compatible with IBM's Network Problem Determination Application (NPDA) program product for SNA/SDLC network problem determination and isolation.**

**274C REMOTE CONTROL UNIT: Provides support for up to 8 devices as standard; up to 3 device adapters may be optionally added, each of which supports an additional 8 devices, for a total cluster configuration of 32 devices. The Dual Host Communications feature allows the 274C to communicate simultaneously with two hosts using the same communications protocol. Local print buffering and format storage and retrieval are also standard features. Attachable devices include the 078, 079, 178, 278, and 279 displays, and the 286F, 287D, 289C, and 387 printers; the 274C also supports the corresponding IBM display and printer models. The 274C is functionally compatible with the IBM 3274 Model 41C Control Unit. A set of diagnostic functions are provided; the 274C is also compatible with IBM's Network Problem Determination Application (NPDA) program product for SNA/SDLC network problem determination and isolation.**

**276 CONTROL UNIT DISPLAY STATION: Provides an integral 278 display, plus support for seven attachable devices, which can be displays and/or printers. The integral display consists of a 15-inch screen, with a 1920- (24 lines by 80 characters), 2560- (32 by 80), 3440- (43 by 80), or 3564-character (27 by 132) display capacity, plus status indicator line. Green phosphor characters are standard on all models; white phosphor characters may be selected for the 1920-character screen. Characters are formed using a 9-by-14 dot matrix. Attachable devices include the 078, 079, 178, 278, and 279 displays, the 281B, 286F, 287D, 289C, and 387 printers, as well as the corresponding IBM models. The 276 is functionally compatible with the IBM 3276 Control Unit Display Station. Field formatting and local display-to-printer copy function are standard features on the 276. A set of diagnostic functions are provided; the 276 is also compatible with IBM's Network Problem Determination Application (NPDA) program product for SNA/SDLC network problem determination and isolation.**

**476 CONTROL UNIT DISPLAY STATION: Can be used as a stand-alone unit, or can be daisy-chained in a cluster of up to 16 476s and/or 479s via the Telex 909 Modem Cluster Adapter. The 476 can operate under BSC (476B) or SNA/SDLC (476S) communications protocols. The 476's integral display consists of a 15-inch screen with a 1920-character display capacity, arranged in 24 lines of 80 characters each (plus a 25th status line). Green or white phosphor characters may be selected, and are displayed using an 8-by-15 dot matrix. The 281B Display Printer may be attached to the 476; in addition, a coax attachment is available to support the 286F, 287D, 289C, and 387 printers. The 476 is functionally compatible with the IBM 3276 Models 2 and 12; it does not support the attachment of additional display devices, however.**

**479 COLOR CONTROL UNIT DISPLAY STATION: A four-color version of the 476. The 479 can operate as a stand-alone unit, or can be daisy-chained in a cluster of up to 16 479s and/or 476s via the Telex 909 Modem Cluster Adapter. The 479 can operate under BSC (479B) or SNA/SDLC (479S) communications protocols. The unit's integral display consists of a 15-inch screen with a 1920-character display capacity, arranged in 24 lines of 80 characters each (plus a 25th status line). Four colors may be displayed: red,**

# Telex 270 Information Display System

green, blue, and white. Characters are formed via an 8-by-15 dot matrix. The 281B Display Printer may be attached to the 479; in addition, a coax attachment is available to support the 286F, 287D, 289C, and 387 printers. The 479 is functionally compatible with the IBM 3276 Models 2 and 12; it does not support the attachment of additional display devices, however.

078 DISPLAY TERMINAL: Contains a 12-inch display screen, with a 1920-character screen capacity arranged in 24 lines by 80 characters. A 25th status line is available. Green or amber phosphor characters may be selected; characters are formed via a 9-by-12 dot matrix in a 9-by-16 block. The 078 contains Telex's new ergonomic enclosure design, which includes a tilt/swivel display capability and a smaller footprint than that found on older Telex displays. The 078 supports the attachment of the 281B Display Printer. The 078 Display Terminal is a plug-compatible replacement for the IBM 3178 Display Station, and can be attached to an IBM 3274 or 3276 Control Unit, as well as to a Telex 174, 274C, or 276 controller.

079 COLOR DISPLAY TERMINAL: Contains a 12-inch display screen, with a 1920-character screen capacity arranged in 24 lines of 80 characters each (plus a 25th status line). Four base colors (red, green blue, white) plus three extended colors (yellow, turquoise, pink) may be displayed. Characters are formed via a 9-by-12 dot matrix in a 9-by-16 block. The 079 contains Telex's new ergonomic enclosure design, which includes a tilt/swivel display and a smaller footprint than that found on older Telex displays. The 079 supports the attachment of the 281B Display Printer. The 079 Color Display Terminal is a plug-compatible replacement for the IBM 3179 Color Display Station, and can be attached to an IBM 3274 or 3276 Control Unit, as well as to a Telex 174, 274C, or 276 controller.

178 DISPLAY STATION: A compact (12-inch screen) version of the 278. The 178's screen features a 1920-character capacity, arranged in 24 lines of 80 characters each. A 25th status line is available. Characters are formed via a 7-by-12 dot matrix, and are displayed in green or white phosphor. Attachment of the 281B Display Printer is supported. The 178 is a plug-compatible replacement for the IBM 3178, and can be attached to an IBM 3274 or 3276 Control Unit, as well as to a Telex 174, 274C, or 276 controller.

278 DISPLAY STATION: Contains a 15-inch display screen, and is available in four models. Model 2 features a 1920-character screen capacity, arranged in 24 lines of 80 characters each. Model 3 features a 2560-character screen capacity, arranged in 32 lines of 80 characters each. Model 4 contains a 3440-character display capacity, arranged in 43 lines of 80 characters each. Model 5 has a 3564-character screen capacity, arranged in 27 lines of 132 characters each. An operator status line is available at the bottom of the screen for all models. Characters are formed utilizing a 9-by-14 dot matrix, and are displayed in green phosphor (white phosphor is available for Model 2 only). Attachment of the 281B Display Printer is supported. The 278 Models 2, 3, 4, and 5 are plug-compatible replacements for the IBM 3278 Models 2, 3, 4, and 5, and are supported for attachment to the IBM 3274 and 3276 Control Units, as well as for attachment to the Telex 174, 274C, and 276 controllers.

279 COLOR DISPLAY STATION: A four-color (red, white, blue, and green) display station. The 279 features a 15-inch screen with a 1920-character display capacity, arranged in 24 lines of 80 characters each, plus a 25th status line. Characters are formed via a 9-by-14 dot matrix. Attachment of the 281B Display Printer is supported. The 279 is a plug-compatible replacement for the IBM 3279 Model 2A Color Display Station, and is supported for attachment to the IBM 3274 and 3276 Control Units, as well as for attachment to the Telex 174, 274C, and 276 controllers. (The IBM 3279 is not supported for attachment to a Telex controller, however.)

078/079 KEYBOARDS: A choice of typewriter or data entry layout keyboards is available for the 078 and 079 displays. Both keyboards feature a low-profile design, are detachable, and provide a height adjustment capability. The keyboards are connected to the display monitor via a 6-foot length coiled cord. Standard features include selectable audible feedback, single key clear, PA1 and PA2 keys, and a 12-key pad with numeric and/or Program Function (PF) keys. The following key pad choices are available: 12-key Numeric Pad (data entry only); PF 13-24 Keypad (typewriter only); 12-key Numeric Pad with PF 13-24 as ALT function (typewriter only); Tripad (typewriter only—controller supported). Alphanumeric, special symbol, and cursor keys are auto repeating. International keyboard layouts are available; contact Telex for details.

178/278/279/476/479 KEYBOARDS: A choice of approximately 35 different keyboard layouts are available for the 178, 278, 279 displays and 276, 476, and 479 control unit display stations. All keyboards are detached (a narrow-width keyboard is available for the 178), and connected to the display monitor via a 6-foot length coiled cord. Keyboards can be obtained with typewriter-style, data entry, or data entry with keypunch layouts. Also available are a numeric pad, function pad, and 12 or 24 program function (PF) keys. A single key clear feature is standard on all keyboards. Keyboard click is switch-selectable. All alphanumeric, special symbol, and cursor control keys are typamatic. Both EBCDIC and ASCII character sets are available.

1186 INTELLIGENT WORKSTATION: A workstation that functions as a multi-function terminal with IBM Personal Computer compatibility, and is supported for 3270 network communications. The 1186 is based on an Intel 80186 microprocessor, and contains 128K bytes of RAM as standard (expandable to 512K bytes). Two 5¼-inch double-sided, double-density diskette drives are standard, each of which contains 360K bytes of storage. A 10MB disk drive is optional. The 1186 supports the MS-DOS operating system, enabling it to run IBM PC-compatible software. A 12-inch monochrome (green or amber) or color display may be selected for use with the 1186. The display includes a tilt capability and a 2000-character screen capacity (arranged in 25 lines of 80 characters each). A choice of IBM PC-compatible or 3270-type keyboards is available. Both keyboards are detachable and feature a low-profile design, with tactile feedback. The 1186 contains one RS-232-C serial port, one RS-422 serial port, and one parallel port. A coax board interface is required for use in a 3270 system. The coax board is optional, and allows the 1186 to support on-line communications in a Telex or IBM 3270 network.

281B DISPLAY PRINTER: A tabletop printer for hard copy output from an attached Telex display. Provides 80 or 132 print positions at a rated speed of 80 cps (bidirectional). The character set contains the full 96-character ASCII set plus 64 graphics symbols. Line spacing is 6 or 8 lines per inch; character spacing is 10 characters per inch using the 80 column format, and 16.5 cpi using the 132 column format. Characters are formed via a 9-by-7 dot matrix. The paper handling system features a friction-feed/pin-feed platen. Up to three part forms can be printed. A tear bar and paper roll are standard; a forms tractor is optional. The 281 can be directly attached to an 078, 079, 178, 278, or 279 display or a 276, 476, or 479 control unit display.

286F DAISY WHEEL PRINTER: A bidirectional printer that can accommodate both platic and metallized print wheels. The 286F operates at speeds up to 80 cps. Line spacing of 6 or 8 lpi and character spacing of 10 or 12 cpi are

# Telex 270 Information Display System

operator selectable; 132 print positions at 10 cpi and 158 print positions at 12 cpi are provided. Print wheels provide character sets of 96 and 127 characters. The 286F prints upper and lower case; ASCII and EBCDIC character sets are supported. Logical buffer sizes range from 960 to 3564 characters. Forms from 3 to 15 inches wide are accepted; up to 6 multi-part copies may be printed. A friction feed platen is standard; options include unidirectional or bidirectional forms tractor, pin feed platen, or single cut sheet feeder. The 286F is plug-compatible with the IBM 3287 Printer, and can be attached to an IBM 3274 or 3276 Control Unit, as well as to a Telex 174, 274C, or 276 controller.

287D MATRIX PRINTER: A bidirectional matrix printer. The 287D operates at speeds up to 150 cps. Line spacing of 6 or 8 lpi and character spacing of 10 or 16.7 cpi are operator selectable; 132 print positions at 10 cpi and 220 print positions at 16.7 cpi are provided. The 287D prints upper and lower case, and single or double space; ASCII and EBCDIC character sets are supported, and international character sets are configuration selectable. Characters are formed within an 8-by-7 dot matrix. A buffer size of 2K characters is standard, with an additional 2K optional. Forms from 3 to 15 inches wide are accepted; up to 6 multi-part copies may be printed. A forms tractor is standard. The 287D is plug-compatible with the IBM 3287 Printer, and can be attached to an IBM 3274 or 3276 Control Unit, as well as to a Telex 174, 274C, or 276 controller.

289C LINE PRINTER: A belt printer with print speeds up to 340 lpm. Line spacing of 6 or 8 lpi is operator selectable; character spacing is 10 cpi, with 132 print positions per line. Upper and lower case printing is selectable, as is single or double spacing. A 94- or 64-character print belt with ASCII or EBCDIC character sets may be specified. Logical buffer sizes range from 1920 to 3564 characters. Forms from 3 to 15 inches wide, and up to 5 parts, are accommodated. A forms tractor is standard. The 289C is plug-compatible with the IBM 3289 Printer, and can be attached to an IBM 3274 or 3276 Control Unit, as well as to a Telex 174, 274C, or 276 controller.

387 MATRIX PRINTER: A bidirectional matrix printer with print speeds up to 400 cps. Line spacing is selectable at 3, 4, 6, or 8 lpi; character spacing is selectable at 10 (136 print positions), 12 (163 print positions), 15 (204 print positions), 16.7 (227 print positions), or 17.1 (233 print positions) cpi. The 387 prints upper and lower case, and ASCII, EBCDIC, or international character sets may be selected. Characters are formed within an 8-by-7 dot matrix in draft quality font, or within a 16-by-14 dot matrix in near letter quality font. A high density (bold) print mode is available for highlighting. Logical buffer sizes range from 960 to 3564 characters. Forms from 3 to 16 inches wide, and up to 6 parts, are accepted. A forms tractor is standard. The 387 is compatible with the IBM 3287 Printer, and can be attached to an IBM 3274 or 3276 Control Unit, as well as to a Telex 174, 274C, or 276 controller.

## PRICING

The 270 system is available for purchase, or on a two- or three-year lease including prime-shift maintenance. Telex offers quantity discounts on some devices. There are no installation charges for the Telex equipment. Telex does not schedule customer training; however, its field engineering personnel and customer representatives provide any necessary on-site training. Full service maintenance on a 24-hour-per-day, 7-day-per-week basis is available on negotiation.

Telex provided the following single-quantity purchase prices and maintenance charges for selected 270 system components. Contact Telex for more detailed pricing. Volume discounts are also available; Telex may be contacted for these prices also.

| Models | Purchase Price ($) |
|---|---|
| 174 Model 1 Control Unit | 5,000 |
| 174 Model 2 Control Unit | 8,500 |
| 274C Control Unit | 10,000 |
| 276 Control Unit Display Station | 5,350 |
| 476 Control Unit Display Station | 2,800 |
| 479 Color Control Unit Display Station | 3,800 |
| 078 Display Terminal | 1,550 |
| 079 Color Display Terminal | 2,095 |
| 178 Display Station | 1,550 |
| 278 Display Station | 2,100 |
| 279 Color Display Station | 3,350 |
| 1186 Intelligent Workstation | 3,025 |
| 281B Display Printer | 900 |
| 286F Daisy Wheel Printer | 5,750 |
| 287D Matrix Printer | 5,000 |
| 289C Line Printer | 11,500 |
| 387 Matrix Printer | 7,200 |

# Telex System/3X Product Series

## MANAGEMENT SUMMARY

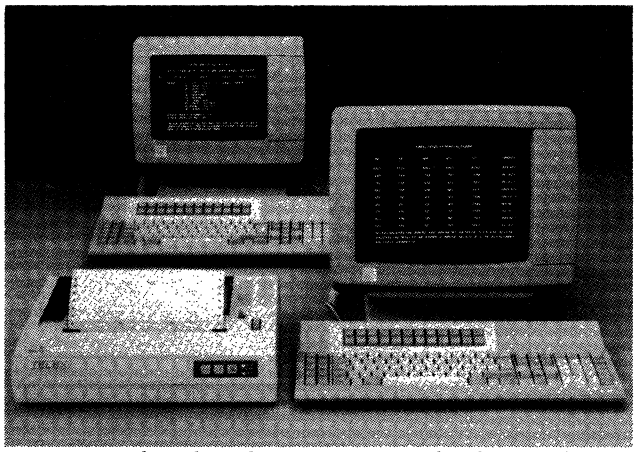
**UPDATE:** *This report introduces the new series of nine Telex System/3X-compatible components. With this product line, Telex plans to become the number one alternative to IBM in the System/3X market.*

"Telex is confidently laying its 3270 reputation on a new line. Our commitment to introduce nine System/3X products as an entry announcement, demonstrates Telex's intent to be a leader in this market." Roy L. King, executive vice president of Field Operations for Telex Computer Products, made this statement in announcing Telex's new venture.

Telex will be marketing the new System/3X products to *Fortune* 1000 customers interested in remote or departmental processing, as well as to small- and medium-sized companies. With over 100,000 System/36, and 25,000 System/38 minicomputers installed worldwide, the Telex entry into this product line should greatly enhance its opportunities within its existing customer base.

The S/3X terminal devices include the 078-2, a 12-inch monochrome display terminal, which displays 1,920 characters in 24 lines of 80 characters each; the 079-2, a 12-inch color display terminal, featuring seven color display capability of 1,920 characters arranged in 24 lines of 80 characters each; the 179-2 is a 14-inch color display terminal, which also features seven color display capability of 1,920 characters in 24 lines of 80 characters each; and the 180-2, a 15-inch monochrome display terminal, which is capable of displaying either 1,920 characters in 24 lines of 80 characters each or 3,564 characters in 27 lines of 132 characters each.

The 5250 Emulation Option provides IBM 3180-2, 5251-11, 5291, or 5292 terminal emulation with a 1260 or 1280 ➢



*Two terminals in the Telex System/3X product line are the 079-2, 12-inch color terminal, which displays characters in seven colors, and the 180-2, 15-inch monochrome display terminal, which features green or amber phosphor.*

**The Telex System/3X Product Series is a full line of plug compatible replacements for various IBM System/3X components. These displays, printers, and intelligent workstation attach to IBM System/36 and System/38 controllers.**

**MODELS: 078-2 Display Terminal, 079-2 Color Display Terminal, 180-2 Display Terminal, 179-2 Color Display Terminal, 5250 Emulation Option, 201 Matrix Printer, 214-XP Matrix Printer, 225 Line Printer, and 851 Ink Jet Message Printer.**
**DISPLAY: The 078-2 and 079-2 contain 12-inch display screens; the 179-2 contains a 14-inch display screen, and the 180-2 contains a 15-inch display screen. The 079-2 and 179-2 are color displays; the 078-2 and 180-2 are monochrome green or amber phosphor. The 5250 Emulation Option is available with a monochrome or color display. Tilt/swivel capability is standard on all models.**
**KEYBOARD: All keyboards contain 122 keys, are detached, and feature a low-profile design. Height adjustment is standard.**
**COMPETITION: IBM, Decision Data, Memorex, and General Business Technology.**
**PRICE: Purchase prices for Telex S/3X displays range from $1,295 to $2,095; the 5250 Emulation Option is priced at $849; and S/3X printers range from $545 to $12,800.**

## CHARACTERISTICS

**VENDOR: Telex Computer Products, Inc., 6422 East 41st Street, Tulsa, OK 74135. Telephone (918) 627-1111. In Canada: Tulsa Computer Products, Ltd., 332 Consumers Road, Willowdale, Ontario M2J 1P8. Telephone (716) 885-1871.**

**DATE OF ANNOUNCEMENT: November 1986.**

**DATE OF FIRST DELIVERY: January 1987**

**NUMBER DELIVERED TO DATE:**

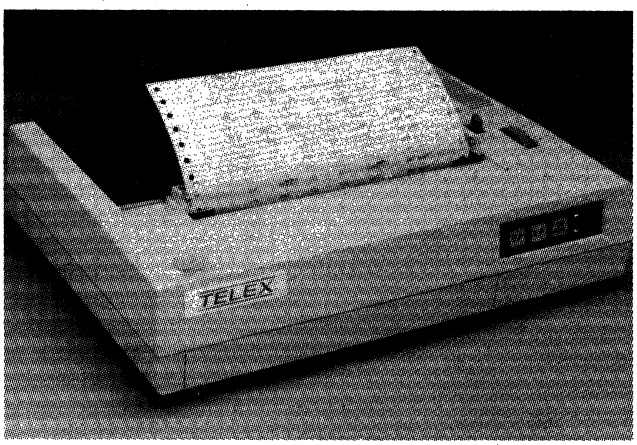
**SERVICED BY: Telex Service Co.**

### CONFIGURATION

**The System 3/X Information Display System is a family of display terminals, an intelligent workstation emulation option, and printers designed for use with IBM's System/36 and System/38 computer systems. Listed below are the premier system components and their configurations:**

***078-02 Display Terminal*—attaches directly to the System/36, System/38, and 5294 Remote Control Unit. If attached to an IBM System/34 or IBM 5251 Model 12, the ➢**

# Telex System/3X Product Series




*The Telex 851 Ink Jet Message Printer offers high quality, high speed printing, while providing the quiet print capability needed for low-noise environments.*

Intelligent Workstation. "Hot-key" between DOS and up to 4 host sessions permits maximum flexibility. One of the sessions allows the Telex 201, 851, or 186 printers to emulate the IBM 5219, 5224, 5224, 5225, or 5256 system printers. Monochrome and color monitors are supported. Cable-thru support is included.

Four Telex printers are available for use with the S/3X, including matrix, line, and ink jet printers. The 201 Matrix Printer attaches to the 3270 and S/36/38 ergonomic terminal line for screen printing applications, or attaches to the Intelligent Workstation. Print speeds of up to 220 cps in draft mode and 44 cps in near letter quality mode (NLQ) are available. The 214-XP Matrix Printer attaches directly to an IBM S/36/38, or 5294 Remote Control Unit. It is software compatible with the IBM 4214 Model 2. The 214-XP provides print speeds of 400 cps in draft mode and 100 cps in NQL mode. The 225 Line Printer is compatible with the IBM 5225 Model 4 line printer and attaches via twinaxial cable to IBM S/36 and S/38 processors, or to the IBM 5294 Remote Control Unit. The 225 offers print speeds of 165 lines per minute (lpm) in near letter quality (NLQ) mode and up to 600 lpm in data processing mode and 800 lpm in high speed draft mode. The last of the Telex S/3X printers is the 851 Ink Jet Message Printer, which can attach as a screen printer to the terminal family or the Intelligent Workstation product line. A print speed of 220 cps is available in draft mode and 110 cps in NLQ mode. The 851 also prints graphics.

## COMPETITIVE POSITION

The Telex tradition of compatibility and reliability has made it the current number one supplier of IBM 3270-compatible terminal equipment. It has strengthened its position in the industry by acquiring the assets of United Technology Communications Company, the PABX division of United Technologies Corp., in 1986. Also in 1986, TCP initiated direct operations in France, the United Kingdom, and Puerto Rico, in addition to its direct operations in Germany, The Netherlands, and Australia.

**078-01 will operate similar to an IBM 3179-2 display attached to the above control units. All 078-02 functions are not supported by these IBM systems.**

***079-02 Color Display Terminal*—displays and transfers data to and from the System/36, System/38, and 5294 Remote Control Units. If attached to an IBM System/34 or IBM 5251 Model 12, the 079-02 will operate similar to an IBM 3179-2 display attached to an IBM System/34 or an IBM 5251 Model 12. All 079-02 functions are not supported by these IBM systems.**

***179-02 Color Display Terminal*—attaches in the same manner as the 079-2. Provides seven color capability.**

***180-02 Display Terminal*—transmits and receives data from an IBM System/36, System/38, or 5294 Controller. The 180-02 is connected to the System/3X daisy chain by way of a twinax adaptor attachment that is shipped with the terminal. If attached to an IBM System/34 or IBM 5251 Model 12, the 180-02 will operate similar to an IBM 3180-02 display attached to an IBM System/34 or an IBM 5251 Model 12. All 180-02 functions are not supported by these IBM systems.**

***5250 Emulation Option*—attaches directly to the System/36, System/38, 5251 Model 12 Remote Control Units or 5294 Remote Controller.**

***201 Dot Matrix Printer*—attaches directly to Telex models: 3270 and S/36/38 ergonomic terminal lines, Intelligent Workstations, and the corresponding IBM devices. Prints up to 220 cps in draft mode and 44 cps in near letter quality (NLQ) mode.**

***214-XP Matrix Printer*—attaches directly to an IBM S/36, S/38, or 5294 Remote Control Unit. Prints up to 400 cps in draft mode and 100 cps in NLQ.**

***225 Line Printer*—attaches directly to IBM S/36 or S/38 processors, or to the 5294 Remote Control Unit. Prints up to 600 lines per minute (lpm) in data processing mode and 800 LPM in high speed draft mode.**

***851 Ink Jet Message Printer*—attaches directly to Telex Models 078, 079, C078, C179, 080, 179, 180-1/046, all S/3X terminals, Telex Intelligent Workstations, and the corresponding IBM devices. Prints up to 220 cps in draft mode and 110 cps in NLQ mode.**

## TRANSMISSION SPECIFICATIONS

**Telex terminals can communicate with the System/36 and System/38 operating under SNA/SDLC. The standard EIA feature allows half-duplex transmission at operator selectable speeds up to 9600 bps over switched and nonswitched facilities, including X.21 facilities attached via an X.21 bis interface.**

## COMPONENTS

**078-2 S/3X DISPLAY TERMINAL: Contains a 12-inch display screen with a 1,920-character screen capacity arranged in 24 lines of 80 characters each. A 25th status line is available. Green or amber phosphor characters may be selected; characters are formed using a 9-by-12 dot matrix in a 9-by-16 block. The 078-2 contains an ergonomic enclosure design which includes a tilt/swivel display capability and a compact footprint.**

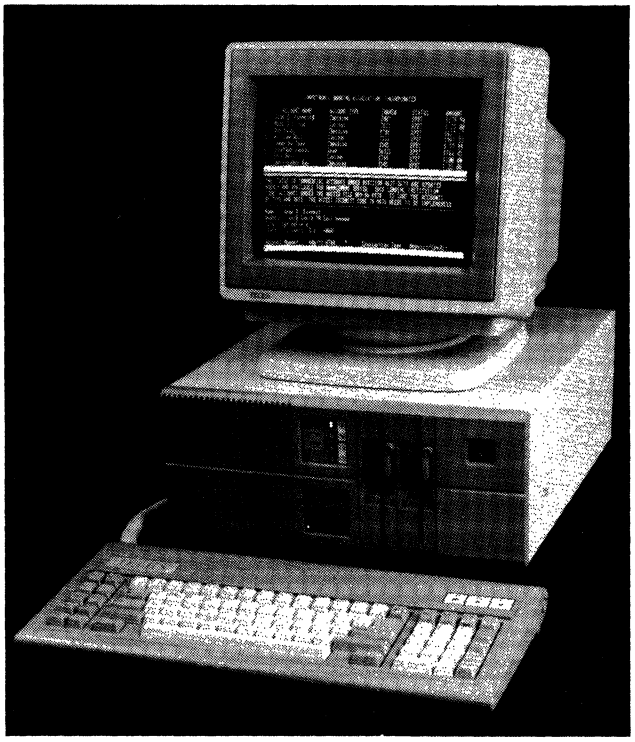
**079-2 S/3X COLOR DISPLAY TERMINAL: Contains a 12-inch display screen with a 1,920-character screen capacity arranged in 24 lines of 80 characters each. A 25th status line is available. The 079-2 features seven color support (red, green, blue, white, yellow, turquoise, pink). Characters**

# Telex System/3X Product Series

If Telex's expansion, and accomplishments in the 3270 market are any indication of what we can expect of its entrance into the IBM System/3X market, its leading independent competitors, Decision Data, Memorex, and General Business Technology, should keep a watchful eye as Telex continues to enhance and expand in this product area.

## ADVANTAGES AND RESTRICTIONS

The major advantages to the Telex System/3X components are that they are plug compatible with corresponding IBM components and may be attached to IBM S/3X controllers. For users requiring personal computing capabilities, the 5250 Emulation Option with advanced PC and "hot key" capability is available. As with other independent vendors, Telex offers comparable products at lower than IBM prices, along with an impressive maintenance organization. Telex is one of only three computer corporations to employ a worldwide network of sales and service engineers. □



*The Telex Intelligent Workstation with 5250 Emulation Option allows the operator to switch between System/3X host sessions and Intelligent Workstation application programs.*

**are formed via a 9-by-12 dot matrix in a 9-by-16 block. This unit features an ergonomic enclosure design which includes a tilt/swivel display and a small footprint.**

**179-2 S/3X COLOR DISPLAY TERMINAL: Contains a 14-inch color display screen with a 1,920-character screen capacity arranged in 24 lines of 80 characters each. A 25th status line is available. The 179-2 features seven color support (red, green, blue, white, yellow, turquoise, pink). Characters are formed using a 7-by-9 dot matrix in a 9-by-16 block. This unit features an ergonomic enclosure design which includes a tilt/swivel display and a small footprint.**

**180-2 S/3X DISPLAY TERMINAL: Contains a 15-inch display screen with two user-selectable screen sizes. Model 2 features a 1,920-character screen capacity, arranged in 24 lines of 80 characters each. Model 5 features a 3,564-character screen capacity, arranged in 27 lines of 132 characters each. Green or amber phosphor characters are available. Characters for Model 2 are formed using an 8-by-12 dot matrix in a 12-by-18 block. Characters for Model 5 are formed using an 8-by-8 dot matrix in a 10-by-16 block. An ergonomic enclosure design which includes tilt/swivel capability and a small footprint is standard.**

**KEYBOARDS: All of the new Telex displays contain a 122-key, low-profile, adjustable height keyboard with six foot coiled cord. This detached unit provides up to 1,500 keystrokes of record/playback capability. In addition, they each feature a standard printer port for attaching a local screen printer, which is not offered by IBM.**

**5250 EMULATION OPTION: This option allows the 1260/1280 Intelligent Workstations to connect with a System/3X host while providing enhanced capabilities. The add-on card and software provide such features as up to four host sessions, built-in system printer emulation, and file transfer capability. The emulator supports both monochrome and color monitors.**

**201 MATRIX PRINTER: A bidirectional matrix printer that operates at speeds up to 220 cps in draft mode and 44 cps in near letter quality mode (NLQ). Line spacing of 6 or 8 lpi and character spacing of 10/12/15/17.1 cpi are operator selectable; 80 print positions at 10 cpi and 137 print positions at 17.1 cpi are provided. The 201 supports ASCII, EBCDIC, and International character sets. Characters are formed in a 9-by-7 dot matrix for draft quality, and in a 19-by-16 dot matrix for NLQ. A buffer size of 2K characters is standard. Forms from 4 to 10.5 inches wide are acceptable for continuous forms, and 4 to 10 inches wide for cut sheets; up to 3-part forms may be printed.**

**214-XP MATRIX PRINTER: A bidirectional, logic seeking printer that operates at speeds up to 400 cps in draft mode and 100 cps in NLQ mode. Character spacing of 5/10/12/15/16.7 cpi is operator selectable; 136 print positions at 10 cpi, and 220 print positions at 16.7 cpi are provided. The 214-XP supports ASCII, EBCDIC, and International character sets. Characters are formed in a 9-by-9 dot matrix for draft mode, and in an 18-by-21 dot matrix for NLQ mode. Forms from 3.5 to 15.5 inches wide are acceptable for continuous forms, and 5.5 to 12 inches wide for cut sheets; up to 6-part forms may be printed.**

**225 LINE PRINTER: An impact line printer that operates at speeds up to 165 lpm in NLQ mode and up to 600 lpm in data processing mode and up to 800 lines per minute in high speed draft mode. Character spacing of 5/10/12/15/16.7 cpi is operator selectable; 132 print positions at 10 cpi, and 220 print positions at 16.7 cpi are provided. The 225 Line Printer supports ASCII, EBCDIC, and International character sets. Characters are formed using a 9-by-9 dot matrix in data processing mode, and a 5-by-9 dot matrix in high speed draft mode. Forms from 3 to 16 inches wide and three to 22 inches in length are acceptable for continuous forms; up to 6-part forms may be printed.**

**851 INK JET MESSAGE PRINTER: An ink jet printer that operates at speeds up to 220 cps in draft mode, and up to 110 cps in NLQ mode. Line spacing of 6 or 8 lpi and character spacing of 10 or 16.3 cpi are operator selectable; 80 print positions at 10 cpi, and 132 print positions at 16.3**

# Telex System/3X Product Series

cpi, are provided. The 851 supports ASCII, EBCDIC, and International character sets. Characters are formed using a 9-by-24 dot matrix in draft mode, and an 18-by-24 dot matrix in NLQ mode. A buffer size of 2K characters is standard. The ink cartridge prints approximately 6 million characters in draft mode and approximately 2.3 million characters in NLQ mode. Forms of 9.5 inches wide are acceptable for continuous forms, and 8.3 to 8.5 inches wide for cut sheets.

## PRICING

The Telex System/3X products are available for purchase or lease. A variety of maintenance plans for the displays are offered through Telex's Field Service organization. Telex employs one of the largest field service organizations in the industry, with over 2,000 service engineers and support personnel worldwide. Volume discounts are also available.

## EQUIPMENT PRICES

| | | Purchase Price ($) |
|---|---|---|
| 078-2 | 12-inch monochrome display w/keyboard | 1,295 |
| 079-2 | 12-inch color display w/keyboard | 1,895 |
| 180-2 | 15-inch monochrome display w/keyboard | 1,995 |
| 179-2 | 14-inch color display w/keyboard | 2,095 |
| 5250 | Emulation Option | 849 |
| 201 | Matrix Printer | 524 |
| 214-XP | Matrix Printer | 5,100 |
| 225 | Line Printer | 12,800 |
| 851 | Ink Jet Message Printer | 775 ■ |