Telex TC 270 Series
Information Display System

■ PROFILE

Function • remote standalone or cluster, 3270-compatible display terminal system for inquiry/update, data entry, and program development • all processing and database services handled by host unless personal computer option is employed • local storage for frequently used screen format • can communicate concurrently with up to 2 host processors.

Architectures Supported • used with IBM S/360, S/370, 3030, 3081, and 4300 processors, and with 3790 Communications Systems • S/370 and 4300 function under SNA/SDLC architecture • S/360, S/370, and 4300 operate under BSC • remote attach by nonswitched private or switched dial line communications facilities in BSC/SDLC at rates up to 19,200 bps for SDLC; 56K bps optional.

Communications • CICS/VS under ACF/VTAM, ACF/VTAME, ACF/TCAM for OS/VS and DOS/VS • IMS/VS under BTAM and ACF/VTAM • single line • up to 19,200 bps; BSC/SDLC protocols; half-/full-duplex • ASCII/EBCDIC code • point-to-point/multipoint • RS-232C interface • interfaces with IBM 27XX and 37XX communications processor.

Operating System • service through host processor under DOS, DOS/VS, DOS/VSE, OS, OS/VS, VM 370.

Database Management • none; only in association with host IMS/VS and CICS/VS facilities unless personal computer option is employed.

Transaction Processing • primarily through CICS or IMS which acts as terminal-oriented transaction monitor with file processing facilities • supports send/receive batch and inquiry tasks • local processing via personal computer.

PURCHASE PRICE RANGE

hardware ▮▮▮▮

5-yr maint/serv fee ▭

TC 174
▮▮▮▭ $23K to $93K

TC 274C
▮▮▮▭ $28K to $98K

TC 276
▮▭ $5.3K to $34K

TC 476
▮▮▮▮▮▮▭ $12K to $184K

TC 479
▮▮▮▮▮▮▭ $16K to $196K

| $50K | $100K | $150K | $200K | $250K |

TELEX CORP TC SERIES PURCHASE PRICING bar graph covers price ranges between "small" and "large" configurations for hardware (solid bars) and associated 5-year period maintenance (open bars) • **TC 174** small configuration consists of an 8-port controller, 4 TC 078 keyboard displays, 2 printer interfaces, and 2 TC 286F printers; **large** configuration consists of a 24-port controller, 8 TC 078, 8 TC 080, 3 TC 179 keyboard-displays, 19 printer interfaces, 2 TC 279D and a TC 289C printer • **TC 274C small** configuration consists of an 8-port controller, 4 TC 078 keyboard-displays, 2 printer interfaces, and 2 TC 286F printers; **large** configuration consists of 24-port controller, 1 dual-host link, 8 TC 078, 8 TC 080, 3 TC 179 keyboard-displays, 3 printer interfaces, a TC 279D and a TC 289C printer • **TC 276 small** configuration consists of TC 276-2 controller display with keyboard; **large** configuration consists of TC 276-4 TC 078 keyboard-displays, 2 TC 286F printer, and 2 printer interfaces • **TC 476 small** configuration consists of a TC 476B controller-display with keyboard, with 4 printer interface, and a TC 286F printer; **large** configuration consists of 8 TC 476S controller-displays with keyboards, 8 printer interfaces, 8 I/O expanders, a Model 909 modem cluster adapter, and 8 TC 286F printers • **TC 479 small** consists of TC 479B and same peripherals as TC 476B; **large** configuration consists of TC 479S with same configuration as the TC 476S. All prices single-quantity purchase; discounts are available.

Support Software • supported by and employs software and program facilities of host processor • no local independent (from host) off-line programming/processing capabilities except for personal computer • system diagnostics checks DTE and DCE.

Processor • 16-bit microprocessor.

Terminals/Workstations • up to 32 CRTs and printers per cluster.

First Delivery • 1979.

Systems Delivered • about 400,000 terminals.

Comparable Systems • Davox 1000, Harris 9200, IBM 3270, Memorex 2070, MDS 92X and Hero, ITT Courier 270 and 9000, Memorex 2070, NCR 7950, Lee Data 300/400, and others.
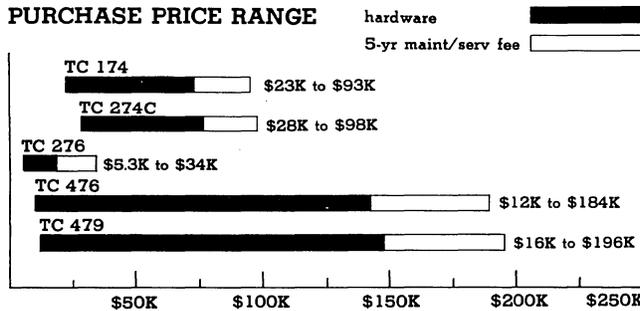
Vendor • Telex Computer Products, Inc; 6422 East 41st Street, Tulsa, OK 74135 • 918-627-1111.

Canadian Headquarters • Tulsa Computer Products; 332 Consumers Road, Willowdale, ON M2J 1P8 • 416-494-4444.

Distribution • direct through Telex sales offices.

GSA Schedule • listed.

■ ANALYSIS

Many vendors attempt to compete against the IBM 3270 by offering lower priced and more readily available equivalents. Others follow the same strategy but add innovative enhancements to their product line. The former group as a whole does well against IBM; the latter group does extremely well.

The Telex product line belongs to the latter group. Consisting of a family of cluster controllers, standalone control-unit/display workstations, keyboard displays, and printers, the products offer all of the important features of their IBM counterparts and then some. For example, the Telex 274C cluster controller competes with the IBM 3274-41C, but unlike that unit it supports 2 **independent high-speed communication links**. The Telex 178, 278-X, and 279-X terminals are identical to the IBM 3178, 3278, and 3279-A, except the Telex products can directly attach a

Telex TC 270 Series
Information Display System

printer to handle screen printing. The IBM terminals must contend with others for use of one of the cluster-attached printers.

Telex shows further innovation with its TC 276, 476, and 479 standalone control-unit displays. The TC 276 competes with all models of the IBM 3276 but, unlike the IBM product, provides a model (Model 5) which displays 132-column lines. Thus, the 276-5 is well-suited for directly displaying a conventional computer-printout line. To get the same display capability with IBM, users must turn to the 3180 or 3278-5—cluster-controlled terminals. The TC 476 is a very unusual unit at first glance; it looks like a TC 276-2 in that it displays 1920 characters. However, the 276 model accommodates up to 7 slaved terminals/printers, whereas the 476 only accommodates a single light pen or low-speed printer. But, up to 16 TC 476s can be daisy-chained at distances up to 5,000 feet. The marketing strategy behind the TC 476 is 2 pronged. First, since the terminal is not designed to cluster slaved devices, it is simpler and less expensive to produce. This makes it very attractive to organizations needing a single terminal who do not want to incur the expense of a protocol converter to make that terminal "look like" a 3276. The ability to daisy-chain 16 devices provides a limited form of clustering without the additional cost of a controller, and it satisfies growth requirements. The TC 479 is identical to the 476, except the former supports 4-color displays while the latter is a monochrome unit.

Until a few months ago, Telex lagged IBM in providing a powerful standalone personal computer which could also function in a 3270 environment. While IBM had its laudable 3270 PC, Telex only offered PROFFIT—an IBM 5150 lookalike that attaches to the PC 278-X. Telex has improved its position significantly with its new TC 1186 Intelligent Workstation, a device with facilities similar to the 3270 PC.

Telex was somewhat slow to respond to IBM's low-cost 3179 and 3180, 2 units that made life miserable for the plug-compatible vendors, but respond it did. The 3179 is a low-cost version of the 3279-S2B, a color terminal most frequently targeted by the lookalike vendors. Telex's response is the TC 079, a unit that matches IBM's 3179 but is priced far less. Telex has also added a low-cost substitute for the 3279-S2A, S2B, and S3G called the TC 179. Again the Telex units are comparable to IBM but cost less.

Against the multiple screen format IBM Model 3180, Telex puts its new TC 080 series. The TC 080, like the 3180, supports 4 different display formats (3564, 3440, 2560, and 1920 characters); however, the Telex units are offered as **individual** models which the IBM products support **all** formats in 1 terminal. We think Telex made a marketing mistake with that decision (see Limitations).

Telex was also slow to introduce a terminal multiplexer to match IBM's 3299. However, the new TC 299 seems to fill the bill at a lower price.

Telex displays marketing savvy with its design strategy for 100 percent IBM compatibility, making it possible to **directly connect** IBM terminals and printers to its controllers, and vice versa. Many vendors opt against this mix and match strategy in favor of selling complete systems. This approach, however, limits the market to those who either have no IBM components or are leasing or renting them. Most users with purchased IBM equipment are reluctant to replace it unless (1) the products no longer meet their needs and/or (2) they no longer like it. An area where IBM controllers are deficient is dual-host communication. Telex provides this with its 174 and 274C; both will also handle IBM terminals/printers.

Telex prices its products 30 to 40 percent below the IBM umbrella. That, along with product innovations for increased user benefits, makes them extremely attractive and competitive in the marketplace.

In summary, Telex seems to be back on track in the price-performance game with the introduction of its new TC 078, 079, 080, 179, and 1186. These products should compete well against the IBM 3178, 3179, 3180, and 3270 PC, and all are **plug-compatible** replacements that work with IBM **and** Telex controllers. In addition, Telex has demonstrated considerable innovation with its TC 479, an IBM 3276 replacement that provides a color capability not offered by IBM. For those users who can live with a display-controller that cannot attach slaved displays but who need a color facility, TC 479 is an interesting product.

In the future, it wouldn't be surprising to see the TC 479 enhanced with the extended display characteristics now employed with the TC 276. The current TC 178, 278, and 279 will probably be phased out in favor of the new low-cost terminals. Nobody, except maybe IBM, can support that much product overlap.

☐ Strengths

The principal strengths of this product line rest with the dual-host capability of the TC 174/274C; the local screen format storage option on the 274C; the response-time monitor on all terminals the TC 1186; the local printer attachment (interface) on all terminals; the TC 186 and the overall price-competitiveness/ technical innovation of the product line.

The dual-host interface facility means that the 174 or 274C cluster controllers can concurrently communicate with 2 independent hosts. For large organizations and/or those with distributed processing, this capability presents a measure of flexibility not offered by IBM. Dual-host interaction adds far more flexibility to the network since users have the option of dialing (if necessary) other compatible hosts.

The local screen format storage facility offered with the TC 274C allows frequently used screen formats to be downline loaded from the host and stored within the controller. Telex implements this through a 128K-byte RAM option which stores and retrieves the formats. The net result of this local storage is that it increases user productivity by reducing wait-times for format retrieval, cuts the overhead on the host front end, and reduces overall communication costs.

The response-time monitor is a strong user benefit for spotting communication overloads and/or terminal-mix incompatibility. Offered on all terminals, it measures and displays system response time to last transaction, longest-response, fastest-response, and average-response time. It also shows the number of transactions recorded since the counter was reset, and the total response time for all transactions since the counter was reset.

The ability to interface a printer directly to the terminal is another performance enhancement and user benefit. Direct data transfer from screen to printer reduces the load on the cluster controller, and eliminates the printing bottlenecks that can occur when too many terminals are bidding for the services of too few cluster printers. Since these printers can also receive data directly from the host (via controller of course) it further speeds the delivery of data. IBM still does not support a direct printer attachment to its 3270 terminals.

While the PROFFIT personal computer attachment did a commendable job of providing local processing services, the TC 1186 Intelligent Workstation far outstrips it. Designed to compete with the IBM 3270 PC, it can be configured with up to 512K bytes of RAM, a 10MB Winchester hard disk, 360KB of 5.25-inch diskette, and runs under MS-DOS. The 1186 can also be fitted with an extended display/communication facility which supports up to 7 independent display windows, and transfer files upline and downline to the host processor.

To handle file transfer, Telex employs a modified version of the Forte PJ which provides 3278/3279 emulation and uploads file data **without** employing the TSO editor. (The editor is a prime bottleneck in most upload operations and is the prime contributor to the lethargic data-transfer speeds users must put up with.) It appears that the Telex version of PJ also has Forte's new Forte Net TSO software, since the file transfer speeds quoted are 4,500 to 6,000 characters per second. Be aware that during file transfers the personal computer cannot be used for other processing tasks, since MS-DOS does not support this level of concurrent processing.

The TC 299 multiplexer is a welcome addition, since it reduces the number of coaxial cable runs needed to service terminal-to-controller connections. The 299 combines up to 8 terminals/printers on a coaxial cable, dramatically reducing the cost of cables normally needed to handle this configuration by a factor of 7. The 299 also allows terminals/printers to be located

Telex TC 270 Series
Information Display System

beyond the 5000-foot-per-unit limit imposed by IBM for units attached via coaxial cable. Using the 299, terminals can be located up to 4,920 feet from the controller.

☐ Limitations

While the Telex line does exhibit some notable technical innovations, it lacks many features which appeal to distributed processing users. Specifically, the product line lacks the facility to communicate with local and remote hosts via the **same** controller; it cannot interface asynchronous terminals such as those used with minicomputers; and it lacks a spooler, data compression, and peer-to-peer terminal addressing.

Having one controller which handles both local and remote host connections is a real asset. Organizations can build local terminal clusters which can be serviced by an on-site host, plus interact with a remote computer for other services. While neither Telex nor IBM offer this facility, Lee Data does with its Models 321 and 421 controllers.

Another very useful feature, especially to users with networks incorporating minicomputers, is the ability to handle asynchronous ASCII/Teletype terminals. This, of course, can be done through protocol converters, but those devices are costly add-ons. In addition, if the site currently does not have asynchronous terminals but wishes to interact with a minicomputer, users must incur the cost of the terminal and software to control it. Lee Data, again, offers a simple solution with its "all-in-one" Model 1220 terminal. That device emulates an ASCII/TTY terminal, and allows users to switch from 3270 mode to asynchronous mode with simple keyboard commands. In addition, Model 1220 incorporates all features of IBM's 3278-2 through -5 terminals, allowing users to switch modes from the keyboard. IBM offers a similar capability with its 3180 Model 1.

When up to 32 devices are operating online, every bit of the available bandwidth must count. A data compression capability provides such a service by eliminating unnecessary data such as zeros, blanks, and redundant characters. The Telex products could certainly benefit from this capability.

Print spooling is a technique whereby information bound for a relatively slow device like a printer is placed on an auxiliary device (usually a disk). This allows the printer to operate at its normal speed and suffer its normal problems without inhibiting the overall data communications function. Neither IBM nor Telex offer a spooler.

Telex, like IBM, also does not allow remote terminals to access the controllers via dial-up facilities. This capability adds considerable operating flexibility and is available from a number of 3270 protocol vendors (e.g., Datastream, Protocol Computers, Innovative, etc).

Another limitation is lack of data encryption. When transmitting sensitive information over a communication network, some ability to encrypt this information is a strong benefit. In fact, some organizations—especially those dealing in financial matters—insist on data encryption. IBM offers this with the 3270; Telex does not.

The final limitation is the fixed screen format of the TC 080 terminal, which is targeted at the 3180 market. But unlike the IBM product which is an all-in-one terminal supporting 4 discrete screen formats (3564, 3440, 2560, and 1920 characters), the TC 080 is offered in **4 different** versions; each supports only **one** display format. For example, the TC 080 Model 2 displays 1920 characters while the Model 3 displays 2560 characters. Users who need format flexibility should consider the all-inclusive screen formatting employed by IBM (and Lee Data, ICOT, and ITT Courier). With these omni products, users can employ a single terminal to handle diverse applications such as data entry, inquiry/update, program development, etc. They can also switch between 80- and 132-column display formats via single-key depression. It is puzzling that Telex packaged the TC 080 in 4 separate versions.

It certainly has technical competence to produce an omni terminal, and the cost factor between a single- and multiple-format terminal isn't that great.

■ COMMUNICATIONS FACILITIES OVERVIEW

☐ Distributed Communications

All Telex products are remote units which interface with the IBM S/360, S/370, 4300, and 303X and are controlled by BTAM, BTAM-ES, TCAM, ACF/TCAM, VTAM, ACF/VTAM, ACF/VTAME, and EXTM. For a description of those communications access methods, **see report 950-I048-3270**.

☐ Distributed Configurations

The Telex TC family is made up of 3 principal components: control units, display terminals, and associated printers. Cluster configurations are built around the TC 174 and TC 274C cluster controllers, and the TC 276 control-unit display station. These controllers provide control, buffer, and multiplexing facilities for directly attached terminals and printers which include the Telex 078, 079, 080, 178, 179, 278, 279 displays and 281B, 286F, 287D, 289C, and 387 printers. Unlike IBM, Telex allows its terminals to directly attach printers which may be used to print screen data directly, or receive data from the host via the cluster controller.

Telex also offers 2 standalone replacements for the IBM 3276 called the TC 476 and TC 479. Both Telex units offer the same operating facilities, but the TC 479 also supports 4- or 7-color displays. Unlike their IBM counterparts, the 476 and 479 cannot attach slaved terminals.

For those requiring standalone processing, Telex offers the TC 1186 Intelligent Workstation. An IBM 3270 PC lookalike, it can also be attached to Telex TC 274C or IBM 3274 controllers. Supporting the TC 1186 are 3 printers: the 181 GP, 182, and 186 AP.

The controllers are all remote units and communicate with the host via leased lines or the DDD at speeds of up to 19.2K bps. The controller can be configured to operate as BSC, SDLC, or both. The following outlines the display cluster configurations.

TC 174 Remote Cluster Controller ● accommodates 8 or 16 display terminals or printers in any combination ● provides single or dual high-speed links for addressing separate host processors ● transmits at 9600 bps each link under BSC or SDLC.

TC 274C Remote Cluster Controller ● accommodates 8, 16, 24, or 32 display terminals or printers in any combination ● provides single or dual high-speed links for addressing separate host processors ● transmits at 19.2K bps on single link under SDLC; 9600-bps single link under BSC; or 9600 bps under dual-link configuration regardless of protocol.

TC 276 Control Unit Display Station ● standalone control unit/display or cluster of up to 7 slave display terminals and/or printers ● offered in BSC or SDLC versions; BSC/SDLC optional ● transmit speed of 9600 bps.

TC 476 Control Unit Display Station ● standalone control-unit/display, or up to 16 units can be daisy-chained up to 5,000 feet apart ● offered in BSC or SDLC versions; BSC/SDLC optional ● transmit speed to 9600 bps.

TC 479 Control Unit Display Station ● same as TC 476, except supports 4-color or optional 7-color displays.

☐ Distributed Utilities

The Telex units employ those utilities offered by IBM for the 3270. These include the Display Exception Monitoring Facility (DEMF); Device Independent Display Operator Console Support (DIDOCS); Network Problem Determination Application (NPDA); Status Display Support (SDS); Interactive Instruction System (IIS); and Service Level Reporter (SLR). See report **950-I048-3270** for a description.

■ SOFTWARE

The Telex TC 270 Series operates under the same systems software as the IBM 3270. When the Professional Office Computer (PROFFIT) option for the TC 278-2 is employed, that personal computer performs local processing under the CP/M 86 operating system and employs software written for that product. A

Telex TC 270 Series
Information Display System

description of the **IBM 3270 software** is presented in report **950-I048-3270.**

□ **Operating Systems**

Compatible operating systems are OS, DOS, OS/VS1, OS/VS2(SVS), OS/VS2(MVS, MVS/SE, MVS/SP), DOS/VS, DOS/VSE, and VM/370. The Time Share Option (TSO) can be used under all OS/DOS facilities.

□ **Data Management**

Again, all IBM 3270 systems can be used, including: Advanced Text Management System II (ATMS-II); Airline Control Program (ACP); Customer Information Control System (CICS/VS); Information Management System (IMS & IMS/VS); Data Language/1 (DL/1); SQL/Data System; and Storage and Information Retrieval System (STAIRS/VS).

□ **Communications/Networks**

TC 174, 274C, 276, 476, and 479 can be configured as clusters of terminals and printers. Local control is handled by the cluster control unit which interacts with the host under BTAM, BTAM-ES, TCAM, ACF/TCAM, VTAM, ACF/VTAM, and VTAME.

□ **Application Development Aids**

The IBM-developed aids offered for the 3270 can be used with the Telex products. The principal offerings are Conversational Monitoring System (VM/CMS); Display Management System (DMS/VS); Generalized Information System (GIS/VS); Structured Program Facility (SPF);, Interactive System Productivity Facility (ISPF); Virtual/Storage Personal Computing (VSPC); VS/APL; and SCRIPT.

■ **HARDWARE**

□ **Terms & Support**

Terms ● all products are available for a purchase lease under a 2- or 3-year lease ● leased terms do not include maintenance ● volume discounts are available ranging from 15 to 40 percent.

Support ● support is rendered through regional centers by Telex field-service personnel ● telephone consulting is also available.

□ **Packaged Components/Overview**

The Telex TC 270 Series is a family of cluster terminal systems and standalone terminals that emulate the IBM 3270 with characteristics and features of an IBM 3274-41C Control Unit (cluster controller), IBM 3276-2 and -12 Control Unit Display Station, IBM 3178, 3179, 3180, 3278, 3279 Display Stations, and IBM 3287, 5210, 3268, and 3289 printers. Specific display stations emulated are the 3178 Models C1 and C2; 3179 Model 1; 3180 Model 1; 3278 Models 2 through 5; and the 3279 Model S2A 4-color display station. The Telex keyboards also duplicate the IBM offerings.

Telex offers 3 terminal-cluster controllers; TC 174, TC 274C, and TC 276. TC 174 emulates the IBM 3276 but, **unlike** that product, clusters 8 or 16 terminals/printers. (The 3276 clusters 7 devices). Acceptable peripherals are the Telex TC 078, 079, 080, 178, 179, and 278 terminals and/or 286F and 289C printers. The TC 174 will also accommodate IBM 3270 Category A devices (except 3290). The TC 174 also differs from the IBM product in that it addresses and communicates with 1 or 2 **independent hosts.** No IBM 3270 controller offers this facility. Like the 3276, the TC 174 also supports BSC or SDLC protocols, and in addition, both protocols as an option. However, an 8-terminal/printer cluster is restricted to the same protocol. Although the TC 174 emulates the 3276, it is not **physically** the same type of product. It has no keyboard-display of its own, and supports a full 16 terminal/printer configuration.

The TC 274C emulates the IBM 3274-41C and supports 8, 16, 24, or 32 terminal/printer configurations. This unit attaches the same terminals/printers as the TC 174, and also accommodates IBM 3270 Category A devices (except 3290). Like the TC 174, this controller supports 1 or 2 independent high-speed data links, and runs under BSC/SDLC protocols. The TC 274C also differs from the IBM product in that local storage is available for holding

frequently used screen formats. IBM has no such facility, and requires that each format be downline loaded from the host.

The TC 276 Control Unit Display Station is virtually identical to the IBM 3276. It contains its own keyboard display and attaches up to 7 slaved displays/printers. It is also offered in BSC and SDLC versions. The TC 276 emulates the 3276 Models 2, 3, 4, 11, 12, 13, and 14; in addition, Telex offers a Model 5 which produces a 27-line x 132-character display format—something IBM does not have.

In addition to these "conventional" IBM-like controllers, Telex offers 2 unique units called the TC 476 and TC 479. Both units emulate the IBM 3276 Models 2 and 11, but differ in that the Telex products are strictly standalone units attaching either a light pen or printer. They do not interface subordinate keyboard-displays like the IBM products. The TC 476 and 479 also have the facility to be daisy-chained (through interface and communication options) with up to 15 similar devices, creating a local network of 16 TC 476s or 479s. Coaxial cable interconnects the units which can be located 5,000 feet apart. IBM offers no such facility with the 3270. The principal difference between the TC 476 and TC 479 is that the latter has 4-color display.

The Telex keyboard display terminals and their IBM counterparts (shown in parentheses) consist of the TC 078 (3178), TC 079 (3179), TC 080 (3278-2 through 5), TC 179 (3179), TC 178 (3178), TC 278-X (3278-2 through 5), and TC 279-X (3279). The newer 078, 079, 080, and 179 models will undoubtedly eventually replace the older 178, 179, 278-X, and 279-X models.

The 078, 079, 080, 178, and 179 all include a choice of typewriter-style or data-entry keyboards as standard equipment, while keyboards are optional on the 278 and 279. The keyboards are available in arrangements equivalent to IBM's 3178, 3179, 3180, 3278, and 3279, but Telex has simplified keyboard operation by providing single-key clear and single-key program attention functions. IBM requires at least 2 keystrokes. Another Telex enhancement is local printer attachment. Every keyboard/display, including the TC 276, 476, and 479 can directly attach a 100-cps matrix printer. This can be used to directly print screen contents and/or receive data from the host via the controller.

The TC 178 Model 2 is the only terminal in the TC 270 Series family that can accommodate a personal-computer attachment to handle local processing. This upgrade is provided by Telex's Professional Office Computer (PROFFIT), a device similar to IBM's 5150. PROFFIT is provided with 128K-byte RAM, a single double-sided 320K-byte diskette drive, and CP/M-86 operating system. Enhancements include memory expansion to 640K bytes, and an additional 320K-byte diskette drive.

For those requiring more power, Telex offers the Model 1186 Intelligent Workstation, a multifunction terminal compatible with the IBM PC and PC/XT and capable of emulating the IBM 3278-2 for attachment to a 3274 controller. The 1186 employs a 16-bit microprocessor and a 16-bit data path, and can be configured with up to 512K bytes of RAM, a 10MB Winchester hard disk plus 320KB of diskette. It also supports graphics and high-level programming languages such as GW-BASIC.

The printers are comparable with their IBM counterparts, but are priced lower. The one exception is the Telex 281B, a 100-/120-cps matrix printer which attaches to the TC 078, 079, 080, 178, 179, 276, 278, 279, 476, and 479. IBM does not offer this type of product.

All Telex controllers are remote units, and interface with their IBM hosts via 270X/370X/3275 front-end controllers. Communication access methods are BTAM, BTAM-ES, TCAM, ACF/TCAM, VTAM, ACF/VTAM, ACF/VTAME, and EXTM. All operate under BSC or SDLC, and the TC 174 and 274C can optionally operate under both protocols. Data transmission is half-/full-duplex at 9600 bps for BSC and 19.2K bps for SDLC. If dual high-speed lines are employed with TC 174 and 274C, the maximum data rate is 9600 bps for each link.

□ **Controllers**

Telex offers 2 cluster control units and 4 terminal-controller combinations. The cluster controllers are designated TC 174 and TC 274C, and cluster up to 16 and up to 32 terminals/printers,

Telex TC 270 Series
Information Display System

respectively. The terminal-controllers are the TC 276, TC 476, TC 479, plus a special library unit called TC 476L. The TC 276 is much like the IBM 3276, and can attach and control up to 7 slave terminals/printers. The TC 476 and 479 provide the same operating facilities as the TC 276, but cannot support slaved terminals. Up to 16 TC 476s and 479s, however, can be daisy-chained to provide a local multiterminal facility, each of which communicates independently with the host. The TC 476L is basically a 476, but can be ordered with special library-oriented keyboards and the facility for handling the American Library Association Machine Readable Catalog Record (ALA-MARC) codes. Up to 16 TC 476Ls can also be daisy-chained.

The TC 174 is actually 2 TC 276s combined. Users have the option of configuring 8- or 16-terminal/printer clusters, and can transmit data to 1 or 2 independent hosts. The TC 274C is a replacement for the IBM 3274-41C, and can handle 8, 16, 24, or 32 terminals/printers. Unlike IBM, however, the TC 274C can also be configured to communicate with 2 independent hosts, and can locally store screen formats. Both of these facilities require that the optional 128K bytes of RAM be specified. Since this RAM is employed both to handle the extended communication control associated with a 2-port controller and also store the downline-loaded screen formats, the use of a dual-port controller diminishes the number of locally stored formats.

Both controllers will attach and control Telex terminals and printers **or** their IBM equivalents. Vendor products can even be **mixed**. This facility is extremely useful and a good marketing move for Telex (see Strengths).

The TC 276's display capability is the same as IBM's 3276-2, 3, 4, 11, 12, 13, and 14. In addition, Telex offers a Model 5 with a 27-line x 132-character format which produces 3,564 displayable characters. IBM has no counterpart.

The TC 476 and 479 emulate the IBM 3276-2 and -12 and display 1920 characters (24 lines x 80 columns). The 479 supports 4 colors.

TC 174 Remote Controller

174 Models 1 & 2 Remote Control Units • tabletop cluster controller supports 8- or 16-display stations or printers • equivalent to 2 IBM 3276 or 2 Telex 276 controllers combined • attaches IBM Category A devices (except 3290), or Telex 078, 079, 080, 178, 179, 278, 286F, and 289C • can operate under BSC, SDLC, or BSC/SDLC; protocol mixing not permitted within 8-channel groups • communicates with IBM S/360, S/370, 4300, and 30XX processors at speeds up to 9600 bps, half-/full-duplex mode • 1 or 2 independent high-speed links.

174 Model 1 • 8-port controller; BSC or SDLC; EBCDIC/ASCII:

$150/$130 mo	$5,000 prch	$28 maint

174 Model 2 • 16-port controller; BSC or SDLC; EBCDIC/ASCII; single or dual high-speed links:

250/225	8,500	35

FC 003 BSC/SDLC Program • factory-installed option supports a single 8-port cluster in BSC/SDLC modes:

17/14	750	4

FC 006 BSC/SDLC Program • same as FC 003, except for second 8-port cluster:

17/14	750	4

FC 009 BSC Program • field-installed option converts controller from SDLC to BSC mode:

100/95	3,500	35

FC 010 SDLC Program • same as FC 009, except converts BSC controller to SDLC:

100/95	3,500	35

FC 011 BSC/SDLC Program • field-installed option converts controller for operation in BSC/SDLC modes:

117/109	4,250	35

FC 35 BSC to SDLC Upgrade • field-installed option upgrading single 8-port controller from BSC to SDLC mode:

NA/NA	350	NA

FC 36 BSC to SDLC Upgrade • field-installed option upgrades 16-port controller from BSC to SDLC:

NA/NA	600	NA

TC 274C Remote Controller

274C Remote Control Unit • floor-console cluster controller supports 8 to 32 display stations or printers equivalent to IBM 3274-41C • attaches IBM Category A devices (except 3290) or Telex 078, 079, 080, 178,179, 278, 279, 286F, 289C, and 387 • can operate under BSC/SDLC • 128K bytes of RAM; RAM expansion for local screen-format storage • half-/full-duplex communication with IBM S/360, S/370, 4300, and 30XX processors at speeds of 19.2K bps via single link under SDLC, 9600 bps via single link under BSC, or 9600 bps via dual link under BSC or SDLC • 1 or 2 independent high-speed links • 56K bps SNA/SDLC optional.

TC 274C • 8-port controller; BSC/SDLC; EBCDIC/ASCII; print buffering; local screen-format storage; single high-speed link:

$395/$345 mo	$10,000 prch	$45 maint

TC 274C • 16-port controller; BSC/SDLC; EBCDIC/ASCII; print buffering; local screen-format storage; single high-speed link:

432/377	11,000	47

TC 274C • 24-port controller; BSC/SDLC; EBCDIC/ASCII; print buffering; local screen-format storage; single high-speed link:

469/409	12,000	49

TC 274C • 32-port controller; BSC/SDLC; EBCDIC/ASCII; print buffering; local screen-format storage; single high-speed link:

506/441	13,000	51

TC 274C Dual Host • dual host communication facilities for all models of TC 274C • includes 128K-byte local storage for print buffer and local screen format storage:

36/28	750	6

FC 50 Device Adapter • adds I/O ports 9 through 16 to controller:

35/30	1,000	2

FC 51 Device Adapter • adds I/O ports 17 through 24 to controller:

35/30	1,000	2

FC 52 Device Adapter • adds I/O ports 25 through 32 to controller:

35/30	1,000	2

FC 31 Expanded Main Storage • adds 128K bytes of RAM to controller storage • prerequisite for high-speed communication link, local print buffering, and/or local screen format storage:

30/22	750	6

Wideband Facility • provides single-link data transfer rate of 56K bps • available for all models of TC 274C:

58/47	1,380	5

Print Buffer • local storage of terminal-initiated print operation when target cluster printer is busy • requires FC 31:

NC/NC	NC	NC

Double-Density Diskette • storage medium for local configurations:

NC/NC	NC	NC

Local Screen-Format Storage • supports local storage of frequently used screen formats • requires FC 31:

NC/NC	NC	NC

TC 276 Control Unit Display Station

Configuration • standalone display or cluster-controller/display;

MO: monthly 2-year/3-year lease prices; does not include maintenance. PRCH: single-quantity purchase price. MAINT: monthly maintenance charge. NA: not available/applicable. NC: no charge. Prices current as of February 1985.

Telex TC 270 Series
Information Display System

attaches up to 7 slave display terminals and/or printers ● modular detached keyboard (see Keyboards for listing) ● attaches single light pen or printer ● fixed base ● BSC or SNA/SDLC versions; available with both BSC and SDLC capabilities ● communicates with IBM S/360, S/370, 4300, and 30XX.

Display ● 15-inch diagonal ● 8x15 dot matrix ● 3564-character 27-line x 132-character (column) format (Model 15); 3440-character 43-line x 80-character format (Models 4 and 14); 2560-character 32-line x 80-character format (Models 3 and 13); 1920-character 24-line x 80-character format (Models 2 and 12); all have extra status indicator line ● 96 EBCDIC or ASCII character sets ● blink or nonblink cursor.

Edit & Format Features ● cursor up, down, left, right, return, home ● tab, backtab, backspace ● cursor address right ● erase to EOF; clear input ● character insert/delete ● protected fields and numeric-only fields ● light-pen field select ● intensity and nonintensity attributes.

Communications ● see Communications section for details.

Peripherals ● selector light pen or 281B matrix printer ● up to 7 Telex 078/079/080/178/179/278/279 or IBM 3278 terminals; a Telex 286F, 287D, 289C, or IBM 3287/3289 printers.

TC 276-2 ● remote BSC with 1920-character display:

$171/$152 mo	$5,350 prch	$30 maint

TC 276-3 ● remote BSC with 2560-character display:

183/161	5,600	30

TC 276-4 ● remote BSC with 3440-character display:

185/163	5,700	30

TC 276-12 ● remote SDLC with 1920-character display:

171/152	5,350	30

TC 276-13 ● remote SDLC with 2560-character display:

183/161	5,600	30

TC 276-14 ● remote SDLC with 3440-character display:

185/163	5,700	30

TC 276-15 ● remote SDLC with 3564-character display:

198/177	6,150	30

TC 276 Terminal Upgrades ● field-installable model upgrades/changes available on purchase basis only.

FC 23 Models 2 to 3 or Models 12 to 13:

NA/NA	350	NA

FC 24 Models 2 to 4 or Models 12 to 14:

NA/NA	300	NA

FC 25 Models 12 to 15:

NA/NA	500	NA

FC 26 Models 3 to 4 or Models 13 to 14:

NA/NA	200	NA

FC 27 Models 13 to 15:

NA/NA	500	NA

FC 28 Models 14 to 15:

NA/NA	500	NA

FC 34 BSC/SDLC Capability ● provides switch-selectable SDLC or BSC operation for all models except Model 15:

17/14	750	3

FC 04 SDLC Conversion Kit ● for field conversion of BSC terminals to SDLC operation ● purchase-only basis:

NA/NA	700	NA

FC 16 Row & Counter Feature ● counts and displays number of keystrokes per row and column:

11/9	300	2

FC 18 Response-Time Indicator ● measures and displays system response time to last transaction, longest response, fastest response, and average response time:

4/3	50	NA

FC 21 Tilt & Rotate Stand ● for all models:

NA/NA	125	NA

FC 12 Security Keylock ● for all models:

NA/NA	30	NA

FC 37 Selector Light Pen ● for all models:

10/9	350	4

FC 35 Audible Alarm ● for all models:

2/2	55	NC

TC 476 Control Unit Display Station

Configuration ● standalone display controller equivalent to 3276-2 and -12; up to 16 units can be daisy-chained up to 5,000 feet apart ● modular detached keyboard (see Keyboards for listing) ● fixed base ● attaches single printer per display-controller, or single light pen; OCR wands or bar-code reader supported by TC 476L ● BSC or SNA/SDLC versions; field upgradable to SNA/SDLC ● attaches to IBM S/360, S/370, 4300, and 30XX.

Display ● 15-inch diagonal ● 8x15 dot matrix ● 1920-character 24-line x 80-column format; 25th status line ● 96 EBCDIC/ASCII character sets; ALA-MARC optional on TC 476L ● blink or non-blink cursor.

Edit & Format Features ● cursor up, down, left, right, return, home ● tab, backtab, backspace ● cursor address right ● erase to EOF; clear input ● character insert/delete ● protected fields and numeric-only fields ● reverse video, blinking, intensity, underline fields (TC 476L only); intensity and nonintensity all others ● light pen field select.

Communications ● see Communications section for details.

Peripherals ● selector light pen or 281B matrix printer ● OCR wand or bar-code reader on TC 476L.

TC 476B ● remote BSC with 1920-character display:

$88/$73 mo	$2,800 prch	$30 maint

TC 476S ● remote SDLC with 1920-character display:

88/73	2,800	30

TC 476L ● remote BSC with 1920-character display:

88/72	2,250	26

SDLC Conversion Kit ● field converts BSC terminals to SDLC operation ● purchase-only basis; $100 field-installation charge:

NA/NA	500	NA

FC 13 Tilt & Rotate Stand ● for all models:

NA/NA	125	NA

FC 35 Audible Alarm ● for all models:

2/2	55	NA

FC 36 Security Keylock ● for all models:

NA/NA	30	NA

FC 37 Selector Light Pen ● for all models:

10/9	350	4

FC 51 Character Set ● foreign character set; available on TC 476L only:

4/3	100	NA

TC 479 Control Unit Color Display Station

Configuration ● standalone display controller equivalent to IBM 3276-2 or -12; up to 16 units can be daisy-chained up to 5,000 feet apart ● fixed-base display and modular-detached keyboard (see Keyboard listings) ● attaches single printer or single light pen per controller ● BSC or SNA/SDLC versions; field upgradable to SNA/SDLC.

Display ● 15-inch diagonal ● 4-color support (red, green, white, blue) ● 8x15 dot matrix ● 1920-character 24-line x 80-column format; 25th status line ● 96 EBCDIC character set ● blink or nonblink cursor.

Edit & Format Features ● cursor up, down, left, right, return, home ● tab, backtab, backspace ● cursor address right ● erase to

Telex TC 270 Series
Information Display System

EOF; clear input • character insert/delete • protected fields and numeric-only fields • reverse-video, blinking fields; intensity and nonintensity all others • row and column indicator • light pen field select.

Communications • see Communications section for details.

Peripherals • selector light pen or 281B matrix printer.

Keyboards • see Keyboards section for details.

TC 479B • remote BSC with 1920-character display:

	$164/$141 mo	$4,200 prch	$30 maint

TC 479S • remote SDLC with 1920-character display:

	164/141	4,200	30

SDLC Conversion Kit • field converts BSC terminals to SDLC operation • purchase-only basis; $100 field-installation charge:

	NA/NA	500	NA

FC 35 Audible Alarm for both models:

	2/2	55	NA

FC 36 Security Keylock • for both models:

	NA/NA	30	NA

FC 37 Selector Light Pen • for both models:

	10/9	350	4

FC 18 Response-Time Indicator • measures and displays system response time to last transaction, longest response, fastest response, and average response times:

	5/3	50	NA

☐ I/O Channels

Remote host processor attachment is established via communications facilities to channel-connected transmission control units/adapters. Local terminal and printer attachment to control units device adapter expansions, such as those shown for TC 274C and TC 276.

The TC 078, 079, 080, 178, 179, 278, and 279 terminals (display stations) and 476, 476L and 479 all attach a selector light pen, and optionally connect the Model 281B printer through a serial interface.

FC 17 Printer Interface • connects Telex 281B printer to TC 078, 079, 080, 179, 278-X, and TC 279 terminals:

	$9/$7 mo	$300 prch	$2 maint

FC 19 Printer Interface • connects Telex 281B printer to TC 178 terminal:

	NA/3	75	NA

TC 44 Printer Interface • connects Telex 281B to TC 476, 476L, and 479 terminal-control unit:

	12/10	500	NA

☐ Communications

The Telex controllers communicate with S/360, S/370, 4300, and 30XX processors over leased lines or the DDD to channels attached to the 2701, 2703, 3704, 3705, or 3725 communications controller or front end. The TC 174 and 274C controllers can connect to 2 independent hosts.

Both controllers can be ordered with BSC, SDLC, or BSC/SDLC protocol-handling facilities. In addition, any controller can be field-modified to accommodate other than the protocol installed at the factory. For example, an SDLC-handling controller can be modified to handle BSC. The standard data transmission rate for the TC 174, 274C, 276, and 476 is 9600 bps. If the 274C is configured as a single high-speed link controller operating under SDLC, the transmission rate is 19.2K bps or optionally 56K bps. For a dual high-speed link version, the data rate is 9600 bps for each line.

The TC 476, 476L, and 479 can function as standalone units; up to 16 units can be daisy-chained up to 5,000 feet apart via an optional Model 909 Modem Cluster Adapter (MCA) which handles the necessary controls to the TC 476, 476L, and 479.

FC 40 Model 909 Modem Cluster Adapter • interfaces and controls to connect up to 16 daisy-chained TC 476, 476L, or 479

terminal controllers:

	$9/$8 mo	$200 prch	NA maint

FC 41 I/O Expander • provides extended serial interface for daisy-chaining TC 476, 476L, or 479:

	9/8	200	NA

Terminal Multiplexer

The TC 299 Terminal Multiplexer connects catagory A terminals to the TC 274 or IBM 3274 Control Unit (except the 51C) and reduces coaxial-cable requirements by combining the outputs of up to 8 terminals on a single coaxial cable connected to the controller. Up to four 299s can be attached to the TC 274 or IBM 3274, except the 61C which is limited to 2. The 299 can be located up to 4,920 feet from each terminal, and the same distance from the controller. Thus, terminals connected in this fashion can be located up to 9,840 feet from the control unit.

TC 299 Terminal Multiplexer • time-division multiplexer (TDM) accommodates 8 category A terminals connected to a TC 274 or IBM 3274:

	$46/$39 mo	$1,000 prch	$8 maint

☐ Workstations/Terminals

The terminals attachable to the TC 174, 274C, and 276 are plug-compatible replacements for IBM 3178, 3179, 3180, 3278, and 3279 terminals. Telex controllers will also accept the applicable IBM terminals.

The Telex terminals offer the same display, edit, and format features as their IBM counterparts. Until September 1983, the Telex products enjoyed 2 advantages over comparable terminals: (1) a **response-time monitor** which measures "turnaround" from the time the user hits the transmit key until a response is displayed, and (2) a direct printer attachment to the terminal. IBM now offers a response-time monitor, but no similar printer capability.

Like IBM, Telex also offers a personal computer attachment to its 278-2 terminal. Called PROFFIT (Professional Office Computer), it is similar to IBM's 5150 personal computer and runs the same communication and control programs. Also like IBM, the personal computer does not interfere with the 278-2 native-mode operation.

PROFFIT contains 128K bytes of RAM expandable to 640K. Standard diskette storage consists of a single-sided, double-density, 5.25-inch diskette drive with a 160K-byte capacity. A second 160K drive is optional. The personal computer runs under CP/M-86; MS-DOS is optional. Auxiliary I/O consists of 2 serial RS-232C ports and a parallel printer port. PROFFIT employs an Intel 8080 microprocessor with a 16-bit architecture and an 8-bit data bus. Its serial interface to the 278 transfers data at 9600 bps.

A standalone personal computer is also available which emulates the IBM 3278-2 and is compatible with the IBM PC and PC/XT. Called the Model 1186 Intelligent Workstation, it employs an Intel 80186 16-bit micro with a 16-bit data path and can be configured with up to 512K bytes of RAM, 10MB of Winchester hard disk and 360KB of 5.25-inch diskette. The 1186 runs under MS-DOS and comes with Micro Soft's GW-BASIC. Its RS-232C or RS-422 interface permits data transfer at 9600 bps. The 1186 can also be equipped with an extended display/communication option which permits **7 independent windows** to be established (each containing a separate application); and allows files to **uploaded/downloaded** to/from the host processor.

The Telex TC 078, 079, and 080 are equivalent to IBM 3178, 3179, and 3180 Model 1, respectively. The TC 080, however, differs from the IBM 3180 in that the latter supports 4 different screen display formats in a single terminal, while the TC 080 is offered in 4 **different** models each supporting a single display format.

The new Telex TC 179 essentially competes with the IBM 3279 Models S2A, S2B, and S3G, but transcends the IBM model in display capacity. While the top-of-the-line 3279-S3G displays 2560 characters, the TC 179 Model 4 provides a 3440 character display. As with **all** Telex TC terminals, the TC 179 is priced below IBM computer parts.

Telex TC 270 Series
Information Display System

The Telex TC 178 and 278 are replacements for the IBM 3178 and 3278-2 through -5. The TC 279 series provide a 4-color display and replaces the IBM 3279 Model S2A. The TC 279, like the newer TC 179, also provides 3440-, 2560-, or 1920-character display, while the IBM 3279-S2A displays only 1920 characters.

TC 078 Keyboard-Display Terminal

Configuration • cluster display terminal for Telex 174/274C/276 controller or attaches directly to IBM 3274/3276 controller and IBM Display/Printer Adapter S/43XX • modular detached typewriter (EBCDIC/International) or data entry style keyboards • attaches single printer or light pen • tilt and swivel base.

Display • 12-inch diagonal • 9x12 dot matrix • 1920-character 24-line x 80-column format; 25th status line • 96 EBCDIC or International character sets • underline or reverse video, blinking or nonblinking cursor.

Edit & Format Features • cursor up, down, left, right, return, home • new line, tab, backtab, backspace • cursor address units • erase to EOF; clear input • character insert and delete • protected and numeric-only fields • blink, intensity, reverse video, underscore, and nondisplay attributors • light pen field select • selectable all uppercase or upper-/lowercase character • typematic.

Communications • via controller (see Communications for details).

Peripherals • selector light pen or 281B matrix printer.

TC 078 Terminal • 1920-character display and typewriter-style keyboard with numeric or program function pad • security keylock, numeric keylock, volume-adjustable alarm, and automatic screen cutoff:

$61/$47 mo	$1,550 prch	$9 maint

078 Data Entry Keyboard • data entry-style keyboard with 12-key numeric pad:

NA/NA	NA	NA

078 Typewriter-Style Keyboard • EBCDIC typewriter-style keyboard with 12 program function key (PF 13-24) keypad:

NC/NC	NC	NA

078 Typewriter-Style Keyboard • EBCDIC typewriter-style keyboard with 12 program function key (PF 13-24) keypad alternate action:

NC/NC	NC	NA

FC 37 Selector Light Pen:

10/9	350	4

TC 079 Color Keyboard-Display Terminal

Configuration • cluster display terminal for Telex 174/274C/276 controllers or attaches directly to IBM 3274/3276 controllers and IBM Display/Printer Adapter S/43XX • modular detached typewriter (EBCDIC/International) or data entry-style keyboards • attaches single printer or light pen • tilt and swivel base.

Display • 12-inch diagonal • 4-color display (red, green, blue, white) or 7-color (red, green, blue, white, yellow, turquoise, pink) • 9x12 dot matrix • 1920 characters, 24 lines x 80 columns; 25th status line • 96 EBCDIC or International character set • underline or reverse video, blinking or nonblinking cursor.

Edit & Format Features • cursor up, down, left, right, home, return • erase to EOF; clear input • character insert/delete • protected and numeric-only fields • tab, backtab • light pen field select • selectable all uppercase or upper-/lowercase character • typematic functions.

Communications • via controller (see Communications for details).

Peripherals • selector light pen or 281B matrix printer.

TC 079-Model 1 Terminal • 4-color, 1920-character display and typewriter-style keyboard with numeric or program function pad • security keylock, numeric keylock, volume-adjustable alarm, and automatic screen cutoff:

$82/$65 mo	$2,095 prch	$12 maint

TC 079 Model 2 Terminal • same as Model 1, except supports 7-color display:

86/68	2,195	12

079 Data-Entry Keyboard • data entry-style keyboard with 12-key numeric pad:

NA/NA	NA	NA

079 Typewriter-Style Keyboard • EBCDIC typewriter-style keyboard with 12 program function key (PF 13-24) keypad:

NC/NC	NC	NA

079 Typewriter-Style Keyboard • EBCDIC typewriter-style keyboard with 12 program function key (PF 13-24) keypad alternate action:

NC/NC	NC	NA

FC 37 Selector Light Pen:

10/9	350	4

TC 080 Keyboard-Display Terminal

Configuration • cluster display terminal for Telex 174/274C/276 controllers or attaches directly to IBM 3274/3276 controller and IBM Display/Printer Adapter S/43XX • modular detached typewriter (EBCDIC/International) or data entry-style keyboards • attaches single light pen, printer or mag stripe reader • tilt and swivel base.

Display • 15-inch diagonal • dot matrix is 7x9 (Models 2 through 5), 9x16 (Model 2), 9x13 (Models 3 and 5), 9x12 (Model 4) • 3564 characters, 27 lines x 132 characters (Model 5); 3440 characters, 43 lines x 80 columns (Model 4); 2560 characters, 32 lines x 80 columns (Model 3); 1920 characters, 24 lines x 80 columns (Model 2); all have extra status line • 96 EBCDIC or International character set • underline or reverse video, blinking or nonblinking cursor.

Edit & Format Features • cursor up, down, left, right, home, return, select • erase to EOF; clear input • character insert/delete • protected and numeric-only fields • reverse video • displayable/nondisplayable characters • light pen field select • tab, backtab; selectable all uppercase or upper-/lower-case characters • typematic functions.

Communications • via controller—see Communications section for details.

Peripherals • selector light pen, mag stripe reader or 281B matrix printer.

TC 080 Model 2 • 1920-character display and typewriter-style keyboard with numeric or program function pad • operator features consists of security keylock, numeric lock, volume-adjustable alarm, and automatic screen cutoff:

$82/$66 mo	$2,195 prch	$13 maint

TC 080 Model 3 • 2560-character display with same keyboard choice and operator features as Model 2:

82/66	2,195	13

TC 080 Model 4 • 3440-character display terminal; same operator features and keyboard choices as Model 2:

82/66	2,195	13

TC 080 Model 5 • 3564-character display terminal; same operator features and keyboard choices as Model 2:

82/66	2,195	13

080 Data Entry Keyboard • data entry-style keyboard with 12-key numeric pad:

NA/NA	NA	NA

080 Typewriter-Style Keyboard • EBCDIC typewriter-style keyboard with 12 program function key (PF 13-24) keypad:

NC/NC	NC	NA

080 Typewriter-Style Keyboard • EBCDIC typewriter-style keyboard with 12-key numeric pad and PF 13-24 alternate action:

NC/NC	NC	NA

FC 16 Row & Counter Feature • counts and displays number of

Telex TC 270 Series
Information Display System

keystrokes per row and column:

	15/9	300	2

FC 18 Response-Time Indicator • measures and displays system response time to last transaction, longest response, fastest response, and average response times:

	5/3	50	NA

FC 37 Selector Light Pen:

	15/9	350	4

TC 179 Color Keyboard-Display Terminal

Configuration • cluster display terminal for Telex 174/274C/276 controllers or attaches directly to IBM 3274/3276 controllers and IBM Display/Printer Adapter S/43XX • modular detached typewriter (EBCDIC/International) or data entry-style keyboards • attaches single printer, light pen, or mag stripe reader • tilt and swivel base.

Display • 14-inch diagonal • 4-color display (red, green, blue, white) • dot matrix is 7x9 (Models 2 through 4), 9x16 (Model 2), 9x13 (Model 3), 9x12 (Model 4) • 3440 characters, 43 lines x 80 columns (Model 4); 2560 characters, 32 lines x 80 columns (Model 3); 1920 characters, 24 lines x 80 columns (Model 2); all have extra status line • 96 EBCDIC or International character set • underline/reverse video, blinking/nonblinking cursor.

Edit & Format Features • cursor up, down, left, right, home, return, select • erase to EOF; clear input • character insert/delete • protected and numeric-only fields • reverse video • displayable/nondisplayable characters • light pen field select • tab, backtab; selectable all uppercase or upper-/lowercase characters • typematic functions.

Communications • via controller—see Communications section for details.

Peripherals • selector light pen, mag stripe reader or 281B matrix printer.

TC 179 Model 2 • 4-color, 1920-character display and typewriter-style keyboard with numeric or program function pad • operator features consists of security keylock, numeric lock, volume-adjustable alarm, and automatic screen cutoff:

	NA/NA mo	$2,295 prch	$14 maint

TC 179 Model 3 • 4-color, 2560-character display with same keyboard choice and operator features as Model 2:

	108/86	2,795	14

TC 179 Model 4 • 4-color, 3440-character display with same keyboard choice and same operator features as Model 2:

	115/91	2,995	14

179 Data Entry Keyboard • data entry-style keyboard with 12-key numeric pad:

	NA/NA	NA	NA

179 Typewriter-Style Keyboard • EBCDIC typewriter-style keyboard with 12 program function key (PF 13-24) keypad:

	NC/NC	NC	NA

179 Typewriter-Style Keyboard • EBCDIC typewriter-style keyboard with 12-key numeric pad and PF 13-24 alternate action:

	NC/NC	NC	NA

FC 16 Row & Counter Feature • counts and displays number of keystrokes per row and column:

	15/9	300	2

FC 18 Response-Time Indicator • measures and displays system response time to last transaction, longest response, fastest response, and average response times:

	5/3	50	NA

FC 37 Selector Light Pen:

	15/9	350	4

Extended 7-Color Support • displays colors red, green, blue, white, yellow, turquoise, and pink:

	NA/NA	NA	NA

178 Keyboard-Display Terminal

Configuration • cluster-display terminal for Telex 174/274C/276 controllers or attaches directly to IBM 3274/3276 • modular detached typewriter (ASCII or EBCDIC) and data entry-style keyboards • attaches single printer or light pen • fixed base.

Display • 12-inch diagonal • 7x12 dot matrix • 1920-character 24-line x 80-column (character) format; 25th status line • 96 ASCII or EBCDIC character sets • blinking and nonblinking cursor.

Edit & Format Features • cursor up, down, left, right, home, return, select • tab/skip, backtab, backspace • cursor address write • erase to EOF; clear input • character insert/delete • protected fields; numeric-only fields; displayable/nondisplayable characters • light-pen field select • selectable all uppercase or upper-/lowercase characters • typematic functions.

Communications • via controller—see Communications section for details.

Peripherals • selector light pen or 281B matrix printer.

TC 178 Model 2 • 1920-character display with choice of FC 74, 77, 83, 92, 106, 113, or 114 keyboard:

	$55/$42 mo	$1,550 prch	$12 maint

FC 72 Tilt & Rotate Stand:

	NA/NA	50	NA

FC 16 Row & Counter Feature • counts and displays number of keystrokes per row and column:

	15/9	300	2

FC 18 Response-Time Indicator • measures and displays system response time to last transaction, longest response, fastest response, and average response time:

	5/3	50	NA

FC 12 Security Keylock:

	NA/NA	30	NA

FC 37 Selector Light Pen:

	15/9	350	4

FC 35 Audible Alarm:

	NA/NA	30	NC

FC 74 Keyboard • EBCDIC typewriter-style with 24 program function keys:

	NC/NC	NC	NA

FC 75 Keyboard • EBCDIC typewriter-style with 12 program function (PF) key keypad:

	15/14	600	NA

FC 76 Keyboard • EBCDIC typewriter-style with numeric keypad:

	10/9	400	NA

FC 77 Keyboard • data entry-style with numeric keypad:

	NC/NC	NC	NA

FC 78 Keyboard • data entry-style with keypunch layout:

	15/14	600	NA

FC 79 Keyboard • ASCII typewriter-style layout with function keypad:

	15/14	600	NA

FC 80 Keyboard • ASCII typewriter-style layout with numeric keypad:

	15/14	600	NA

FC 83 Keyboard • EBCDIC typewriter-style with 24 program function (PF) keys, single-key clear, and 2 program attention keys:

	NC/NC	NC	NA

FC 92 Keyboard • EBCDIC typewriter-style with numeric keypad, 12 alternate function keys, 2 program attention (PA) keys, and single-key clear:

	NC/NC	NC	NA

FC 106 Keyboard • EBCDIC data entry-style with 10-key numeric

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Telex TC 270 Series
Information Display System

pad and single-key clear:

	NC/NC	NC	NA

FC 113 Keyboard ● EBCDIC typewriter-style with 12 program functions, 12 alternate function keys, 2 program attention (PA) keys, and single-key clear:

	NC/NC	NC	NA

FC 114 Keyboard ● EBCDIC typewriter-style with 12 program function (PF) key keypad and 12 alterate function keys:

	NC/NC	NC	NA

TC 278-X Keyboard/Display Terminal

Configuration ● cluster-display terminal for Telex 174/274C/ 276 controllers, or attached directly to IBM 3274/3276 ● modular detached typewriter- (ASCII or EBCDIC) and data entry-style keyboards ● fixed base ● attaches light pen or printer ● upgradable to personal computer via PROFFIT option.

Display ● 15-inch diagonal ● 9x14 dot matrix (Model 2); 9x12 dot matrix (Models 3, 4, 5) ● 3564 characters, 27 lines x 132 columns (Model 5); 3440 characters, 43 lines x 80 columns (Model 4); 2560 characters, 32 lines x 80 columns (Model 3); 1920 characters, 24 lines x 80 characters (Model 2); all have extra status line ● 96 ASCII or EBCDIC character set ● blinking and nonblinking cursor.

Edit & Format Features ● cursor up, down, left, right, home, return, select ● cursor address write ● erase to EOF; clear input ● character insert/delete ● protected and numeric-only fields ● reverse video ● displayable/nondisplayable characters ● light-pen field select ● typematic functions ● selectable all uppercase or upper-/lowercase characters ● tab, backtab.

Communications ● via controller—see Communications section for details.

Peripherals ● selector light pen or 281B matrix printer.

TC 278-2 ● 1920-character display:

	$53/$47 mo	$2,100 prch	$12 maint

TC 278-3 ● 2560-character display:

	64/58	2,300	13

TC 278-4 ● 3440-character display:

	65/59	2,500	14

TC 278-5 ● 3564-character display:

	77/70	2,800	15

TC 278 Display Upgrades ● field-installable model upgrades/changes available for purchase only.

FC 23 Model 2 to Model 3:

	NA/NA	550	NA

FC 24 Model 2 to Model 4:

	NA/NA	660	NA

FC 25 Model 2 to Model 5:

	NA/NA	1,050	NA

FC 26 Model 3 to Model 4:

	NA/NA	600	NA

FC 27 Model 3 to Model 5:

	NA/NA	1,050	NA

FC 28 Model 4 to Model 5:

	NA/NA	1,050	NA

FC 12 Security Keylock ● for all models:

	NA/NA	30	NA

FC 16 Row & Counter Feature ● counts and displays number of keystrokes per row and column:

	11/9	300	2

FC 37 Selector Light Pen ● for all models:

	10/9	350	4

FC 35 Audible Alarm ● for all models:

	2/2	55	NC

FC 18 Response-Time Indicator ● measures and displays system response time to last transaction, longest response, fastest response, and average response time:

	4/3	50	NA

FC 21 Tilt & Rotate Stand ● for all models:

	NA/NA	125	NA

FC XX Keyboard ● same as offered with TC 279-X.

Professional Office Computer (PROFFIT) ● provides personal computer attachment to TC 278-Z ● 128K bytes of RAM and single double-sided 320K-byte diskette drive ● CP/M-86:

	88/63	1,830	25

FC 26 Double-Sided Diskette Drive ● adds second 320K-byte diskette drive to PROFFIT:

	22/16	450	5

FC 15 Memory Upgrade ● 256K RAM module:

	16/12	325	2

FC 16 Memory Upgrade ● 384K RAM module:

	38/27	775	4

FC 17 Memory Upgrade ● 512K RAM module:

	53/38	1,100	6

FC 18 Memory Upgrade ● 640K RAM module:

	69/49	1,425	8

TC 279 Color Keyboard/Display Terminal

Configuration ● color cluster-display terminal for Telex 174/274C/276 controller; also attaches directly to IBM 3274/3276 ● modular detached typewriter- (ASCII or EBCDIC) and data entry-style keyboards ● fixed base ● attaches light pen or printer.

Display ● 15-inch diagonal ● 4 colors ● 9x14 dot matrix (Model 2A); 9x12 dot matrix (Models 3A and 4A) ● 3440 characters, 43 lines x 80 columns (Model 4A); 9x12 dot matrix (Models 3A and 4A) ● 3440 characters, 43 lines x 80 columns (Model 4A); 2560 characters, 32 lines x 80 columns (Model 3A); 1920 characters, 24 lines x 80 columns (Model 2A); all have extra status line ● 96 ASCII or EBCDIC character set ● blinking and nonblinking cursor.

Edit & Format Features ● cursor up, down, left, right, home, return, select ● erase to EOF; clear input ● character insert/delete ● protected and numeric-only fields ● reverse video ● displayable/nondisplayable characters ● light-pen field select ● tab, backtab, selectable all uppercase or upper-/lowercase characters ● typematic functions.

Communications ● via controller—see Communications section for details.

Peripherals ● selector light pen or 281B matrix printer.

TC 279-2A ● 4-color, 1920-character display terminal:

	$89/$76 mo	$3,350 prch	$12 maint

TC 279-3A ● 4-color, 2560-character display terminal:

	99/85	3,600	13

TC 279-4A ● 4-color, 3440-character display terminal:

	104/88	3,850	14

FC 12 Security Keylock ● for all models:

	NA/NA	30	NA

FC 16 Row & Counter Feature ● counts and displays number of keystrokes per row and column:

	11/9	300	2

FC 18 Response-Time Indicator ● measures and displays system response time to last transaction, longest response time to last transaction, longest response, fastest response, and average response time:

	4/3	50	NA

FC 21 Tilt & Rotate Stand ● for all models:

	NA/NA	125	NA

Telex TC 270 Series
Information Display System

FC 37 Selector Light Pen ● for all models:

10/9	350	4

FC 35 Audible Alarm ● for all models:

2/2	55	NC

TC 1186 Intelligent Workstation ● multifunction terminal compatible with IBM PC and PC/XT; also emulates IBM 3278-2 for use in 3274 environments ● standard features include Intel 80186 microprocessor with 16-bit data path and 6-MHz clock speed; 128K bytes of RAM expandable to 512K; 32K bytes of ROM ● dual 5.25-inch doubled-sided, double-density diskettes with 360K bytes each; optional 10M-byte hard disk ● MS-DOS operating system; GW-BASIC ● 12-inch CRT with 7x9 dot character matrix; color and monochrome RGB color graphics 640x200 pixel addressability (8x8 dot character) ● detached PC-compatible and 3278/style keyboard ● RS-232C, RS-422, and parallel ports; coax board/3270 support optional.

TC 1186 Model 1 ● 12-inch color and monochromatic tilt and swivel monitor, dual 5.25-inch diskette, MS-DOS, 2 serial ports (RS-232C and RS-422) and single parallel printer port; PC or 3278 keyboard; all other standard features:

145/103	3,025	31

1186 Model 10 ● 12-inch color and monochrome tilt and swivel monitor, single 5.25-inch diskette, 10M-byte Winchester hard disk, MS-DOS, 2 serial ports (RS-232C and RS-422) and single parallel printer port; PC or 3278 keyboard; all other standard features:

239/170	4,980	32

RAM Upgrade ● 128K RAM upgrade for Models 1 and 10; maximum of 3 units:

10/7	200	NC

Extended Display/Communications ● provide facility for simultaneously displaying 7 concurrent independent applications ● communications facility also uploading/ downloading files under TSO CMS control:

NA/NA	600	NA

3270 Coaxial Interface ● allows Model 1 to connect to Telex 274 or IBM 3274 controllers via coaxial cable:

NA/NA	42	NC

3270 Coaxial Interface ● allows Model 10 to connect to Telex 274 or IBM 3274 controllers via coaxial cable:

NA/NA	61	NC

☐ Keyboards

Aside from the special keyboards offered with the FC 178, Telex provides a number of keyboards compatible with the 276, 278, 279, 476, and 479. In the following list, FC 80 through FC 113 keyboards are available for TC 178, 278, and 279 only. All others, with the exception of FC 88 and FC 93 through FC 104, are available for TC 276, 476, and 479.

TC 80 Keyboard ● EBCDIC typewriter-style with 24 program function (PF) keys:

$15/$14 mo	$600 prch	NA maint

TC 81 Keyboard ● same as TC 80, except has single-key clear:

15/14	600	NA

TC 82 Keyboard ● same as TC 80; except also has 2 single-key activated program attentions (PA):

15/14	600	NA

TC 83 Keyboard ● same as TC 82, except also has single-key clear:

10/9	400	NA

TC 84 Keyboard ● EBCDIC typewriter-style with 12 program function (PF) keys:

15/14	600	NA

TC 85 Keyboard ● same as TC 84, except has single-key clear:

15/14	600	NA

TC 86 Keyboard ● same as TC 84, except has 2 single-key activated program attentions (PA):

15/14	600	NA

TC 87 Keyboard ● same as TC 86, except has single-key clear:

15/14	600	NA

TC 88 Keyboard ● same as TC 87, except also conforms to IBM RPQ 8K0808 ● not available for TC 276, 476, or 479:

15/14	600	NA

TC 89 Keyboard ● EBCDIC typewriter-style with numeric keypad and 12 alternate-action program function (PF) keys:

15/14	600	NA

TC 90 Keyboard ● same as TC 89, except has single-key clear:

15/14	600	NA

TC 91 Keyboard ● same as TC 89, except also has 2 single-key activated program attentions (PA):

15/14	600	NA

TC 92 Keyboard ● same as TC 91, except has single-key clear:

10/9	400	NA

TC 93 Keyboard ● ASCII typewriter-style with 24 program function (PF) keys ● not available for TC 276, 476, 479:

15/14	600	NA

TC 94 Keyboard ● same as TC 93, except has single-key clear:

15/14	600	NA

TC 95 Keyboard ● same as TC 93, except also has 2 single-key activated program attentions (PA):

15/14	600	NA

TC 96 Keyboard ● same as TC 95, except has single-key clear:

15/14	600	NA

TC 97 Keyboard ● ASCII typewriter-style with 12 program function (PF) keys ● not available for TC 276, 476, 479:

15/14	600	NA

TC 98 Keyboard ● same as TC 97, except has single-key clear:

15/14	600	NA

TC 99 Keyboard ● same as TC 97, except also has 2 single-key activated program attentions (PA):

15/14	600	NA

TC 100 Keyboard ● same as TC 99, except has single-key clear:

15/14	600	NA

TC 101 Keyboard ● ASCII typewriter-style with numeric keypad and 12 alternate-action program function (PF) keys ● not available for TC 276, 476, 479:

15/14	600	NA

TC 102 Keyboard ● same as TC 101, except has single-key clear:

15/14	600	NA

TC 103 Keyboard ● same as TC 101, except also has 2 single-key activated program attentions (PA):

15/14	600	NA

TC 104 Keyboard ● same as TC 103, except has single-key clear:

15/14	600	NA

TC 105 Keyboard ● EBCDIC data entry-style with 10-key numeric pad:

15/14	600	NA

TC 106 Keyboard ● same as TC 105, except has single-key clear:

10/9	400	NA

TC 107 Keyboard ● EBCDIC data entry-style:

15/14	600	NA

TC 108 Keyboard ● same as TC 107, except has single-key clear:

15/14	600	NA

Telex TC 270 Series
Information Display System

TC 109 Keyboard • EBCDIC data entry-style with 10-key numeric pad:

15/14	600	NA

TC 110 Keyboard • same as TC 109, except has single-key clear:

15/14	600	NA

TC 111 Keyboard • EBCDIC data entry-style with key-punch layout:

15/14	600	NA

TC 112 Keyboard • EBCDIC data entry-style with single-key clear:

15/14	600	NA

TC 113 Keyboard • EBCDIC typewriter-style with 12 program function (PF) keys, 12 alternate-action program keys, 2 single-key activated program attentions (PA), and single-key clear:

10/9	400	NA

FC 53 Keyboard • ASCII or EBCDIC typewriter-style with 12 program function (PF) keys • available on TC 476L only:

10/9	400	NA

FC 54 Keyboard • typewriter-style with ALA/MARC keycaps • available on TC 476L only:

14/12	500	NA

FC 55 Keyboard • typewriter-style with foreign language keycaps • available on TC 476L only:

14/12	500	NA

☐ Printers

The Telex printers consist of 5 tabletop serial matrix, 2 serial daisywheels, and a pedestal-mounted spinning-belt character printer. Three printers, the 181 GP, 182 and 186 AP, attach only to the TC 1186. The 281B is a "screen" printer which interfaces with the TC keyboard-display products.

181 GP Printer

Configuration • tabletop serial matrix impact • 2000-character buffer • attaches to TC 1186 workstation.

Printer • 120-cps bidirectional; 12x8 dot matrix (at 80 columns) and 9x8 dot matrix (132 columns) • logic-seeking circuits • 96 ASCII/Programmable Graphics/International character set • 80/132 columns • 10 cpi (80 columns) or 17 cpi (132 columns); 2, 3, 4, or 8 lpi • pin-feed sprocket • 3-part forms:

$31/$22 mo	$640 prch	$8 maint

182 GP Printer

Configuration • same as 181 GP.

Printer • 120-cps bidirectional; 9x8 dot matrix • logic-seeking circuits • 96 ASCII/Programmable Graphics/International character set • 132/218 columns • 10 cpi (132 columns) or 17 cpi (218 columns); 2, 3, 4, or 8 lpi • pin-feed sprocket • 3-part forms:

$45/$32 mo	$940 prch	$9 maint

186 AP Letter-Quality Printer

Configuration • tabletop daisywheel impact printer • 1920-character buffer • attaches to TC 1186 workstation.

Printer • 40-cps bidirectional • 96 ASCII character set • 136/163 columns • ribbon cartridge • friction feed; 3-part forms:

$108/$77 mo	$2,250 prch	$30 maint

281B Printers

Configuration • tabletop serial matrix impact • 1920-character buffer • attaches to TC 078, 079, 080, 178, 179, 276, 278-X, 476, and 479 displays.

Printer • 100-cps (standard) or 120-cps (with PROFFIT) bidirectional 7x9 dot matrix impact • 96 ASCII/EBCDIC character sets; European character sets optional • 80/132 columns • 10 cpi (80 columns) or 17 cpi (132 columns); 2, 3, 4, or 8 lpi • roll- or pin-feed, adjustable sprocket • 3-part forms.

TC 281B Matrix Printer • 100 cps:

$34/$26 mo	$900 prch	$21 maint

TC 281AP Matrix Printer • 120 cps • employed with PROFFIT personal computer option:

41/30	850	15

286F Printer

Configuration • tabletop serial daisy-wheel printer • 960/1920/2560/3440/3564-character buffer • cluster printer for Telex 174/274C/276 and IBM 3274/3276.

Printer • 60-/80-cps bidirectional • 96-/127-character ASCII-B or EBCDIC character sets • 132/158 print positions at 10/12 cpi, respectively • 6/8 lpi • mono-/dual-case printing • friction-feed platen; 3- to 15-inch form width; 6-part forms:

$185/$165 mo	$5,750 prch	$50 maint

FC 84 Bidirectional Forms Tractor:

20/15	530	4

FC 85 Unidirectional Forms Tractor:

12/9	270	4

FC 97 Single-Sheet Feeder:

NA/NA	1,800	20

287D Printer

Configuration • tabletop serial matrix impact • 1920-character buffer standard, 1920 additional character extra-cost option • attaches to Telex 174/274C/276 or IBM 3274/3276.

Printer • 75/100/150-cps bidirectional • 7x8 dot matrix, 96 ASCII/EBCDIC character sets • 132 columns • 10 cpi, 6/8 lpi • 3- to 15-inch pinfeed forms tractor • 5-part forms:

$176/$155 mo	$5,000 prch	$40 maint

FC 47 Buffer Expansion • 1920-character expansion buffer:

4/3	105	NA

289C Line Printer

Configuration • pedestal-mounted character spinning-belt printer • 1920-character buffer standard; 1920 characters optional • cluster line printer attaches to Telex 174/274C/276 and IBM 3274/3276.

Printer • 340 lpm with 64-character belt; 280 lpm with 96-character belt • 64/96 ASCII/EBCDIC character set • up to 132 characters per line; 6/8 lpi; 10 cpi • 3- to 15-inch forms tractor • operator-selectable form length, line length, print density, mono-/dual-case printing, single/double spacing:

$440/$350 mo	$11,500 prch	$100 maint

FC 26 Buffer Expansion • 1920-character expansion buffer:

20/16	400	NA

387 Printer

Configuration • tabletop serial matrix impact • 960/1920/2560/3440/3564-character buffer • attaches to Telex 174/274C/276 and IBM 3274/3276.

Printer • 140/280/400-cps bidirectional • 8x7 dot matrix (280 and 400 cps) or 16x14 dot matrix (140 cps) • 96 ASCII/EBCDIC character sets; APL text • 136/163/204/227/233 print positions at 10/12/15/16.7/17.1 cpi, respectively • high-density bold print available in all cpi configurations • 3/4/6/8 lpi; 10/12/15/16.7/17.1 cpi • mono-/dual-case character printing • 3- to 16-inch pinfeed forms tractor • 6-part forms:

$240/$210 mo	$7,200 prch	$55 maint

• **END**