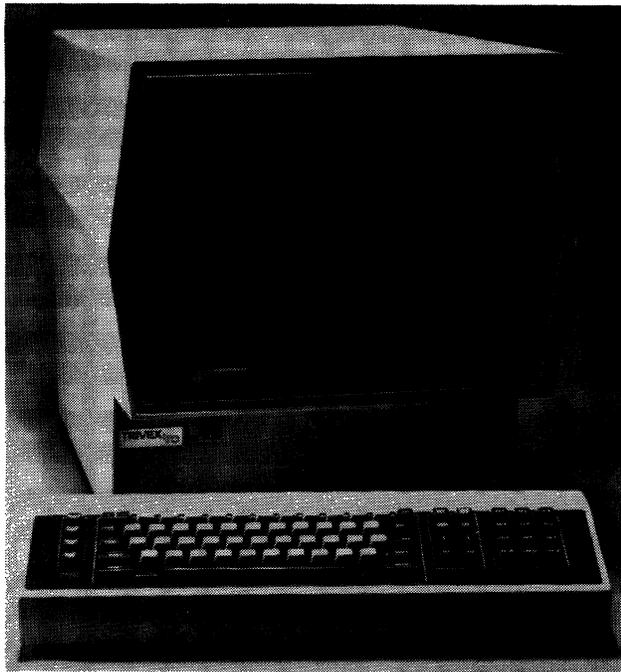


Trivex Plus 70



MANAGEMENT SUMMARY

Trivex reacted to IBM's May 1977 announcement of its revised 3270 Information Display System with the following changes:

- A new eight-station remote cluster configuration competitive with the new IBM 3276.
- A new 125-lpm matrix printer.
- Price decrease on display station.

Trivex plans to become more competitive with the IBM 3270 System and says it will introduce additional components and features in 1978 equivalent to IBM's newly introduced components and features, such as 2560- and 3440-character display screen capacities, at competitive prices.

The Trivex Plus 70 is a microprocessor-based clustered terminal designed for local operation as an IBM System/370 peripheral subsystem or for remote operation as an interactive terminal. A major advantage of the Trivex Plus 70 is that it is fully interchangeable with existing IBM 3270 components; i.e., IBM display stations and printers can be attached to Trivex controllers and the converse. The Plus 70 is also designed to use existing IBM cables, although, Trivex does furnish its own.

The Trivex Plus 70 provides complete compatibility with the IBM 3270 with respect to line discipline, commands and command-code structure, and addressing sequence. ➤

A microprocessor-based replacement for the IBM 3270 Information Display System in a local or remote environment. It supports any mix of up to 32 display stations and printers.

Enhancements include extended display features and print speeds.

A typical 8-station (1920-character screens) remote terminal without printers costs \$816 per month including maintenance on a 2-year lease.

A 16-station remote terminal consisting of 15 1920-character display stations and one 165-cps printer costs \$1,639 per month including maintenance on a 2-year lease.

The Plus 70 is completely compatible with the IBM 3270 and can use existing IBM cables. IBM and Trivex components can be mixed on the same system.

CHARACTERISTICS

VENDOR: Trivex, Inc., 3180 Red Hill Avenue, Costa Mesa, California 92626. Phone (714) 546-7781.

DATE OF ANNOUNCEMENT: March 1975.

DATE OF FIRST DELIVERY: May 1975.

NUMBER DELIVERED TO DATE: Over 1500.

SERVICED BY: Trivex, about 25 service locations.

CONFIGURATION

The Trivex Plus 70 is a microprocessor-based alphanumeric display terminal designed as a replacement for the IBM 3270 Information Display System in a local or remote environment.

The Plus 70 is available in the following configurations:

- Model 752—a remote stand-alone terminal.
- Model 722—a local cluster terminal subsystem.
- Model 712—a remote cluster terminal.
- Model 712M—a remote mini-cluster terminal.

The Model 752 remote stand-alone terminal includes one display monitor; a keyboard and an unbuffered 80- or 165-cps or 125-lpm printer can be added. An OCR wand and a light pen can also be added.

The Model 712 remote cluster controller and Model 722 local cluster controller can each accommodate up to 32 devices including any combination of Model 722 display stations and 80-cps, 165-cps, or 125-lpm printers. The basic controllers contain a device adapter that can accommodate ➤

Trivex Plus 70

➤ The Trivex terminals also provide all the features and functions that are currently available with existing IBM 3270 components, as well as some worthwhile enhancements.

The salient features of the Plus 70 system as compared with those of IBM include:

- Display capacity—Like existing IBM display stations (IBM Models 3277 and 3275), the Plus 70 offers a choice of two screen sizes, 480 and 1920 characters. The two screen sizes can be mixed in a cluster.
- System configuration—Clustered Trivex systems are available in both local and remote configurations, and like the IBM 3270, can accommodate any mix of displays and printers in increments of up to 8 devices to a maximum system size of 32 devices. The remote mini-cluster configuration, like its IBM 3276 counterpart, includes one display station and accommodates up to seven additional displays or printers in any combination. A stand-alone version is also available.
- Displayed output—The Plus 70 display units feature a standard displayable character set of 64 symbols; 96-symbols (including lower case alphabets) are available as an option. Display resolution is the same as the IBM 3270; each character is formed by a 7x9 dot matrix. By contrast, the IBM 3277 and 3275 displays provide a standard 64-character set of upper case alphabets (lower case alphabets are available via an RPQ). Like its IBM counterparts, the Plus 70 features two beam intensity levels and beam blanking; individual characters or fields can be displayed at a brighter-than-normal intensity to contrast with data displayed at a normal level of brightness, or the data can be blanked (not displayed) for security purposes. Also standard for the Plus 70 is protected format operation.
- Key entry—Five keyboard styles are available, which are equivalent to the IBM 66-key data entry and typewriter keyboards and 78-key typewriter (with or without a numeric pad) and operator console keyboards.
- Printed output—Trivex currently offers three models of serial impact printers rated at 80 cps, 165 cps, or 125 lpm. The printers offered by Trivex have 132 print positions and a 1920-character buffer so (in cluster configurations) that printing does not affect system throughput speed. By comparison, IBM offers impact printers rated at 40, 66, or 120 cps and line printers rated at 120 or 300 lpm. All are available with 132 print positions and are buffered.
- Communications—Transmission speeds for the Plus 70 range from 300 to 19,200 bits per second, compared with 1200 to 7200 bits per second for the IBM 3270. Communications protocol is IBM BSC or SDLC as desired.

➤ up to eight devices. Eight additional devices can be accommodated via each subsequent device adapter, up to a total of four adapters for 32 devices.

The Model 712M mini-cluster controller includes a master display station and contains one device adapter that can accommodate up to four devices, including the master display station. Four additional devices can be accommodated via one additional device adapter (Display Expander). The master display station (only) will not support the optional OCR Wand, but will support the other display options. There are no option restrictions for the seven additional devices attached to the 0712M controller.

In each of the cluster configurations, including the mini-cluster, the control unit provides individual buffering for each device, which can be located up to 2000 cable-feet from the control unit. Each display unit can support a light pen and an OCR hand-held wand.

Models 712 and 712M, the remote controllers, support BSC protocol and are attached to a communications facility via a modem. The maximum cable length between controller and modem is 50 feet. Model 722, the local controller, contains a channel interface for direct connection (via up to 200 cable-feet) to an IBM System 360 Models 25 through 195 or IBM System/370 Models 115 through 195, via a Selector, Multiplexor, or Block Multiplexor Channel. The data transfer rate can range from 10K to 650K characters per second.

The Model 772 Display Station and 800 series printers are interchangeable with IBM 3270 equipment and can be directly connected to IBM controllers in place of the equivalent IBM components.

TRANSMISSION SPECIFICATIONS

Transmission is half-duplex, synchronous at switch-selectable data rates from 300 to 19,200 bits/second using 8-level EBCDIC transmission code. IBM BSC or SDLC communications protocol can be specified for the cluster configuration; only BSC is provided for the stand alone configuration. The remote controllers provide an EIA Standard RS-232C interface for connection to a voice-grade communications facility via a modem. Bell System modems that can be used include the 103A/F or 113A/B (up to 300 bps) and the Dataphone 1200, 1800, 2400, 4800 and 9600.

DEVICE CONTROL

The Trivex Plus 70 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 Plus 70 responds to and executes the full repertoire of IBM 3270 commands via a firmware-controlled microprocessor.

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, backtabbed to the beginning of the previous unprotected data field or home position, and reset to line position. Switch selection provides cursor blinking or nonblinking.

Program Function and Program Attention keys, a standard feature of the IBM 3270, are also standard in the Plus 70. 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 accom-

Trivex Plus 70

- ● **Compatibility**—Each of the major components (controller, display, and printer) is microprocessor controlled and can replace the equivalent component within an IBM 3270 configuration.
- **Software support**—The Plus 70 is compatible with all existing IBM software supporting the 3270.

Trivex, an early manufacturer of replacement CRT terminals for the IBM 2260 and 2265 market, introduced itself to the IBM 3270 environment in May 1975 as a manufacturer and vendor of IBM 3270-compatible terminals.

USER REACTION

In November 1977, Datapro interviewed six users of the Trivex Plus 70. A total of 483 display units were represented. These users rated the Plus 70 as follows:

	Excellent	Good	Fair	Poor	WA*
Overall performance	6	0	0	0	4.0
Ease of operation	3	3	0	0	3.5
Display clarity	5	1	0	0	3.8
Keyboard feel & usability	3	3	0	0	3.5
Hardware reliability	6	0	0	0	4.0
Maintenance service	5	1	0	0	3.8

*Weighted Average on a scale of 4.0 for Excellent.

These well satisfied users cited low cost as the key advantage of the Trivex Plus 70. Other advantages mentioned were flexibility, reliability, and strong vendor support. No serious disadvantages were mentioned, but one user mentioned nonprogrammability as a disadvantage, while another noted that the display unit was large and bulky. Two of these installations (one with 300 displays) mixed IBM 3270 and Trivex Plus 70 components (controllers, displays, and printers) within the same terminal without any adverse reaction. One very satisfied user cited delivery time as the reason for his use of Trivex over IBM (or other) terminals; he stated that Trivex delivered within 5 to 6 weeks compared with 7 or 8 months for IBM. □

- **pany 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 clustered display and functionally corresponds to IBM's Selector Pen, a 3270 option. Any one or 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.

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 attribute codes is the same as for the IBM 3270. Optionally, each character position in a data entry field can be filled with dots, which are replaced by keyed data. Character and field blanking can be specified by the program, which can also specify high or low beam intensity.

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

The switch selectable audible alarm alerts the operator upon illegal entry.

The Numeric Key Lock option locks the keyboard in numeric mode; i.e., limits entry to numbers, minus sign, and period; the Duplicate function is also active.

The Display Print option provides a local copy capability, without intervention from the host. Two local print modes are provided. Priority Print produces a printed copy of the entire contents of the display buffer by the first available printer. Assigned Print prints the contents of a display buffer on a printer assigned by the display station operator.

In addition to the IBM standard on-line indicators, the Plus 70 provides five terminal status indicators. A diagnostic program is also provided for off-line self test and fault isolation in each system component.

COMPONENTS

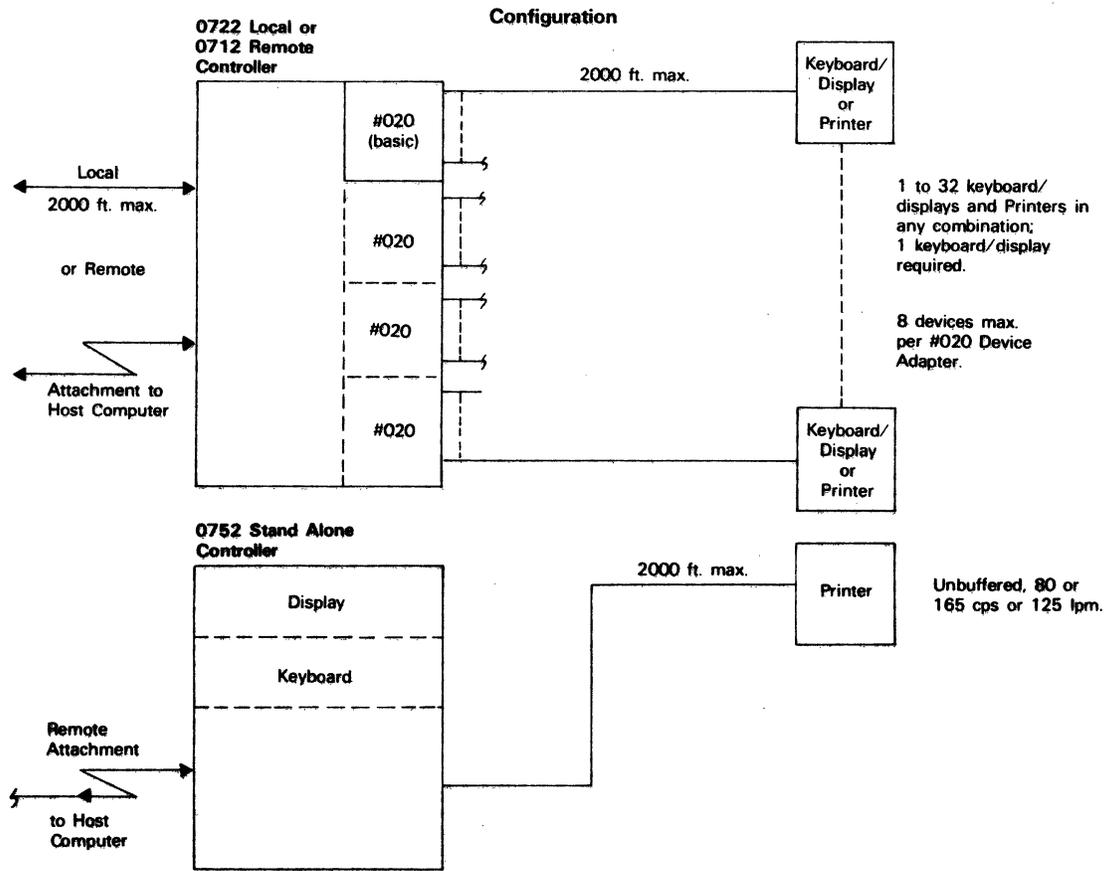
DISPLAY STATION: A CRT display unit with 15-inch (diagonal measurement), anti-glare screen and detachable keyboard. The display area measures 8 inches high by 11 inches wide. The display arrangement is 24 lines of 80 characters each for a total of 1920 characters. An optional 25th line, displayed above the first line in the right-hand sector, is used for operator prompting (displayed messages) and line and character position counts. A character set of 64 or 96 (optional) EBCDIC symbols including upper and lower (optional) case alphabets, numerics, and special symbols is displayed in white or green (optional) against a dark background. Each character is formed by a matrix of 7 by 9 dots to allow for lower case descenders. Dots are displayed in variable field locations. A blinking or non-blinking cursor is switchable. The display unit contains a 768 word PROM memory expandable to 4K for control program (firmware) storage and a 2K RAM display memory expandable to 4K.

The display station is interchangeable with the IBM 3277 Model 2 and can be attached directly to an IBM controller in place of the IBM display station.

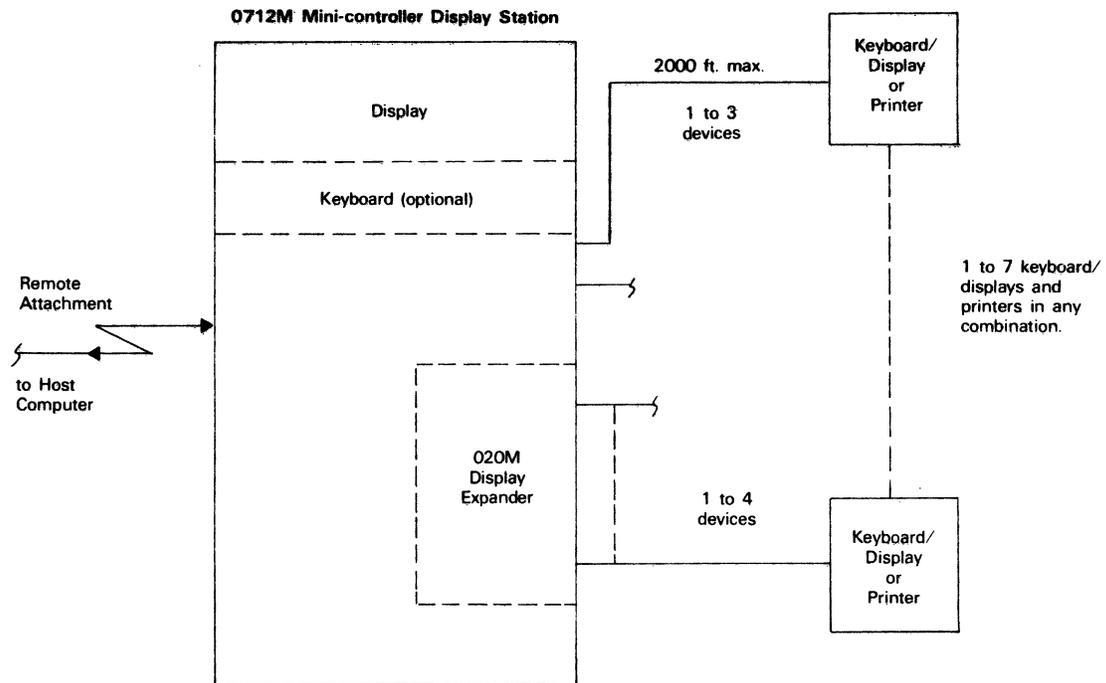
KEYBOARD: Five detachable keyboard models including typewriter, data entry, and operator console keyboard styles are available. All models generate the EBCDIC code exclusively. Three models of typewriter-style keyboards include a 66-key (Model 0630) version, a 78-key (Model 0633) version (with 12 Program Function keys), and a 78-key (Model 0634) version with combined 12-key numeric pad and Program Function keys. The Program Function keys are enabled via shifting. The two other keyboards include a 66-key data entry style keyboard and a 78-key operator console keyboard. Keyboard options include N-Key rollover and a security keylock.

LINE PRINTER: Model 0884 is a shuttle matrix printer with 132 character positions rated at 125 lines/minute. The microprocessor-controlled buffered printer is interchangeable with the IBM 3288 printer for use on Trivex or IBM controllers. The standard character set includes 64 upper case symbols; 96- and 128-character symbol sets are optional. Each character is formed within a 5-by-7 or 5-by-9 (lower case) dot matrix. Horizontal spacing is 10 characters/inch; vertical spacing is switchable at 6 or 8 lines/inch. The adjustable tractor feed accommodates multipart forms up to 5 copies (including an original) from 5 to 16 inches

Trivex Plus 70



Configuration



Trivex Plus 70

► wide. An electronic 12-channel vertical forms unit is standard. Rear or bottom paper feed is available.

SERIAL PRINTER: Two models of serial impact printers are available for use with either Trivex Plus 70 or IBM 3270 controllers. Both models are buffered and print bidirectionally. Model 0842 is rated at 80 chars./second, Model 0862 is rated at 165 chars./second. Both models print up to 132 print columns and contain a 1920-character print buffer. The standard character set consists of 64 printable characters; 96- or 128-character sets are optional. Each character is formed via a 7-by-9 dot matrix. The printers feature adjustable tractor feed and accommodate continuous 5-part, pin-fed forms from 2¼ to 14⅞ inches wide. Spacing is 10 char./inch horizontally and 6 or 8 lines/inch vertically. Vertical formatting is implemented via an 8-channel paper tape loop.

OCR WAND: A hand held device with a pistol grip that reads basic OCR-A optical font bidirectionally. The unit

connects directly to the controller through an RS-232 interface. The operator simply moves the wand across the line of data to be read. A skew of up to eight percent can be tolerated. The source surface can be flat or curved.

PRICING

The Trivex Plus 70 is available for purchase or on a 1-, 2-, 3-, or 4-year lease. Maintenance contracts are available for leased or purchased equipment for either prime-shift or full 24-hr./day, 7-day/week device. Full maintenance service is priced 50 percent more than prime-shift service. Service calls outside of contracted service hours are charged at \$45/hr. plus travel time. No installation fees are charged except for cables. The investment tax credit is passed on to the customer for purchased equipment or leased (4-year leases only). On-site training is tailored to customer specifications at no extra cost and includes documentation.

		Monthly Charge (1)					
		1-Yr. Lease	2-Yr. Lease	3-Yr. Lease	4-Yr. Lease	Purchase	Monthly Maint.
Control Units							
0712	Remote, Bisync (2)	\$175	\$160	\$150	\$137	\$4,185	\$25
0722	Local (2)	217	200	187	170	5,390	30
020	Device Adapter	15	14	13	12	375	2
Mini Cluster							
0712M	Mini-Controller and display unit (without keyboard)	(5)	(5)	125	118	3,950	20
020M	Display Expander	(5)	(5)	10	9	315	2
0772M	Display with 78-key keyboard	(5)	(5)	79	72.50	2,980	4
0772M	Display with 66-Key Keyboard	(5)	(5)	76	69.50	2,910	4
Display Stations							
0771	480-Character Display Unit without keyboard	85	77	70	64.50	2,900	4
0772	1920-Character Display Unit without keyboard	85	76	67	61	2,900	7
0752	1920-Character Stand-Alone Display Terminal without keyboard, BSC	140	125	118	110	3,950	20
Display Station Options							
032	Lower Case Alphabets	7	6	6	5	285	1
035	Light Pen	26	24	22	20	660	2
034	Numeric Key Lock	35(4)	35(4)	35(4)	35(4)	35(4)	0
037	OCR Wand	140	130	120	110	3,750	15
021	Display Print	2	2	2	2	75	0
033	Prompting Line (0772 only)	2	2	2	2	60	0
Keyboards							
0630	66-Key Typewriter	7	6	5	4.50	315	2
0631	66-Key Data Entry	7	6	5	4.50	315	2
0632	78-Key Operator Console	26	24	22	20	625	4
0633	78-Key Typewriter	10	9	8	7.50	385	3
0633N	N-Key Rollover	3	3	3	3	60	1
0634	78-Key Typewriter with 10-key Numeric Pad	19	17	16	15	445	3
Printers							
0842	Printer, 80 cps with integral electronics	229	210	193	181	5,625	25
0862	Printer, 165 cps with integral electronics	255	235	220	208	6,450	30
0844	Printer, 80 cps with separate electronics	229	210	193	181	5,625	25
0864	Printer, 165 cps with separate electronics	255	235	220	208	6,450	30
0884	Printer, 125 lpm with separate electronics	360	335	305	290	8,100	80
0843	Printer for 0752 stand-alone terminal, 80 cps	172	160	151	136	4,600	22
0863	Printer for 0752 stand-alone terminal, 165 cps	193	181	173	150	5,300	28
0883	Printer for 0752 stand-alone terminal, 125 lpm	290	265	250	235	6,900	70
045	Forms Stand (for 842 and 862)					50	
046	Printer Ribbon					5.50	
047	Dust Cover					35	

Trivex Plus 70

Monthly Charge (1)

	<u>1-Yr.</u>	<u>2-Yr.</u>	<u>3-Yr.</u>	<u>4-Yr.</u>	<u>Purchase</u>	<u>Monthly</u>
	<u>Lease</u>	<u>Lease</u>	<u>Lease</u>	<u>Lease</u>		<u>Maint.</u>
Printers (cont'd)						
053	Format Control Memory (for 842 and 862; up to 8 formats)				95	
051	Printer Table				150	
049	Forms, Stand, (for 884)				250	
041	Printer Station Kit (contains 12 ribbons and 6 VFU tapes) (3)				155	

(1) Includes prime-shift maintenance.

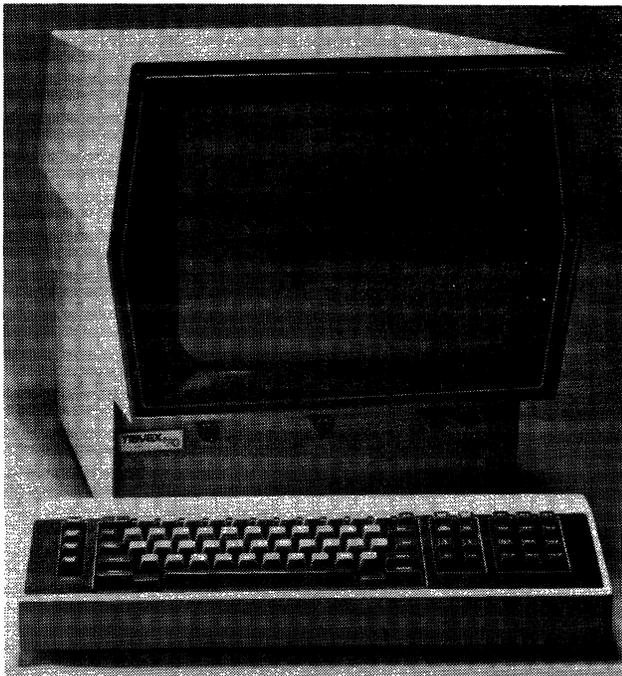
(2) Includes one Device Adapter, which accommodates three additional adapters for a total of four. Each adapter handles 8 devices.

(3) Forms stand (045) and Dust Cover (047) are included in the price of the 842, 862, 843, 863, 844, and 864 printers when the printer Starter Kit is purchased.

(4) Single use charge.

(5) Currently not available on a one- or two-year lease.■

Trivex Plus 70



A microprocessor-based replacement for the IBM 3270 Information Display System in a local or remote environment. It supports any mix of up to 32 display stations and printers.

Enhancements include extended display features and print speeds.

A typical 8-station (1920-character screens) remote terminal without printers costs \$1,016 per month including maintenance on a 2-year lease.

A 16-station remote terminal consisting of 8 1920-character display stations and 8 165-cps printers costs \$2,910 per month including maintenance on a 2-year lease.

The Plus 70 is completely compatible with the IBM 3270 and can use existing IBM cables.

MANAGEMENT SUMMARY

Trivex, an early manufacturer of replacement CRT terminals for the IBM 2260 and 2265 market, introduced itself to the IBM 3270 environment in May 1975 as a manufacturer and vendor of IBM 3270-compatible terminals. The Trivex Plus 70 is a microprocessor-based, clustered terminal designed for local operation as an IBM System/370 peripheral subsystem or for remote operation as an interactive terminal. The cluster configuration can contain as many as 32 devices, including any combination of CRT display stations and printers. The Plus 70 can use existing IBM cables; however, Trivex also furnishes cables.

The Trivex Plus 70 provides complete compatibility with the IBM 3270 with respect to line discipline, commands and command-code structure, and addressing sequence. The Trivex terminals also provide all the features and functions that are currently available with the IBM 3270, as well as some worthwhile enhancements.

The salient features of the Plus 70 system as compared with those of IBM include:

- Display capacity—Like its IBM counterpart, the Plus 70 offers a choice of two screen sizes: 480 and 1920 characters. The two screen sizes can be mixed in a cluster.
- System configuration—The clustered systems are available in both local and remote configurations, and like the IBM 3270, can accommodate any mix of displays and printers in increments of up to 8 devices to a ▶

CHARACTERISTICS

VENDOR: Trivex, Inc., 3180 Red Hill Avenue, Costa Mesa, California 92626. Phone (714) 546-7781.

DATE OF ANNOUNCEMENT: March 1975.

DATE OF FIRST DELIVERY: May 1975.

NUMBER DELIVERED TO DATE: Over 800.

SERVICED BY: Trivex; about 20 service locations.

CONFIGURATION

The Trivex Plus 70 is a microprocessor-based alphanumeric display terminal designed as a replacement for the IBM 3270 Information Display System in a local or remote environment.

The Plus 70 is available in a cluster configuration that can accommodate up to 32 devices, including any mix of CRT display units and serial printers. The control unit provides individual buffering for each device, which can be located up to 2000 cable-feet from the control unit. Each display unit can support a light pen, an ID card reader, and an OCR hand-held wand.

Three models of cluster control units are available: Model 0722, for local operation; Model 0712, for remote BSC operation and Model 07112 for remote SDLC operation. The local controller contains a channel interface for direct connection (via up to 200 feet of cable) to an IBM System/360 Models 25 through 195 or 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 is attached to a communications facility via a modem. The maximum cable length between controller and modem is 50 feet. ▶

Trivex Plus 70

▷ maximum system size of 32 devices. A stand-alone version is also available.

- Displayed output—The Plus 70 display units feature a standard displayable character set of 64 symbols; 96-symbols (including lower case alphabets) are available as an option. Display resolution is the same as the IBM 3270; each character is formed by a 7x9 dot matrix. By contrast, the IBM 3270 has a standard 64-character set of upper case alphabets (lower case alphabets are available via an RPQ). Like its IBM counterpart, the Plus 70 features two beam intensity levels and beam blanking; individual characters or fields can be displayed at a brighter-than-normal intensity to contrast with data displayed at a normal level of brightness, or the data can be blanked (not displayed) for security purposes. Also standard for the Plus 70 is protected format operation.
- Key entry—Four keyboard styles are available, which are equivalent to the IBM 66-key data entry and typewriter keyboards and 78-key typewriter and operator console keyboards.
- Printed output—Trivex currently offers two models of serial impact printers rated at 80 cps or 165 cps. Both printers offered by Trivex have 132 print positions and a 1920-character buffer so that printing does not effect system throughput speed. By comparison, IBM offers two serial impact printers rated at 40 or 66 cps and a line printer rated at 120 lpm. All are available with 132 print positions and except for the line printer, all are buffered.
- Communications—Transmission speeds for the Plus 70 range from 300 to 9600 bits per second, compared with 1200 to 4800 bits per second for the IBM 3270. Communications protocol is IBM BSC or SDLC as desired.
- Compatibility—Each of the major components (controller, display, and printer) is microprocessor controlled and can replace the equivalent component within an IBM 3270 configuration.
- Software support—The Plus 70 is compatible with all existing IBM software supporting the 3270. □

▷ The basic cluster control unit (all models) contains one device adapter that can accommodate up to eight devices. Eight additional devices can be accommodated via each subsequent device adapter, up to a total of four adapters. Each adapter can accommodate any combination of the display unit and printer models.

The stand alone controller (Model 0752) is packaged with a CRT display. A keyboard and an unbuffered 80 or 165 cps printer can be added.

TRANSMISSION SPECIFICATIONS

Transmission is half-duplex, synchronous at switch-selectable data rates from 110 to 9600 bits/second using 8-level EBCDIC transmission code. IBM BSC or SDLC

communications protocol can be specified for the cluster configuration; only BSC is provided for the stand alone configuration. The remote controllers provide an EIA Standard RS-232C interface for connection to a voice-grade communications facility via a modem. Bell System modems that can be used include the 103A/F or 113A/B (up to 300 bps) and the Dataphone 1200, 1800, 2400, 4800 and 9600.

DEVICE CONTROL

The Trivex Plus 70 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 Plus 70 responds to and executes the full repertoire of IBM 3270 commands via a firmware-controlled microprocessor.

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, backtabbed to the beginning of the previous unprotected data field or home position, and reset to line position. Switch selection provides cursor blinking or nonblinking.

Program Function and Program Attention keys, a standard feature of the IBM 3270, are also standard in the Plus 70. 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 clustered display and functionally corresponds to IBM's Selector Pen, a 3270 option. Any one or 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.

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 attribute codes is the same as for the IBM 3270. Optionally, each character position in a data entry field can be filled with dots, which are replaced by keyed data. Character and field blanking can be specified by the program, which can also specify high or low beam intensity.

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

The switch selectable audible alarm alerts the operator upon illegal entry.

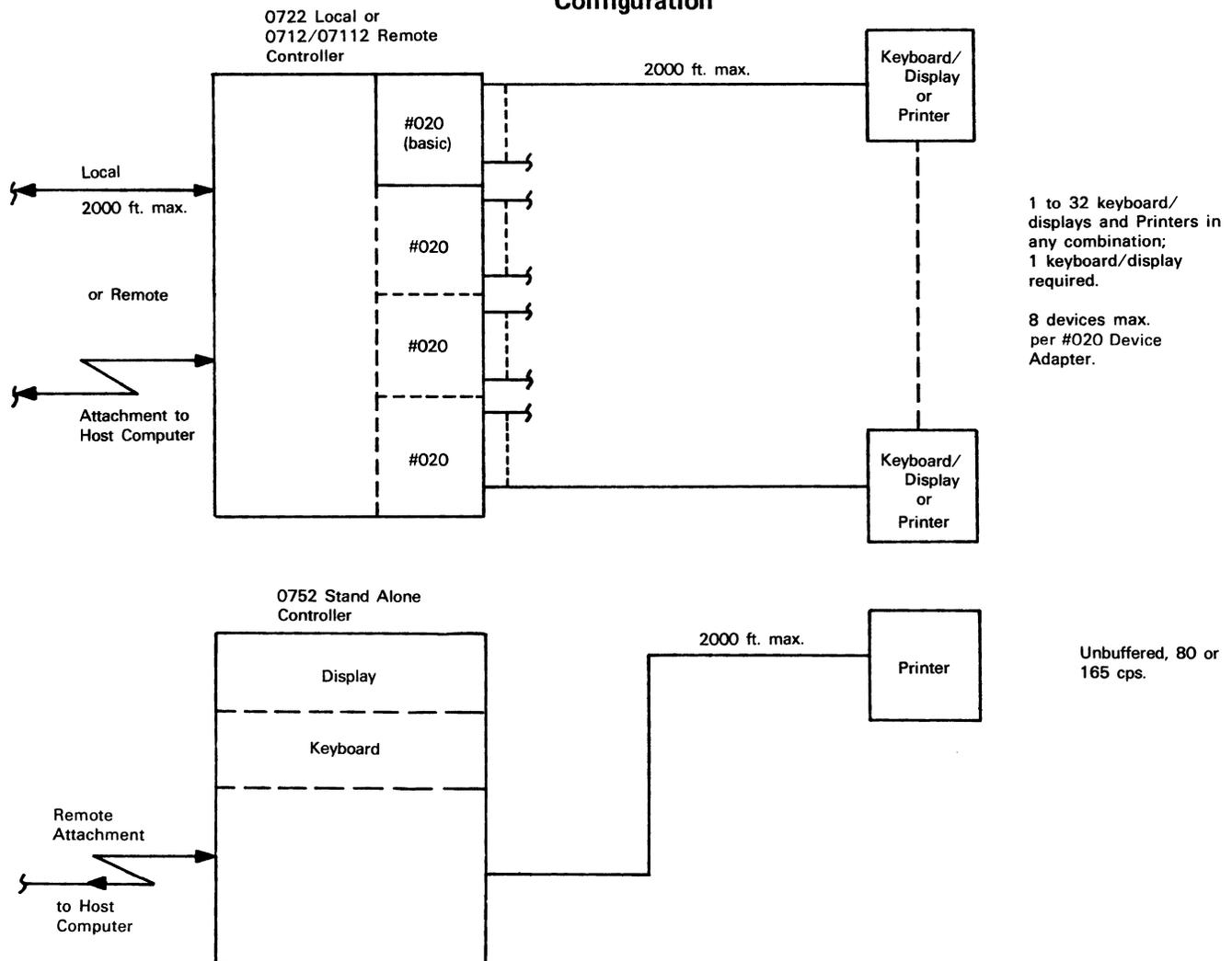
In addition to the IBM standard on-line indicators, the Plus 70 provides five terminal status indicators. A diagnostic program is also provided for off-line self test and fault isolation in each system component.

COMPONENTS

DISPLAY STATION: A CRT display unit with 14-inch (diagonal measurement) anti-glare screen and detachable ▶

Trivex Plus 70

Configuration



► keyboard. The display area measures 8 inches high by 11 inches wide. A character set of 64 or 96 (optional) symbols including upper and lower (optional) case alphabets, numerics, and special symbols is displayed in white or green (optional) against a dark background. Each character is formed by a matrix of 7 by 9 dots. The display unit contains a 768 word PROM memory expandable to 4K for control program (firmware) storage and a 2K RAM display memory expandable to 4K. Two models of display units are available.

	0771	0772
Characters/display:	480	1920
Lines/display:	12	24
Characters/line:	40	80

Four keyboard models including typewriter, data entry, and operator console keyboard styles are available. All models generate the EBCDIC code exclusively. Two models of typewriter-style keyboards include a 66-key (Model 0630) and a 78-key (Model 0633) version equivalent to their IBM counterparts; the 78-key keyboard provides 12 Program Function keys. The two other keyboards include a 66-key data entry style keyboard and a 78-key operator console keyboard equivalent to the counterpart IBM keyboards.

SERIAL PRINTER: Two models of serial impact printers are available for use with either Trivex Plus 70 or IBM 3270 controllers. Both models are buffered and print bidirectionally. Model 0842 is rated at 80 chars./second, Model 0862 is rated at 165 chars./second. Both models print up to 132 print columns and contain a 1920-character print buffer. The standard character set consists of 64 printable characters; 96- or 128-character sets are optional. Each character is formed via a 7-by-9 dot matrix. The printers feature adjustable tractor feed and accommodate continuous 5-part, pin-fed forms from 2¼ to 14⅞ inches wide. Spacing is 10 char./inch horizontally and 6 or 8 lines/inch vertically. Vertical formatting is implemented via an 8-channel paper tape loop.

OCR WAND: A hand held device with a pistol grip that reads basic OCR-A optical font bidirectionally. The unit connects directly to the controller through an RS-232 interface. The operator simply moves the wand across the line of data to be read. A skew of up to eight percent can be tolerated. The source surface can be flat or curved.

PRICING

The Trivex Plus 70 is available for purchase or on a 2-, 3-, or 4-year lease. Maintenance contracts are available for leased or purchased equipment for either prime-shift or ►

Trivex Plus 70

► full 24-hr./day, 7-day/week device. Full maintenance service is priced 50 percent more than prime-shift service. Service calls outside of contracted service hours are charged at \$45/hr. plus travel time. No installation fees

are charged except for cables. The investment tax credit is passed on to the customer for purchased equipment or leased (4-year leases only). On-site training is tailored to customer specifications at no extra cost and includes documentation.

		Monthly Rental (1)				Purchase	Monthly Maint. (4)
		1-Yr. Lease	2-Yr. Lease	3-Yr. Lease	4-Yr. Lease		
Control Units							
0722	Local (2)	\$207	\$200	\$187	\$170	\$5,390	\$30
0712	Remote, Bisync (2)	175	160	150	137	4,185	25
07112	Remote, SDLC (2)	220	205	191	170	5,570	30
020	Display Adapter	15	14	13	12	375	2
0752	Stand alone, Remote, BSC (includes display)	155	120	108	98	3,950	20
Display Stations (3)							
0772	1920 character	104	95	88	79	2,900	7
Keyboards							
0630	66-key Typewriter	13	12	11	10	315	2
0633	78-key Typewriter	17	15	14	13	385	3
0631	66-key Data Entry	13	12	11	10	315	2
0632	78-key Operator Console	26	24	22	20	625	4
Printers							
0842	80 cps	229	210	193	181	5,625	25
0862	165 cps	255	235	220	208	6,450	30
045	Forms Stand	—	—	—	—	50	—
046	Printer Ribbon	—	—	—	—	5.50	—
047	Dust Cover	—	—	—	—	25	—
Options							
032	Displayed lower case alphabets	7	6	6	5	285	1
034	Security Keylock	—	—	—	—	35	—
035	Selector Light Pen	26	24	22	20	660	2
036	Operator ID Card Reader	16	15	14	12	435	1
037	OCR Wand	115	105	97	87	2,500	10

Cables are priced as follows:

Channel to controller: \$300 plus \$0.10/ft.

Modem to controller: \$12 plus \$0.20/ft.

Display station to controller: \$7,50 plus \$0.16/ft.

Printer controller: \$120 plus \$0.40/ft.

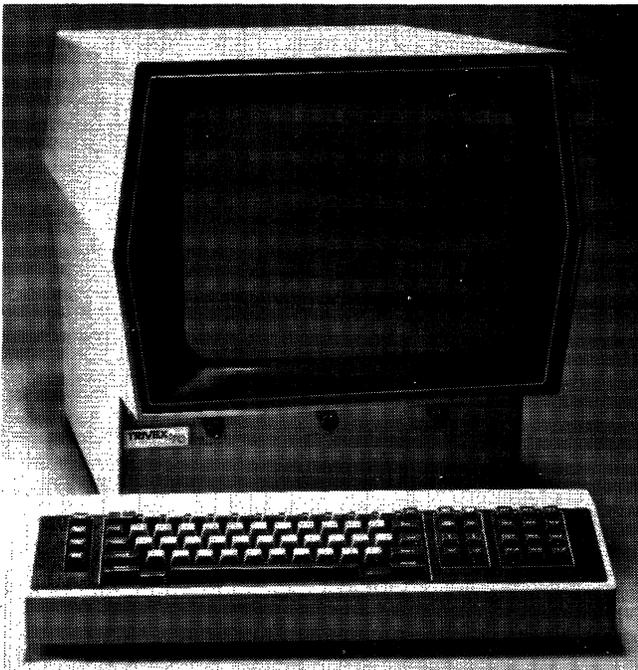
(1) Includes prime-shift maintenance.

Includes one Device Adapter; accommodates three additional adapters for a total of four. Each adapter handles 8 devices.

(3) Contact vendor for prices on 480-character display.

(4) Prime-shift maintenance; service for 24 hours/day, 7 days/week is priced 1.5 times this rate.■

Trivex Plus 70



MANAGEMENT SUMMARY

Trivex, an early manufacturer of replacement CRT terminals for the IBM 2260 and 2265 market, introduced itself to the IBM 3270 environment in May 1975 as a manufacturer and vendor of IBM 3270-compatible terminals. The Trivex Plus 70 is a microprocessor-based, clustered terminal designed for local operation as an IBM System/370 peripheral subsystem or for remote operation as an interactive terminal. The cluster configuration can contain as many as 32 devices, including any combination of CRT display stations and printers. The Plus 70 can use existing IBM cables; however, Trivex also furnishes cables.

The Trivex Plus 70 provides complete compatibility with the IBM 3270 with respect to line discipline, commands and command-code structure, and addressing sequence. The Trivex terminals also provide all the features and functions that are currently available with the IBM 3270, as well as some worthwhile enhancements.

The salient features of the Plus 70 system as compared with those of IBM include:

- Display capacity—Like its IBM counterpart, the Plus 70 offers a choice of two screen sizes: 480 and 1920 characters. The two screen sizes can be mixed in a cluster.
- System configuration—The clustered systems are available in both local and remote configurations, and like the IBM 3270, can accommodate any mix of displays and printers in increments of up to 8 devices to a maximum system size of 32 devices.

A microprocessor-based replacement for the IBM 3270 Information Display System in a local or remote environment. It supports any mix of up to 32 display stations and printers.

Enhancements include extended display features and print speeds.

A typical 8-station (1920-character screens) remote terminal without printers costs \$1,088 per month including maintenance on a 2-year lease.

A 16-station remote terminal consisting of 8 1920-character display stations and 8 165-cps printers costs \$2,830 per month including maintenance on a 2-year lease.

The Plus 70 is completely compatible with the IBM 3270 and can use existing IBM cables.

CHARACTERISTICS

VENDOR: Trivex, Inc., 3180 Red Hill Avenue, Costa Mesa, California 92626. Phone (714) 546-7781.

DATE OF ANNOUNCEMENT: March 1975.

DATE OF FIRST DELIVERY: May 1975.

NUMBER DELIVERED TO DATE: Over 800.

SERVICED BY: Trivex; about 20 service locations.

CONFIGURATION

The Trivex Plus 70 is a microprocessor-based alphanumeric display terminal designed as a replacement for the IBM 3270 Information Display System in a local or remote environment. The plus 70 is available in a cluster configuration that can accommodate up to 32 devices, including any mix of CRT display units and serial printers. The control unit provides individual buffering for each device, which can be located up to 2000 cable-feet from the control unit. Each display unit can support a light pen and ID card reader.

Two models of control units are available: Model 0722, for local operation, and Model 0712, for remote operation. The local controller, Model 0722, contains a channel interface for direct connection (via up to 200 feet of cable) to an IBM System/360 Models 25 through 195 or 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 0712, is attached to a communications facility via a modem. The maximum cable length between controller and modem is 50 feet.

The basic control unit (both models) contains one device adapter that can accommodate up to eight devices. Eight additional devices can be accommodated via each

Trivex Plus 70

- ● Displayed output—The Plus 70 display units feature a standard displayable character set of 64 symbols; 96-symbols (including lower case alphabets) are available as an option. Display resolution is the same as the IBM 3270; each character is formed by a 7x9 dot matrix. By contrast, the IBM 3270 has a standard 64-character set of upper case alphabets (lower case alphabets are available via an RPQ). Like its IBM counterpart, the Plus 70 features two beam intensity levels and beam blanking; individual characters or fields can be displayed at a brighter-than-normal intensity to contrast with data displayed at a normal level of brightness, or the data can be blanked (not displayed) for security purposes. Also standard for the Plus 70 is protected format operation.
- Key entry—Four keyboard styles are available, which are equivalent to the IBM 66-key data entry and typewriter keyboards and 78-key typewriter and operator console keyboards.
- Printed output—Trivex currently offers two models of serial impact printers rated at 80 cps or 165 cps. Both printers offered by Trivex have 132 print positions and a 1920-character buffer so that printing does not effect system throughput speed. By comparison, IBM offers two serial impact printers rated at 40 or 66 cps and a line printer rated at 120 lpm. All are available with 132 print positions and except for the line printer, all are buffered.
- Communications—Transmission speeds for the Plus 70 range from 300 to 9600 bits per second, compared with 1200 to 4800 bits per second for the IBM 3270. Communications protocol is IBM BSC or SDLC as desired.
- Software support—The Plus 70 is compatible with all existing IBM software supporting the 3270. □
- subsequent device adapter, up to a total of four adapters. Each adapter can accommodate any combination of the display unit and printer models.

TRANSMISSION SPECIFICATIONS

Transmission is half duplex, synchronous at switch-selectable data rates from 110 to 9600 bits/second using 8-level EBCDIC transmission code. IBM BSC or SDLC communications protocol can be specified. The Model 0712 controller provides an EIA Standard RS-232C interface for connection to a voice-grade communications facility via a modem. Bell System modems that can be used include the 103A/F or 113A/B (up to 300 bps) and the Dataphone 1200, 1800, 2400, 4800 and 9600.

DEVICE CONTROL

The Trivex Plus 70 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 Plus 70 responds to and executes the full repertoire of IBM 3270 commands via a firmware-controlled microprocessor.

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, backtabbed to the beginning of the previous unprotected data field or home position, and reset to line position. Switch selection provides cursor blinking or nonblinking.

Program Function and Program Attention keys, a standard feature of the IBM 3270, are also standard in the Plus 70. 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 and functionally corresponds to IBM's Selector Pen, a 3270 option. Any one or 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.

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 attribute codes is the same as for the IBM 3270. Optionally, each character position in a data entry field can be filled with dots, which are replaced by keyed data. Character and field blanking can be specified by the program, which can also specify high or low beam intensity.

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

The switch selectable audible alarm alerts the operator, upon illegal entry.

In addition to the IBM-standard on-line indicators, the Plus 70 provides five terminal status indicators. A diagnostic program is also provided for off-line self test and fault isolation.

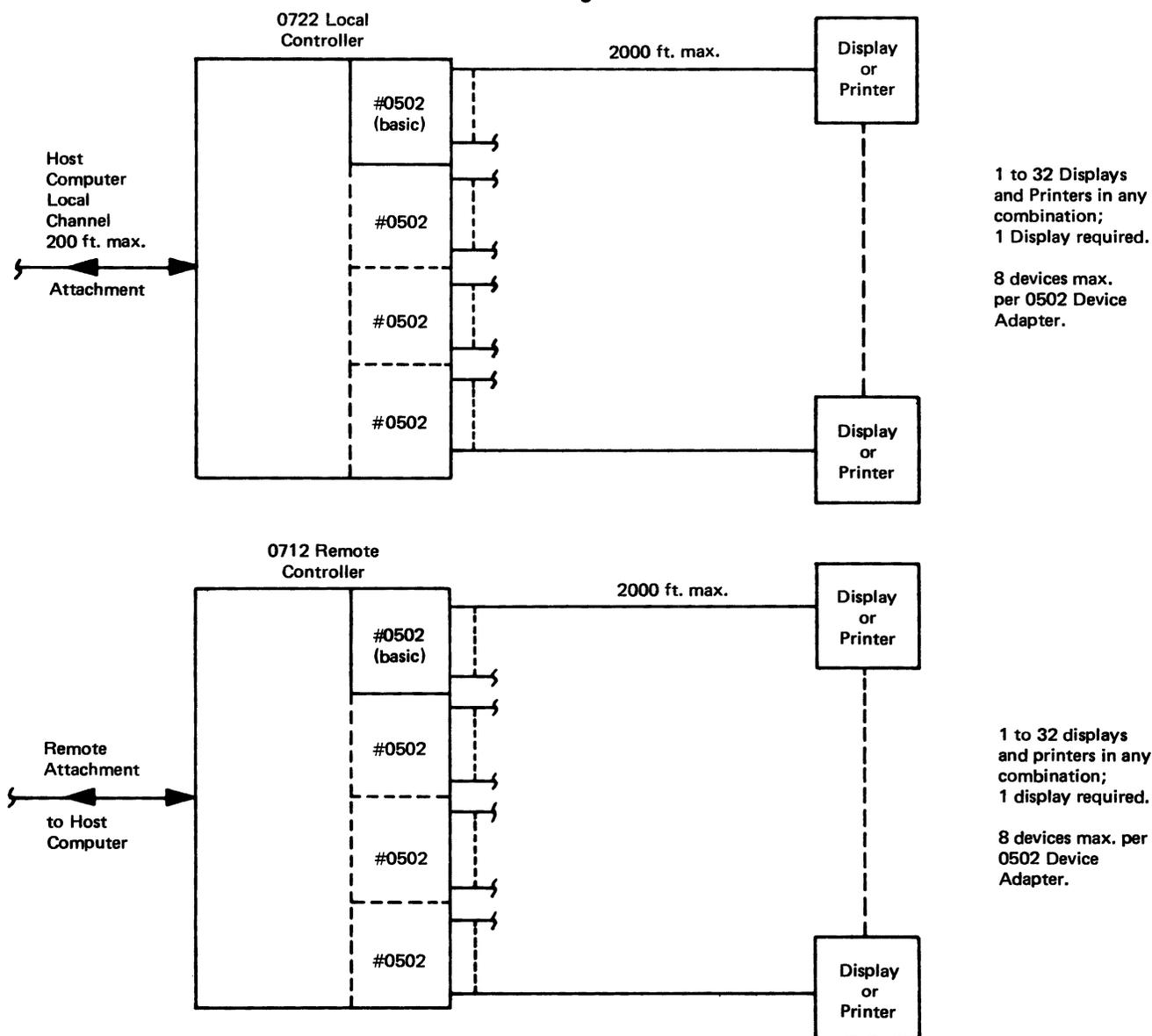
COMPONENTS

DISPLAY STATION: A CRT display unit with 14-inch (diagonal measurement) anti-glare screen and detachable keyboard. The display area measures 8 inches high by 11 inches wide. A character set of 64 or 96 (optional) symbols including upper and lower (optional) case alphabets, numerics, and special symbols is displayed in white or green (optional) against a dark background. Each character is formed by a matrix of 7 by 9 dots. The display unit contains a 768 word PROM memory expandable to 2K for control program (firmware) storage and a 2K RAM display memory expandable to 4K. Two models of display units are available.

	<u>0771</u>	<u>0772</u>
Characters/display:	480	1920
Lines/display:	12	24
Characters/line:	40	80

Trivex Plus 70

Configuration



► Four keyboard models including typewriter, data entry, and operator console keyboard styles are available. All models generate the EBCDIC code exclusively. Two models of typewriter-style keyboards include a 66-key (Model 0630) and a 78-key (Model 0633) version equivalent to their IBM counterparts; the 78-key keyboard provides 12 Program Function keys. The two other keyboards include a 66-key data entry style keyboard and a 78-key operator console keyboard equivalent to the counterpart IBM keyboards.

SERIAL PRINTER: Two models of serial impact printers are available for use with either Trivex Plus 70 or IBM 3270 controllers. Both models are buffered and print bi-directionally. Model 0822 is rated at 80 chars./second, Model 0842 is rated at 165 chars./second. Both models are available with 120, 126, or 132 print columns and contain a 1920-character print buffer. The standard character set

consists of 64 printable characters; 96- or 128-character sets are optional. Each character is formed via a 7-by-9 dot matrix. The printers feature adjustable tractor feed and accommodate continuous 5-part, pin-fed forms from 2-3/4 to 14-7/8 inches wide. Spacing is 10 char./inch horizontally and 6 or 8 lines/inch vertically. Vertical formatting is implemented via an 8-channel paper tape loop. Double width boldface characters can be specified by program control.

PRICING

The Trivex Plus 70 is available for purchase or on a 2-, 3-, or 4-year lease. Maintenance contracts are available for leased or purchased equipment for either prime-shift or full 24-hr./day, 7-day/week device. Full maintenance service is priced 50 percent more than prime-shift service. Service ►

Trivex Plus 70

► calls outside of contracted service hours are charged at \$45/hr. plus travel time. No installation fees are charged except for cables. The investment tax credit is passed on to the customer for purchased equipment or leased equipment

(4-year leases only). On-site training is tailored to customer specifications at no extra cost and includes documentation.

The Trivex Plus 70 pricing is shown below.

	Monthly Rental (1)			Monthly Maint. (3)
	2-Yr. Lease	3-Yr. Lease	Purchase	
Control Units				
Model 0722 Local (2)	\$200	\$187	\$5,390	\$30
Model 0712 Remote (2)	160	150	4,185	25
Device Adapter (0502)	22	21	375	10
Display Stations				
Model 0771 (480-char. screen)	Contact Vendor			
Model 0772 (1920-char. screen)	104	95	2,900	7
Keyboards				
Model 0630, 66-key Typewriter	12	11	315	2
Model 0633, 78-key Typewriter	15	14	385	3
Model 0631, 66-key Data Entry	12	11	315	2
Model 0632, 78-key Operator Console	24	22	625	4
Printers				
Model 0822, 80 cps	185	168	5,625	30
Model 0842, 165 cps	205	190	6,450	
Options				
Displayed lower case alphabetics	6	6	285	1
Security Keylock	35 (4)	35 (4)	35 (4)	0
Selector Light Pen	22	20	600	2
Operator ID Card Reader	15	14	435	1
Option print sets:				
96 characters	Contact Vendor			
128 characters	Contact Vendor			

Cables are priced as follows:

- Channel to controller: \$300 plus \$0.10/ft.
- Modem to controller: \$12 plus \$0.20/ft.
- Display station to controller: \$7.50 plus \$0.16/ft.
- Printer to controller: \$120 plus \$0.40/ft.

- (1) Includes prime-shift maintenance.
- (2) Includes one Device Adapter; accommodates three additional adapters for a total of four. Each adapter handles 8 devices.
- (3) Prime-shift maintenance; service for 24 hours/day, 7 days/week is priced 1.5 times this rate.
- (4) Single-use charge. ■