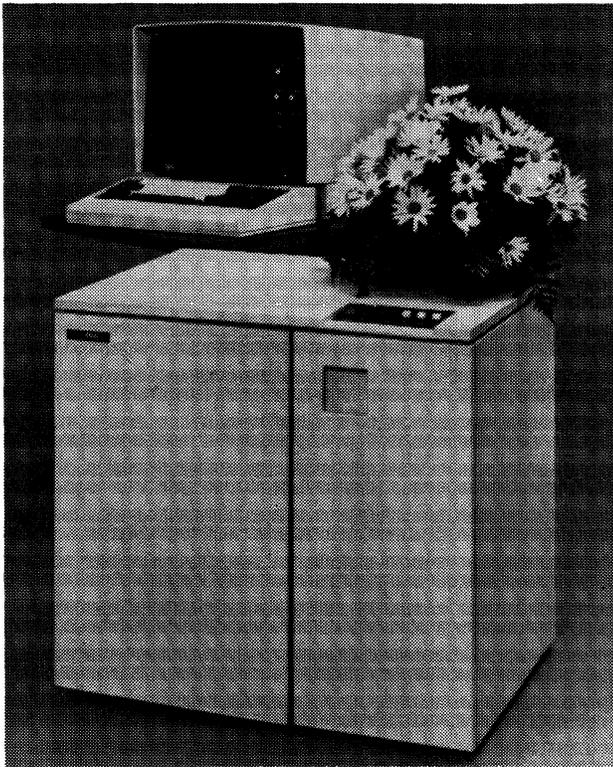


## MDS Trivex Plus 70 & Plus 80



*The MDS Trivex Plus 80 System includes the 8074 Remote Controller and the 8078 Display Station. Up to 32 devices can be connected to the 8074, including 8078 displays and MDS Trivex 8087 serial printers (not shown). The Plus 80 components are fully plug-compatible with the IBM 3274 controller and the IBM 3278 display, and feature SNA/SDLC protocol compatibility.*

### MANAGEMENT SUMMARY

MDS Trivex, a subsidiary of Mohawk Data Sciences, currently offers two families of plug-compatible replacements for the IBM 3270 Information Display System. The Plus 70 family, introduced in 1975, consists of controllers offering 3271/3272 compatibility, and displays offering 3275/3277 compatibility. The Plus 80 family was unveiled in late 1979 with the introduction of a 3278-compatible display. In June 1980, MDS Trivex expanded the Plus 80 family by adding a 3274-compatible controller.

A major advantage of the MDS Trivex Plus 70 and Plus 80 systems is that they are fully interchangeable with existing IBM 3270 components; i.e., IBM display stations and printers can be attached to MDS Trivex controllers and the converse. The Plus 70 and Plus 80 are also designed to use existing IBM cables, although MDS Trivex does furnish its own.

The MDS Trivex Plus 70 and Plus 80 provide complete compatibility with the IBM 3270 with respect to line ▶

**Plug-compatible replacements for first and second generation members of the IBM 3270 Information Display System.**

Plus 70 components include: remote and local controllers compatible with the IBM 3271 and 3272; a 3275-compatible stand-alone display station; a cluster display compatible with the 3277; and a mini-cluster display. Components of the newer Plus 80 series include a 3274-compatible controller and a 3278-compatible display. Impact printers are available for both the Plus 70 and Plus 80 families.

A typical Plus 80 configuration including a remote controller, 16 displays, and two printers is priced at \$1,841 per month on a two-year lease.

### CHARACTERISTICS

**VENDOR:** MDS Trivex, Inc. (a subsidiary of Mohawk Data Sciences), 3180 Red Hill Avenue, Costa Mesa, California 92626. Phone (714) 546-7781.

**DATE OF ANNOUNCEMENT:** Plus 70—March 1975; Plus 80—October 1979.

**DATE OF FIRST DELIVERY:** Plus 70—May 1975; Plus 80—1st Quarter 1980.

**NUMBER DELIVERED TO DATE:** Approximately 37,000 display units.

**SERVICED BY:** MDS Trivex, about 120 service locations.

### CONFIGURATION

The MDS Trivex Plus 70 and Plus 80 are microprocessor-based alphanumeric display terminal families designed as replacements for the IBM 3270 Information Display System in a local or remote environment.

The Plus 70 Series is available in the following configurations:

- Model 0752—a remote stand-alone terminal.
- Model 0722—a local cluster terminal subsystem.
- Model 0712—a remote cluster terminal.
- Model 0712M—a remote mini-cluster terminal.

The Model 0752 remote stand-alone terminal includes one display monitor; a keyboard and an unbuffered 165-cps or 125-lpm printer can be added. Display characteristics are identical to those of the Model 0772 Display Station. An OCR wand and a light pen can also be added. Model 0752 is interchangeable with an IBM 3275 Model 2 operating in half-duplex multipoint mode on full duplex facilities at speeds up to 9600 bps.

The Model 0712 remote cluster controller and Model 0722 local cluster controller can each accommodate up to 32 devices including any combination of Model 0722 display stations and 165-cps or 125-lpm printers. The basic controllers contain a 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 ▶

## MDS Trivex Plus 70 & Plus 80

▷ discipline, commands and command-code structure, and addressing sequence. The MDS Trivex terminals also provide all the features and functions that are currently available with the specific IBM 3270 components they emulate, as well as some worthwhile enhancements, such as easier-to-use self-diagnostics, a wider range of transmission rates, and switchable screen capacities.

MDS Trivex has implemented SNA/SDLC protocol compatibility on the Plus 80 Series. The older Plus 70 Series, however, does not support SDLC.

The Series 800 Printer Stations are available for use with the Plus 70 Series. Two models of serial impact printers are available, as buffered or unbuffered units; both feature print speeds of 165 cps. In November 1981, MDS Trivex enhanced the Plus 80 Series with the addition of the Model 8087 Printer. The 8087, a plug-compatible replacement for the IBM 3287, is an impact printer with a print speed of 180 cps.

Trivex, Inc. was an early manufacturer of replacement CRT terminals for the IBM 2260 and 2265 market. The company entered the IBM 3270 replacement market in 1975 with the introduction of the Plus 70 Series. Trivex was acquired by Mohawk Data Sciences Corporation in January 1979, and the company's name was changed to MDS Trivex.

### USER REACTION

In Datapro's 1981 survey of alphanumeric display terminal users, four responses were received from users of MDS Trivex equipment. All four users responding reported on their experiences with Model 8078 (Plus 80) Display Stations. A total of 70 displays were installed at the four user sites. The ratings given for the MDS Trivex terminals are summarized in the following table.

	Excellent	Good	Fair	Poor	WA*
Overall performance	0	2	2	0	2.5
Ease of operation	0	4	0	0	3.0
Display clarity	1	2	1	0	3.0
Keyboard feel & usability	0	2	2	0	2.5
Hardware reliability	0	1	1	2	1.8
Maintenance service	1	2	1	0	3.0
Technical support	1	0	3	0	2.5

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

Principal applications for the 8078 displays included: program development (4 users); data entry (2 users); and text editing, intracompany message traffic, and as a system console (1 user each). The terminal's detachable keyboard, green phosphor characters, and local editing capabilities were cited as important features.

When asked if they would recommend the Plus 80 terminals to other users with similar applications, three of the users answered that they would; one user said that he would not. □

▶ four adapters for 32 devices. Models 0712 and 0722 are interchangeable with IBM's Model 3271-2 and 3272-2 Control Units, respectively.

The Model 0712M 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). Master display station characteristics are identical to those of the Model 0772 Display Station, except that the master display station will not support the optional OCR Wand. There are no option restrictions for the seven additional devices attached to the 0712M controller. Model 0712M is interchangeable with the IBM 3276-2 Control Unit/Display Station.

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.

The Model 0772 Display Station and 0800 Series printers are interchangeable with IBM 3270 equipment and can be directly connected to IBM controllers in place of the equivalent IBM components.

The Plus 80 Series currently includes the Model 8078, a cluster terminal replacement for the IBM 3278, and the Model 8074 Controller, a plug-replacement for the IBM 3274 Control Unit. MDS Trivex has also added the 8087 printer, a plug-replacement for the IBM 3287 printer.

In the basic Plus 80 configuration, the 8074 Remote Controller can accommodate up to 32 Category A devices, including the 8078 Display Models 1, 2, 3, or 4, the 8087 Printer, or the equivalent IBM components. The 8074 provides control for up to 24 Category B devices, including the 0772 Display, the Series 800 Printers, or the equivalent IBM components. The basic controller contains a device adapter that will control up to eight devices. The unit can be expanded to 32 devices by additional device adapters to increment the devices by eight.

### TRANSMISSION SPECIFICATIONS

Transmission is half-duplex, synchronous at switch-selectable data rates from 300 to 9600 bits/second using 8-level EBCDIC transmission code. 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 MDS Trivex Plus 70 and Plus 80 operate 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 and Plus 80 respond to and execute 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. ▶

## MDS Trivex Plus 70 & Plus 80

► **Program Function and Program Attention keys**, a standard feature of the IBM 3270, are also standard in the Plus 70 and Plus 80. 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 displays 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 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

**MODEL 0712 (PLUS 70) REMOTE CONTROLLER:** A plug-compatible replacement for the IBM 3271 Control Unit, interfacing to the IBM 360/370 System via modems in BSC data link mode. The basic unit will control up to eight devices, in any combination of displays and/or printers, in a remote cluster. A maximum of 32 devices, in increments of eight, can be controlled through the addition of device adapters.

**MODEL 0722 (PLUS 70) LOCAL CONTROLLER:** A plug-compatible replacement for the IBM 3272 Control Unit, interfacing to the IBM 360/370 System via a selector, multiplexer, or block multiplexer channel using existing cables. The basic unit will control up to eight devices, in any combination of displays and/or printers, in a local cluster. A maximum of 32 devices, in increments of eight, can be controlled through the addition of device adapters.

**MODEL 8074 (PLUS 80) REMOTE CONTROLLER:** A plug-compatible replacement for the IBM 3274 Control Unit, interfacing to the IBM 360/370, 303X, 3380, or 4300 Systems via modems in BSC or SNA/SDLC modes. The basic unit will control up to eight devices, in any combination of displays and/or printers, in a remote cluster. A maximum of 32 Category A devices, or 24 Category B devices, in increments of eight, can be controlled through the addition of device adapters.

**MODEL 0712M (PLUS 70) MINI CLUSTER DISPLAY:** A control unit/display station for remote clusters of up to eight devices. Seven additional displays and/or printers can be connected to the 0712M. The basic unit contains a 15-inch (diagonal) anti-glare screen and a detachable keyboard. The display arrangement is 24 lines of 80 characters each for a total of 1920 characters. An EBCDIC character set is standard, displayed in white or green (optional), and formed utilizing a 7-by-9 dot matrix.

**MODEL 0752 (PLUS 70) STAND-ALONE DISPLAY STATION:** A stand-alone display unit with a 15-inch (diagonal) anti-glare screen and a detachable keyboard. The display arrangement is 24 lines of 80 characters each for a total of 1920 characters. An EBCDIC character set is standard, displayed in white or green (optional), and formed utilizing a 7-by-9 dot matrix.

The display station is interchangeable with the IBM 3275 Model 2.

**MODEL 0772 (PLUS 70) DISPLAY STATION:** A CRT display unit with 15-inch (diagonal), 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). 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 nonblinking 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.

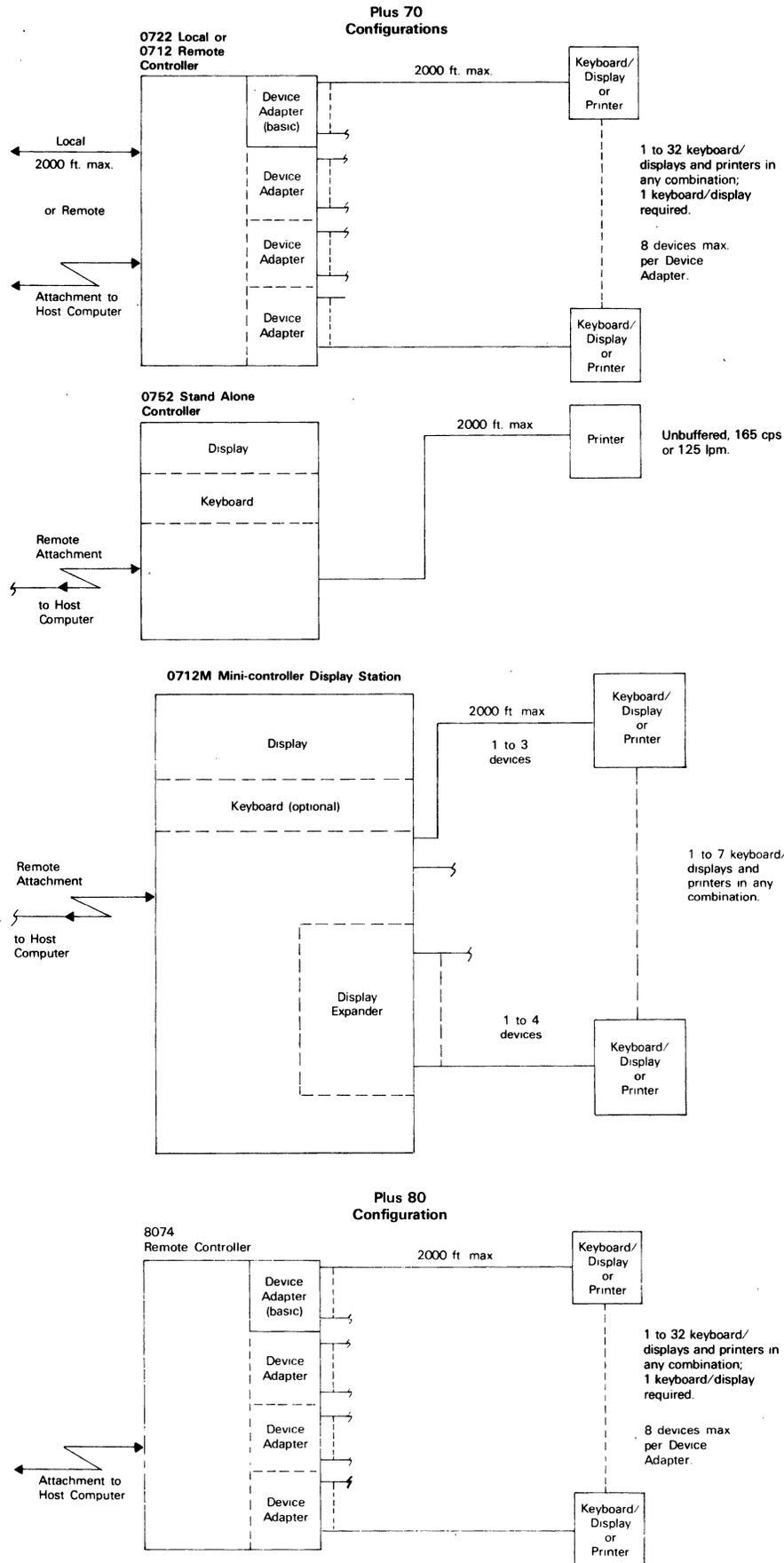
The display station is interchangeable with the IBM 3277 Model 2 and can be attached directly to an IBM controller in place of the IBM display station.

**MODEL 8078 (PLUS 80) DISPLAY STATION:** A CRT display unit with a 15-inch (diagonal) screen and detachable keyboard. Four versions are available which differ only in their display capacities: Model 8078-1 can display 480 or 960 characters (12 lines of 40 or 80 characters); Model 8078-2 displays 1920 characters (24 lines of 80 characters); Model 8078-3 can display 1920 or 2560 characters, (24 or 32 lines of 80 characters); and Model 4 can display 1920 or 3440 characters (24 or 43 lines of 80 characters). Below the last data display line is an operator information area that displays operator, status and error messages. A 94-character set, including upper and lower case alphabets, in either EBCDIC or ASCII code is provided as standard. Each character is formed by a 7-by-14 dot matrix (Models 1, 2, and 3) or 7-by-9 dot matrix (Model 4). A blinking or nonblinking block or underline cursor is switch-selectable. A monospace switch provides an upper-case-only mode compatible with MDS Trivex 0772 or IBM 3277 displays.

The display station is interchangeable with the IBM 3278 Display Station and can be attached directly to an IBM Model 3276 or 3274 controller in place of an IBM display station.

**KEYBOARDS FOR MODEL 0712M, 0752, & 0772 DISPLAY STATIONS:** 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 version, a 78-key version (with 12 Program Function keys), and a 78-key version with ►

## MDS Trivex Plus 70 & Plus 80



## MDS Trivex Plus 70 & Plus 80

► combined 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.

**KEYBOARDS FOR MODEL 8078 DISPLAY STATION:** Six keyboards including typewriter or data entry styles, are available. The four typewriter-style keyboards feature combinations of EBCDIC or ASCII character sets with or without a 12-key numeric/Program Function cluster (the 12 Program Function Keys are enabled by shifting). The two data entry keyboards provide EBCDIC character sets only; one of the two versions is a data entry/keypunch keyboard that provides standard keypunch placement of the Enter key. Alphanumeric, special symbol, and cursor movement keys are typamatic and are set at a standard speed of 10 cps. Optionally, the cursor movement, tab and backtab, and new line keys can be set at 20 cps, and the space bar and dash (underscore) keys at 30 cps. A security lock is also optional.

**MODELS 0862 & 0863 (PLUS 70) SERIAL PRINTERS:** Two models of serial impact printers are available. Model 0862 contains a 1920-character print buffer and is designed for use with the Trivex or IBM controllers. Model 0863 is unbuffered and is designed for use with the Trivex 0752 Stand Alone Display Station. Both models print bi-directional at 165 cps. Maximum print width is 132 columns. The standard character set consists of 64 printable characters; 96- or 128-character sets 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 2¾ to 14⅞ inches wide. Spacing is 10 char./inch horizontally and 6 or 8 lines/inch vertically. Vertical formatting is implemented via the Format Control Memory option, which provides PROM storage for up to eight user-specified operator-selectable formats.

**MODEL 8087 (PLUS 80) SERIAL PRINTER:** A plug-compatible replacement for the IBM 3287 Printer. The 8087 features bi-directional printing at 180 cps. Maximum print width is 132 columns. The standard character set consists of 95 printable EBCDIC characters. Each character is formed via a 7-by-8 dot matrix. The printer features an adjustable sprocket feed and accommodates 5-part forms up to 14⅞ inches wide. Vertical spacing is 6 or 8 lines/inch.

### PRICING

The MDS Trivex Plus 70 is available for purchase or on a 1-, 2-, or 3-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. No installation fees are charged except for cables. On-site training is tailored to customer specifications at no extra cost and includes documentation.

MDS Trivex declined to provide detailed component pricing for the Plus 70 and Plus 80. They did, however, provide the following representative configuration pricing.

**Plus 70 configuration including one 0712 Remote Controller, 16 0772 Display Stations with typewriter-style keyboards, and two 0862 Serial Printers—\$1,696/month on a two-year lease, including maintenance.**

**Plus 80 configuration including one 8074 Remote Controller, 16 8078 Display Stations with typewriter-style keyboards, and two 8087 Serial Printers—\$1,841/month on a two-year lease, including maintenance.■**



## MDS Trivex Plus 70 & Plus 80



MDS Trivex's latest offering, the Model 8078 Display Station, provides plug-for-plug compatibility with IBM's 3278 display. Available in four models, the 8078 supports screen capacities of 480, 960, 1920, 2560, or 3440 characters.

### MANAGEMENT SUMMARY

MDS Corporation, formerly Mohawk Data Sciences Corporation, acquired Trivex, Inc. in January 1979. As a result of the merger, Trivex changed to its present name, MDS Trivex, Inc.

MDS Trivex currently produces a wide range of equipment designed as replacement components for IBM's 3270 Information Display System. Their latest offering, the Model 8078 Display Station, is the first member of their new Plus 80 line. Future plans for the Plus 80 family include the addition of a Model 8074 Controller, a replacement for IBM's 3274 Control Unit, to be announced in May 1980.

The MDS Trivex Plus 70 family contains microprocessor-based clustered and stand-alone terminals designed for local operation as an IBM System/370 peripheral subsystem or for remote operation as interactive terminals.

A major advantage of the MDS Trivex Plus 70 and Plus 80 systems is that they are fully interchangeable with existing IBM 3270 components; i.e., IBM display stations and printers can be attached to MDS Trivex controllers and the converse. The Plus 70 and Plus 80 are also designed to use existing IBM cables, although MDS Trivex does furnish its own. ➤

Two families of cluster and stand-alone display terminals that support plug-for-plug replacement of first and second generation members of the IBM 3270 Information Display System in a local or remote environment.

Components include control units for a cluster of 32 devices or a mini-cluster of 8 devices, a stand-alone display terminal, cluster display stations, and serial or line printers.

The Plus 70 family is compatible with IBM 3271, 3272, 3275, 3276, and 3277 components. The Plus 80 family provides a display station replacement for the IBM 3278.

A typical 16-station remote terminal configuration consisting of 15 1920-character display stations and one 165-cps line printer is priced at \$1,065 per month including maintenance on a two-year lease.

### CHARACTERISTICS

**VENDOR:** MDS Trivex, Inc. (a subsidiary of Mohawk Data Sciences), 3180 Red Hill Avenue, Costa Mesa, California 92626. Phone (714) 546-7781.

**DATE OF ANNOUNCEMENT:** Plus 70—March 1975; Plus 80—October 1979.

**DATE OF FIRST DELIVERY:** Plus 70—May 1975; Plus 80—1st Quarter 1980.

**NUMBER DELIVERED TO DATE:** Over 6000.

**SERVICED BY:** MDS Trivex, about 120 service locations.

### CONFIGURATION

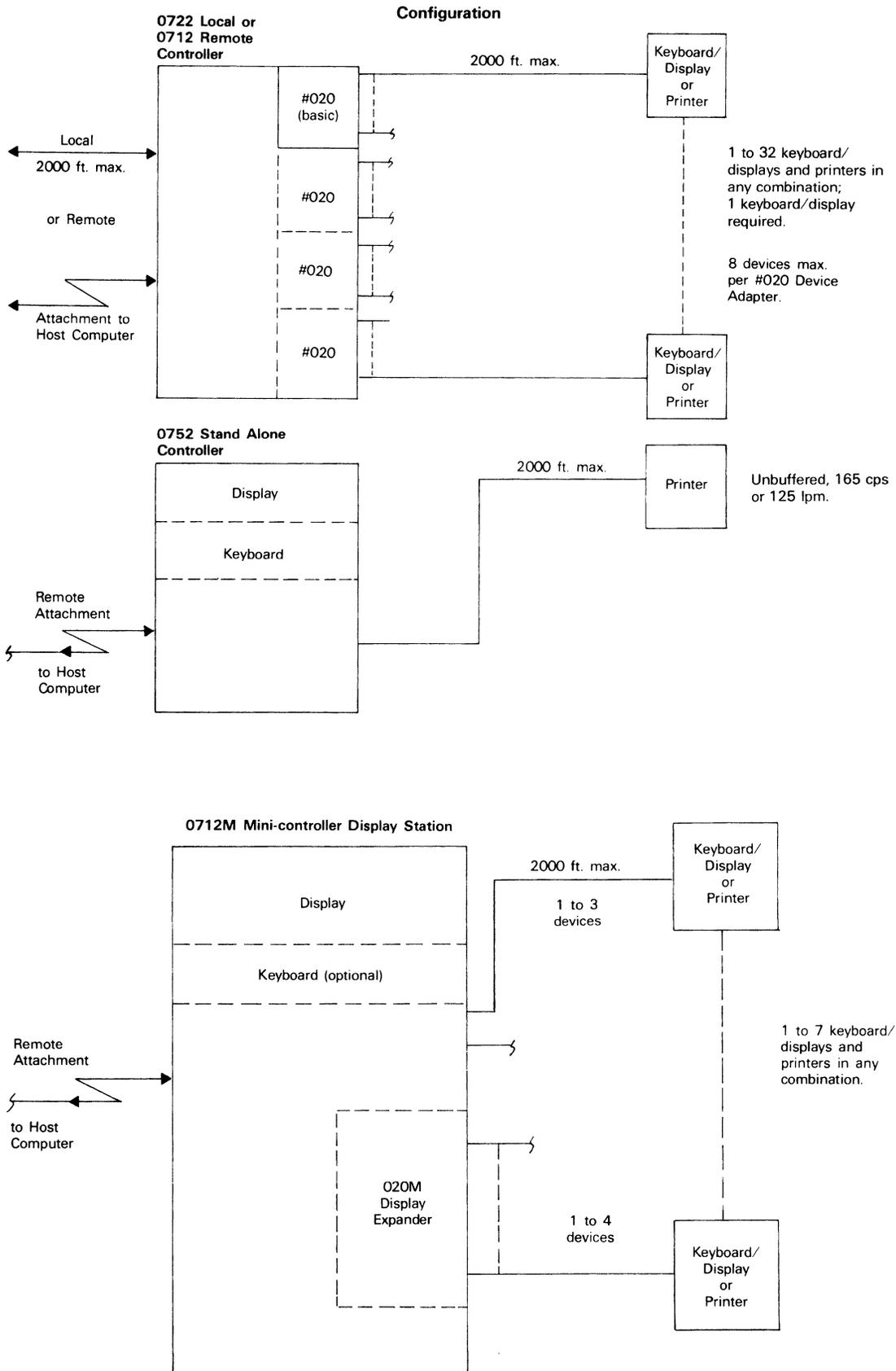
The MDS Trivex Plus 70 and Plus 80 are microprocessor-based alphanumeric display terminal families designed as replacements for the IBM 3270 Information Display System in a local or remote environment.

The Plus 70 Series is available in the following configurations:

- Model 0752—a remote stand-alone terminal.
- Model 0722—a local cluster terminal subsystem.
- Model 0712—a remote cluster terminal.
- Model 0712M—a remote mini-cluster terminal.

The Model 0752 remote stand-alone terminal includes one display monitor; a keyboard and an unbuffered 165-cps or 125-lpm printer can be added. Display characteristics are identical to those of the Model 0772 Display Station. An ➤

### MDS Trivex Plus 70 & Plus 80



## MDS Trivex Plus 70 & Plus 80

▷ The MDS Trivex Plus 70 and Plus 80 provide complete compatibility with the IBM 3270 with respect to line discipline, commands and command-code structure, and addressing sequence. The MDS Trivex terminals also provide all the features and functions that are currently available with the specific IBM 3270 components they emulate, as well as some worthwhile enhancements, such as easier-to-use self-diagnostics, a wider range of transmission rates, and switchable screen capacities. Transmission speeds for the Plus 70 and Plus 80 range from 300 to 9600 bits per second, compared with 1200 to 7200 bits per second for the IBM 3270. However, support for SDLC protocol is not provided by MDS Trivex.

MDS Trivex currently offers two models of serial impact printers rated at 165 cps or 125 lpm. The printers offered by MDS Trivex have 132 print positions and a 1920-character buffer so that (in cluster configurations) 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.

MDS 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 Datapro's 1979 survey of alphanumeric display terminal users, responses were received from eight MDS Trivex Plus 70 users reporting on their experiences with a total of 17 units. Their ratings are summarized below.

	Excellent	Good	Fair	Poor	WA*
Overall performance	5	3	0	0	3.6
Ease of operation	2	6	0	0	3.3
Display clarity	2	3	3	0	2.9
Keyboard feel & usability	2	6	0	0	3.3
Hardware reliability	5	2	1	0	3.5
Maintenance service	4	3	0	1	3.3
Technical support	0	2	0	4	1.7

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

All eight users reported that they were using the display as a plug-compatible replacement for the IBM 3270/3275. They were divided evenly with respect to configuration: four used their Plus 70's as single stations and four as clustered stations.

A high degree of user satisfaction with the MDS Trivex Plus 70 is indicated by the ratings for every aspect except Technical Support. The physical size of the unit was cited as an advantage by four users. Interestingly, four respondents cited price as a strength while four others listed it as a weakness. □

▶ OCR wand and a light pen can also be added. Model 0752 is interchangeable with an IBM 3275 Model 2 operating in half-duplex multipoint mode on full duplex facilities at speeds up to 9600 bps.

The Model 0712 remote cluster controller and Model 0722 local cluster controller can each accommodate up to 32 devices including any combination of Model 0722 display stations and 165-cps or 125-lpm printers. The basic controllers contain a 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 for 32 devices. Models 0712 and 0722 are interchangeable with IBM's Model 3271-2 and 3272-2 Control Units, respectively.

The Model 0712M 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). Master display station characteristics are identical to those of the Model 0772 Display Station, except that the master display station will not support the optional OCR Wand. There are no option restrictions for the seven additional devices attached to the 0712M controller. Model 0712M is interchangeable with the IBM 3276-2 Control Unit/Display Station.

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 0712 and 0712M, 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 0722, 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 0772 Display Station and 0800 Series printers are interchangeable with IBM 3270 equipment and can be directly connected to IBM controllers in place of the equivalent IBM components.

The Plus 80 Series currently includes only the Model 8078, a cluster terminal replacement for the IBM 3278. Announcement of a Model 8074 Controller is anticipated for May 1980; the new controller is expected to be a plug-replacement for the IBM 3274 Control Unit.

### TRANSMISSION SPECIFICATIONS

Transmission is half-duplex, synchronous at switch-selectable data rates from 300 to 9600 bits/second using 8-level EBCDIC transmission code. 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 MDS Trivex Plus 70 and Plus 80 operate 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 and ▶

## MDS Trivex Plus 70 & Plus 80

- Plus 80 respond to and execute 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 and Plus 80. 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 displays 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 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

**MODEL 0772 (PLUS 70) 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.

**MODEL 8078 (PLUS 80) DISPLAY STATION:** A CRT display unit with a 15-inch (diagonal measurement) screen and detachable keyboard. Four versions are available which differ only in their display capacities: Model 8078-1 can display 480 or 960 characters (12 lines of 40 or 80 characters); Model 8078-2 displays 1920 characters (24 lines of 80 characters); Model 8078-3 can display 1920 or 2560 characters, (24 or 32 lines of 80 characters); and Model 4 can display 1920 or 3440 characters (24 or 43 lines of 80 characters). Below the last data display line is an operator information area that displays operator, status and error messages. A 94-character set, including upper and lower case alphabets, in either EBCDIC or ASCII code is provided as standard. Each character is formed by a 7-by-14 dot matrix (Models 1, 2, and 3) or 7-by-9 dot matrix (Model 4). A blinking or non-blinking block or underline cursor is switch-selectable. A monospace switch provides an upper-case-only mode compatible with MDS Trivex 0772 or IBM 3277 displays.

The display station is interchangeable with the IBM 3278 Display Station and can be attached directly to an IBM Model 3276 or 3274 controller in place of an IBM display station.

**KEYBOARDS FOR MODEL 0772 DISPLAY STATION:** 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.

**KEYBOARDS FOR MODEL 8078 DISPLAY STATION:** Six keyboards including typewriter or data entry styles, are available. The four typewriter-style keyboards feature combinations of EBCDIC or ASCII character sets with or without a 12-key numeric/Program Function cluster (the 12 Program Function Keys are enabled by shifting). The two data entry keyboards provide EBCDIC character sets only; one of the two versions is a data entry/keypunch keyboard that provides standard keypunch placement of the Enter key. Alphanumeric, special symbol, and cursor movement keys are typamatic and are set at a standard speed of 10 cps. Optionally, the cursor movement, tab and backtab, and new line keys can be set at 20 cps, and the space bar and dash (underscore) keys at 30 cps. A security lock is also optional.

**LINE PRINTER:** Models 0884 and 0883 are shuttle matrix printers with 132 character positions and are rated at 125 lines/minute. Model 0884 is a microprocessor-controlled buffered printer interchangeable with the IBM 3288 printer for use on Trivex or IBM controllers. Model 0883 is unbuffered and is designed for use with the Trivex 0752 Stand Alone Display Station. 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 wide. An electronic 12-channel vertical forms unit is standard. Rear or bottom paper feed is available. ►

## MDS Trivex Plus 70 & Plus 80

► **SERIAL PRINTER:** Two models of serial impact printers are available. Model 0862 contains a 1920-character print buffer and is designed for use with the Trivex or IBM controllers. Model 0863 is unbuffered and is designed for use with the Trivex 0752 Stand Alone Display Station. Both models print bidirectionally at 165 chars./second. Maximum print width is 132 columns. 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 the Format Control Memory option, which provides PROM storage for up to eight user-specified operator-selectable formats.

**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 inter-

face. 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 MDS Trivex Plus 70 is available for purchase or on a 1-, 2-, or 3-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 \$55/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 (3-year leases only). On-site training is tailored to customer specifications at no extra cost and includes documentation.

As we went to press, pricing was not yet available on the Plus 80 Display Unit.

### Monthly Charge\*

		1-Yr. Lease	2-Yr. Lease	3-Yr. Lease	Purchase	Monthly Maint.
<b>Control Units</b>						
0712	Remote, Bisync; includes one Device Adapter	\$184	\$169	\$159	\$4,185	\$34
0722	Local; includes one Device Adapter	230	213	200	5,390	43
020	Device Adapter; handles up to 8 devices	16	15	14	375	3
<b>Mini Cluster</b>						
0712M	Mini-Controller and display unit (without keyboard)	162	147	127	3,950	22
020M	Display Expander	15	14	10	315	2
0772M8	Display with 78-key keyboard	79	69	59	2,980	14
0772M6	Display with 66-key keyboard	75	65	55	2,910	13
<b>Display Stations</b>						
0772	1920-Character Display Unit without keyboard	108	99	92	2,900	11
0752	1920-Character Stand-Alone Display Terminal without keyboard, BSC	142	127	120	3,950	22
0878	Display Unit	Contact vendor for pricing				
<b>Display Station Options</b>						
011	Green Screen Feature	0	0	0	0	0
032	Lower Case Alphabetics	8	8	7	285	2
035	Light Pen	27	25	23	660	3
034	Security Lock	35**	35**	35**	35	—
037	OCR Wand	151	141	131	3,750	26
021	Display Print	2	2	2	75	—
033	Prompting Line (0772 and 0712M only)	2	2	2	60	—
038	Response Time Statistics	2	2	2	75	—
<b>Keyboards</b>						
0630	66-Key Typewriter	14	13	12	315	3
0631	66-Key Data Entry	14	13	12	315	3
0632	78-Key Operator Console	27	25	23	625	5
0633	78-Key Typewriter	18	16	15	385	4
0633N	N-Key Rollover; for any Plus 70 keyboard	20	18	17	445	4
0634	78-Key Typewriter with 10-key Numeric Pad	20	18	17	445	4
<b>Printers</b>						
0862	Printer, 165 cps with integral electronics	276	256	241	6,450	51
0864	Printer, 165 cps with separate electronics	276	256	241	6,450	51
0884	Printer, 125 lpm with separate electronics	315	285	270	8,100	60
0863	Printer for 0752 stand-alone terminal, 165 cps	203	191	183	5,300	38
0883	Printer for 0752 stand-alone terminal, 125 lpm	245	230	215	6,900	50
045	Forms Stand (for 862)	50**	50**	50**	50	—
046	Printer Ribbon, per spool	—	—	—	8.50	—
048	Dust Cover/Tear Bar	35**	35**	35**	35	—
053	Format Control Memory (up to 8 formats)	95**	95**	95**	95	—
049	Forms Stand (required for 884)	250**	250**	250**	250	—
041	Printer Station Kit (contains 6 ribbon cartridges)	—	—	—	75	—
056	Cartridge Ribbon	—	—	—	12.50	—

\*Includes prime-shift maintenance.

\*\*Single use charge. ■

