

# Sycor 290 Display System



## MANAGEMENT SUMMARY

The Sycor 290 is Sycor's response to IBM's May 1977 announcement of its revised 3270 Information Display System.

A microprocessor-based display terminal, the Sycor 290 is designed as a direct replacement for the IBM 3270 in a local or remote environment. Sycor's new terminal provides complete compatibility with the IBM 3270; no hardware or software changes are required.

The Sycor 290 is available in three configurations: a remote cluster that can consist of up to 16 display stations and printers; a local cluster that can also include up to 16 devices; and a remote mini-cluster limited to 8 devices, of which up to 5 can be printers. Sycor's rationale for limiting its maximum cluster size to half that of IBM's is two-fold. One is that it is price/performance competitive. Secondly, it provides system redundancy; i.e., an inoperative controller disables only 16 stations instead of 32 as with the IBM 3270.

Sycor's 290 System features a 15-inch display screen (compared with IBM's 14-inch screen) but is currently limited to a 1920-character display capacity. Sycor plans to introduce the other IBM standard display capacities (480, 960, 2560, and 3440 characters) by the time IBM begins its deliveries of 3276 and 3278 display stations with these capacities in February to August 1978. Sycor ➤

Replaces the IBM 3270 Information Display System in a local or remote environment; accommodates up to 8 or 16 display stations and printers in any combination.

Features are identical with those of the IBM 3270 except for a single screen capacity of 1920 characters and faster serial printers (66, 120, and 180 cps). Terminal functions are software implemented and include system diagnostics.

A typical 8-station remote terminal without printers leases for \$540 per month, including maintenance, on a 42 month lease.

A typical 16-station remote terminal without printers leases for \$1,039 per month, including maintenance, on a 42 month lease.

## CHARACTERISTICS

**VENDOR:** Sycor, Inc., 100 Phoenix Drive, Ann Arbor, Michigan 48104. Telephone (313) 995-1121.

**DATE OF ANNOUNCEMENT:** September 1977.

**DATE OF FIRST DELIVERY:** December 1977.

**NUMBER DELIVERED TO DATE:** —

**SERVICED BY:** Sycor, Inc.

## MODELS

The Sycor 290 Display System 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 Sycor 290 is available in the following configurations:

- Model 291 — a remote cluster terminal.
- Model 292 — a local cluster terminal subsystem.
- Model 296 — a remote multi-cluster terminal.

The Model 291 Remote Cluster Control Unit and Model 292 Local Cluster Control Unit can each accommodate up to 16 devices including any combination of Model 297 Display Stations and 66-cps, 120-cps, and 180-cps Sycor Sprinter printers.

The basic controller model is equipped with one display adapter which accommodates one or two displays. Up to seven additional device adapters including any mix of display and printer adapters can be installed to accommodate up to 16 devices. The configuration must include at least one Model 297 Display Station. A cassette tape drive within the controller is used to load the cassette-based operating system and system diagnostics. The cassette drive is accessible to the operator. ➤

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➤ offers six keyboard styles comparable with these offered by IBM, except for the number of program function keys, which Sycor limits to 12 instead of the 24 available from IBM on two of its keyboards.

Sycor provides three printer models with its 290 System: Sycor's second-generation matrix printers are available with rated speeds of 66, 120, and 180 cps and with a character set of 64 or 96 characters. All models operate bi-directionally via microprocessor control. By comparison, IBM's matrix printers are rated at 66, 80, and 120 cps and are available with a 94 character set. But IBM also offers line printers that are rated at 120 lpm to 300 lpm with a 64-character set.

Terminal control is performed by software. Sycor's operating system is loaded from cassette tape, with system flexibility in reconfiguring a terminal. Diagnostics, also loaded from cassette, pin-point failures while the terminal is switched off line.

Transmission parameters are comparable with those of the IBM 3270. BSC or SDLC protocol is available and Sycor offers its own modems for operation at 1200 or 2400 bps.

The key attraction for the Sycor 290 is a better bottom line. Sycor's pricing provides monthly savings of up to 20 percent on a one-year lease (including maintenance) compared to IBM's monthly rental prices and up to 15 percent on a two-year lease (including maintenance) compared to IBM's two-year lease prices. Monthly savings are increased to as much as 25 percent compared to IBM's two-year lease prices under Sycor's 42-month lease plan. These percentages are based on IBM prices under its Lease Rental Agreement (LRA) for its new equipment; i.e., the 3274 and 3276 control units and 3278 displays. For purchased equipment, Sycor's prices average 5 percent below IBM's, but quantity discounts are available. Also, Sycor's printers are priced substantially below those of equivalent IBM models.

In summary, the Sycor 290 offers the IBM 3270 market an IBM replacement at substantially lower cost. Based on Sycor's proven image as a prominent independent vendor of IBM replacement and data-entry display terminals, the Sycor 290 warrants serious consideration by the potential user. □

➤ The 291 and 292 controllers contain dual microprocessors; one is subordinate to the other to maintain control. The master processor performs communications and cassette tape-related functions, as well as controlling the subordinate processor, which performs keyboard, display, and printer functions. Each microprocessor is equipped with 16K bytes of dedicated memory, but shares the remainder of memory. Maximum memory capacity is 72K bytes; 2K bytes are assigned to each display station or printer buffer storage, leaving 8K bytes to be shared by both processors for data interchange and for the operating program.

The Model 296 Mini-Cluster Controller consists of one display station and cassette tape drive and can accommodate up to 7 additional devices including Model 297 Display Stations and 66-cps, 120-cps, and 180-cps Sprinter printers. The 296 Controller contains a single microprocessor with 28K bytes of ROM and up to 40K bytes of RAM. The

28K-byte ROM contains basic instructions (17K bytes), diagnostics (8K bytes), and 1K bytes each for language translation tables, light pen, and badge reader. Communications buffers, tables, and other data areas are assigned 8K bytes of RAM total; 2K-bytes of RAM are assigned to each display station or printer as buffer storage. The cassette tape drive, accessible to the operator, is used to load the cassette-based operating system and system diagnostics.

The Model 297 Display Station can accommodate any of six keyboard styles, a light pen, and a badge reader.

### TRANSMISSION SPECIFICATIONS

Transmission is synchronous in the half- or full-duplex mode at transmission rates from 1200 to 9600 bits/second. BSC or SDLC protocol can be specified, as well as ASCII or EBCDIC transmission code. Transmission at 1200 bps is internally clocked. All other speeds require clocking by an external modem. The terminals are equipped with an RS-232C interface. Sycor provides two modems: the 2923-1 for 2400 bps operation over leased lines and the 2960 for 1200 bps operation.

### DEVICE CONTROL

The Sycor 290 operates under control of the program stored at the remote computer and provides complete compatibility with the addressing sequence, command code structure, and BSC or SDLC line discipline employed by the IBM 3270 Information Display System. The Sycor 290 responds to and executes the full repertoire of IBM 3270 commands via microprocessor control and a Sycor 290 operating system loaded from cassette tape.

Operator controls are provided for cursor control, editing, and program functions.

Cursor controls position the cursor up, down, left, or right, step-by-step or repetitively if the key is held depressed. The cursor can also be backspaced one character position, moved to the beginning of the next line or beginning of the next unprotected data field, tab to the beginning of the next unprotected data field, and backtab to the beginning of the previous unprotected data field.

Edit controls permit data to be inserted in or deleted from text, character by character. Following data is automatically expanded or contracted.

Program Function keys are used to initiate program functions or identify data that can be transmitted with an accompanying program function code.

Character Addressing permits a message to be written beginning at any screen location. Addressing can be interspersed with data throughout a message received from the computer. Character Addressing also permits the selective modification of attribute control codes.

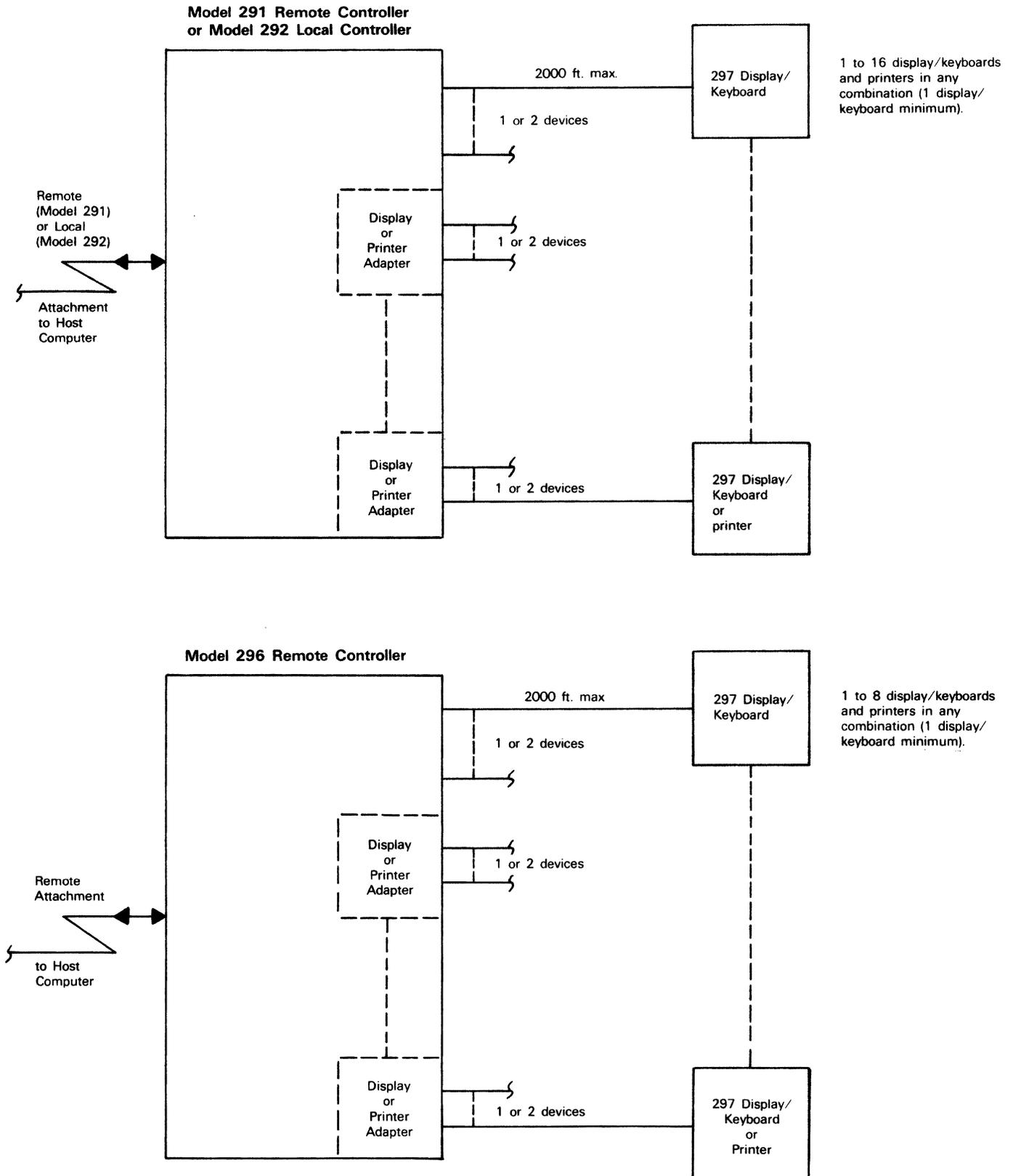
Program control by data field provides a flexible formatting capability. A field, identified by an attribute control code (nondisplayed) in the initial character position, can possess any one of several characteristics. The attribute control code can specify a protected or unprotected field (for fixed format operation), bean intensity or brightness (off, normal, or bright), alphanumeric or numeric (automatic shift) input, auto lock or skip, tab stop, or light pen selection. Sycor 290 field attribute codes are identical with those of the IBM 3270 and control all the same field characteristics, except for lack of reverse video.

Null suppression is a standard feature. Blank (null) characters are not transmitted for increased communications efficiency.

The Status Line, an additional line at the bottom of the screen, replaces the system status indicator lamp employed by IBM on its 3270. ➤

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## Configuration



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- Diagnostic testing is automatically performed on power-up and system initialization. Off-line diagnostics can also be operator identified to the operator via a displayed message.

### COMPONENTS

**CRT DISPLAY UNIT:** A 15-inch (measured diagonally) CRT with a 1920-character display capacity. The display arrangement is 24 lines of 80 characters each. An additional bottom line displays terminal status. The character set contains 64 or 96 (no-cost option) displayable symbols including upper and lower (optional) case alphabets. Each character is formed within a 7-by-9 dot matrix for upper case characters or a 7-by-12 dot matrix for lower case characters. Data is displayed in green. Highlighting and security features include dual intensity and blanking, respectively.

**KEYBOARD:** Six detachable keyboard models include:

- Model 2930 — a 66-key, typewriter-style keyboard with ASCII (A or B) or EBCDIC code.
- Model 2931 — a 66-key, data entry style keyboard with ASCII (A or B) or EBCDIC code.
- Model 2932 — a 66-key, keypunch keyboard with ASCII (A or B) or EBCDIC code.
- Model 2933 — a 78-key, typewriter-style keyboard with a 12-key Program Function keypad with ASCII (A or B) or EBCDIC code.
- Model 2934 — a 78-key, operator console keyboard with a 12-key Program Function keypad with EBCDIC code only.
- Model 2935 — a 78-key, typewriter-style keyboard with a 12-key dual-function keypad. The dual-function keys operate as a numeric pad or program function keys. The numeric keys operate in lower case, while Program Functions are initiated in upper case. It is available with ASCII (A or B) or EBCDIC code.

**PRINTER:** The Sprinter printer is a bi-directional, micro-processor-controlled, impact matrix printer equipped with

132 print positions and is available with one of three rated speeds: 66 cps, 120 cps, or 180 cps. The printer is equipped with a 64 character set of upper case ASCII or EBCDIC symbols; a 96 character set of upper and lower case ASCII or EBCDIC symbols is optional. Horizontal spacing is 10 characters/inch; an option provides either switch or program controlled spacing at 10 or 16.5 cps. Vertical spacing is 6 lines/inch. An optional switch selects spacing at 6 or 8 lpi. Automatic double line feed is a standard switchable feature. The standard printer is equipped with an adjustable tractor feed with or without a tear bar. The printer accommodates multipart continuous forms from 4 to 15 inches wide.

Vertical tabs and form feed are program controlled. Vertical slewing is automatic at 50 lpm on detection of blank lines. A firmware option on 180-cps printers provides automatic horizontal slewing at 350 cps over blank fields. A monitored, out-of-paper switch does not halt printing until the bottom of the form is reached (an average of an extra 14 lines). The printer also features a pre-computed default margin (132nd clear position) and default form length according to the user's average form.

Printer control keys establish forms parameters such as length, left margin, and vertical tabs.

### PRICING

The Sycor 290 System is available for purchase or on a one-year, two-year, three-year, or 42-month lease. A separate maintenance contract is available for leased or purchased equipment. Quantity discounts are available on purchased equipment. Installation is priced at \$100 per site. The investment tax credit is passed on to the customer for purchased equipment; however, the transfer of the ITC is negotiable for leased equipment.

Sycor provides its own maintenance service through a nationwide network of 95 service locations joined by a centralized dispatch system at Ann Arbor.

A minimal amount of customer training is provided; it consists of three days at the factory or training center and programmed instruction. Training centers are located at Washington, D.C. and San Francisco.

	Monthly Charge*		
	1-Year Lease	42-Month Lease	Purchase Price
Model 291 Remote Cluster Controller; for up to 16 devices; includes one display adapter for up to two display stations	\$269	\$214	\$11,530
Model 292 Local Cluster Controller; for up to 16 devices; includes one display adapter for up to two display stations	392	315	13,670
Model 296 Mini-Cluster Controller; for up to 8 devices; includes one display adapter for up to two display stations	167	135	7,520
Model 297 Display Station, 1920 characters; without keyboard	57	45	2,700
Display Adapter; accommodates two display stations	18	15	650
Printer Adapter; accommodates two printers	14	12	450
66-Key Typewriter Keyboard	N/C	N/C	N/C
66-Key Data Entry/Keypunch	N/C	N/C	N/C
78-Key Typewriter Keyboard; includes 12 Program Function keys	1	1	50
78-Key Console Keyboard; includes 12 Program Function keys	1	1	50
78-Key Typewriter Keyboard; includes 12 dual-function keys	2	2	100
Security Keylock	5	5	50
Light Pen	25	20	1,000
Badge Reader	25	20	1,000
201C Compatible Modem; 2400 bps	60	48	2,000
202C Compatible Modem; 1200 bps	32	26	1,000
Sprinter Printer; 66 cps; includes 1920-character buffer and 2000-foot cable	115	94	4,570
Sprinter Printer; 120 cps; includes 1920-character buffer and 2000-foot cable	144	120	4,910
Sprinter Printer; 180 cps; includes 1920-character buffer and 2000-foot cable	197	162	6,745

\*Includes maintenance.  
 N/C — no charge.■