

Beehive Alphanumeric Display Terminals



Beehive's newest display terminal is the ATL-004. The second member of the company's ATL series, the ATL-004 features a 14-inch display with tilt/swivel capability, an 80/132-column display format, a detachable, low-profile keyboard which conforms to the DIN standard for ergonomics, and a range of smart terminal features.

MANAGEMENT SUMMARY

Beehive International, a long-time leader and innovator in the alphanumeric display terminal industry, continues to expand and diversify their product line. That line currently consists of eight models, seven of which are covered in this report: the Basic, Standard, Plus, DM78, DM83, ATL-004, and ATL-008. The eighth model, Topper, is an intelligent terminal; for more information on this product, see Report C21-010-101.

The Basic, Standard, and Plus are the company's general-purpose display offerings, succeeding Beehive's older DM5/DM10/DM20/DM30 models. The Basic is an entry-level smart terminal, the Plus a mid-level model, and the Standard an expanded function model. All three terminals feature conversational and block mode transmission, visual attributes, and the same physical design (12-inch display, detachable keyboard).

The DM78 is an asynchronous terminal designed to emulate the IBM 3278, at a considerable cost saving, when used in conjunction with a protocol converter. The DM78 contains a 12-inch display and a detachable keyboard with an IBM 3278-type layout.

The DM83 provides the user with Burroughs TD830 and MT983 compatibility. Standard features on the DM83 include a 12-inch display, detachable keyboard, 9 pages of display memory, 16 function keys, and visual and logical attributes. The DM83 operates in asynchronous, isochronous, and synchronous communications modes, and supports all major Burroughs polling protocols. The terminal can operate as a standalone unit, or can be a part of a daisy chain cluster of other DM83s.

Beehive International is a traditional leader in the OEM custom terminal market. The company offers a broad line of terminal products, ranging from entry-level smart terminals, to IBM and Burroughs emulators, to fully-featured ANSI X3.64-compatible models. Terminals feature 12-inch or 14-inch displays, detachable keyboards, and a wide range of operating functions, depending on the model selected. The Beehive terminals are available for purchase (with OEM discounts available), or for lease. Several maintenance plans are available.

MODELS: Basic, Standard, Plus, DM78, DM83, ATL-004, & ATL-008.

DISPLAY: The Basic, Standard, Plus, DM78, and DM83 contain a 12-inch display, with a 24-line by 80-character display format. The ATL-004 and ATL-008 contain a 14-inch display with a 27-line by 80/132-character format.

KEYBOARD: The Basic, Standard, and Plus feature a choice of typewriter-style keyboards. The DM78 features a keyboard with an IBM 3278-style layout. The DM83 features a 110-key typewriter-style keyboard. The ATL-004 and ATL-008 include a low-profile, 94-key keyboard that conforms to the DIN standard for ergonomics. All keyboards are detachable, and all models except the Basic contain function keys.

COMPETITION: Lear Siegler, TeleVideo, and several others in the general-purpose ASCII terminal market.

PRICE: Purchase prices range from \$930 to \$1,695.

CHARACTERISTICS

VENDOR: Beehive International, 4910 Amelia Earhart Drive, Box 25668, Salt Lake City, UT 84125. Telephone (801) 355-6000.

DATE OF ANNOUNCEMENT: Basic—November 1982; Standard—November 1982; Plus—November 1982; DM78—January 1982; DM83—April 1982; ATL-004—May 1983; and ATL-008—November 1982.

DATE OF FIRST DELIVERY: Basic—April 1983; Standard—April 1983; Plus—April 1983; DM78—April 1982; DM83—May 1982; ATL-004—July 1983; and ATL-008—April 1983.

NUMBER DELIVERED TO DATE: —.

SERVICED BY: Beehive and Western Union.

Beehive Alphanumeric Display Terminals

▷ Beehive's newest terminal product line is the ATL series, currently consisting of the ATL-004 and ATL-008. These new models feature ANSI X3.64 compatibility, as well as a new ergonomic design which includes a 14-inch tilt/swivel display, and a low-profile detachable keyboard. The ATL-004 contains 80/132-column display capability, full editing features, visual attributes, graphics, and multiple resident character sets. The ATL-008 contains all of the features of the ATL-004, plus 12 pages of memory. Both models feature DEC VT100 compatibility.

COMPETITIVE POSITION

Beehive has been a leader in the OEM custom terminal market for several years. More recently, the company has expanded into the small systems area, with the Topper, and into the ANSI X3.64/DEC VT100 market with the ATL series. Beehive has revamped their product offerings considerably in the past few years, and additional new products are expected in the coming months to continue this trend.

ADVANTAGES AND RESTRICTIONS

In the custom terminal market, Beehive has a long history of success and expertise. The new ATL series, although in a somewhat different market niche (ANSI X3.64), should benefit from this success. The company is moving to broaden their market by entering the systems field, and it remains to be seen what degree of success they will enjoy in this area.□

► MODELS

Current Beehive alphanumeric display terminal offerings include the following models:

- **Basic**—an entry-level, character/block mode smart terminal.
- **Standard**—contains all of the features available on Basic, plus split screen operation, function keys, and an independent auxiliary I/O port.
- **Plus**—a multi-function smart terminal with full editing features, extended formatting capabilities, extended function keys, and buffered transmission.
- **DM78**—an asynchronous terminal designed to emulate the IBM 3278 when used in conjunction with a protocol converter.
- **DM83**—a terminal designed for compatibility with the Burroughs TD830 and MT983 terminals. The DM83 can operate in a daisy chain cluster, in addition to standalone.
- **ATL-004**—a buffered smart display that conforms to the ANSI X3.64 standard. The ATL-004 features DEC VT100 compatibility, with 80/132-column display capability.
- **ATL-008**—an enhanced version of the ATL-004, featuring up to 12 pages of display memory.

TRANSMISSION SPECIFICATIONS

The Basic, Standard, Plus, and DM78 transmit data asynchronously, in half- or full-duplex, at switch-selectable speeds from 110 to 19,200 bits per second. The DM83 features asynchronous, synchronous, and isochronous trans-

mission, in half-duplex, at switch-selectable speeds from 50 to 19,200 bits per second. The ATL-004 and ATL-008 feature asynchronous and isochronous transmission, in half- or full-duplex, at selectable speeds from 50 to 19,200 bits per second. All models feature an RS-232-C communications interface; 20mA current loop and RS-422 interfaces are available on some models. An auxiliary bidirectional interface is available on all models except the Basic. Odd, even, mark, or space parity is selectable.

The DM83 supports all major Burroughs polling protocols, including poll/select, fast select, group poll, and multipoint contention. Multiple DM83s can be daisy-chained in a cluster configuration.

DEVICE CONTROL

Basic, Standard, & Plus: All three models feature conversational (character-by-character) or block transmission. Conversational, Local (off-line data entry), and Line Monitor (displays escape and control codes) modes are available. In addition, the Plus features Line, Page, and Forms (formatted display) modes.

Cursor controls include up, down, left, right, home, carriage return, and line feed. Cursor sensing and addressing (X-Y) are standard. The cursor may be selected as a blinking or non-blinking block or underline.

Visual attributes available on all models include normal, reverse, blink, underline, half/bright intensity, and security fields. Line lock and memory address pointer are standard features on all three models; memory lock is standard on the Standard and Plus. Scrolling and selectable top down overwrite (roll) are also available on all three models.

The Plus contains a range of editing operations. These include insert/delete on a character or line basis, backspace, character overwrite, erase to end of page/field/line, clear variable data, and clear all data. Also available on the Plus are logical (field) attributes, which include protected, alphanumeric only, modified data transmission, must fill, total fill, and constants. Other features common to all three models include CPU message deposit, error indicators, and time of day clock.

DM78: Operational modes include conversational and line monitor. Cursor controls are identical to those found on the Basic, Standard, and Plus. Visual attributes available include normal, reverse, blink, underline, half-intensity, and security fields. Editing functions include insert/delete character on a line or page basis, backspace, character overwrite, erase end of field, and clear. Memory address pointer and self diagnostics are also standard.

DM83: Operational modes include block, line, and page. Cursor controls are identical to those found on the Basic, Standard, Plus, and DM78. Visual attributes include normal, reverse, blink, underline, bright, and security fields. Logical attributes include left and right justified unprotected fields, and transmittable and non-transmittable protected fields. Scroll and self-test are also available.

Edit functions available on the DM83 include insert/delete character in line or page, insert/delete line, backspace, character overwrite, erase to end of page/field/line, clear variable data, and clear entire screen. Nine pages of memory are available, from four to 120 lines of 80 characters each.

ATL-004 & ATL-008: Both models feature conversational, block, line, and page transmission. Cursor controls are identical to those found on the Basic, Standard, Plus, DM78, and DM83. Visual attributes available on a char-

Beehive Alphanumeric Display Terminals

►acter or field basis include reverse, blink, underline, blank (security), and half-intensity. Visual attributes available on a line basis include double wide and double high/double wide. Smooth scroll with variable rates, or jump scroll are available. Logical attributes include alpha only, alphanumeric, numeric only, unprotect, protect, constant, total fill, space fill (ATL-008), zero fill (ATL-008), and must enter (ATL-008).

Editing commands include insert/delete character in line, page, or area (ATL-008), insert/delete line, erase entry, erase unprotected, erase to end of line/page, erase screen, and erase from beginning of line. Memory lock and line lock are standard.

The ATL-008 provides up to 12 pages of display memory. Each page has its own viewing window; the window may be the same size as the page or smaller.

A confidence test for each model may be initiated from the keyboard or the host. A basic confidence test is available on both models; an extended confidence test is available on the ATL-008. A feature called the Terminal Configuration Manager (TCM) is also available on both models, configurable from the keyboard or host. Two separate parameter groupings are available: Operator and Installation.

COMPONENTS

BASIC, STANDARD, & PLUS CRT DISPLAY UNIT: A 12-inch (diagonally measured) display screen is standard. Display capacity is 1920 characters, arranged in 24 lines of 80 characters each; a 25th line for the display of status information is available. Characters are formed within a 7-by-10 dot matrix, with descenders for lower case. White (P4) or green (P42) phosphor may be selected at time of purchase. The 128-character ASCII set is displayable; a line drawing graphic set (11 characters) is also included.

DM78 CRT DISPLAY UNIT: A 12-inch (diagonally measured) display screen is standard; a 15-inch display size is optional. Display capacity is 1920 characters, arranged in 24 lines of 80 characters each; a 25th line for the display of status information is programmable (an 80-character message buffer displays host CPU data). Characters are formed within a 7-by-10 dot matrix, and displayed in green (P42) phosphor. A total of 256 displayable characters are available, including ASCII and EBCDIC. Graphics symbols are available for the simulation of an IBM 3278-style status line.

DM83 CRT DISPLAY UNIT: A 12-inch (diagonally measured) display screen is standard. Display capacity is 1920 characters, arranged in 24 lines of 80 characters each; a 25th line is available for the display of status information. Characters are formed via a 5-by-7 matrix in an 8-by-10 cell, with descenders for lower case. Green (P42) phosphor characters are displayed. The 128-character ASCII set is displayable; a line drawing graphics set (11 characters) is also included.

ATL-004 & ATL-008 CRT DISPLAY UNIT: A 14-inch (diagonally measured) display screen is standard; the display monitor features tilt (20°) and swivel (360°) capabilities for operator comfort. Display capacity is either 1920 or 3168 characters, arranged in 24 lines of 80 or 132 characters each. The 26th display line is available for status and host message information, while the 27th line is designated for the labeling of soft function keys. Characters are formed via a 7-by-9 dot matrix in a 9-by-13 cell, and displayed in green (P31) phosphor. The ATL-004 provides a total of 512 displayable characters, including 128 ASCII, nine resident foreign character sets, icons and plotting symbols for business graphics, mathematical symbols with Roman numerals, super- and subscript characters, and bar code

graphics symbols. The ATL-008 provides a standard 256-character set, including control characters, 64 extended plotting and business graphics characters, and nine resident foreign character sets. An additional 256-character set may be added and addressed on a character-by-character basis.

BASIC KEYBOARDS: A choice of two keyboard styles, both of which are detachable. Each keyboard contains 75 keys; one contains two clusters of special function/editing keys and alternate shift functions, while the other features a numeric pad. Foreign keyboard versions are available.

STANDARD KEYBOARDS: A choice of two keyboard styles, both of which are detachable. An 87-key keyboard includes 16 alternate shift function keys, editing keys, and a 12-key numeric pad. Also available for the Standard is a 95-key keyboard with 12 single action function keys, editing keys, and a 14-key numeric pad. Foreign keyboard versions are available.

PLUS KEYBOARDS: A choice of two keyboard styles, both of which are detachable. One is an 87-key keyboard with 16 alternate shift function keys, a 12-key numeric pad, and editing keys. The other keyboard version contains 115 keys, with 16 single action function keys and a 14-key numeric pad.

DM78 KEYBOARD: A detachable, 87-key keyboard with an IBM 3278-style layout. A 12-key numeric pad is included.

DM83 KEYBOARD: A detachable, 110-key keyboard which includes a numeric pad, cursor control keys, edit keys, and 16 user-definable function keys.

ATL-004 & ATL-008 KEYBOARD: A detachable, low-profile keyboard which conforms to the DIN standard for ergonomics. A total of 94 keys are contained, including 16 programmed function keys, eight user-defined soft function keys with labels on display line 27, and a 14-key numeric pad. Cursor control keys are also contained in a special group. N-key rollover and an operator-selectable repeat rate are standard. ►



The DM83 is Beehive's Burroughs TD830/MT983 emulator. The DM83 operates in all communications modes (asynchronous, isochronous, synchronous), and supports all major Burroughs polling protocols. The terminal can operate as a standalone unit or as part of a daisy chain cluster.

Beehive Alphanumeric Display Terminals

► PRICING

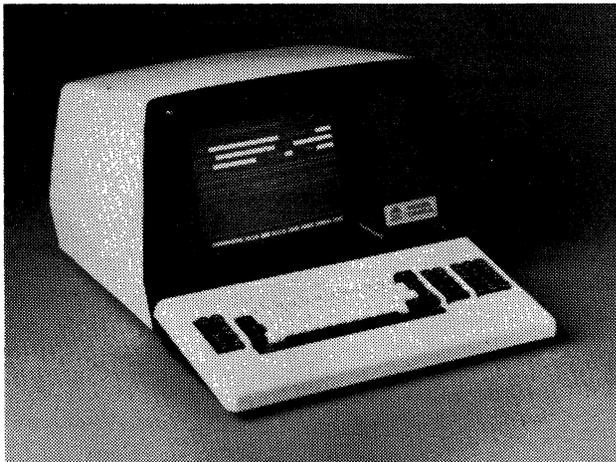
Beehive display terminals are available for purchase, with OEM quantity discounts available. Beehive has also recently established a leasing program for their terminal line. This program offers lease plans for one-, two-, three-, and five-year periods, including maintenance. Contact Beehive for lease pricing.

Beehive offers several types of maintenance service, including on-site maintenance, time and material, depot carry-in/ship-in, contract, and flat rate repair. Product support may be obtained through 12 company-operated service centers and two service depots, located in major metropolitan areas. Service may also be obtained in over 450 locations through Beehive's third-party subcontractors, including Western Union.

Prime-shift and full period (24 hours/day, 7 days/week) maintenance service is available. Monthly maintenance rates begin at \$17.95 per terminal, for units installed within 25 miles of a service center. Service that exceeds the 25-mile radius has a zone adder for each 50-mile increase. For more detailed pricing, contact Beehive or the Beehive Field Service center.

	Purchase Price
Basic	\$ 930
Standard	1,145
Plus	1,345
DM78	1,195
DM83	1,695
ATL-004	1,195
ATL-008	1,495■

Beehive Alphanumeric Display Terminals



Beehive's new DM5 is a microprocessor-based smart terminal designed to fit entry-level applications, while offering editing capabilities and block, as well as character-by-character, transmission. The DM5A, pictured above, offers all of the features of the basic DM5, plus a numeric pad, program function keys, and an auxiliary printer interface.

MANAGEMENT SUMMARY

Beehive has recently revamped their alphanumeric display terminal product line with the introduction of the DM5, a low-priced, entry level terminal with editing capabilities. The DM5 is the newest member of the company's DM series, a series of smart ASCII terminals which replaced Beehive's earlier Micro Bee series. In addition to the DM series, Beehive also offers the Micro 4400, a unit which offers Burroughs TD Series emulation, and the DM3270, a DM series terminal which is not an ASCII model but a control unit display station featuring IBM 3270 compatibility.

The basic DM5 features block and character transmission, edit functions, memory lock (split screen), and line drawing capability. The unit has a 12" non-glare display screen, with a display format of 24 lines of 80 characters each. A 25th line displays terminal status information. Characters are displayed in green (P42 phosphor). A 128 character ASCII set is displayable, and characters are formed utilizing a 5 x 7 dot matrix in a 7 x 10 cell. Upper and lower case characters can be displayed. The DM5 includes a 75-key typewriter-style keyboard with auto character repeat, two-key rollover, cursor control keys, alpha lock, and shift lock. Other standard features include: cursor addressing and sensing; scrolling; tabbing; audible alarm; self diagnostics; and video attributes such as reverse video, blinking, underline, half intensity, and security fields. Transmission rates are switch-selectable from 110 to 19,200 bps.

Beehive also offers two variations of the DM5—the DM5A and DM5B. The DM5A contains all of the features of the DM5, plus extended features including a ➤

A family of microprocessor-based, smart video display terminals.

The family consists of the DM series of ASCII editing terminals; a unit that offers Burroughs TD Series compatibility; and a stand-alone control unit display station with IBM 3270 compatibility. All models feature a 12" diagonal display screen (a 15" screen is optional on most models), and a display format of 24 lines by 80 columns. A detachable keyboard is also standard on all terminals.

Purchase prices for the Beehive terminals range from \$880 for the entry level DM5 to \$3,245 for the Micro 4400, featuring Burroughs emulation. Quantity discounts are available. Leasing for Beehive terminals is available only through third party distributors.

CHARACTERISTICS

VENDOR: Beehive International, 4910 Amelia Earhart Drive, P.O. Box 25668, Salt Lake City, Utah 84125. Telephone (801) 355-6000.

DATE OF ANNOUNCEMENT: DM5—April 1981; DM30—June 1979; DM3270—January 1981; Micro 4400—July 1980.

DATE OF FIRST DELIVERY: DM5—April 1981; DM30—June 1979; DM3270—February 1981; Micro 4400—August 1980.

NUMBER DELIVERED TO DATE: Approximately 100,000 (all models).

SERVICED BY: Beehive and Western Union.

MODELS

The Beehive display terminals currently available include:

- **DM5**—an entry level smart terminal featuring block or character transmission and editing capabilities.
- **DM5A**—a smart terminal with all of the features of the DM5 plus extended features including a 12-key numeric pad, 16 program function keys, an auxiliary printer port, and an optional current loop interface.
- **DM5B**—a smart terminal with all of the features contained on the DM5 and DM5A, plus a switch-selectable RS-232/RS-422 interface on the main port, and full formatting forms mode capability.
- **DM30**—a fully featured smart terminal with two pages of display memory standard, as well as extensive editing and formatting capabilities and character, line, page, block, or message transmission modes.
- **DM3270**—a stand-alone control unit display station with IBM 3270 compatibility. The DM3270 operates as an ➤

Beehive Alphanumeric Display Terminals

▷ 12-key numeric pad, 16 program function keys, an auxiliary printer port with flow control, an optional current loop interface, and X-on, X-off flow control. The DM5B has all of these features, plus a switch-selectable RS-232/RS-422 interface on the main port, and full formatting forms mode capability.

The high end model of the DM series of ASCII terminals is the DM30, a fully featured smart terminal. The DM30 features two pages of display memory, along with extensive editing and formatting capabilities. A plug compatible parallel printer interface is standard. Transmission modes include character, block, line, page, or message modes. The DM30 has a 12" display screen with a 24 line by 80 character display format, and a 61-key TTY/typewriter-style keyboard with a 14-key numeric pad. Options available on the DM30 include 16 loadable function keys and up to two additional pages of memory.

Beehive's hardware entry into the IBM 3270-compatible market is the DM3270, a control unit display station that operates as an IBM 3276-2 stand-alone lookalike. The DM3270 can be used on either dial-up or dedicated lines remote to the host. The Unit is compatible with IBM 3270 (BSC) protocol. Remote site applications with single- or multi-station requirements can be satisfied by the DM3270. Remote locations requiring up to eight stations can be equipped with individual DM3270 stations instead of with a single controller and a number of slave display stations. In single-station applications, the DM3270 allows for the use of a serial ASCII printer (such as the Beehive P1600) in place of an IBM 3287 printer. The DM3270 is double buffered to achieve a higher throughput than the IBM equipment with a comparable speed printer.

The DM3270 features a 12" display screen, a 24-line by 80-character format and green (P42 phosphor) characters. The typewriter-style keyboard is detached and contains 87 keys, including a 12-key numeric pad, cursor control keys, edit keys, 24 program function keys, and 3 program access keys. The DM3270 is compatible with the IBM 3279 field blink; other standard features include line drawing capability, and visual attributes such as reverse video, underline, normal, bright, and security intensity.

The Micro 4400 Communications Terminal is compatible in both protocol and features with the Burroughs TD Series Terminals. Beehive has incorporated a Terminal Configuration Manager (TCM) into the Micro 4400, allowing the unit to be configured from the keyboard. After storing the parameters in EAROM there is no need for reconfiguration on power-up. The Micro 4400 offers a chaining capability that eliminates the need for a controller. Another feature offered by the Beehive unit is the shared printer capability. The Micro 4400 may act as an independent intelligent printer controller so that a P1600 printer may be shared by several 4400s, or act as a communications output device receiving data from the host.

▶ IBM 3276-2 look-alike; it can be used on either dial-up or dedicated lines remote to the host, and can satisfy single- or multi-station requirements.

- Micro 4400—a communications terminal offering compatibility with the Burroughs TD Series. The Micro 4400 features 16K bytes of RAM memory as standard, synchronous or asynchronous transmission, shared printer capability, chained terminal capability, and soft configurability through its Terminal Configuration Manager (TCM).

TRANSMISSION SPECIFICATIONS

The DM5, DM5A, DM5B, and DM30 operate asynchronously in half-duplex, full-duplex, or echoplex modes. The 8-level ASCII transmission code is used. Transmission rates are switch-selectable from 110 to 9600 bps (19,200 bps used with X-on/X-off protocol). Odd, even, mark, or space parity is switch-selectable. A serial RS-232-C interface is standard on all models; a current loop interface is also available with all models except the basic DM5.

The DM3270 transmits synchronously in half-duplex mode. The EBCDIC code is used. Transmission rates are switch-selectable from 150 to 9600 bps. An RS-232-C interface is standard, as is the bidirectional RS-232-C auxiliary port.

The Micro 4400 operates synchronously or asynchronously in half-duplex mode. The ASCII code is used. Transmission rates are programmable from 50 to 19,200 bps. An RS-232-C or Burroughs TDI interface are switch-selectable. A current loop interface is optional. Odd, even, mark, or space parity is switch-selectable. A shared serial I/O printer port allows multiple units to share a common serial printer on a daisy chain. A parallel printer port is optional.

DEVICE CONTROL

DM5: Data is transmitted character-by-character, a line at a time, or a full or partial page at a time on the DM5, DM5A, and DM5B. The Local mode allows off-line keying of data into the display memory. A Line Monitor mode permits display of all ESCape code and control code sequences. Data can be displayed in normal or half intensity, shown in reverse video, blinked, or blanked (for security). A switch-selectable roll/scroll feature determines how data is entered on a full screen. If the roll function is selected, the cursor automatically returns to the top left of the screen when the bottom line of the display memory is filled; as new data is entered, the top line of existing data is overwritten. With the scroll function, all lines move up by one; new data is entered on the bottom line of the screen. In either case, the top line of data is lost. An audible beep sounds when a bell code is received or the 72nd character of a line is keyed. A self-test function can be initiated by the host, by the operator, or upon power-up; error messages are displayed on the 25th line of the screen.

Cursor sensing and addressing are standard. The host CPU can independently access any part of the display memory without interfering with screen operations using a memory address pointer. The pointer acts as an "invisible" second cursor that permits the host to enter data into the memory or to read the ASCII value of a character located at the pointer, without interfering with other ongoing screen operations. A line lock function permits the host to designate selected lines in display memory as inaccessible to the visible cursor. A memory lock function permits the operator or the host to designate up to 23 lines above the line on which the cursor is located as inaccessible to the visible cursor. Areas locked by the line lock or memory lock are frozen on the screen and exempted from subsequent rolling or scrolling operations.

Beehive Alphanumeric Display Terminals

➤ Standard features on the Micro 4400 include a 12" display screen, a 24-line by 80-character display format, and green (P42 phosphor) characters. Two detachable keyboard versions are offered: a Burroughs look-alike keyboard with function keys, and an extended function keyboard. Synchronous or asynchronous operation is accommodated, at speeds up to 19,200 bps. Standard memory is 16K bytes of RAM. Optional features include a 15" display screen and 32K bytes of RAM.

Beehive offers several types of maintenance services ranging from on-site maintenance to depot carry-in/ship-in. Product support can be obtained through ten company-owned service offices and two service depots, located in major metropolitan areas. Service in all other cities can be obtained through Western Union.

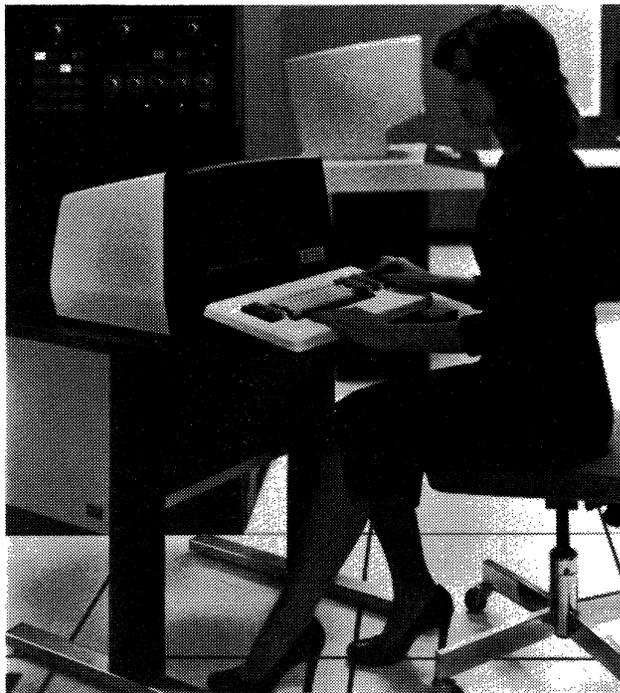
USER REACTION

Datapro contacted five users of the Beehive alphanumeric display terminals in July 1981, who reported on their experience with nearly 850 units. The units had been installed for an average of 1½ years. The ratings are summarized below.

	Excellent	Good	Fair	Poor	WA*
Overall Performance	1	3	1	0	3.0
Ease of Operation	1	4	0	0	3.2
Display Clarity	3	1	1	0	3.4
Keyboard Feel & Usability	2	1	2	0	3.0
Hardware Reliability	1	3	0	1	2.8
Maintenance Service**	2	0	0	1	3.0
Technical Support	2	2	0	1	3.0

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

**Two of the users serviced the terminals themselves.



The DM3270 Control Unit Display Station offers "enhanced emulation" of the IBM 3276-2 stand-alone station. The DM3270 can satisfy remote site requirements for both single- and multi-station applications.

➤ The CPU Message Deposit feature permits the host to flag a transmitted message for the terminal operator's attention. The message, which can be up to 80 characters in length and is accompanied by an identifying ESC sequence, is held in a special buffer, and a "MSG WAIT" message is displayed on the 25th line of the screen. When the operator responds, the message is displayed.

DM30: Includes all of the features of the DM5, plus these additional features: 16 program function keys; auxiliary I/O device controls; forms mode; two page memory; print control; and forward and reverse scrolling.

The program function keys generate unique code sequences that can be transmitted to the host to initiate user-defined program functions or identify data. Auxiliary I/O controls permit the establishment of a direct data path between the terminal keyboard and the I/O device, so that data keyed by the operator can be received by the peripheral, and between the host CPU and the I/O device, so that the CPU can access the peripheral independently from other terminal operations.

Editing operations include character and line insertion and deletion, plus a clear entry function that erases the field the cursor is in and repositions the cursor at the beginning of that same field. Erase functions permit erasure to the end of a field, line, or page; clearing of unprotected data; and clearing of all data. Editing, erase, and certain other terminal functions may be subject to applicable protected field restrictions in forms mode.

The forms mode allows the operator or host to create and operate on a formatted display. A line drawing set (displayable on all models) containing eleven graphic symbols for drawing forms and contiguous lines, and the previously mentioned display attributes, can be used in forms design. Fields can also be designated as protected, numeric only, alpha only, alphanumeric, must fill, total fill, or constant.

The print control permits the operator to enable/disable an attached printer. The two-page memory contains a total of 3840 characters, arranged in 48 lines of 80 characters. The forward and reverse scrolling functions permit the operator or host to operate on the entire paging memory as if it were a single page.

DM3270: Operation may be over either leased or dedicated communications lines, or through a display facility, in a polled communications environment. As data is keyed, it is entered into the terminal's buffer in response to a request from the host program. All data is then transmitted to the host computer as a single message.

The cursor appears as a block or underline, and can be selected by the operator to be blinking or non-blinking. Cursor controls include up, down, left, right, home, new line tab, backtab, high speed right, and high speed left. Data can be displayed at normal intensity, at bright intensity, in reverse video, blinking, or underlined. In security intensity, data exists in the buffer but is displayed on the screen as blanks. Protected or unprotected fields can be defined. Data cannot be entered from the keyboard into a protected field.

Editing operations include insert/delete character. Erase functions include erase to end of field, erase variable data, and erase screen.

The host can organize the display into one or more separate display fields through the introduction of an attribute character into the display buffer. The attribute character occupies a display position on the screen but is displayed as a blank. All character positions following the attribute character up to, but not including, the next attribute

Beehive Alphanumeric Display Terminals

➤ The users appeared generally satisfied with the Beehive equipment. The wide range of available function keys and the Beehive terminal's flexibility were the objects of repeated praise. "The function keys are a definite strength," stated one user, "It's easy to adapt them (the terminals) to our applications." One user praised the Beehive organization for its aid in expanding his terminals' functionality. Another user, who multi-dropped his Micro 4400 terminals on a polled network using a Burroughs computer, was particularly pleased with the terminal's editing capability. Other highlights of the Beehive product line mentioned by the users were the detachable keyboards and compact, neat appearance.

When asked to cite the product's weaknesses, user comments focused on two areas: power supply and the keyboards. Two of the five users had experienced problems with power supplies. "The DM 30s are critical to power fluctuations and noise on the circuits; they appear to be more sensitive than the SuperBees," stated one user. The other user experienced serious problems in this regard. According to him, spikes of high voltage tended to shut down his terminals, crippling his extensive network. This user felt the terminals had engineering deficiencies in this respect and that Beehive was unresponsive to his problem.

Two other users had reservations about the keyboards. One cited the fact that the design was unlike that of the IBM Selectric as the root of his problems, which included a tendency to strike two keys at once, and lack of a comfortable place to rest one's wrists. □

➤ character, constitute the field. A field may wrap from one line to the next, or it may wrap the screen.

Micro 4400: The unit's Terminal Configuration Manager (TCM) allows the operator to configure the Micro 4400 for specific applications through the keyboard. A RAM memory of 16K bytes is standard; a 32K byte memory is optional. The Electronically Alterable ROM (EAROM) of the Micro 4400 "remembers" the configuration parameters even when the terminal is powered down. Hardware is included to allow checking by the self test and concurrently providing the operator with a high level of confidence in the integrity of the terminal.

Visual attributes on the Micro 4400 include normal and reverse video, blinking, underlining, half intensity/highlight, and security. Logical attributes include normal, alpha only, numeric only, must enter alpha, must enter numeric, total fill alpha, total fill numeric, constant, and right justified. The cursor appears as a blinking or non-blinking block or underline, or no cursor. Cursor controls include up, down, left, right, home, carriage return, and line feed. Cursor sensing and addressing is standard.

Editing operations include insert/delete character or line, tab and backtab, backspace and character overwrite. Erase functions include erase to end of page, erase to end of field, erase to end of line, clear variable data, and clear entire screen.

COMPONENTS

DM5 CRT DISPLAY UNIT: A 12" (diagonally measured) CRT monitor with a 1920-character screen capacity,

arranged in 24 lines of 80 characters each. A 25th line displays terminal status information. The 128-character ASCII set is displayable, as well as 11 graphic symbols for forms and line drawing. Characters are formed utilizing a 5 x 7 dot matrix, with descenders on lower case characters in a 7 x 10 cell. Characters are displayed in green (P42 phosphor) on a dark background. All of the above features are also standard on the DM5A and DM5B.

DM30 CRT DISPLAY UNIT: A 12" (diagonally measured) CRT monitor with a 1920-character screen capacity, arranged in 24 lines of 80 characters each. A 25th line displays terminal status information. A 15" diagonal CRT monitor is optional. The 128-character ASCII set is displayable, as well as 11 graphic symbols for forms and line drawing. Characters are formed within an 8 x 8 dot matrix, with descenders. Characters are displayed in white on a dark background.

DM3270 CRT DISPLAY UNIT: A 12" (diagonally measured) CRT monitor with a 1920-character screen capacity, arranged in 24 lines of 80 characters each. A 25th line displays terminal status information. A 15" diagonal CRT monitor is optional. The 128-character ASCII set is displayable. A full line drawing set is supported. Characters are formed utilizing a 7 x 7 dot matrix with descenders on lower case characters in an 8 x 10 cell. Characters are displayed in white on a dark background.

MICRO 4400 CRT DISPLAY UNIT: A 12" (diagonally measured) CRT monitor with a 1920-character screen capacity, arranged in 24 lines of 80 characters each. A 25th line displays status information. A 15" diagonal CRT monitor is optional. The 128-character ASCII set is displayable, as well as 11 graphics symbols for forms and line drawing. Characters are formed utilizing a 5 x 7 dot matrix with descenders on lower case characters, in a 7 x 10 cell. Characters are displayed in white on a dark background.

DM5 KEYBOARD: A detachable 75-key typewriter-style keyboard. Standard features include cursor control keys, two-key rollover, auto character repeat, alpha lock, and shift lock. The key tops are sculptured.

DM5A, DM5B KEYBOARDS: A detachable 87-key typewriter-style keyboard. Standard features include 16 program function keys (alternate function), a 12-key numeric pad with alternate line drawing functions, and all of the standard features of the DM5 keyboard. Keys with alternate functions have the second function printed on the front of the key cap. Foreign keyboards are optionally available with both the DM5A and DM5B.

DM30 KEYBOARD: A detachable 75-key typewriter-style keyboard. Standard features include a 14-key numeric pad with associated field termination control keys, 16 programmed function keys, cursor control keys, two-key rollover, auto repeat, alpha lock, and lower case inhibit. A system mode on control keys is included. Sixteen loadable function keys are available as an option.

DM3270 KEYBOARD: A detached 87-key IBM typewriter-style keyboard. Standard features include a 12-key numeric pad, 24 program function keys, 3 program access keys, cursor control keys, edit keys, and alpha lock. The user can select an audible key click, as well as an audible alarm which sounds when an invalid keyboard entry is made.

MICRO 4400 KEYBOARD: Two keyboard versions are available: an extended function keyboard, and a Burroughs look-alike keyboard for existing Burroughs users. Both versions are typewriter-style keyboards with 115 keys. Standard features include a 14-key numeric pad, 16 user-definable function keys, cursor control keys, edit keys, and alpha lock. Specified keys repeat at a programmable rate. ➤

Beehive Alphanumeric Display Terminals

► **P1600 MATRIX PRINTER:** A serial matrix printer compatible with all Beehive display terminals. Operation of the unit may be controlled locally from the terminal or via the host processor, depending on the application. The P1600 prints at 160 cps, at up to 200 lpm. Standard features include compressed print capability, double width character capability, upper and lower case character printing, a dual path tractor, and a cartridge ribbon.

PRICING

The Beehive display terminals are available for purchase only. Quantity discounts are provided. Installation charges are extra and average \$75 per terminal. Beehive currently does not have a lease program, but will negotiate lease terms with a third party.

Beehive provides service in all cities that have a Beehive service enter; other cities are covered by Western Union.

Prime shift and full period (24 hours/day; 7 days/week) maintenance service is available. Monthly maintenance is priced at \$17.95 to \$22.95 per month for units installed within 25 miles of a service center, depending on the model, and \$24.00 to \$30.50 per month for units installed 25 to 100 miles from a service center.

The standard warranty provides factory service for 90 days. When the purchase of a terminal and a maintenance contract coincides, the standard warranty is converted to on-site service, extending the one-year contract to 15 months.

Customer training is provided at the factory and consists of Level I (4 days) and Level II (15 days) training. The class size is limited to 10 students. On-site training is negotiable.

Beehive will customize its terminals to fit the user's specific applications.

OEM discounts are available.

	<u>Purchase Price</u>
DM5	\$ 880
DM5A	1,095
DM5B	1,295
DM30	2,095
DM3270	2,395
Micro 4400	3,245
P1600	2,395■

Beehive Alphanumeric Display Terminals



All Micro Bee Terminals in the DM Series include modular display and keyboard components housed in the newly-designed stylized cabinetry shown with the Model DM1A above.

MANAGEMENT SUMMARY

The Beehive family of alphanumeric display terminals includes five non-programmable terminals, which comprise the Micro Bee Series, plus one programmable terminal, Model B550. The B550 is described in Report C21-090-201. This report includes all other current Beehive offerings.

The newest terminals in the Micro Bee Series were announced at the National Computer Conference in June 1979 and replace all previous Micro Bee and B Series models except the B550. The new models are designated the DM Series, for "detachable models", because all feature a modular construction with detachable keyboards. Updated cabinet styling and a more compact case also distinguish these terminals from previous Micro Bee offerings. All models are controlled by an Intel 8085A microprocessor. Three of the DM Series terminals correspond in terms of features to older Micro Bee models: the DM10 replaces the Micro Bee; the DM1A, the Micro Bee 1; and the DM20, the Micro Bee 2. The other two models, DM1S and DM30, are completely new.

The DM Series terminals are designed around a concept of ordered progression in which each more sophisticated model contains all of the features of those models less sophisticated than itself. The low end of the series is the Model DM10, a basic conversational terminal. When expanded to include cursor controls, program function keys, and an auxiliary I/O port, it becomes the DM1A. The next level of capability, which adds full editing/formatting functions and a number of other features, is represented by the DM20. The high-end ➤

A family of microprocessor-based keyboard/display terminals.

The five non-programmable models, which comprise the Micro Bee Series, range in capability from a basic conversational terminal to a full editing/formatting terminal with a two-page memory and 16 program function keys.

Beehive terminals are available for purchase only. Prices start at \$995 for the low-end Model DM10 and range upward to \$1,995 for the high-end Model DM30. Quantity discounts are provided.

CHARACTERISTICS

VENDOR: Beehive International, 4910 Amelia Earhart Drive, P.O. Box 25668, Salt Lake City, Utah 84125. Telephone (801) 355-6000.

DATE OF ANNOUNCEMENT: Micro Bee DM Series—June 1979.

DATE OF FIRST DELIVERY: Micro Bee DM Series—July 1979.

NUMBER DELIVERED TO DATE: Information not available.

SERVICED BY: Beehive and Western Union.

MODELS

The Micro Bee Series includes:

- DM10—a basic conversational terminal.
- DM1A—an expanded version of the DM10 including full cursor controls, 12 program function keys, and an auxiliary I/O port.
- DM1S—a terminal with features identical to the DM1A plus empty ROM sockets that can accommodate emulation firmware from Beehive or customer-generated programs for special applications. Beehive currently offers emulation packages for the Data General Dasher Model 6053, Microdata Prism, DEC VT52, ADDS Regent 100, and Beehive's Micro Bee DM1A, DM20, and B150 (lower level). The cursor controls and program function keys are optional but may be required for use with certain emulators.
- DM20—a block mode version of the DM1A featuring full editing/formatting capabilities and 16 program function keys.
- DM30—a terminal similar to the DM20, but including two pages of display memory and a parallel Centronics-compatible printer interface. ➤

Beehive Alphanumeric Display Terminals

- Model DM30 provides a second page of display memory and a parallel printer interface as standard features.

The family also includes Model DM1S, a special version of the DM1A developed primarily for the OEM market. This terminal is equipped with depopulated ROM sockets which are designed to accommodate emulation firmware from Beehive and/or customer-generated programs for special applications. Beehive currently offers emulators for the DEC VT52, Microdata Prism, Data General Dasher, ADDS Regent 100, and Beehive's DM1A.

All DM Series terminals except the DM10 provide an auxiliary I/O port for connection of a user-supplied peripheral. Model DM30 is also equipped with a parallel printer interface that provides plug-compatibility with a user-supplied Centronics (or equivalent) printer. Beehive itself does not offer peripheral devices for attachment to its terminals; however, the user generally will be able to acquire such equipment through a Beehive distributor or representative. □

► TRANSMISSION SPECIFICATIONS

All models operate asynchronously in switch-selectable half-duplex, full-duplex, or echoplex mode. The 8-level ASCII transmission code is used. Odd or even parity or a space or mark condition is switch-selectable. A serial RS-232C interface and a current loop interface are standard and provide for communications line attachment. Switch-selectable transmission rates of up to 19,200 bps are supported via the RS-232C interface and up to 9600 bps via the current loop interface. A XON/XOFF protocol is also supported at transmission rates up to 19,200 bps on Model DM20 and DM30 only. All incoming and outgoing data is collected via buffers to maximize efficient use of the communications line.

A buffered bidirectional serial auxiliary I/O port is standard on Models DM1A, DM1S, DM20, and DM30, and provides for transfer of data from the host to an auxiliary peripheral device using an independent communications mode and transmission speed, as well as keyboard-to-peripheral operation. Model DM30 also includes a parallel Centronics-compatible printer interface.

DEVICE CONTROL

DM10: Data is transmitted character-by-character. The Local mode allows off-line keying of data into the display memory. A Line Monitor mode permits display of all ESCape code and control code sequences. The carriage return function can be performed with or without automatic line feed; a separate line feed function is also provided. Forward tabulation is standard; tab stops are fixed at 8-position intervals. Data can be displayed in normal or half intensity, shown in reverse video, blinked, or blanked (for security). A switch-selectable roll/scroll feature determines how data is entered on a full screen. If the roll function is selected, the cursor automatically returns to the top left of the screen when the bottom line of the display memory is filled; as new data is entered, the top line of existing data is overwritten. With the scroll function, all lines move up by one; new data is entered on the bottom line of the screen. In either case, the top line of data is lost. An audible beep sounds when a bell code is received or the 72nd character of a line is keyed. A self-test function can be initiated by the host, by the operator, or upon power-up; error messages are displayed on the 25th line of the screen.

Cursor sensing and addressing are standard, but no operator controls for cursor movement are provided on the DM10. The host CPU can independently access any part of the display memory without interfering with screen operations using a memory address pointer. The pointer acts as an "invisible" second cursor that permits the host to enter data into the memory or to read the ASCII value of a character located at the pointer, without interfering with other ongoing screen operations. A line lock function permits the host to designate selected lines in display memory as inaccessible to the visible cursor. A memory lock function permits the operator or the host to designate up to 23 lines above the line on which the cursor is located as inaccessible to the visible cursor. Areas locked by the line lock or memory lock are frozen on the screen and exempted from subsequent rolling or scrolling operations.

The CPU Message Deposit feature permits the host to flag a transmitted message for the terminal operator's attention. The message, which can be up to 80 characters in length and is accompanied by an identifying ESC sequence, is held in a special buffer, and a "MSG WAIT" message is displayed on the 25th line of the screen. When the operator responds, the message is displayed.

DM1A and DM1S: Includes all the features of the DM10, plus cursor controls, program function keys, and auxiliary I/O device controls. Cursor controls permit the operator to position the cursor up, down, left, right, or home. Twelve program function keys generate unique code sequences that can be transmitted to the host to initiate user-defined program functions or identify data. Auxiliary I/O controls permit the establishment of a direct data path between the terminal keyboard and the I/O device, so that data keyed by the operator can be received by the peripheral, and between the host CPU and the I/O device, so that the CPU can access the peripheral independently from other terminal operations.

DM20: Includes all the features of the DM1A, plus these additional features: forms mode; line, page, and modified mode transmission; line- and page-based editing functions; backward tabulation; and four extra program function keys.

The forms mode allows the operator or host to create and operate on a formatted display. A line drawing set (displayable on all models) containing eleven graphic symbols for drawing forms and contiguous lines, and the previously mentioned display attributes, can be used in forms design. Fields can also be designated as protected, numeric only, alpha only, alphanumeric, must fill, total fill, or constant.

Line transmission mode permits data to be blocked line-by-line for transmission. Page transmission mode allows an entire page of display memory, or (in forms mode) all unprotected data, to be transmitted. Modified mode, operable only in forms mode, transmits only data that has been changed by the operator; a tab code is transmitted in place of unchanged data.

Editing operations include character and line insertion and deletion, plus a clear entry function that erases the field the cursor is in and repositions the cursor at the beginning of that same field. Erase functions permit erasure to the end of a field, line, or page; clearing of unprotected data; and clearing of all data. Editing, erase, and certain other terminal functions may be subject to applicable protected field restrictions in forms mode.

The addition of a backtab function allows the operator to tab forward or backward from one fixed tab stop or format field to another.

The total number of program function keys is 16.

Beehive Alphanumeric Display Terminals

► **DM30:** Includes all of the features of the DM20 plus these additional features: a print control, a two-page memory, and forward and reverse scrolling. The print control permits the operator to enable/disable an attached printer. The two-page memory contains a total of 3840 characters, arranged in 48 lines of 80 characters. The forward and reverse scrolling functions permit the operator or host to operate on the entire paging memory as if it were a single page.

COMPONENTS

CRT DISPLAY UNIT: All models contain a 12-inch (measured diagonally) CRT monitor with a 1920-character screen capacity, arranged in 24 lines of 80 characters each. A 25th line displays modes of operation, error and status messages, configuration information, and a real-time clock. The full 128 ASCII character set is displayable, including lower case alphabets with descenders, using an 8-by-8 dot matrix. A line drawing set containing eleven graphic symbols for drawing forms and contiguous lines is also standard. Display attributes include reverse video, blink, underline, half intensity, and blank (security). The cursor is a non-destructive blinking block.

KEYBOARD: A 61-key ANSI-compatible teletypewriter keyboard that features auto repeat, two-key rollover, alpha lock, and lower case inhibit. A separate 14-key numeric pad is standard. The DM1A and DM1S keyboards also include a row of 12 program function keys, three terminal control keys, and five cursor control keys, located directly above the main keygroup. The DM20 and DM30 keyboards include two rows of keys above the main

keygroup; the top row contains 16 user-definable program function keys and four editing control keys; the second row 20 additional control keys. All keyboards generate 128 ASCII characters.

PRICING

The Beehive display terminals are available for purchase only. Quantity discounts are provided. Installation charges are extra and average \$75 per terminal. Beehive currently does not have a lease program, but will negotiate lease terms with a third party.

Beehive provides service in all cities that have a Beehive service center; other cities are covered by Western Union.

Prime shift and full period (24 hours/day; 7 days/week) maintenance service is available. Monthly maintenance is priced at \$17.95 to \$22.95 per month for units installed within 25 miles of a service center, depending on the model, and \$24.00 to \$30.50 per month for units installed 25 to 100 miles from a service center.

The standard warranty provides factory service for 90 days. When the purchase of a terminal and a maintenance contract coincides, the standard warranty is converted to on-site service, extending the one-year contract to 15 months.

Customer training is provided at the factory and consists of Level I (4 days) and Level II (15 days) training. The class size is limited to 10 students. On-site training is negotiable.

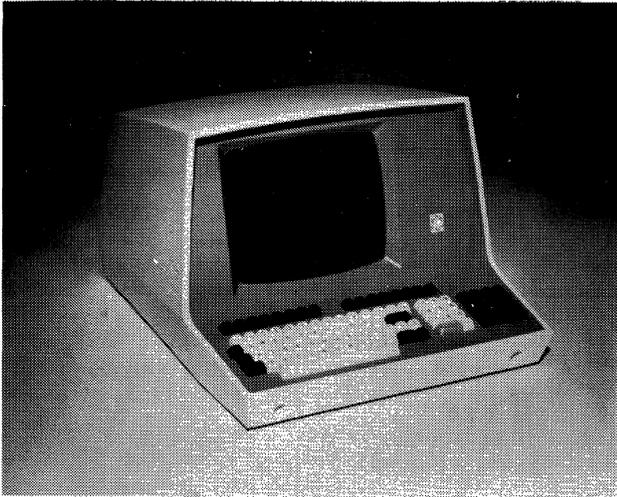
	<u>Purchase Price</u>
DM10	\$ 995
DM1A	1,395
DM1S	1,345
DM20	1,695
DM30	1,995

OPTIONS

50 Hz 230V	45
1 row of function keys and auxiliary port (DM1S only)	20

Emulators (DM1S only) for other major manufacturers' terminals will be quoted upon request. ■

Beehive Alphanumeric Display Terminals



The B 100 shown above was introduced in June 1976 and is the entry-level model in Beehive's family of display terminals. The B 100 is Teletype compatible and features an addressable sensor and a 960- or 1920-character screen.

MANAGEMENT SUMMARY

Beehive, formed in 1968, is a prominent vendor of alphanumeric display terminals. Its current offering, a family of nine terminals, ranges from the Mini Bee and the B 100, low-cost entry-level terminals to the microprocessor-based B 800, a user-programmable terminal that reflects current trends in intelligent terminal technology. These products are designed to meet the needs of both OEM and end users. This report includes all models except the programmable Models B 500 and B 800.

In June 1976, Beehive announced its "B" family of terminals composed of new models, (including Models B 100, B 500, and B 800) and relabeled existing models. The relabeled models are the B 200 (formerly Mini Bee 4), B 300 (formerly Super Bee 2), and B 400 (formerly Super Bee 3), B 600 (formerly Edit Bee), and B 700 (formerly Speedi Bee). The B 800 is a modified Brilliant Bee. The Mini Bee 2 was not relabeled to fit in the "B" series family because of its somewhat smaller size. According to Beehive, the Mini Bee 2 is still in production, is actively marketed, and is a strong seller with about 5000 units delivered.

The B 300 (Super Bee 2) is another of Beehive's strong products also boasting over 5000 installed units. Beehive's markets are diversified and include retail businesses, hotels, law enforcement agencies, schools, airlines (reservations), newspapers, shipping firms, pharmacies, and banks.

All models (except Model 600) contain a standard 12 inch CRT; a 15 inch CRT is optional. A white phosphor is ➤

A large family of keyboard/display terminals that offer a wide range of features.

Features include formatted operation, extensive editing (including specialized text editing), extensive cursor control, paging, scrolling, etc.

Configurations are stand-alone, although some terminals can be daisy-chained. Some models support a user-supplied serial printer via an RS-232 interface.

Pricing ranges from \$1,495 to \$3,995 in unit quantities; quantity discounts are provided. Beehive currently does not provide a lease program.

CHARACTERISTICS

VENDOR: Beehive Terminals (a subsidiary of Beehive Medical Electronics, Inc.), 870 West 2600 South, Box 25668, Salt Lake City, Utah 84125. Telephone (801) 972-6000.

DATE OF ANNOUNCEMENT: Typically six to nine months prior to production deliveries.

DATE OF FIRST DELIVERY: Mini Bee 2 – 1st qtr. 1973; B 100 – September 1976; B 200 (Mini Bee 4) – 2nd qtr. 1975; B 300 (Super Bee 2) – 2nd qtr. 1973; B 400 (Super Bee 3) – 3rd qtr. 1974; B 600 (Edit Bee), – 3rd qtr. 1975; B 700 (Speedi Bee) – 1st qtr. 1975.

NUMBER DELIVERED TO DATE: About 20,000 display terminals.

SERVICED BY: Beehive and Sorbus.

MODELS

The Beehive family of alphanumeric display terminals includes nine members: the Mini Bee 2 and Models B 100, B 200, B 300, B 400, B 500, B 600, B 700, and B 800. Model B 800 is described in Report C21-090-101. All models except Models B 600 and B 700 provide an RS-232C printer interface.

TRANSMISSION SPECIFICATIONS

The transmission parameters for each of the models are presented in the accompanying table.

All models operate in either half or full-duplex mode. External clocking is required for synchronous transmission. The 8-level ASCII (including parity) transmission code is used. Parity for the Mini Bee 2 and Models B 100, B 200 and B 700 is strap-selectable for odd, even, mark, or space. Parity for Models B 300, B 400, and B 600 is even for ➤

Beehive Alphanumeric Display Terminals

Beehive Display Terminal Transmission Specifications

Model	Technique	Rate, bits/sec.	Bits per char.	Interface
Mini Bee 2*	Asyn.	Up to 9600	10/11	232C
B 100*	Asyn.	110 to 19,200	10/11	232C or 20 ma dc
B 200*	Asyn. or Syn.	Up to 9600	8/10/11	232C or 20 ma dc
B 300*	Asyn. or Syn.	Up to 9600	8/10/11	232C or 20 ma dc
B 400**	Asyn. or Syn.	Up to 4800	8/10/11	232C
B 600*	Asyn. or Syn.	Up to 9600	8/10/11	232C
B 700	Asyn. or Syn.	Up to 500K cps	8	TTL (parallel)

* Switch selectable data rates.
** Strap selectable data rates.

▷ standard; green is optional. The standard display arrangement, common to all models except the B 100, is 25 lines of 80 characters each. The B 100 provides 12 lines of 80 characters. The keyboards of all models except the B 100 are detachable. The salient features of each of the Beehive terminals in this report are presented as follows:

- Mini Bee 2 – a Teletype replacement. Features include a Teletype compatible keyboard, TTY compatible protocol, and switch-selectable transmission speeds up to 9600 bps.
- B 100 – a low-cost, general-purpose terminal with integral keyboard. Standard features include a numeric pad, addressable cursor, and switch-selectable transmission rates up to 19,200 bps. Options include 16 Program Function keys, edit, and additional control functions. A 20 ma dc current loop interface can be substituted for its standard RS-232C interface. A second RS-232 interface is provided for printer output.
- B 200 – a general-purpose terminal that supports formatted data entry via a protected format, block, or character transmission, and entry of control codes into message block. Edit functions other than erasure are not provided. Standard features include a 128-character set of display symbols, a numeric pad, addressable cursor, switch-selectable transmission rates up to 9600 bps, and Teletype-compatible codes. A 20 ma dc current loop interface is optional.
- B 300 – a microprocessor-based terminal packed with features. Key features include an addressable/readable cursor, protected format, paging, control code entry, full edit capability, a non-spatial memory, eight program function keys, a numeric pad, and switch-selectable transmission rates up to 9600 bps. A 20 ma dc current loop interface and rack mount are optional. Volume users can specify communications protocol implemented via ROM.
- B 400 – a microprocessor-based terminal designed for polling/addressing environments and loaded with features. In essence, the B 400 is a polling/addressing version of the B 300 with a few extra features such as the capability to store a block of data and control

▶ asynchronous transmission and odd for synchronous transmission. Parity can be ignored on Models 300 and 400. A longitudinal redundancy character (LRC) follows each transmission (directly behind the ETX character) on Models 400 and 600.

DEVICE CONTROL

Mini Bee 2: Transmission is performed character by character. Cursor controls can position the cursor up, down, left, right or to home. Carriage return and line feed are also included. Erase functions erase from error to end of line, from cursor to end of memory, and all of memory. Control mode provides terminal control functions. An audible beep sounds when a bell code is received or the 70th character of a line is entered.

B 100: Transmission is character-by-character. The cursor is addressable. Cursor controls can position the cursor up, down, left, right, or to home. Carriage return and line feed are also provided. Erase functions erase from cursor to end of line, from cursor to end of memory, all data, or unprotected fields in the optional format mode. A scroll feature rolls data up by one line when data is added after display memory is filled; the first line is lost. An audible beep sounds when a Bell code is received or the 72nd character of a line is entered. Options include Format and Edit modes, line or page block transmit, and 16 program function keys. The optional format mode includes format protection and tabulation. The Edit option includes character insert and delete functions only.

B200: Transmission is character-by-character or by line or page in the block mode. The cursor is addressable. Cursor controls, scroll, erase, and alarm features are identical to those of the B 100. The scroll feature operates only when operating on-line. The Format mode, a standard feature, provides format protection and tabulation between unprotected (data) fields, which are displayed in reverse video. Tabbing via inserted horizontal control characters can also be performed when not operating in the Format mode. A local print function is also provided. Printing can be initiated both locally and remotely. Program Entry mode permits control characters (except Delete) to be entered within a message for transmission. A special, but standard, feature called Space Overwrite moves the cursor to the right without changing memory by depressing the space bar. The function is cleared by a line feed.

B 300: Transmission is performed in the character or block mode. In the character mode each character is transmitted as it is keyed. In the block mode, keyed data is stored in memory for later transmission as a complete message. The cursor is addressable and readable. Cursor controls are identical to the B 100 with the addition of a New Line function. Format and Program Entry modes are standard and are identical with those of the B 200. Tabulation and Space Overwrite features, also standard, are identical with

Beehive Alphanumeric Display Terminals

▷ characters in memory (Code Pack) and the capability to display unprotected fields in reverse video (Highlight).

- B 600 — a text editing terminal designed to satisfy the needs of the publishing industry. Key features include a 15 inch CRT, an extended character set consisting of 256 symbols, paging, extended cursor control and edit functions, and format protection. Transmission rates are switch-selectable to 9600 bps. A numeric pad is standard. The B 600 can be custom programmed to incorporate additional or alternative features.
- B 700 — a high-speed terminal with parallel interface for use as part of another terminal or computer system. The B 700 provides a TTL interface capable of rates of up to 500,000 cps. Key features include block transmission, format protection, an addressable cursor, standard erase functions, and the capability to store data and control characters as a block within memory. Graphics and a programmable keyboard are optional. Edit functions are not provided, nor is a numeric pad.

The Beehive terminals provide an RS-232 serial interface for connection to an external user-supplied printer. Beehive does not offer printers; however, the user may be able to acquire a printer through a Beehive distributor or representative.

USER REACTION

In Datapro's 1976 survey of alphanumeric display terminal users, 10 users reported on their experience with 36 Beehive terminals. Their ratings follow.

	<u>Excellent</u>	<u>Good</u>	<u>Fair</u>	<u>Poor</u>	<u>WA*</u>
Overall performance	5	3	0	1	3.3
Ease of operation	6	3	0	0	3.7
Display clarity	5	4	0	0	3.6
Keyboard feel & usability	4	5	0	0	3.4
Hardware reliability	2	5	1	2	2.7
Maintenance service	0	5	2	3	2.2
Software & technical support	0	4	5	1	2.3

*Weighted Average on a scale of 4.0 for Excellent.

These users were pleased with terminal operation and performance as reflected by their better than average scores. Applicability, flexibility, and reliability (even though it's rated slightly low) were cited as key advantages. On the other hand, these users cited poor support as the key disadvantage. This is reflected in the above ratings. One disenchanted user returned his terminal (a Super Bee 3) to the factory with a broken space bar and random memory errors. According to this user, the factory-returned terminal had different memory problems and the space bar was still faulty. Users were ambivalent with respect to cost. Four users felt the cost per terminal was high while four others felt the cost to be low. □

▶ those provided for the B 200. Erasure and alarm features are also standard and are identical with those of the B 100.

Standard edit features include page and line edit modes. Character or line insert and delete functions can be performed in the Edit mode. Only character insert and delete functions are provided in the Format mode and only within unprotected fields. In the Program Entry mode, a control code is inserted at the cursor location, but the function is not performed. Page edit functions effect all of display memory between cursor and end of memory; line edit functions are restricted to the line occupied by the cursor. Scroll down and scroll up features are standard.

Paging functions for next page and previous page are also provided. The paging functions move 25 lines ahead or behind in display memory. Paging in the Format mode moves the cursor to the initial character location of the first unprotected field of the page.

Memory is non-spatial; i.e., only data and control codes are stored and each line is terminated with a New Line code; the next character is displayed as the first character of the next line. Via this technique the 2048-byte memory can store up to 256 lines of not less than 7 characters per line. When memory is filled, further entry will automatically scroll all data upward so that a line is lost from the top of memory.

Three print modes permit printing on-line with or without displaying the received data and printing off-line. When not displayed, the received data can be printed while data is keyed into memory. The print modes can be selected from the keyboard or remotely.

B 400: Transmission is performed in the block mode only in a polling and addressing environment. All features provided for the B 300 are also standard with the B 400. Memory organization is also identical with the B 300. Additional features (also standard) include Code Pack, Highlight, and Message modes. The Code Pack mode permits data and control characters to be blocked and displayed without any action initiated. Code Pack can be entered and exited locally or remotely. The Highlight mode displays all unprotected fields in the Format mode in reverse video. Message mode transmits a block or page as selected. A page of data consists of all data following the home position. A block is defined as a selected segment of a page.

B 600: Transmission is performed in the block mode only in a polling and addressing environment. The B 600 is designed for text editing and features extensive editing, data manipulation, and display capabilities. The cursor is addressable, but not readable.

Cursor controls move the cursor left, right, up, down, or to home. Other cursor controls include skip the cursor by 16 locations to the left or right; skip the cursor to the previous page, to the next page, or to the next or previous field (in Format mode); and tab or backtab the cursor.

Edit functions include character, word, sentence, and paragraph insertion and deletion; margin control; hyphenation; block move; and memory erasure (entire memory or the segment between cursor and end of memory).

Search, a standard feature, locates data in a block of text from a keyed identifier.

Scrolling, up or down, is also standard, but does not cause data to be lost from memory. ▶

Beehive Alphanumeric Display Terminals

► Memory organization is the same as that of Models 300 and 400; however, a full memory will not displace stored data with new data. Further entry is inhibited and a beep alarm is sounded.

Format mode, a standard feature, operates in the same manner as in Models 200, 300, and 400. Protected fields are displayed in reverse video. The mode can be entered or exited locally or remotely.

B 700: Transmission is performed character by character or by block. Standard features include addressable cursor, audible alarm, cursor and tabulation functions, and Program, Format, and Erase modes. These features are identical in operation to those of the B 200, B 300, and B 400. Display parameters include blinking and reverse video. Memory organization is the same as that of the B 100 and B 200, not like the non-spatial B 300, B 400, and B 600 memories.

COMPONENTS

CRT DISPLAY UNIT: All models except Model 600 contain a 12-inch (measured diagonally) CRT screen with a viewing area 6.5 inches high and 8.5 inches wide. Model 600 contains a 15-inch CRT screen with a viewing area 7 inches high by 9 inches wide. The other models are available with an optional 15-inch CRT. The display arrangements for the various models are presented below.

	Model 100	Model 700	Other Models
Characters/display	960; 1920 opt.	2000 or 1000	2000
Characters/line	12; 24 opt.	25	25
Lines/display	80	80 or 40	80

The total number of displayable characters is 64 or 95 (optional) for Model 100; 128 for Model 200, 300, and 400; and 256 for Model 600. Each character is formed within a 5-by-7 dot matrix on all models except Model 600 which forms each character within a 7-by-9 dot matrix. Data is displayed in white or as an option in green. Models 300 and 400 feature four display parameters: normal, blink, reverse video, and reverse video with blink.

MINI BEE 2 KEYBOARD: A detachable, typewriter-style keyboard that provides Teletype compatibility.

B 100 KEYBOARD: A 74-key non-detachable, typewriter-style keyboard that features two-key rollover, alpha lock, and auto repeat and includes an 11-key numeric pad with

decimal to the right of the main keygroup, and an 8-key block of cursor and control keys to the extreme right. Options include a set of 16 function keys (located over the main keygroup) and 8 additional function keys added to the existing block of 8 cursor and control keys.

B 200 KEYBOARD: An 80-key, detachable, typewriter-style keyboard that features two-key rollover, auto repeat, and shift lock and includes an 11-key numeric pad with decimal to the right of the main keygroup.

B 300, B 400, B 600 KEYBOARDS: A 106-key, detachable, typewriter-style keyboard that features auto repeat and remote enable/disable and includes a block of 12 cursor and control keys and an 11-key numeric pad including decimal to the right of the main keygroup. The keyboards also include a row of eight function keys (optional on Model 600) and five lighted mode indicator/switches located over the main keygroup.

B 700 KEYBOARD: An 80-key, detachable, typewriter-style keyboard that features two-key rollover and shift lock, and includes a 10-key block of cursor and control keys to the right of the main keygroup.

PRICING

The Beehive display terminals are available for purchase only. Quantity discounts are provided. Installation charges are extra and average \$70 per terminal. Beehive currently does not provide a lease program, but will negotiate lease terms with a third party.

Beehive provides service in all cities with Beehive service centers; other cities are covered by Sorbus. Prime shift and full period (24 hours/day, 7 days/week) maintenance service is available. Beehive declined to provide maintenance costs because of the variance with geographical locations, number of units installed, etc.

Customer training is provided at the factory and consists of Level I (3 days) and Level II (2 weeks) training. The class size is limited to 10 students. On-site training is negotiable.

	Purchase Price
Mini Bee 2	\$1,795
B 100	1,495
B 200	2,395
B 300	3,295
B 400	3,695
B 600	3,995
B 700	3,995

Beehive also declined to provide pricing information on options. ■