

MICROCOMPUTER PRODUCTS

April 1980

VT103 LSI-11 Video Terminal



The VT103-AA and VT103-BA are compact video terminals which include all display and keyboard features of the VT100. They can be configured by the user to become a complete LSI-11 microcomputer system by the addition of module options available from DIGITAL. The units can be placed on a desk top or table for the convenience of the operator.

Each VT103 terminal contains a 305mm (12 in.) diagonally measured video display, a separate keyboard that attaches by a cable, an internal LSI-11 backplane assembly, the terminal controller module, the standard terminal port (STP) module and a power supply.

In addition, the VT103-BA terminal includes two TU58 DECTape II cartridge transports and the associated read/write controller logic. These tape units allow operating programs to be loaded into the VT103 from

the tape cartridges or allow program data to be stored on tape.

A complete series of LSI-11 processor modules, memory modules, and interface modules are available from Digital Equipment Corporation and can be installed into the backplane connectors of the VT103 to form a microcomputer system specifically designed to meet your processing requirements.

NOTE: The LSI-11 CPU and LSI-11 Bus options needed to complete an application are not part of the basic VT103 offering and need to be ordered separately.

These features, together with the availability of the RT-11 (single-interactive user) and RSX-11S (multi-tasking, memory-resident) operating software, provide the functionality normally found only in larger minicomputer systems.

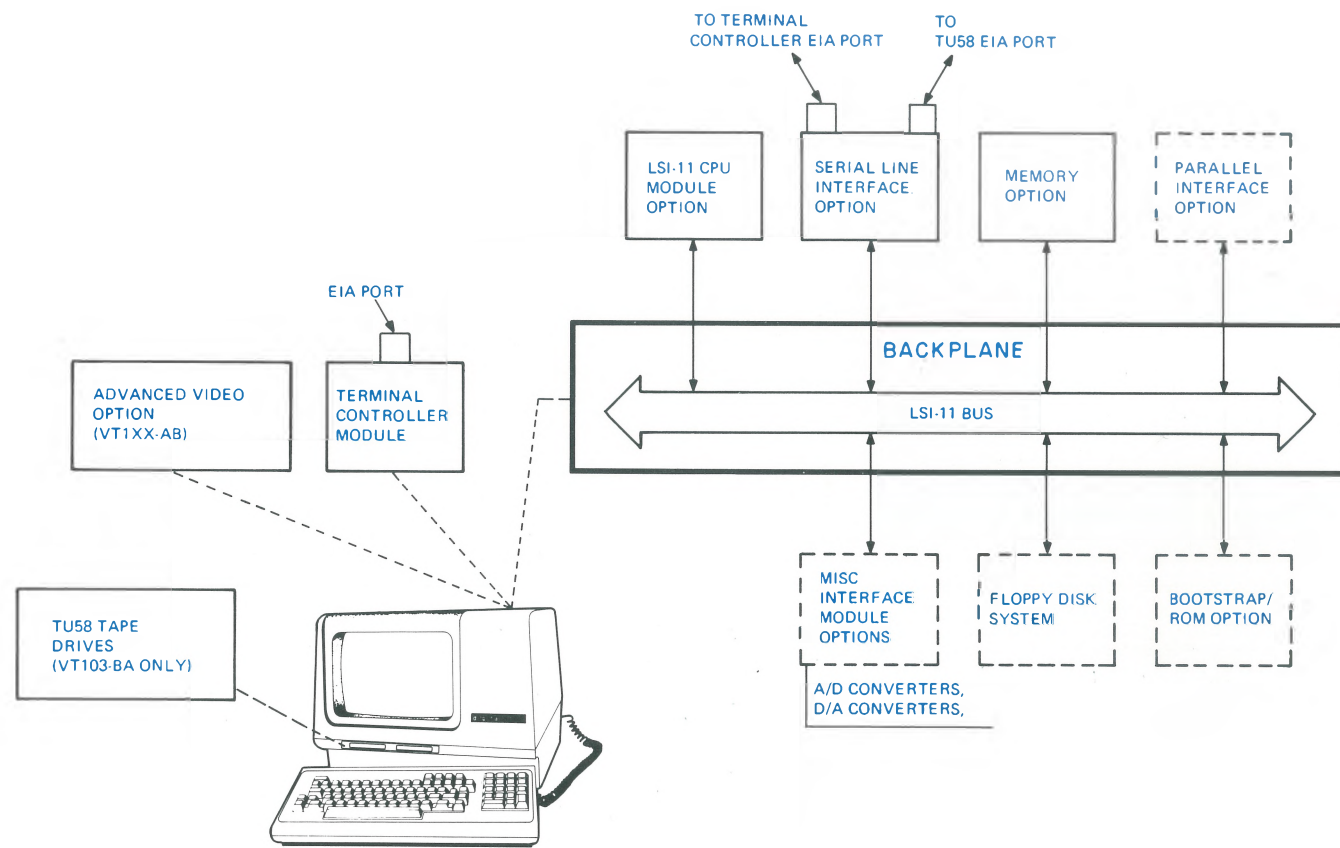


Figure 1

MR-4583

Description

Figure 1 shows the VT103 components and the options available. The terminal controller module, included with the VT103, contains the logic which generates and controls video characters and set-up features of the display. It also provides a 25-pin EIA compatible connector for a printer terminal or communications device.

The Advanced Video option increases the number of lines displayable in 132 column operation from 14 to 24 lines and provides additional character attributes including boldface, blinking and underlining.

The backplane assembly contains a four row by four slot (4 x 4) connector that forms the LSI-11 Bus. This

bus will accept up to four quad-height modules 26.7cm x 22.6cm (10.5 in. x 8.9 in.) or eight double-height modules, 13.2cm x 22.6cm (5.2 in. x 8.9 in.). Backplane does not include C-D interconnect and therefore does not support either RLV11 or RLV21. A mix of double and quad-height modules may be installed in a single bus. The CPU modules available are the LSI-11/2 or the LSI-11/23 microcomputers which can be configured with memory modules consisting of RAM, ROM, PROM and EPROM. A complete line of interface modules are also available and can be used to transfer serial or parallel data between character printers, floppy disk drive units or instrumentation devices and the LSI-11 Bus.

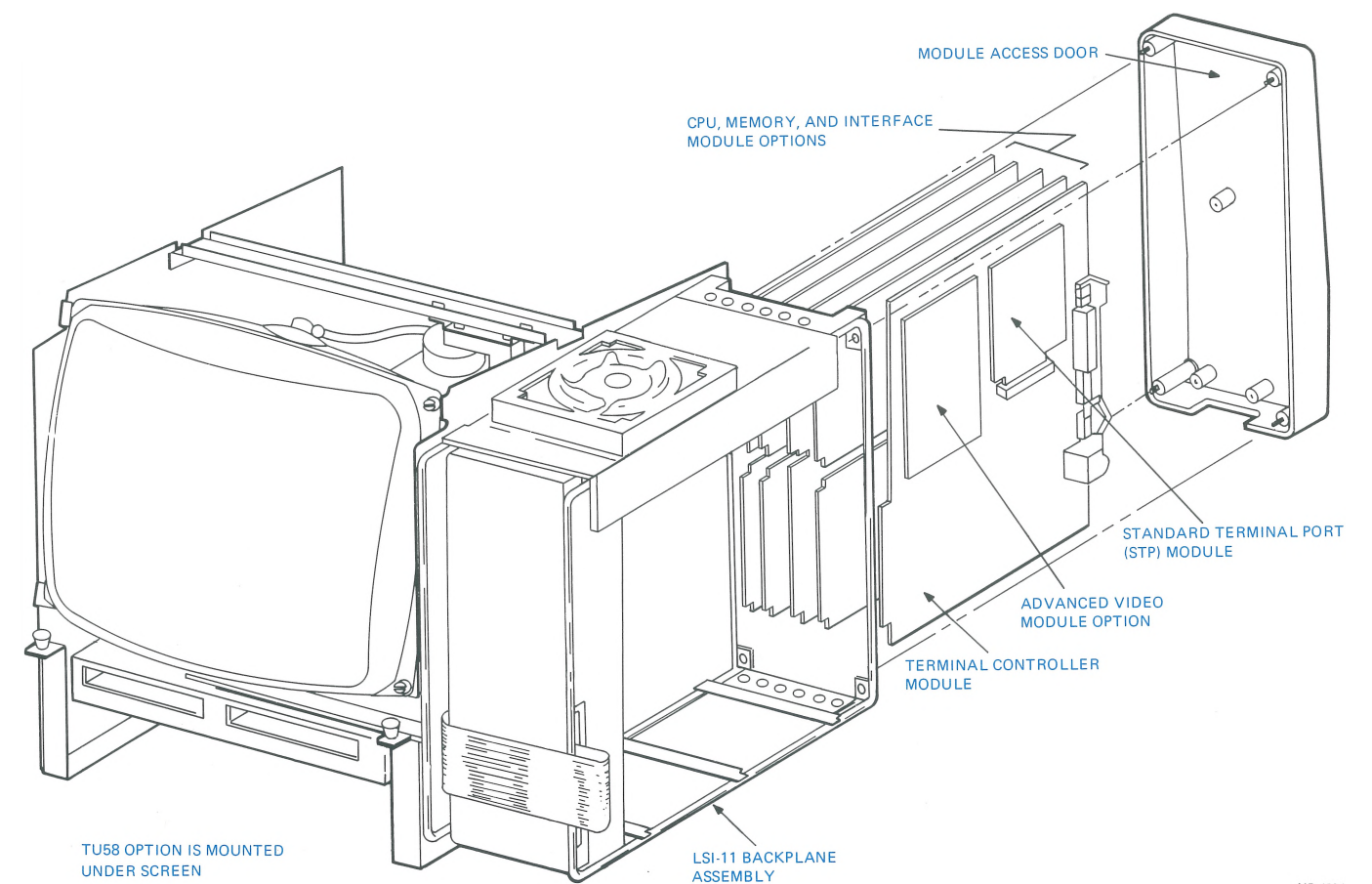


Figure 2

MR-4584

Figure 2 shows the location of the assemblies and modules in the VT103 unit. The CRT, high voltage and low voltage power supplies are located on the left side of the unit. The LSI-11 backplane assembly, located at the right side, provides the connectors for mounting the

CPU, memory and interface modules. The Terminal Controller module and Standard Terminal Port (STP) module are supplied with the VT103. The STP module is installed by the user onto the Terminal Controller module to facilitate internal cabling.

Module Options

DIGITAL provides a complete line of LSI-11 compatible interface modules for a variety of applications. Listed are some of the modules available. For information on other modules and for more detailed module descriptions refer to the *Microcomputer Processor* handbook and *Interfaces* handbook available from your local Digital Equipment Corporation sales office.

• LSI-11/2 CPU Module

KD11-HA (double-height) A low cost processor with direct addressing of 64K bytes. Eight general purpose registers and over 400 instructions. Asynchronous bus operations and DMA data transfers. ODT console emulator included. Extended Instruction Set (EIS) and 32-bit Floating Point Instruction Set (FIS) available with the KEV11 option.

• LSI-11/23 CPU Module

KDF11-AA (double-height) A high performance processor with memory management of 256K bytes of memory space. Eight general purpose registers and over 400 instructions. Four-level vectored interrupt structure. Asynchronous bus operation and DMA data transfers. ODT console emulator and Extended Instruction Set (EIS) are included. 32- and 64-bit Floating Point Instruction Set (FP11) is available with the KEF11 option.

• LSI-11 Memory Modules

MRV11-AA (double-height) Thirty-two IC sockets for up to 8K bytes of PROM/ROM and accepts 256 x 4 bit or 512 x 4 bit ICs. Not for > 64K byte systems.

MRV11-BA (double-height) Eight IC sockets for up to 8K bytes of UV PROM memory. Includes 512 bytes of static RAM.

MRV11-C (double-height) Sixteen IC sockets to accept a variety of standard erasable and fusible link PROM ICs and ROM formats of 1K x 8 bits, 2K x 8 bits and 4K x 8 bits. Supports up to 64K bytes and has 18-bit addressing. Window mapping capability.

MSV11-DD (double-height) 64K bytes of dynamic RAM, including memory refresh logic.

• LSI-11 Multifunction Module

MXV11-AA, -AC (double-height) 8K or 32K bytes of dynamic RAM including memory refresh logic. Two IC sockets for user PROM or system device bootstrap ROM option (MXV11-A2). Two serial line interface channels for EIA RS-232C or RS-423 specification. 60 Hz crystal oscillator for event interrupt.

• RX02 Double Density Floppy Disk System

RXV21 (double-height) Interface module controls the operation of the two floppy disk drives in the RX02 which stores up to 512K bytes per drive. Allows DMA data transfer rates of up to 62K bytes per second.

• Serial Line Interface Modules

DLV11-E (double-height) An asynchronous serial line interface with modem control for data sets or other EIA compatible devices.

DLV11-F (double-height) An asynchronous serial line interface for 20 MA or EIA compatible data only devices.

DLV11-J (double-height) A four channel asynchronous serial line interface to transfer EIA data to and from peripheral devices. Operates with 20 MA current loop devices when DLV11-KA option is used. RS-232C, RS-423, or RS-422 operation at rates up to 38.4K baud.

DUV11 (quad-height) A buffered, program controlled, single line interface that is used to establish communications transfers between a Bell 201 synchronous modem or equivalent and the LSI-11 Bus.

DZV11 (quad-height) An asynchronous multiplexer interface which allows the connection of up to four asynchronous communications devices.

• Parallel Line Interface Modules

DRV11 (double-height) A general purpose, 16-bit word I/O interface for TTL compatible devices.

DRV11-B (quad-height) A general purpose, 16-bit word or 8-bit byte I/O interface for DMA transfers up to 500K words per second.

DRV11-J (double-height) A general purpose, four-channel 16-bit I/O interface with programmable bit-level interrupt request logic.

• Converter Modules

AAV11-A (quad-height) A four-channel, 12-bit D to A converter with separate channel addressing.

ADV11-A (quad-height) A 12-bit, A to D converter with a 16 channel multiplexer.

• Instrument Interface

IBV11-A (double-height) Connects up to 15 instrument devices which are compatible with IEEE 488-1975 standard.

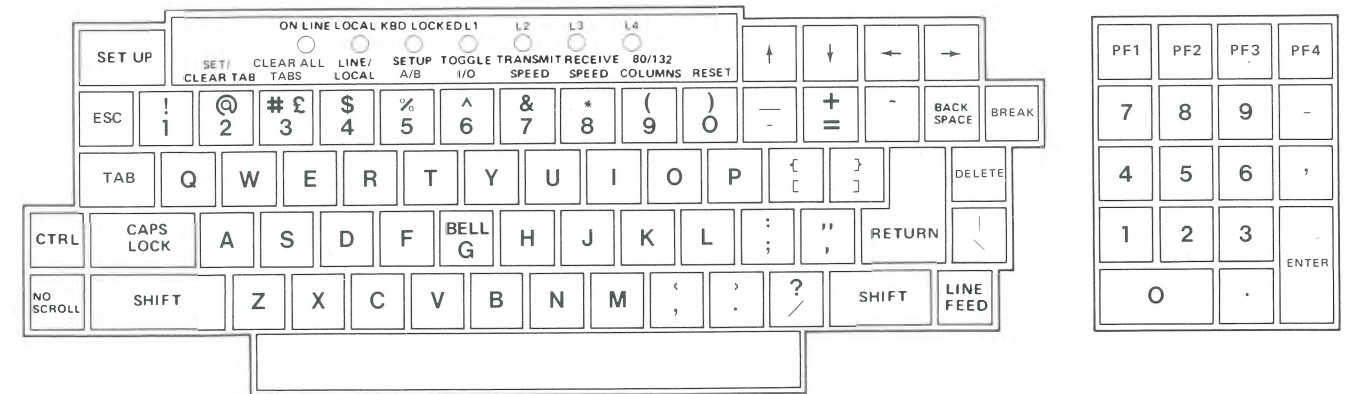


Figure 3

Keyboard

The VT103 includes a separate keyboard which attaches to the main unit through a coiled cord. Two keypads are mounted on the keyboard surface as shown in Figure 3. The main keypad consists of 65 keys arranged in a configuration similar to a standard typewriter. Keys are provided to control the presentation of the display.

Located above the keypad are LED indicators which display the status of the VT103.

The numeric keypad contains 18 keys consisting of numerals, punctuation, and special function keys. The numeric key permits direct entry of numerals similar to a calculator keypad. As an aid to the operator a short tone or click occurs when most of the keys are pressed.

Set Up Mode

The VT103 has many features which are selectable under keyboard control. Typical of the set-up features for computer compatibility are:

- answerback message
- auto XON/XOFF
- bits per character
- characters per line
- parity and parity sense
- transmit and receive speed

The operator comfort features include:

- auto repeat
- cursor
- margin bell
- screen brightness and background
- scroll

Video Display

The CRT is a 305mm (12 inch) diagonally measured display which provides 24 lines at 80 characters per line or 14 lines at 132 characters per line. The displayed characters are formed by a 7 x 9 dot matrix and includes a 96 character subset with upper- and lower-case characters, numerics and punctuation. The cursor is keyboard selectable and provides blinking block characters or character underlines.

With the installation of the Advanced Video option (VT1XX-AB) into the VT103, ten additional lines are displayed on the CRT in 132 characters per line format. Additional character attributes are also provided with the option and consist of boldface, blinking characters, underlining, and reverse video.

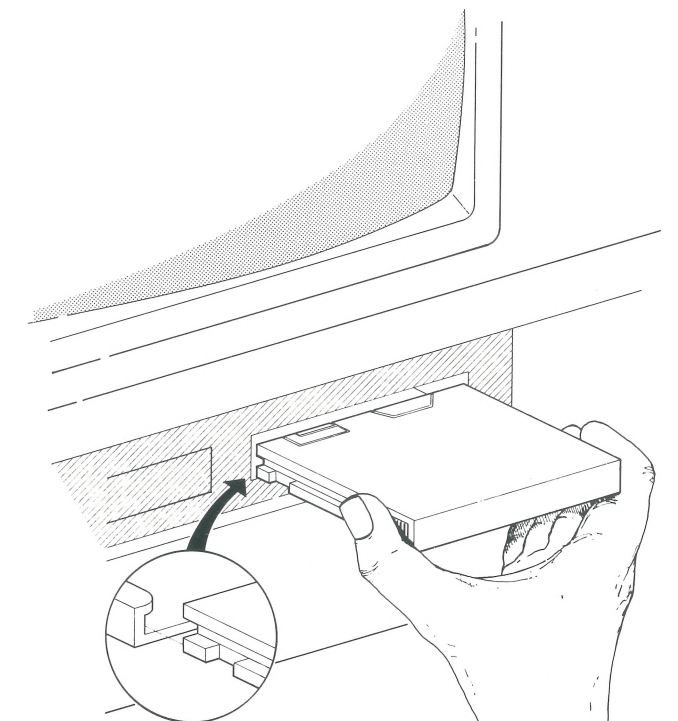


Figure 4

TU58 Tape Drive

The VT103-BA terminal contains two TU58 DECTape II transports mounted at the front of the unit below the video display. The tape drives operate with preformatted TU58-K tape cassettes and will store up to 256K bytes of program information or data on each of the two cartridges. A write protect tab on the cartridge prevents the possibility of destroying valuable data. Figure 4 shows the operator installing a tape cartridge into tape drive 1.

System Configuration

Many system configurations can be implemented using the modules previously described. Figure 5 shows two typical module layouts. Both double height and quad height modules can be intermixed into the backplane assembly. One serial line interface is required for communication with the terminal controller module in all VT103 units. The VT103-BA also requires a serial line interface to connect to the TU58 DEctape II controller module.

Configuration A is a complete microcomputer system contained on two double-height modules: the LSI-11/2 CPU module and the MXV11-A multifunction option. The MXV11-A module contains up to 32K bytes of RAM and

two serial line interfaces. One interface connects to the terminal controller module and one interface can be connected to either the TU58 DEctape II (VT103-BA) or to the EIA connector available at the rear of the unit.

Two 24-pin IC sockets on the MXV11-A module provide locations for application programs or for the bootstrap loader program stored in ROMs, MXV11-A2, which are used to load program information from the TU58 cartridges (VT103-BA) or from disk drives when they are used. Additional optional modules may be installed in the remaining locations of the backplane to increase the system capabilities.

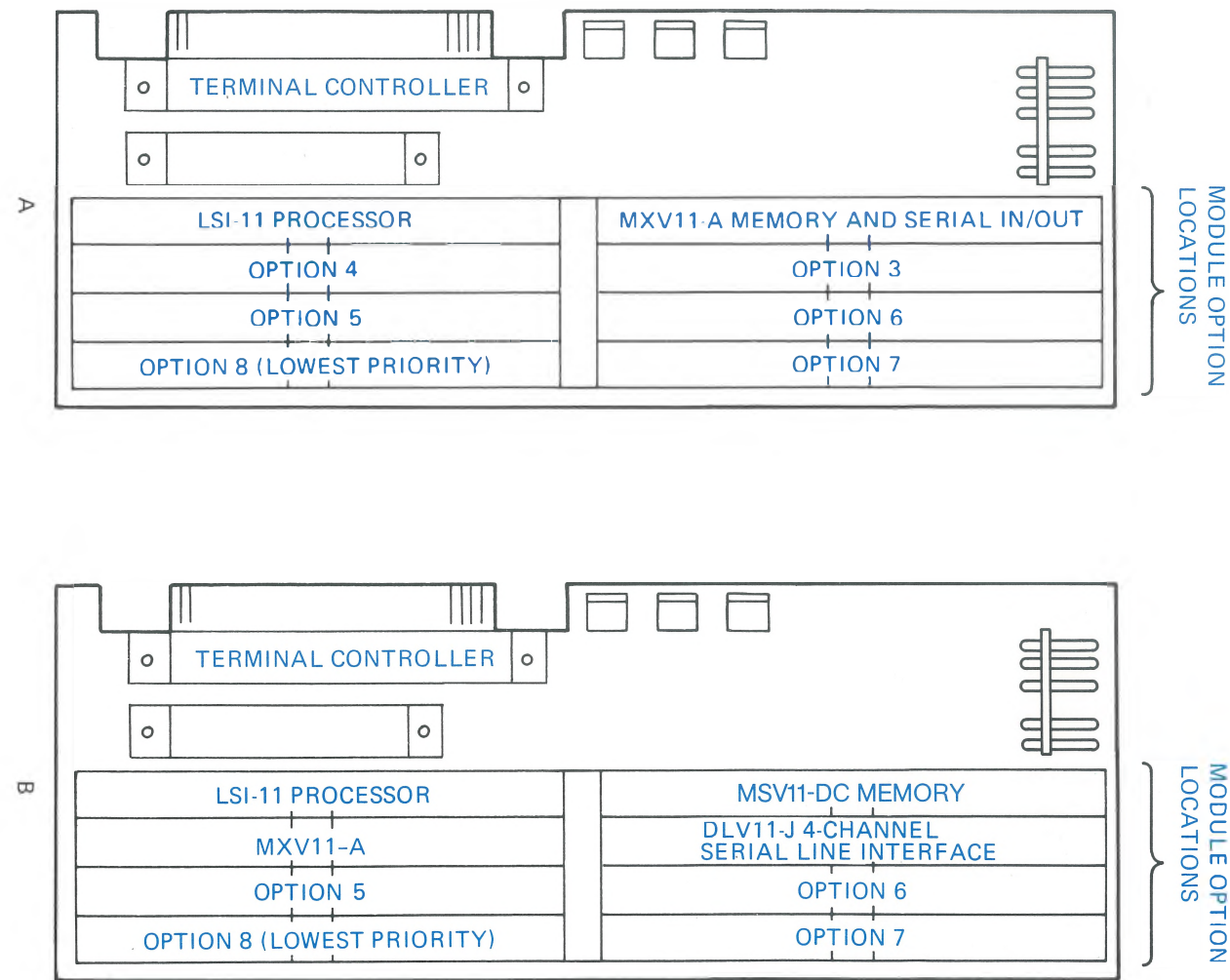


Figure 5

The B configuration of the backplane consists of four double-height modules: an LSI-11 CPU, and MSV11-DC main memory option, a DLV11-J four-channel serial line interface option, and an MXV11-A option module which contains additional RAM, two serial lines and the optional MXV11-A2 bootstrap loader program. The CPU module can be either the LSI-11/23 (KDF11-A option) or the LSI-11/23 (KDF11-A option). The MSV11-DC module consists of 32K bytes of dynamic RAM and memory

refresh logic. Mounted on the DLV11-J are four 10-pin connectors, one for each serial line channel. One channel provides the termination for the terminal controller module within the VT103 and another channel can be dedicated to an external communications device. In a VT103-BA unit, the third serial line interface connects to the TU58 DEctape II controller module. The remaining channel is available for direct connection to printer terminal or other devices.

VT103 Interconnections

Figure 6 shows the connections between the modules and options of a typical system configuration. Mounted on the terminal controller module is a 25-pin EIA connector for an external communications device, coaxial connectors for external video input and output and the keyboard cord connector. Information transfers between the LSI-11 module options and the terminal controller are made by cables connected to the Standard Terminal

Port (STP) module which is mounted on the terminal controller module. The advanced video module also mounts on the terminal controller module.

Option modules such as the DLV11-E, -F or DUV11 connect directly by cable to the 40-pin connector on the STP module, or modules such as the MXV11-A and DLV11-J connect to the 10-pin connectors on the STP module.

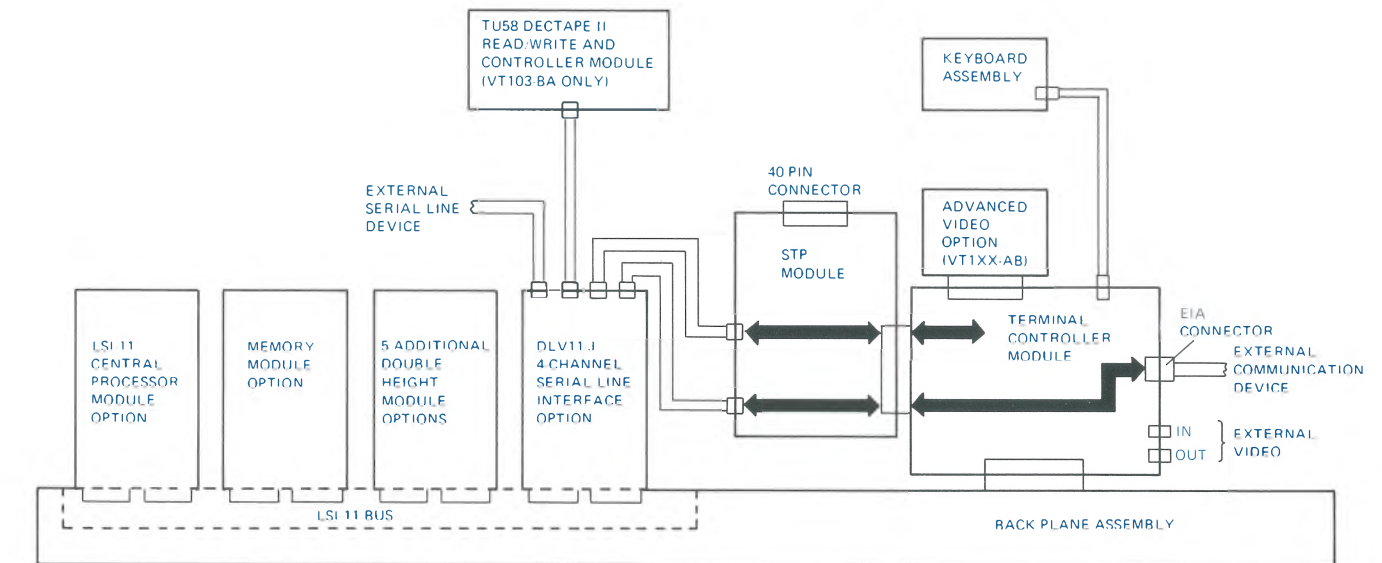


Figure 6

VT103 Specifications

Dimensions

Monitor	Height: 36.83cm (14.5 in.) Width: 45.72cm (18 in.) Depth: 36.20cm (14.25 in.)
Keyboard	Height: 8.89cm (3.5 in.) Width: 45.72cm (18 in.) Depth: 20.32cm (8 in.) Minimum table depth: 51.4cm (20.25 in.)

Weight

Monitor	15kg (33 lbs.)
Keyboard	2.0kg (4.5 lbs.)
Shipping Weight	20.5kg (45 lbs.)

Environment (VT103-AA)

Operating	Temperature: 5° to 40°C (50° to 104°F) Relative humidity: 10% to 90% Maximum wet bulb: 28°C (82°F) Minimum dew point: 2°C (36°F) Altitude: 2.4Km (8,000 ft)
Non-Operating	Temperature: -40° to 66°C (-40° to 151°F) Relative humidity: 0 to 95% Altitude: 9.1Km (30,000 ft)

Environment (VT103-BA)

Operating	Temperature: 15° to 32°C (59° to 90°F) Relative humidity: 20% to 80%
Non-Operating	Temperature: -34° to +60°C (-29° to +110°F) Relative humidity: 5% to 95%

NOTE:

The TU58 medium is rated at 10% to 80% relative humidity non-operating.

Power

Line Voltage	90-128 V RMS single phase, 2 wire 180-256 V RMS single phase, 2 wire (switch-selectable)
Line Frequency	47-63 Hz
Current	4.0 A RMS maximum at 115 V RMS 2.0 A RMS maximum at 230 V RMS

Cables

Line cord	115 V line cord supplied with VT103-AA, -BA
Signal cable	BC08R-01 cable is required when the DLV11-E, -F, or DUV11 options are to be connected to the STP module. Two 10 conductor flat cables are supplied with the VT103 for STP connections. The TU58 signal cable is supplied with VT103-BA units.

Other items supplied Users Guide, four module support guides.



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