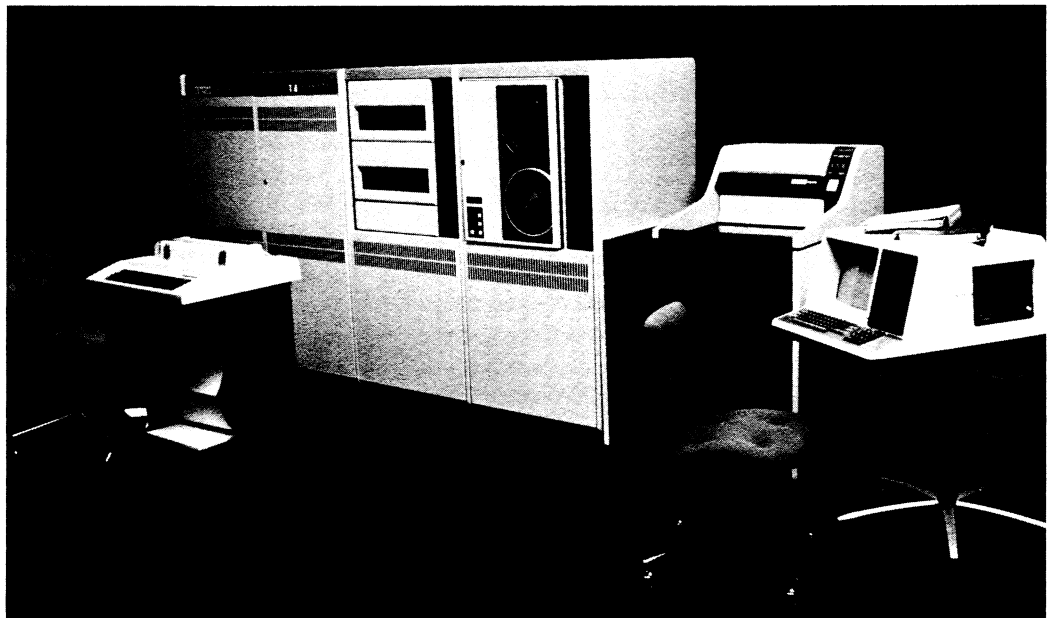**digital**

VAX11 780

**RP06/TE16 and RP06/TU77 Based
VAX-11/780 System Configuration**

The VT52 terminal photographed with this system must be purchased separately.

Effective: April 1980

Configuration Guidelines

This VAX-11/780 packaged system is configured with 1 million bytes of ECC MOS memory, an REP06 single access 176 million byte disk drive with MASSBUS adapter, a TEE16 (45 inches/second) or TEU77 (125 inches/second) magnetic tape transport unit with MASSBUS adapter, an LA 120 DECwriter III console terminal, and a BA11-K extension mounting box containing one DD11-DK backpanel mounting unit and one DZ11-A asynchronous multiplexer for connection of eight EIA communication lines.

Please note that there may be no substitution made for the LA120 console terminal in this packaged system. Also note that it is not advisable to use a video terminal as the console device because there are cases where diagnostics and system software messages are longer than the number of lines available on the screen. In these cases, parts of the error messages would be lost as they scrolled off the top of the screen.

Memory (Local and Shared)
The CPU cabinet in this system has predesignated space available for an additional 3,072K bytes of ECC MOS, 16K chip memory for a total of four million bytes in the basic CPU cabinet. Additional memory may be ordered in any of the combinations noted in the *VAX-11/780 SYSTEMS AND OPTIONS SUMMARY*.

For expansion beyond the four million bytes to a maximum of eight million bytes of local memory, an H9602-HA(HB) CPU Expansion Cabinet can be ordered. An additional four million bytes of memory with control (one MS780-C plus combinations of MS780-D expansion memory) can be mounted in this cabinet. The MS780-C controller requires two Option Panel Spaces in the CPU Expansion Cabinet.

Physical memory can also be expanded using the MA780 Multiport (shared) Memory Option. Two of these options can be added to a VAX-11/780 system. Each MA780 holds up to 2 million bytes of ECC MOS memory.

Maximum VAX-11/780 configurations will therefore support up to 12 million bytes of ECC MOS memory.

The MA780 Multiport Memory Option is connected to a VAX-11/780 via port interfaces (MA780-C). One MA780-C can be mounted in the basic CPU cabinet. If two MA780 subsystems are to be connected, an Option Panel Space in the CPU Expansion

Cabinet is required. The MA780 cabinet is always positioned adjacent to the CPU cabinet or the CPU Expansion Cabinet.

I/O Adapters (UNIBUS and MASSBUS)
One DW780 UNIBUS Adapter (UBA) and two MASSBUS adapters (MBA) are mounted in predesignated CPU cabinet space. Additional UBAs and MBAs can be mounted in the Option Panel Spaces available in the CPU Expansion Cabinet, H9602-HA(HB). Each additional UBA and MBA requires one Option Panel Space. VAX-11/780 systems can accommodate up to four UNIBUS adapters AND four MASSBUS adapters.

The system can run as many devices from a UBA as will mount into the allowable backplanes (within the power and bus load limits of the UNIBUS) and as are supported by the VAX/VMS operating system. One BA11-K must be ordered for each UBA which is added to a VAX-11/780 system, in order to mount options which are to be connected to additional UNIBUSes.

Additional disks (RM03 and RP06) can be added to either MASS-BUS on this system without expanding it to a third MASSBUS. Likewise, additional magnetic tapes can be added to this system's magtape MASSBUS. When application considerations dictate more than two MASSBUSes, additional MBAs may be ordered.

These are REM03, REP06, TEE16, TEU45, and TEU77 which include the mass storage device, its controller, a MASSBUS adapter, and its power supply.

Each MBA can run up to eight disk drives, OR eight tape drives and seven disk drives on its MASSBUS.

Table I lists necessary information on expansion space, plus available power and bus loads for configuring add-on equipment to this VAX-11/780 packaged system.

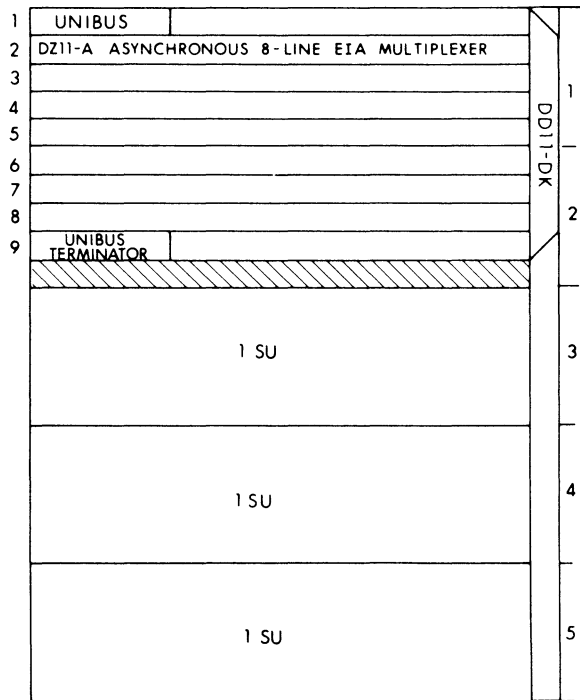## High-Performance Channel Interface
The DR780 is a general-purpose interface which can be used to connect customer-designed devices to a VAX-11/780. Also, two DR780s can be used to connect two VAX-11/780 systems.

The DR780 requires one Option Panel Space in a CPU Expansion Cabinet, H9602-HA(HB). It includes the interface logic, power supply and 25 ft. of cable. There is a limit of one DR780 per VAX-

RP06/TE16 and RP06/TU77 VAX-11/780 System Configuration

VAX-11/780 CPU CABINET — UNIBUS EXPANSION CABINET — DEDICATED MAGTAPE CABINET — DEDICATED DISK CABINET
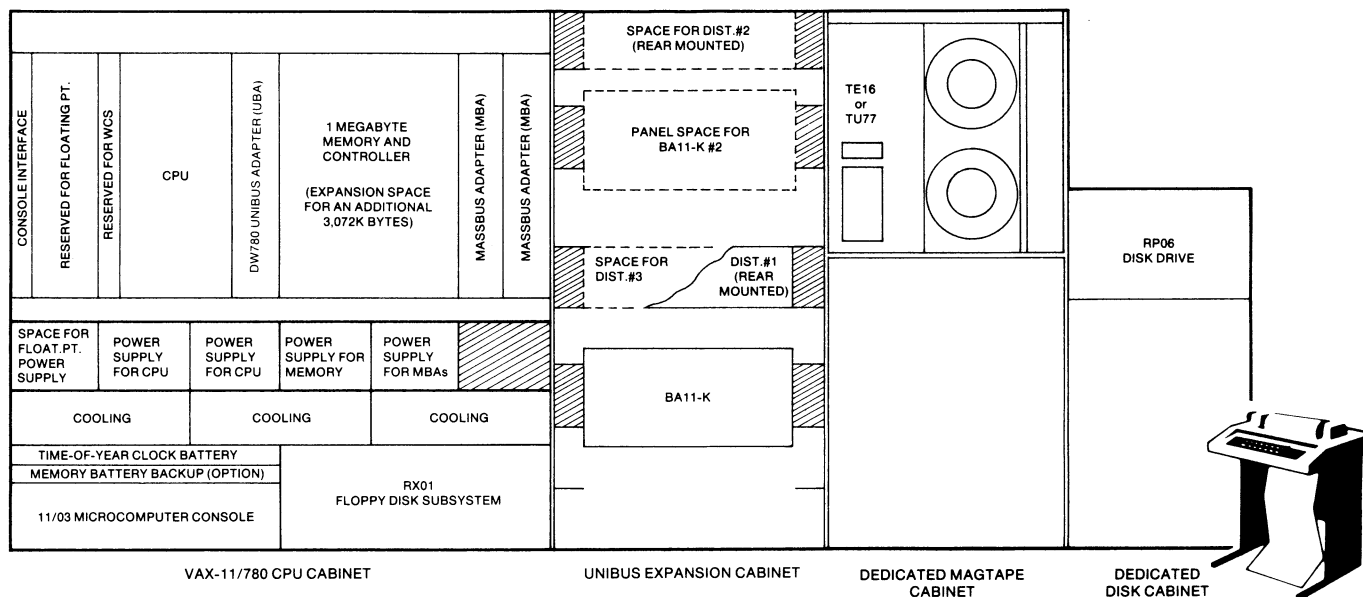
11/780 system and the DR780 cannot be configured on systems which already include the MA780 Multiport Memory. The cable from the user device to the DR780 can be up to 80 ft. in length.

```
1 | UNIBUS
2 | DZ11-A  ASYNCHRONOUS  8-LINE  EIA  MULTIPLEXER
3 |                                                      1
4 |                                              D
5 |                                              D
6 |                                              1
7 |                                              1
8 |                                              D    2
9 | UNIBUS                                       K
  | TERMINATOR
  |
  |                    1 SU                           3
  |
  |
  |                    1 SU                           4
  |
  |
  |                    1 SU                           5
```

BA11-KE(KF) EXTENSION MOUNTING BOX

UNIBUS Expansion Cabinet

An integral component in all VAX-11/780 packaged systems is the UNIBUS Expansion Cabinet which contains one BA11-K extension mounting box, one DD11-DK backpanel mounting unit, and one DZ11-A asynchronous multiplexer. The UNIBUS Expansion Cabinet can house a maximum of two BA11-K extension mounting boxes and provides space for up to three DZ11 distribution panels. Each distribution panel is capable of handling up to 16 lines for either EIA or 20mA terminals for a possible total of 48 asynchronous lines.

To expand beyond the limits of the UNIBUS Expansion Cabinet, a UNIBUS Options Cabinet, H9602-DF(DH), can be ordered (see back cover). This cabinet, which includes an 861-C(B) power control, provides space for two additional BA11-K boxes and three more DZ11 distribution panels.

The illustration above shows where the DZ11-A and the DD11-DK mount in the system's BA11-K, leaving a total of 6 Hex slots and 2 Quad slots of additional mounting space.

Asynchronous Multiplexers (Programmed I/0)

There are two kinds of asynchronous multiplexers available on VAX-11/780 systems, one for 20mA current loop operation and one for EIA/CCITT. Each of these is available in 8- or 16-line units.

The table below indicates the correct options to order based upon the number and type of terminals or lines to be used. Note that a DZ11-A with eight EIA lines is standard with every packaged system.

Quantities of EIA lines and 20mA lines can be mixed, but only in groups of eight on different distribution panels. The first 8 lines of either option includes a 16-line distribution panel which is prewired. So, for example, if 8 lines of EIA and 8 lines of 20mA are desired, two different distribution panels are required. To expand to more than 48 lines, an H9602-DF(DH) UNIBUS Options Cabinet can be added.

NUMBER LINES	EIA	20 milliampere loop
1-8	DZ11-A (incl.)	DZ11-C
9-16	DZ11-B	DZ11-F
17-24	DZ11-E	DZ11-F + DZ11-C
25-32	DZ11-E + DZ11-B	DZ11-F + DZ11-F
33-40	DZ11-E + DZ11-E	DZ11-F + DZ11-F + DZ11-C
41-48	DZ11-E + DZ11-E + DZ11-B	DZ11-F + DZ11-F + DZ11-F

The information in this table should only be used for an initial VAX-11/780 system.

Power Supplies

This VAX-11/780 configuration includes four power supplies which provide power for the CPU, UNIBUS Adapter, two MASS-BUS adapters, optional WCS (KU780), and the first four million bytes of ECC MOS memory.

There is predesignated space in the CPU cabinet for the power supplies included with the Floating Point Accelerator option and the H7112-A(B) memory battery backup option.

The optional VAX-11/780 CPU Expansion Cabinet, H9602-HA(HB), also includes space for two power supplies to accommodate additional memory and I/O adapters, and for the power supply included with the optional memory battery backup.

In the RP06/TE16 or RP06/TU77 system configuration, there is a total of 46.5 amps of power available @ +5V or 18 bus loads for UNIBUS options expansion. (See Table I below.)

SYSTEM CODE	MEMORY	MASS STORAGE	EXPANSION SPACE	POWER AVAILABLE Amps@ +5V	BUS LOADS AVAILABLE
SV-AXCVB-CA SV-AXCVB-CD	1 MB ECC MOS	RP06 TE16	**BA11-K:** SU 1-2: 6 Hex slots 2 Quad slots	21.5	18
SV-AXCBA-CA SV-AXCBA-CD	1 MB ECC MOS	RP06 TU77	SU 3-5: 3 SUs **CPU:** FP780-AA(AB) KU780 3,072K bytes memory H7112-A(B)	25.0 N/A	N/A

Table I

Environmental Considerations

VAX-11/780 systems, as well as other DIGITAL products, are designed to perform while exposed to a variety of environmental conditions. DIGITAL recommends the following environmental operating specifications for the computer facility for maximum reliability:

- Temperature: 18°C to 24°C (65° to 75°F)
- Temperature rate of change: 2°C/hr.(3.6°F/hr.).
- Relative humidity: 40% to 60% (non-condensing).
- Humidity rate of change: 2%/hr.

All VAX-11/780 system environments should be fully evaluated by a Field Service representative to ensure proper performance.

For further information on environmental considerations and site preparation, please refer to the *VAX-11/780* and *CORPORATE SITE PREPARATION GUIDE*s.

Add-On UNIBUS Options Cabinet
H9602-DF(DH)

For UNIBUS expansion beyond the limits of the system's UNIBUS expansion cabinet, the UNIBUS Options Cabinet may be ordered, H9602-DF(DH). This single-width, high-boy cabinet, which includes an 861-C(B) power control, can accept two additional extension mounting boxes (shown in the diagram to the far right as BA11-K #3 & BA11-K #4), and three more DZ11 distribution panels.

Please note that backpanel mounting units must be ordered separately for use in this add-on UNIBUS Options Cabinet.

VAX-11/780 CPU Expansion Cabinet
H9602-HA(HB)

A single-width, high-boy cabinet, referred to as the H9602-HA(HB) CPU Expansion Cabinet. This cabinet includes four Option Panel Spaces which may be used to mount additional memory, port interfaces for the Multiport Memory option, I/O adapters and the DR780 interface option.

These subsystems can be configured as required up to the maximum number of each device supported by the VAX/VMS operating system and within the available mounting space in each system. Refer to the *VAX-11/780 Systems and Options Summary* for more detailed information on the mounting requirements of the various subsystems.

The H9602-HA(HB) is always positioned adjacent to the main CPU cabinet.

Extension Mounting Box Diagram
BA11-KE(KF)

When an additional BA11-K is mounted in a UNIBUS cabinet, use this diagram to configure the option modules.

However, please note that the BA11-K does not include DD11-CK or DD11-DK backpanel mounting units. Therefore, DD11s must be added to your CONFIGURING WORKSHEET as separate line items to convert system unit space to module slots.

For your reference, a DD11-DK has been included in this diagram.
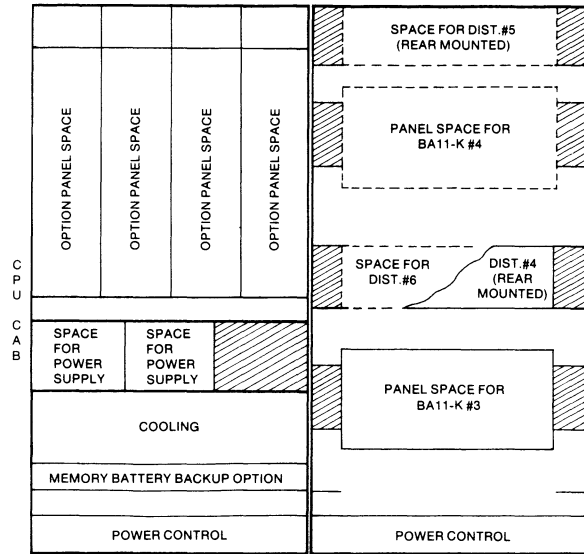
VAX-11/780 CPU EXPANSION
CABINET H9602-HA(HB)

ADD-ON UNIBUS
OPTIONS CABINET
H9602-DF(DH)
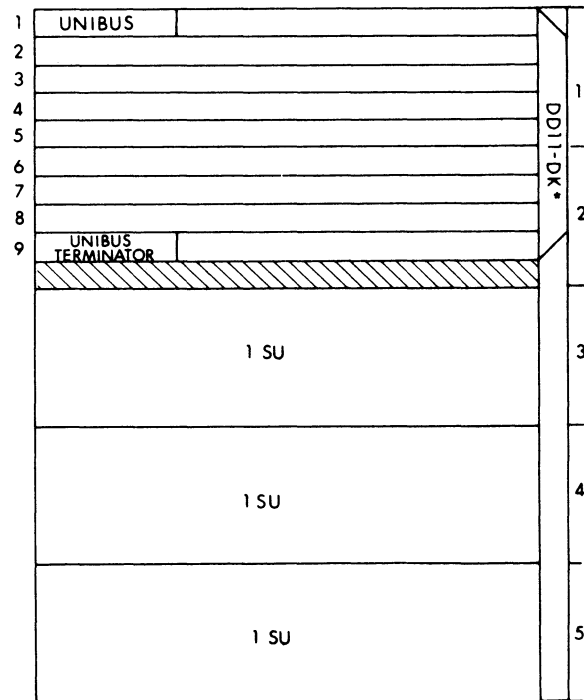
BA11-KE (KF) EXTENSION MOUNTING BOX

* For information only - not included in the BA11-KE(KF).