

|  |  |  |
| :--- | :--- | :--- |

INDUSTRY-COMPATIBLE MAGNETIC TAPE
TM11/TU10 Vacuum-column buffered Tape Transport and Control for either 7 - or 9 -channeI, $1 / 2$-inch industry-compatible magnetic tape: 800 BPI, 45 IPS (7-channel model also has provision for 556 and 200 BPI , program selectable). Up to seven additional slave tape transports may be added. Cabinet included.
The following configurations are available:

|  | $115 \mathrm{~V}, 60 \mathrm{~Hz}$ | $230 \mathrm{~V}, 60 \mathrm{~Hz}$ | $115 \mathrm{~V}, 50 \mathrm{~Hz}$ | $230 \mathrm{~V}, 50 \mathrm{~Hz}$ |
| :--- | :--- | :--- | :--- | :--- |
| Control Unit | TM11-A | TM11-A | TM11-B | TM11-B |
| 9-track Master Transport | TU10-EA | TU10-EB | TU10-EC | TU10-ED |
| 9-track Slave Transport | TU10-EE | TU10-EF | TU10-EH | TU10-EJ |
| 7-track Master Transport | TU10-FA | TU10-FB | TU10-FC | TU10-FD |
| 7-track Slave Transport | TU10-FE | TU10-FF | TU10-FH | TU10-FJ |

TU10

TM11

7 or 9-Channel, Master or Slave Transport (select model designation from above).
Tape Controller for up to eight TU10 Transports (select mode) designation from above).

| PDP-11/20 6,950 H - - <br> TM11     |  |  |  | 400 | Note 2 <br> Yes |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| PDP-11/20 | 3,000 | H | - | - | 25 | 240 | Note 2 <br> Yes |



## ROTATING MEMORY

| RF11 | Controller for up to 8 RS11 Disks (includes cabinet) |
| :--- | :--- |
| RS11 | 256K Word Fixed-Head Disk Drive; $16 \mu \mathrm{sec} /$ /word transfer; 17 msec <br> average access time |
| RS11-A | Same as above; 230V, 50Hz. |
| RK02 | 600K-Word DECpack Removable Disk Cartridge System. 22.16 usec/word <br> transter rate; 80 msec average access time; Expandable to 2.4 million <br> words. <br> Same as above; for 230V, 50Hz |
| RK02-A | Controller for up to four RK02 DECpack disk cartridge drives. <br> 64K-Word DECdisk Fixed-Head Disk Drive; 16 usec/word transfer rate; <br> RK11 |
| RS64 | Same as above; for 230V, 50Hz. |
| RS64-A | Controller for up to four RS64 DECdisks. |


| PDP-11/20 | 5,000 | H | - | - | 25 | 220 | Note 2 <br> Yes |
| :--- | :---: | :--- | :--- | :--- | :--- | :--- | :--- |
| RF11 | 9,000 | H | - | - | 40 | 240 | Note 2 <br> Yes |
| PDP-11/20 <br> RF11 | 9,000 | H | - | - | 40 | 240 | Note 2 <br> Yes |
| PDP-11/20 <br> RK11 | 7,000 | H | - | - | 60 | 260 | No |
| PDP-11/20 <br> RK11 | 7,000 | H | - | - | 60 | 260 | No |
| PDP-11/20 | 5,900 | H | - | - | 40 | 240 | No |
| PDP-11/20 <br> RC11 | 4,500 | H | - | - | 15 | 240 | Note 2 <br> PDP-11/20 |
| 4,500 | H | - | - | 15 | 240 | Note 2 <br> RC11 |  |
| YDP-11/20 | 2,450 | H | - | - | 20 | 150 | Note 2 |
|  |  |  |  |  |  |  | Yes |

## EXTENDED ARITHMETIC ELEMENT

KE11-A Extended Arithmetic Hardware Element; Multiply, Divide, multiple shifts, normalizes - handles signed numbers

## CARD EQUIPMENT

| CR11 | Card Reader; for 80 -column punched cards; rate 200 cards per minute <br> (table top) |
| :--- | :--- |
| CR11-A | $230 \mathrm{~V}, 50 \mathrm{~Hz}$ model |


| PDP-11/20 | 4,500 | G | - | 1 | 50 | 240 | No |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| PDP-11/20 | 4,500 | G | - | 1 | 50 | 240 | No |

CLOCKS
KW11-L Real Time Clock-Line Frequency. Causes interrupt each $16.6 \mathrm{~ms}(60 \mathrm{~Hz})$

PDP-11/20
250 D or 20 ms ( 50 Hz )

## PAPER TAPE AND TELETYPE

|  |  |  |  |  | ote |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| PC11 | High Speed Paper Tape Reader ( 300 cps ) and Punch ( 50 cps ) with control 115 V 60 Hz | PDP-11/20 | 3,900 | G | 0 | 1 | 25 | 300 | Note 2 <br> Yes |
| PC11-A | Same as PC11 except that it requires 115 V 50 Hz 230 V requires $\mathrm{H}-722$ | PDP-11/20 | 3,900 | G | 0 | 1 | 25 | 300 | $\begin{aligned} & \text { Note } 2 \\ & \text { Yes } \end{aligned}$ |
| PR11 | High Speed Paper Tape Reader ( 300 cps ) with Control $115 \mathrm{~V} 50 / 60 \mathrm{~Hz}$ 230 V requires $\mathrm{H}-722$ | PDP-11/20 | 2,400 | G | 0 | 1 | 15 | 150 | Note 2 Yes |
| H-722 | Transformer 230V to $115 \mathrm{~V} 50 / 60 \mathrm{~Hz}$ required for 230 V operation of PC 11 and PR11 | PC11 or PR11 | 100 | E | - | - | - | - | $\begin{aligned} & \text { Note } 2 \\ & \text { Yes } \end{aligned}$ |
| KL11-A | Teletype Control for LT33 or LT35 including address select and interrupt control | PDP-11/20 | 400 | G | 0 | 1 | 6 | 60 | $\text { Note } 2$ Yes |
| LT33-DC | ASR-33 Teletype 115V 60 Hz | KL11A | 1,500 | - | - | - | 30 | 120 | No |
| LT33-DD | ASR-33 Teletype 230 V 50 Hz | KL11A | 1,500 | - | - | - | 30 | 120 | No |
| LT33-CC | KSR-33 Teletype 115V60 Hz | KL11A | 1,200 | - | - | - | 25 | 80 | No |
| LT33-CD | KSR-33 Teletype 230V 50 Hz | KL11A | 1,200 | - | - | - | 25 | 80 | No |
| LT35-DC | ASR-35 Teletype 115V 60 Hz | KL11A | 4,500 | - | - | - | 25 | 150 | No |
| LT35-DD | ASR-35 Teletype 230V 50 Hz | KL11A | 4,500 | - | - | - | 25 | 150 | No |
| LT35-CC | KSR-35 Teletype 115V 60 Hz | KL11A | 3,000 | - | - | - | 22 | 80 | No |
| LT35-CD | KSR-35 Teletype 230 V 50 Hz | KL11A | 3,000 | - | - | - | 22 | 80 | No |



## LINE PRINTERS

| LP11 | $300 \mathrm{lpm}, 80$-col. line printer includes control logic |
| :---: | :---: |
| LP11-FA | 80 Col. Line Printer, 64 Char. 115V 60 Hz |
| LP11-FB | 80 Col. Line Printer. 64 Char. 230V 50 Hz |
| LP11-HA | 80 Col. Line Printer, 96 Char. 115V 60 Hz |
| LP11-HB | 80 Col. Line Printer, 96 Char. 230V 50 Hz |
| LP11-JA | 132 Col. Line Printer, 64 Char. 115 V 60 Hz |
| LP11-JB | 132 Col. Line Printer, 64 Char. 230V 50 Hz |
| LP11-KA | 132 Col. Line Printer, 96 Char. 115V 60 Hz |
| LP11-KB | 132 Col. Line Printer, 96 Char. 230 V 50 Hz |


|  | F,G | 0 | 1 | 55 | 200 | No |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 12,000 | - | - | - | - | - | - |
| 12,000 | - | - | - | - | - | - |
| 1,500 | - | - | - | - | - | - |
| 13,500 | - | - | - | - | - | - |
| 17,500 | - | - | - | - | - | - |
| 17,500 | - | - | - | - | - | - |
| 19,000 | - | - | - | - | - | - |
| 19,000 | - | - | - | - | - | - |

PDP-11/20
PDP-11/20

## None


#### Abstract

Non






None
None

## None

None

| BC11A-2 | $2^{\prime}$ |
| :--- | :--- |
| BC11A-5 | $5^{\prime}$ |
| BC11A-8F | $8^{\prime} 6^{\prime \prime}$ |
| BC11A-10 | $10^{\prime}$ |
| BC11A-15 | $15^{\prime}$ |
| BC11A-25 | $25^{\prime}$ |

## CRT DISPLAYS

| VT01-A | Tektronix 611 Storage Tube Display |
| :--- | :--- |
| VR01A | Tektronix RM503 Oscilliscope Display |
| VR14 | $7^{\prime \prime} \times 9^{\prime \prime}$ Point Plot Display |
| VR14A | Same except 230V, 50/60 Hz |
| AA11-D | Digital to Analog Control. Space available for 4 BA614 Analog-to-Digital <br> converter modules for scope control |


| AA11-D <br> AA11-A <br> +(2) BA614 | 3,000 | - | - | - | 66 | 60 | No |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| AA11-D+ <br> AA11-B+ <br> (2) BA614 | 1,000 | H | - | - | - | - | - |
| AA11-D+ <br> AA11-C+ <br> (2) BA614 | 2,450 | H | - | - | 18 | 100 | No |
| AA11-D+ <br> AA11-C+ <br> (2) BA614 <br> PDP-11/20 | 2,450 | H | - | - | 18 | 100 | No |
|  | 1,000 | B | 1 | 0 | 6 | - | Note 2 <br> Yes |



## CRT DISPLAYS

BA614
Digital to Analog Converter; (4) mounts in AA11-D.

AA11-A
AA11-B Control for RM503 Scope. Space available for 2 more BA614; mounts in AA11-D
AA11-C Control for VR12 Scope. Space available for 2 more BA614; mounts in AA11-D
VT06
Alphanumeric CRT visual display terminal with keyboard. Half or full duplex, 110 Baud to 2400 Baud switch selectable. - table top model


AA11-D

AA11-D+
(2) BA614

AA11-D+
(2) BA614

AA11-D
(2) 'BA614

DE11-A+ KL11-E
or
DC11-AA +
DC11-AB

## ANALOG TO DIGITAL

ADO1-D Analog to Digital Conversion Subsystem. 10 bit unipolar or 10 bit plus sign (optional) analog to digital converter, multiplexer control for up to 32 channels of single-ended, high-level inputs; with interface and power supply. Program selectable input ranges of: 0 to $+1.25 \mathrm{~V},+2.5 \mathrm{~V},+5.0$ or +10.0 V unipolar; 0 to $\pm 1.25 \mathrm{~V}, \pm 2.5 \mathrm{~V}, \pm 10.0 \mathrm{~V}$ bipolar.

## Options - mount in ADO1-D

A124 Mux Module 4 channels

AHO4 Sample \& Hold
AH05 Sign Bit, 11th Bit, 2's complement
AD01-D
AD01-D

AD01-D

| 60 | - | - | - | $N / C$ | 60 | Note 2 <br> Yes |
| :---: | :---: | :---: | :---: | :---: | :---: | :--- |
| 300 | - | - | - | 6 | 60 | Note 2 <br> Yes |
| 400 | - | - | - | 6 | 60 | Note 2 <br> Yes |

## DIGITAL TO ANALOG

AA11-D

BA614
Digital to Analog Converter Subsystem. 11 bits plus sign digital to analog conversion with up to 4 channels available with an adjustable full-scale output voltage of 0 to $\pm 10 \mathrm{~V}$ at 10 ma . Space available for 2 more BA614 Digital to Analog Converter - mounts in AA11-D.

## COMMUNICATIONS

| DC11-AA | Dual Asynchronous Serial Line System Unit and Clock for mounting 2 DC11DA Module Sets. 110, 134.5, 150, 300 Baud (typical speeds with 103 modem, program selectable) |
| :---: | :---: |
| DC11-AB | Same as DC11AA above but 110, 150, 1200 and 1800 Baud (typical 202 speeds, program selectable) |
| DC11-AC | Same as DC11AA except $110,150,600$ and 1200 Baud (typical European, program selectable) |
| DC11-DA | Full Duplex Serial Module Set for DC11A (DC11A accomodates 2 ea) with EIA/CCITT termination suitable for direct use with 103 or 202 modem. Handles $5,6,7$, or 8 bit codes with 1 or 2 stop bits. |
| H312A | Asynchronous Null Modem allows direct connection of any peripheral having an EIA232 interface with a DC11. Also allows direct computer-tocomputer data transfers between two PDP-11's. Each must have a DC11DA and the machines must not be separated by greater than 50 feet. |
| DE11-A | EIA level, RS-232-C line adaptor for VT06 or other EIA level devices (Requires KL11 interface). Mounts on KL11. |
| KL11-B | Full Duplex Asynchronous Line Interface Unit; 150 Baud |
| KL11-C | Same as KL11-B, except 300 Baud |
| KL11-D | Same as KL 11-B, except 600 Baud |
| KL11-E | Same as KL11-B, except 1200 Baud send, 110 Baud receive |
| KL11-F | Same as KL11-B, except 2400 Baud |


| PDP-11/20 | 1,000 | B | 1 | 0 | 6 | - | Note 2 Yes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| AA11-D | 375 | - | - | - | 1 | 60 | Note 2 <br> Yes |
| PDP-11/20 | 250 | B | 1 | 0 | - | 20 | Note 2 Yes |
| PDP-11/20 | 250 | B | 1 | 0 | - | 20 | Note 2 Yes |
| PDP-11/20 | 250 | B | 1 | 0 | - | 20 | $\begin{aligned} & \text { Note } 2 \\ & \text { Yes } \end{aligned}$ |
| $\begin{aligned} & D C 11-A A \\ & A B \text { or } A C \end{aligned}$ | 600 | - | - | - | - | 30 | Note 2 Yes |
| DC110 | 60 | - | - | - | - | - | Note 2 Yes |
| KL11 series interfaces | 100 | - | - | - | - | - | Note 2 <br> Yes |
| - | 400 | G | - | - | - | - | Note 2 <br> Yes |
| - | 400 | G | - | - | - | - | Note 2 Yes |
| - | 400 | G | - | - | - | - | Note 2 Yes |
| - | 400 | G | - | - | - | - | Note 2 Yes |
| - | 400 | G | - | - | - | - | $\begin{aligned} & \text { Note } 2 \\ & \text { Yes } \end{aligned}$ |



## MOUNTING BOXES AND POWER SUPPLIES

| BA11-EC | Extension Mounting Box with Table Top Cover. Includes a fan and BC11A-8F UNIBUS Cable | None | 450 | - | - | - | - | 60 | Note 2 Yes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| BA11-ES | Extension Mounting Box with Tilt and Lock Chassis Slides. Includes fans and $\mathrm{BC} 11 \mathrm{~A}-8 \mathrm{~F}$ UNIBUS Cable | None | 400 | - | - | - | - | 60 | Note 2 Yes |
| H720-A | Power Supply 115V 50/60 Hz | None | 500 | B | - | - | - | - | Note 2 Yes |
| H720-B | Power Supply 230V $50 / 60 \mathrm{~Hz}$ | None | 500 | B | - | - | - | - | $\begin{aligned} & \text { Note } 2 \\ & \text { Yes } \end{aligned}$ |
| H960-CA | Free Standing Base Cabinet. Includes fans, power distribution panel, extension feet, front bezel panels | None | 650 | - | - | - | - | - | Note 2 Yes |
| H952-HA | Free Standing Table with adjustable height legs for use with H960-CA cabinet | None | 120 | - | - | - | - | - | Note 2 Yes |
| H961-A | Free Standing Cabinet without end panels | None | 430 | - | - | - | - | - | Note 2 Yes |

## MAINTENANCE AND SPARE PARTS

| KM11A | Maintenance Module - light and switch card for examination of machine states | None | 250 | - | - | - | - | - | Note 2 Yes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SP11-KA | KA11 Spare Parts | PDP-11/20 | 2,950 | - | - | - | - | - | Note 2 <br> Yes |
| SP11-MM | MM11-E Spare Parts | PDP-11/20 | 700 | - | - | - | - | - | $\begin{aligned} & \text { Note } 2 \\ & \text { Yes } \end{aligned}$ |
| SP11-PS | Spare Parts for H720 | H720 | 195 | - | - | - | - | - | Note 2 <br> Yes |

## MOUNTING CODES

A - Mounts in Basic Mounting Box
B-Mounts in Basic or Extension Mounting Box
C-One MR11-A and one MW11-A mount in a single System Unit which is included with the purchase of the MR11-A option. Each MR11-A requires one System Unit of mounting space and provides space for one MW11-A.

D-Mounts in the KA11 Processor
E- Mounts on rear door of H960-CA or similar cabinet
F-Line Printer free-standing HWD (inches) $=46 \times 24 \times 22$
G-Mounts in one of the two small peripheral controller slots in the KA-11 or one of the four small peripheral controller slots in a DD11-A.
H-Cabinet Mounted


* = PROCESSOR, MEMORY, EAE , DD11, KWII-L
** = DD11, DR11, BB11, MEMORY, SMALL PERIPHERAL CONTROLS, COMMUNICATIONS



## Note 1

When ordering PDP-11 systems it is important that sufficient mounting hardware is ordered to accommodate each system. Particular attention should be given to the number of DD11's required and whether a BA11-EC or BA11-ES Extension Mounting Box is needed.

DD11's are System Units prewired to mount small peripheral controllers such as a Teletype control or a High Speed Paper Tape Reader/Punch control. Each DD11 can hold four controllers and mounts in $1 / 6$ of a Basic or Extension Mounting Box. This is in addition to the two small peripheral controller slots available in the KA-11.

To determine the number of DD11's to order, total the number of spaces required for each item ordered times the quantity ordered. Subtract two from this number and divide by four. Round up to the next whole number if there is a remainder. Order this number of DD11's.

$$
\frac{\# \text { of "Spaces" used }-2}{4}=\# \text { of DD11's needed Note: Round up to a whole number }
$$

Six System Units will mount in either the Basic or the Extension Mounting Box. To determine whether to order an Extension Mounting Box, total the products of the number of System Units required for each item ordered times the quantity ordered. Include DD11's and BB11's. Add one and divide the new total by six and round up to the next whole number if there is a remainder. If the result is one, an Extension Mounting Box is not needed. If the result is two, order an Extension Mounting Box (BA11-ES or BA11-EC) and Power Supply (H720A or H720B).
$\frac{\# \text { of System Units used }}{6}=\#$ of Mounting Boxes Required
Note: Round up to a whole number. If the result is greater
than one an Extension Mounting Box is needed.

Note 2
Discountable under a PDP-11 Discount Agreement.

## Note 3

Discountable under a Module Discount Agreement.
All prices quoted are FOB Maynard, Massachusetts and apply in the continental United States only. Federal, state, and local taxes are not included.
All prices and specifications are subject to change without notice.

## Disk Operating System

The PDP-11 Disk Monitor is a disk-resident software system which enables a PDP-11 user to efficiently develop and execute his programs. During program development, the monitor serves the user by providing a simple, easy-to-use interface with program development software such as the relocating assembler, FORTRAN compiler, editor, etc. During program execution, the monitor eases the burden on the user program by providing common I/O device handling routines, loaders, operator interface, and basic resources accounting.

## FORTRANHV

FORTRAN-IV is a full ANSI standard compiler which operates under the PDP-11 Disk Monitor System. In addition, PDP-1,1 FORTRAN includes language elements which permit compatibility with IBM 1130 FORTRAN programs.

```
CONFGURATONS AVAILABLE
PDP- 11 Disk Operating Systems
1130 compatible; FORTRAN IV
Configuration I
- PDP-11/20; extra 4K core (8K total); with cabinet and Teletype
- RF11/RS11 256K-word DEC Disk and Control
- TC11/TU56 Dual DECtape Transport and Control
- KW11-L Real-Time Clock
- BM792-YB ROM Bootstrap Loader
List Price: \$37,200
SYSTEM PACKAGE PRICE*: \(\$ 35,950\)
```

Configuration II

- PDP-11/20; extra 4K core (8K total); with cabinet and Teletype
- RF11/RS11 256K-word DEC Disk and Control
- PC11 High-Speed Paper Tape Reader and Punch
- BM792-YB ROM Bootstrap Loader

List Price: $\$ 33,150$

Configuration III

- PDP-11/20; extra 4K core (8K total); with cabinet and Teletype
- RC11/RS64 64K-word Disk and Control
- TC11/TU56 Dual DECtape Transport and Control
- BM792-YB ROM Bootstrap Loader

List Price: $\$ 29,900$
KW11-L Clock is optional in DOS configuration.
*Package price applies only if configuration is ordered as stated.

## BTSS...PDP-11 BASIC Time-Sharing System

The PDP-11 BASIC Time-Sharing System is a multi-purpose, multi-user system, allowing many users to develop their own programs or interact with standard applications programs for information, retrieval, data processing, and text editing. BTSS BASIC is a greatly enriched version of the popular time-sharing language, expanded to provide the greatest possible utility in a small computer time sharing environment. Key features of BTSS are the power and flexibility of BASIC (includes matricies, strings and files) and user access to $1 / 0$ devices for high-speed input and output.
BTSS Configuration for 16 users with local TY terminals:

- PDP-11/20 with 16K core, cabinet and console Teletype
- RF11/RS11 256K DEC Disk and Control
- TC11/TU56 Dual DECtape Transport and Control
- KW11L Real-Time Clock
- BM792-YB DECtape ROM Bootstrap Loader
- BA11£S Extension Mounting Box
- H720 Power Supply
- Four DD 11-A Mounting Units for KL11 Interfacing
- DB11-B Bus Extension

Note: One KL11 and one Teletype should be added for each local user. Altemate configurations are available which utilize combinations of 16 -line multiplexer, remote-terminal interfaces, altemative terminals, the RS64 swapping disk and the RK02 moving head disk. Card reader and line printer may be added.
Price: $\$ 46,550$; software is included with supporting hardware.

