

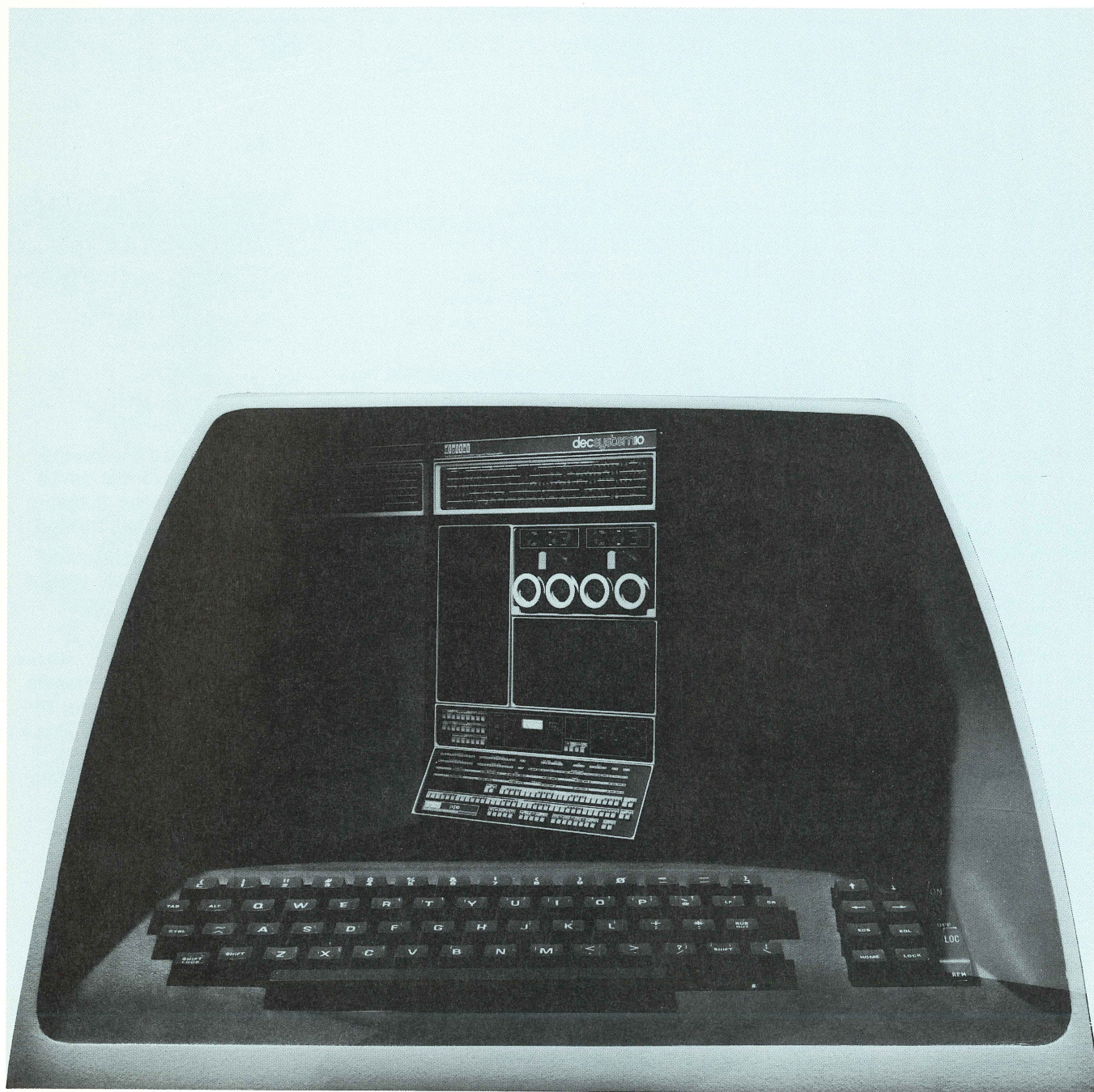
DIGITAL EQUIPMENT CORPORATION

OPTION BULLETIN

decsystem10

JULY 1973

Communications Systems

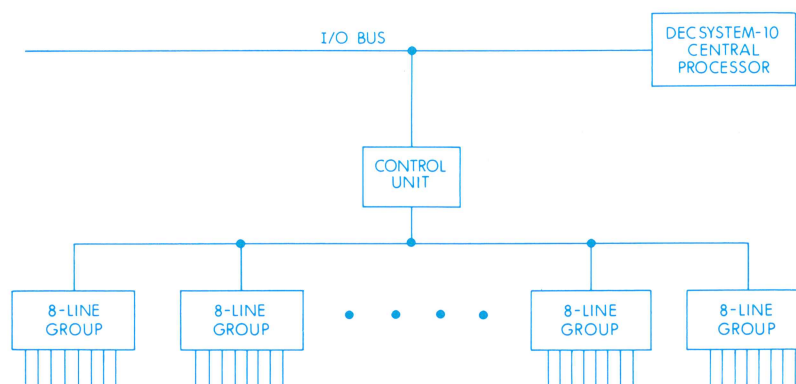


digital

DC10 Data Line Scanner

Features

- System supports up to 64 interactive terminals
- Terminals may include paper tape reader or punch. The reader must be equipped to respond to the X-ON and X-OFF reader control characters
- Standard speeds are 110, 150, 300, 600, 1200 or 2400 baud
- Continuous character repetition without processor attention



UP TO 8 LINE GROUPS-LOCAL OR DATASET CONTROLLED

DC10 Summary Table

#Controlled Data			
#Local Lines*	Set Lines	#DC10B's	#DC10E's
64	0	8	0
48	8	7	1
32	16	6	2
16	24	5	3
0	32	4	4

*DATASETS may be connected to local lines if no automatic status control is required.

The data line scanner provides a two-way interface between the DECSYSTEM-10 and a maximum of 64 teletype-like terminals. The data lines are controlled by the central processor on a priority interrupt basis. Each data line serviced can be connected for any of three signaling speeds.

The DC10 Data Line Scanner is modular in form to provide the user with his specific needs and still have the flexibility required for future expansion. The DC10A Control Unit is the heart of the DC10. It provides the necessary interface between the central processor and up to 8 line groups. The DC10B Line Group Unit provides the necessary interface between the control unit and 8 teletype-like devices. The optional DC10C Telegraph Relay Assembly provides relay buffering for half-duplex or long full-duplex circuits. Power to operate telegraph lines associated with the telegraph relay assemblies can be provided by the DC10D Telegraph Power Supply. The DC10E Expanded Data Set Control provides status and operational controls for 8 standard datasets (two may be provided with automatic calling equipment). Additional cabinet space for larger data line scanner systems is provided by the DC10F Expander Cabinet.

Baud rates available and software supported include 110, 150, 300, 600, 1200 and 2400. The three clock frequencies used in establishing the signaling speeds of the data lines are generated in the DC10A and routed to

the DC10Bs where they are assigned on a line-by-line basis. The crystal frequency of the three clocks can be selected to meet the customer specifications. Standard software for DC10 service limits input rate to 300 baud.

Modifications to scanner service routine can be made to increase the input rate on a line-by-line basis. Output speed with standard software may be considerably higher, up to 4800 baud.

The DC10E, in conjunction with the DC10B, provides the computer with positive automatic control over datasets. Datasets such as those used in voice-dial networks, TWX and TELEX systems can be used with the DC10E. These datasets may also be used alone with the DC10B if a lesser degree of system security is acceptable. Certain datasets may require manual control if used with the DC10B alone.

The DECSYSTEM-10 Advanced Systems Group will provide optional support for the DC10 to handle APL terminals. The DC10H is an eight-line group to handle IBM 2741 and plug-to-plug compatible 2741-type terminals with the following restrictions:

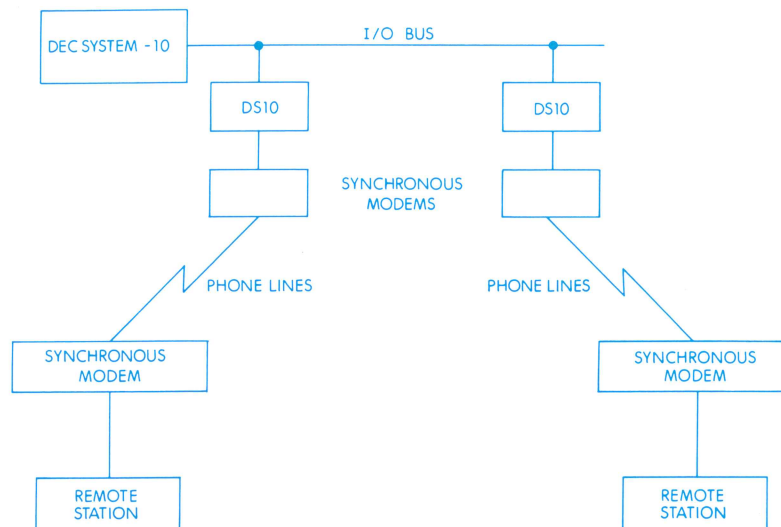
Non-pollable terminals;
Correspondence or Binary Coded Decimal codes;
Break key required and Debreak key recommended.

Modification of a single line on a DC10B to handle 2741-type terminals is also available.

DS10 Single Line Synchronous Interface

Features

- Full DECsystem-10 software for communication to remote stations
- Compatible with synchronous modems that meet EIA RS-232B or C and CCITT V.24 (white book) Standards
- Modem control and data operate on separate interrupt channels
- Interchangeable circuit cards for synchronization and EOT codes
- Programmable character width, 6 or 8 bits
- Continuous character repetition without processor attention



The DS10 Single Line Synchronous Interface is a 9600 bps interface which allows the DECsystem-10 to communicate with remote devices such as other computers, high speed displays, remote job entry, and remote batch terminals. System software will support two DS10 units on the DECsystem-10 I/O bus.

The DS10 communicates with the remote stations in full duplex mode, using separate interrupt channels for modem control and data transfer. Compatible modems include the Bell System 203, Bell System 208, Rixon PM24, ICC Modem 2200, or any synchronous modem which conforms to the Electronics Industries Association RS-232B or C Computer Interface Standards as well as CCITT V.24 (white book) standards.

The DS10 minimizes interrupt overhead by using a full word buffer and assembling serial data into words for transmission to the DECsystem-10 and disassembling 36-bit words into characters for serial transmission to

remote stations. Character length is programmable in either 6 or 8 bits.

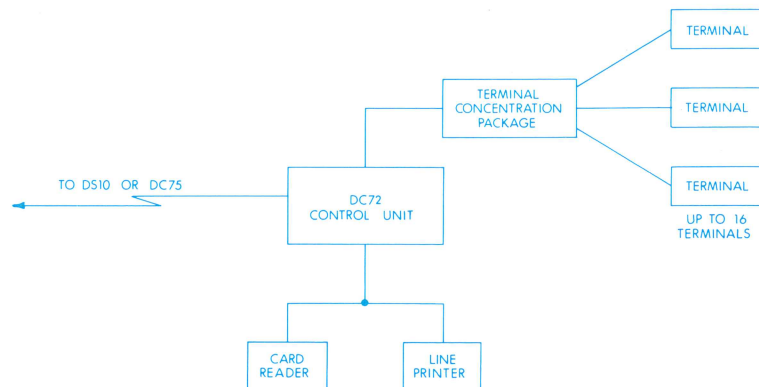
The device assembles 6-bit data into a 6-character word and 8-bit data into a 4-character word. On remote transmission, the DS10 receives a 36-bit word from the DECsystem-10, disassembles it into 6- or 8-bit characters and transmits them serially through the modem.

Interchangeable circuit cards for the device make it possible to use various synchronization and end of transmission (EOT) codes. The DS10 can also continuously repeat a character supplied by the central processor without processor attention. Character repetition is useful, for example, to keep a transmission line open.

Message formatting, error detection, and code conversion are handled by the DECsystem-10 service program, allowing the DS10 to interface a variety of terminals. DECsystem-10 software uses Digital Equipment Corporation standard communication format.

Features

- Full duplex, bi-directional, simultaneous transmission
- Card reader, 300 cards/minute
- Line printer, 132 columns, speeds from 165 characters/second up to 1000 lines/minute
- Up to 16 local terminals at speeds up to 2400 baud
- Computer-based remote station offers flexibility for special remote transmission needs
- Automatic error checking and line control
- Dedicated Line
- Meets EIA-RS232-C or CCITT V.24 (white book) modem interface standards



The DC72A, B and C are basic stations that include a 10-character/second operator console, a 300-card/minute reader and a 132-column line printer.

The DC72L is a terminal-concentrator package, for

The supporting software for the DC72 is an evolution of the DC71 software announced in 1971. It takes full advantage of full duplex communication with the DEC-system-10 to run both card reader and line printer simultaneously, while providing good interactive response for up to 16 terminals.

The DC72, connected to a DECSYSTEM-10, is the ideal solution for a group that needs the DECSYSTEM-10's capabilities, but lacks space for a complete system or is located some distance from the central site.

DC72 SUMMARY

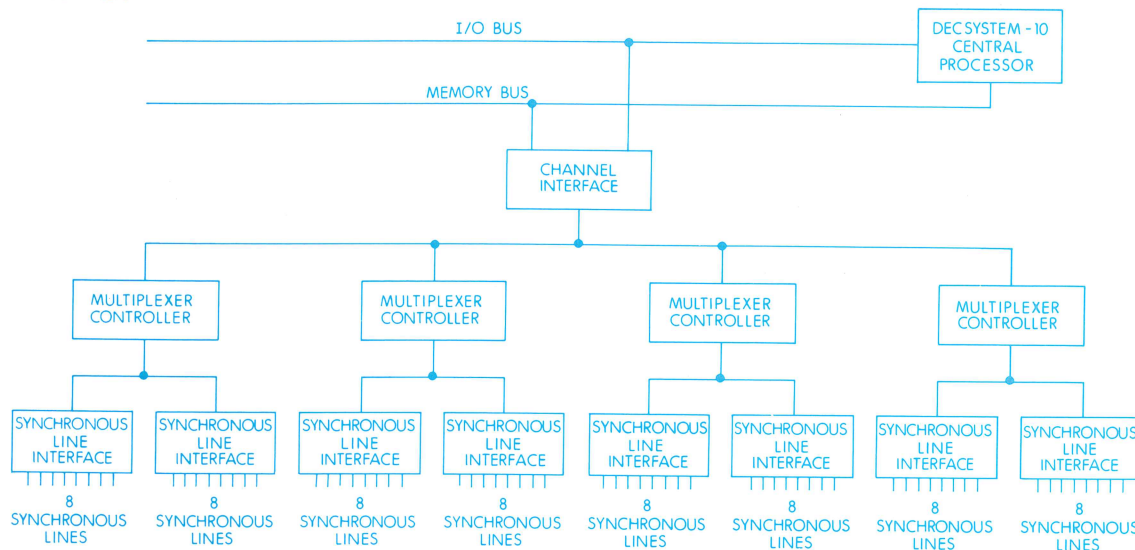
	Console	Processor	Card Reader	Line Printer	Terminals
DC72A	10 characters/second	PDP-8/E	300 cards/minute	64-character set 165 characters/second	up to 16 with DC72L terminal concentrator
DC72B	10 characters/second	PDP-8/E	300 cards/minute	64-character set 245 lines/minute	up to 16 with DC72L terminal concentrator
DC72C	10 characters/second	PDP-8/E	300 cards/minute	96-character set 173 lines/minute	up to 16 with DC72L terminal concentrator

DC75 Synchronous Communications Multiplexer

Features

- 8 full-duplex synchronous lines
- Speeds of 2,400, 4,800, 9,600 bps
- Capacity of 40K bps
- Provision for adding up to three controllers, each with capacity of 40K bps in each direction simultaneously and 16 synchronous lines

MAXIMUM CONFIGURATION



The DC75 Synchronous Communications Multiplexer provides a highly reliable, high-speed path between the central DECSYSTEM-10 computer and remotely located batch stations or other computer systems. Transmission over high-speed synchronous lines is on a message basis rather than the character-by-character method of low-speed asynchronous transmission.

Recommended for applications involving multiple synchronous lines, special remote devices or high data rates, the DC75 system handles a total traffic load of approximately 10,000 characters per second, including error checking, formatting and line control. The DC75A consists of a high-speed interface to the DECSYSTEM-10 memory bus (DL10), minicomputer (PDP11) multiplexer controller, and a multiple line synchronous interface (DS11). The multiplexer controller packs and unpacks characters directly into the DECSYSTEM-10 memory and can execute instructions from the -10 memory for bootstrap operations. The multiple line synchronous interface handles 8 full-duplex lines and can be expanded to handle up to 16 full-duplex lines. The multiplexer hardware may be programmed to handle character sizes of 6, 7, 8, and 12 bits and may be programmed to recognize a variety of synchronous codes in full- or half-duplex operation. Standard system software supplied with the DC75 operates in full-duplex mode using 8-bit characters.

All character processing overhead is assumed by the DC75. Communication between the DC75 and the DEC-

system-10 is entirely on a message-by-message basis. Idle characters are automatically transmitted.

Modems (not supplied by Digital Equipment Corporation) should meet the EIA-RS232-C or CCITT V.24 (white book) standard.

Components

DC75A SYNCHRONOUS COMMUNICATIONS

SYSTEM: provides direct memory interface for full-duplex synchronous lines. Total throughput capacity is 40 Kbps; i.e., four lines at 9600 bps or eight lines at 4800 bps.

The DC75A provides eight lines and connects to a memory access port (Prerequisite is a DECSYSTEM-10).

DC75D EXPANDER OPTION FOR DC75A: provides an additional 40 Kbps throughput capacity for a DC75A; i.e., eight additional lines at 4800 bps. Up to three DC75D's can be added to one DC75A (Prerequisite is a DC75A or DC76A).

DC75E INCREMENTAL EIGHT-LINE GROUP FOR DC75A or DC75D: provides up to eight additional lines on a DC75A or DC75D for a total of up to 16 lines. The DC75E does not increase the throughput capacity of the DC75A; it remains at 40 Kbps; i.e., 16 lines at 2400 bps. Only one DC75E can be added per basic DC75A or DC75D (Prerequisite is a DC75A).

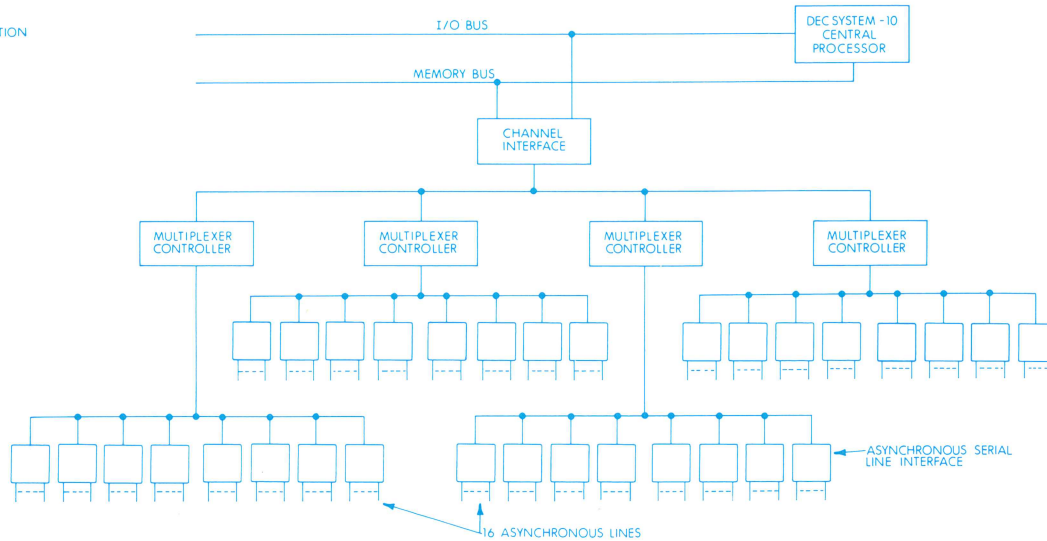
Note: the basic DC75 is capable of supporting up to 3 additional PDP-11 multiplexer controllers. These multiplexers may either be DC75D's or DC76D's (Asynchronous multiplexer expander) or a combination of the two.

DC76 Asynchronous Communications Multiplexer

Features

- Up to 128 full-duplex asynchronous lines
- Speeds from 50 through 9600 baud
- Provision for adding up to three additional controllers, with each controller terminating up to 128 lines
- Programmable character size
- ASCII, EBCDIC, APL or Correspondence codes independently selectable on each line
- Auto baud rate detection (110, 150, 300 baud)

MAXIMUM CONFIGURATION



The DC76 Asynchronous Communications Multiplexer provides a highly reliable, high-speed path between the central DECsystem-10 computer and remotely located asynchronous terminals.

Recommended for handling applications involving numbers of asynchronous lines at variable (dial-up or split-speed) line transmission rates, the DC76A handles a traffic load of approximately 30K baud, including formatting and echo-plex. The DC76A consists of a high-speed interface to the DECsystem-10 memory bus (DL10), minicomputer (PDP-11) multiplexer controller, and multiple serial asynchronous 16-line communication multiplexers (DH11). The multiplexer-controller packs and unpacks characters directly into or from the DECsystem-10 memory and can execute instructions from the DECsystem-10 memory for bootstrap operations. Each communication multiplexer terminates up to 16 asynchronous lines. The DC76A can be expanded to support up to eight communications multiplexers. The multiplexer hardware can be programmed to handle character sizes of 5, 6, 7, and 8 data bits; 1, 1.5 (5-bit code only), or 2 stop bits; and odd, even, or no parity. The communication lines may operate in either full-duplex or alternate simplex mode.

Data transmission may take place in both directions simultaneously without direct interaction by the DECsystem-10 processor. Modems should meet with EIA-RS232-C standard, 20 mil current loop or CCITT V.24 (white book).

The DC76 was developed to provide users with a flexible, high capacity data communications system. The DC76 allows the user to accommodate up to 512 asynchronous terminals with wide choice of transmission speeds, modem connections and data code including ASCII, EBCDIC, APL and Correspondence. Optionally,

the user may elect to interface DC75 communications equipment to handle synchronous data communications requirements including the use of DC72 Remote Stations.

The DC76 is the cost effective solution for the user community requiring a medium to large number of asynchronous lines, flexibility in growth and terminals supported and the capability to interface synchronous communications hardware.

Components

DC76A ASYNCHRONOUS COMMUNICATION SYSTEM:

Provides direct memory interface for asynchronous communication lines. Total throughput capacity is approximately 30 Kbaud; i.e., 16 lines at 2400 baud or 32 lines at 1200 baud. The DC76A provides 16 lines and connects to a memory access port (prerequisite is a DECsystem-10).

DC76D EXPANDER OPTION FOR DC76:

Provides an additional 30 Kbaud throughput capacity for a DC76A; i.e., 16 additional lines at 1200 baud. Up to 3 DC76D's may be added to one DC76A (prerequisite is a DC76A or DC75A).

DC76E INCREMENTAL 16 LINE GROUP:

For DC76A or DC76D: Provides up to 16 additional lines on a DC76A or DC76D. The DC76E does not increase the throughput of the DC76A or DC76D. It remains at 30 Kbaud. Up to 7 DC76E's can be added per basic DC76A or DC76D (prerequisite is a DC76A).

Note: the basic DC76 is capable of supporting up to three additional PDP-11 multiplexer-controllers. These multiplexers may be either DC75D's (synchronous Multiplexer expander) or DC76D's or a combination of the two.

DECsystem-10 Communications Systems Summary

	Number Supported by Standard Software	Maximum Number of Lines per DECsystem-10	Maximum Throughput	Transmission Speeds	Data Modes	Line Types		Attachment to DECsystem-10	Comments
						Local	Modem Control		
DC10 Data Line Scanner	1	64	50Kbaud	up to 2400 baud	Full duplex; Full duplex with local copy; Half duplex	yes	yes	I/O bus	DC10 will also support Telegraph (long distance lines); 8-bit character
DS10 Single Line Synchronous Interface	2	2	9600 bps	up to 9600 bps	Full duplex	yes	yes	I/O bus	8-bit character
DC72 Remote Station	32	16 each station plus operator's console	4800 baud	up to 1200 baud	Full duplex	yes	no	DS10 or DC75	Handles 300 card/minute reader and up to 245 line/minute printer; PDP-8/E processor; 8-bit character
DC75 Synchronous Communications Multiplexer System	1	64	160K bps	up to 9600 bps	Full duplex	yes	yes	I/O bus and Memory bus	Programmable character of 6, 7, 8 or 12 bits; up to 4 PDP-11 processors; will also support up to three DC76D Asynchronous Multiplexers
DC76 Asynchronous Communications Multiplexer System	1	512	120K baud	up to 9600 baud	Full duplex, alternate simplex	yes	yes	I/O bus and Memory bus	Programmable character of 5, 6, 7 or 8 bits; auto baud rate detection; up to 4 PDP-11 processors; will also support up to three DC75D Synchronous Multiplexers

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P.O. Box 491, Crows Nest
N.S.W. Australia 3065
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Cable: Digital, Sydney
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60 Park Street, South Melbourne, Victoria, 3205
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643 Murray Street
West Perth, Western Australia 6005
Telephone: 21-4993 Telex: AA92140
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Queensland, Australia 4101
Telephone: 44-4047 Telex: AA40616
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Digital Equipment Corporation Ltd.
AUCKLAND
Hilton House, 430 Queen Street, Box 2471
Auckland, New Zealand
Telephone: 75533

JAPAN

Digital Equipment Corporation International
TOKYO
Kova Building No. 17, Second Floor
2-7 Nishi-Azabu 1-Chome
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Digital Equipment Corporation de Puerto Rico
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American Airlines Bldg.
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