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THE ELDORADO 102 AND 125 COMMUNICATIONS

TERMINAL SYSTEMS



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INTRODUCTION:

THE ELDORADO 102 AND 125 COMMUNICATIONS TERMINAL SYSTEMS provide a complete and flexible data communications/teleprocessing network. Source data is captured, edited, and transmitted for subsequent processing by the most economical means possible.

The operation of the terminals is simple. Any person familiar with a typewriter can operate the Eldorado Terminals with a minimum of instruction.

The Eldorado 102 and 125 Terminals are simple to install. Because of its compatibility with a large number of industry standards (plug-for-plug compatibility), installation usually means meeting the standards you have already established. If your computer system does not already have communications hardware, Eldorado will assist you in establishing a communications system that best meets your needs.

THE 102 DATA TERMINAL

TERMINAL OPERATING FEATURES

On-Line Operation

The Terminal operator may communicate directly with a central computer just by dialing the appropriate telephone number. Data goes directly from the keyboard to the central computer at approximately 15 CPS.

Remote Batch Operation

The Terminal operator may record the data to be processed on the magnetic tape cassette. After all of the data has been recorded, the operator may then transmit the data to a central computer at speeds up to 1200 BPS. Data coming back from the computer is transmitted back to the magnetic tape cassette. After transmission is completed, the operator will have the terminal print the data that has been processed by the central computer.

Automatic Answer Feature (Optional)

If it is desired, the terminal will transmit and receive data in an unattended mode of operation. After data is recorded on the magnetic tape cassette, the central computer will call the terminal for the data. The terminal will automatically answer and transmit the data to the central computer. After processing, the central computer will call the terminal again and transmit the processed data to the tape cassette. Later, the operator will have the terminal print the data that has been processed by the central computer.

Off-Line Operation

The recording of data, editing, formatting and corrections are all made offline. No telephone lines are tied up during these operations, nor is there a need to use the central computer.

Off-Line Operating Software Functions

Keypunch simulator: This program performs the function of reading from the keyboard a pattern or template describing the fields, validate characters (alpha, numeric, special) for each field and will edit for proper data format. Keying errors are correctable prior to entry upon the cassette.

Cassette to printer (input): This program lists the input data that has been recorded on the cassette.

Cassette to printer (output): Output from the central computer is listable with tab stops, forms changes, and line spacing.

TERMINAL HARDWARE CONFIGURATION

Standard Configuration IBM Selectric Typewriter One Magnetic Tape Cassette Drive *300 BPS Asynchronous Modem and Interface Processor/Controller - 1K, 8 Bit-Byte Core Automatic Answer Feature Multi-Point Capability

Optional Hardware 10-Key Auxiliary Keyboard 1200 BPS Asynchronous Modem and Interface Read Only Cassette Drive Desk

*Allows for IBM 2741 and ASR-33 Teletype Compatible Communications

COMMUNICATIONS SOFTWARE FOR THE 102 TERMINAL

- Eldorado offers the following communications software with the Eldorado 102 Data Terminal:
 - ASR-33 Teletype Communications Package
 - IBM 2741 Communications Package
 - Burroughs TC 500 Communications Package

THE 125 PROGRAMMABLE DATA TERMINAL

TERMINAL OPERATING FEATURES

General

The operating features of the Eldorado 125 Programmable Data Terminal have been greatly expanded over the Model 102 Data Terminal.

There are two cassette drives. This allows the user to record twice as much data (total of 180,000 characters per cassette). The user may also copy from one cassette to another, optionally stopping on a selected sequence line to allow for the correction of keying errors.

Transmission speeds can be increased to 9600 BPS.

Off-Line Computing

The user of the Eldorado Model 125 Programmable Data Terminal has the option to do large amounts of his computer processing off-line. He has available to him up to 32K of core, card readers, line printers and a simple but powerful programming language (ESP, Eldorado String Processor).

With this combination of hardware and software, the user has unlimited options for implementing an economical data communications network. Such a network has a high degree of flexibility and can be modified to meet the changing needs of the company. Off-Line applications include, but are not limited to general accounting functions, desk-top calculator functions and management information reports.

TERMINAL HARDWARE CONFIGURATION

Standard Configuration IBM Selectric Typewriter Two Magnetic Tape Cassette Drives 1200 BPS Asynchronous Modem and Interface Processor/Controller - 4K, 8 Bit-Byte Core Automatic Answer Feature Multi-Point Capability Desk

Optional Hardware 10-Key Auxiliary Keyboard 300 CPM Card Reader 135 LPM Auxiliary Printer 132 Col. 64 Character Set 600 LPM Auxiliary Printer 132 Col. 64 Character Set 1/2" Tape Drive, 7 or 9 track 556 or 800 BPI Disk Drive - 1 Million Byte - IBM 2315 Compatible Cartidge 2000/9600 BPS Synchronous Modem Interface IBM 2741 Compatible Communications Feature ASR-33 Teletype Compatible Communications Feature Additional Core, 4K Increments (Up to 32K)

OFF-LINE PROGRAMMING CAPABILITIES

Eldorado's Programming Language (*ESP) allows the terminal user to write and modify his own editing, formatting and correction routines with ease.

*ESP is a one pass symbolic compiler program which allows for compilation of absolute programs for and on the Eldorado 125 Data Terminal. The compiler is contained in 4096 bytes and is designed to operate using a keyboard for error messages and magnetic tape units for input of *ESP source statements and output of MAP source statements.

COMMUNICATIONS SOFTWARE FOR THE 125 TERMINAL

Eldorado offers the following communications software with the Eldorado Model 125 Programmable Data Terminal:

- ASR-33 Teletype Communications Package
- IBM 2741 Communications Package
- Burroughs TC 500 Communications Package
- IBM 2780 Communications Package
- Univac 1004 Communications Package
- Univac DCT 2000 Communications Package
- CDC User 200 Communications Package

THE ELDORADO TERMINAL CONTROLLER

Configuration ASR-33 Teletype 1200 BPS Data Port Auto Call Feature Processor/Controller - 4K, 8Bit-Byte Core Console

Optional Hardware 1/2" Tape Drive 1 Million Byte Disk Drive Additional Core, 4K Increments (Up to 32K) Additional Data Ports (Total of six maximum)

*Eldorado String Processor

Functions

The Eldorado Terminal Controller operates in the following manner:

The Terminal Controller will automatically call each remote terminal and receive the data that had been recorded by the terminal operator. As the data is received, the Terminal Controller concentrates the transmitted data and sends it to the host computer for subsequent processing. When processing is completed, the Terminal Controller will automatically call each terminal and transmit the processed data. STANDARD HARDWARE CONFIGURATIONS

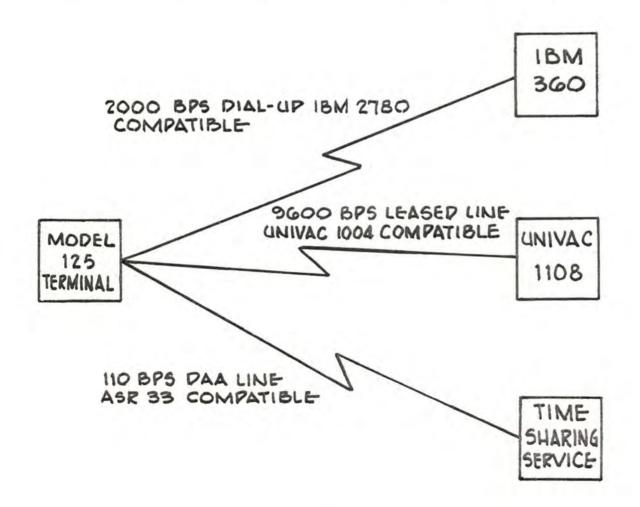
TRANSMISSION CHARACTERISTICS

Transmission Speed	Transmission Characteristics			
110 BPS	ASR-33 Teletype			
134.5 BPS	IBM 2741			
1200 BPS	Burroughs TC 500			
2000-9600 BPS	IBM 2780			
2000-9600 BPS	Univac 1004			
2000-9600 BPS	Univac DCT 2000			

The Eldorado Terminals can transmit to the following computers that are equipped with the manufacturer's standard communications hardware:

- RCA Spectra 70 Series
- IBM 360, 370
- Univac 1100 Series

- Burroughs B300 to B6500
- Honeywell 200 Series
- GE 200, 400 & 600 Series



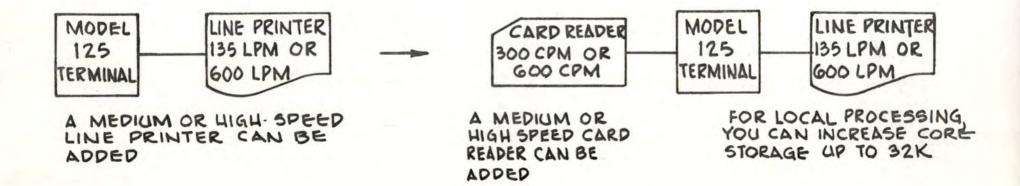
EXPANSION CAPABILITIES

MODEL MODEL 125 102 TERMINAL TERMINAL

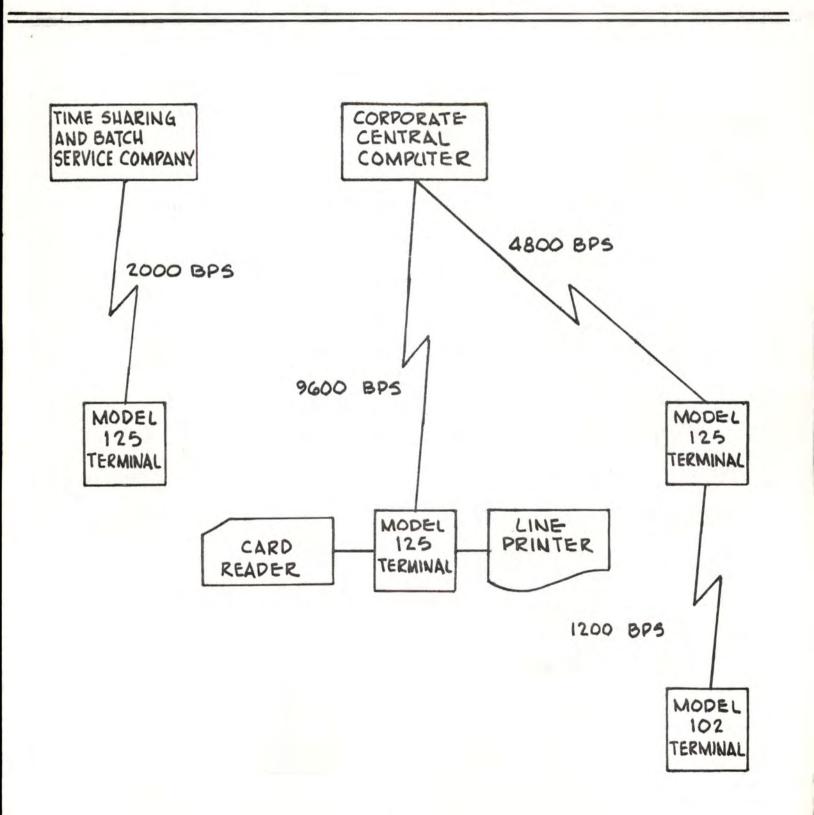
THE 102 DATA TERMINAL CAN BE CONVERTED, IN THE FIELD, TO A 125 PROGRAMMABLE PATA TERMINAL

MODEL 125 TERMINAL HIGH SPEED TRANSMISSION CAN BE ADDED. 2000/9600 BPS

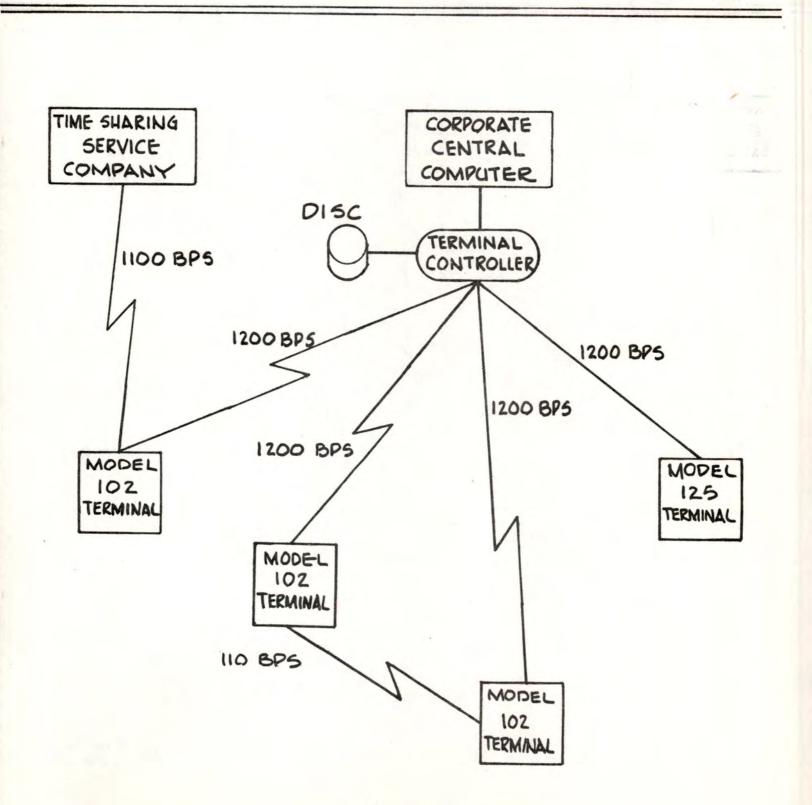
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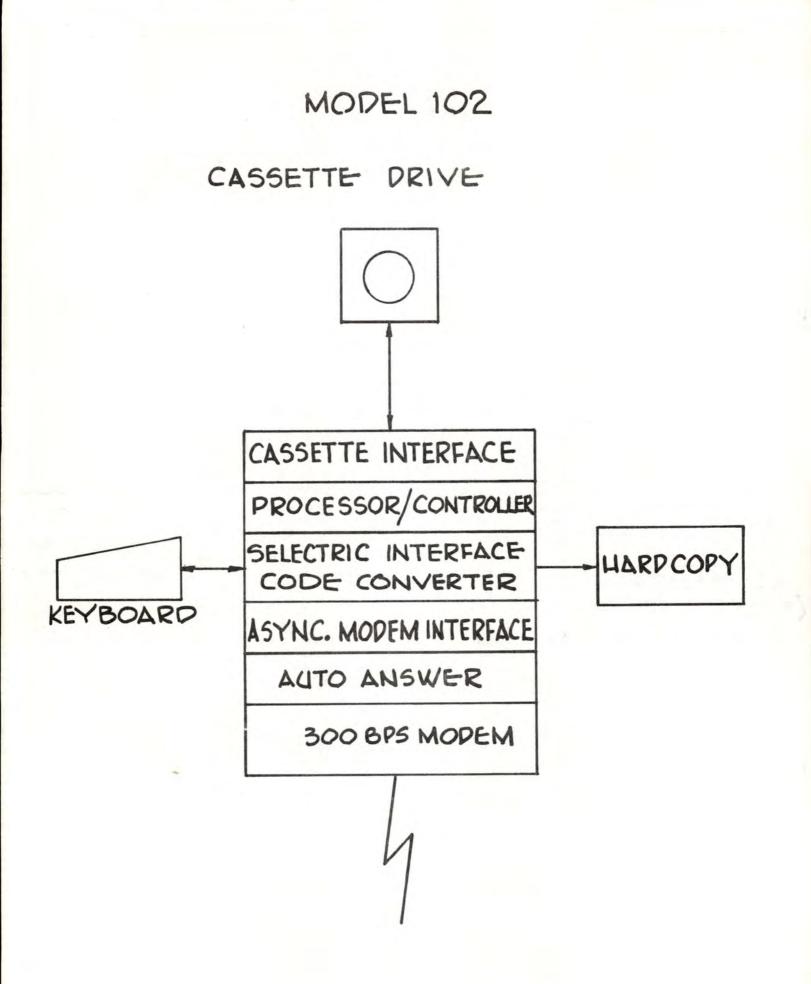


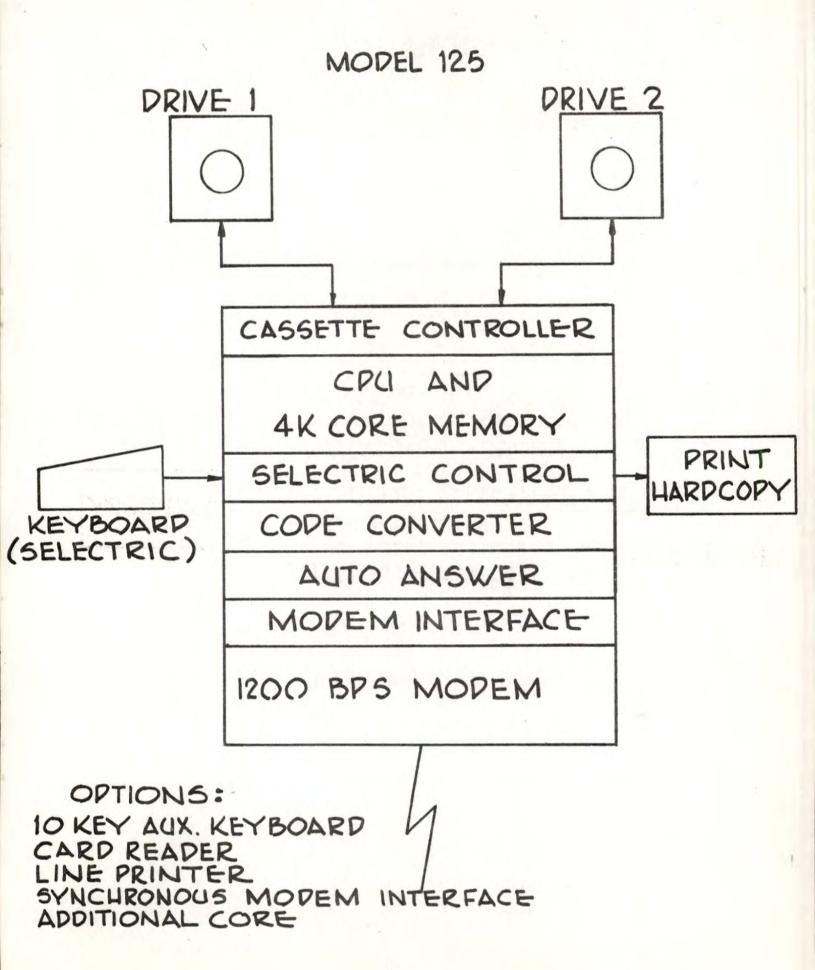
REPRESENTATIVE CONFIGURATION OF A COMMUNICATIONS NETWORK USING ELDORADO 102 AND 125 DATA TERMINALS



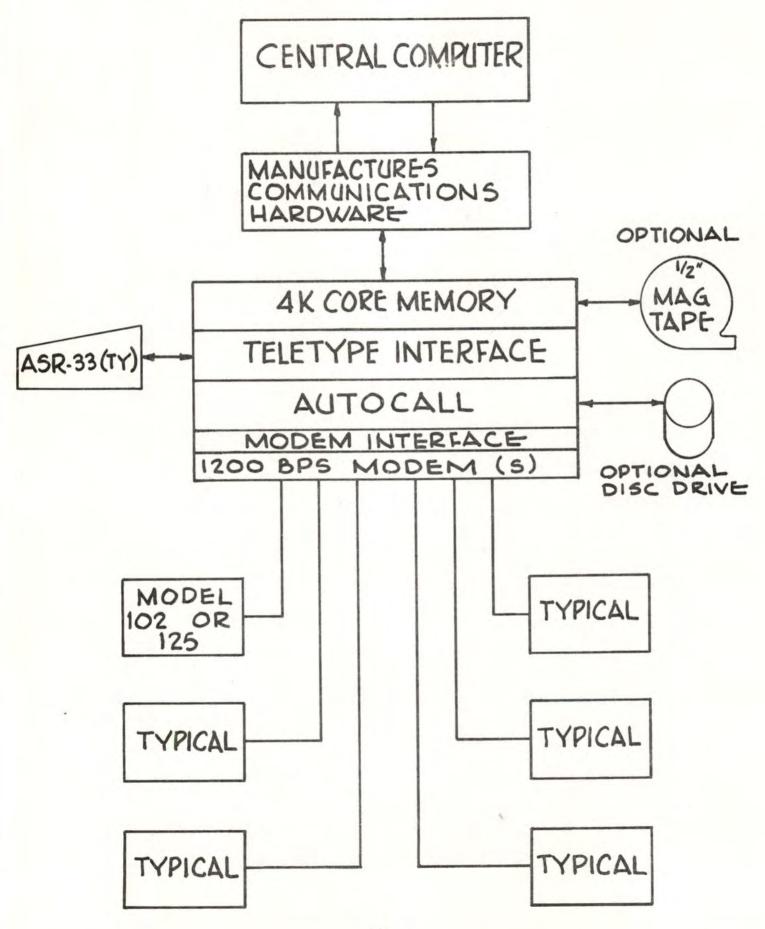
REPRESENTATIVE CONFIGURATION OF A COMMUNICATIONS NETWORK USING ELPORADO 102 AND 125 DATA TERMINALS







ELDORADO TERMINAL CONTROLLER





MODEL ee200 Easily Expandable

A VIEW FROM THE BACK OF THE BUS

Of course you could put the rack ears on the other end and then you would have a view from the front of the bus. We just wanted to choose a view which would show some of the advanced thinking which went into the ee 200 as exemplified by:

ELDORADO'S ANSWER TO BUS-SING-A UNIVERSAL BUS

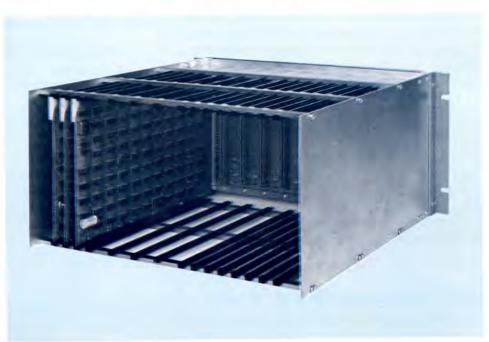
The universal bus is utopia to a systems integrater. It allows him to intermix memories, peripherals or read only memory with no thought about neighborhood or which device is next door. The peripherals can communicate indiscriminately with memory and each other without consulting the CPU since all are on the same bus. Therefore, all 12 slots that you see in the picture are for your specific needs. The minute you need it, you can plug in additional memory and I/O controllers without regard to sequence or location. This means easy expandability.

VERTICAL RUNNING BOARDS

Sounds like a little thing, but it isn't. Vertical mounting lets convection do the cooling and it's lots quieter and less expensive than a fan. And cooler components mean longer life—since all components operate at derated levels, we mean much longer life. In addition, the board size allows the average interface to have approximately 100 integrated circuits on one board which minimizes interconnections between peripherals and the computer. This means ready reliability.

THE BUS DRIVER

See those three boards seated on the left? They comprise the complete central processing unit and bus controller. And what a CPU it is! It's faster than a greyhound, with a 5MHz clock and 8, 16 and 24 bit instructions. And it responds quickly and automatically with 16 levels of priority interrupt; each level has 8 general purpose 16-bit registers-which allows real time and multiprocessing through one computer. Further, a stack pointer allows complete re-entry according to subroutine during interrupts. Because the CPU is controlled by memory for I/O speeds, asynchronous memories and peripherals can be used. Therefore, memory can range from microsecond core to nanosecond bi-polar and these memories can be interchanged and field alternated with no programming changes. This means valuable versatility.



LOADING THE BUS

An automatic bootstrap loader and a serial interface for an ASR-33/35 teletypewriter are included in the standard ee 200. The basic bootstrap and teletype loader routines are built into the ee 200 hardware. At long last, something for nothing.

PROJECT HEADSTART-TEACHING THE ee 200

The ee 200 features the most extensive address modification capability of any mini. The machine accepts relative addressing, 65k direct addressing, indexed addressing, indexed addressing plus displacement, and indexed with displacement at an automatic increment and decrement index register. There are 69 basic commands and thousands of permutations of each. All peripheral devices are assigned addresses and any peripheral device can input and output any one of the above addressing modes. In a real time environment, the hardware automatically keeps track of your interrupt level and automatically switches from one interrupt level to another, via a single instruction. And that's saying a lot.

THE FLUENTLY MULTI-LINGUAL MACHINES

The ee 200 understands a large number of languages. Several assemblers are available. Some are written in Fortran, the Eldorado String Processor and a standard Basic interpreter. There is a comprehensive debugging and diagnostic set. Whatever your language background, the ee 200 will feel like home. Now that's the end of the rap gap.

IN FACT, THAT'S THE END OF THE RAP.

Please turn the page for full specifications on the remarkable ee 200.



MODEL ee200 Easily Expandable

OEM PRICES AND PERIPHERAL INTERFACES

ee 200		Pre-			PRICE			CURRENT REQD. (Amperes)
Model No.	DESCRIPTION	requisite	1-5	6-10	11-20	21-50	51-100	+5V -10V +10V
	CPU, ENCLOSURE, BASIC CONTROL PANEL		\$1,765	\$1,610	\$1,460	\$1,310	\$1,160	4,85
	4096 BYTES (8 BITS) CORE MEMORY 1.0 μ s FULL CYCLE TIME	A	\$ 900	\$ 865	\$ 830	\$ 795	\$ 755 Standby Operate	0.68 0.07 1.45 1.70
	16384 BYTES (8 BITS) CORE MEMORY 1.2μs FULL CYCLE TIME	A	\$2,000	\$1,825	\$1,660	\$1,485	\$1,315 Standby Operate	2.500.150.12.505.000.5
	CARD READER INTERFACE FOR DOCUMATION MODEL 200	A, 1-B	\$ 495	\$ 450	\$ 410	\$ 370	\$ 325	0.63
E	ROM MEMORY 64 BYTES FOR READER	D	\$ 295	\$ 270	\$ 245	\$ 220	\$ 195	0.50
	LINE PRINTER INTERFACE FOR DATAPRINTER V132	А, 1-В	\$ 495	\$ 450	\$ 410	\$ 370	\$ 325	0.72
	SYNCHRONOUS MODEM INTERFACE, 202C	А, 1-В	\$ 495	\$ 450	\$ 410	\$ 370	\$ 325	1.0
	ASYNCHRONOUS MODEM INTERFACE 110, 300, 1200 BAUD	А, 1-В	\$ 495	\$ 450	\$ 410	\$ 370	\$ 325	1.12
	TYPEWRITER INTERFACE FOR IBM SELECTRIC 735	А, 1-В	\$ 600	\$ 550	\$ 500	\$ 445	\$ 395	0.8
	CASSETTE INTERFACE FOR 1 TO 3 SYKES TT 100	А, 1-В	\$ 650	\$ 595	\$ 540	\$ 480	\$ 425	2.55
к	ROM MEMORY 64 BYTES FOR CASSETTE	J	\$ 250	\$ 225	\$ 205	\$ 185	\$ 165	0.5
	DISC INTERFACE FOR IOMEC 2002 OR 2012	A, 1-C	\$1,900	\$1,250	\$1,145	\$1,020	\$ 900	2.0
	MAGNETIC TAPE INTERFACE FOR PERTEC 6000 & 7000 SERIES	A, 2-B (or 1-C)	\$1,900	\$1,250	\$1,145	\$1,020	\$ 900	1.7
	PARALLEL TELETYPE INTERFACE FOR ASR 33/35	А, 1-В	\$ 495	\$ 450	\$ 410	\$ 370	\$ 325	0.8
	ROM MEMORY 64 BYTES TO CUSTOMER SPECIFICATION	1200	\$ 325	\$ 295	\$ 270	\$ 240	\$ 215	0.5
	POWER SUPPLY, REMOTE SENSE +5V @ 10A, -10V @ 5A, +10V @ 2A	А	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	
	AUGMENTED POWER SUPPLY, REMOTE SENSE +5V @ 20A, –10V @ 5A, +10V @ 2A	A	\$ 375	\$ 375	\$ 375	\$ 375	\$ 375	
R	EXTENDER BOARD, CPU	A	\$ 75	\$ 70	\$ 65	\$ 55	\$ 50	
S	EXTENDER BOARD, I/O	А	\$ 75	\$ 70	\$ 65	\$ 55	\$ 50	
	UNIVERSAL INTERFACE BOARD. FRONT WITH BUS LOGIC AND REAR FOR CUSTOMER WIRE WRAP	A	\$ 325	\$ 295	\$ 270	\$ 240	\$ 215	
	PAPER TAPE READER 300 CPS (DIGITRONICS)	A	\$ 495	\$ 450	\$ 410	\$ 370	\$ 325	0.7

Prices and Specifications are subject to change without notice. Prices are F.O.B. Concord, California. Terms are N30.



(EE 200-03)

The ee 200 Computer

The ee 200 presents a concept in computer architecture-a concept so flexible, so versatile that the user has unmatched advantages in his ability to tailor a computer to his individual requirements, in the ease of modifying the computer in the field and-last, but not least-in the significant cost savings.

UNIVERSAL BUS CONSTRUCTION

Keystone of the ee 200's organization is its Universal Bus construction. This results in a basic, simple, powerful computer without an ounce of unnecessary hardware. You don't pay for options-or the circuitry to support them-until you actually need them.

The "basic" ee 200 consists of an enclosure (ready for rack mounting) with an operating console, three circuit boards containing the entire central processor, 12 positions for memory and input/output device controllers. The Universal Bus concept is so straightforward that additional memory and peripheral controllers, on the same size circuit boards, and using the same size connectors, can be plugged into any position without regard to sequence or combinations.

ASYNCHRONOUS MEMORY INTERFACE

An asynchronous memory interface allows you to select various combinations of memory size and speed. For example, intermixing of high speed register files with 400 nanosecond MOS memory modules, a 1.2 microsecond core memory and read-only memories of any capacities. Since instruction execution time is directly related to memory cycle time, desired processor speed can be achieved by the memory selection. Thus, a 16-bit add operation can range from 9.6 microseconds using core memory to 2.0 microseconds using a 200 nanosecond file memory.

The asynchronous nature of the memory interface also means that newer and/or faster types of memories which may be available in the future can be used by simply mounting them on a standard ee 200 circuit board.

DYNAMIC REGISTER ALLOCATION

Handling a real-time environment involves rapid context switching; e.g., moving from one process to another with a minimum of overhead in time and instructions.

Multiple sets of registers provide unusually efficient interrupt processing, eliminating saving and restoring. There are eight 16-bit registers in each register set and there are 16 sets . . . One set is allocated to normal background processing and 15 sets are dedicated to 15 levels of interrupt processing.

MEMORY SELECTION

Core	 4K and 16K bytes
High Speed IC	 16, 32, 64, 128 bytes
Read-Only	 64 bytes

Up to 65K bytes of memory are available with the ee 200, with all 65K directly addressable.

WORD LENGTH AND INSTRUCTIONS

The ee 200 operates with parallel arithmetic capability, 2's complement, on either 8-bit bytes or 16-bit words. The instruction list includes 8, 16 and some 24-bit commands. There are 69 basic commands and hundreds of permutations.

ADDRESS MODIFICATION

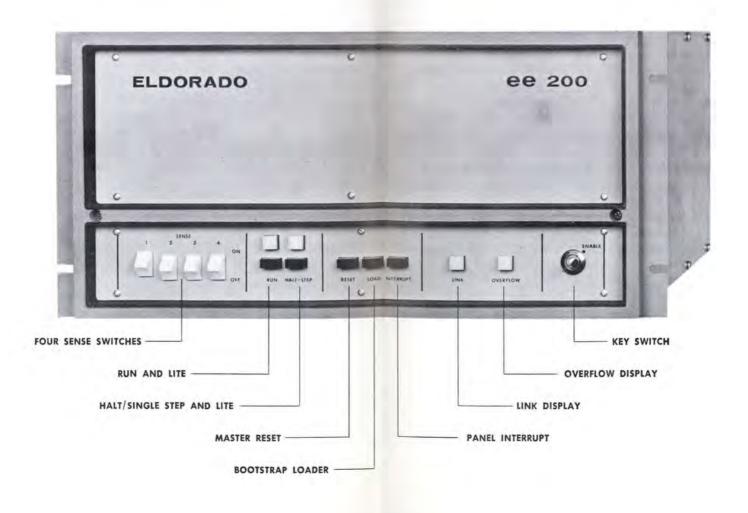
Address modification of the ee 200 is unusually versatile and powerful. Modes include:

- 1. Direct addressing of any I/O device or up to 65K memory.
- 2. Fully extended indirect addressing.
- 3. Relative addressing.
- 4. Relative indirect addressing.
- 5. One and two-byte literals.

INDEXING

Any of the eight general purpose registers can be used as index registers. Indexing modes are:

- 1. Straight Indexing-with and without displacement
- 2. Automatic Incrementing-with and without displacement
- 3. Automatic Decrementing-with and without displacement
- (All modes can also be used for Indirect Indexing.)



Software

The ee 200 basic software philosophy is to minimize time and cost needed for customers to write their own programs. All utility programs and general application subroutines are written for minimum memory configurations. Subroutines are re-entrant and relocatable.

UTILITY AND APPLICATION SOFTWARE

Additional software includes:

- LOADERS-Binary Loader-Bootstrap Loader-Linkage Editor
- ASSEMBLERS-Resident Absolute Assembler-Relocatable Assembler-Cross Assembler For Batch Processing

COMPLIERS-ESP String Processor Complier-Dartmuth Basic

UTILITIES—Debug Package Including Traps—Math Package— Peripheral Software Drivers, Text Editor

All software is dedicated to being operationally efficient and to using the smallest possible memory.

INPUT/OUTPUT CAPABILITY

The Universal Bus provides the same wide dimensions of input/output capability that it brings to memory make-up. For example, all external devices can directly access memory without going through the central processor. Peripheral devices can communicate directly with each other. Transfer rates between memory and external devices or between external devices can be more than 1 million bytes/second.

Serial interface for an ASR 33/35 teletypewriter is included in the basic ee 200. The basic teletypewriter bootstrap routine is built into the ee 200 hardware. All other peripherals are put on-line with the simple plug-in of a controller into one of the available card positions.

RELIABILITY

Because the ee 200 is designed for demanding on-line, real time systems work, the goal of reliable, dependable operation received design attention far beyond what is normally expected in a computer of this class. For example, circuit boards are mounted vertically for maximum cooling without the need for a cooling fan. Large connector fingers are used for maximum reliability.

A 0.8 inch space between circuit boards provides ample convection cooling for components, sharply decreasing heat build up and adding substantially to component life. The ee 200 circuit boards, including central processor, memory modules and I/O controllers, use connectors with low density MIL-spec spacing of .156 inch between centers, making all plug-in connections simpler, less costly and more reliable.

As another step toward reliability, the core memory, basically an 850-nanosecond design, operates on a 1.2 microsecond cycle to further decrease heat build-up. The only wiring within the ee 200 enclosure, besides the power supply cable, runs a short distance between front panel and motherboard. Processor is made of TTL logic elements with extensive use of MSI devices.

ee 200 Instructions

MNEMONIC NAME

Control (1 Byte)

WAIT	Wait for Interrupt (Halt)
NOP	
SF	
RF	Reset Fault
El	Enable Interrupt System
DI	Disable Interrupt System
SL	Set Link
RL	Reset Link
	Complement Link
	Return from Subroutine
	Return from Interrupt
	Return from Interrupt Modified
ELO	
	Transfer PC to X
	Delay 4.55 milliseconds

Conditional Branches (2 Bytes)

BL Branch if Link Set
BNL Branch if Link Not Set
BF Branch if Fault Set
BNF Branch if Fault Not Set
BZ Branch if Equal to Zero
BNZ Branch if Not Equal to Zero
BM Branch if Minus Set
BP Branch on Plus
BGZ Branch if Greater than Zero
BLE Branch if Less Than or Equal to Zero
BS1 Branch if Sense Switch 1 Set
BS2 Branch if Sense Switch 2 Set
BS3 Branch if Sense Switch 3 Set
BS4 Branch if Sense Switch 4 Set
BTM Branch on Teletype MARK
BRU Unconditional Branch

Single Register Operations (1 or 2 Bytes)

INR(B)	 Increment Register
DCR(B)	 Decrement Register
CLR(B)	 Clear Register
IVR(B)	 Invert Register (1's complement)

MNEMONIC NAME

Single Register Operations (continued)

SRR(B)					Shift Right
SLR(B)					Shift Left
RRR(B)			÷		Rotate Right
RLR(B)					Rotate Left
					Increment A by 1
					Decrement A by 1
CLA(B)					
IVA(B)	i				Invert A
SRA(B)					Shift Right A
SLA(B)				Ļ	Shift Left A
INX					Increment X (Word) by 1
DCX					Decrement X (Word) by 1

Double Register Operations

ADD(B) Add
SUB(B) Subtract
AND(B) AND
OR(B) OR Inclusive
ORE(B) OR Exclusive
XFR(B) Transfer
AAB(B) Add A Register and B Register
SAB(B) Subtract A Register and B Register
NAB(B) AND A Register and B Register
XAX(B) Transfer A Register to X Register
XAY(B) Transfer A Register to Y Register
XAB(B) Transfer A Register to B Register
XAZ(B) Transfer A Register to Z Register
XAS(B) Transfer A Register to S Register

Memory Reference

LDA(B)	•			•	Load A Register
STA(B)	,				Store A Register
LDB(B)			•		Load B Register
STB(B)					Store B Register
LDX		÷			Load X Register
STX					Store X Register
JMP					Jump
JSR			÷		Jump to Subroutine

PHYSICAL SPECIFICATIONS

MECHANICAL: SIZE: Nominal 84" x 17" x 194" (HxWxD). With Rack Ears Attached, Conforms to Standard 84" Rack Mounting Height

WEIGHT: (Basic CPU, Enclosure, Control Panel) 17 Lbs., Shipping 27 Lbs.

ENVIRONMENTAL: OPERATING TEMPERATURE: 0°C to +50°C

STORAGE TEMPERATURE: -55°C to +80°C

HUMIDITY: 0 to 95% RH Non-Condensing



ee 200-01