Keyware OS-65D Disk Operating System

Product Bulletin

The C-100 utilizes the powerful, easy-to-use OS-65D Disk Operating System which provides the software interface required between the user and the hardware. OS-65D allows the user to create, manipulate, store, execute and retrieve programs and files easily. The disk operating system provides this capability through a four-layered hierarchical structure, including:

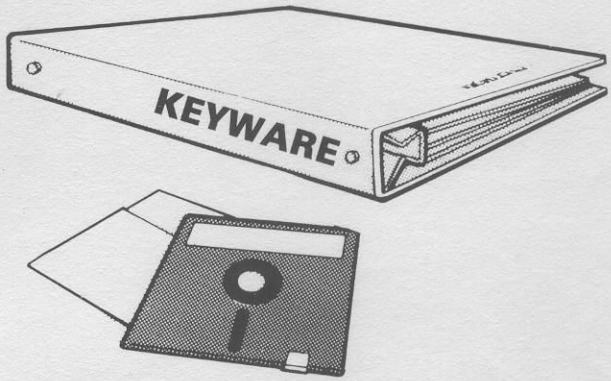
- The OS Kernel or nucleus
- BEXEC® Executive
- System utilities, and
- I/O drivers and distributors

OS-65D fully supports Microsoft® 9-digit extended BASIC, a 6502 resident Assembler/Editor, a 6502 Extended Machine Code Monitor, and the various input/output drivers and distributors required to handle I/O devices and operations.

The BASIC programming language is convenient and easy-to-use due to its interpretitive nature and English language-like syntax. Programs can be written in BASIC and 6502 assembler, and machine code subroutines can be used in conjunction with BASIC programs. Both sequential and random access data files can be created, written to and read from disk as required.

In addition to its comprehensive assembler and machine code capabilities, the Extended Monitor includes an extensive machine code debugging capability. The operating system also has several advanced features such as variable sector length and standalone disk operating system that can support other high level languages (e.g., Pascal, FORTRAN).

OS-65D is designed as a "self-teaching" operating system utlilizing a set of diskettes and easy-to-follow manuals that lead the first time user from the operation of simple menu-based programs, through programming in BASIC and assembler, to a complete program development system with advanced capabilities.



Features Summary:

- Microsoft® extended BASIC
- 6502 Assembler Language
- Flexible screen formatting commands
- Complete upper/lower case BASIC commands
- Typewriter-like keyboard operation
- PRINT USING
- Disk FIND command
- "ON ERROR GOTO" (error trapping)
- Full Hazeltine emulator with window definitions and 15 levels of foreground (16 colors)
- Programmable, paging printer driver
- Comprehensive graphics support including direct X, Y, plotting and the ability to dump medium resolution (64 x 128) graphics directly to the AC-19 low-cost printer
- Enhanced utilities including: greatly simplified create, initialize and delete functions, new single disk copier, communications support utility for optional modem, and an optional resequencer
- Enhanced disk I/O throughput
- Assembler/Editor
- Extended Machine Code Monitor with Debugger

M/A-COM Office Systems, Inc. 7 Oak Park Bedford, Massachusetts 01730 (617) 275-4440

Available Through:

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Keyware OS-65U General Purpose Operating System

Product Bulletin

All the Keyfamily Series computers except the C-100 utilize the OS-65U general purpose operating system. OS-65U provides the interface required between the user or applications programmer and the hardware to provide efficient management of system resources, allow multiple users to share those resources in an efficient and non-interfering manner, and ensure system and data integrity and security.

OS-65U is a powerful, comprehensive 9-digit BASIC language system that includes a complete named file operating system for removable floppy disks as well as large capacity hard disks; the file system supports both data and program files. Data files appear to the user as a single contiguous block of data bytes that can be read or written sequentially or randomly. High-speed file searches can be performed via a special FIND command to locate a specified character or character string.

Flexible I/O files can be easily accessed at any point in a file by setting the character pointer to any desired position in the file, thus permitting both sequential and random file accessing. Program files hold BASIC programs in "tokenized", ready-to-run form for higher execution speed.

OS-65U includes a number of extensions to BASIC that provide added capabilities for programmers who will be creating end-user oriented applications software. These extensions include programmer control of errors (error trapping), comprehensive file access, "password" control, and a BASIC statement trace for efficient debugging.

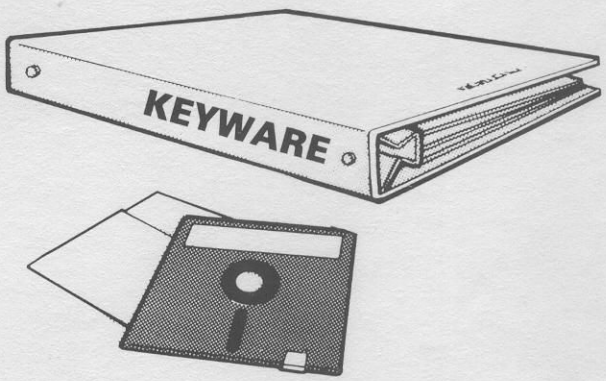
The line edit command speeds program entry or modification, and user INPUT has the same edit capabilities as the BASIC line editor.

A chain mode permits virtually any number of programs to be RUN in succession while retaining the values of all variables, thus allowing programs of virtually any length.

The KILL command allows deletion (elimination) of individual simple or array variables, and a "wild card" feature permits all simple or all array variables to be deleted.

WAIT FOR/WAIT CLEAR commands can be used to coordinate file allocation, access, exclusive use, etc., in timesharing and networked systems.

PRINT statements can be left and right justified to the required field width. Extended INPUT modes allow the maximum length and type of response to be specified; types available include integer, money, ASCII and encoded.



Features Summary:

- Automatically configures itself for CPU clock rates
- OS-65U is included with all M/A-COM OSI Business systems providing transportability and upward compatibility
- Both random and sequential access to files
- Data file commands that include OPEN, PRINT, INPUT, FIND, INDEX and CLOSE
- Program files hold BASIC programs in "tokenized", ready-to-run form for higher execution speed
- A common I/O distributor permits easy selection of any I/O device or combination of output devices
- OS-65U programs can be readily modified on any size system from floppy disk to hard disk based networking systems
- OSI's virtual data file DOS and extended BASIC are highly recommended for business applications
- Includes powerful BASIC program editor, and resequencer
- Spooling is included to increase system throughput.

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Available Through:

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Keyfamily Board Descriptions

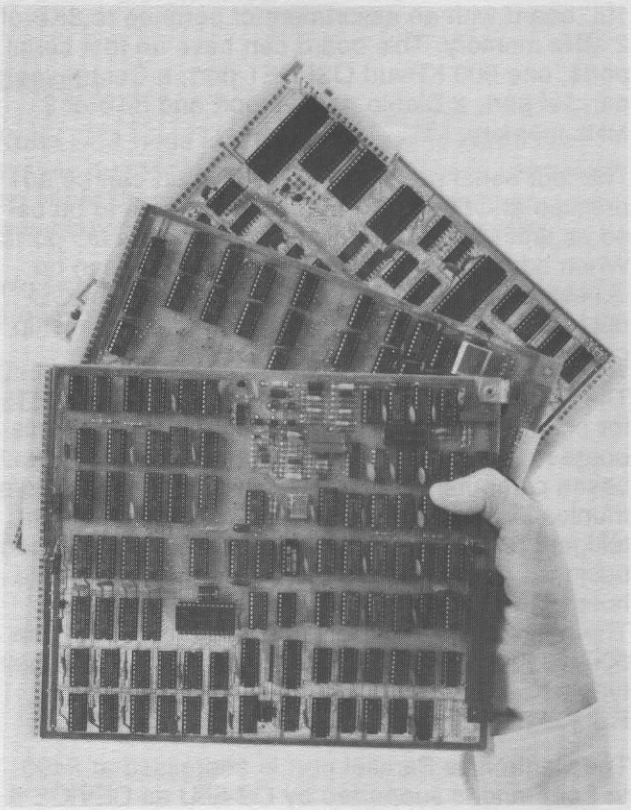
Feature Summary:

CA-9	Centronics parallel printer interface board
CA-9D	Diablo parallel printer interface board
CA-10	Serial I/O board, 1 - 16 RS.232 ports
CA-18	Multipurpose I/O board; Centronics, Diablo, Serial, Net ports
CA-20	Calendar clock board
CA-30	6502 only CPU board, serial, 1 MHz
CA-31	6502 only CPU board, video based, 2 MHz
CA-32	6502/Z-80 CPU board, serial, 2 MHz
CA-50	OSI format floppy disk controller
CA-58	8'' hard disk controller board
CA-59	14'' hard disk controller set (two boards and mini backplane)
CM-6	48K 1 MHz dynamic memory board
CM-20	48K 2 MHz static memory board

CA-9
The CA-9 board is an 8 x 10'' OSI BUS board. This board contains a Centronics parallel interface. This interface is addressed at F400.

CA-9D
The CA-9D board is an OSI 8 x 10'' board and contains a Diable 12-bit parallel interface. This board is addressed at F500.

CA-10 (550)
The CA-10 is an 8 x 10 '' OSI BUS board with up to 16 RS-232 ports. The board can be configured in many ways and is currently being supplied by OSI in the configurations below. The board is easily configurable in the field by an OSI qualified technician and can be used for any application requiring serial data transfer at speeds from 110 Baud to 19.2 KBaud. Through the addition of jumpers, and a few IC's, various forms of handshaking can be implemented. These include DTR, DSR, CTS and RTS as well as clock signals. When clock signals are used 250 KBaud and 500 KBaud are available. When handshaking is implemented the board may be restricted to less than 16 ports.



The board is addressed at CF00 and can be accessed directly from OS-65U basic as DEVICE 3 or DEVICE 8 with the input/output being routed to any port on the board. This routing is defined by the use of the program PRTSET.

Current OSI Uses:
CA-10-2H: The CA-10 board is addressed at CF00 and is populated with two serial ports set at 9600 Baud with DTR and DSR handshaking. The ports will send data when the DTR line is brought high.

CA-10-5TS: The CA-10 board is addressed at CE00 and is populated with five serial ports set at 9600 Baud. These ports are used under timesharing for users 1 to 5.

CA-10-2: Addressed at CF00, two serial ports w/o handshaking.

CA-10-8: Addressed at CF00, eight serial ports w/o handshaking.

CA-10-16: Addressed at CF00, 16 serial ports w/o handshaking.

CA-18 (555)
The CA-18 is an extremely versatile and flexible OSI BUS input/output board. It is a standard 8 x 10'' board with an assortment of ports up to 8KB of 2 MHz memory. This board can have up to 4 serial ports, one 500 KBaud OSI NET port, a Centronics parallel port, a Diablo parallel port and 8KB of 2 MHz memory.

The four serial ports and OSI NET port can be addressed at CF00 and CE00 to allow them to be used as timeshare console ports or as serial I/O ports. When addressed at CF00 the serial ports can be accessed as DEVICE 3 and DEVICE 8 under OS-65U Basic. The port to device number relationship can be set with the program PRTSET.

The 500 KBaud OSI NET port is used by OSI NET for communications to other OSI computers. If this board is in a NODE computer (any OSI hard disk based computer) it is used for NODE to NODE communications to another CA-18 board. It is in an intelligent terminal/workstation (any OSI floppy based business computer) used to communicate with the host NODE (any OSI hard disk based computer). The board it talks to in this case is the CA-11. The 500 KBaud OSI NET port is of the differential driver type while the other serial ports are standard RS-232 ports.

The Centronics Parallel port is addressed at F400 to F4FF and is supported by OS-65U as DEVICE 5 and under CP/M as the LPT: device. This is the default printer device under CP/M.

The Diablo Parallel port is addressed at F500 to F5FF and is supported under OS-65U as DEVICE 6 with a special driver called up by the program WPDRIV. Under CP/M this device is not currently supported.

The CA-18 board can be supplied with up to 8K 2MHz static RAM in steps of 4K. The memory is addressed at D000 and E000 (HEX). The memory at D000 is used for the multiuser executive as well as for semaphore locking under OS-65U. Under CP/M both D000 and E000 are required. In systems with hard disks, the memory at E000 must be removed and/or disabled so as not to conflict with the memory in the hard disk controller which is also addressed at E000.

The CA-18 is currently available in the following configurations:

CA-18: Populated with 2 serial ports addressed at CF00 (printer ports), 1 Centronics parallel port and 1 Diablo parallel port.

CA-18B: Populated with 1 Centronics parallel port, 1 Diablo parallel port, 1 OSI NET port, 8K of memory addressed at D000 and E000 as well as three serial ports addressed at CF00 and CE00. These ports can be used for either printers or timeshare user console ports. Third serial port has DTR and DSR handshaking.

CA-18C: As CA-18B but only 4K at D000.

CA-18E: Populated with 1 Centronics parallel port, 1 Diablo parallel port, 1 OSI NET port, 4K of memory addressed at D000 and 2 serial ports addressed at CF00 with DTR and DSR handshaking (printer ports).

CA-20
The CA-20 is an 8 by 10'' OSI BUS board. It has a battery powered, self recharging real time clock. This clock stores the date, in day-month-year, as well as the time, in hour-min-sec-1/10sec. This board also has additional 16 line interface ports for the connection of OSI hardware development boards (head end cards).

CA-30 (505A)
The CA-30 board is an 8 x 10'' OSI BUS board. This board has a 6502 CPU, an OSI compatible Floppy Disk Controller as well as 1 RS-232 serial port. Address at FC00.

The serial port is an RS-232 compatible EIA port for the connection of the console terminal. It is strapable from 110 Baud to 9.6K Baud. The Floppy Disk Controller is OSI format, single sided or double sided, single density, 8'' or 5¼''. This board is used in the low cost business systems. The standard clock rate for this board is 1 MHz.

CA-31 (505B)
The CA-31 is an 8 x 10'' OSI BUS board. This board has one 6502 CPU, an OSI Format Floppy Disk Controller, as well as various peripheral interface chips. This board is used in video based OSI systems. The on board Floppy Disk Controller is single sided or double sided, single density, 8'' or 5¼''. The standard clock rate for this board is 2 MHz.

CA-32 (510)
The CA-32 is an 8 x 10'' OSI BUS board. This board contains one 6502 CPU as well as a Z80 CPU. These two processors are software selectable, making the board the versatile base upon which OSI business systems are built. The 6502 chip is used to run the operating systems OS-65D, OS-65U, Pascal, and Fortran. The Z80 runs the CP/M operating system. This board also contains one RS-232 Serial port for the connection of the console terminal. This port has a baud rate selectable from 75-19.2KBaud and can be used as a current loop port. The standard clock rate for this board is 2 MHz. This CPU board is required for timesharing operation under the 65U operating system.

CA-50 (470)
The CA-50 is an 8 x 10'' OSI BUS floppy disk controller. This board will support single or double sided floppy disks, single density 8'' or 5¼'' in an OSI proprietary format.

CA-59 (590, 525)
The CA-59 is a set of 14'' hard disk controller boards as well as a miniature two slot backplane. This controller board set is comprised of two 8 x 10'' OSI BUS boards. The first board is the CA-53 hard disk controller board. The second board is the CA-54 dual port memory board. In general, these boards function in the following manner: the data moves between the hard disk and the dual port memory board serially at 8 MBaud. This data transfer requires no CPU intervention. The data is buffered in the 4K memory on the dual port memory board. This memory is addressed at E000. Once this buffer is loaded with the disk data, the CPU then transfers the data from this buffer to the individual user-buffer. The two 8 x 10'' boards must be inserted in the OSI BUS next to each other, and the two slot miniature backplane must connect the outside edges of these two boards. This controller board set will support up to two 14 inch hard disks, 36 or 74 MBs.

CM-6
The CM-6 board is an 8 x 10'' OSI BUS memory board. This board contains 48K 1MHz dynamic memory addressed from 0000 to BFFF. This board is the standard memory board in the OSI low cost business machines. When using this board as an additional partition in a multi-user system, this board must be addressed to the proper memory bank. This board can only be used for multiuser operation in pre-key series computers.

CM-20 (524)
The CM-20 is an 8 x 10 '' OSI BUS card. This board contains 48K 2MHz static memory. This board will operate at 2MHz and memory is addressed from 0000 to BFFF. This board is the normal board for upgrading systems to multi-user operations. Each additional user requires one of these boards called partitions to function. Each board must be addressed to the right partition using the on board DIP switches.

Glossary

Node — A node is a hard disk based computer system supporting multiple users. These users can be either time share/multiprocessor users or workstations. Node is the center of a network.

Workstation — Any single user computer system in a network.

Cluster — any group of workstations that are attached to a node.

Network Port — A 500KB serial port for transmission of data among OSI computers.

Available Through:

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Keymate C-100 Microcomputer

Product Bulletin

The OSI Keymate C-100 is a very reliable, self-contained microcomputer system designed for a variety of small office and home computer applications. The C-100's versatile and cost-effective design is based on years of innovative microcomputer design and high volume manufacturing experience.

The standard system includes the popular 6502 microprocessor, 48K bytes of random access memory (RAM), one 80K byte mini floppy drive, compact typewriter-style keyboard, acoustic modem, and a number of input/output ports that allow a variety of optional serial and video display devices to be easily connected to the system. The C-100 video and graphics capability includes full 16-color support, and 256 x 512 bit-mapped, high-resolution graphics that establish new standards for microcomputers.

A wide range of standard software is provided with the C-100 including OSI's versatile OS-65D Disk Operating System, BASIC programming language, and a variety of application software packages. Typical applications supported include record keeping, accounting, financial planning, computation, word processing, education and home entertainment.

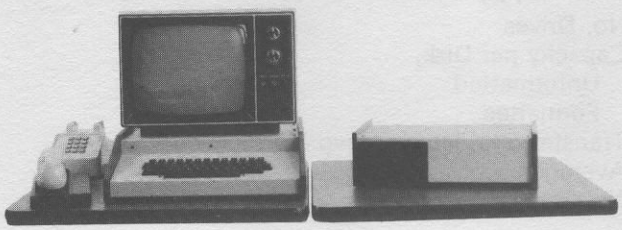
A number of options are available including black and white or color video monitor, a second 80K byte mini floppy, serial matrix or word processing printer, UCSD® Pascal and FORTRAN, and a variety of optional applications and home entertainment software packages.

The C-100 is housed in a compact, table top cabinet and can be used with a closed circuit TV video monitor, a standard color TV, an OSI black and white monitor, or an OSI color monitor.

This reliable, well designed hardware and software configuration, combined with the available options, provide a level of versatility and performance seldom achieved in microcomputers of comparable size and price, designed for small office and home computer applications.

Standard Features:

- 6502 CPU (2MHz clock rate)
- 48K byte RAM
- Compact, typewriter-style keyboard
- Single 80K byte mini floppy drive
- Acoustic modem
- Standard I/O ports, including:
  - Two RS-232 connectors
  - Two Joystick inputs



  - Two numeric keypad inputs
  - Three 16-pin connectors
  - Tone generator output (200 Hz to 49KHz)
  - AC control output (AC Control Unit optional)
  - Video output
  - DAC output

Standard Software Included:

- OS-65D Operating System
- MDMS Management System
- Planner Plus Financial Planning System
- Plot BASIC
- WP3-2 Word Processing software
- HIRES graphics software
- DAC 1 musical software
- Game Disk
- Sargon® Chess Game

Documentation Provided:

- Introductory Manual
- User's Manual
- Servicing Data
- BASIC Reference Manual
- 65D Reference Manual
- 65V Primer (introduction to assembler programming)
- MDMS Reference Manual
- MDMS Planner Plus Manual
- Plot BASIC Manual
- DAC 1 Manual

NOTE: Hardware availability to be determined by FCC certification.

M/A-COM Office Systems, Inc. 7 Oak Park Bedford, Massachusetts 01730 (617) 275-4440

C-100 Specifications

System Operating Characteristics

CPU

Processor types & clock rates	6502 at 2MHz
Type memory	Static RAM
Memory capacity	48K bytes
No. serial ports	2

Mini Floppy Drives

No. Drives	(1std)
Capacity per Disk,	
Unformatted	150K bytes
Formatted	80K bytes
Transfer rate, latency (avg.)	125K bits/ sec
Average access time	100 msec
No. Tracks	40

System Specifications

Environmental

Temperature	60° to 75°F (15.5 to 23.9°C)
Humidity (non-condensing)	30% to 80%
Power	115 VAC, 60 Hz
Physical Dimensions	4¾"H x 18.0"D x 16¼"W
Mini Floppy Drives	9.0"H x 10½"D x 14½"W
(Two drives stacked)	

Weight

CPU	15.0 lbs. (6.5 Kg)
Mini Floppy Drives**	8.5 lbs. (3.7 Kg)

**NOTE: Mini Floppy weight is for one drive, double weight for two drives; CPU and mini floppy weights are approximate.

C-100 System Configurations:

Description: 5¼" floppy based, 48K RAM video desk top system with acoustic modem

Replaces: C4P MF

Disk: One 5¼" floppy disk drive, SS, SD 80K (formatted) storage per drive

Boards:

CA-31	505B	6502 CPU (2Mhz)
CA-41	542B	53 Key Keyboard
CA-40	540B1	Color Video Board
CA-38	541	Hi res graphics/24K memory (2Mhz) Board
CM-09	527	24K memory (2Mhz) Board

Rear Panel:

1 phono	Video
2 phono	Sound (tone generator and DAC)
1 phono	AC remote control
2 phono	Unused
4 DB9	For joysticks and numeric key pads
1 DB25	Serial port - printer
1 DB25	Serial port - modem
3 16 pin connectors	OSI Head end cards
1 pot	Color adjust

Software:
- OS-65D V3.3 Tutorial Set
- High Resolution Graphics package
- WP3 Word Processor
- MDMS Planner Plus financial planning
- Plot BASIC more graphics
- DAC I musical package
- Sargon® Chess Game
- Game Disk

Expansion:
- Second disk drive
- CA-21 48 line parallel I/O card
- CA-22 High speed analog I/O module
- CA-23 PROM programmer
- CA-24 Solderless prototyping board

Model Number: C-100/0 - 115 VAC, 60 Hz power.

Available Through:

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Masterkey Single-User System 220 Series

Product Bulletin

The Masterkey 220 Series is a low cost, reliable, self-contained, desk top member of M/A-COM OSI's Keyfamily of systems. The 220 Series is designed as a single-user, floppy or hard disk based system, providing cost effective solutions for a wide variety of business and industrial applications.

Durability and reliability are built into the 220 Series. All components meet industry standards for field performance and compatibility — the result of many years of design and manufacturing experience.

Main Features

System Architecture

The 220 Series feataures a simple physical layout in a compact cabinet. All electronic circuitry is contained on 8 inch x 10 inch OSI BUS compatible PC cards. The cards are plugged into an 8 slot backplane to allow for easy access and maintenance. Disk drives are front mounted and the entire system is powered by rugged, universal open-frame, UL listed power supplies.

The 220C system utilizes the powerful 6502 microprocessor, 48K bytes of random access memory (RAM), and dual 8-inch, 400K byte (275K byte formatted) floppy disk drives. Input/Output interface with printers and the console is accomplished via three serial I/O ports.

The 220E system also utilizes the 6502 microprocessor, 52K bytes of RAM, a 10M byte (7.3M byte formatted) Winchester hard disk drive, and a single 8-inch, 400K byte (275K byte formatted) floppy disk drive. Three serial I/O ports are also provided.

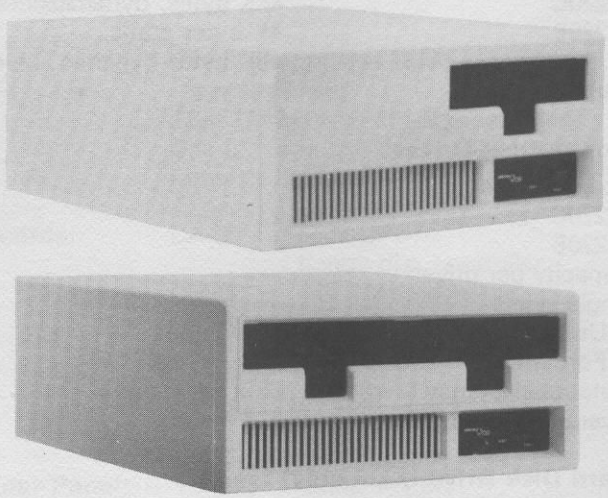
Hardware options include serial Video Display Terminals (VDTs), dot-matrix and letter quality printers.

Software

The 220 Series is supplied with the powerful Keyware OS-65U Advanced Operating system with Microsoft* extended BASIC. Optional software includes UCSD** Pascal and FORTRAN and a variety of application packages.

Summary

Designed to be reliable, compatible, and economical the Masterkey 220 Series is a logical choice for single-user microcomputer business and industrial applications not requiring multiuser support.



Hardware

- 6502 microprocessor, 1MHz clock rate
- 48K bytes dynamic RAM + 4K bytes static RAM (220E)
- One (220E) or two (220C) 8-inch floppy disk drives
- One (220E) Winchester hard disk drive
- 8-slot chassis, OSI BUS compatible
- UL listed, kuniversal power supplies
- Single, compact, easy access, desk top cabinet

Software (standard)

- Keyware OS-65U Advanced Operating System
- Microsoft* extended BASIC

Options

- Video Display Terminals
- Dot-matrix or letter quality printers
- UCSD** Pascal and FORTRAN
- Wide variety of applications software
- Masterkey Systems Service Manual

Documentation Provided

- Masterkey 220 Series User's Guide
- M/A-COM OSI BASIC Reference Manual
- Keyware OS-65U User's Guide and Reference Manual

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System Operating Characteristics

CPU

Processor type & clock rate	6502 at 1MHz
Memory type	Dynamic and static RAM
Memory capacity	
220C	48K bytes, dynamic
220E	4K bytes static, 48K bytes dynamic
Serial I/O ports	3

Floppy Disk Drives

No. of drives	
220C	2
220E	1
Capacity per drive: single sided -	
Unformatted	400K bytes
Formatted	275K bytes
Rotational latency (avg)	83.3 msec
Average access time	226 msec

Hard Disk Drive (220E only)

No. of drives	1
Capacity (unformatted)	
Per drive	10.67M bytes
Per surface	2.67M bytes
Per track	10.4K bytes
Capacity (formatted)	
Per drive	7.3M bytes
Per surface	1.84M bytes
Per track	7.17K bytes
Per sector	3,584 bytes
Sectors/track	2
Transfer rate	4.34M bits/sec
Access time	
Average	70 msec
Maximum	150 msed
Average latency	9.6 msec

System Specifications

Environmental

Temperature	59° to 90°F (15° to 32°C)
Humidity (non-condensing)	20% to 80%

Power

Domestic (USA)	115 VAC, 60Hz, single phase
European	230 VAC, 50 Hz single phase

Physical Dimensions

CPU cabinet	9"H x 23.5"D x 19"W (22.9 cm H x 62.2cm D x 48.3 cmW)

Weight

	220C	220E
Operating Weight	80 lbs(36.3 Kg)	95 lbs(43.1 Kg)
Shipping Weight	85 lbs(38.6 Kg)	100 lbs(45.4 Kg)

Model Numbers:

220 C/0 - floppy based system
115 VAC, 60 Hz power

220 C/1 - floppy based system,
230 VAC, 50 Hz power

220 E/0 - 10M byte hard disk system,
115 VAC, 60 Hz power

220 E/1 - 10M byte hard disk system,
230 VAC, 50 Hz power

220C System Configurations:

Low cost floppy based table-top computer system for business applications	
Replaces:	C2-OEM
Backplane:	8 slot
Disks:	Two 8" floppy disk drive, single sided, single density 275K (formatted) storage per drive
Boards:	CA-30 6502 CPU, floppy disk controller CM-6 48K 1MHz dynamic memory board CA-10-2H Serial I/O board with 2 ports
Rear Panel:	1 DB25 Console Port 2 DB25 Serial ports
Software:	Keyware OS-65U Operating System

220E System Configurations:

Low cost hard based table-top computer system for business applications	
Replaces:	C2-D
Backplane:	8 slot
Disks:	One 8" floppy disk drive, single sided, single density 275K (formatted) storage per drive One 8" hard disk drive, 10MB (7.3 formatted)
Boards:	CA-30 6502 CPU, floppy disk controller CM-6 48K 1MHz dynamic memory board CA-10-2H Serial I/O Board with 2 ports. CA-58 8" Hard disk controller
Rear Panel:	1 DB25 Console Port 2 DB25 Serial ports
Software:	Keyware OS-65U Operating System

Available Through:

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Masterkey Time Sharing Systems
230 Series

Product Bulletin

The 230 Series microcomputer is a desk top member of the powerful and reliable M/A-COM OSI Keyfamily of computer systems. The 230 Series systems, incorporating M/A-COM OSI's unique dual-microprocessor Central Processing Unit (CPU), are offered in two models readily adaptable to suit user needs. All 230's are readily expandable to 4 time sharing users.

The 230C is suitable for applications not requiring hard disk storage. It is competitively priced and built to the same standards of design and manufacturing excellence displayed in all M/A-COM OSI Masterkey computers. The 230C can be used as a workstation in an OSI keyring network.

The 230E incorporates an 8-inch, 10M byte (7.3M byte formatted) Winchester type hard disk drive. Coupled with M/A-COM OSI's OS65U operating system with integrated business BASIC, the 230E is readily configured to supply cost effective solutions for small business applications requiring the speed and capacity of hard disk storage, and multiuser and/or keyring network support.

Main Features

Dual-Microprocessor Architecture

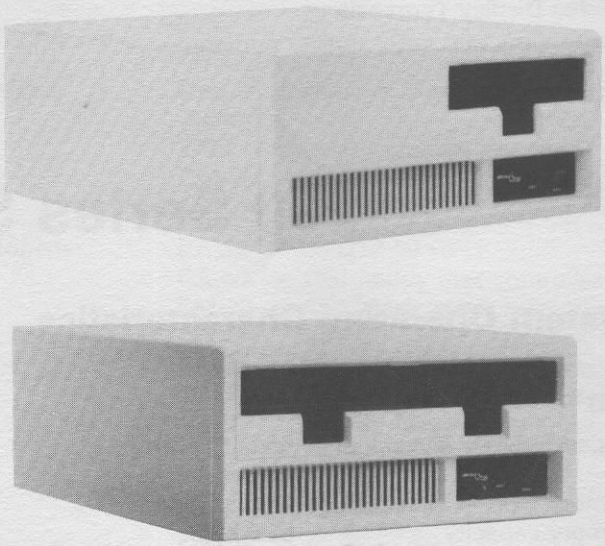
The unique OSI dual-microprocessor architecture utilizes the powerful 6502 processor operating at 2MHz and the popular Z80 processor operating at 4MHz. The basic system configuration includes 56K bytes of random access memory (RAM). The 230 easily expands to a multi-user system by the simple installation of one board per user up to the maximum configuration of four users. Two parallel (Centronics and Diablo compatible) and four serial input/output (I/O) ports, and one Keyring network port to accommodate a variety of I/O devices including printers and Video Display Terminals (VDTs).

Hardware

The Masterkey 230C is supplied with dual 8-inch floppy disk drives. The 8-slot, 48-line OSI BUS provides modularity, flexibility, and ease of expansion.

The Masterkey 230E includes a 10M byte (7.3M byte formatted) high speed, Winchester hard disk drive and a 400K byte (275K formatted) floppy disk drive for data transport and backup. An 8-slot chassis accepts numerous hardware options to further expand the system's capabilities.

Hardware options and accessories include additional memory partitions (up to a total of four), VDTs, dot-matrix and letter quality printers.



Software

The standard software for the 230 Series is the Keyware OS-65U Advanced Business Operating System and Microsoft* extended BASIC. Optionally available are the CP/M operating system, UCSD** PASCAL and FORTRAN.

Summary

The Masterkey 230 Series of microcomputer systems offers versatility and reliability at very competitive prices. When combined with the Keyware OS-65U Advanced Business Operating System, Microsoft* BASIC, and available applications software packages, the 230C and 230E computer systems provide capability in business environments equal to that of many minicomputers — at far less cost.

230 Series System Specifications

Hardware

- Dual-microprocessor CPU, 6502 and Z80
- 56K bytes static RAM
- One (230E) or two (230C) 8-inch floppy disk drives
- One Winchester 10M byte hard disk (230E only)
- An 8-slot, 48 line, M/A-COM OSI BUS compatible chassis
- UL listed universal power supply

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Software (standard)

- Keyware OS-65U* Advanced Business Operating System
- Microsoft* extended Business BASIC
- OS-65U time sharing software

Options

- Additional memory partitions for multiuser time sharing
- Video Display Terminals
- Dot-matrix and letter quality printers
- Various business software packages
- Keyring network software
- Masterkey Series Service Manual

Documentation Provided

- Masterkey 230 User's Guide
- M/A-COM OSI BASIC Reference Manual
- OS-65U User's Guide and Reference Manual

230 Series Specifications

System Operating Characteristics

CPU

Processor types & clock rates	6502 at 2MHz Z80 at 4MHz
Memory type	Static RAM
Memory capacity	56K bytes
Parallel I/O ports	2
Serial I/O ports	4
Network port (500K baud)	1

Floppy Disk Drives

No. of drives	2 (230C), 1 (230E)
Capacity per drive: single sided -	
Unformatted	400K bytes
Formatted	275K bytes
Rotational latency (avg.)	83.3 msec
Average Access Time	226 msec

Hard Disk Drive (230E only)

No. of drives	1
Capacity (unformatted)	
Per drive	10.67M bytes
Per surface	2.67M bytes
Per track	10.4K bytes
Capacity (formatted)	
Per drive	7.3M bytes
Per surface	1.84M bytes
Per track	7.17K bytes
Per sector	3584 bytes
Sectors per track	2
Transfer rate	4.34M bits/sec
Access Time	
Average	70 msec
Maximum	150 msec
Average latency	9.6 msec

System Specifications

Environmental

Temperature	59° to 90°F (15° to 32°C)
Humidity (non-condensing)	20% to 80%

Power

Domestic (USA)	115 VAC, 60 Hz single phase
European	230 VAC, 50 Hz, single phase

Physical Dimensions

CPU cabinet	8¾"H x 24.5"D x 19"W (22.9 cm H x 62.2 cm D x 48.3 cm W)

Weight

	230C	230E
Operating Weight	80 lbs(36.3 Kg)	95 lbs(43.1 Kg)
Shipping Weight	85 lbs(38.6 Kg)	(100 lbs(45.4 Kg)

Model Numbers:

230C/0 - floppy based system, 115 VAC, 60 Hz power
230C/1 - floppy based system, 230 VAC, 50 Hz power
230E/0 - 10M byte hard disk system, 115 VAC, 60 Hz power
230E/1 - 10M byte hard disk system, 230 VAC, 50 Hz power

230C System Configurations:

Floppy disk based table-top computer system for business applications	
Replaces:	C3-OEM
Backplane:	8 slot
Disks:	Two 8" floppy disk drive, single sided, single density 275K (formatted) storage per drive
Boards:	CA-32 6502/Z-80 CPU CA-50 OSI floppy disk controller CM-20 48K 2MHz static memory board CA-18B I/O board with Centronics, Diablo, Net 3 serial ports 8K memory
Rear Panel:	1 DB25 Console Port 3 DB25 Serial ports, for printers or users 1 50 pin Diablo port 1 36 pin Centronics port 1 9 pin Network port
Software:	Keyware OS-65U Operating System
Expansion:	Multiuser Operation Yes, up to four Hard disk (10MB) Yes Hard disk (36MB) Yes Hard disk (74MB) Yes Node operation No IT operation Yes CP/M operation Yes

230E System Configurations:

Hard disk based table-top computer system for business applications	
Replaces:	C3-D
Backplane:	8 slot
Disks:	One 8" floppy disk drive, single sided, single density 275K (formatted) storage per drive One 8" hard disk drive, 10MB (7.3 Mb formatted)
Boards:	CA-32 6502/Z-80 CPU CA-50 OSI floppy disk controller CM-20 48K 2MHz static memory board CA-58 8" hard disk controller CA-18C I/O board with Centronics, Diablo, Net 3 serial ports 4K memory
Rear Panel:	1 DB25 Console Port 3 DB25 Serial ports, for printers or users 1 50 pin Diablo port 1 36 pin Centronics port 1 9 pin Network port
Software:	Keyware OS-65U Operating System
Expansion:	Multiuser Operation Yes, up to four Node operation Yes, supports up to 8 workstations Node-Node Yes CP/M operation Yes

Available Through:

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Masterkey Time Sharing System 250 Series

Product Bulletin

The 250 Series microcomputer is the largest and most powerful member of the OSI KEY family of computer systems. The 250 Series computer systems incorporates M/A-COM OSI's unique dual-microprocessor Central Processing Unit (CPU) and offer the versatility of substantial, built-in random access memory (RAM) and Winchester hard disk drive on-line storage capacity.

All 250 Series components are housed in a single cabinet with a locking rear door. The CPU, floppy disk drive, and Winchester disk drive(s) are slide mounted within the cabinet for easy access and servicing.

A flexible, 14-slot OSI BUS chassis and the dual-microprocessor architecture enable the user to easily configure, update, and expand the system to serve a variety of needs. Plug-in circuitry accommodates time sharing and network data base configurations. The advanced OS-65U Keyware Time Sharing Operating System executes an extensive range of integrated business and industry-specific software packages.

The 250I incorporates 56K bytes of RAM and 40M bytes (36M bytes formatted) of Winchester hard disk drive storage. The 250J offers 80M bytes (74M bytes formatted) of Winchester hard disk storage capacity. Both the 250I and 250J microcomputer systems include one 8-inch floppy disk drive for data transport and back up.

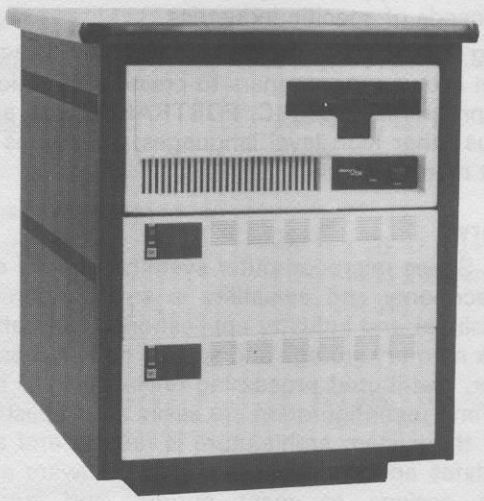
The 250 Series offers optimum performance in microcomputer, business system applications at a very competitive cost.

Main Features

Dual-Microprocessor Architecture

The unique OSI dual-microprocessor architecture utilizes the powerful 6502 processor operating at a 2MHz clock rate and the popular Z80 processor operating at a 4MHz clock rate. The basic system configuration includes 56K bytes of RAM, 40MB or 80MB 14-inch Winchester type hard disk storage, and one 8-inch floppy disk drive.

Input/Output (I/O) is provided through two parallel I/O ports (compatible with Centronics and Diablo interfaces), eight serial I/O ports, and one local keyring networking port. Thus the 250 Series system accommodates many of the available Video Display Terminals (VDTs), dot-matrix and letter quality printers.



Winchester hard disk drives offer high density memory storage and rapid data access at moderate cost. Mechanical reliability is achieved by using a fixed, non-replaceable storage media (rotating disk); installed, calibrataed and sealed at the factory. High speed disk transfers are performed by a dedicated disk controller board via a large, dual-port buffer. This configuration eliminates the need for the CPU to control disk accessing functions, freeing it to respond quickly to user commands in multiuser systems and minimizing the delay for VDT screen response.

The 250 Series systems offer either the 40M byte (250I) or 80M byte (250J) Winchester hard disk drive. Enhanced 250 Series systems include two Winchester disk drives; the 250II is supplied with two 40M byte units and the 250JJ with two 80M byte units.

The 8-inch floppy disk drives allow the user to backup (transfer a recorded copy) of hard disk files or to transport files and programs generated elsewhere.

Software

Standard software for the 250 Series system includes the Keyware OS-65U Timesharing Operating System and Microsoft* extended BASIC. Programs already developed on other systems utilizing a Keyware OS-65U operating System are fully compatible with the 250 Series. Optional Keyware includes the popular CP/M Operating System, and UCSD* Pascal and FORTRAN for programming and scientific applications.

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Keyring networking software permits one or two hard disk based, time-sharing systems and many intelligent terminals to be interconnected in a local network to allow the majority of the workload to be processed where the information is needed most (distributed processing).

Numerous business packages are available for general business applications including word processing, general ledger, accounts receivable, inventory, shipping/receiving, and others. Additionally, many software application packages are available to suit the needs of specific industries.

Adding the CP/M Operating system, and Softech* P-system allows programmers to create application-specific programs in BASIC, FORTRAN, Pascal and numerous other high level languages, as well as in very fast machine code.

Summary

The 250 Series microcomputer systems provide excellent economy and versatility in small and mid-sized business and industry applications. They offer hard disk memory storage and speedy data access in multiuser, distributed processing environments. Expansion and reconfiguration are easily accomplished because the system architecture is flexible and accommodates an extensive variety of hardware and software options to meet current and future customer needs.

Hardware:

- Dual-microprocessor CPU
- 56K bytes of static RAM
- One 8-inch floppy disk drive
- One (250I & 250J) or two (250II & 250JJ) Winchester hard disk drives
- Two parallel and nine serial I/O ports
- A 14-slot, OSI BUS compatible chassis
- Compact cabinet with slide mounts for floppy and hard disk drives and locking rear door.

Software (standard)

- Keyware OS-65U Operating System
- Microsoft* extended BASIC
- Microsoft* extended BASIC

Options:

- Additional memory partitions (up to 6 total)
- Video Display Terminals
- Dot-matrix and letter quality printers
- Keyring network option
- CP/M operating system (floppy and hard disk versions)
- UCSD Pascal and FORTRAN (floppy version only)
- Masterkey Systems Service Manual

Documentation Provided:

- Masterkey 250 User's Guide
- M/A-COM OSI BASIC Reference Manual
- OS-65U Keyware

250 Series System Specifications

System Operating Characteristics

CPU	250I	250J
Processor types & clock rates	6502 at 2MHz Z80 at 4MHz	Same Same
Memory type	Static RAM	Same
Memory capacity	56K byte	Same
Parallel I/O ports	2	Same
Serial I/O ports	8	Same
Network port (500K baud)	1	Same
Floppy Disk Drives		
No. of 8-inch Drives	1	Same
Capacity per drive:		
Single sided -		
Unformatted	400K bytes	Same
Formatted	275K bytes	Same
Rotational latency (avg.)	83.3 msec	Same
Average access time	226 msec	Same
Hard Disk Drives		
No. of Drives		
250I, 250J	1	1
250II, 250JJ	2	2
Capacity (unformatted)		
Per drive	40M bytes	80M bytes
Per surface	13.4M bytes	Same
Per track	20K bytes	Same
Data tracks per surface	678	Same
No. of surfaces	3	6
Capacity (formatted)		
Per drive	36M bytes	74M bytes
Per surface	12.3M bytes	Same
Per track	17.9K bytes	Same
Per sector	3,584 bytes	Same
Sectors per track	5	Same
Transfer rate	7.97M bytes/sec	Same
Access Time		
Average	38 msec	Same
Maximum	75 msec	Same
Average latency	10.1 msec	Same

System Specifications

Environmental	
Temperature	59° to 90°F (15 to 32°C)
Humidity (non-condensing)	20% to 80%
Power	
Domestic (USA)	115 VAC, 60 Hz, single phase
European	230 VAC, 50 Hz single phase
Physical Dimensions	
CPU cabinet	48"H x 26"D x 24¼"W (122 cm.H x 66 cm.D x 61.6 cm.W)
Weight	
CPU cabinet	± 325 lbs. (146 kg.)

Model Numbers:

- 250I/0 - 40M byte drive systems, 115 VAC, 60 Hz power
- 250I/1 - 40M byte drive systems, 230 VAC, 50 Hz power
- 250II/0 - two 40M byte drive system, 115 VAC, 60 Hz power
- 250II/1 - two 40M byte drive system, 230 BAC, 50 Hz power
- 250J/0 - 80M byte drive system, 115 VAc, 60 Hz power
- 250J/1 - 80M byte drive system, 230 VAC, 50 Hz power
- 250JJ/0 - two 80M byte drive system, 115 VAC, 60 Hz power
- 250JJ/1 - two 80M byte drive system, 230 VAC, 50 Hz power

System Configurations:

Hard Disk Based Rack Mount Computer System		
Replaces:	C3-B/C	
Backplane:	14 slot	
Disks:	One 8" floppy disk drive, single sided, single density 275K (formatted) storage per drive One 14" hard disk drive, 36MB*, (74MB)** *(for I & II systems) **(for J, & JJ Systems)	
Boards:	CA-32 CA-50 CM-20 CA-59 CA-10-5TS CA-18E	6502/Z-80 CPU OSI floppy disk controller 48K 2MHz static memory board 14" hard disk controller set Serial port board, 5 user ports I/O board with Centronics, Diablo, Net 2 serial ports with handshaking, 4K memory
Rear Panel:	1 DB25 2 DB25 5 DB25 1 50 pin 1 36 pin 1 9 pin 1 Knockout for tape backup 1 Knockout for network expansion (2 x 50) pin	Console Serial ports, for printers Serial ports, for users Centronics port Diablo port With Keyring Network Port
Software:	Keyware OS-65U Operating System	
Expansion:	Multiuser Operation Node to node networking Node to IT networking CP/M Operation Second 36MB hard disk Second 74MB hard disk Softech* P-system	Yes Yes Yes Yes Yes Yes Yes

NOTE: Suffix I indicates one 36MB hard disk
Suffix II indicates two 36MB hard disks
Suffix J indicates one 74MB hard disk
Suffix JJ indicates two 74MB hard disks

Available Through:

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Keyware Planner Plus

Product Bulletin

Planner Plus is M/A-COM Office Systems Inc.'s Financial Planning Package. It is designed for exclusive use with all M/A-COM OSI personal and business computers incorporating 8-inch floppy disk drives or hard disks with a capacity of up to 74M bytes of on-line storage.

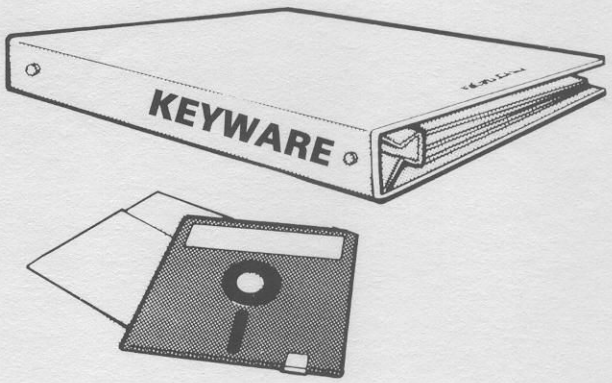
The Planner Plus system gives businessmen, engineers, and financial analysts the ability to create financial and scientific models to assist in answering today's pressing "what if" questions. Using simple, English-like commands the user can apply the 27 powerful rules contained in Planner Plus to applications ranging from trend analysis to linear programming.

Models are created by describing rows and columns of data (tables) with Planner's easy-to-use, on-screen editor. Data relationships are defined by rules with the Rule Editor. Manipulating the rules alters the relationships within the data tables. Data can be changed interactively and the results appear immediately on the screen.

The Planner Plus package includes:

- Utility programs for creating and installing a library of model files.
- Plotting features for graphically displaying information

Planner Plus can be used in a stand-alone fashion or as part of a multiuser or network system.



Features Summary:

- Manipulates model sizes on OSI 8-inch floppy disks in a range from 12 columns by 2,279 lines to 96 columns by 419 lines.
- Manipulates model sizes on OSI hard disks up to 96 columns by 32,767 lines.
- Supports stand-alone and multiuser environments.
- Supports a wide range of Video Display Terminals (VDTs) and printers.
- Provides easy-to-use, menu-driven editing using a full screen editor for convenient data input and correction.
- Pages vertically and horizontally through a model.
- Offers split-screen capability for comparison viewing of a large model. For example, quarterly sales comparisons between Year 1 and Year 2.
- Incorporates 27 rules allowing extremely powerful computation, including:
  - — arithmetical operations
  - — scientific functions
  - — conditional branch statements
  - — on-line data entry.
- Generates automatic numeric formatting for lines and columns (integer, dollar, and percentage).
- Contains a flexible report writer.
- Capable of plotting and graphing information in a choice of five different formats for such applications as trend or spreadsheet analysis.
- Furnished on two 8-inch diskettes — one contains the Planner Plus, the other sample models.

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