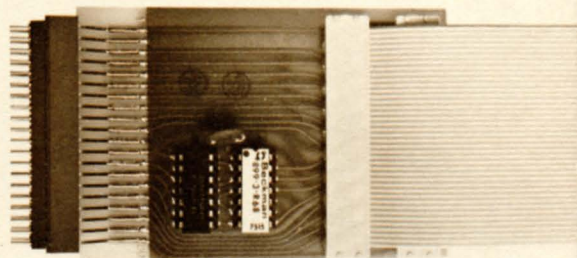


## Universal microcomputers for product development data processing and dedicated control

Futuredata Universal systems are available for the most popular microprocessors—8080, 8085, 6800 and Z-80.

All of these systems are designed specifically to handle a wide variety of applications and are being used as powerful microcomputer development systems, general purpose data processing systems and dedicated controllers.



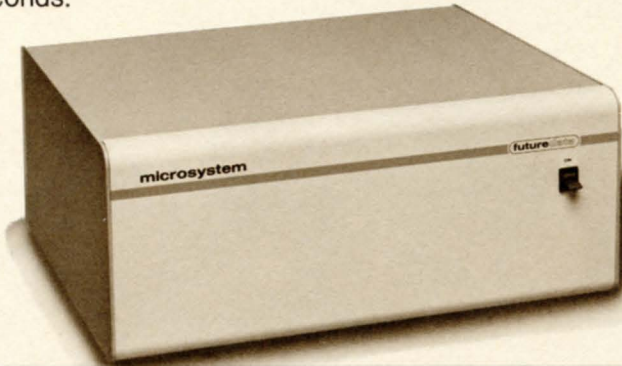


# Futuredata offers the largest selection of microcomputer hardware and software operating systems...

## Futuredata Universal Microsystems for 8080, 8085, 6800 and Z-80

Futuredata has the largest selection of complete micro-computer systems in the industry. Each MICROSYSTEM comes complete with an 8080, 8085, 6800 or Z-80 processor, a 960 character CRT-display, a 53-key ASCII keyboard, memory, peripherals, full operating software and a full set of manuals.

One system can handle all the processors with the addition of optional low-cost conversion packages consisting of a plug-in processor module, software and manuals. The module allows the system processor to be changed in seconds.

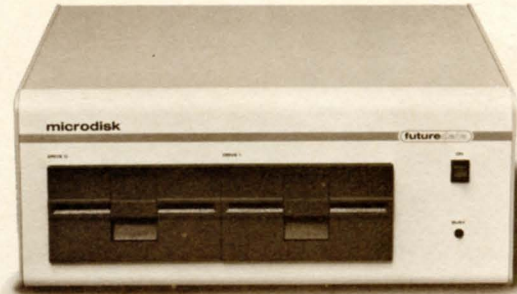


All Futuredata MICROSYSTEMS include dual EIA RS-232 serial ports, 8-bit parallel TTL I/O port, real-time clock, memory write protect under software control, bootstrap loader in PROM, vectored interrupts and DMA capability. Monitor, Debugger, Editor, Assembler and Utility software is provided with every system.

**MICROSYSTEM/10—Cassette Tape Based Systems—**This low-cost system is available with 8080 or 6800 processors and is complete with 8K bytes of RAM memory, CRT display, keyboard, dual drive cassette tape unit and full operating software on cassette tape.

**MICROSYSTEM/12—Cassette Tape Based Systems—**Identical to MICROSYSTEM/10 except is available with Z-80 as well as 8080 or 6800 processors and is furnished with 16K bytes of RAM memory.

**MICROSYSTEM/15 QUICKRUN™—Memory Resident Systems—**Available with all processors and is similar to the MICROSYSTEM/10 except that it comes with 32K bytes of RAM memory and QUICKRUN™ software. The QUICKRUN™ package is a unique software system that includes the Monitor/Debugger, Editor and Assembler all co-resident in memory for instantaneous system response.



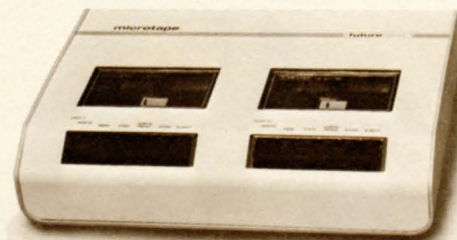
**MICROSYSTEM/20—5" Mini Floppy Disk Based Systems**—Available with all processors, complete with 16K bytes of RAM memory, CRT display, keyboard, dual drive 5" floppy disk unit, DOS software on diskette and a full set of manuals. Each disk has a formatted capacity of 80,640 bytes or 161,280 bytes per dual drive system.

**MICROSYSTEM/30—8" Floppy Disk Based Systems—**Available with all processors, complete with 16K bytes of RAM memory, CRT display, keyboard, dual drive 8" floppy disk unit, DOS software on diskette and a full set of manuals. Each 8" floppy disk has a formatted capacity of 256,256 bytes or 512,512 bytes per dual drive system.

**MICROSYSTEM/32—8" Double-Sided, Double-Density Floppy Disk Based Systems—**Available with all processors, complete with 16K bytes of RAM memory, CRT display, keyboard, dual drive 8" double-sided double-density floppy disk unit, DOS software on diskette and a full set of manuals. Each 8" disk has a formatted capacity of 1,261,568 bytes or 2,523,136 bytes per dual drive system.

**DUAL MICROSYSTEMS—Two Terminal Microcomputer Systems—**Futuredata Dual MICROSYSTEMS represent a significant cost breakthrough by providing two complete MICROSYSTEMS in a single system enclosure. Each of the two subsystems in a DUAL MICROSYSTEM is complete with its own 8080, 8085, 6800 or Z-80 processor, memory, CRT display, keyboard and peripherals. Each of the subsystems may be a MICROSYSTEM/10, 12, 15, 20, 30 or 32 and supports any of the optional line printers. In addition, one of the two subsystems may support a MICROEMULATOR™ in-circuit emulator.

Futuredata DUAL MICROSYSTEMS allow two design engineers to work simultaneously with significant savings when compared to two separate systems.





# Hardware system features

## CRT Display Lets the System Respond Instantly

Futuredata pioneered the concept of integrating the CRT display and keyboard console into every microcomputer system it manufactures. And this display is not an ordinary serial CRT—it is a DMA refreshed display that lets the processor directly store data into the 960 character CRT display buffer. Every character position on the CRT is directly addressable by the CPU. This allows the display to be changed as fast as the CPU can store data into the display memory buffer (20,000 characters per second minimum).

With an ultra high-speed CRT integrated into every system, there is no need for a front panel display or switches. Under control of our debugging software, simple keyboard commands provide the flexibility of hundreds of switches. And the debugging software formats 160 memory bytes into a hexadecimal dump display just like a large IBM system.



## MICROEMULATOR™ In-Circuit Emulators for 8080, 8085, 6800 and Z-80; EPROM Programmer for 2704, 2708, 2758 and 2716.

One of the most significant features of the Futuredata system, when used for product development, is the MICROEMULATOR™ in-circuit emulator. This powerful tool extends the editing, assembling and debugging facilities directly into a prototype or production system, and provides EPROM programming, too. The MICROEMULATOR™ probe plugs directly into your prototype CPU socket. Programs residing in the RAM memory can execute and access the memory and I/O devices of your system, emulating actual usage in your system's own environment.

The MICROEMULATOR™ software package is extremely simple to use and provides for enabling emulation mode, single-step and trace execution, hardware breakpoints and EPROM programming.

## Optional Line Printers—

MICROPRINT/30—132 column, 30 character per second, upper case only with tractor feed.

MICROPRINT/120—132 column, 120 character per second, upper/lower case, with tractor feed and electronic top of forms.

MICROPRINT/180—132 column, 180 character per second, upper/lower case, with tractor feed and electronic top of forms.





# Software system features

## Super-fast Debugger

This interactive debugging program generates full screen hexadecimal memory dump displays instantaneously. Commands include Display, Store, Execute, Change Memory Write Protection, Find Data in Memory, Set, Reset and Display Breakpoints.

## Powerful Editor

The extensive capability of this screen-based editor is learned quickly and is easy to use. Changes are displayed instantly and in full context on the 24-line CRT. The user can quickly scroll ahead or back; insert, delete and edit lines; load and dump data and insert, delete or replace characters within a line.

## Relocating Macro Assemblers

Macro Assemblers are available for 8080, 8085, 6800 and Z-80 and produce relocatable object files. All assemblers use manufacturers standard instruction mnemonics, and allow for external symbol references.

## Linkage Editor

Used to combine relocatable object files into executable programs. The Futuredata Linkage Editor resolves external references between relocatable files, and assigns absolute addresses. This advanced feature is an essential software tool in the development of large programs because it allows the programs to be written and assembled in small, manageable segments.

## Universal BASIC Compilers for 8080, 8085, 6800 and Z-80

Futuredata pioneered the concept of a universal microcomputer system and now is again the first to introduce high level language compilers that provide truly universal high level language capability. A program written in Futuredata Universal BASIC can be compiled to run on the 8080, 8085, 6800 and Z-80. The BASIC language includes all the standard BASIC statements, plus string variables, array variables, bit functions, PEEK, POKE, INP and OUT functions.

## High-Level BASIC Debugger

Included with the BASIC Compiler package is a high-level debugger that allows program debugging without dealing directly with assembly language. The BASIC Debugger provides for setting and clearing breakpoints using BASIC statement numbers, and also provides for displaying variables in memory using the BASIC variable name directly. This is the breakthrough in high-level language programming that the micro-computer industry has been waiting for!

**Extended BASIC Interpreter Provides General Purpose Data Processing Capability**—Futuredata Extended BASIC has been designed with data processing in mind. As a result it has every feature and every function to support complex BASIC language programs.

Extended BASIC provides extended precision, real and integer arithmetic, user-selectable up to 60 digits. And, of course, strings are provided along with a full comple-

ment of string functions. The math functions support up to 21 digits of precision. Data management capabilities for disk, tape and printer are unsurpassed by any microcomputer BASIC. Disk BASIC supports sequential, random, formatted and unformatted I/O. In addition, full file management functions including Create, Delete, Rename and Free Space are provided. For printed output, full formatting functions are available. BASIC also allows calls to assembly language subroutines, and has useful functions such as PEEK, POKE, INP and OUT to directly access memory and I/O ports.

**QUICKRUN™—Unique Memory Resident Software Concept**—QUICKRUN™ is a complete "in-memory" operating system consisting of a Monitor/Debugger, Editor and Assembler all co-resident in memory along with source and object code workspace. QUICKRUN™ runs in a minimum of 32K bytes of memory which provides enough space for a 1000 statement source program, a 4K byte object area and all the system software. QUICKRUN™ can automatically adapt to memory sizes up to 56K bytes which provides enough space for programs of up to 2500 statements.

**Instantaneous program development**—With everything in memory, the user can instantly switch from editing to assembling to debugging. Changes are made directly in the source program. The program is then re-assembled and is ready for testing in seconds. Once the QUICKRUN™ software and the source program are loaded, all subsequent processing is performed in memory and virtually all I/O is eliminated. Program development using QUICKRUN™ becomes substantially faster than with any other type of system, even disk-based.

## Futuredata Disk Operating Systems

DOS for 8080, 8085, 6800 and Z-80 combines Futuredata's full line of software tools—Monitor, Debugger, Editor, Relocating Macro Assemblers, Linkage Editor, and Utility—with the speed and capacity of dual floppy disks. With these tools, development and debugging of large

programs is a snap. Editing and assembling of large programs can be done 16 times faster than tape-based systems and 160 times faster than TTY-based systems.

Futuredata DOS is unsurpassed by any other microcomputer disk operating system. DOS features include:

- Powerful screen-based debugger
- Versatile screen-based editor
- Fast assembler
- Variable size, named files
- Dynamic allocation of files by tracks
- Files can be write-protected
- Files can be "permanent" to prevent accidental deletion
- Files automatically expand

allocation as necessary • Unused space can be released from files • PROM loader allows virtually all of memory to be loaded from diskette • Disk I/O can be overlapped with processor execution • Diskette files can be copied to and from cassette tape • All data management functions are callable from user programs.





# ...for every application

## For Product Development

Universal Systems with full support for 8080, 8085, 6800 and Z-80; software support for 8048/8748/8035, 1802 and 3870 microprocessors.

### Choose from—

- Low cost cassette tape systems
- High-speed, low-cost QUICKRUN™ memory resident systems
- 5" Mini Floppy Disk, 8" Floppy Disk or 8" Double-Sided, Double-Density Floppy Disk Systems

### Complete with—

- In-Circuit Emulators for 8080, 8085, 6800, Z-80
- High-Level Languages, including Extended disk and tape BASIC interpreter for 8080, Z-80; BASIC Compilers for 8080, 8085, 6800, Z-80
- EPROM Programmers for 2704, 2708, 2758, 2716
- Full Software for 8080, 8085, 6800, Z-80 (Monitor, Debugger, Assembler, Editor, Utility) and Optional Relocatable Macro Assembler and Linkage Editor.



## For Data Processing and Problem Solving

The full range of Futuredata systems permits you to match cost and performance to your application.

Just select the Futuredata tape or disk system that matches your needs. Add Futuredata's Extended BASIC high level programming language for general purpose data processing, problem solving, data acquisition or sorting. Produce professional reports with one of Futuredata's 132 column, high-speed, tractor-feed line printers.

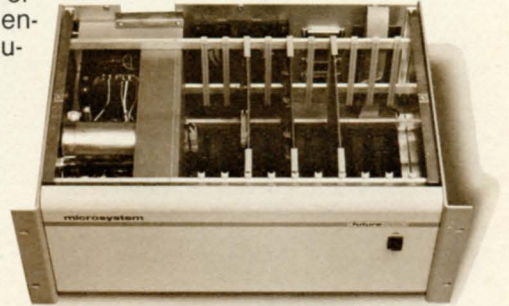
## For Dedicated Control

### MICROCONTROL/10 Barebones Micro Controller

For dedicated control applications this system is ideal. In-

cludes table top or rack-mountable enclosure with regulated power supplies, CPU module with processor of your choice, PROM/RAM memory and universal prototype board for customized I/O.

Add any of Futuredata's system modules to custom tailor the micro controller to your application.



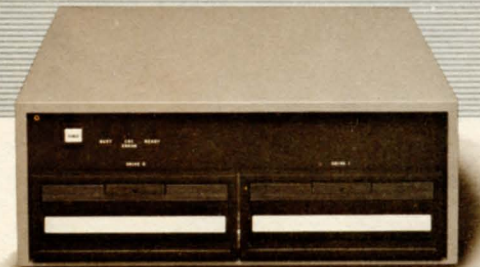
### Widest range of low-cost I/O options

- CRT Display
- ASCII Keyboard
- Dual Cassette Tape Unit
- Dual Mini Floppy or Dual 8" Floppy Disk

**All the development tools you need**—Futuredata's micro-computer development system product line, including in-circuit MICROEMULATOR™, provides full hardware/software support for your controller.

**Use the CPU that fits your application**—You're not limited with just one choice for a CPU. The Futuredata universal system gives you a choice of 8080, 8085, 6800 or Z-80.

**Get the proven reliability you need**—Great care and quality components give you the rock-stable reliability you need for control applications.



futuredata



# Futuredata systems

## HARDWARE SUMMARY

### PROCESSORS

8080  
8085  
6800  
Z-80

### MEMORY

RAM  
RAM Write Protect  
RAM Expansion  
EPROM

### PERIPHERALS

CRT Display  
Keyboard  
Dual Cassette Tape Unit  
Dual 5" Mini Floppy Disk Unit  
Dual 8" Floppy Disk Unit  
Dual 8" Double-Sided, Double-Density Floppy Disk Unit  
Line Printers (30, 120 or 180 characters per second)

### FEATURES

Bootstrap in PROM  
Dual EIA Serial I/O Ports  
8-bit TTL I/O Ports  
Real-Time Clock  
Vectored Interrupts  
1 Megabyte/Sec. DMA  
10 Slot Card Cage  
Finished Table-Top Enclosure  
Rack Mountable  
Regulated Power Supplies & Fan

### OPTIONS

MICROEMULATOR/8080  
MICROEMULATOR/8085  
MICROEMULATOR/6800  
MICROEMULATOR/Z-80  
Dual USART Serial I/O  
Quad 8-bit parallel TTL I/O  
EPROM Programmer  
Debug: Hardware Breakpoint, Single Step, Trace

	MICROSYSTEM/10	MICROSYSTEM/12	MICROSYSTEM/15	MICROSYSTEM/20	MICROSYSTEM/30	MICROSYSTEM/32
8080	☆	☆	☆	☆	☆	☆
8085	☆	☆	☆	☆	☆	☆
6800	☆	☆	☆	☆	☆	☆
Z-80		☆	☆	☆	☆	☆
RAM	8K	16K	32K	16K	16K	2K
RAM Write Protect	●	●	●	●	●	○
RAM Expansion	○	○	○	○	○	○
EPROM	○	○	○	○	○	8K
CRT Display	●	●	●	●	●	○
Keyboard	●	●	●	●	●	○
Dual Cassette Tape Unit	●	●	●	○	○	○
Dual 5" Mini Floppy Disk Unit	○	○	○	●	○	○
Dual 8" Floppy Disk Unit	○	○	○	○	○	○
Dual 8" Double-Sided, Double-Density Floppy Disk Unit	○	○	○	○	●	○
Line Printers (30, 120 or 180 characters per second)	○	○	○	○	○	○
Bootstrap in PROM	●	●	●	●	●	○
Dual EIA Serial I/O Ports	●	●	●	●	●	○
8-bit TTL I/O Ports	●	●	●	●	●	○
Real-Time Clock	●	●	●	●	●	○
Vectored Interrupts	●	●	●	●	●	●
1 Megabyte/Sec. DMA	●	●	●	●	●	●
10 Slot Card Cage	●	●	●	●	●	●
Finished Table-Top Enclosure	●	●	●	●	●	●
Rack Mountable	○	○	○	○	○	●
Regulated Power Supplies & Fan	●	●	●	●	●	●
MICROEMULATOR/8080	○	○	○	○	○	○
MICROEMULATOR/8085	○	○	○	○	○	○
MICROEMULATOR/6800	○	○	○	○	○	○
MICROEMULATOR/Z-80	○	○	○	○	○	○
Dual USART Serial I/O	○	○	○	○	○	○
Quad 8-bit parallel TTL I/O	○	○	○	○	○	○
EPROM Programmer	○	○	○	○	○	○
Debug: Hardware Breakpoint, Single Step, Trace	○	○	○	○	○	○

## SOFTWARE SUMMARY

### TAPE SOFTWARE

for MICROSYSTEM/10, 12 & 15

Monitor/Debugger  
Editor  
Assembler  
Copy Utility  
QUICKRUN (Co-Resident Assembler Editor, Debugger)  
MICROEMULATOR Debugger  
MICROEMULATOR QUICKRUN  
Extended BASIC Interpreter

### DISK SOFTWARE

for MICROSYSTEM/20, 30, 32

Monitor  
Debugger  
Editor  
Assembler  
Utility  
MICROEMULATOR Debugger  
Extended BASIC Interpreter

### OPTIONAL DISK SOFTWARE

Relocating Macro Assembler  
Linkage Editor  
BASIC Compiler  
BASIC Debugger

### OTHER OPTIONAL SOFTWARE

Word Processor  
Utility Source  
CRT Output  
Keyboard Input  
EIA Serial Output  
EIA Serial Input  
QUICKRUN/1802  
QUICKRUN/8048  
QUICKRUN/3870

	8080	8085	6800	Z-80
Monitor/Debugger	●	●	●	●
Editor	●	●	●	●
Assembler	●	●	●	●
Copy Utility	●	●	●	●
QUICKRUN (Co-Resident Assembler Editor, Debugger)	○	○	○	○
MICROEMULATOR Debugger	○	○	○	○
MICROEMULATOR QUICKRUN	○	○	○	○
Extended BASIC Interpreter	○	○	○	○
Monitor		●	●	●
Debugger		●	●	●
Editor		●	●	●
Assembler		●	●	●
Utility		●	●	●
MICROEMULATOR Debugger	○	○	○	○
Extended BASIC Interpreter	○	○	○	○
Relocating Macro Assembler	●	●	●	●
Linkage Editor	●	●	●	●
BASIC Compiler	●	●	●	●
BASIC Debugger	●	●	●	●
Word Processor	○	○	○	○
Utility Source	○	○	○	○
CRT Output	○	○	○	○
Keyboard Input	○	○	○	○
EIA Serial Output	○	○	○	○
EIA Serial Input	○	○	○	○
QUICKRUN/1802	○	○	○	○
QUICKRUN/8048	○	○	○	○
QUICKRUN/3870	○	○	○	○

● Standard ○ Optional ☆ Choose one, others optional