

CPZ-186 S-100 BUS 80186 CPU

From Intercontinental Micro Systems

16-BIT MASTER PROCESSOR

The CPZ-186, our 16-bit 8 Mhz, 80186 Single Board Computer (SBC), features 256K RAM, expandable to 512K or 1 Megabyte of on board Dynamic RAM.

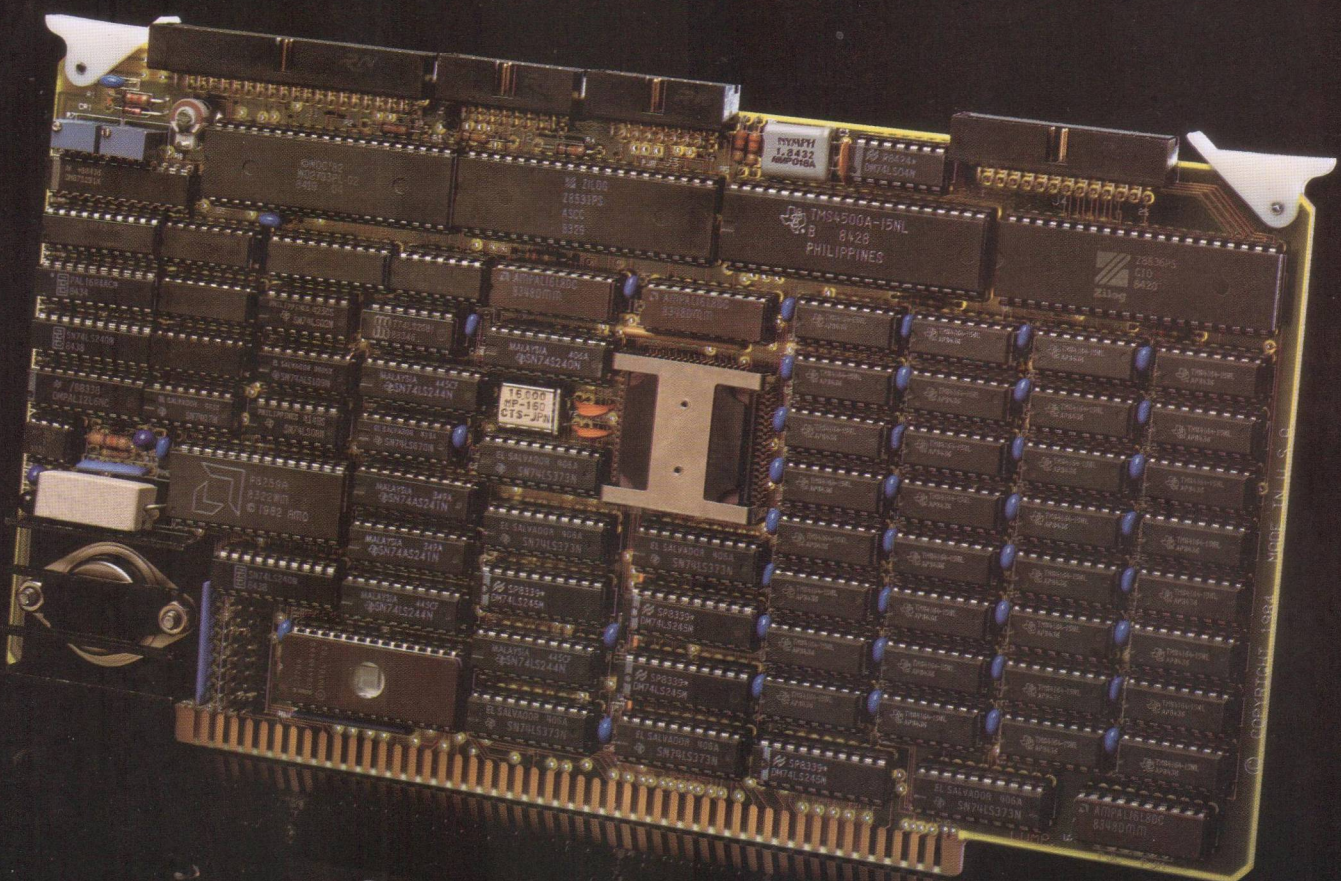
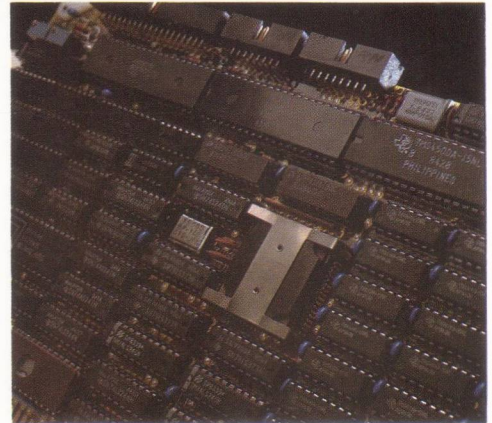
As with our CPZ-4800X 8-bit SBC, the CPZ-186 has 2 serial I/O Ports, 20 parallel I/O lines (16 data lines plus 4 handshaking lines) and one floppy disk port. The CPZ-186 incorporates Memory Management with 4 Megabytes of External Memory on 256K Relocatable pages. Other features which further increase the speed and flexibility are the 2 channel integrated DMA controller, and 18 channels of Vectored Priority Interrupts and on board Floppy Disk Controller. Software selectable baud rates of up to 1 MegaBAUD eliminate costly, complicated hardware modifications to change baud rate.

The CPZ-186 can be used as a highly sophisticated, single-user computer. Under ICM's TurboLAN™ multi-user architecture, the CPZ-186 can act as the Master (File Server) to a network (in any combination) of IBM-PC's™, XT's™, AT's™, Z-100's™, PC-JR's™, PC compatibles, 8-bit and/or 16-bit S-100 bus slaves, or ICM's diskless workstations. Up to 255 computers can be networked with one CPZ, although 16 to 32 users is more typical. 4000 users can be networked together using multiple masters, ICM's ARCnet™ hardware and TurboLAN software. TurboLAN uses Software 2000's TurboDOS™ and TurboDOS/PC Multi-User Operating System to run literally thousands of PC-DOS™, CP/M™, CP/M 86™, MS-DOS™, and MP/M 86™ application programs. Wondering about

our experience? ICM has been building Local Area Networks for over 3-1/2 years, and has installations throughout the world. Overall, there have been more than 50,000 TurboDOS networks installed.

TECHNICAL FEATURES

- 8 MHz, 80186 CPU
- IEEE 696.1/D2 S-100 compliance. The CPZ-186 will interface with most IEEE S-100 Bus products on the market.
- RS232 communications and floppy controller Personality Boards included.
- Floppy Disk Controller (FDC) with on-chip data separator. Single or double density, Single or double sided. Simultaneous 8" and 5-1/4" in any combination. The choice is yours, up to 4 drives.
- Two synchronous (SCC) or asynchronous (ASCC) serial I/O channels. One channel can be programmed in Direct Memory Access (DMA), interrupt, or programmable I/O mode.
- Two parallel I/O channels (CIO). Both channels are programmable in interrupt or programmable I/O mode.
- Two channel on-chip DMA controller.
- 256K Bytes of on-board RAM, expandable to 512KB or 1 Megabyte.
- Memory Management Unit (MMU). Addresses up to 4 Megabytes of system memory.
- Eighteen vectored priority interrupts.
- Can communicate via standard Programmed I/O or through Memory Mapped Mode on the Bus.
- Provisions for 2K, 4K or 8K of on-board EPROM. A boot up function in a 4K 2732 EPROM is supplied.
- Software selectable baud rates. Eliminates costly, complicated hardware modifications to change baud rates. Up to 1 MegaBAUD in synchronous mode.
- IBM Bisync, HDLC, SDLC and other protocols. All are handled through a Z8530 SCC chip. Permits communication with micro's, mini's or mainframes.
- TurboDOS operating system available, which runs Application Software for PC-DOS, CP/M 86, MS-DOS, CP/M, or MP/M™.
- DMA to extended memory.



TurboLAN NETWORK ARCHITECTURE

ICM's revolutionary TurboLAN architecture uses the TurboDOS Operating System to build sophisticated, cost effective, multi-user systems and networks.

TurboLAN provides the flexibility of building multi-user systems with S-100 BUS Structured Networks and ARCnet Local Area Networks. TurboLAN offers:

- Ability to network S-100 Bus Systems, PC's, XT's, AT's, Z-100's, PC-JR's, PC Compatibles, ICM's WS80 Diskless Workstations, and other ARCnet computers.
- Uses Master Processor (File Server) such as ICM's CPZ-4800X (8-bit) or CPZ-186 (16-bit) Single Board Computers.
- Up to 4000 users per network with 255 nodes per network segment.
- Network self configures and efficiency increases as nodes are added.
- Up to 40 miles between processors (Active Hub) or 2300 Ft. (Passive Hub).
- 2.5 MBIT/SEC data transfers.
- Communication across S-100 BUS, Coax cable, or twisted pair.

TurboDOS OPERATING SYSTEM

TurboDOS is a true multi-user Operating System because it was designed from its beginnings to handle multiple computers running simultaneously on one or more networks. Each user is assigned an individual PC or a terminal attached to a Single Board Computer/Processor. This PC or individual processor is called a Slave Processor in the TurboDOS architecture and acts independently of all other slaves on the network. A Master Processor, also known as a File Server, controls the network by downloading the operating system to each slave. The Master also downloads system files and orchestrates the use of all common peripherals. With its modular architecture, TurboDOS can increase the number of users or add peripherals on the network with a general software command that "links and patches". TurboDOS is the most sophisticated, yet cost effective Multi-user operating system available today.

TurboDOS FEATURES

- Compatible with many OS's Application Software: PC-DOS, CP/M, CP/M-86, MS-DOS, MP/M, MP/M-86, CP/M-Plus™, Concurrent CP/M-86™.
- Ability to mix Z-80™, 8-bit; 8088 and 8086, 16-bit families of processors.
- Flexibility to build Bus Structured (Tightly Coupled) Networks and Cable Structured (Loosely Coupled) Local Area Networks using ICM's TurboLAN.
- Record and File Locking with File Sharing among multiple users.
- Typically 300% faster than CP/M, MP/M, Oasis™ or similar multi-user, single-processor, multi-tasking OS's.
- 16 Logical Disk Drives per Master Processor/File Server.

- Up to 1000 MB per drive and 134 MB per file.
- 32 user areas (file libraries) on each disk.
- 25% to 30% more floppy disk capacity.
- Sharing of costly peripherals and disk drives.
- Read after Write verification of floppy and hard disk drives.
- Logon/Logoff and Privileged/Non-privileged Security.
- Background processing and Archival Back-up of files.
- Queuing of multiple tasks—processing or printing.
- Automatic Print Spooling.
- Each individual TurboDOS OS has 4 Circuit Drivers with 255 nodes (slaves) per circuit driver = 1020 users per File Server.
- Multiple File Servers can be linked together with ICM's TurboLAN drivers.



Performance Specifications

MICROPROCESSOR

Clock rate...8 MHz 80186

BUS INTERFACE...IEEE 696.1/D2 S100

DYNAMIC RAM MEMORY

Capacity...256K Bytes (64K × 1 DRAM's) or 512KB or 1 MegaByte (256K × 1 DRAM's)
Wait States...None

SERIAL I/O CHANNELS

Synchronous Operation
Baud Rate...Up to 921.6K BAUD
Data Transfer...DMA, interrupt or Programmed I/O
Asynchronous Operation
Baud Rate...Up to 921.6K BAUD
Clock Rate...1, 16, 32, or 64 times Baud Rate
Bits/Character...5, 6, 7 or 8
Stop Bits...1, 1½ or 2
Parity...Odd, Even or None
Data Transfer...DMA, Interrupt or Programmed I/O
I/O Interface...Through Personality Boards (Typically 2" × 3")

PARALLEL I/O CHANNELS

DATA RATE...Up to 500 KBytes/Sec
Channel A Data Transfer...DMA, Interrupt or Programmed I/O
Channel B Data Transfer...Interrupt or Programmed I/O
Interface Signals...16 DataLines Plus 4 Handshaking Lines
I/O Interface...Through Personality Boards

FLOPPY DISK CONTROLLER

Data Rate/8-inch Single-Density...250,000 Bits/Sec
Data Rate/8-inch Double-Density...500,000 Bits/Sec
Data Rate/5¼-inch Single-Density...125,000 Bits/Sec
Data Rate/5¼-inch Double-Density...250,000 Bits/Sec
Format...IBM 3740, 512 × 16 Sectors, or TurboDOS 1K Sector, IBM-PC Diskettes
Data Transfer...DMA, Interrupt or Programmed I/O
I/O Interface...Through Personality Boards

INTERRUPT CONTROL

Number of Channels...18
Priority...Rotating or Fixed
Interrupt Mode...Master Cascade

REAL-TIME CLOCK

Operation...Software Polled or Interrupt Driven
Range...37.5 Hz to 921.6 KHz

DIRECT MEMORY ACCESS CONTROLLER

Channel 0...Floppy Disk Controller
Channel 1...Channel A of ASCC Controller or Channel A of CIO Controller
Memory-to-Memory utilizes both Channel 0 and 1

DIRECT EXTERNAL MEMORY TRANSFERS

To/From ASCC (SCC), CIO, FDC or Memory

EPROM

Type...2716 2K, 2732 4K (standard), or 2764 8K
Wait States...Three
Function...Boot up

POWER REQUIREMENTS

Voltages...+8 VDC @ 3.0A (max)
+16 VDC @ 0.2A (max)
-16 VDC @ 0.2A (max)
Power...30.4W (max)

OPERATING ENVIRONMENT

Temperature...0 to 50 Degrees Celsius (32 to 122 Degrees Fahrenheit)
Relative Humidity...0 to 95%

CONSTRUCTION

Circuit Board...Four Layer Glass Epoxy, Soldermask over copper
All IC's in sockets
Connectors...Shrouded for Protection
TESTING...Completely tested and 24 hour burn-in
WARRANTY...One Year Warranty (Parts and Labor)

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CP/M, CP/M 86, MP/M, MP/M 86, CP/M PLUS, Concurrent CP/M 86 are Trademarks of Digital Research.

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