CPS-16X S-100 BUS 16-BIT SLAVE PROCESSOR
From Intercontinental Micro Systems

16-BIT SPEED

The CPS-16X Slave Processor is a single board computer using the 8 MHZ, 8086 CPU, and 256K of dynamic RAM, expandable to 1 Megabyte of DRAM. Specifically designed to interface with Intercontinental's CPZ-4800X, 8-bit master, the CPS-16X slave will also interface with an Intercontinental 16-bit master scheduled for release in the 4th quarter, 1984. Operating under the TurboDOS™ operating system, a high performance, high throughput multi-user network can be integrated into an S-100 Bus structured network.

Up to 16 slaves can be linked to one Master. With one terminal per slave, no user has to share a single CPU's time as with MP/M,™ OASIS™ or UNIX.™ TurboDOS™ allows CP/M 86,™ MP/M 86™ and most MS-DOS™ application software to be run on the CPS-16X.

Intercontinental's slaves have been successfully used as batch processors in both multi-user and single-user systems. All of ICM's Slave Processors are Memory Mapped, resulting in data transfers that are at least twice as fast as standard I/O mapped slaves. Remember, the CPZ-4800X Master can handle both I/O and Memory Mapped slaves. Intercontinental chose Memory Mapping simply because it is

faster. TurboDOS allows mixing Intercontinental's 8-bit, Z80 based slaves and 16-bit, 8086 slaves on the same bus and Micronet™ architecture allows linking 4080 slave processors together or linking 255 IBM PCs into the same network.

FEATURES

- ☐ 8 MHZ, 8086-2 CPU
- ☐ Compatible with (1) ICM's CPZ-4800X master processor, (2) any Z80 based CPU with extended address capability, (3) any 16-bit based CPU complying with IEEE 696.1/D2 S-100 bus standard, (4) all ICM serial & parallel personality boards.
- ☐ Data transfers: parallel 16-bit or 8-bit (8-bit with CPZ-4800X or any Z80 processor with extended addressing).
- ☐ Memory mapped master/slaves transfers across S-100 Bus.
- ☐ On-board RAM memory: 256 Kbyte, expandable to 1 Megabyte.
- ☐ LSI memory refresh & accessing controller.
- ☐ S-100 resident address is jumper selectable in 64K boundaries.
- ☐ 20 parallel I/O lines.
- ☐ 2 serial I/O ports: synchronous or asynchronous.

- ☐ I/O port address: jumper selectable from 00 to FF (HEX).
- ☐ Software selectable baud rate.
- ☐ Priority interrupts: 8 vectored, fixed or rotating interrupts, eliminates polling.
- ☐ Real time clock.
- ☐ Software compatibility: TurboDOS, CP/M 86, MS-DOS.
- ☐ Each CPS-16X includes one RPB-100, RS 232 personality board.
- ☐ Numeric Co-Processor option (available 4th Qtr. 1984).
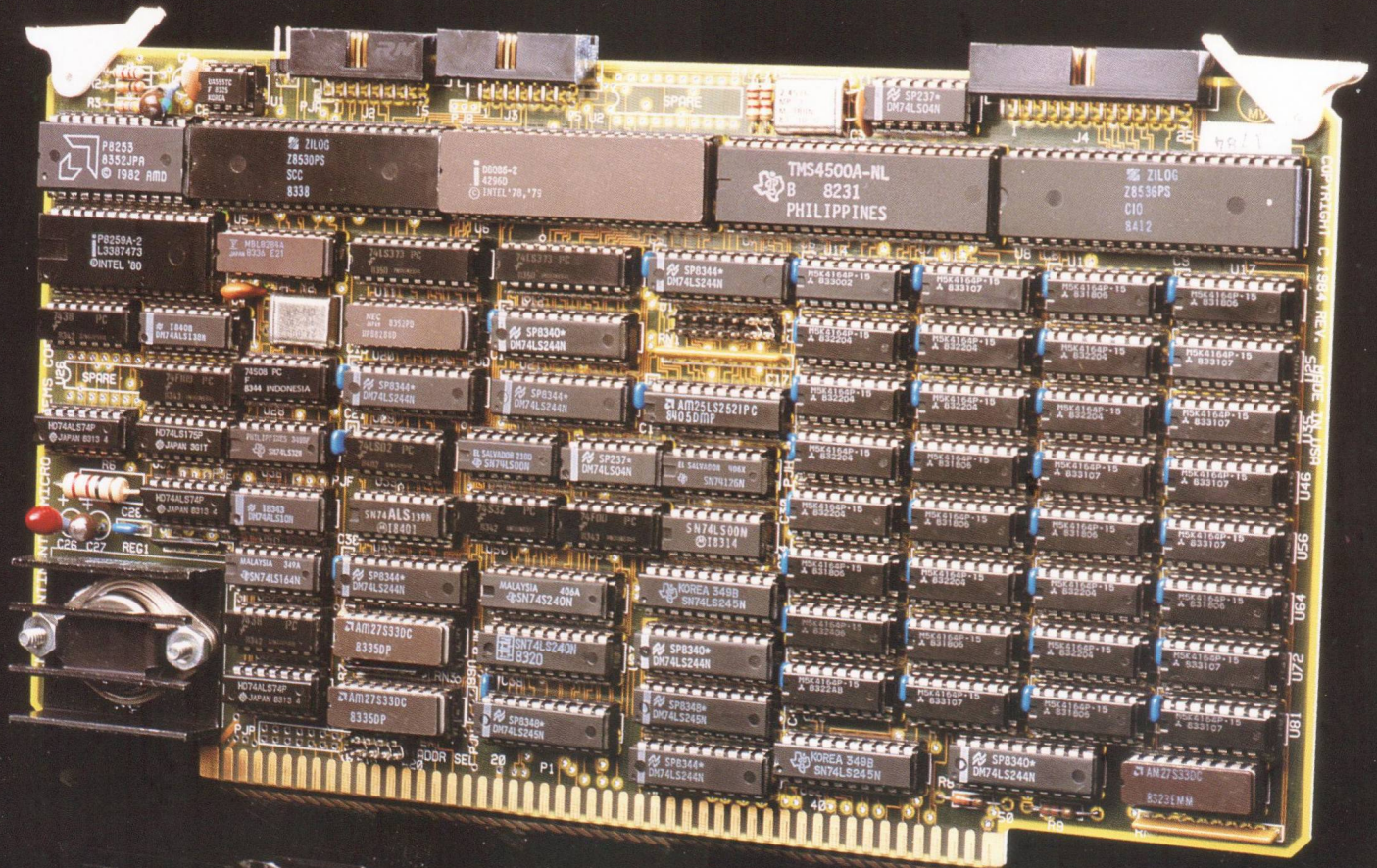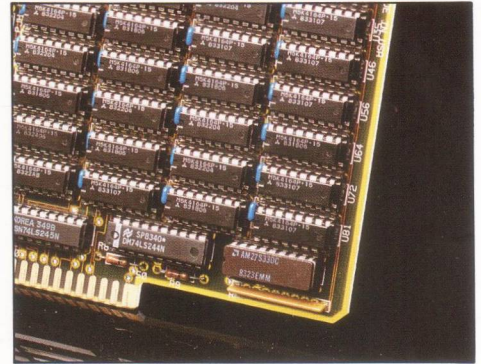
MicroNet™ NETWORK ARCHITECTURE

ICM's revolutionary MicroNet architecture uses the TurboDOS™ Operating System to build sophisticated, cost effective, multi-user systems and networks. MicroNet provides the flexibility of building multi-user systems with S-100 BUS Structured Networks and ARCnet Local Area Networks. MicroNet offers:

- ☐ Ability to network S-100 Bus Systems, IBM-PC's, PC Compatibles, ICM's WS80 & WS16 Diskless Workstations, and other ARCnet computers.
- ☐ Uses Master Processor/File Server such as ICM's CPZ-4800X Single Board Computer.
- ☐ Up to 4080 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: CP/M,™ CP/M-86,™ PC-DOS,™ MS-DOS,™ MP/M,™ MP/M 86,™ CP/M™ even CP/M 86,™ CPM PLUS,™ Concurrent CP/M 86.™
- ☐ Ability to mix Z-80, 8-bit; and 8086, 16-bit families of processors.
- ☐ Flexibility to build Bus Structured (Tightly Coupled) Networks and Local Area (Loosely Coupled) Networks using ICM's MicroNet.
- ☐ 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.
- ☐ Each user can independently STOP, RESUME or ABORT a program.
- ☐ Sharing of costly peripherals and disk drives.
- ☐ Read after Write verification of floppy and hard disks.
- ☐ Logon/Logoff and Privileged/Non-privileged Security.
- ☐ Background processing and Archival Back-up of files.
- ☐ Queing 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

BUS INTERFACE . . . . IEEE 696.1/D2 S-100
Status, control, data and address. Slave I/O port address switch selectable for address range from 00h to FFh. Slave memory address switch selectable for address range from 010000h to 1FFFFFh at 64K boundaries.

I/O CHANNELS:

SERIAL I/O CHANNELS (2 PORTS)
CPS-16A (asynchronous) . . . . up to 800 Kbaud
CPS-16S (synchronous) . . . . up to 800 Kbaud
I/O Interface . . . . through personality boards RS232 modem, and RS-422 interface boards.

PARALLEL I/O CHANNELS (20 LINES)

DATA RATE . . . . up to 300 Kbytes/sec.
INTERFACE SIGNALS . . . . eight data lines plus two handshaking lines per port.
I/O INTERFACE . . . . . . through personality boards such as Centronics Printer, Priam SASI and ST506 Intelligent Hard Disk interface boards.

PROGRAMMABLE I/O MODE

2, 8-BIT BI-DIRECTIONAL DATA LINE PORTS.
1, 4-BIT PROGRAMMABLE SPECIAL PURPOSE PORT.
4 HANDSHAKE MODES, 2 HANDSHAKE LINES PER PORT (including IEEE 488).
3 16-BIT TIMERS

256 KBYTE (1 MEGABYTE) DYNAMIC RAM:

TYPE . . . . 64K x 1 (256K x 1)
WAIT STATES . . . . none required
DIRECT MEMORY TRANSFERS . . . . to/from CPZ-4800X SBCP
DATA TRANSFER RATE (NON-DMA) . . . . . 190 Kbytes/sec.
DATA TRANSFER RATE (DMA) . . . . 571 Kbytes/sec.
MEMORY ADDRESS . . . . . . Switch selectable in 64 Kbyte boundaries for a total of 256 Kbyte (1 Megabyte) pages.

REAL TIME CLOCK

37.5 Hz to 1.228 MHz RANGE
INTERRUPT DRIVEN OR SOFTWARE POLLED

NUMERIC CO-PROCESSOR 4MHZ OPERATION OPTION
(available 4th quarter 1984)
8087 NUMERIC DATA PROCESSOR (supports floating point, trigonometric, logarithmic & exponential functions)

POWER REQUIREMENTS

Voltages . . . . +8 VDC@ 2.3A (max)
Power . . . . 18.4 W (max)

OPERATING ENVIRONMENT

Temperature . . . . 0° to 45° Celsius
Relative Humidity . . . . 0 to 85%

CONSTRUCTION . . . . 4 Layer Glass Epoxy, Vacrel Soldermask. All IC's in sockets.

TESTING . . . . Completely tested and 24-hour burned-in

WARRANTY . . . . One Year Parts and Labor

Intercontinental Micro Systems

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