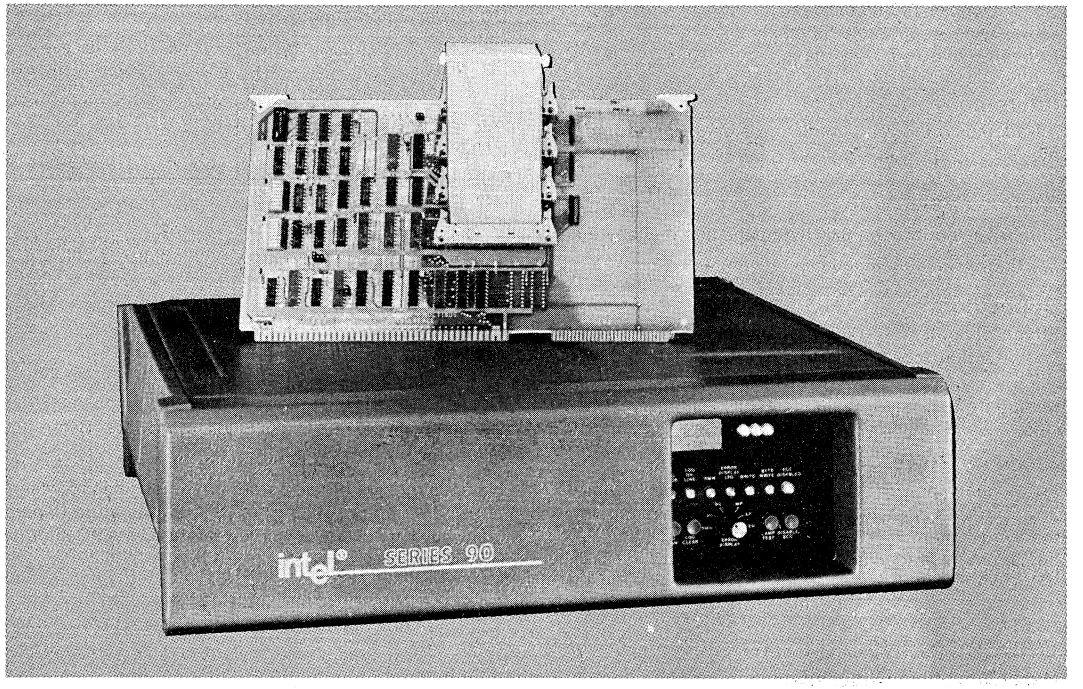
iSBC 090™ MEMORY SYSTEM

- **512K, 768K or 1024 K-byte capacities**
- **Compatible with Intellec Model 286 Series III development system**
- **Error check and correcting (ECC) circuitry provides single-bit correction and double-bit detection**
- **8-bit or 16-bit word transfer**
- **Error logger and display isolates single bit errors to the memory device level**
- **Switch-selectable starting address on any 4K byte boundary**
- **Field expandability**

The Intel® iSBC 090 Memory System is a random-access dynamic memory system to be used with Intel's MULTIBUS™ System and iSBC 80/86™ product line. The iSBC 090 Memory System can provide up to 1 Megabyte of memory in 256K-byte increments or up to 512K-bytes in 128K-byte increments. It consists of a MULTIBUS Interface Board and a Series 90 Random Access Dynamic Memory. The Interface Board plugs directly into the MULTIBUS backplane, and through four ten-foot cables interfaces the MULTIBUS system and the memory.

The Interface Board is a 12.0 inch by 6.75 inch printed circuit board that occupies any one slot in the MULTIBUS backplane. It allows the user to select the beginning and ending addresses to which the iSBC 090 Memory System will respond; it permits either 8-bit or 16-bit bus masters, or mixes of both, as well as supporting the normal read, write, refresh, and inhibit RAM cycles of the MULTIBUS system. Operating power for the interface is supplied by the MULTIBUS chassis and is not affected by increases in memory capacity.

The memory is a self-contained unit measuring 5.21 inches high by 19.00 inches wide and by 19.5 inches deep. It includes a memory storage area, which provides up to 1 Megabyte of memory. In addition, its control interface provides single-bit error detection and correction, double-bit error detection, and refresh arbitration. The memory also includes an error logger and error display, as well as its own power supplies and blower assembly. It is available as a table-top system with either 115 or 220 VAC input power.



FUNCTIONAL DESCRIPTION

The memory portion of the iSBC 090 Memory System (Figure 1) provides the memory storage area and the error detection and correction functions for the system.

The MULTIBUS Interface Board provides address compatibility between the MULTIBUS system and the memory; supports the four types of data transfer across the MULTIBUS interface; and generates the required control and status signals. Interface Board address circuits permit the iSBC 090 System to fit any address space from 4K-bytes to one megabyte, starting at any 4K boundary.

The Error Logger and Display records error, syndrome, and status signals, then on request displays them for quick location of memory errors.

Capacity

The iSBC 090 Memory System provides up to one megabyte of memory in 256K increments. Each 256K-byte increment is provided by adding one memory module in the memory. Three standard system capacities are offered: 512K, 768K and 1024K-bytes. The 768K-byte and 512K systems can be expanded to 1024K-bytes by the addition of one or two memory modules respectively.

Addressability

The address space which the iSBC 090 Memory System will occupy in the MULTIBUS addressing scheme is determined by two eight-position DIP switches on the Interface Board. The switches allow the memory to be any size, ranging from 4K-bytes to one megabyte, starting and ending on any 4K boundary.

Error Logger and Display

The Error Logger is a random-access memory which stores (logs) ECC syndrome bits that identify the failing bit and its location. The logger memory can store a maximum of 4096 single and double-bit errors. A display panel shows error information for user reference.

The error logger operates in three modes: log (write), scan (read), and clear. In normal system operation, the logger is operated in log mode and accessed only when one or more of the syndrome bits go active, indicating an error condition. The syndrome pattern identifying the error and the address of the error location are stored in the logger memory.

To look at the stored error information, the logger is placed in scan mode, taking it off-line. The logger memory is sequentially scanned until error information is reached. Scanning stops and the memory card identification, the card row, the data byte and the data bit are displayed on the logger display panel. The scan can be resumed using a scan control button.

INSTALLATION

The MULTIBUS Interface Board plugs directly into the MULTIBUS backplane. All operating power is furnished through the MULTIBUS connectors. Interface to the memory portion of the iSBC 090 Memory System is made using four 50-pin flat-ribbon cables, supplied with the System.

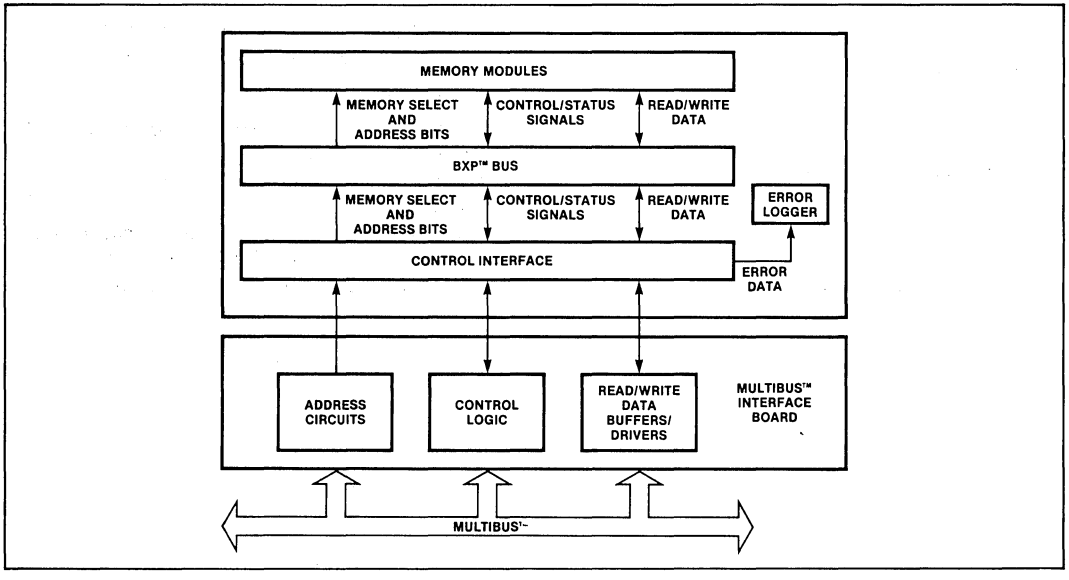


Figure 1. iSBC 090™ Memory System, Block Diagram

The iSBC 090 is available as a 19-inch rack-mounted unit with slide attachments or as a table top configuration with side covers instead of slides.

Depending on the configuration selected, the memory is connected to either 115 VAC, 50/60 Hz, single-phase, or 220 VAC, 50/60 Hz, single-phase power.

SPECIFICATIONS

Storage Capacity

512K, 768K, 1024K bytes

Word Length

8/16 bits plus 6 bits for ECC

Operating Cycles

Read Cycle
Write Cycle
Inhibit RAM Cycle
Refresh Cycle

Read Access Time (8- or 16-Bit Transfer)

450 nsec max (MRDC* to XACK*)

Write Access Time

8-Bit Transfer — 485 nsec max (MWTC* to XACK*)
16-Bit Transfer — 150 nsec max (MWTC* to XACK*)

*MWTC = Memory Write Command
XACK = Transfer Acknowledge
MRDC = Memory Read Command

(Reference MULTIBUS Manual 9800683)

Read Cycle Time (8- or 16-Bit Transfer)

485 nsec max

Write Cycle Time

8-Bit Transfer — 700 nsec max
16-Bit Transfer — 400 nsec max

Refresh Cycle Time (8- or 16-Bit Transfer)

450 nsec max

Logic Levels Input

Logic High — +2.0V to 5.25V
Logic Low — −0.5V to ±0.80V

Logic Levels Output

Logic High — +2.5V to +5.25V at 0.1 mA
Logic Low — 0.0V to +0.5V at 16.0 mA

Physical Characteristics

iSBC Interface Board

Height — 6.75 in. (17.15 cm)
Width — 12.0 in. (30.48 cm)
Thickness — 0.5 in. (1.27 cm)
Weight — 3 lbs. (1.4 Kg) (with interface cables)

Series 90 Memory System

Height — 5.21 in. (13.2 cm)
Width — 19.0 in. (48.25 cm)
Depth — 19.5 in. (49.53 cm)
Weight — 30 lbs. (13.5 Kg) max.
Mounting — table top

Electrical Characteristics

MULTIBUS Interface Board

+5V ± 6.0%
2 Amps typical
3 Amps worst case

Series 90 Memory System

115 VAC, 50/60 Hz, 2.8A
220 VAC, 50/60 Hz, 1.6A

Environmental Requirements

Ambient Operating Temperature — 0°C to 50°C
Relative Humidity — 10 to 90% without condensation

REFERENCE MANUAL

The iSBC 090 Memory System is supported by a full line of documentation, as listed below:

111710, Technical Manual for iSBC 090™ Memory System

111784, Technical Manual for Series 90 Random Access Memory Systems with CI-9000 Control Interface

111764, Technical Manual for Series 90, CM-90 Dynamic Memory Module

ORDERING INFORMATION

Model Number	Description
SBC-090-x1K	512K Byte Multibus-compatible dynamic RAM memory system with ECC. Expandable to 1024K Bytes using CM-90100-H22 memory module (below). "x" in model number must be specified per NOTE below to define input voltage and chassis configurations.
SBC-090-x1L	768K Byte memory system. Otherwise identical to SBC-090-x1K.
SBC-090-x1M	1024K Byte memory system. Not expandable. Otherwise identical to above SBC-090-x1K.
CM-90100-H22	256K Byte memory module for expansion of SBC-090-x1K or L.
SBC-090/556 Kit	768K Byte memory system—provides an enhanced compile environment when used with the Model 556 Functional Series III Upgrade Package for Intellec Series II/80, Series II/85 Microcomputer Development System (110V/60Hz or 220V/60Hz).
SBC-090/556I Kit	768K Byte memory system—provides an enhanced compile environment when used with the Model 556 Functional Series III Upgrade Package which consists of the Model 556 software and hardware performance package and the integrated 8085 processor board (IPC-85). This upgrade package is for Intellec Series II/80 Development System (110V/60Hz or 220V/50Hz).

NOTE

To order SBC 090, the "x" in model no. *must* be specified as shown below to define input voltage and chassis configuration.

x = 2 for table-top unit, 110 VAC
x = 3 for table-top unit, 220 VAC