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# iSBX™ 217C ¼-INCH TAPE DRIVE INTERFACE MULTIMODULE™ BOARD

- **iSBX™ MULTIMODULE™ Interface Provides Tape Backup Capability for iSBC® 215 Generic Winchester Controller**

- **Configurable to Interface with up to Four QIC-02 Compatible or 3M HCD-75 Compatible Tape Drives**

- **Implements the QIC-02 with Parity Streaming Tape Interface Standard**

- **Supports Transfer Rates of 90K, 30K or 17K Bytes per Second Depending on Tape Speed**

- **Supported by iRMX™ 86 and XENIX* Operating Systems when Used on iSBC® 215 Generic Winchester Controller Board**

- **+5 Volt Only Operation**

The iSBX 217C ¼-Inch Tape Drive Interface module is a member of Intel's family of iSBX bus compatible MULTIMODULE products. iSBX MULTIMODULE boards plug directly onto any iSBX bus compatible host board, offering incremental on-board I/O expansion. The module is particularly useful for implementing cartridge tape back-up capability directly on the iSBC 215 Generic Winchester Disk Controller via DMA. The iSBX 217C board can also provide a low-cost tape storage interface for any Intel single board computer, with an iSBX connector, via programmed I/O. The iSBX 217C module interfaces with up to four streaming tape drives. Typically, these drives provide 20 to 45 megabytes of storage each. When used in conjunction with these drives and the iSBX 215 board, the module can transfer 20 megabytes of data from disk to tape in about fourteen minutes. Alternatively, the iSBX 217C board can interface with up to four 3M Company HCD-75 compatible start/stop tape drives, for those applications requiring access to individual data files on tape.
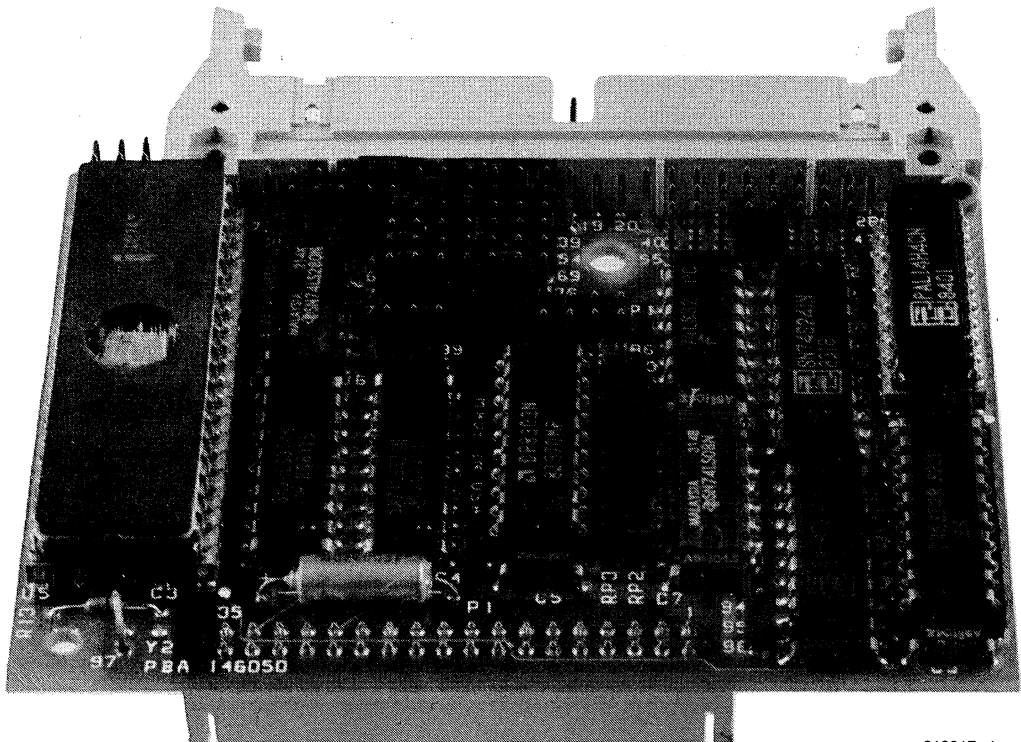
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*XENIX™ is a trademark of Microsoft Corporation.

FUNCTIONAL DESCRIPTION

The iSBX 217C module implements an interface between a host iSBC board and a cartridge $\frac{1}{4}$-inch magnetic tape drive, with a minimum of host software overhead. Data transfers may occur in either a direct memory access (DMA) or programmed I/O mode. The DMA mode is available only with host iSBC boards which have DMA capability. In both modes, the host must be able to transfer data at a rate of 90K, 30K or 17K bytes per second, depending on the speed of the tape drive.

Communication with the iSBC® Host

A command plus one-to-five parameter bytes are issued by the host iSBC board to the iSBX 217C module to initiate any tape interface operation. Commands for the QIC-02 and 3M interfaces are summarized in Table 1. If the function is a Read or a

Write operation, the host must then be ready to transfer data a byte at a time to or from the module. In programmed I/O mode, with QIC-02 drives, the host polls the iSBX 217C status port to learn when the tape interface is ready for the next 512 byte data block. During the data block transfer, the host is interrupted by MWAIT/ when the interface is ready to transfer a data byte. With 3M tape drives, the host may be interrupted or use MDRQT to detect when the module is ready for the next byte transfer. In DMA mode, the host board uses the DMA Request signal (MDRQT) of the iSBX bus to synchronize the data transfer. At the conclusion of a tape operation, the iSBC host must read one or more of the iSBX 217C module's Sense Bytes to receive status information on the completed opeation. When the iSBX 217C module is used on the iSBC 215 Generic Winchester Controller board, these requirements are fulfilled by the standard on-board firmware and are transparent to the user.

Table 1. Commands required by QIC-02 and 3M tape drives. Number indicates the parameter bytes required by the command. N indicates the command is not supported by the drive.

| Hex Code	Command	Parameter Bytes		Type of Command
		QIC-2	3M	
00	Reset iSBX 217C Board	1	1	a
01	Initialize Drive	1	1	a
02	Write A Block	1	3	b
03	Write a File Mark	1	1	a
04	Read a Block	1	3	b
05	Read File Mark Command	1	N	a
06	Read Status	1	1	a
07	Rewind	1	N	a
08	Retension	1	N	a
09	Erase Tape	1	N	a
0C	Unload Tape	N	1	a
14	Continue	N	1	a
15	Write RAM	N	5	b
16	Read RAM	N	5	b
17	Verify	N	5	a
18	Run Selftest 1	1	N	a
1A	Read Extended Status	1	N	a
1B	Set Alternate Select Mode	1	N	a
1C	Return Raw Drive Status	1	N	a
20	Reset Bad Parity Flag	0	N	c
40	Start of Transfer (SOT)	1	1	c
80	End of Transfer (EOT)	1	1	c
81	Pause Command	1	N	c
82	Please Pause Command	1	N	c
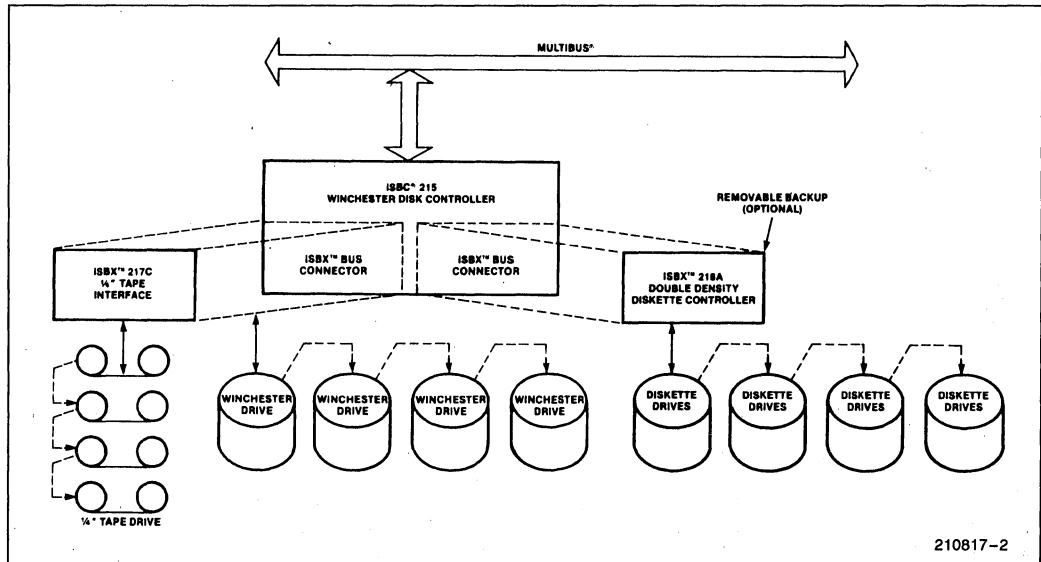
Figure 1. Subsystem Configuration (with optional Diskette and ¼" Tape Backup)

SPECIFICATIONS

Compatibility

Host—Any iSBC signal board computer or peripheral controller with an iSBX connector. The iSBC 215 Generic Winchester Controller includes on-board firmware to support the iSBX 217C under either the iRMX 86 or XENIX Operating Systems. The firmware on the iSBC 215A and iSBX 215B Winchester Controllers cannot support the iSBX 217C module.

Drives—Any QIC-02 or 3M HCD-75 interface compatible cartridge ¼-inch magnetic tape drive.

Transfer Rate

90K (one byte every 11 microseconds), 30K (one byte every 33 microseconds) or 17K (one byte every 53 microseconds) depending on tape drive speed.

Equipment Supplied

iSBX 217C Interface Module
Reference Schematic

Controller-to-drive cabling and connectors are not supplied. Cables can be fabricated with flat cable and commercially-available connectors as described in the Hardware Reference Manual.

Nylon mounting bolts

Physical Characteristics

Width: 3.08 inches (7.82 cm)
Height: 0.809 inches (2.05 cm)
Length: 3.70 inches (9.40 cm)
Shipping Weight: 3.5 ounces (99.2 gm)
Mounting: Occupies one single-wide iSBC
MULTIMODULE position on boards

Electrical Characteristics

Power Requirements: +5 VDC @ 1.5A

Environmental Characteristics

Temperature: 0°C to +55°C (operating) @200 LFM;
−55°C to +85°C (non operating)

Humidity: Up to 90% relative humidity without condensation (operating); all conditions without condensation or frost (non-operating)

Reference Manual

D146704-001— iSBX 217C Board Hardware Reference Manual (NOT SUPPLIED)

ORDERING INFORMATION

Part Number	Description
SBX 217C	Cartridge ¼-inch Tape Drive Interface