



SBC 201 DISKETTE CONTROLLER

Provides interface for high-speed random access bulk storage capability for Intel® OEM Computers

Provides microprocessor control of two flexible diskette drives

Microprogrammed for maximum flexibility and easy software development

Compatible with majority of diskette drives, including Shugart and Control Data

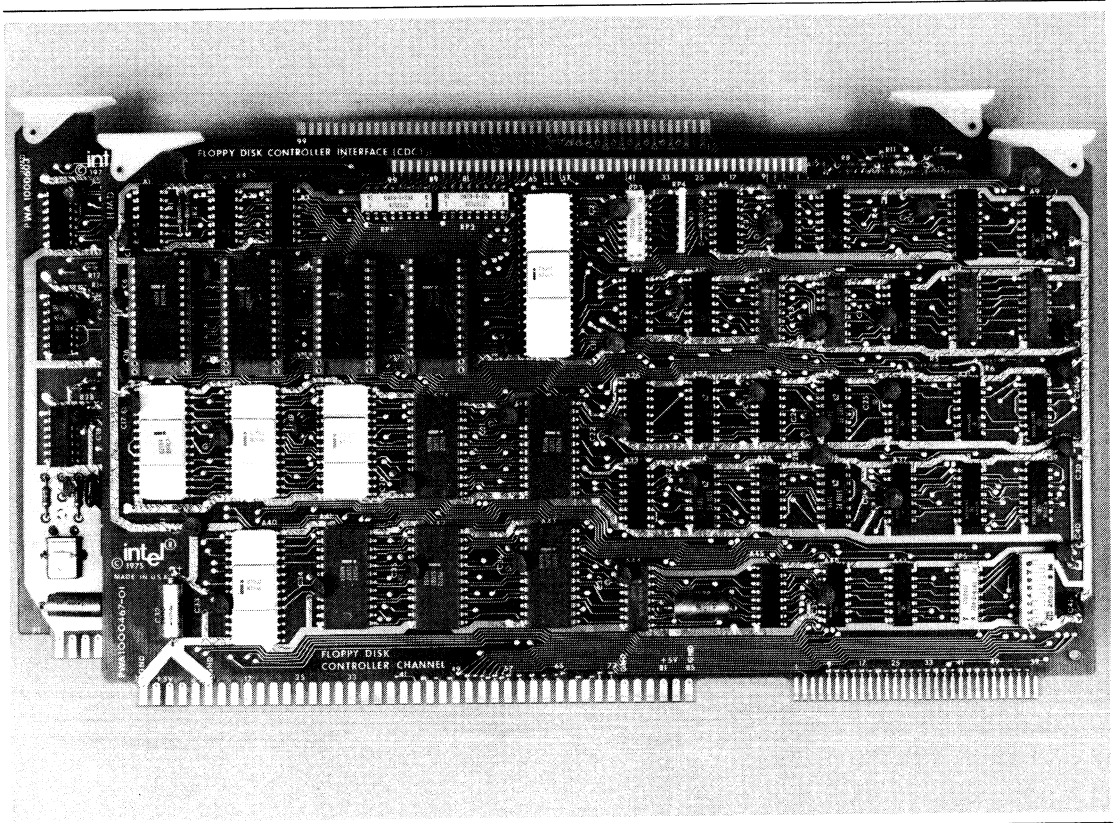
Complete CRC data checking

Data addressed using IBM soft-sectored format which allows 256K bytes of data capacity per diskette

SBC bus compatible — plugs into standard System 80 Backplane or SBC 604/614 Cardcage

Optional Go/No Go Diagnostic

The SBC 201 Diskette Controller is a high-speed, modular set of boards which provides the OEM with a powerful and easy to use control technique for the interfacing of Intel® OEM Computers with industry standard flexible diskettes. The Diskette controller is directly compatible with the entire family of System 80 and SBC 80 OEM computers, and will interface directly with the majority of the flexible diskette drives in use today.



The SBC 201 Diskette Controller provides an easy to use interface for the OEM using Intel's OEM computers and other manufacturer's flexible diskettes. The controller enables the OEM to develop his system software in a simple, straightforward manner. All DMA logic is provided, so no additional boards or circuitry are required, and either one or two flexible diskette drivers may be interfaced to the Intel Computer with each SBC 201. The controller is implemented with Intel's powerful Series 3000 Bipolar Microprocessor Set. The controller facilitates recording all data in the IBM-compatible soft-sector format. The controller consists of two boards which may reside in the System 80 chassis, the SBC 604 or 614 Modular Cardcage, or in the OEM's own custom designed, Intel Bus-compatible Backplane. The Channel Board and the Interface Board are discussed in detail below.

CHANNEL BOARD

The Channel Board is the primary control module within the diskette controller. The Channel Board receives, decodes, and responds to channel commands from the Central Processor Unit (CPU) in the Intel OEM Computer System. The Channel Board can access a block of system memory to determine the particular diskette operations to be performed and fetch the parameters required for the successful completion of the specified operation.

The control functions of the Channel Board have been achieved with an 8-bit microprogrammed processor, designed with Intel's Series 3000 Bipolar Microcomputer Set. This 8-bit processor includes four 3002 Central Processing Elements (2-bit slice per CPE), a 3001 Microprogram Control Unit, and 512 X 32 bits of 3604 programmable read-only memory (PROM) which stores the microprogram. It is the execution of the microprogram by the microcomputer set which actually effects the control capability of the Channel Board.

INTERFACE BOARD

The Interface Board provides the SBC 201 Diskette Controller with a means of communication with the diskette drives, as well as with the Intel OEM Computer System Bus. Under control of the microprogram being executed on the Channel Board, the Interface Board generates those signals which cause the read/write head on the selected drive to be loaded (i.e., to come in contact with the diskette platter), cause the head to move to the proper track and verify successful operation. The Interface Board accepts the data being read off the diskette, interprets synchronizing bit patterns, checks the validity of the data using a cyclic redundancy check (CRC) polynomial, and then transfers the data to the Channel Board.

During write operations, the Interface Board outputs the data and clock bits to the selected drive at the proper times, and generates the CRC characters which are then appended to the data.

When the diskette controller requires access to the system memory, the Interface Board requests and maintains DMA master control of the system bus, and generates the appropriate memory command. The Interface Board also acknowledges I/O commands as required by the Intel OEM Computer Bus.

The diskette controller is capable of performing seven different operations: recalibrate, seek, format track, write data, write deleted data, read data, and verify CRC.

PROGRAMMING WITH THE SBC FLEXIBLE DISKETTE CONTROLLER

The controller has been designed to make programming very easy, but also with unique capabilities which allow the OEM to generate sophisticated software when required. All diskette operations are initiated by Intel OEM Computer, with standard I/O commands. Once initiated, however, the Diskette Controller completes the specified operation without further intervention on the part of the CPU. From the CPU's point of view, there are only three general steps required to complete any diskette operation:

1. The CPU must prepare and store in system memory an I/O Parameter Block (IOPB) for each operation to be performed. If multiple operations are desired, the IOPBs can be linked together in the proper order.
2. The CPU then passes the memory address of the first (or only) IOPB to the diskette controller.
3. The CPU must process the resultant information from the diskette controller upon completion of the operation(s).

The preparation of the IOPB(s) by the CPU requires no interaction with the diskette controller. The IOPB is prepared as any block of data in memory would be prepared. The 10-byte parameter block must adopt the following format:

Byte	1	Channel Word
	2	Diskette Instruction
	3	Number of Records
	4	Track Address
	5	Sector Address
	6	Buffer Address (Lower)
	7	Buffer Address (Upper)
	8	Block Number
	9	Next IOPB Address (Lower)
	10	Next IOPB Address (Upper)

The channel word or command provides the controller with information which:

1. Determines the method of assigning logical sector addresses
2. Enables or disables a series of possible diskette interrupts
3. Determines if the parameter block is properly prepared
4. Determines the length of the data word to be transferred

COMPATIBLE INTERFACE CABLES

For the convenience of the OEM, Intel provides cables for use with specific manufacturer's drives. The SBC 951 Cable may be used to connect the diskette controller to a Shugart Model 800/800R Flexible Diskette Drive. The SBC 952 may be used to connect the controller to a Control Data Model 9404 Flexible Diskette Drive. The OEM could, of course, fabricate his own cabling for these drives or any other flexible diskette drives.

GO/NO GO DIAGNOSTIC

For the convenience of the OEM, Intel makes available a diskette exerciser and monitor program which facilitates the checkout and debugging of OEM built systems using

Intel OEM Computers and Diskette Controllers. The SBC 915 and SBC 925 Go/No Go Diagnostic programs are available on four 1K byte ROMs which can be installed in the PROM/ROM memory section of the Intel Computer. The programs include commands to display and alter main memory and registers, insert instructions, move main memory, substitute main memory, and to exercise the flexible

diskette drives by reading and/or writing individual sectors, reading sequentially sector-to-sector and track-to-track, and writing/reading random sectors and tracks.

The Go/No Go Diagnostic program is designed to give the OEM a convenient means of determining the functionality of his system.

SPECIFICATIONS

MEDIA

Flexible Diskette
One Recording Surface
IBM Soft-Sector Format
77 Tracks/Diskette
26 Sectors/Tracks
128 Bytes/Sector

PHYSICAL CHARACTERISTICS

Mounting: Occupies two slots of System 80 Chassis or
SBC 604/614 Cardcage
Height: 6.75 in. (17.15 mm)
Width: 12.00 in. (30.48 mm)
Depth: 0.50 in. each board (1.27 mm)

ELECTRICAL CHARACTERISTICS

DC Power Requirements:
Channel Board: 5V @ 3.75A (typ), 5A (max)
Interface Board: 5V @ 1.5A (typ), 2.5A (max)

ENVIRONMENTAL CHARACTERISTICS

Temperature:
Operating: 0 to 55°C
Non-Operating: -55°C to +85°C
Humidity:
Operating: Up to 90% relative humidity without
condensation.
Non-Operating: All conditions without condensation of
water or frost.

EQUIPMENT SUPPLIED

FDC Channel Board
FDC Interface Board
Dual Auxiliary Board Connector
Hardware Reference Manual
Reference Schematics

OPTIONAL EQUIPMENT

SBC 915 Go/No Go Diagnostic and Monitor Program for
SBC 80/10 and System 80/10
SBC 925 Go/No Go Diagnostic and Monitor Program for
SBC 80/20
SBC 951 Cables for Shugart Model 800/800R Diskette
Drives
SBC 952 Cables for CDC Model 9404 Diskette Drives