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FDC-1 is a microcomputer on a board. It incorporates a monitor and all the I/O normally required in a system.

## CENTRAL PROCESSOR

The 4MHz Z-80A microprocessor is utilized as the CPU. The Z-80A provides the capability to support many sophisticated applications. At the user's option one wait-state can be added to all memory functions so that standard 450ns memory boards can be used with the system. The interrupt structure of the Z-80A is utilized by the on-board peripheral IC's. Its current popularity and ease of use ensure broad software support.

## FLOPPY DISK CONTROL

NECuPD765 — The NECuPD765 chip allows single- and double-density data storage on both 5¼" and 8" floppy drives providing the following capabilities which minimize overhead burden on the CPU and software:

- Single- and double-density data transfer are under software control.
- Can control up to 3 5¼" or 4 8" drives. Five inch and 8" drives can be controlled simultaneously under software control.
- IBM diskette formatting provides for ease of information exchange with IBM-compatible controllers using similar operating system software.
- Compatible with double- and single-sided drives (i.e., GSI Siemens®, Micropolis®, Per-Sci®, Remex®, Innotronics®, and any other ANSI-compatible flexible disk drive).
- Automatically reads sequential sectors on a diskette.
- With appropriate software, the uPD765 can automatically read both tracks of a two-sided diskette.
- Maximum formatted data storage available is 286k bytes on double-sided 5¼" diskettes (708k bytes for Micropolis®) and 1024k bytes on double-sided 8" diskettes.
- Under software control, record (sector) sizes of 128 (single density only), 256, 512, or 1024 bytes can be selected.
- Disk errors are detected via CRC.
- Search for particular information on a diskette.

Phase Locked Oscillator (PLO) — An on-board phase locked oscillator, which requires no adjustment, is used to stabilize separated information and clock for precise data recovery.

## MEMORY

EPROM/ROM/RAM can be mixed in any combination up to 8k bytes. The standard board is configured for 6k bytes of EPROM or ROM and 2k bytes of RAM. Other combinations are possible and require a change of one of the on-board bipolar PROMs. Please consult Teletex for further information.

- EPROM — One Intel-type 2716 EPROM is supplied with a monitor program; there is space on board for two additional 2716s.
- ROM — Intel-type 2316 ROMs may be used in place of or in addition to EPROMs. Each 2316 contains 2k bytes of information space.
- RAM — One Mostek MK4118 (1k byte) RAM is supplied on-board for use as stack and buffer space. In place of the Mostek 1k RAM, the TI TMS 4016 (2k bytes) RAM may be used to provide 2k of RAM.

## SERIAL PORTS

Two RS232C-compatible serial ports are provided. Both ports can be operated at speeds from 45 to 9600 baud. Speed and operation of serial ports are independent of one another and under software control. Operation can be synchronous or asynchronous. Either serial port can be operated under interrupt control. Both ports include the following control signals:

- Data Carrier Detect
- Ready to Send
- Clear to Send
- Data Terminal Ready

## PARALLEL PORTS

There are two parallel ports on board. One has 8 data lines and 4 handshake lines. This port is normally configured as a keyboard

input, but because it is under software control it can be reconfigured by the user. The second port has 3 data lines available, with the remaining 5 lines being used for existing on-board functions. All data lines can be configured for input, output or bi-directional data transfers. Operation of parallel ports is under interrupt control.

## HARD DISK CONTROL

With external gating the FDC-I can control intelligent hard disks via the parallel ports. Contact Teletex for further information.

## REAL TIME CLOCK

An on-board counter/timer chip provides software-settable clocks for both serial ports and a real time clock. The real time clock is used by the monitor to provide date and timekeeping functions. It normally functions under interrupt control requiring a minimum of overhead. This real time clock can be used by software for any time-related functions such as a stopwatch or software timing loops.

## RESET-JUMP

A reset-jump circuit makes the CPU jump to the monitor software on board whenever the system reset button is activated. This is useful for systems which do not have a front panel. For systems with a front panel, reset-jump will override the functions of the front panel. A power-on-clear function is included which automatically generates a reset when power is first applied.

## PROGRAMMER

All of the hardware and monitor routines necessary to program and verify Intel-type 2716s are provided on board. An external 25.5 ± 0.7 V @ 50mA is required.

## INTERRUPTS

FDC-I utilizes the vectored interrupts of the Z-80A CPU. The standard monitor provides space for ten vectors in addition to those used by on-board peripheral IC's. Devices in the system which interrupt must provide an 8-bit vector during the interrupt-acknowledge cycle of the Z-80A.

## STANDARD 2k MONITOR

The standard FDC-I 2k monitor provides routines for initializing the LSI circuits of the FDC, programming Intel-type 2716s, assigning input and output devices, loading and examining memory, moving memory, verifying memory, reading and writing to floppy disk (both single- and double-density), and transferring execution. The monitor provides the routines necessary to interface to the floppy disk, which means the operating system need only make a simple call to perform disk operations. It also provides a complete software driver for some memory-mapped video interfaces.

## TECHNICAL SPECIFICATIONS

- 4MHz Z-80A clock, crystal-controlled.
- 2MHz system clock.
- Designed for S-100 systems. However, FDC-I does not provide 8080-type I/O addressing; only the lower 8 address bits contain the I/O address.
- Edge connector is gold-plated.
- Printed circuit board is solder-masked.
- Workmanship conforms to the requirements of MIL-STD-454.
- All output connectors, plugs, floppy disk drive cable, and manual with complete information for designing compatible software are provided.
- Requires +8V at 1.5A, +16V at 50mA and -16V at 50mA.
- Forced-air cooling is required.

## WARRANTY

FDC-I is warranted against defects in materials and workmanship for a period of one year from date of shipment. For the exact terms of the warranty, please consult the user's manual.

Specifications are subject to change without notice.

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## TELETEK

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