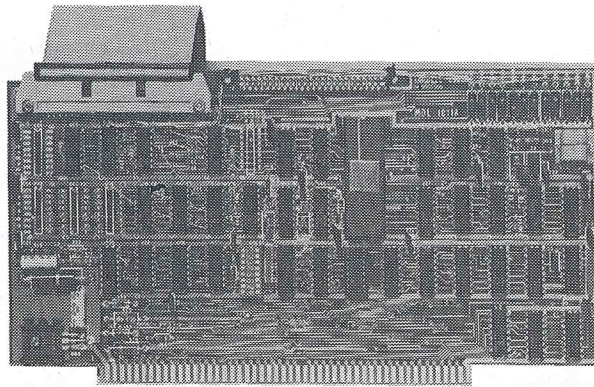


The Tarbell Single Density Floppy Disk Interface

- Adaptable to a wide variety of drives, including older models, 5-inch, 8-inch, Shugart, PerSci.
- Fully software supported by Tarbell with a CP/M® disk operating system.
- Is capable of running with several formats, including standard IBM (128 bytes per sector, 26 sectors, 76 tracks), 256, 512, or 1024 bytes per sector.
- On-board 32-byte bootstrap is executed at reset. It reads in the first sector from the first track at address 0000, then disables itself and jumps to the coldstart loader routine it read in. This 128-byte program then reads the rest of CP/M in and executes it. This scheme allows for the greatest flexibility, since all 64 kbytes of address space are available for use.

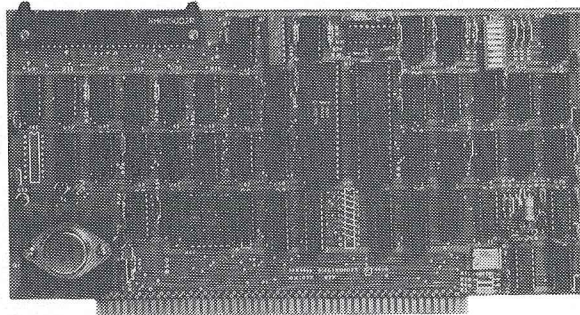


- Available in kit or fully assembled & tested form. For assembled units, please specify for which floppy disk drive.
- Supports up to 4 8-inch drives, single or double sided. 5-inch drives can be used with modifications to the interface (included in manual).

- Four extra IC slots are provided to allow you to do your own thing.
- No on-board buffer, so data can be transferred at maximum possible speed: one full track per revolution (250,000 bits per second).
- Programmed-data-transfer, not memory mapped, so all 64 kbytes of address space are available.
- Full capacity in IBM format: 256 kbytes. 243 kbytes under CP/M.
- Will run at 2 or 4 Mhz with 8080, Z80, or 8085 CPU's. (If running at 2 Mhz, memory should have no wait states.)
- Full six-month warranty covers all labor & parts on Tarbell Factory assembled units, only parts on kits.
- We have been shipping these interfaces since July, 1977.

The Tarbell Double Density Floppy Disk Interface

- Fully software supported by Tarbell with the CP/M® disk operating system and the MP/M® multi-user multi-tasking operating system.
- Single or double density, software selectable. Under the Tarbell double-density CP/M (by Digital Research), single and double density disks can be mixed. The system determines which type of diskette is in place automatically.
- The on-board phase-locked-loop and write-precompensation circuits provide highly reliable operation with a variety of drives.
- Not memory-mapped, so all 64 kbytes of address space is available.
- No on-board buffer, so data can be transferred at maximum possible speed: one full track per revolution.
- True Direct Memory Access (DMA) in single or double density mode makes possible efficient multi-user and multi-tasking systems.



- Also capable of programmed-data-transfer method, which works in single density at 2 or 4 Mhz, and double density at 4 Mhz.
- Transfer rates are 500,000 bits / sec double density, 250,000 bits / sec single density.
- Double Density Capacity: 474 kbytes free under standard CP/M (51 128-byte sectors / track). 483 kbytes total disk (51 128-byte sectors / track). 497 kbytes total disk IBM (26 256-byte sectors/track). (first track is single density in all formats)

- Extended addressing capability provides 8 extra address bits on the lines defined by the IEEE S-100 standard. This allows direct transfers to and from anyplace in 16 Mbyte address range.
- Up to 4 8-inch drives can be selected, single or double-sided.
- Connects directly to any Shugart-compatible drive. Instructions included to modify for PerSci drives.
- Disk included with interface has auto-select Basic Input Output System (BIOS), format program, and test program.
- On-board bootstrap PROM is disabled after bootstrap operation, so all 64k memory address space is available to user.
- Full six-month warranty covers all labor & parts on TARBELL Factory assembled units.
- We have been shipping this product since September, 1979.

CP/M and MP/M are trademark/tradenames of Digital Research, Inc.

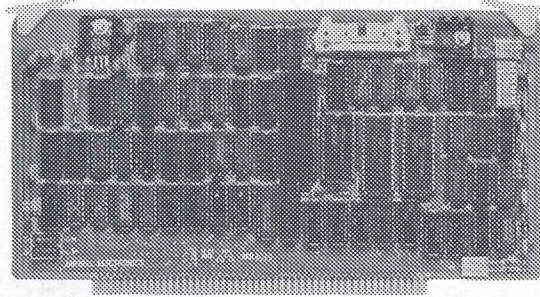
Tarbell Z-80A S-100 CPU/IO Board

Powerful Memory Management

One of the outstanding features of this new CPU board is memory-management hardware that allows dynamic mapping of logical to 1 Megabyte of physical memory in 4K blocks. The on-board table memory may be loaded by the programmer or system software with I/O commands.

OTHER FEATURES:

- Designed to implement multi-user operating systems, such as MP/M® from Digital Research.
- Includes crystal-controlled programmable timer (8253), which can be used for time-slicing multi-tasking operations.
- Programmable priority vectored interrupt hardware allows the programmer to selectively disable any combination of six interrupt lines.
- Along with single/double density floppy interface and 32K memory card, provides complete support capability.
- Note: The following features are **not** available: ROM, front panel interface, parallel ports.
- Full 6-month warranty.



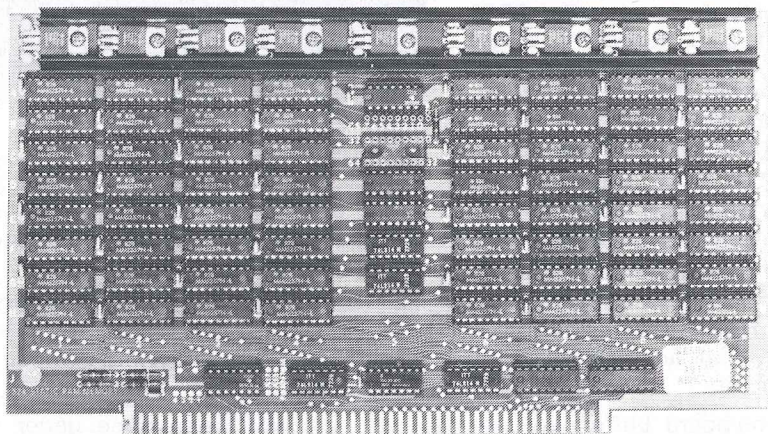
SPECIFICATIONS:

INTERFACE: S-100
CPU CHIP: Z-80A
SPEED: 2 or 4 MHz Jumper Block Selectable
INTERRUPTS: 8080 Restart Vectors or Z-80 Mode 2
SERIAL I/O: 2 - 8251 USARTS with RS-232 Interface and Handshaking
I/O SPACE: Selectable Starting Base Address of 00HEX or 10HEX
BAUD RATE: Each serial port's baud rate may be set for 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, or 19,200 baud by an on-board dip switch.

POWER CONSUMPTION: + 8V @ 1.5 AMPS Typical
+16V @ 70 MA Typical
-16V @ 70 MA Typical

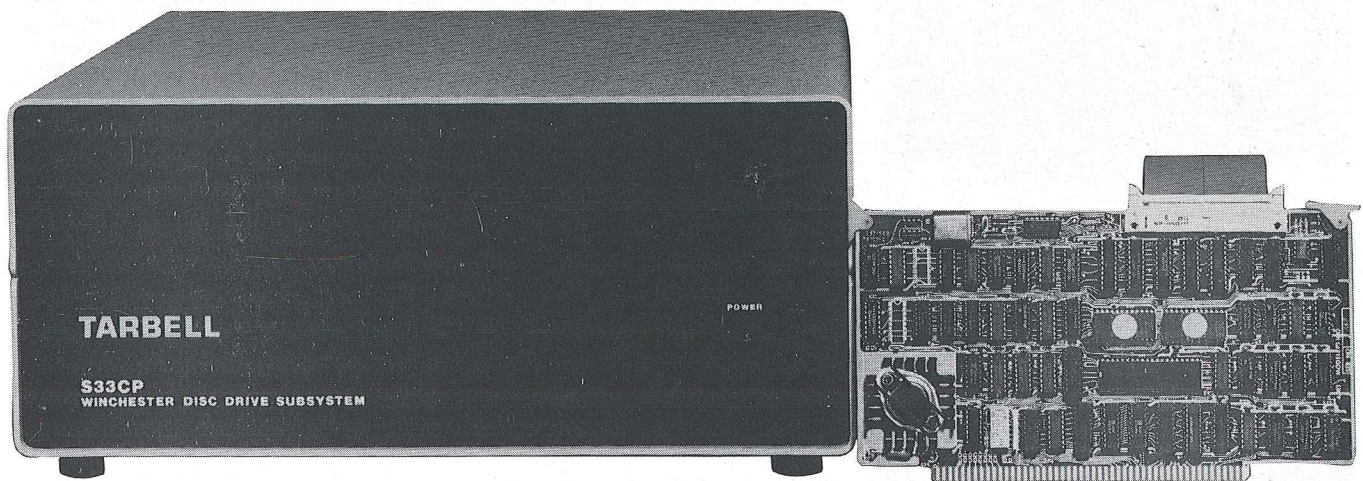
Tarbell 32K RAM Memory

- S-100 BUS
- WORKS AT 4 MHz
- STATIC MEMORY
- 9 REGULATORS PROVIDE EXCELLENT HEAT DISTRIBUTION
- EXTENDED ADDRESSING (Bank Switching)
- LOW POWER REQUIREMENT
- PHANTOM LINE
- 20 PAGE OPERATING MANUAL
- FULL 1-YEAR WARRANTY



S-100 Computer Owners...

Looking for more capacity, speed and reliability?



Tarbell 33 megabyte winchester subsystem

CAPACITY

Are you finding you need more disk memory for business applications? Tarbell's hard disk subsystems allow expansion from 10 to over 200 megabytes. And our ATTACH program provides a way to get up-and-running quickly. Start with a small system, if you like, then add up to four drives of any capacity.

SPEED

In most business applications, speed of the disk subsystem is the limiting factor for overall system speed. Major factors which affect disk speed are access time and data transfer rate. All Tarbell hard disk subsystems 33 megabytes and above use a voice-coil actuator which provides an average access time of 50 milliseconds. Data comes off the disk into your deblocking buffer at the maximum possible speed of 1 megabyte per second, meaning that a 24 kilobyte file can be loaded into memory in about one second!

RELIABILITY

Winchester drives have higher inherent reliability because the media and heads are in an air-sealed environment. Other types of drives are open to contamination from smoke, chemicals, and other particles in the air.

ADDITIONAL FEATURES

- Uses only one S-100 board slot
- On-board CRC performed on data
- Automatic alternate sector assignment
- 512-byte on-board deblock buffer

Subsystem includes S-100 interface, drive, cabinet, power supply, cables, software, and all documentation.

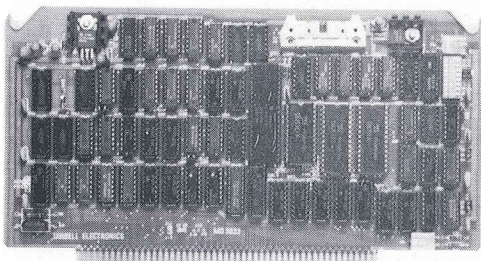
Tarbell
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Suite B
Carson, CA 90746
(213) 538-4251

Q. What do these four boards have in common?

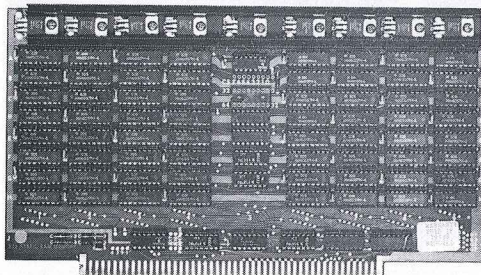
A. Tarbell quality.



CPU/IO BOARD

Zilog Z-80A will run at 2 or 4 Mhz Two RS-232 Serial I/O ports Allows dynamic mapping of logical to 1 Megabyte of physical memory in 4K blocks. Designed to implement multi-user operating systems, such as MP/M[®] from Digital Research. Includes crystal-controlled programmable timer (8253), which can be used for time-slicing multi-tasking operations. Programmable priority vectored interrupt hardware allows the programmer to selectively disable any combination of six interrupt lines.

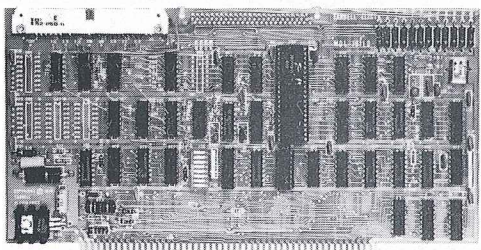
A & T \$450



32K RAM

S-100 Bus Works at 4 Mhz Static Memory for Ease of Maintenance 9 Regulators Provide Excellent Heat Distribution Extended Addressing (Bank Switching) Low Power Requirement Phantom Line Each 4K Block is Individually Addressable Within 32K Full 1-Year Warranty.

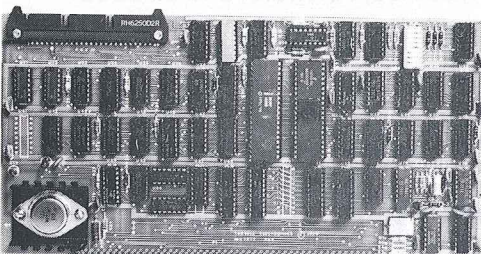
A & T \$725



SINGLE DENSITY FLOPPY DISK INTERFACE

Adaptable to wide variety of drives, including older models, 5-inch, 8-inch, Shugart, PerSci. Fully software-supported by Tarbell with a CP/M[®] disk operating system. Capable of running with several formats, including standard IBM (128 bytes per sector, 26 sectors, 76 tracks), 256, 512, or 1024 bytes per sector. Available in kit or fully assembled and tested form. Supports up to 4 8-inch drives, single or double sided. 5-inch drives can be used with modifications to the interface (included in manual).

KIT \$225 A & T \$325



DOUBLE DENSITY FLOPPY DISK INTERFACE

Fully software-supported by Tarbell with the CP/M disk operating system and the MP/M multi-user multi-tasking operating system. Under the Tarbell double-density CP/M, single and double density disks can be mixed automatically. True Direct Memory Access (DMA) in single or double density mode makes possible efficient multi-user and multi-tasking systems. Also capable of programmed-data-transfer method, which works in single density at 2 or 4 Mhz, and double density at 4 Mhz. Extended addressing capability provides 8 extra address bits on the lines defined by the IEEE S-100 standard. This allows direct transfers to and from anyplace in 16 Mbyte address range.

A & T \$495

You'll find these quality S-100 boards at your local Tarbell Dealer.

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THANK YOU FOR YOUR RECENT INQUIRY

We're pleased with your interest in Tarbell products. And we know that the quality of our products is worthy of your interest.

We start with the very best, parts available. We also make exhaustive tests. Every step in our manufacturing procedure is checked and double-checked. Only when we're absolutely sure that our products perform the way they were designed to perform, do we ship them to our customers.

We believe that no one has a better product than Tarbell. And we believe in Value: Quality Products, Competitively Priced, backed up by Solid Service.

TARBELL VDS-III

Vertical Disk Subsystem

SYSTEM INCLUDES:

- 2 Siemens 8" Disk Drives
- 1 Cabinet with Fan and Power Supply
- 1 Tarbell Floppy Disk Interface, assembled & tested
- 1 CP/M* Disk Operating System
- 1 Tarbell BASIC
- All Cables and Connectors
- Complete User Documentation
- Fully Factory Assembled and Tested

CP/M is a product of Digital Research Corp.



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Tarbell
Electronics

Dept. M
950 Dovlen Place, Suite B
Carson, California 90746

TARBELL ELECTRONICS, 950 Dovlen Place, Suite B
 Carson, CA 90746 phone (213) 538-4251 or 2254
 Monday through Friday 9:30-4:30 PST

HARDWARE PRICE LIST 10/1/81

Part No.	Description	List
EMPIRE-I	64k 1.2mb DD COMPUTER	See your dealer for
EMPIRE-II	64K 19-SLOT COMPUTER	computer
EMPIRE-III	64k 2.4mb DD DS COMPUTER	prices.
EMPIRE-III9	64K 19-SLT 2.4mb COMPUTER	
HDS-10	10mb 8-INCH HD SUBSYS	3750.00
HDS-33	33mb 14-INCH HD SUBSYS	5200.00
HDS-66	66mb 14-INCH HD SUBSYS	6650.00
HDC-ASM	HARD DISK CONTROLLER ONLY	1000.00
HD-10	10mb 8-INCH DRIVE	3458.00
HD-33	33mb 14-INCH DRIVE	4543.50
HD-66	66mb 14-INCH DRIVE	6194.50
VDS-II	SD VERTICAL DISK SUB-SYS	2288.00
VDS-IID	DD VERTICAL DISK SUB-SYS	2399.00
VDS-IIDD	DD DS VERTICAL DISK SS	2799.00
VDS-IISD	SD DS VERTICAL DISK SS	2688.00
VDS-IIM	8-SLOT MF WITH 2 FD & FDI	2488.00
VDS-IIMD	8-SLOT MF WITH 2 FD & DD	2599.00
VDS-IIMDD	8S MF WITH 2 DS FD & DD	2999.00
VDS-IIMSD	8S MF WITH 2 DS FD & FDI	2888.00
MF-19	19-SLOT MAINFRAME	895.00
VDS-0	DUAL 8" FLOPPY CABINET	400.00
VDS-M	8-SLOT MF CAB W/POWER	1100.00
VDS-P	DUAL 8" CABINET W/POWER	550.00
CPU/IO-ASM	Z80 CPU WITH 2 RS232 & MM	450.00
CPU/IO-MAN	CPU BOARD MANUAL	15.00
DD-ASM	DOUBLE DENSITY FDI ASM	495.00
DD-MAN	DOUBLE DENSITY MANUAL	15.00
FDI-ASM	SD FLOPPY DISK I/F ASM	325.00
FDI-KIT	SD FLOPPY DISK I/F KIT	225.00
FDI-MAN	FLOPPY DISK I/F MANUAL	10.00
MEM-32K-ASM	32K STATIC MEMORY	725.00
CDC-DD	CDC DD DS FLOPPY DRIVE	800.00
FDD-100-8D	SIEMENS FLOPPY DISK DRIVE	600.00
QUME-DD	QUME DD DS FLOPPY DRIVE	800.00
SA800	SHUGART DD FLOPPY DRIVE	600.00
MX-80	EPSON DOT MATRIX PRINTER	650.00
SPINWRITER	NEC SPINDLE PRINTER	3400.00
VIEWPOINT	ADDS CRT TERMINAL	695.00
DESK	DESK WITHOUT SHELF	250.00
DESK-SHELF	COMPUTER DESK SHELF	150.00

Prices are subject to change without notice.



SOFTWARE PRICE LIST 10/1/81

Part No.	Description	List
SUPERCALC	SORCIM WORKSHEET PROGRAM	295.00
DBASE-II	RELATIONAL DATABASE SYS	700.00
DBASE-MAN	DBASE-II MANUAL	50.00
CB80	D.R. BUSINESS COMPILER	500.00
CB80-MAN	D.R. COMPILER MANUAL	30.00
CPM-2.2	D.R. CP/M 2.2 WITHOUT DOC	120.00
CPM2-MS	D.R. CP/M 2.2 MANUAL SET	30.00
MPM2	D.R. MP/M WITH OUR XIOS	500.00
MPM2-MS	D.R. MP/M 2.0 MANUAL SET	50.00
CPNET	D.R. NETWORK SYSTEM	200.00
CPNET-MAN	D.R. CP/NET MANUAL	15.00
PLI	D.R. PL/I-80 COMPILER	500.00
PLI-MAN	D.R. PL/I-80 MANUAL	35.00
LINK-80	D.R. LINKER & RUNTIME LIB	100.00
MAC	D.R. MACRO ASSEMBLER	90.00
BT-80	D.R. RECORD RETRIEVAL SYS	200.00
BT-80-MAN	D.R. BT-80 MANUAL	25.00
DESPOOL	D.R. SPOOLER FOR CP/M	50.00
TEX	D.R. TEXT PROCESSOR	100.00
ZSID	D.R. Z-80 SYMBOLIC DEBUG	100.00
SID	D.R. SYMBOLIC DEBUGGER	75.00
WORDSTAR	MICRO PRO WORD PROCESSOR	495.00
DATASAR	MICROPRO DATA PROCESSOR	350.00
MAILMERGE	MICROPRO MAIL PACKAGE	150.00
SPELLSTAR	MICRO PRO PROOFREADER	250.00
SUPERSORT1	MICRO PRO SORT PKG 1	250.00
SUPERSORT2	MICRO PRO SORT PKG 2	200.00
WORDMASTER	MICROPRO EDITOR	150.00
DB-1	TARBELL DATABASE SYSTEM	50.00
TBAS-DSK	TARBELL DISK BASIC	100.00
TBAS-CAS	TARBELL CASSETTE BASIC	100.00
TBAS-MAN	TARBELL BASIC MANUAL	15.00
TBAS-LST	TARBELL BASIC SOURCE LIST	50.00
TBAS-SRC	TARBELL BASIC SOURCE DISK	50.00
TDBASIC-UD	TARBELL DISK BASIC UPDATE	25.00
TCBASIC-UD	TARBELL CASS BASIC UPDATE	25.00
CAM-LIB	CAMEO LIBRARIES FOR MP/M	50.00
DEBLOCK	512-BYTE/SECTOR CP/M BIOS	25.00
DEBLOCK-CAM	512-BYTE CAMEO BIOS DISK	75.00
TBCXIOS	I/O FOR CAMEO-MP/M 1.1	100.00
TBXIOS	DEBLOCK BIOS FOR MP/M 1.1	100.00
TBXIOS2	DEBLOCK BIOS FOR MP/M2.0	50.00
XIOS	B-F I/O FOR MP/M 1.1	100.00
BASE-MAN	BASIC-E COMPILER MANUAL	7.00
CBAS-DSK	CBASIC-2 WITH MANUAL	150.00
CBAS-MAN	CBASIC-2 MANUAL	30.00
DMW-1	DMW SOFTWARE UTILITIES	35.00
EMPL-CAS	EMPL MICRO APL ON CASS	20.00
PBLC-DMN-1	PUBLIC DOMAIN DISK #1	15.00
PBLC-DMN-2	PUBLIC DOMAIN DISK #2	15.00
SPLR	KLH SYSTEMS SPOOLER	95.00
TELE-COM	TELECOMMUNICATIONS SYS	195.00

Prices are subject to change without notice.