# MOSTEK 1980 CIRCUITS AND SYSTEMS PRODUCT GUIDE



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# Mostek. Technology for Today and Tomorrow

### **TECHNOLOGY**

From the beginning, Mostek has been recognized as an innovator. In 1970, Mostek developed the MK4006 1K dynamic RAM and the world's first single-chip calculator circuit, the MK6010. These technical breakthroughs proved the benefits of ion-implantation and cost-effectiveness of MOS. Now, Mostek represents one of the industry's most productive bases of MOS/LSI technology. Each innovation - in memories, microcomputers and telecommunications - adds to that technological capability.

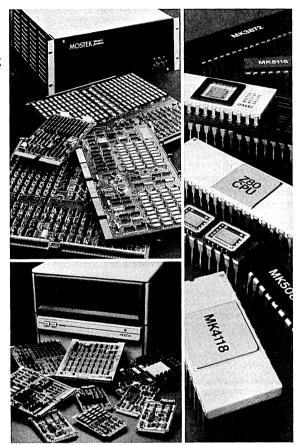
### QUALITY

The worth of a Mostek product is measured by its quality. How well it's designed, manufactured and tested. How well it works in your system.

In design, production and testing, our goal is meeting the spec every time. This goal requires a strict discipline, both from the company and from the individual. This discipline, coupled with a very personal pride, has driven Mostek to build in quality at every level, until every product we take to the market is as well-engineered as can be found in the industry.

### PRODUCTION CAPABILITY

Mostek's commitment to increasing production capability has made us the world's largest manufacturer of dynamic RAMs. In 1979 we shipped 25 million 4K and 16K dynamic RAMs. We built our first telecommunication tone dialer in 1974; since then, we've shipped over 5 million telecom circuits. The MK3870 single-chip microprocessor is also a large volume product with over two million in application around the world. To meet the demand for our products, production capability must be constantly increased. To accomplish this,



Mostek has been in a constant process of expanding and refining our production capabilities.

### **PRODUCTS**

# Telecommunications and Industrial Products

Mostek has made a solid commitment to telecommunications with a new generation of products, such as Integrated Pulse Dialers, Tone Dialers, CODECs, monolithic filters, tone receivers, A/D converters and counter time-base circuits.

Since 1974 over five million telecom circuits have been shipped, making Mostek the leading supplier of tone/pulse dialers and CODECs.

# **Mostek. Technology for Today and Tomorrow**

### **Memory Products**

Through innovations in both circuit design, wafer processing and production, Mostek has become the industry's leading supplier of memory products.

An example of Mostek leadership is our new BYTEWYDE™ family of static RAMs, ROMs, and EPROMs. All provide high performance, N words x 8-bit organization and common pin configurations to allow easy system upgrades in density and performance. Another important product area is fast static RAMs. With major advances in technology, Mostek static RAMs now feature access times as low as 55 nanoseconds. With high density ROMs and PROMs, static RAMs, dynamic RAMs and pseudostatic RAMs, Mostek now offers one of industry's broadest and most versatile memory families.

### Microcomputer Components

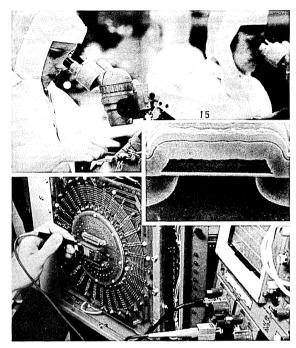
Mostek's microcomputer components are designed for a wide range of applications.

Our Z80 family is the highest performance 8-bit microcomputer available today. The MK3870 family is one of the industry's most popular 8-bit single-chip microcomputers, offering upgrade options in ROM, RAM, and I/O, all in the same socket. The MK3874 EPROM version supports and prototypes the entire family.

### Microcomputer Systems

Supporting the entire component product line is the powerful MATRIX™ microcomputer development system, a Z80-based, dual floppy-disk system that is used to develop and debug software and hardware for all Mostek microcomputers.

A software operating system, FLP-80DOS, speeds and eases the design cycle with powerful commands. BASIC, and FORTRAN, are also available for use on the MATRIX.



Mostek's MD Series<sup>™</sup> features both standalone microcomputer boards and expandable microcomputer boards. The expandable boards are modularized by function, reducing system cost because the designer buys only the specific functional modules his system requires. All MDX boards are STD-Z80 BUS compatible.

The STD-Z80 BUS is a multi-sourced motherboard interconnect system designed to handle any MDX card in any card slot.

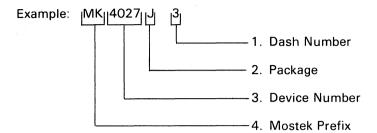
### **Memory Systems**

Taking full advantage of our leadership in memory components technology, Mostek Memory Systems offers a broad line of products, all with the performance and reliability to match our industry-standard circuits. Mostek Memory Systems offers add-in memory boards for popular DEC and Data General minicomputers.

Mostek also offers special purpose and custom memory boards for special applications.

# Ordering Information

Factory orders for parts described in this book should include a four-part number as explained below:



#### Dash Number

One or two numerical characters defining specific device performance characteristic.

#### 2. Package

P - Gold side-brazed ceramic DIP

J - CER-DIP

N - Epoxy DIP (Plastic)

K - Tin side-brazed ceramic DIP

T - Ceramic DIP with transparent lid

E - Ceramic leadless chip carrier

#### 3. Device Number

1XXX or 1XXXX - Shift Register, ROM

2XXX or 2XXXX - ROM, EPROM

3XXX or 3XXXX - ROM, EPROM

38XX

- Microcomputer Components

4XXX or 4XXXX - RAM

5XXX or 5XXXX - Counters, Telecommunication and Industrial

7XXX or 7XXXX - Microcomputer Systems

#### 4. Mostek Prefix

#### MK-Standard Prefix

MKB-100% 883B screening, with final electrical test at low, room and high-rated temperatures.

# 



#### CORPORATE HEADQUARTERS

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Northwest Northwest Mostek 1107 North East 45th Street Suite 411 Seattle, Wa. 98105 206/632-0245 TWX 910-444-4030

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ARIZONA

Summit Sales 7336 E. Shoeman Lane Suite 116E Scottsdale, AZ 85251 602/994-4587 TWX 910-950-1283

ARKANSAS Beacon Elect. Assoc., Inc. P.O. Box 5382, Brady Station Little Rock, AK 72215 501/224-5449 TWX 910-722-7310

CALIFORNIA

Harvey King, Inc. 8124 Miramar Road San Diego, CA 92126 714/566-5252 TWX 910-335-1231

COLORADO

Waugaman Associates 4800 Van Gordon Wheat Ridge, CO 80033 303/423-1020 TWX 910-938-0750

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MINNESOTA Cahill, Schmitz & Cahill, Inc. 315 N. Pierce St. Paul, MN 55104 612/646-7217 TWX 910-563-3737

MISSOURI MISSOURI Rush & West Associates 481 Melanie Meadows Lane Ballwin, MO 63011 314/394-7271

NEW JERSEY Tritek Sales, Inc. 21E Euclid Ave. Haddonfield, NJ 08033 Haddontield, NJ 08033 609/429-1551 215/627-0149 (Philadelphia Line) TWX 710-896-0881

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516/349-1190 TWX 510-221-1849 Precision Sales Corp. 5 Arbustus Ln., MR-97 Binghamton, NY 13901 607/648-3686

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Precision Sales Corp. 3594 Monroe Avenue Rochester, NY 14534 716/381-2820

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Rich Electronic Marketing 141 E. Aurora Road Northfield, Ohio 44067 216/468-0583 TWX 810-427-9210

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TWX 910/580-3106 Kierulff Electronics 9797 Balboa Avenue San Diego, CA 92123 714/278-2112 TWX 910/335-1182 Kierulff Electronics 14101 Franklin Avenue Orange County, CA 92680 714/731-5711

TWX 910/595-2599 Schweber Electronics 17811 Gillette Avenue Irvine, CA 92714 714/556-3880 TWX 910/595-1720

Wyle Distribution Group 124 Maryland Street El Segundo, CA 90245 213/322-8100 TWX 910/348-7111 Wyle Distribution Group

Wyle Distribution Group 9525 Chesapeake Drive San Diego, CA 92123 714/565-9171 TWX 910/335-1590 Wyle Distribution Group 17872 Cowan Ave. Irvine, CA 92714 714/641-1600

TWX 910/348-7111

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TWX 510/959-6337 Diplomat Southland 2120 Calumet Clearwater, FL 33515 813/443-4514 TWX 810/866-0436 Kierulff Electronics

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317./297-4910
TWX 810/341-3228
Ft. Wayne Electronics
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Hauppauge, NY 11787 516/231-1000 TWX 510/227-6623 Lionex Corporation 415 Crossway Park, Drive Woodbury, LI., NY 11797 516/921-417 TWX 510/221-2196 Schweber Electronics 2 Twin Line Circle Rochester, NY 14623 716/424-2222 Schweber Electronics Jericho Turnpike Westbury, NY 11590 516/334-7474 TWX 510/222-3660

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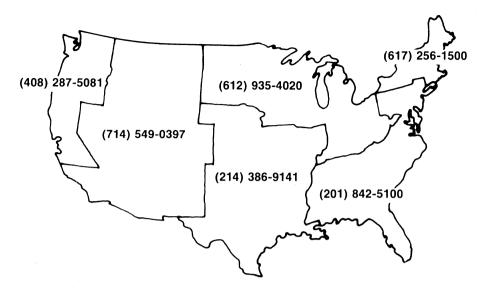
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### **MEMORY PRODUCTS**

With a history of innovative products and a reputation for reliability, Mostek has become a recognized leader in memory products. Leadership in volume production of high performance dynamic RAMs

was achieved through innovations in both circuit design and wafer processing. Circuit processing advances include Poly I<sup>TM</sup> (single-level poly) and Poly II<sup>TM</sup> (double-level poly). Another technique in wafer processing is the optical reduction of the basic design. This "scaling" technique results in smaller chip sizes and increased performance. All new products from Mostek will utilize this technology designated "scaled Poly 5"<sup>TM</sup>

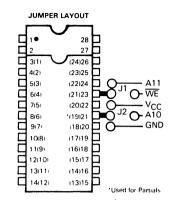
Mostek's leadership position is strengthened by a product development program aimed at a wide range of applications. To complement our dynamic RAMs. Mostek offers industry standard 4K and 8K static RAMs which allow +5 volt RAM/ROM microcomputer system compatibility without compromising either speed or power. The MK4104 and MK4118 are part of a family of devices based on an Edge Activated™ design concept. The Mostek BYTEWYDE™ Memory Family offers greater system design flexibility with common RAM/ROM/EPROM, JEDEC approved standard pinout.

Another design is Mostek's MK36000 65,536-bit ROM. This high density ROM is pin-compatible with Mostek's 8K and 16K ROMs, allowing easy system upgrade in both density and performance.

Mostek's reputation for reliable products is based on a testing program which is one of industry's most accelerated stress-testing. Mostek's goal is superior circuit performance and operating margins.

# BYTEWYDE™ Memory ≡

Memory Type	Part Number	Capacity	Package	Jumper J1 J2
ROM	MK34000	2K x 8	24 Pin	NC A10
ROM	MK37000△	8K x 8	28 Pin	A11 A10
RAM	MK4118	1K x 8	24 Pın	WE VCC
RAM	MK4802Δ	2K x 8	24 Pın	WE A10
Psuedostatic RAM	MK4816	2K × 8	28 Pın	NC A10
EPROM	MK2716	2K x 8	24 Pın	V <sub>CC</sub> A10
EPROM	MK2764∴	8K x 8	28 Pın	A11 A10



△ available 1980

	BYTEWYDE™ FAMILY PINOUTS																
4118 1K×8 STATIC RAM	4802 2K x 8 STATIC RAM	34000 2K × 8 ROM	2716 2K x 8 EPROM	4816 2K x 8 PSEUDO- STATIC RAM	37000 8K x 8 ROM	2764 8K x 8 EPROM			\ <i></i>	1	2764 8K x 8 EPROM	37000 8K x 8 ROM	4816 2K × 8 PSEUDO- STATIC RAM	2716 2K x 8 EPROM	34000 2K x 8 ROM	4802 2K x 8 STATIC RAM	4118 1K x 8 STATIC RAM
				RFSH	NC	NC A12		1	28			VCC	V <sub>CC</sub>				
				NC	A12	A12	片	2	27	_	NC	NC	WE				
Α7	A7	A7	A7	A7	A7	A7	느	3(1)	(24)26		-110	NC	CS	Vcc	Vcc	Vcc	$_{\text{Vcc}}$
A6	A6	A6	A6	A6	A6	A6	L	4(2)	(23)25	L		A8	A8	A8	A8	A8	A8
A5	A5	A5	A5	A5	A5	A5		5(3)	(22)24	Р	A9	A9	A9	A9	A9	A9	A9
A4	A4	A4	A4	A4	A4	Α4		6(4)	(21)23		A11	A11	NC	$V_{PP}$	NC	WE	WE
A3	A3	A3	A3	A3	A3	A3		7(5)	(20)22		OE/V <sub>PP</sub>	ŌĒ	ŌĒ	OE	ŌE	ŌE	ŌE
A2	A2	A2	A2	A2	A2	A2		8(6)	(19)21	D		A10	A10	A10	A10	A10	Г
A1	A1	A1	A1	A1	A1	A1		9(7)	(18)20	Ь	CE	CE	CE	CE	CE	CE	CE
AO	A0	A0	A0	A0	AO	A0		10(8)	(17)19	b	D7	D7	D7	D7	D7	D7	D7
DO	DO	DO	DO	DO	DO	DO		11(9)	(16)18	_		D6	D6	D6	D6	D6	D6
D1	D1	D1	D1	D1	D1	D1	П	12(10				D5	D5	D5	D5	D5	D5
D2	D2	D2	D2	D2	D2	D2	Я					D4	D4	D4	D4	D4	D4
V <sub>SS</sub>	V <sub>SS</sub>	V <sub>SS</sub>	V <sub>SS</sub>	V <sub>SS</sub>	V <sub>SS</sub>	V <sub>SS</sub>	2	14(12		_		D3	D3	D3	D3	D3	D3

## ∃ Read-Only Memory ⊑

### MK34000(P/J/N)-3 16,384-Bit Static ROM

- Single +5 volt power supply (±10% tolerance)
- Completely static operation (no clocks required)
- 350ns Access Time
- Contact programmed for fast turnaround

- Directly TTL compatible
- PROM pinout compatible
- Three programmable chip select inputs
- Input protection against static charge
- Standard 24-pin DIP
- High performance replacement for AMI-6831B and Intel 8316E

### MK36000(P/J/N)-4/5 65,536-Bit ROM

- "Edge Activated"™ operation
- 250ns (-4); 300ns (-5) maximum access time
- Single +5V (±10%) power supply
- Average Power Dissipation—220mW maximum
- Standby Power Dissipation—45mW typical (CE High)

- On-chip latches for addresses
- Inputs and three-state outputs TTL compatible
- Outputs drive 2 TTL loads and 100pF
- Standard 24-pin DIP (EPROM Pinout Compatible)

### Available Soon MK37000(J/N)-4 65,536-Bit ROM

- 8K x 8 organization "Edge Activated"™ operation (CE)
- Pin compatible with Mostek's "BYTEWYDE"™ Memory Family (MK2764 64K EPROM Type Pinout)
- 250ns maximum access time

- Single +5V  $\pm$  10% power supply
- Low power dissipation 220mW active 45mW standby
- On chip latches for addresses
- Standard 28 pin DIP (600 mil)
- Inputs and three-state outputs TTL compatible
- OE function provides flexible system operation

# ∃Programmable Read-Only Memory **=**

### MK2716(J) Series

### 16,384-Bit Electrically Programmable/ Ultraviolet Erasable ROM

- Replacement for popular 2048 x 8-bit 2716 type EPROM
- Single +5 volt power supply during READ operation
- Access Time: 300ns (-5), 350ns (-6), 400ns (-7), 450ns (-8), 650ns (-12)
- Low Power Dissipation: 525mW max active

- Power Down mode: 132mW max
- Three-State Output OR-tie capability
- Six modes of operation for greater system flexibility
- Single programming requirement: single location programming with one 50nsec pulse
- Pin Compatible with MK34000 16K ROM
- TTL compatible in all operating modes
- Standard 24-pin DIP with transparent lid

### Available Soon

MK2764(T)-8

### 65,536-Bit Electrically Programmable/ Ultraviolet Erasable ROM

- 8K x 8 Organization
- Single +5-volt power supply during read operation
- Single programming requirement: single location programming with one 50ms pulse

- 450ns maximum access time in read mode
- Output enable <del>OE</del> function for greater system flexibility
- Low power dissipation 525mW active 132mW standby
- Pin compatible with the MK37000 mask programmable ROM
- Standard 28 pin dip with transparent lid
- TTL compatible in all operating modes

# Dynamic RAM

## MK4006(P)-6/MK4008(P)-6\*

### 1024 x 1-Bit Dynamic RAM

- TTL/DTL compatible inputs
- No clocks required
- Access Time: MK4006P-6 under 400ns MK4008P-Under 500ns

#### Standby power: under 50mW

- 16-pin standard DIP
- Supply Voltage: +5V and -12V

### \*Not Recommended for New Design

### MK4027(J/N)-1/2/3/4

### 4096 x 1-Bit Dynamic RAM

- Standard 16-pin DIP
- All Inputs are Low Capacitance and TTL compatible
- Input Latches for Addresses, Chip Select and Data In
- Inputs Protected Against Static Charge
- Three-state TTL Compatible Output
- Output Data Latched and Valid Into Next Cycle
- Pin Compatible with MK4096

- Improved performance with "gated CAS", "RAS only" refresh and page mode capability
- Random read or write cycles of 320ns (-1 and -2) and 375ns (-3 and -4)
- Random access of 120ns (-1), 150ns (-2), 200ns (-3) and 250ns (-4)
- Page access of 85ns (-1), 100ns (-2), 135ns (-3) and 165ns (-4)
- Low Power: Active power under 462mW
   Standby power under 27mW
- Standard power supplies +12V, +5V, -5V (all with +10% tolerance)

### MK4116(J/N)-2/3/4

### 16,384-Bit Dynamic RAM

- Industry standard 16-pin DIP with pinout and timing suitable for easy upgrade of MK4027 based systems.
- All inputs are low capacitance and TTL compatible.
- Random access of 150ns (-2), 200ns (-3), 250ns (-4); page mode access of 100ns (-2), 135ns (-3), 165ns (-4)
- Input latches for data-in and address

- Three-state TTL outputs with data latched till end of the cycle
- Common I/O capability
- Two dimensional selection using RAS and CAS
- Low power—less than 500mW
- Flexible timing with Read-Modify-Write, RAS only refresh, and Page Mode Capability
- Standard power supplies +12V, +5V and -5V (all with  $\pm$  10% tolerance)

#### **Available Soon**

MK4516(J/N)-10/12

### 16,384 x 1-Bit Dynamic RAM

- Industry standard 16-pin DIP with pinout and timing suitable for easy upgrade to MK4164
- All inputs are low capacitance and TTL compatible
- High performance Poly 5<sup>™</sup> process
- Low power, 140mW active (max) and 17mW standby (max)
- Single +5V (± 10%) power supply operation
- On-chip substrate bias generator

- Flexible timing with Random Read, Write, R-M-W, page mode operation, and hidden refresh
- 128-cycle refresh (2ms) using conventional RAS only or pin 1 (RFSH) refresh feature
- New CAS latching feature provides versatile control of three-state TTL output
- Common I/O capability using early write
- Pin 1 refresh permits low power battery backup operation while reducing the hardware requirements necessary for the refresh
- Random Access of 100ns (-10), 120ns (-12);
   Page Mode Access of 50ns (-10), 60ns (-12)

### Available Soon

MK4164(J/N)-10/12

### 65,336 x 1-Bit Dynamic RAM

- Industry standard 16-pin DIP configuration
- All inputs are low capacitance and TTL compatible
- High performance Poly 5<sup>™</sup> process
- Low power, 330mW active (max) and 22mW standby (max)
- Single +5 (± 10%) power supply operation
- On-chip substrate bias generator

- Flexible timing with Random Read, Write, R-M-W page mode operation, and hidden refresh
- 128-cycle refresh (2ms) using conventional RAS only or pin 1 (RFSH) refresh feature
- New CAS latching feature provides versatile control of three-state TTL output
- Common I/O capability using early write
- Pin 1 refresh permits low power battery backup operation while reducing the hardware requirements necessary for the refresh function
- Random Access of 100ns (-10), 120ns (-12)
   Page Mode Access of 50ns (-10), 60ns (-12)

### MK4332(D)-3

### 32,768 x 1-Bit Dynamic RAM

- Utilizes two industry standard MK4116 devices in an 18-pin package configuration
- 200ns access time, 375ns cycle (MK4116-3)
- Separate RAS, CAS Clocks
- ± 10% tolerance on all power supplies (+12V, ±)
- Low power: 482mW active, 40mW standby (max)
- Output data controlled by CAS and unlatched

at end of cycle to allow two dimensional chip selection and extended page boundary

- Common I/O capability using "early write" operation
- Read-Modify-Write, RAS-only refresh, and page mode capability
- All inputs TTL compatible, low capacitance, and protected against static charge
   128 refresh cycles for each MK4116 device in the dual density configuration
- Pin compatible to MK4116 and MK4164

## Static RAM

### Available Soon

MK2147(J/N)-55/70/90

#### 4096 x 1-Bit Static RAM

- Industry standard 18-pin DIP configuration
- High performance scaled Poly 5<sup>™</sup> technology
- Access time 55ns (-55), 70ns (-70) and 90ns (-90)
- 900mW maximum "active" power, standby power 150mW (55ns) and 100mW (70-90ns)

- Equal access and cycle times
- Single +5V (± 10%) power supply
- Chip select power down feature
- All inputs are low capacitance and TTL compatible
- Three-state TTL compatible output
- On-chip Substrate Bias Generator

### MK4104(J/N) Series

### 4096 x 1-Bit Static RAM

- Static storage matrix, clocked chip enable—no refresh
- +5V single power supply (± 10% tolerance)
- 150mW maximum "active" power, 90mW typical
- Separate I/O

- Fully TTL compatible
- Standard 18-pin DIP
- Access Time 200ns (-3), 250ns (-4), 300ns (-5) and 350ns (-6)
- -3X series: standby mode 3.0V @ 3.3mA for battery backup operation

### MK4118(P/J/N)-1/2/3/4 1024 x 8-Bit Static RAM

- Address Activated\*™ Interface combines benefits of Edge Activated™ and fully static
- High performance Cycle Time and Access Time:
  - MK4118-1 120nsec
  - MK4118-2 150nsec
  - MK4118-3 200nsec
  - MK4118-4 250nsec

- Single +5 volt ± tolerance
- TTL compatible I/O Fanout:

2—Standard TTL 2-Schottky TTL

12-Low power Schottky TTL

- 24-pin—ROM/PROM compatible package
- CE, OE, and LATCH functions for flexible system operation

### MK2148(P/J)-70/85 1024 x 4-Bit Static RAM

- Scaled Poly 5<sup>™</sup> Technology
- Industry standard 18-pin DIP configuration
- High performance: 70ns (-70), 85ns (-85)
- Address Activated™ static memory no clock or timing strobe required
- Access time equal cycle time
- Chip enable power down feature
- Single +5V (± 10%) power supply
- · Common data input and output
- All inputs are low capacitance and TTL compatible with three-state TTL compatible output

# Available Soon MK4802(P/J)-70/90 2048 x 8-Bit Static RAM

- Fully static operation
- High performance 70ns (-70), 90ns (-90)
- Pin compatible with Mostke's BYTEWYDE™ memory family
- Double density version of the MK4118 1K x 8 static RAM
- 24/28 pin ROM/PROM compatible pin configuration

## ⊒ Pseudostatic™ RAM ⊑

### MK4816(J/N)-3/4/5 2048 x 8-Bit Pseudostatic™ RAM

- 28-pin "JEDEC" defined ROM/PROM compatible package
- On-chip Substrate Bias Generator
- Access time: 200ns (-3), 250ns (-4) and 300ns (-5)
- Single +5V (± 10%) power supply
- Low power 150mW active and 25mW standby

- 128 refresh cycles/2ms refresh interval
- All pins TTL compatible
- Built-in refresh multiplexer and refresh address counter
- Power down (standby) refresh mode
- Automatic precharge for minimum cycle time
- Latched address, CS and independent OE for easy interface in any microprocessor system

### **Available Soon**

MK4808(J/N)-3/4/5

### 1024 x 8-Bit Pseudostatic™ RAM

- 28-pin "JEDEC" defined ROM/PROM compatible package
- On-chip Substrate Bias Generator
- Access time 200ns (-3), 250ns (-4) and 300ns (-5)
- Single +5V (± 10%) power supply
- Low power -150mW active and 25mW standby

- 128 refresh cycles/2ms refresh interval
- All pins TTL compatible
- Built-in refresh multiplexer and refresh address counter
- · Power down (standby) refresh mode
- Automatic precharge for minimum cycle time
- Latched address, CS and independent OE for easy interface in any microprocessor system
- Select function on pin 21 must be at V<sub>IH</sub> during address set-up and hold time

### Available Soon

MK4809(J/N)-3/4/5

### 1024 x 8-Bit Pseudostatic™ RAM

- 28-pin "JEDEC" defined ROM/PROM compatible package
- On-chip Substrate Bias Generator
- Access time: 200ns (-3), 250ns (-4) and 300ns (-5)
- Single +5V (± 10%) power supply
- Low power 150mW active and 25mW standby

- 128 refresh cycles/2ms refresh interval
- All pins TTL compatible
- Built-in refrsh multiplexer and refresh address counter
- Power down (standby) refresh mode
- Automatic precharge for minimum cycle time
- Latched address, CS and independent OE for easy interface in any microprocessor system
- Select function on pin 21 must be at V<sub>IL</sub> during address set-up and hold time

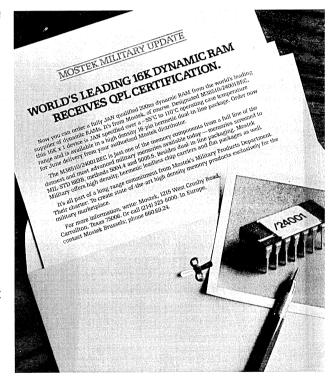
### **MILITARY/HI-REL PRODUCTS**

The Defense and Aerospace industries are more concerned than ever before about the price and performance of the integrated circuits that they purchase. The traditional Military IC manufacturers have

met the stringent reliability of the Military at the cost of being several years behind the state-of-the-art in commercial products. Mostek, which has long been known for being at the leading edge in MOS technology, has a separate Military Products Department serving the special needs of the Defense and Aerospace industries. This organization has the primary objective of providing Mostek's state-of-the-art products screened to MIL Std. 883. Methods 5004.4 and 5005.5. As MIL-M-38510 slash sheets are issued, the Military Products Department will qualify Mostek's products in the Jan 38510 program.

Mostek is currently listed on the QPL for its 16K dynamic RAM, the MK4116. The QPL part number is 38510/240. Mostek thus brings the most dense memory in history to QPL status.

Mostek prefixes its Military parts with MKB to denote processing to MIL Std. 883B, Method 5004.4, Class B. Class C devices are available via special order.



#### **PACKAGING**

Mostek offers a variety of packaging types for its Military Products.

- "J" CERDIP Hermetic Package
- "P" Ceramic Dual-In-Line Hermatic Package
- "E" Leadless Hermetic Chip Carrier
- "T" EPROM Hermetic Package
- "F" Ceramic Flat Package

# ∃ Hi Rel Memory ⊑

### MKB4027(J)-83/84

### 4096 x 1-Dynamic RAM

- Extended operating temperature range (-55° C to 1+85° C) for (J)83/84
- Standard 16-pin DIP
- All inputs are low capacitance and TTL compatible
- · Inputs protected against static charge
- Three state TTL compatible output

- Output data latched and valid into next cycle
- Pin compatible with MK4096
- Improved performance with "gated CAS," "RAS only" refresh and page mode capability: Random access of 200ns (-3) (-83), 150ns (-2), 250ns (-4) (84)
- Low Power: Active power under 462mW
   Standby power under 40mW
- Standard power supplies +12V, +5V, -5V (all with ± 10% tolerance)

### MKB4116(J)-82/83/84,(E),(F)-83/84 16.384 x 1-Bit Dvnamic RAM

- Extended operating temperature range (-55° C to +85° C) J82/83/84, E, F/83/84
- Industry standard DIP with pinout and timing suitable for easy upgrade of MK4027 based systems
- Flat Pack (CF) and leadless chip carrier available for high density applications
- All inputs are low capacitance and TTL compatible
- Random Access of 150ns (-82), 200ns (-83), 250ns (-84)

- Low power: 462mW active, 30mW standby (max)
- Output data controlled by CAS and unlatched at end of cycle to allow two dimensional chip selection and extended page boundary
- Common I/O capability using "early write" operation
- Read-Modify-Write, RAS-only refresh, and Page-Mode capability
- 128 refresh cycles (2 msec refresh interval)

### MKB4104(P/J)-84/85/86

### 4096 x 1-Bit Static RAM

- Extended operating temperature range (-55° C to +125° C) P/J(-85) (-86)
- (-84) 250ns access
- (-85) 300ns access
- (-86) 350ns access
- Static storage matrix, clocked chip enable no refresh

- +5V single power supply (±10% tolerance)
- 150mW maximum "active" power, 100mW typical
- 50mW standby power max, 25mW typical
- Separate I/O
- Fully TTL compatible
- Standard 18-pin DIP

### MKB4118(P/J)-82/83/84

#### 1024 x 8-Bit Static RAM

- Extended Operating Temperature Range –55° C to 125° C
- Address Activated<sup>\*™</sup> Interface combines benefits of Edge Activated<sup>™</sup> and fully static
- High performance access time = cycle time
  - MKB4118-82 150ns
  - MKB4118-83 200ns
  - MKB4118-84 250ns

- Single +5V ± 5% power supply
- TTL compatible I/O Fanout:
  - 2 Standard TTL
  - 2 Schottky TTL
  - 12 Low power Schottky TTL
- 24 pin ROM/PROM compatible package
- CS, OE, and Latch functions for flexible system operation

### MKB36000(P)-80/84

### 64K-Bit MOS Read-Only Memory

- MK36000 8K x 8 organization "Edge Activated" operation (CE)
- Maximum access time: 300ns (-84) 250ns (-83)
- Single +5V ±10% power supply
- Low power dissipation 220mW max active
- Extended operating temperature range (-55° C < T<sub>Δ</sub> < +125° C):</li>

- Low standby power dissipation -55mW typical (CE High)
- On-chip latches for addresses
- Inputs and three-state outputs TTL compatible
- Outputs drive 2 TTL loads and 100 pf
- Standard 24-pin DIP (EPROM pinout compatible)

### MKB2716(T)

### 16K Electrically Programmable/ Ultraviolet Eraseable ROM

- Two operating temperature ranges: -55° C<T<sub>A</sub>< 100° C</li>
  - Single +5Volt power supply during READ operation
- Fast access time: 450ns maximum
- Low power dissipation: 636mW max active

- Power down mode: 165mW max
- Three state output or tie capability
- Six modes of operation for greater system flexibility
- Single programming requirement: single location programming with one 50msec pulse
- TTL compatible in all operating modes
- Standard 24-pin DIP with transparent LID

### **TELECOMMUNICATIONS & INDUSTRIAL PRODUCTS**

Mostek offers a complete line of integrated circuits for telecommunications and industrial product applications.

Mostek has made great strides in the telecommunications field. The first series of integrated tone dialers was introduced in 1974. Followed by a Tone IITM series, these telephone dialer products have found their way into more than five million telephones. Now, the new Tone IIITM series of integrated tone dialers is leading the way with higher performance features providing maximum system density in telephone applications. Other products for the telephone include Pulse Dialers and Repertory Dialers.

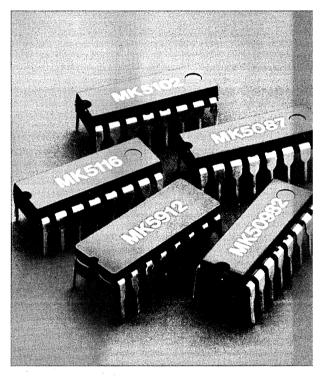
Mostek has also become the leader in integrated interface circuits for digital Central Office or PBX switching systems. This series of circuits consists of  $\mu$ -Law or A-Law companding CODECs and monolithic PCM filters.

Another family of products that Mostek offers is the tone decoder family.

Industrial circuits include a new series of multiple input A/D converters and a family of low-cost, synchronous, up/down counter/display decoders which provide four-decade to six-decade

counting capability. Other high-performance MOS circuits include a Counter Time Base, a Top-Octave Frequency

Generator, and a Digital Alarm Clock.



# **TELECOMMUNICATIONS PRODUCTS**

### Tone Dialers

# MK5087(N) Integrated Tone Dialer II

- Pin-for-pin replacement for MK5085(N) with improved performance
- · Low standby power
- · Auxiliary switching function on chip
- Minimum external parts count

- Uses inexpensive 3.579545 MHz television color-burst crystal to provide high-accuracy tones
- On-chip regulation of dual and single-tone amplitudes
- Multiple key entry pin-selectable to either single tone or no tone
- Uses low-cost calculator-type keyboard (Form A contact) or standard 2-of-8 keyboard

### MK5089(N) Integrated Tone Dialer II

The MK5089 was designed specifically for integrated tone-dialer applications that require the following: fixed supply operation, negative-true keyboard input, tone-disable input, stable output tone level, and an Any Key Down output that is open circuit when no keyboard buttons are pushed and pulls to the V-supply when a button is pushed.

- Minimum external parts count
- High-accuracy tones

- Digital divider logic, resistive ladder network, and CMOS operational amplifier on single chip
- Uses inexpensive 3.579545 MHz television color-burst crystal
- Multiple key entry pin-selectable to either single tone or no tone
- Tone Disable allows Any Key Down output to function from keyboard input without generating tones
- Interfaces easily in electronic or μP dialing applications

### Available Soon MK5387(ℕ) Integrated Tone Dialer III

- Pin-for-pin compatible in keyboard applications with MK5087 with improved performance
- Direct telephone-line operation with no external power supply
- Low standby power
- Minimum external parts count
- Uses inexpensive 3.579545 MHz television color-burst crystal to provide high-accuracy tones

- On-chip regulation of dual- and single-tone amplitudes
- Improved distortion
- Lower voltage operation 2.5 volt instantaneous in loop applications
- Uses low-cost calculator-type keyboard (Form A contact) or standard 2-of-8 keyboard
- Auxiliary switching functions on chip
- Multiple key entry pin-selectable to either single tone or no tone

### Available Soon ₩K5389(N) Integrated Tone Dialer III

The MK5389 is a monolithic integrated circuit fabricated using the complementary-symmetry

MOS (CMOS) process. A member of the Tone III family of integrated tone dialers, the MK5389 uses an inexpensive crystal reference to provide eight different audio sinusoidal frequencies, which are mixed to provide tones suitable for Dual-Tone-Multi-Frequency (DTMF) telephone dialing.

### **Available Soon**

MK5494(N)

### **Integrated Tone Dialer III with Redial**

- Direct telephone-line operation with no external power supply
- Minimum external parts count
- Uses inexpensive 3.579545 MHz television color-burst crystal to provide high-accuracy tones
- Improved distortion
- Lower voltage operation 2.5 volt instantaneous in loop applications
- Low standby power

- Uses low-cost calculator-type keyboard (Form A contact) or standard 2-of-8 keyboard with common V-
- Tone Disable allows Any Key Down output to function from keyboard input without tone generation
- On-chip regulation of dual- and single-tone amplitudes
- 13-digit last number redial
- Up to 2 PBX access digits may be dialed before using last number redial function
- · Off-hook store into memory without dialing
- On-chip power-up-clear and memory-lossdetect circuitry
- Low on-hook memory retention current

## Pulse Dialers

### MK50981(N)

### Integrated Pulse Dialer with Redial

- Direct telephone-line operation
- CMOS technology is used for low-voltage, lowpower operation
- Uses standard 2-of-7 matrix with pos-true common or the inexpensive Form A-type keyboard
- Ceramic resonator used as frequency reference for guaranteed accuracy

- Make/break ratio pin-selectable
- Redial with either a \* or # input
- · Provision for rapid testing
- On-chip voltage regulator
- Power-up-clear circuitry
- "1"-true Pulse output
- "0"-true Mute output

### MK50982(N)

### Integrated Pulse Dialer with Redial

- Direct telephone-line operation
- CMOS technology is used for low-voltage, lowpower operation
- Uses standard 2-of-7 matrix with pos-true common or the inexpensive Form A-type keyboard
- Ceramic resonator used as frequency reference for guaranteed accuracy
- Make/break ratio pin-selectable
- Redial with either \* or #
- Provision for rapid testing
- On-chip voltage regulator
- Power-up-clear circuitry

### MK50991(N)

### **Integrated Pulse Dialer with Redial**

- Direct telephone-line operation
- CMOS technology is used for low-voltage, lowpower operation
- Uses either a standard 2-of-7 matrix keyboard or the inexpensive Form A-type keyboard
- Inexpensive RC oscillator used as frequency reference

- Redial with either a \* or # input
- Mute output interfaces with bistable latching relay
- 66/60% make/break ratio and 20/10 pulse rate are pin-selectable
- Provision for rapid testing
- On-chip voltage regulator
- Power-up-clear circuitry
- "0"-true Pulse output

### MK50992(N)

### **Integrated Pulse Dialer with Redial**

- Direct telephone-line operation
- Uses standard 2-of-7 keyboard
- CMOS technology for low-voltage, low-power operation
- Supply voltage range 2.5 to 6 volts

- 66/60% make/break ratio pin-selectable
- 20/10pps pin-selectable
- Redial with # or \*
- Inexpensive RC oscillator
- "0"-true Pulse output
- "0"-true Mute output

# Tone Decoders

### MK5102(N)-5

# Integrated Tone Decoder

- Detects all 16 standard DTMF digits
- Requires minimum external parts count for minimum system cost
- Uses inexpensive 3.579545 MHz crystal for reference
- Digital counter detection with period averaging insures minimum false responses

- 16-pin package for high system density
- Single supply: 5 volts ± 10%
- Output in either 4-bit binary code or dual 2-bit row/column code
- Will operate at 18dB S/N ratio under worst-case signal conditions
- Latched outputs
- Good for use in a speech-intensive system

### MK5103(N)-5

### **Integrated Tone Decoder**

- Detects all 16 standard DTMF digits
- Requires minimum external parts count for minimum system cost
- Uses inexpensive 3.579545 MHz crystal for reference
- Digital counter detection with period averaging insures minimum false responses

- 16-pin package for high system density
- Single supply: 5 volts ± 10%
- Output in either 4-bit binary code or dual 2-bit row/column code
- Will operate at 14dB S/N ratio under worst-case signal conditions
- Latched outputs

# CODECs =

### MK5116(J/P)

# PCM CODEC - $\mu$ -Law

- ±5-volt power supplies
- Lower power dissipation 30mW (typ)
- Follows the  $\mu$ -255 companding law
- Exceeds D3 channel bank transmission specifications
- Full asynchronous or synchronous operation
- On-chip sample and hold

- On-chip offset-null circuit eliminates long-term drift errors and need for trimming
- Single 16-pin package
- Minimal external circuitry required
- Serial data output of 64 kb/s 2.048 Mb/s at 8 kHz sampling rate
- Separate analog and digital grounding pins reduce system noise problems

### MK5151(J/P)

## PCM CODEC - $\mu$ -Law

- ± 5-volt power supplies
- Low power dissipation 30mW (typ)
- Follows μ-255 companding law
- Exceeds D3 specifications zero code suppression and sign-magnitude data format
- Full asynchronous or synchronous operation
- Includes full A/B signalling

- On-chip sample and hold
- On-chip offset-null circuit eliminates long-term drift errors and need for trimming
- Single 24-pin package
- Minimal external circuitry required
- Serial data output of 64 kb/s 2.048 Mb/s at 8 kHz sampling rate
- Separate analog and digital grounding pins reduce system noise problems

### MK5156(J/P)

# PCM CODEC - A-Law

- ± 5-volt power supplies
- Low power dissipation 30mW (typ)
- Follows the A-law companding code
- Exceeds CCITT specifications, includes evenorder-bit inversion
- Full asynchronous or synchronous operation
- On-chip sample and hold

- On-chip offset-null circuit eliminates long-term drift errors and need for trimming
- Single 16-pin package
- Minimal external circuitry required
- Serial data output of 64 kb/s 2.048 Mb/s at 8 kHz sampling rate
- Separate analog and digital grounding pins reduce system noise problems

# Transmit/Receive Filters

# MK5912(N/J/P)

### **PCM Transmit/Receive Filters**

- Monolithic device includes both transmit and receive filters
- CCITT G712 and AT&T D3/D4 compatible
- Transmit filter includes 50/60 Hz rejection
- Receive filter includes sin x/x compensation
- External gain adjustment, both transmit and receive filters

- Low power consumption:
  - 20mW typical without power amplifiers
  - < 1mW typical in power-down mode</p>
- Direct interface with transformer or electronic telephone hybrids
- ± 5% power supplies; +5V, -5V
- Standard 16-pin package

# **CODEC/Filter**

### **Available Soon**

MK5300(J/P)

# $\mu$ -255 Law Companding CODEC and Filter

The MK5300 is a monolithic device containing both transmit and receive filters and a  $\mu$ -255 law companding CODEC on a single chip. This device

was designed to meet the needs of the telecommunications industry for per-channel CODECs and filters. The MK5300 features a microcomputer mode which provides on-chip time slot computation. The MK5300 also features a stable on-chip voltage reference to provide accurate A/D and D/A conversions.

# Repertory Dialers =

### MK5170(N)

# Repertory Dialer

- Repertory of 10, 24, 50, or 100 different telephone numbers comprising up to 20 digits each
- Repertory size determined by amount of RAM installed. 1K, 2K, 4K, and 8K enable a repertory of 10, 24, 50, and 100 numbers respectively
- Speed dialing of the wanted call numbers is initiated by pressing the appropriate keys
- User can update the repertory
- Display drive is provided to display the address code and the 20-digit number
- Any call number can be manually dialed; digits

- will be displayed as they are entered and the dialed number can be stored as part of the repertory
- Any number in the repertory can be displayed by entering its address code
- Simple four-button dialer operation
- Operate with both pulse and DTMF Mostek dialers
- An outputs signal inhibits tone generation when the keyboard is being interrogated by the MK5170
- The last number dialed is retained in an internal dial buffer so that it can be used for redialing
- On-chip clock/timer

### **Available Soon**

MK5175(N)

### **Ten Number Repertory Dialer**

The MK5175 is a monolithic integrated ten number repertory dialer manufactured using

Mostek's Silicon Gate CMOS process. The circuit accepts keyboard inputs and provides the Pulse and Mute logic levels required for loop disconnect signalling. For DTMF Signalling, the MK5175 may be interfaced with Mostek's Tone Generators.

# INDUSTRIAL PRODUCTS

# Counter/Time Base

### MK5009(P/N)

### **Counter Time Base Circuit**

- Ion-implanted for full TTL/DTL compatibility
- Internal clock operates from:
  - External signal
  - External RC network
  - External crystal

- Operates DC to 2 MHz
- Binary-encoded for frequency selection
- 1 to 36 x 10<sup>8</sup> divide range

# 🛮 Counter/Decoders 🗏

# MK5002/5/7(P/N)

# 4-Digit Counter/Display Decoder

- Ion-implanted for TTL/DTL compatibility
- Single +5V operation; low-power (25mW)
- On-chip oscillators for scan control and for counter input
- MK5002 provides 7-segment and BCD outputs in a 28-pin dual-in-line package
- MK5005 provides 7-segment outputs in a 24-pin dual-in-line package
- MK5007 provides BCD outputs in a 16-pin dualin-line package. Blanking, Decimal, and Complement controls excluded

### MK50395/6/7(N)

## Six-Decade Counter/Display Decoder

- Up/down counter
- Schmitt Trigger on the count input
- Look-ahead carry or borrow
- · Loadable counter
- Loadable compare-register with comparator output

- Multiplexed BCD and seven-segment outputs
- Internal scan oscillator
- Direct LED segment drive
- Interfaces with CMOS logic
- MK50396 programmed to count time: 99 hrs. 59 min. 59 sec.
- MK50397 programmed to count time: 59 min. 59 sec. 99/100 sec.

### MK50398/9(N)

### Six-Decade Counter/Display Decoder

- 28-pin dual-in-line package
- Single power supply (+10V to +15V)
- Schmitt Trigger on the count input

- Six decades of synchronous up/down counting
- Loadable counter
- Interfaces with CMOS logic
- Multiplexed BCD outputs (MK50399)
- Multiplexed seven-segment outputs (MK50398)

# 🗄 Frequency Generator 🚍

### MK50240/1/2(P/N) Series

# **Top-Octave Frequency Generator**

- Single power supply
- Broad supply-voltage operating range
- Low power dissipation

- High output-drive capability
- MK50240 50% output duty cycle, 13 notes
- MK50241 30% output duty cycle, 13 notes
- MK50242 50% output duty cycle, 12 notes
- 100 2500 kHz input-frequency range

# A/D Converters

### MK50816(N)

# 8-Bit A/D Converter

- 8-bit linear A-to-D converter
- Low-power CMOS
- Single 5-volt supply
- 16-channel input (expandable)

- No missing codes
- μP-compatible with three-state outputs
- Second source available (National ADC0816)
- Absolute or ratiometric conversion
- 40-pin package
- 108 μS conversion time (typ)

### MK50808(N)

### 8-Bit A/D Converter

- '8-bit linear A-to-D converter
- Low-power CMOS
- Single 5-volt supply

- 8-channel input
- Absolute or ratiometric conversion
- μP-compatible with three-state outputs
- Second source available (National ADC0808)
- 28-pin package

# 🖃 Digital Alarm Clock 🚞

# MK50250/3/4(N)\* MOS Digital Alarm Clock

- Single-voltage power supply
- Intensity control
- · Simple time setting
- 4-or 6-digit display
- AM/PM and activity indicator

- Selectable input frequency and output mode
- MK50250 12 hr/60 Hz or 24 hr/50 Hz MK50253 - 12 hr/50 Hz or 24 hr/50 Hz MK50254 - 12 hr/ 60 Hz or 24 hr/60 Hz
- 24-hr. alarm
- Snooze alarm
- \*Not Recommended for New Design

# MICROCOMPUTER COMPONENTS

Mostek's microcomputer components cover the full spectrum of microcomputer applications.

Mostek 8086—industry's most popular 16-bit microcomputer family—will be available soon.

Mostek's Z80 is the most powerful 8-bit microcomputer available. And it's available in three speed versions: 6MHz for high throughput applications; 4.0MHz for fast system; and 2.5MHz.

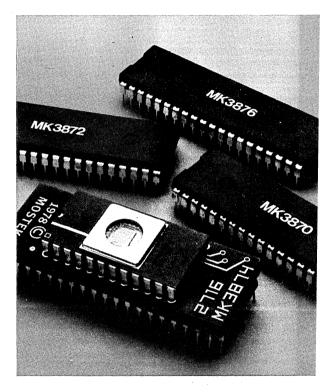
Plus you can design Z80 minimum chip configuration systems by using Mostek's Combo™ Chip. Only a Combo™ Chip, Z80 CPU, ROM or PROM memory, are required.

Mostek's 3870 family is the industry's most popular family of 8-bit single-chip microcomputers. Software compatible with the F8, Mostek's 3870 covers the full range of low-cost microcomputer applications. An EPROM version—the MK3874—also supports and prototypes the entire family.

Mostek's F8 family offers important advantages in system efficiency, system cost and versatility.

Supporting Mostek's entire component product line is the powerful MATRIX™ microcomputer development system. This Z80-based, dual floppydisk system develops and debugs software and hardware for all Mostek

microcomputers including our SD™ and MD Series™ of OEM microcomputer boards. For more details see the Micro Systems section.



# ∃3870 Microcomputer Family ⊑

### MK3870(P/N)

# **Single-Chip Microcomputer**

The MK3870 is a complete 8-bit microcomputer on single MOS integrated circuit. The 3870 can execute the F8 instruction set of more than 70 commands, allowing expansion into multi-chip configurations with software compatibility.

- 2K x 8 mask programmable ROM
- 64 x 8 scratchpad RAM
- 32 bits (4 ports) bidirectional TTL compatible I/O

- Ready strobe provides handshake capability with port 4
- Programmable binary timer
- Vectored interrupts
- Versatile single phase clock (4 modes)
- Low power (typically 275 mW)
- Standard 40-pin plastic or ceramic package

# MK3872(P/N)

## Single-Chip Microcomputer

Second in a growing family of single-chip microcomputers, the MK3872 features double the ROM and double the RAM as the MK3870. The key features are: 4032 x 8 bytes of mask programmable ROM, 64 bytes of scratchpad RAM and an additional 64 bytes of executable RAM. Supporting the executable RAM is a standy-by power mode for easy battery backup. These characteristics enable the MK3872 to control sophisticated mechanical devices and instruments. Or the MK3872 may be used to

combine several programs into one system, thereby lowering manufacturing cost.

- 32-bits (4 eight bit ports) TTL compatible I/O (30 with Standby Option)
- Programmable binary timer
- External interrupt
- Crystal, LC, RC, external, or internal time base
- Low power (285mW typ.)
- Single +5V ±10% power supply
- Same pinout as MK3870

### MK3873(P/N)

# **Single-Chip Microcomputer**

- 2048 x 8 mask programmable ROM
- 64 byte scratchpad RAM
- 29 bits (4 ports) TTL compatible parallel I/O
- Serial Input/Output port
  - External or Internal Serial Port Clock
  - Transmit and Receive registers doubly buffered
  - Internal Baud rate generator
  - Asynchronous
  - Data rates to 9600 bits per second
  - Synchronous or Asynchronous serial I/O
  - Vectored interrupts
  - 3 I/O pins dedicated as Serial in, Serial Out, and Serial Clock
  - Serial In/Serial Clock Schmitt Trigger Inputs, T<sup>2</sup>L compatible

- Programmable binary timer
  - Internal timer mode
  - Pulse width measurement mode
  - Event counter mode
- External Interrupt
- Crystal, LC, RC or external time base
- Low power (325 mW typ)
- Single +5V power supply
  - $-+5V \pm 10\% 3873-00$
  - $-+5V \pm 5\% 3873-05$
- Pinout compatible with 3870 family

### MK38P73(R) PRELIMINARY

# P-PROM™ Microcomputer

EPROM version of MK3873

Accepts industry standard 2K x 8 EPROM (2716 type)

### MK3876(P/N)

# Single-Chip Microcomputer

This chip features the same ROM as the MK3870.

- 2K x 8 mask programmable ROM
- 64 x 8 scratchpad RAM
- 32 bits (4 ports) bidirectional TTL compatible I/O
- Ready strobe provides handshake capability with port 4

- · Programmable binary timer
- Vectored interrupts (4 modes)
- Versatile single phase clock—4MHz
- Low power (typically 275mW)
- Standard 40-pin plastic or ceramic package
- 64 bytes, executable RAM, plus a standby power mode

### MK3874(S)

## P-PROM™ Microcomputer

- EPROM version of the MK3870, MK3872 and MK3876
- Accepts 24-pin, industry-standard EPROMs or bi-polar PROMs
- PROM capacity: 1K, 2K, 4K bytes
- Completely pin compatible with 3870 family of single-chip microcomputers
- Software compatibility with 3870
- Use as prototyping tool or for low volume production
- 64 x 8 scratchpad RAM
- 64 x 8 of executable RAM addressable by program or data counter

- Standby power mode option for executable RAM which includes
  - Low standby power, less than 12mW
  - Minimum 3.2V standby supply voltage
  - No external components required to trickle charge battery
- 32 bits (4 eight-bit ports) TTL compatible I/O (30 with Standby Option)
- Programmable binary timer which includes:
  - Interval timer mode
  - Pulse width measurement mode
  - Event counter mode
- External interrupt
- Crystal, LC, RC, or external time base
- Single +5 volt supply

# F8 Microcomputer Family

## MK3850(P/N)-3 Central Processing Unit

The MK3850 is the Central Processing Unit (CPU) for the F8 Microprocessor Family. It is used in conjunction with other F8 family devices to configure the optimal microprocessor system for the amount of RAM, ROM/PROM, and I/O required in the user's application.

64 bytes of scratchpad RAM memory included

on the F8 CPU eliminates the need for external RAM circuits in many applications.

- Clock and power-on-reset circuitry, normally requiring additional integrated circuit packages, are included on-chip.
- Contains 16-bits of full bidirectional input/output lines internally latched (for storing output data) and capable of driving a standard TTL load.

### MK3851(P/N)

### **Program Storage Unit**

- Contains 1024 bytes of mask programmable ROM for program and constant storage.
- Includes the addressing logic for memory referencing, a Program Counter, an Indirect Address Register (the Data Counter) and a Stack Register.
- Complete vectored interrupt level, including an external interrupt line to alert the central processor.

- The 8-bit Programmable Timer is especially useful for generating real time delays.
- An additional 16-bits of TTL compatible, bidirectional, fully latched I/O lines. (Systems requiring more program storage may be expanded by adding more PSU circuits. For example, one F8 CPU and three F8 PSUs will produce a microprocessor system complete with 64 bytes of RAM, 3072 bytes of ROM, 64 I/O bits, three interrupt levels, and three programmable timers. This complete system will require only four IC packages.)

### MK3852(P/N)

### **Dynamic Memory Interface**

For applications requiring more than the 64 byte RAM located on the CPU, two memory interface circuits are available in the F8 set. Each device generates the 16 address lines and the signals necessary to interface with up to 65K bytes of RAM, PROM or ROM memory.

The Dynamic Memory Interface (DMI) contains all of the logic necessary to refresh MOS dynamic memories without degrading the system throughput time. The F8 DMI can also interface with static memories when desired.

- 2 μs cycle time
- Control up to 64K of memory

- Dynamic memory interface for standard RAMs
- Provides RAM refreshing automatically
- Memory CE time up to 580ns
- 16-bit Program Counter
- 16-bit Stack Register
- Two 16-bit Data Counters
- +5V and +12V power supplies
- Low power dissipation—typically less than 335mW
- Incrementer/Adder
- Interfaces with the 3854 to establish Direct Memory Access Channel

# MK3853(P/N) Static Memory Interface

The MK3853 Static Memory Interface (SMI) provides all necessary address lines and control signals to interface up to 65,536 bytes of Static RAM, ROM or PROM to an F8 microcomputer system. When quantities do not justify the mask charges for the MK3851 PSU, or a fast turn around is of high importance, the MK3853 SMI along with standard PROM can emulate the memory function of the 3851 PSU, while the 3861 provides the I/O ports, interrupt and timer features of the 3851 PSU.

- Static Memory Interface to RAM, ROM, or PROM
- Programmable Timer
- Programmable Interrupt Vectors for Timer and External Interrupts
- Low Power Dissipation typically Less than 335mW
- The Static Memory Interface (SMI) contains a full level of interrupt capability with a programmable interrupt vector and a programmable timer.

### MK3854(P/N)

### **Direct Memory Access**

Mostek's Direct Memory Access (DMA) device sets up a high speed data path to link F8 memory with peripheral electronics. The F8 DMA circuit, when working in conjunction with the F8 DMI, does not require overhead electronics to keep track of memory addresses, bytes transferred and handshaking signals. The data transfer is initiated by the CPU under program control. Once started, the DMA transfer will continue without CPU intervention. The CPU can sense the enable line of the DMA to determine the completion of a transfer. The DMA transfer is totally transparent to

the CPU so processing throughput is not degraded.

- 2 μs cycle time
- Provides strobe for timing peripherals
- 16-bit address
- 12-bit byte count
- Control registers
- Port address selection
- +5V and +12V power supplies
- Low power dissipation—280mW

### MK3861(P/N)

### Peripheral Input/Output

The peripheral I/O circuit (PIO) can be used to provide 16 bidirectional ports, an extra time, and an extra vectored interrupt. The port address and interrupt address are preset on the PIO. Several versions with varying combinations of port and interrupt addresses are available.

Because the I/O, timer, and interrupt functions of the PIO are identical to those of the PSU, a PIO

can also be used in conjunction with and SMI (Static Memory Interface) and PROM to emulate a PSU. The SMI-PROM emulates the memory function with the PIO emulating the I/O, timer and interrupt functions of a PSU.

- Two 8-bit I/O ports
- Programmable timer
- External/timer interrupt control circuitry
- Low power dissipation—typically less than 200mW

### MK3871(P/N)

# Peripheral Input/Output

The Peripheral I/O circuit (PIO) can be used to provide 16 bidirectional ports, a binary readable timer, and an extra vectored interrupt. The port address and interrupt address are preset on the PIO. Several versions with varying combinations of port and interrupt addresses are available.

Because the I/O, timer, and interrupt functions of the PIO are identical to those of the MK3870, a PIO can also be used in conjunction with SMI and

PROM to emulate an MK3870. The SMI-PROM emulates the memory function with the PIO emulating the I/O, timer and interrupt functions of an MK3870.

- Two 8-bit I/O ports
- Programmable binary timer
- External/timer interrupt control circuitry
- Low power dissipation—typically less than 200mW

# == 3870/F8 Development Aids =

### MATRIX (MK78125)

# **Dual Disk-based Development System**

- 64K bytes RAM
- Supports both 3870 and Z80 development
- FLP-80 DOS Operating System
- Complete Documentation
- Supports PPG8/16C, AIM-72E, FZCASM and MACRO70

### EVAL-70(MK79086)

# Single-Board 3870 Family Evaluation/Development Station

 Full in-circuit emulation of MK3870 single-chip microcomputer family.

- On-board 2K firmware monitor (DDT-70)
- On-card keypad and display
- Programming socket for 2716/2758
- Serial I/O Interface Current loop or RS232

### AIM-72E(MK79077)

## Application Interface Modules for 3870 Series

 AIM-72E (Application Interface Module) is a unique development aid for debugging 3870, 3872, 3874, and 3876 hardware and software in the user's "Target" system

- Provides real-time in-circuit emulation of the 3870, 3872, 3874, and 3876
- Provides breakpoint insertion
- Provides single-step operation
- Operates directly with the MATRIX Floppy-Disk System

### FZCASM(MK79079)

## MATRIX Floppy-Disk System Cross Assembler

- AID-80F Floppy-Disk System cross-assembler for 3870 Series/F8 multichip devices
- Assembles all standard 3870/F8 source statements
- Supports conditional assembly, relocatable and linkable modules, symbol table and cross reference listings
- Assembles source statements in two passes with second pass repeatable
- Object output in industry standard hexidecimal format extended for relocatable and linkable programs

# MACRO-70(MK79085) 3870/F8 Macro Cross Assembler

- Assembles standard 3870/F8 instruction set to produce relocatable, linkable object modules.
- Provides nested conditional assembly, an extensive expression evaluation capability and an extended set of assembler pseudo-ops.
- · Provides options for obtaining a printed cross-
- reference listing, terminating after pass 1 if errors are encountered, redefining standard 3870 opcodes via macros, and obtaining an unused-symbol reference table.
- Provides the most advanced macro handling capability on the microcomputer market.
- Compatible with other Mostek 3870/F8 assemblers and FLP-80DOS Version 2.0 or higher. Requires 32K or more of system RAM.

# XFOR-50/70(MK79012) Fortran IV Cross Assembler

- The Mostek F8 Cross Assembler is written in ANSI FORTRAN IV
- It may be compiled and executed on any computer system which has at least a 16-bit word length for integer storage and 13K of memory for product storage.
- Cross Assembler is machine independent for:
  - Character representation (ASCII or BCD)
  - Numerical representation (1's or 2's complement)
- I/O logical device assignments are user definable

- 2 pass assembly easily accommondated if no secondary storage available
- Memory required: 13K words (typical)
- Assembler directives
  - Title 'Set Page Title'
  - Eiect 'Page'
  - EQU 'Values'
  - Org 'Beginning Address'
  - Punch 'Create Load Tape F8 Loader Format'
  - Print 'Off and On' Enable for Output Listing
  - DC 'Define Constants'
  - END

# Z80 Microcomputer Family

# MK3880(P/N)

# Central Processing Unit (Z80 CPU)

Powerful features make Mostek's Z80 the best 8-bit microcomputer available. The Z80-CPU interfaces directly with standard dynamic memories and provides both refresh and timing signals. The results: easier system design with fewer components. The Z80 is software compatible with the 8080A yet has 80 additional instructions.

- Powerful I/O block transfer capability
- Three Modes of fast interrupt response plus a non-maskable interrupt
- Available in three speeds: 6MHz, 4.0MHz, and 2.5MHz

- Memory block transfer ability that moves up to 65K bytes with a single instruction
- Single-chip, N-Channel Silicon-Gage CPU
- 22 internal registers
- Built-in dynamic RAM refresh circuitry
- All pins TTL compatible
- 2.5MHz and 4.0MHz versions available
- Single +5 VDC supply and single-phase 5 Volt clock
- The Z80-CPU is very easy to implement into a system because of its single voltage requirement plus all output signals are fully decoded and timed to control standard memory or peripheral circuits

### MK3881(P/N)

# Parallel input/Output Controller (Z80 PIO)

Parallel I/O Controller—is a programmable, twoport device which provides TTL compatible interfacing between peripheral device and the Z80-CPU

- Interrupt driven "handshake" for fast response
- Any one of the following modes of operation may be selected for either port

Byte output Byte input

# MK3882(P/N)

# Counter Timer Circuit (Z80 CTC)

- N-Channel Silicon-Gate Depletion-Load Technology in 28-pin DIP
- Single 5 volt supply
- Single-phase TTL-level clock
- Four independent programmable 8-bit counter/16-bit timer channels with selectable counter or timer mode

- Readable down counters
- Selectable 16 or 256 clock prescaler for each timer channel for resolution of 64 μs to 32ms
- Selective positive or negative trigger for counter operation
- Capable of driving Darlington transistors
- Daisy chain priority interrupt logic with programmable interrupt vectoring
- All inputs and outputs are fully TTL compatible

# MK3883(P/N)

# Direct Memory Access Controller (Z80 DMA)

- N-Channel Silicon-Gate Depletion-Load Technology in 40-pin DIP
- Handles bidirectional data transfers between main memory and Z80 peripherals
- Three modes of transfer selectable, byte at a time, burst, continuous

- 1.2M byte/sec data handling rate
- Channel status on program request
- Two modes of operation: transfer data or search data
- Daisy chain priority logic with programmable interrupt vectoring
- Single 5 Volt supply

### MK3884/5/7(P/N)

# Serial Input/Output Controller (Z80 SIO)

Serial I/O Controller is designed to handle peripherals with serial data interface requirements, both synchronous and asynchronous

Capable of full duplex serial I/O channel operation

- Parity checking included
- Daisy chain priority logic with programmable interrupt vectoring
- Asynchronous with 5 to 8-bit data
- Synchronous with IBM BiSync and SDLC compatability

### MK3886

## **Z80 Combo Chip**

The MK3886 enhances the Z80 chip set by providing a more general purpose peripheral device which will reduce the number of components required in minimum system configurations. This competes head-on with the Intel 8085 circuit set by providing the user with a three chip minimum system (CPU+ROM+3886).

Additionally this circuit is capable of interfacing with any standard microprocessor.

- 256 X 8 RAM
- Two timers
- Serial I/O port
- Software programmable interrupt vector
- Power down on 64 x 8 RAM (approx 3.5mA)

# Micro Peripheral Components ==

### MK14007N

# **Serial Control Unit (SCU1)**

The Serial Control Unit 1 (SCU1) acts as a complete, remote Input/Output controller, performing 19 pre-programmed I/O tasks received from a host processor via a half-duplex serial link.

- Provides programmable remote I/O functions as well as network communications on a single 40 pin chip
- Performs a specific programmed function on command; including:
  - Bit input and bit output
  - Byte input and byte output
  - Set, clear and toggle selected pins

- Interface to A/D converter, D/A converter or 3½ digit DPM
- Monitor input pins for a specific bit pattern
- 19 preprogrammed functions
- Allows a user to communicate with multiple SCU's over a single communications channel
- Asynchronous serial data transmission
- Secure, error resistant data link protocol
- Up to 255 SCU's allowed in a network
- Easy to use and implement
- Requires single +5 volt supply
- Low power (275mW typ)

# Z80 Development Aids

### MATRIX (MK78125)

### **Development System**

- Powerful features, yet simple operation
- Complete Disk-Based Computer
- Batch-File-Definable Operation
- Built around separately-available OEM cards (OEM-80E, RAM-80BE, FLP-80E and OEM software FLP-80DOS)
- Supports AIM\* Series extended debug for Z80/3870
- Z80 multichip family-based
- 64K Dynamic RAM memory
- 4 programmable 8-bit parallel I/O ports with handshake lines
- 3-channel event counter/timer
- Dual 250K-byte storage per single-sided drive

- Flexible I/O system through Logical Unit assignment
- Both Physical and Logical Record I/O controller system application programs
- Relocating/Absolute Linking Loader
- Linker to build executable File images
- Peripheral Interchange Program for File Generation, Deletion, Cataloging, Maintenance, Status, Listing
- Virtual Memory Text Editor
- Debugger with software single-step and relocatable debug
- DOS with 20 request commands and complete error reporting for developing other applications programs
  - \*Trademark of Mostek Corporation

# SDB-80E(MK78103/MK78104)

### Software Development Board

 The SDB-80E is a stand-alone microcomputer designed by Mostek around the advanced Z80 microprocessor family.

#### Hardware

- 4K bytes of RAM, or 16K Bytes of RAM
- Four 8-bit I/O ports with handshake lines
- Serial ASCII interface (110-9600 BAUD)

- Fully-buffered for system expandability
- Four counter/timer channels
- On-board capacity from 5K bytes of PROM to 20K bytes of ROM/PROM

### Software

- 2K x 8 Operating System in ROM (DDT-80)
- 8K x 8 assembler/editor in ROM (ASMB-80)
- Channeled I/O for user convenience

### DDT-80(MK78118)

### Operating System for SDB-80E

- DDT-80 is the Operating System for the Z80 Software Development Board (SDB-80). It resides in a 2K ROM (MK34000) resident on the SDB-80 provides the necessary tools and techniques to operate the system, i.e., to efficiently and conveniently perform the tasks necessary to develop microcomputer software.
- Program debug capability
- Channeled I/O for user convenience
- I/O peripheral drivers is supplied
- Interactive hexadecimal addition and subtraction when entering commands
- User-expandable operating system

### ASMB-80(MK78119)

### Assembler/Editor/Loader

- The Mostek ASMB-80 is a software package which consists of a Text Editor, Z80 Assembler, and Relocating Linking Loader. The software is supplied in ROM for the Mostek SDB-80 (Z80 Software Development Board).
- Allows input and modification of ASCII text on the Mostek SDB-80
- · Allows line and character editing
- Has two alternate command buffers for pseudomacro command capability

# XFOR-80(MK78117)

### Fortran IV Cross Assembler

- The XFOR-80 is a cross Assembler for assembling Z80 source programs into the corresponding machine code for the Z80 microprocessor
- ANSI-Fortran IV Source
- Executes on 16-bit word length machine
- Cross Assembler is machine independent for: Character representation (ASCII or BCD) Numerical representation (1's or 2's complement)

- I/O logical device assignments are user-definable
- 2-pass assembly easily accommodated if no secondary storage is available
- Memory required: 20K words (typical)
- Assembles all standard Z80 source statements and MACROs
- · Object output in compatible hex format
- Size of program to be assembled is limited only by memory available for symbol table

## MACRO-80(MK78165) Z80 MACRO Assembler

- Assembles standard Z80 instruction set to produce relocatable, linkable, object modules.
- Provides nested conditional assembly, an extensive expression evaluation capability, and an extended set of assembler pseudo-ops.
- Provides options for obtaining a printed crossreference listing, terminating after pass 1 if errors are encountered, redefining standard Z80 opcodes via MACROs, and obtaining an unused-symbol reference table.

- Provides the most advanced MACRO handling capability in the microcomputer market.
- Listing and object modules can be output on disk files or any device.
- Compatible with other Mostek Z80 assemblers and FLP-80DOS Version 2.0 or higher. Requires 32K or more of system RAM.
  - MACRO-80 is fully upward compatible with all other Mostek Z80 Assemblers.

# AIM-80E(MK78106)

# Application Interface Module (2.5MHz) Hardware

- Direct Interface with SDB-80E and MATRIX Development System
- Single-step/multistep with register trace
- Execution intercept (breakpoint) intercepts on memory access, port access, external trigger, event counter, or delay counter
- Push-button execution intercept
- 256 x 32 history memory which samples Data Bus, Address Bus, M1, MREQ, RD, IORQ, and four external probes

- Selectable history memory clock M1, MREQ, IORQ, or INTERRUPT ACKNOWLEDGE
- Selectable history memory clock conditions read only, write only, DMA only, or external probe only (high or low)
- 8K x 8 ROM memory (firmware)
- Limited to 2.5MHz emulation

#### Software

- ROM-resident mnemonic disassembler
- ROM-resident RAM test for SDB or target RAM

# Micro Peripheral Accessories

### AIM-Z80AE

# **Application Interface Module (4MHz)**

- Direct interface to the Matrix Development System
- Single-step/multistep with register trace
- Execution intercept (breakpoint) intercepts on memory access, port access, external trigger, event counter or delay counter
- 1024 x 48 History memory which samples Data Bus, Address Bus, M1, MREQ, RD, I0RQ and 18 external probes—this capability replaces logic analyzer.
- 16K or 32K bytes of real-time-emulation RAM (no wait states) mappable into the target memory map in 256-byte increments.
- Extensive DEBUG software supplied on FLP-80DOS compatible diskette.

# PPG-8/16(MK79081) PROM Programmer

The PPG-8/16 is a low-cost UV PROM programmer directly compatible with the SDB-50/70, SDB-80 and AID-80F.

- Programs, reads, and verifies 2708, 2758, and 2716-type EPROMs
- Zero-insertion-force socket
- Power and programming indicators

# MOSTEK VT(MK78190-1) CRT Terminal

- All 128 ASCII Codes
- 94 Displayable Characters including Lower Case
- High-Resolution Characters using a 7 x 10 Dot Matrix
- ANSI-Standard Keyboard Layout
- Separate Integral Numeric Pad

- Dual Intensity
- · Cursor Addressing and Sensing
- EIA and 20mA Interface
- Baud Rates up to 19.2KB
- Auxiliary EIA Output
- Remote Editing Commands
- Standard or Reverse Video

# MOSTEK LP(MK78191-1)

### Line Printer

- Bidirectional logic-seeking printing
- Print original plus 5 copies

- Tractor Feed/Pin Feed platen
- 7 x 7 dot matrix, 64 Standard ASCII characters
- Print speed: 120cps
- Cables included to interface to Matrix.



# **MICROCOMPUTER SYSTEMS**

For powerful and versatile microcomputer systems, Mostek has your solution.

Mostek's MD Series™ features both stand-alone

microcomputer boards (designated MD) and expandable microcomputer boards (designated MDX). All the boards measure just 4.5" x 6.5" making system packaging easier.

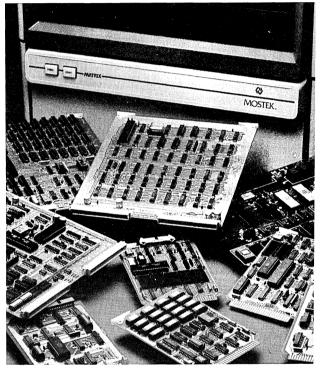
The MDX boards are modularized by function. This reduces system cost since the designer buys only the specific functional modules his system requires. Any combination of MDX boards can be used to configure the final system because all the MDX boards are STD-Z80 BUS compatible.

The STD-Z80 BUS is a multisourced motherboard interconnect system designed to handle any MDX card in any card slot.

Mostek's SD SERIES™ of OEM microcomputer boards offer powerful features and versatility to the OEM. Utilizing the Mostek Z80 and Mostek's industry-standard memories, the SD SERIES™ enables the user to construct high-performance, memory-intensive systems for a wide range of applications.

Mostek's Development Systems come in a wide array of boards and systems, the most powerful being our Matrix™ Series Development Systems. These Z80-based dual-floppy-disk development systems develop and debug software and hardware for Mostek's entire microcomputer line, including the SD SERIES™ and MD SERIES™

A powerful software operating system—FLP-80DOS—speeds and eases the design cycle with powerful commands. BASIC, and FORTRAN are also available for use on the Matrix™ Series.



# **Microcomputer Systems**

### OEM-80E

# **Z80 Single-Board Computer**

- 4 or 16K Bytes of RAM on-board
- Four fully-buffered and terminated userprogrammable 8-Bit I/O ports with handshake lines and sockets for buffers and terminators
- Serial ASCII Interface (110-9600 Baud)
- Four counter/timer channels
- On-board capacity for 5-20K bytes of EPROM or ROM
- Bipolar mapping PROMs for flexibility

### RAM-80E Series

## **Random Access Memory Board**

- The RAM-80E is designed to provide RAM expansion capability for the Z80-based OEM-80E Microcomputer. For user flexibility, it is offered in three basic configurations designated RAM-80AE, RAM-80BE and RAM-80CE.
- The RAM-80AE is the basic 16K-byte RAM board for users requiring the most economical means for adding RAM to an OEM-80E Microcomputer. It is designed using the highperformance MK4027-4 4096 x 1-bit dynamic RAM, and includes address strapping options

for positioning the decoded memory space to start on any 4K incremental address boundary.

- The RAM-80CE is similar to the RAM-80AE except that it is shipped with 4116 16K x 1-bit RAMs. The RAM-80CE can be expanded to 64K bytes of RAM by the addition of 4116 RAMs.
- The RAM-80BE is a combination memory and I/O expansion board. The memory may be configured to have a memory capacity of 16K, 32K, 48K or 65K bytes of RAM.
- Memory Access Time—345ns (maximum)
- Memory Cycle Time—450ns (minimum)

### FLP-80E

# **Floppy Disk Controller**

- Soft-Sector format-IBM 3740 compatible
- Controls up to four single-or double-sided single-density drives
- Full-sector (128 Bytes) FIF0 buffering for data allows real-time operation
- Double buffering for control and status
- FLP-80DOS Operating System available

#### VDI-80E

# Video Display Interface

- Upper and lower case character set
- User-programmable character font
- Inverse video is character-by-character programmable
- 110-9600 Baud Serial ASCII interface
- 3300 Char/sec parallel interface
- Direct cursor addressing
- 50/60 Hz operation

#### A/D-80E

# **Analog-to-Digital Conversion Boards**

The A/D-80E series has 7 different boards with different features and options.

- Interfaces with OEM-80E, SDB-80E and Matrix
- 12-bit resolution
- Three input ranges
  - Low-level: 0-10 millivolts or ±10 millivolts
  - High-level: 0-5 volts or ±5 volts, 0-10 volts or ±10 volts

- Wide-range both low- and high-level ranges through jumper selection
- Current-input option
- Programmable-gain option
- Isolation available for low-level and wide-range inputs
- Single-ended/differential inputs
- 35kHz conversion speed standard, 100kHz optional
- Two-channel 12-bit D/A with scope control

### OEM RACK ASSEMBLIES

### **SD-RMC6 Rack-Mounted System**

- 6 slots for SD/E series modules
- Saturated power supply
  - +5V at 12a
  - +12V at 1.5a
  - -12V at 1.5a
- PC motherboard designed for minimum crosstalk
- Simple cabling to external peripherals

- 19" rack
- 7" panel height
- Fan-cooled
- 50/60 Hz 100/115/230 volt operation
- Works with SD/E series cards
- Table-top version also available
- For stand-alone or expanded (with RMDFSS) operation

### **MATRIX (MK78125)**

### **Development System**

A dual disk-based microcomputer development system which provides the user with state-of-theart capability for creating and debugging programs for several types of microcomputers.

- Contains OEM-80E, RAM-80BE, FLP-80E, 2 single-sided single-density floppy disc drives
- Expandable to 6 SDE cards

- Includes the following software packages:
  - Floppy Disc Handler
  - Input/Output Control System (IOCS)
  - Monitor
  - Z80 MACRO Assembler (MACRO-80)
  - Editor (EDIT)
  - Peripheral Interchange Program (PIP)
  - Linker (LINK)
- Compatible with In-Circuit Emulator cards for the Z80 and the 3870 family

### RMDFSS

### **Dual-Floppy-Disk Enclosure**

- Horizontally mounts two standard 8-inch floppy-disk units
- Integral power supply
  - +24 Volts at 3a
  - +5 Volts at 3a
  - -5 Volts at 1a

- 50/60 Hz 100/115/230 volt operation
- Compatible with SD-RMC6
- 19" rack mounting
- 7" standard height
- Available with and without floppy drives

# 🛮 Microcomputer Software 🚞

#### FLP-80DOS

- Full operating system available to be licensed by OEMs
- Includes the following functions
  - Monitor
  - Debugger

- Text Editor
- Z80 Assembler
- Linker
- Peripheral Interchange Program
- Generalized I/O System for peripherals
- FLP-80DOS with no system PROMs

# MOSTEK ANSI BASIC (MK78157)

# **Basic Interpreter**

- Operates with FLP-80DOS and 32K bytes of memory
- Direct access to CPU I/O ports
- Unique features include long variable names, substring assignments and hexadecimal and octal constants
- Full PRINT USING capabilities for formatted output
- Arrays with up to 255 dimensions
- Can call assembly language subroutines
- Ability to read or write any memory location (PEEK, POKE)

# MOSTEK FORTRAN(MK78158) Fortran IV Compiler

- All of ANSI standard FORTRAN IV (X 3.9 -1966) except complex data types
- · Generates relocatable linkable object code
- Subroutines may be compiled separately and stored in a system library
- Long descriptive error messages
  - Z80 assembly language subprograms can be called from FORTRAN programs
- Runs with FLP-80DOS and 48K bytes of RAM

# DDT-80(MK78118)

# **Operating System for SDB-80E**

 DDT-80 is the Operating System for the Z80 Software Development Board (SDB-80E). It resides in a 2K ROM (MK34000) resident on the SDB-80E and provides the necessary tools and techniques to operate the system, i.e., to efficiently and conveniently perform the tasks necessary to develop microcomputer software.

- Program debug capability
- Channeled I/O for user convenience
- I/O peripheral drivers
- Interactive hexadecimal addition and subtraction when entering commands
- User-expandable operating system

### ASMB-80(MK78119)

### Assembler/Editor/Loader

 The Mostek ASMB-80 is a software package which consists of a Text Editor, Z80 Assembler, and Relocating Linking Loader. The software is supplied in ROM for the Mostek SDB-80 (Z80 Software Development Board).

- Allows input and modification of ASCII text on the the Mostek SDB-80F
- · Allows line and character editing
- Has two alternate command buffers for pseudomacro command capability

# MACRO-80(MK78165) Z80 MACRO Assembler

- Assembles standard Z80 instruction set to produce relocatable, linkable, object modules.
- Provides nested conditional assembly, an extensive expression evaluation capability, and an extended set of assembler pseudo-ops.
- Provides options for obtaining a printed crossreference listing, terminating after pass 1 if errors are encountered, redefining standard

- Z80 opcodes via MACROs, and obtaining an unused-symbol reference table.
- Provides the most advanced MACRO handling capability in the microcomputer market.
- Listing and object modules can be output on disk files or any device.
- Compatible with other Mostek Z80 assemblers and FLP-80DOS Version 2.0 or higher. Requires 32K or more of system RAM.
- MACRO-80 is fully upward compatible with all other MOSTEK Z80 Assemblers.

# MACRO-70(MK79085)

# 3870/F8 Macro Cross Assembler

- Assembles standard 3870/F8 instruction set to produce relocatable, linkable object modules.
- Provides nested conditional assembly, an extensive expression evaluation capability and an extended set of assembler pseudo-ops.
- Provides options for obtaining a printed cross-

reference listing, terminating after pass 1 if errors are encountered, redefining standard 3870 opcodes via macros, and obtaining an unused-symbol reference table.

- Provides the most advanced macro handling capability on the microcomputer market.
- Compatible with other Mostek 3870/F8 assemblers and FLP-80DOS Version 2.0 or higher. Requires 32K or more of system RAM.

### MITE-80/BIOS (MK77972)

### **Multiple Independent Task Executive**

- Provides basic services for managing CPU's resources
- Runs under FLP-80DOS
  - Operates with the MATRIX Development System
  - Operates with an MDX System
- Accomodates applications requiring real-time asynchronous event handling

- · Has simplistic data structures
- Provides fast context switching between tasks
- Provides up to 127 priority levels for task execution
- Provides message queing by several options
- Handles unlimited number of tasks
- · Accomodates interrupt-driven device handlers
- Can be stored in RAM or EPROM/ROM

# MEDEX-80(MK77968)

## MDX Expandable Diagnostic Exercise

- Modular MDX board-level software
- User-expandable diagnostics
- Stand-alone or Integrated Diagnostic Package Execution
- Can Be Interrupt-Driven
- Board-level Diagnostics for CPU SC/D A/D8 RAM FLP ROM MATH
- Requires MDX-CPU and MDX-SC/D for operation

### LIB-80-V1 (MK78164)

# FLP-80DOS Library Volume I

- Includes 23 useful subroutines and programs for the Z80, including:
  - Lawrence Livermore Lab's Basic
  - Generalized sort program for up to 8 fields per record
  - 8080 Z80 Source code converter
  - Fast disk-to-disk copy utility
  - Hexadecimal Dump Utility to duplicate memory on files

- Assembly Language Formatter Utility to format Z80 source into columns
- Word Processor Program Version 2.0, used to format documents
- Disk Recovery Utility used to recover bad disk files
- All programs are supplied in source, object, and binary format with complete documentation on a standard FLP-80DOS diskette.

# STD-Z80 Bus Systems

The STD BUS concept is a joint design between Mostek and Pro-Log to satisfy the need for cost-effective OEM Microcomputer Systems. The definition of the STD BUS and the MD Series™ of OEM microcomputer modules is a result of years of microcomputer component and module manufacturing experience. The STD BUS uses a motherboard interconnect system concept and is designed to handle any MD Series™ card in any card slot. Modules for the STD BUS range from CPU, RAM and EPROM Modules to Input, Output, A/D and TRIAC control modules.

Printed circuit modules for the STD BUS are a compact 4.5 x 6.5 inches providing for system partitioning by function (RAM, PROM, I/O). This smaller module size makes system packaging easier while increasing MOS-LSI densities provide high functionality per module. Mostek has defined the STD-Z80 BUS which is a subset of the general-purpose STD BUS. This bus is defined extensively for the Z80 microprocessor and its

supporting peripherals. By specifying the STD-Z80 BUS, exact functional pin descriptions and bus timing can be given. A STD-Z80 system will be guaranteed to work with all STD-Z80-designed boards. The STD-Z80 BUS fully supports the powerful Mode 2 interrupt capability of the Z80 microprocessor.

The MD Series™ provides both STD-Z80 BUS expandable modules, designated as MDX, and single-board stand-alone modules, designated as MD. For those applications requiring bus expandability, the MDX-CPU1 provides that capability; if a single-board microcomputer is sufficient, the MD-SBC1 provides the system designer with a powerful Z80-based microcomputer solution.

The MD Series<sup>™</sup> of OEM microcomputer boards and the STD-Z80 BUS offer the most cost-effective system configuration available to the OEM system designer.

# MDX Data Processing

### MDX-CPU1 (MK77850-0)

Designed to be the CPU of a multi-module Z80-based microcomputer. STD-Z80 BUS compatible on a 4.5 x 6.5 inch card size. This module is compatible with all Mostek Z80 development equipment.

- Z80-CPU
- 4K x 8 PROM (2716s not included)
- 256 x 8 RAM (compatible with DDT-80 debugger)

- Flexible memory decoding
- Restart to 0000H or to E000H
- Four counter/timer channels
- 4MHz version available (MDX-CPU1-4) (MK77850-4)
- STD-Z80 BUS compatible
- Single +5-volt supply

## MD-SBC1 (MK77851-0)

Designed to be a complete Z80 microprocessor system on one  $4.5 \times 6.5$  inch card with a 56-pin edge connector.

- Z80 processor
- 2K-byte RAM capacity with 1K included

- Sockets for four 2716 EPROMs
- Crystal-controlled clock
- Three 8-bit output ports
- Two 8-bit input ports
- External expansion to 16 ports

### MDX-MATH (MK77852-0)

Designed to provide high-speed computation using AMD-9511 math processor.

- Uses AMD-9511 math processor
- Interrupt-driven data transfers

- Asynchronous operation from system clock
- On-board Wait-State generator
- 32-bit Floating Point operations
- STD-Z80 BUS compatible

# MDX Memory Family

### MDX-DRAM (MK77750/2/4)

Designed to be add-on RAM module for the STD-Z80 BUS using Mostek's dynamic RAMs.

- Memory sizes
  - 8K x 8 (MDX-DRAM8, MK7750-0); uses 4108
     RAMs
- 16K x 8 (MDX-DRAM16, MK77754-0); uses 4116 RAMs
- 32K x 8 (MDX-DRAM32, MK77752-0); uses 4116 RAMs
- 4MHz version available (MDX-DRAM-4)
- STD-Z80 BUS compatible

### MDX-EPROM/UART (MK77753-0)

Designed as a universal PROM add-on module for the STD-Z80 BUS. Includes a fully-buffered asynchronous I/O port with a teletype reader-step control.

- 10K x 8 EPROM/ROM (2716's not included)
- Serial I/O channel
  - RS-232 and 20mA interfaces
  - Reader-step control for teletypes
  - Baud-rate generator: 110-9600 baud
- 4MHz version available (MDX-EPROM/UART-4)
- STD-Z80 BUS compatible

### MDX-SRAM (MK77755/6)

Designed as a static RAM card for the STD-Z80 BUS using Mostek RAMs

• Two memory sizes available

- 4K x 8 MK77755: MDX-SRAM 4 (uses 4118s)
- 8K x 8 MK77756: MDX-SRAM 8 (uses 4118s)
- Selectable addressing on 4K boundary
- STD-Z80 compatible

### MDX-EPROM-4 (MK77758)

Designed as a 2716/2758 EPROM module.

Supplied with 8 2716 EPROMs

- Selectable Wait-State generator
- Single +5-volt supply
- STD-Z80 BUS compatible

# MDX-UMC(MK77759)

Designed as a Universal Memory Card for use with STD-Z80 BUS.

- Can use the following memory devices:
  - Static RAM/EPROM/ROM
  - MK4118 (1K x 8), MK2758 (1K x 8), MK30000 (1K x 8)
- MK4802 (2K x 8), MK2716 (2K x 8), MK34000 (2K x 8)
- 8 sockets for memory devices
- Selectable Wait State for each socket
- STD-Z80 BUS compatible

# ∃MDX - I/O Family ≡

# MDX-PIO(MK77650-0)

Designed to be a general-purpose interruptable programmable parallel interface for the STD-Z80 BUS using MK3881 Z80-PIOs.

- Fully programmable

   Up to 4 input/output ports any mix: 2
   bidirectional plus 2 input or output ports
- Full interrupt capability

- Supports Z80 mode 2 interrupts
- Two handshake signals for each port
- Strap-selectable port addresses
- Single +5-volt supply
- STD-Z80 BUS compatible
- 4MHz version available (MDX-PIO-4) (MK77650-4)

### MDX-SIO (MK77651-0)

Designed to be an interrupt-driven multiprotocol asynchronous or synchronous I/O module for the STD BUS using the Mostek MK3884 Z80-SIO.

- Two full-duplex multi-protocol channels
  - Asynchronous
  - Bisynchronous
  - HDLC or SDLC
  - Receiver data registers quadruple-buffered

- Transmitter data registers double-buffered
- Dual baud-rate generator
- Data and clock buffered for RS-232 and 20mA current loop
- Eight modem controls buffered for RS-232
- STD-Z80 BUS compatible
- 4MHz version available (MDX-SIO-4) (MK77651-4)

### MDX-A/D 8 (MK77669-0)

Designed to be an 8-bit 16-channel analog-to-digital converter module.

- 16 single-ended input channels
- 5-Volt input range

- Accuracy to ±1/2 LSB
- No adjustments required
- 4MHz version available (MK77669-4)
- STD-Z80 BUS compatible

### MDX-AIO(MK77654)

Designed to be a complete analog input/output module. Contains both A/D and D/A converters on a STD-Z80 module.

- 10-bit A/D converter with 16 single-ended or 8 differential input channels
- Sample-and-hold amplifier
- 2 output channels with 8-bit D/A converters
- On-board DC/DC converter
- +5-volt supply
- STD-Z80 BUS compatible

### MDX-A/D-12 Family Family of 12-Bit Analog-to-Digital MD Series™ boards

12-bit resolution

- 16 single-ended or 8 differential inputs
- Expandable input capability
- Mode 2 Interrupts generated
- STD-Z80 BUS compatible

# MDX-D/A Family Family of Digital to Analog MD Series™ Boards

- 8-bit or 12-bit D/A output resolution
- 4 output channels per board
- STD-Z80 BUS compatible

# MDX - Accessory Family 💳

# MDX-FLP (MK77652-0)

Designed to be a floppy disk controller module capable of handling up to 4 drives on the STD-Z80 BUS.

On-board DMA controller

- Supports up to 4 drives
- Single-density operation
- IBM 3740 soft-sector compatible
- Supports 5- or 8-inch drives
- STD-Z80 BUS compatible

## MDX-DEBUG (MK77950-0)

Designed to provide a low-cost way to generate and debug Z80 programs on the STD BUS. This module may be used in place of external development equipment.

- 10K bytes of firmware (DDT-80, ASMB-80)
  - Editor (line or character oriented)
  - Debugger (memory exam, register exam, breakpoint, etc.)
  - Assembler (relocatable object code with linking loader)

- Serial I/O port
  - RS-232 and 20mA interfaces
  - Reader-step control for teletype
  - Baud-rate generator: 110-19,200 baud
- STD-Z80 BUS compatible
- 4MHz version available (MDX-DEBUG-4) (MK77950-4)
- Requires MDX-CPU and MDX-DRAM. Any MDX-DRAM module will work; the larger RAM modules provide larger edit buffers and symbol tables

# MDX-PROTO(MK77951-0)

Designed to provide a low-cost evaluation package for the MD Series™ of OEM microcomputer modules.

- MDX-CPU1
- MDX-DRAM8
- MDX-DEBUG

- Wire-Wrap Module
- Cables to interface a Teletype and EIA RS-232 Terminal
- Extender Board
- 4MHz version available Card Cage (MDX-PROTO-4) (MK77961-4)

### MDX-SST (MK77958)

Provides Single-step instructions in conjunction with MDX-CPU1 card

Hardware Single-step capability

- STD-Z80 BUS compatible
- Compatible with DDT-80 Operating System
- Single +5-volt supply

### MDX-INT(MK77967-0)

Provides interrupt expansion capability on the STD-Z80 Bus

- User-programmable CTC provides:
  - 4 vectored interrupt inputs or,
  - 4 counter timer channels or
  - Any combination of the above

- Daisy-chain interrupt expansion
- Single +5-volt supply
- STD-Z80 Bus compatible
- 4MHz option available (MDX-INT-4) (MK77967-4)

### MDX-SC/D (MK77963-0)

Designed as a system controller and diagnostic module for the MD Series™ of boards.

- Provides operator interface via control switches and display readouts
- Push-button reset
- Memory sockets for up to 10K of EPROM
- 4MHz version available (MDX-SC/D-4) (MK77963-4)
- Single +5 volt supply

## MD-PWR1 (MK77964)

Designed as a system power supply for MDX modules.

Open-frame supply

- +5 volts at 6.0A.; ±12 volts at 1.7A.
- 115/230 V.A.C. = 10%; 47 440Hz
- +5 volts over-voltage protected
- Fold-back current limit

### MD ACCESSORIES

- MD-WW2 (MK77952) MD Series™ Wire Wrap card with holes only
- MD-EXT (MK77953) MD Extender Card
- MD-WW1 (MK77959) MD Series™ Wire Wrap card with bussed power and ground
- MD-CC12 (MK77969) MD Series 12-slot card cage on 34" centers
- MD-CC6 (MK77923) MD Series 6-slot card cage on 34" centers

#### MD SOFTWARE

- DDT-80 (MK78118) 2K ROM Operating System for Proto Kit
- ASMB-80 (MK78119) 8K ROM-based Text Editor, Z80 Assembler and Relocating Linking Loader
- XFOR-80 (MK78117) FORTRAN IV Cross Assembler for Z80 microprocessor
- FLP-80DOS (MK77962) Floppy-Disk Operating System with MDX PROMs
- MITE-80 Multiple Independent Task Executive
- Mostek ANSI BASIC
- MEDEX-80 MD Series™ Diagnostic Programs

# MD-RMC12 (MK77966)

Provides standard 19" rack mountable environment for MD Series™ modules.

- Removable structural-foam front panel
- 12-slot STD-Z80 BUS card cage
- Integral power supply w/line card and 150 CFM cooling fan
- Reset and power-on indicator

### RMDFSS(MK78183)

Provides rack-mount capability for two 8" floppy • 7" height disk drives.

Integral power supply

- 19" rack mounting
- Available with two 5" drives

# **MEMORY SYSTEMS**

Mostek Memory Systems is one of the industry's fastest growing suppliers of memory systems. And quality is only the first reason.

Taking full advantage of our leadership in

memory component technology, Mostek Memory Systems offers a broad line of products, all with the performance and reliability to match our industry-standard circuits.

Add-in memory systems include compatible memories for standard minicomputers such as PDP-11\*, PDP-8\*, LSI-11/2\*, LSI-11/23\*, Nova 3,\*\* Eclipse,\*\* and VAX\*\*.

For PDP-11/70\* add-on systems, our 7-inch chassis with a two megabyte capacity is the most compact available.

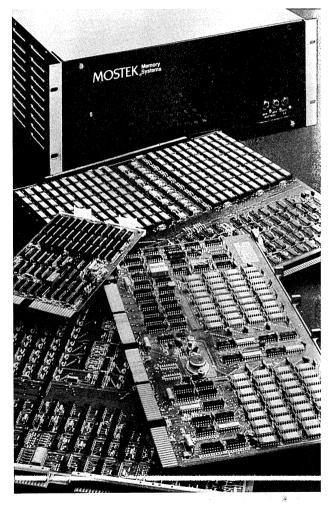
Mostek's general purpose MK8000 (128K x 24 storage card) in a 12½ inch chassis is designated the MK8600. This system has a maximum capacity of five megabytes and is ideal for mass storage applications.

For density, performance, and reliability, come to the source: Mostek Memory Systems.

\* TM of Digital Equipment Corporation \*\*TM of Data General Corporation

NOTE:

STANDARD MEMORY SYSTEMS ARE SOLD BY THE MEMORY SYSTEMS SALES FORCE. PLEASE CALL YOUR LOCAL OFFICE SHOWN IN THE SALES OFFICE INDEX.



# 🛚 Memory Systems 🚞

#### BUK8000

### **General Purpose OEM Memory**

A single card with speed and power features that make Mostek's 128K x 24 MK8000 the best value in the industry. For small storage or rotating media replacement it's possible to configure a one megabyte (128K x 72) system with only three memory cards.

#### **FEATURES**

Extender card

ECC option card (application dependent)
 High speed

Byte control

I/O socket card for customer I/O

Inverting or non-inverting data

Address and data may be bidirectional bus

• Customer controlled timing options available

• +15V option

#### **SPECIFICATIONS**

Capacity:

Words 16384 to 131072 Bits 12 to

24 Max 131K x 24 on a single PC

card

Speed:

Access 250ns Cycle 450ns

Optional: Access 175ns

Cycle 275ns

Power:

+12V +5% @ 1.10 Amps Max. +5V

+5% @ 3.00 Amps Max.

**Operating Modes:** 

R,W,R/M/W

Temperature:

Operating 0° C to 50° C up to 90%

RH with no condensation

Storage -40° C to 125° C up to 95%

RH with no condensation

Dimensions:

15.40L x 11.75W x 0.4H

Weight:

2.5 lbs./per storage card

### MK8001

### PDP-11 Add-In Memory

With several capacity options — 16K, 32K, or 64K words x 18 bits, on a single hex board. And they're completely hardware and software compatible with equivalent Digital Equipment Corporation memory modules.

#### **FEATURES**

High speed

Low power

Parity option

Address select dip switches (4K increments)

Bus terminator option

Hex card size

I/O page select 1K, 2K, 4K

Full one year warranty

#### **SPECIFICATIONS**

Capacity:

Words 16384 to 65536 Bits 16 or

18 Max 65K x 18 on a single PC

card

Speed:

Access 350ns

Cycle 650ns

Power:

Operating 15 watts

Standby 8 watts

Battery back-up provision

Temperature:

Operating 0°C to 50°C up to 90%

RH with no condensation

Storage -40° C to 125° C up to 95%

RH with no condensation

Bus Loading:

One load per board

Operating Modes:

R,W, Refresh

Dimensions:

8.8L x 15.69W x 0.4H

Weight:

2 lbs.

#### MK8003

# **NOVA 3 Add-In Memory**

A super-dense 128K x 17 configuration. The MK8003 add-in memory systems series is available in 16K, 32K, 64K or 128K words x 17 bits, on a single board measuring just 15" x 15" x .440.

#### **FEATURES**

Totally hardware and software compatible

Plugs into any memory slot

Low power

High reliability

• Full one year warranty

### **SPECIFICATIONS**

Capacity:

Words 16384 to 131072 Bits 17

Max 128K x 17 on a single PC

Typ. Max.

card

Speed:

Access 350ns max

Cycle 700ns

Power: +15 ±59

+15 ±5% 0.6A 0.75A + 5 ±5% 2.4A 3.0A

Operating Modes:

R,W,R/M/W, Refresh

Temperature:

Operating 0°C to 55°C up to 90%

RH with no condensation

Storage -55° C to 85° C up to 95%

RH with no condensation

Dimensions:

15.0L x 15.0W x 0.44H

Weight:

3 lbs.

#### MK8004

# **Eclipse Add-In Memory**

The MK8004 add-in memory systems series is available in 16K, 32K, 64K, or 128K words  $\times$  16/21 bits, 15"  $\times$  15"  $\times$  .440.

#### **FEATURES**

Totally hardware and software compatible

Low power

High reliability

One year warranty

ERCC bits

#### **SPECIFICATIONS**

Capacity:

Words 16384 to 131072 Bits 16/21

Max 128K x 16/21

Speed:

Access 300ns Read cycle 500ns Write cycle 700ns

Operating Modes:

R,W,R/M/W, Refresh

Temperature:

Operating 0°C to 50°C up to 90%

RH with no condensation

Storage -55° C to 85° C up to 95%

RH with no condensation

Dimensions:

15.0L x 15.0W x 0.44H

#### MK8005

# LSI-11/2, LSI-11/23 Add-In Memory

A totally hardware and software compatible card for the LSI-11, LSI-11/2, LSI-11/23, or PDP-11/03 or PDP-11/23. The MK8005 series ranges in capacity from 8K x 16 to 32K x 16. Capacities with optional byte parity are 8K x 18 to 32K x 18.

#### **FEATURES**

32K x 16 on a single "dual" card

Low power

Internal distributed refresh

Address DIP switch for address start

Optional byte parity generation and checking

• Full one-year warranty.

Addressable from 0K to 128K

#### **SPECIFICATIONS**

Capacity:

Words 8192 to 32768 Bits 16 or 18

Max 32K x 18 on a single PC card

Speed:

Write access 86ns Read access 318ns

Cycle 425ns

Power:

Operating +5VDC, 1.5A

typical +12VDC, 0.1A typical

Operating Modes:

R,W,R/M/W, Refresh

Temperature:

Operating 0°C to 50°C up to 90%

RH with no condensation

Dimensions:

9" x 5.2"

Weight:

1 lb.

# MK8009-A1"X"/PDP-8 Add-In Memory

A highly versatile system that is totally hardware and software compatible with DEC's PDP-8-A version. The MK8009-A1"X" lets you add up to 128K x 12 of memory to the PDP-8 in two Omnibus slots.

- Single +5V supply
- Synchronous "hidden" refresh
- 16K RAM technology (MK4116)
- Full one year warranty
- Totally hardware and software compatible with PDP-8-A
- · Low cost high reliability

- Compatible with DEC memory management to extend total capacity to 128K x 12 with just two cards
- Address DIP Switch for assigning configuration in 4K increments
- Flexible capacities: 16K x 12, 32K x 12, 48K x 12, 64K x 12

### **SPECIFICATIONS**

Cycle/Access Time: Compatible with PDP-8A

Power Requirements: +5VDC, 2.5A operating(Max) (All

other voltages generated on the

board.)

Power Dissipation: 12.5W operating (max)

10.0W standby (max)

Weight:

1lb.

Size:

8.44" x 13.2"

# MK8009-A0"X"/PDP-8 Add-In Memory

A highly versatile system that is totally hardware and software compatible with DEC's PDP-8-E, F and M versions. The MK8009-A0"X" lets you add up to 32K x 12 of memory to the PDP-8 in one Omnibus slot.

### **FEATURES**

- Single +5V supply
- Synchronous "hidden" refresh
- 16K RAM technology (MK4116)
- Full one year warranty
- Totally hardware and software compatible with PDP-8-E, F, M

- Low cost high reliability
- Address DIP Switch for assigning configuration in 4K increments
- Flexible capacities: 16K x 12, 32K x 12

#### **SPECIFICATIONS**

Access/Cycle Time: Compatible with PDP-8E, F, M

Power Requirements: +5VDC, 2.5A operating (max) (All

other voltages generated on the

board)

Power Dissipation: 12.5W operating (max)

10.0W standby (max)

Weight:

1lb.

Size:

8.44" x 10.45"

#### MK8011

# PDP-11 Fast, Parity Checking Add-In Memory

The MK8011 features a fast write access time of 100ns for applications requiring high throughput. Available is on-board parity generation and checking. The MK8011 series offers capacity options of 16K, 32K, or 64K x 18 on a single card.

#### **FEATURES**

High speed

Includes on-board parity generation and checking

Low power

Address select DIP switches (4K increments)

Single hex card size

I/O page select 1K, 2K, 4K

Full one-year warranty

Totally hardware and software compatible

#### **SPECIFICATIONS**

Capacity:

Words 16384 to 65536 Bits 18 Max

64K x 18 on a single PC card

Speed:

Write access 100ns

Read access 380ns

Cycle 650ns

Power:

Operating 15 watts

Standby 8 watts

Battery backup provision

Temperature:

Operating 0° C to 50° C up to 90%

RH with no condensation

Storage -40° C to 125° C up to 95%

RH with no condensation

Bus Loading:

One load per board

**Operating Modes:** 

R.W. Refresh

Dimensions:

8.8L x 15.69W x 0.4H

Weight:

2 lbs.

### MK8012/PDP-11

# Add-In Memory

This extremely dense 128K x 18 add-in memory board is compatible with the PDP-11/04, 05, 10, 15, 20, 34, 35, 40, 45, 50, 55, & 60. It is completely hardware and software compatible and is available with parity option.

#### **FEATURES**

Address select DIP switch (4K Increments)

Full year warranty

I/O page select 1K, 2K, 4K

Parity option

Low power

Dynamic RAM technology

#### SPECIFICATIONS

Capacity:

Words 65536 to 131072 Bits 16/18

Max 128K x 18 on singe P.C. Card

Speed:

Access 350ns

Cycle 650ns

Power:

20 Watts operating

10 Watts standby

**Battery Backup Provision** 

Bus Loading:

One load per board

Temperature:

Operating 0° C to 50° C up to 90%

RH with no condensation

Storage -40° C to 125° C up to 90%

RH with no condensation

### MK8016/VAX-11/780

### Add-In Memory

The Mostek MK8016 is a 256KB or 512KB Add-In Memory Board for the VAX-11/780. It is a direct replacement for the DEC M8210 array board and is completely hardware and software compatible with the VAX.

#### **FEATURES**

- 32K x 72 Bit (64-bits Data, 8-bits ECC) or 64K x 72 bit (64-bits Data, 8-bits ECC)
- Totally hardware and software compatible
- Mostek dynamic RAM technology
- Direct replacement for the DEC M8210 memory

- One year warranty
- Socketed RAMs

#### **SPECIFICATIONS**

Capacity:

Bytes 262,144 Bits 72 (64 bits

Data, 8 Bits ECC) Max 256KB

Speed:

Compatible to VAX-11/780

Power:

42 Watts operating

Dimensions:

15.64" x 11.93" x .4"

Temperature:

0° C to 50° C

Cooling:

Provided by VAX chassis

### MK8600

## **General Purpose Memory System**

The MK8600 has a total capacity of six megabytes (industry's largest), plus ECC and 2 additional slots for I/O. It's ideal for mainframe add-on memory and disk replacement.

#### **FEATURES**

- To 6 Megabytes in 12¼ inch RETMA rack
- High speed
- Low power
- Full one year warranty
- Address, DI, DO may be bussed, however separated on the backplane
- High reliability

- I/O cards available
- Timing options
- Extender card

### **SPECIFICATIONS**

Capacity:

2359K x 16 w/power 786K x 72

w/power Optional capacities

available

Speed:

Access 250ns Cycle 450ns

Optional: Access 175ns Cycle 275ns

Modes:

R,W,R/M/W, Refresh (Internal or

customer controlled)

Dimensions:

20L x 19W x 12.25H

### MK8500

### **Universal Interface Card**

11.75 x 5.40 PCB

 Accessory for use with the MK8000 Memory System

### MK8501

#### **Extender Card**

Extender Card

 11.75 x 15.40 for use with the MK8000 Memory System

#### MK8502

### **Vertical Chassis**

#### 12½"H x 19"W RETMA Mount Chassis

• Chassis has slots for 27 MK8000 memory cards

### MK8503

### 7" Horizontal Mount

- Chassis has self-contained power and cooling
- Capacity for 8 MK8000 memory cards with two slots remaining for use as I/O card slots
- MK8503 may be ordered w/o power and cooling

#### **WK8504**

# **Vertical Mount Power Supply**

- For use with the MK8502 vertical chassis.
- +5V @ 50A +12V @ 12A

 Specify if input power is to be other than 110 VAC, 50/60 HZ.

MK8505 Fanpack	Fanpack for use with the MK8502 to cool up to 27 cards	
MK8506 Power Supply	<ul><li>+5V @ 25A</li><li>+12V @ 6A</li></ul>	

### MK8601

# PDP-11/70 Add-On Memory

A 7-inch chassis for up to 2MB memory, with ECC and logging. Using field-proven design technques, Mostek Memory Systems 11/70 is the most compact available.

#### **FEATURES**

- totally hardware and software compatible
- 7" chassis, includes power and cooling
- Error log for ease of maintenance
- Easy installation
- Off line switch
- ECC off/on switch
- Interleave up to existing capacity and then serial above

- Up to 2 MK8601 chassis may be daisy-chained
- Single control/ECC card controls up to 4 megabytes
- CPU data parity indicator
- Memory access indicator
- Address/parity control indicator
- Battery back up optional
- Maintenance mode to purge system

### **SPECIFICATIONS**

Capacity:

To 2MB in 7" chassis

Speed:

Access 580ns

Cycle 800ns

Temperature:

Operating 0°C to 50°C

Dimensions:

23L x 19W x 7H



# PRODUCT LITERATURE LIBRARY

Mostek's constantly expanding base in the area of MOS IC components and sub-systems is supported by a library of up-to-date technical literature. This reference library provides descriptions of data sheets, application

notes, and systems documentation aids to help the engineer increase his knowledge of Mosteks' broad line of memory, military, microcomputer, telecommunication, industrial and memory systems products.

A limit of four items are provided at no charge, except where a cost is specified. Volume pricing is available upon request.



# Memory Product Literature

# Memory Data Book & Designers Guide \$10.00

Contains complete data sheets and application notes on all Mostek memory products (460 pages)

### BYTEWYDE™ Memory Data Book \$5.00

Contains complete data sheets and application notes on all Mostek BYTEWYDE™ memory products (96 pages)

## **Read-Only Memory Device Data Sheets**

MK34000(P/J/N)-3 16K-Bit ROM MK36000(P/J/N)-4/5 64K-Bit ROM MK37000(J/N)-4 64K-Bit ROM

### **Programmable ROM Device Data Sheets**

MK2716(T/J) Series 16K-Bit UV EPROM MK2764(T)-8 64K-Bit UV EPROM

### **Dynamic RAM Device Data Sheets**

MK4006(P)-6/MK4008(P)-6 1K-Bit Dyn RAM MK4027(J/N)-2/3/4 14K-Bit Dyn RAM MK4116(J/N)-2/3/4 16K-Bit Dyn RAM MK4164(J/N) 64K-Bit Dyn RAM MK4332(D)-3 32K-Bit Dyn RAM MK4516(J/N)-16K-Bit Dyn RAM

### Static RAM Device Data Sheets

MK2147(J/N)-55/70/90 4K-Bit Static RAM MK4104(J/N) 4K-Bit Static RAM MK4118(P/J)-1/2/3/4 8K-Bit Static RAM MK2148(P) 4K-Bit Static RAM MK4802(P) 8K-Bit Static RAM

### **Psuedo Static RAM Device Data Sheets**

MK4808(J/N)-2/3/4/5 Pseudo Static RAM MK4809(J/N)-2/3/4/5 8K Pseudo Static RAM MK4816(J/N)-2/3/4/5 16K Psuedo Static RAM

# ∃Military Hi ∕ Rel Product Literature 🖃

# Device Data Sheets (Supplemental to standard part data sheets)

MKB4027(J)-83/84 4K-Bit Dyn RAM MKB4116(J)-83/84, (E), (F)-84 16K-Bit Dyn RAM MKB4104(P/J)-84/85/86 4K-Bit Dyn RAM MKB36000(P)-80/84 64K-Bit ROM MKB2716(T) 16K UV EPROM

### Miscellaneous

Military Processing Specifications Screening and Quality Conformance Guide Sampling Plan

# Telecommunication Product Literature

#### Telecommunications Data Book \$5.00

Contains complete data sheets and application MK5102(N)-5 Tone Decoder notes on all Telecom Products (146 pages) MK5103(N)-5 Tone Decoder

### **Device Data Sheets**

MKB4118(P/J)-82/83/84

MK5087(N) Tone Dialer II
MK5089(N) Tone Dialer II
MK5387(N) Tone Dialer III
MK5389(N) Tone Dialer III
MK5494(N) Tone Dialer III with Redial
MK50981(N) Pulse Dialer with Redial
MK50982(N) Pulse Dialer with Redial
MK50991(N) Pulse Dialer with Redial

MK50992(N) Pulse Dialer with Redial MK5102(N)-5 Tone Decoder MK5103(N)-5 Tone Decoder MK5116(J/P) PCM CODEC-μ Law MK5151(J/P) PCM CODEC-μ Law

MK5156(J/P) PCM CODEC-A Law MK5300(J/P) μ-255 Law Companding

CODEC and filter

MK5912(N/J/P) PCM Transmit/Receive Filters

MK5170(N) Repertory Dialer

MK5175(N) Ten Number Repertory Dialer

# Industrial Product Literature

### Industrial Products Data Book \$5.00

Contains complete data sheets and application notes on all Industrial products (96 pages)

### **Device Data Sheets**

MK5002/5/7(P/N) Four-digit Counter/Display Decoder

MK5009(P/N) Counter Time Base Circuit

MK50240/1/2(P/N) Top Octave Freq. Gen. MK50395/6/7(N) Six-Decade Counter/Display Decoder

MK50398/9(N) Six-Decade Counter/Display Decoder

MK50816(N) 8-Bit A/D Converter MK50808(N) 8-Bit A/D Converter \*MK50250/3/4(N) MOS Digital Alarm Clock \*Not For New Design

# **≕**Memory Systems Literature ≡

## Memory System Product Guide \$3.00

A complete description of all Mostek Memory Systems and accessories (48 pages)

### **Device Data Sheets**

MK8000 Gen. Purpose OEM Memory MK8001 PDP-11 Add-In Memory MK8003 Nova 3 Add-In Memory MK8004 Eclipse Add-In Memory MK8005 LSI-11/2, LSI-11/23 Add-In Memory MK8009-A1"X"/PDP-8 MK8009-A0"X"/PDP-8 MK8011 PDP-11 Parity Checking
Add-In Memory
MK8012 PDP-11
MK8016 VAX-11/780
MK8600 Gen. Purpose OEM Memory
MK8601 PDP-11/70 Add-On Memory
MK8500 Universal Interface Card
MK8501 Extender Card
MK8502 Vertical Chassis
MK8503 Horizontal Mount
MK8506 Power Supply

# ■Microcomputer Component Literature 💳

# Microcomputer Components and Systems Data Book (846 pages) \$10.00

Contains Data Sheets on Z80, 3870 and F8 microcomputer component families, MD Series Boards, SD Series Boards, Development Systems and Development Aids. (824 pages)

### **Device Data Sheets**

MK3873(P/N) Single-chip Microcomputer MK3874(S) P-PROM Microcomputer MK3876(P/N) Single-chip Microcomputer

### 3870/Z80/F8 Development Aids

3870 Programming Manual \$10.00 Matrix Development System Data Sheet F/8 Programming Guide \$10.00 F8 Programming Reminder Card .50 Z80 Programming Manual \$10.00 Z80 Micro Reference Manual .50

# Microcomputer Systems Literature

# Microcomputer Components and Systems Data Book \$10.00

Contains Data Sheets on Z80, 3870 and F8 microcomputer component families, MD Series Boards, SD Series Boards, Development Systems and Development Aids (824 pages)

# MD Series Product Guide \$2.50

Complete description of all MD system boards and peripheral accessories

<b>Operations</b>	<b>Manuals</b>
-------------------	----------------

MD Data Processing	Part No.	Publication No.	Price
MD-SBC1	77851-0	MK79609	\$10.00
MDX-CPU1	77850-0,77850-4	MK79612	10.00
MDX-MATH	77852-0	MK79741	10.00
MD Memory			
MDX-EPROM/UART	77753-0, 77753-4	MK79604	\$10.00
MDX-EPROM/ROM	77758	MK79671	10.00
MDX-DRAM	77750-0, 77752-0, 77752-4	MK79624	10.00
MDX-SRAM	77755, 77756	MK79673	10.00
MDX-UMC	77759	MK79667	10.00
MD Input/Output			
MDX-PIO	77650-0, 77650-4	MK79606	\$10.00
MDX-SIO	77651-0, 77651-4	MK79742	10.00
MDX-FLP	77652-0	MK79639	10.00
MDX-AIO	77654	MK79775	10.00
MDX-A/D8	77669-0	MK79659	5.00
<b>MD</b> Accessories	•		
MDX-DEBUG	77950-0	MK79611	\$10.00
MDX-SST	77958	MK79638	10.00
MDX-SC/D	77963-0	MK79678	10.00
MD-STD-Z80 BUS		MK79646	10.00
MD-RMC12	77966, 77975	MK79738	10.00
SDE-RMC6	78182-1, 78182-2	MK79783	5.00
RMDFSS	78183, 78185	MK79740	5.00
SD Data Processing			
OEM-80E	78122, 78124,	MK78548	\$ 5.00
	78124-1, 78124-2,		
	78124-3		
SD Memory			
RAM-80AE	78109	MK78574	\$ 5.00
RAM-80BE	78110	MK78555	5.00
FLP-80E	78112	MK78561	5.00

Software			
Macro-80	78165	MK79635	\$ 7.50
Macro-70	79085	MK79658	7.50
FLP-80/DOS	78142	MK78557	20.00
ANSI BASIC	78157	MK79708	10.00
Fortran IV	78158	MK79643	10.00
<b>Development Systems</b>	,		
AIM-Z80A	78180-0, 78180-2	MK79649	\$ 5.00
AIM-80E	78106	MK78559	5.00
AIM-Z80AE	78181-1, 78182-2	MK79650	5.00
AIM-72E	79077	MK79579	5.00
EMU-72	79078	MK79581	5.00
EVAL-70	79086	MK79717	10.00
MATRIX	78188	MK79730	10.00
PPG-8/16	79081	MK79603	5.00
Source Listings			
DDT-80 Operating Sys	stems for SDR-80F	MK78534	\$ 50.00
ASMB-80 Assembler/I		MK78536	200.00
VAB2 Video Adapter E		MK79561	15.00
TABL TIGGO Adaptor L	20u1u	141147 556 1	10.00

<sup>\*</sup>Program Source Listing orders must be accompanied by a signed software licensing agreement found in data sheet.



### LITERATURE REQUEST

To order literature from the Mostek Product Information Library list each document in the space provided. A limit of four no charge items are provided complimentary. For additional documents beyond the limit, include 50 cents per item. Indicate the amount and type of payment enclosed.

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Date Company Name Area Code  Street Address State Zip  Phone Number ( Extension Extension )		(Print plainly. One character per square. Use abbreviations where necessary.)
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1215 W. Crosby Rd. • Carrollton, Texas 75006 • 214/323-6000 In Europe, Contact: MOSTEK Brussels 150 Chaussee de la Hulpe, B1170, Belgium; Telephone: 660.69.24