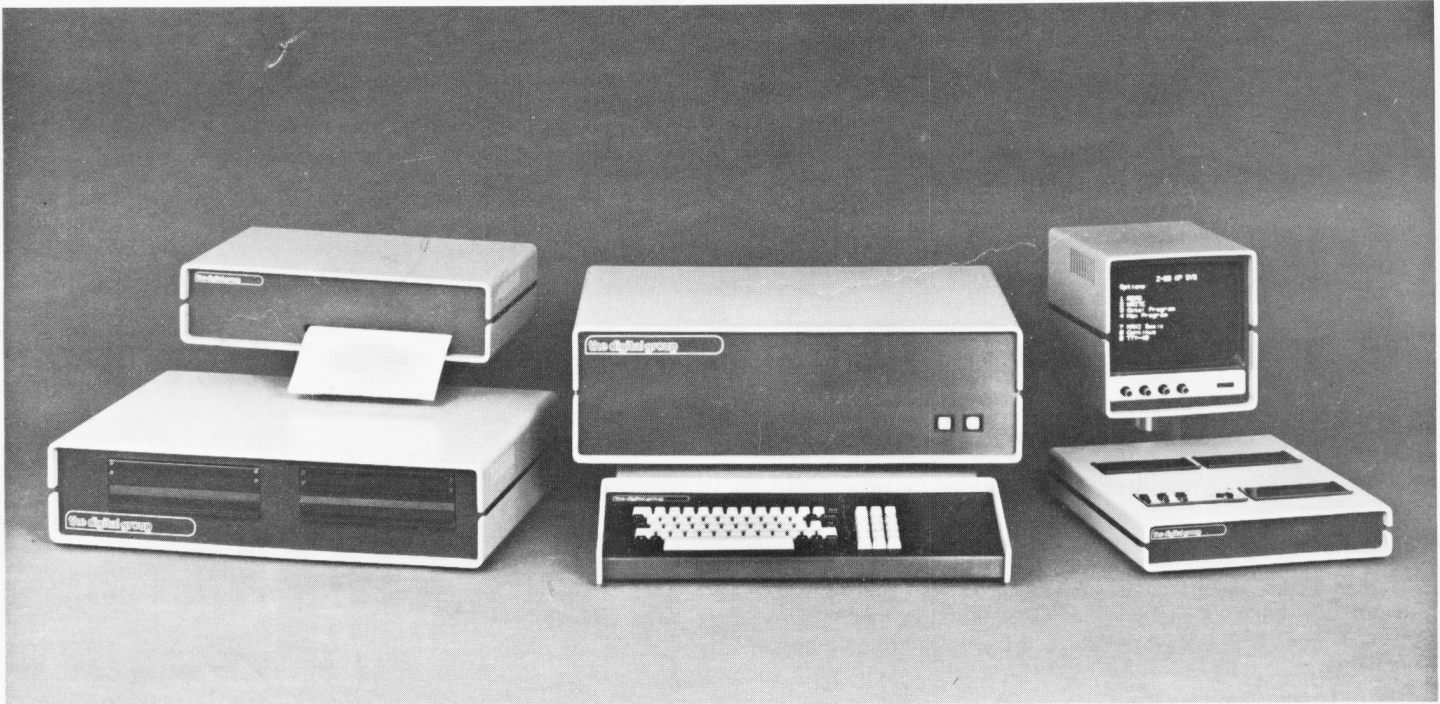


the digital group^{INC.}

flyer number 10



To our Digital Group customers:

The Digital Group has always tried to announce a new, significant and meaningful product for you in each of our flyers. This one is no exception. In fact, we've got not one but *two* major tantalizing new goodies designed to enhance your Digital Group system ... and intended to make your investment the best for the money.

Our new Disk Subsystem really completes your Digital Group system. We've come up with a highly flexible design to provide you with direct access to your data ... at a price we think you'll like. Be sure to read all the details.

Next, our new 32K Static Memory boards give you a lot of memory that take up just a little bit of space. Nifty.

There's more, too. Like no-nonsense organizers for the thrifty among you ... a new I/O card for RS232 peripherals ... and some other little surprises.

Again, thanks for your interest in Digital Group products.

CONTENTS

- **DISK SUBSYSTEM**
- **SYSTEMS 5, 6, and 7**
- **THE ORGANIZERS**
- **32K Memory**
- **COMMUNICATIONS INTERFACE**

The Digital Group Adds Disks!



THE DIGITAL GROUP DISK SUBSYSTEM

The Digital Group delayed announcing our disks until we knew we had a fully tested and functional design with what we considered an outstanding amount of flexibility. In addition, we were determined to again deliver first quantities within three weeks after announcement.

Adding a disk system requires a great deal more than just lashing up a floppy drive to a configuration. We found the task almost as challenging as designing a complete new CPU. The results of our efforts are now available as the Digital Group Disk Subsystem.

The Digital Group Disk Subsystem consists of the following 5 major components:

- 1) Disk Interface Card
- 2) Disk Power Supply
- 3) Disk Cabinet and Cables
- 4) Disk Drive(s)
- 5) Documentation and Software on Floppy

DISK INTERFACE CARD (FSS-INT1)

The disk interface card provides the electrical interface between the disk drives and the computer.

Features: Both hard and soft sectored disks are supported (standard user installed and changeable option). Soft sectored disks give greater flexibility in data block size and format. They can also allow compatibility with older systems such as provided by IBM. Hard sectored disks, while not quite as adaptable as soft sectored disks, can usually contain more total data and are now becoming much more common.

An LSI controller chip is used to enhance reliability.

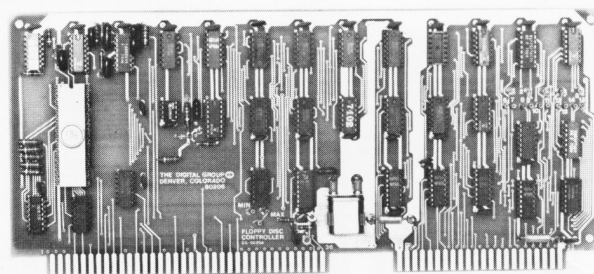
Single interface supports up to 4 drives including those from Innovex, Shugart, Pertec, and others, and also Shugart mini-floppies (not mixed with standard floppies).

DISK POWER SUPPLY (DSS-PWR2)

Each disk power supply provides all power required for up to 2 drives.

DISK CABINET AND CABLES (DSS-CB2)

The disk cabinets provide housing for 1 to 2 drives plus the power supply. Assembled cabling is provided for connection between all system components. All mounting hardware is included as well as a fan. The standard-size disk (8") cabinet is designed to exactly fit on top of a standard CPU cabinet.



DISK DRIVES (DSS-DRIN1)

The Digital Group disk subsystem supports standard floppy disk drives (8") from Innovex, Shugart, Pertec, and others. Drives may be mixed. In addition, mini-floppy drive systems will be available for those who wish to have the function of a disk at minimum cost.

DOCUMENTATION AND SOFTWARE

Standard documentation includes:

- Construction guides
- Drive manufacturer's maintenance manual or equivalent
- Theory of operation
- Software user documentation
- Full disk driver software listings

Z-80 disk driver software includes the following functions:

- Initialize disk
- Seek to track
- Read a block
- Write a block
- Test routines
- Disk driver software is supplied in floppy disk (included).

The software included with the disk subsystem is intended to provide initial support. Maxi-Basic support will be initially provided through machine language calls. This support will be provided via hard copy listings of examples of the calls.

An independent effort is currently under way by David Bryant (author of Phi-Mon) to provide disk support via Z-80 Disk-Mon. Phi-Decks will also be supported. His estimated completion date is the end of September. The estimated price for Disk-Mon is \$35 including a new 1702 for your CPU plus Disk-Mon on floppy.

DISK SUBSYSTEM SPECIFICATIONS

Interface:

- Supports 4 drives - mini or standard (not mixable)
- Requires 1 I/O slot
- Supported by Z80 only
- Power for board: +5VDC @ .9Amps
+12VDC @ 35ma
-5VDC (negligible)
- Power for drive: +5V DC @ 2.5A
-5V DC @ 75ma
+24V DC @ 1.4A
115V AC @ 2A

Mechanical Characteristics:

- Ambient operating temperature of drive 50°F to 100°F
- Wet bulb temperature of 78°F
- Heat Dissipation 102-250 BTU 1 hour (245 typical)
- Weight 14 lbs.
- Height 9"
- (with Bezel) 10-1/4"
- Width 4-3/8"
- Depth 14-1/8"

Drive Characteristics:

- Rotation Speed - 360 rpm
- Rotation Period - 166.67 ms
- Average Rotational Latency - 88.3 ms
- Recording Method - Double Frequency
- Drive Data Rate - 31,250 bytes/sec
- Note: These rates are determined by drive characteristics and not the CPU or interface card.)
- Recording Density - Single Density - 13,262
- Flux Reversals/Radian - 3,200 bits/inch
- Number of Tracks - 77
- Track Density - 48 TPI
- Head Life - 15,000 hours
- Access Times - Track-to-track - 10ms + 18 ms settling time
Average access time - 51 sec
Worst case access time - 98 sec (from power up, running start)
Settling Time - 18 ms
Head Load less than 35 ms
- Error Rates - Soft data error - 1 in 10¹⁰ bits
Head data error est. less than 1 in 10¹⁰ bits
Seek less than 1 in 10⁷ seeks
- Media Life - greater than 3.5 x 10⁶ passes/track
- Media Insertions - greater than 30,000
- MTBF - Est. 5000 POH under heavy usage
Est. 8000 POH under typical usage

Format Specifications:

Format: Conforms to IBM 3740/3540 physical data format IBM 3740/3540 logical data format may be employed at the user's discretion.

Records: Up to 26 fixed length records/track in IBM format
Up to 36 hard sectors/track-non-IBM format

Maximum Record Size: 1024 bytes to retain IBM standard

Data Capacity: 3328 bytes/track to 4096 bytes/track, depending on size of recorded sectors 256,256 bytes/disk to 315,392 bytes/disk in IBM standard. Note: If user does not desire to retain IBM compatibility, then total unformatted bytes/disk less than 391,006 bytes

Sectoring: Soft sectoring on disks is employed to retain IBM compatibility. Provisions for hard sectoring have been retained and may be optionally employed by the user

Card Specifications: Card will support up to 4 floppy drives. Interface is standard Digital Group I/O slot.

Software Memory Requirements: 1.5K to support basic drive operations

CPU Requirements: Presently supplied for Z80 systems. Host system must have at least one 8K memory board to support minimum software requirements.

ORDERING AND DELIVERY

Estimated first customer ship date for standard disk system - September 6, 1977

Estimated first customer ship date for mini-floppy system - October 15, 1977

Disk cabinets will be delivered 60-90 days later, but will not be allowed to delay shipment of the functional components of your disk system (including cables). We want to get your disks to you and up as quickly as possible.

DRIVE MANUFACTURER SPECIFICATION

We currently have standard drives in stock from Innovex and will fill orders from this stock unless directed otherwise. Shugart or Pertec drives may be specified as an alternative but initially they may incur a longer lead time.

For the shortest order lead time, we would suggest that you permit us to determine which brand to ship, if possible. However, if you have a preference, please specify and we will accommodate your selection as quickly as possible.

STANDARD DISK SUBSYSTEM COMPONENTS PRICE LIST

| Code | Description | Kit | Assem |
|------------|------------------------------------|-----------|----------|
| DSS-INT1 | Interface Card | \$ 195.00 | \$245.00 |
| DSS-DRIN1 | Standard 8" Floppy Drive (Innovex) | N/A | 550.00 |
| DSS-DRSH1 | Standard 8" Floppy Drive (Shugart) | N/A | 550.00 |
| DSS-DRPT1 | Standard 8" Floppy Drive (Pertec) | N/A | 550.00 |
| DSS-PWR2 | Power Supply for 2 Standard Drives | 65.00 | 85.00 |
| DSS-CB1 | Single Drive Cabinet | 85.00 | N/A |
| DSS-CB2 | Dual Drive Cabinet | 105.00 | N/A |
| DSS-CBLPK1 | Cables #1, 2, 3 | N/A | 60.00 |
| DSS-CBLPK2 | Cables #1 through 4 | N/A | 80.00 |

COMPLETE DISK SUBSYSTEMS

Interface, Power Supply, Cabinet, Cables as Appropriate

| Code | Description | Kit | Assem |
|-----------|--------------------------|-----------|-----------|
| DSS-COMP1 | Single Drive | \$ 895.00 | \$ 995.00 |
| DSS-COMP2 | Dual Drive | 1395.00 | 1545.00 |
| DSS-COMP3 | Three-Drive (2 cabinets) | 1995.00 | 2195.00 |
| DSS-COMP4 | Four-Drive | 2495.00 | 2695.00 |

MINI-DISK SUBSYSTEM PRICE LIST

| Code | Description | Kit | Assem |
|-----------|----------------------------------|-----------|-----------|
| DSM-INT1 | Interface Card | \$ 195.00 | \$ 245.00 |
| DSM-DRSH1 | Mini-Floppy (5") Drive (Shugart) | N/A | 345.00 |
| DSM-PWR2 | Power Supply for 2 Mini-Floppies | 65.00 | 85.00 |
| DSM-CB1 | Single Mini-Drive Cabinet | 65.00 | N/A |
| DSM-CB2 | Dual Mini-Drive Cabinet | 85.00 | N/A |

COMPLETE MINI-DISK SUBSYSTEM

| Code | Description | Kit | Assem |
|-----------|-------------|-----------|-----------|
| DSM-COMP1 | Single | \$ 675.00 | \$ 725.00 |
| DSM-COMP2 | Dual | 995.00 | 1145.00 |
| DSM-COMP3 | Three | 1495.00 | 1695.00 |
| DSM-COMP4 | Four | 1820.00 | 2045.00 |

FLOPPY SUBSYSTEMS ACCESSORIES

| Code | Description | Kit | Assem |
|----------|--------------------------|-----|---------|
| DSS-F1H | 1-8" Floppy Hard Sector | N/A | \$ 7.00 |
| DSS-F5H | 5-8" Floppy Hard Sector | N/A | 30.00 |
| DSS-F10H | 10-8" Floppy Hard Sector | N/A | 50.00 |
| DSS-F1S | 1-8" Soft Sector Floppy | N/A | 7.00 |
| DSS-F5S | 5-8" Soft Sector Floppy | N/A | 30.00 |
| DSS-F10S | 10-8" Soft Sector Floppy | N/A | 50.00 |

SYSTEMS 5, 6, and 7



NEW SYSTEM PACKAGES:

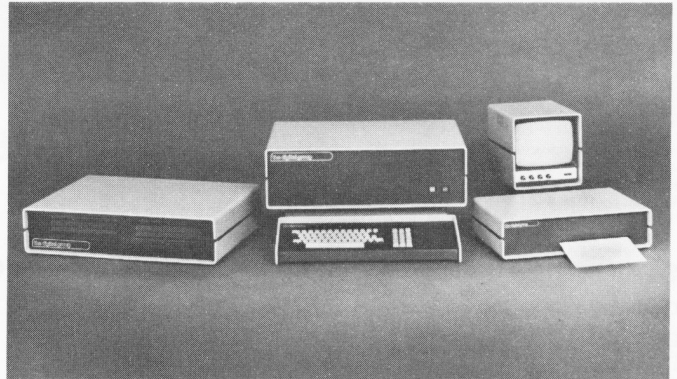
Once again, we could not resist packaging our products in three new complete systems. We did our best to package as standard the options we felt were most appropriate.

SYSTEM 5

The System 5 is an 18k Z80 dual disk based system with 64-character video, keyboard and hard copy printer. All cabling is included. The System 5 consists of the following order codes:

| | |
|-------------------|------------|
| Mainframe (CPU): | Z80-SYS2 |
| Standard Options: | TVC-64 |
| | SYSOPT-16A |
| Printer: | PT-96COMP |
| Monitor: | MON9+CB |
| Keyboard: | KEY1+CB |
| Disk: | DSS-COMP2 |

Order Code: Z80-SYS5



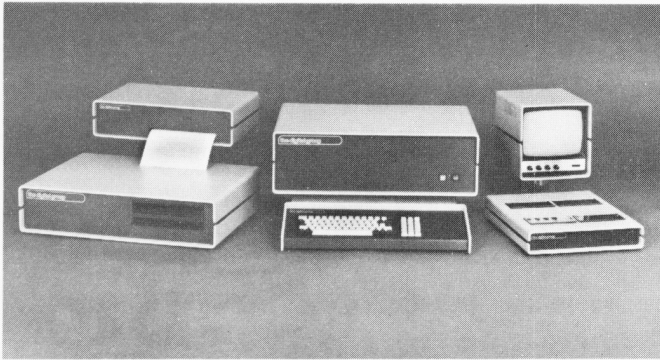
SYSTEM 6

The System 6 is an 18k Z80 disk and tape system. We feel it will prove to be one of our most cost-effective systems. A tape and disk system combines the advantages of disk processing with the mass-storage capabilities of tape. The System 6 has up to 3,000,000 characters available on tape and over 300,000 characters on disk which makes it extremely powerful.

The System 6 consists of the following order codes:

| | |
|-------------------|-------------------|
| Mainframe (CPU): | Z80-SYS2 |
| Standard Options: | TVC-64 |
| | SYSOPT-16A |
| Printer: | PT-96COMP |
| Monitor: | MON9+CB |
| Keyboard: | KEY1+CB |
| Disk: | DSS-COMP1 |
| Tape: | PHI-F and CAS+CB4 |

Order Code: Z80-SYS6



SYSTEM 7

The System 7 is identical to the System 6 except that a second disk drive is included for those who wish the extra performance of dual disks along with the mass storage capabilities of tape.

Order Code: Z80-Sys7

System deliveries will be made via partial shipments of order code units as they become available. You should begin receiving deliveries within 30 days. However, due to demand and supplier bottlenecks, it may require up to 120 days to complete your order. Please call or write for latest information.

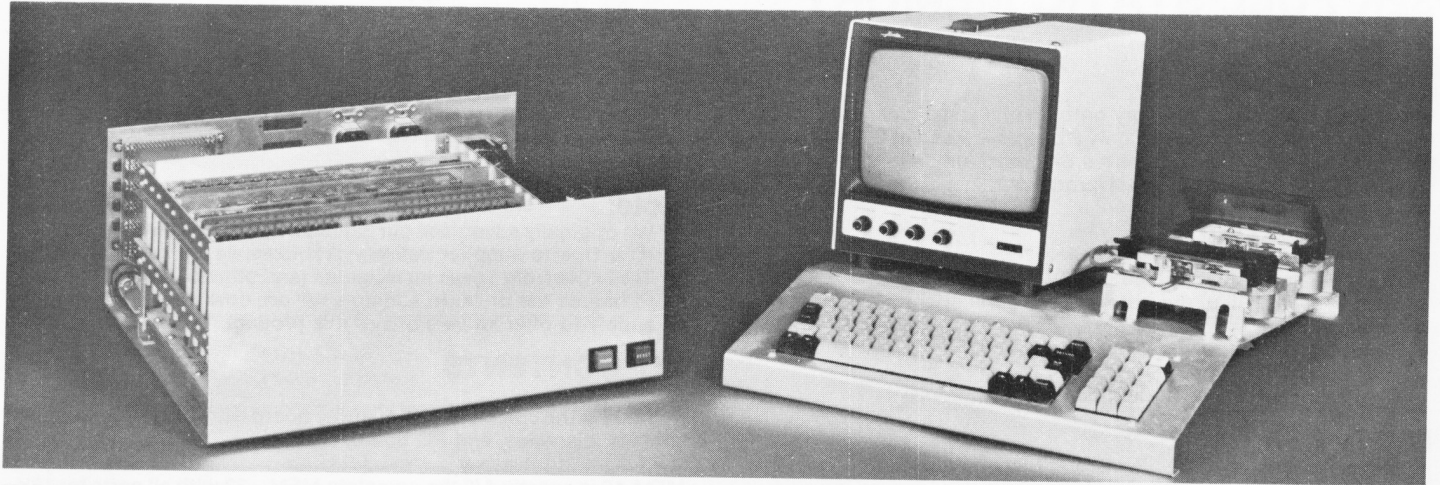
As part of our new communication procedure, we will do our utmost to keep you informed as to your order status.

SYSTEM ORDERING INFORMATION:

| Code | Description | Kit | Assem |
|------------|---|-----------|-----------|
| Z80-SYS5 | System 5 | \$3445.00 | \$3995.00 |
| Z80-SYS6 | System 6 | 3545.00 | 4195.00 |
| Z80-SYS7 | System 7 | 3995.00 | 4695.00 |
| SYSOPT-32B | Add 16K to SYS5,6 or 7 | 375.00 | 425.00 |
| SYS-MEM32 | Add 1 full 32K Memory Board to any system | 795.00 | 895.00 |



THE ORGANIZERS



THE BASIC BOX and THE PERIPHERAL PLATE

Now, for the no-nonsense computer builder, we are providing two products with only the bare essentials. These products are intended for the basic computer experimenter who helped get this industry started and for those people who are trying to get the absolute maximum results with the minimum dollar expense.

THE BASIC BOX

The Basic Box is intended to provide all the mechanical requirements for your computer's mainframe. It will also enable you to custom-install your system inside a rack-panel cabinet, a desk or whatever you desire.

FEATURES

- Tilt-up chassis for ease of servicing and interconnection.
- Heavy-duty semi-finished aluminum used throughout
- Provision has been made for the following items:
 - Digital Group System with Standard Motherboard
 - 2 AC convenience outlets (std. wall type)
 - Fan and Fan On/Off switch
 - 12 Amp +5V power supply (as in DG's PWR 12)
 - 3-Voltage supply (DG's PWR-0)
 - Backpanel Motherboard and 6 22-pin connectors for paddle card I/O
 - 6 D-connector spaces
 - Power and Reset switches
 - UHF Video jack, Power cord w/strain relief, Fuse holder, Miniature audio jacks

STANDARD BASIC BOX

The Standard Basic Box includes:

Outer box, Card cage with all card guides, Power & Reset switches. All necessary nuts, bolts, ect. as in Complete Basic Box. Power cord w/strain relief, Fuse holder & Fuse, Full documentation.

All other components (including wire) must be supplied by the purchaser.

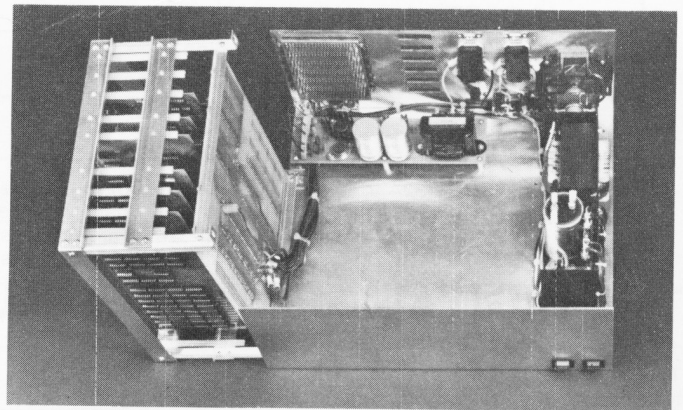
Order Code=BB-STD

COMPLETE BASIC BOX

The Complete Basic Box includes:

The Standard Basic Box plus: Wiring harness for power, Backpanel Motherboard, Two 22-pin w/w connectors, Two PAD-STD Paddle cards, Two AC outlets, Fan and Fan On/Off switch, Two miniature audio jacks

Order Code=BB-COMP



BASIC BOX DIMENSIONS:

Height=7-1/4" (w/o feet)
Width=17"
Depth=15-1/4" (16-3/8" with all protrusions)

PERIPHERAL PLATE

The Peripheral Plate is designed to help organize your input-output devices at minimum expense. It is simply a piece of semi-finished heavy-duty aluminum bent to be self-supporting. You can use it as is or, for the more resourceful, paint it, cover it with vinyl, add wood end-caps, ect. The Peripheral Plate is a very straightforward but nifty addition to your basic computer system.

FEATURES:

Prepunched for a KEY1 keyboard and Two Phi-Decks cable routing holes. Space is provided for a 9" monitor of your choice plus an audio cassette recorder (as a substitute for the Phi-Decks).

Peripheral Plate Dimensions:

Height=3" at highest point w/o components
Width=17"
Depth=20-1/4"

Order Code=PP-1

ORDERING INFORMATION

| Code | Description | Kit |
|---------|--------------------|---------|
| BB-STD | Standard Basic Box | \$45.00 |
| BB-COMP | Complete Basic Box | 95.00 |
| PP-1 | Peripheral Plate | 19.50 |

32K FULL STATIC MEMORY

The Digital Group is pleased to announce the availability of our new 32K memory boards.

We've squeezed 32K of memory onto one fully static card, so a full 64K architecture now requires only 2 boards instead of 8. That's a 4-to-1 space reduction, which leaves one extra memory slot on our standard motherboard for future products.

SPECIFICATIONS:

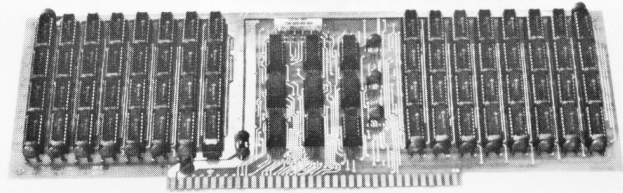
- 32K on single card.
- Available as 32K assembled or 32K/16K kit.
- Speed--450ns. All of our current CPU's will operate at full-rated speed.
- Decoding--lower or upper 32K bank.
- Power--5V only @4A.
- Card size--12"x5" (excluding connector fingers).

FEATURES:

- May be intermixed on Digital Group systems with our 8K memory cards.
- All data and address lines are buffered.
- Fully static memories--TI TMS 4044 or equivalent.

ORDERING INFORMATION

| Code | Description | Kit | Assem |
|-----------------------|---|-----------|-----------|
| MEM-32 | 32K Memory Board | \$ 845.00 | \$ 945.00 |
| MEM-16 | 16K Memory Board | 445.00 | N/A |
| MEM16-32 | 16K to 32K Upgrade | 425.00 | N/A |
| System Options | | | |
| SYSOPT-32A | Substitute 32K board in system 2 thru 7 | 375.00 | 425.00 |
| SYSOPT-16A | Substitute 16K board in system 2 thru 7 | N/C | N/C |
| SYS-MEM32 | Add 1 full 32K board to a system order | 795.00 | 895.00 |
| SYS-MEM16 | Add 1 full 16K board to a system order | 425.00 | N/A |



Note:

We originally advertised our 32K board populated with EMM 4801 IC's. Due to supplier delivery problems, we are substituting the TMS 4044 from Texas Instruments (and others). We are also able to reduce the price. In addition, we are now assured of enough supply to offer kit versions of this product.

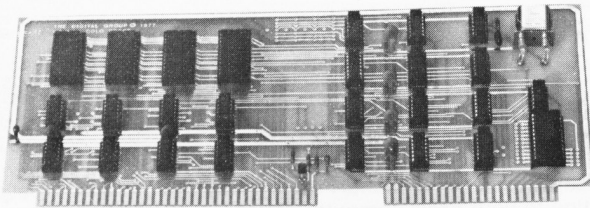
KIT CONTENTS

MEM-32 is the complete 32K memory board with all IC's, connector, sockets, discretes, and PC board.

MEM-16 is exactly 1/2 the complete MEM-32 with all parts for 16K only. MEM-16-32 is the upgrade kit which includes all IC's, sockets, and discrete parts for an additional 16K.

THE DIGITAL GROUP COMMUNICATIONS INTERFACE

The Digital Group Communications Interface is designed for system to system and system-terminal communications. Serial data transmission techniques are employed in both asynchronous and synchronous modes including IBM Bi-Sync. RS-232 support is also standard. This interface represents our initial entry into the world of communications and should add substantial capabilities to your system.



FEATURES:

- Programmable
- Operates on digital Group Bus with Port Addresses selectable in groups of 8 (2 ports/channel)
- May optionally be driven directly from ports (1 in, 2 out) as a standalone device.
- 4 Input Channels
- 4 Output Channels
- Full duplex operation
- All channels are double buffered
- Each input and output pair is speed selectable at standard baud rates
- All parallel to serial and serial to parallel conversions are done within the interface

| Code | Description | Kit | Assem |
|--------|---|----------|----------|
| COMM-1 | Communications Interface with parts for 1 I/O channel | \$ 95.00 | N/A |
| COMM-4 | Communications Interface with 4 I/O channels | \$145.00 | \$195.00 |

SPECIFICATIONS:

- Asynchronous Mode:
 - 1, 1-1/2, or 2 stop bits--software selectable Data word lengths of 5, 6, 7 or 8 bits.
 - Parity optional and software selectable--odd or even.
- Synchronous Mode:
 - Compatible with IBM Bi-Sync
 - Operational up to 56K baud.
 - Sync detect provided.
- Baud rates:
 - All crystal controlled--no tuning required.
 - 110, 150, 300, 600, 1200, 2400, 4800, 9600.
 - An external clock interface is provided.
- Standard software-controlled RS-232 signals available:
 - Clear to Send (CTS)
 - Request to Send (RTS)
 - Data Set Ready (DSR)
 - Data Terminal Ready (DTR)
 - Send
 - Receive
- Signal Levels Available:
 - RS-232 ($\pm 12V$)
 - TTL (0,5V)
 - 1 20ma current loop output for async or sync
- Status Available:
 - Framing error, Overrun, Parity
- Power Supply Requirements:
 - +5V, $\pm 12V$

Software initially supplied as device-driver level only. Supplied in hardcopy source and object listings. Communication protocols are a user responsibility.

- ▣ disk subsystem
- ▣ 32k memory board
- ▣ the organizers
- ▣ systems 5, 6, and 7
- ▣ communications interface

the digital group
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