



Cabinets clockwise from top: CPU, Dual-cassette drive, Keyboard, 9" Monitor.

Meet The Digital Group

If you are seriously considering the purchase of a microcomputer system for personal or business use...or just beginning to feel the first twinges of interest in a fascinating hobby...the Digital Group is a company you should get acquainted with.

For many months now, we've been feverishly (and rather quietly) at work on our unique, high-quality product—a microcomputer system designed from the inside out to be the most comprehensive, easy-to-use and adaptable system you'll find anywhere. And our reputation has been getting around *fast*. In fact, you may have already heard a little something about us from a friend. We've found our own best salesmen are our many satisfied customers.

There's a good reason. Simply, the Digital Group has a lot to offer: state-of-the-art designs, a totally complete systems philosophy, unexcelled quality, reasonable software, affordable prices and the promise that our products will not become rapidly obsolete, even in this fast-moving, high-technology field.

The Advantages

Here are a few specific advantages of our product line:

- We offer interchangeable CPUs from different manufacturers (including the new "super chip"—the Z-80 from Zilog) which are interchangeable at the CPU card level. That way, your system won't become instantly obsolete with each new design breakthrough. The major portion of your investment in memory and I/O is protected.
- Digital Group systems are complete and fully featured, so there's no need to purchase bits and pieces from different manufacturers. We have everything you need, but almost any other equipment can be easily supported, too, thanks to the universal nature of our systems.
- Our systems are specifically designed to be easy to use. With our combination of TV, keyboard, and cassette recorder, you have a system that is quick, quiet, and inexpensive. To get going merely power on, load cassette and go!
- Design shortcuts have been avoided—all CPUs run at full maximum rated speed.
- All system components are available with our beautiful new custom cabinets. And every new product will maintain the same unmistakable Digital Group image.

The Features

Digital Group Systems—CPUs currently being delivered: Z-80 by Zilog 8080A/9080A 6800 6500 by MOS Technology

All are completely interchangeable at the CPU card level. Standard features with all systems:

- Video-based operating system

- Video/Cassette Interface Card
512 character upper & lower case video interface
100 character/second audio cassette interface
- CPU Card
2K RAM, Direct Memory Access (DMA)
Vectored Interrupts (up to 128)
256 byte 1702A bootstrap loader
All buffering, CPU dependencies, and housekeeping circuitry
- Input/Output Card
Four 8-bit parallel input ports
Four 8-bit parallel output ports
- Motherboard

Prices for standard systems including the above features start at \$475 for Z-80, \$425 for 8080 or 6800, \$375 for 6500.

More

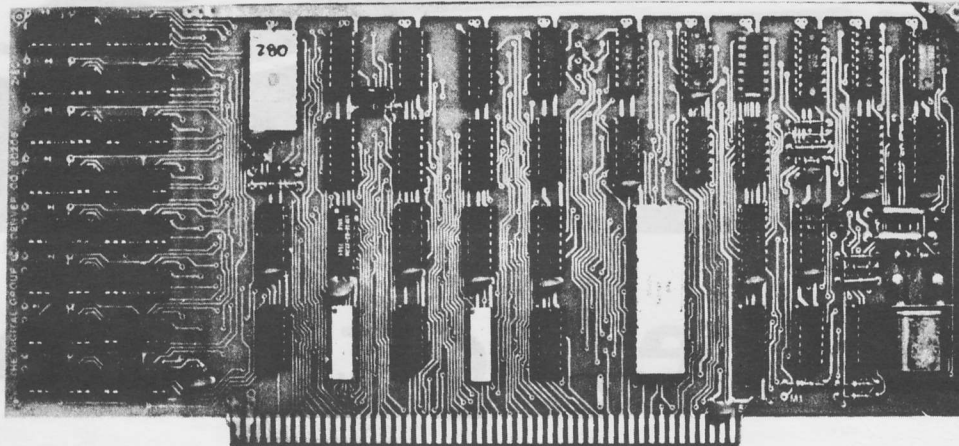
Many options, peripherals, expansion capabilities and accessories are already available. They include rapid computer-controlled cassette drives for mass storage, memory, I/O, monitors, prom boards, multiple power supplies, prototyping cards and others. Software packages include BASICS, Assemblers, games, ham radio applications, software training cassettes, system packages and more (even biorhythm).

Sounds neat—now what?

Now that you know a little about who we are and what we're doing, we need to know more about you. In order for us to get more information to you, please take a few seconds and fill in our mailing list coupon. We think you'll be pleased with what you get back.

SUPER CHIP!

The Z-80 CPU by Zilog



From The Digital Group, of course.

If you are considering the purchase of an 8080-based system, look no further. The Z-80 has arrived. A new generation 8080 by the same individuals who helped design the original 8080 — combining all the advantages of the 6800, 6500 and 8080 into one fantastic little chip! And, the Z-80 maintains complete compatibility with 8080 software.

What's even better . . . the Z-80 is being brought to you by The Digital Group — people who understand quality and realize you expect the ultimate for your expenditure. With the Z-80, combined with the Digital Group System's video-based operation, you're at state of the art. There's no place better.

Take a look at some specifications:

Z-80 FEATURES

- Complete compatibility with 8080A object code
- 80 new instructions for a total of 158
- 696 Op codes
- Extensive 16-bit arithmetic
- 3 Interrupt modes (incl 8080), mode 2 provides 128 interrupt vectors

- New Instructions (highlights):
 - Block move up to 64k bytes memory to memory
 - Block I/O up to 256 bytes to/from memory directly
 - String Search
 - Direct bit manipulation
- 22 Registers — 16 general purpose
- 1, 4, 8 and 16 bit operations

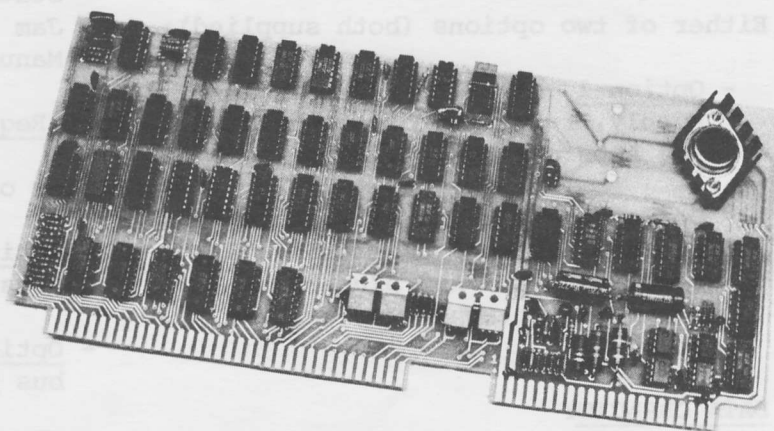
DIGITAL GROUP Z-80 CPU CARD

- 2k bytes 500ns static RAM
- 256 bytes EPROM bootstrap loader (1702A)
- 2 Direct Memory Access (DMA) channels
- Hardware Interrupt controller
 - Supports all 3 modes of interrupt
 - Mode 2 supports 128 interrupt vectors
- Data and Address bus lines drive 30 TTL loads
- Z-80 runs at maximum rated speed
- Single step or single instruction step
- EPROM de-selectable for full 64k RAM availability (programs may start at location 0)
- Complete interchangeability with Digital Group 8080A, 6800 and 6500 CPUs

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1,000,000 BYTES ON-LINE!



The Digital Group Cassette Storage System

The Digital Group Cassette Storage System gives you total magnetic tape data storage and retrieval for your microprocessor, capable of operating 1 to 4 computer-controlled Phi-Deck cassette transports. Within seconds (20 at most), your system zips to any of over one-quarter million 8-bit bytes per drive. And that really puts it all on-line!

The Digital Group Cassette Storage System is ideal for:

- Large data files — names, accounts, etc.
- Indexed computer-controlled program files
- Sorts
- Inexpensive mass storage
- Work files
- Indexed random retrieval
- Multi-pass compilers
- System residence

In addition, with a Digital Group System and a Phi-Deck transport, your total load procedure is reduced to a single action — turning on power. Everything else is automatic! Your Digital Group System is completely ready for use in a very few seconds. And you avoid a large investment in single-use PROM memory.

MAJOR STORAGE SYSTEM COMPONENTS

1. Controlling and Formatting Interface — single card for 1 to 4 drives
2. Software Operating System
3. Computer-controlled Cassette Drive(s)

Selected Specifications

Data Rate: 800 bytes per second, 8K loads in 10 seconds
Media: High-quality standard audio cassettes
Search Speed: 100 inches per second
Tape Speed: 5 inches per second

Power Requirements: +12V to +20V at .7A peak and +5V at 1A plus 60ma per drive

Port Requirements: One 8-bit parallel input port plus two 8-bit parallel output ports

Cassette Drive is an enhanced Phi-Deck with a digital head, cast head bar, stronger capstan, and four-foot cabling.

SOFTWARE OPERATING SYSTEM

8080 based — 650 bytes

Error Detection: CRC

Retries after soft errors

Automatically bypasses hard errors

Block size = 1 to 256 bytes or multiple of 256 bytes

Functions supplied:

- Record multiple blocks
- Record 1 block
- Read 1 block
- CRC check
- Fast reverse
- Fast forward
- Search for block

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THE DIGITAL GROUP CASSETTE STORAGE SYSTEM - MORE SPECIFICATIONS

Recording Density: 1600 FCPI (Flux Changes per Inch)
 Interblock gap: 1/8"
 Error Rate: Virtually zero when using software package supplied with deck and high-quality media

Power Requirements:

Either of two options (both supplied):

- Option 1 - +12V to +15V single supply, regulated or unregulated. 1.4 Amps average, 1.7 Amps peak
- Option 2 - +12V to +20V at .4 Amps average, .7 Amps peak and +5V regulated at 1 Amp plus 60 ma per drive attached for capstan motor.

DATA CAPACITY

8-bit bytes

No. of Drives	Media		
	C-30	C-60	C-90
1	254,000	508,000	762,000
2	508,000	1,016,000	1,524,000
3	762,000	1,524,000	2,286,000
4	1,016,000	2,032,000	3,048,000

PRICES:

Interface Board (full kit of all parts including software for Z80/8080)
 Digital Group Phi-Deck Drive

INTERFACE SPECIFICATIONS

A complete interface for up to 4 drives on a single card supplies the following:

- Data formatting & serializing
- Control signals
- All power for 4 drives
- Status conditions
- Jam sensing
- Manual stop switch (sw. not supp.)

Port Requirements (up to 4 drives):

Either of two options (both supplied):

- Option 1: 1 8-bit parallel Input port plus 2 parallel Output ports
- Option 2: Bi-directional I/O data bus plus four strobe lines

Ports are TTL-level signals.

Miscellaneous:

- Card size = 5" high by 12" wide
- Connectors are dual 22-pin and dual 36-pin along 12" edge on .156" centers. Connectors are supplied in kit with w/w posts (.025).

CASSETTE DRIVE SPECIFICATIONS:

Digital Group Phi-Deck - Included Enhancements:

- High speed - 5 ips
- Digital Head - Enhanced cassette interchangeability
- Cast Head Bar - better tape alignment
- Stronger Capstan shaft
- 4 foot cables with Molex connectors for easy connecting
- Motor power lines have been reoriented for best control

Order Code	Kit	Assembled
PHI-F	\$135.00	\$195.00
PHI-1	na	\$115.00

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DIGITAL GROUP SYSTEMS - General Information on the computers

3-Board System (& Mini-Mother)

The Digital Group Systems basic configuration for any CPU consists of:

- 1 - CPU card with 2K RAM
- 1 - Input/Output card with 4 ports in and 4 ports out
- 1 - TV Readout and audio Cassette Interface
- 1 - Mini-Mother

which is referred to as the 3-Board System. The Mini-Mother has one additional space which can hold an additional 8K Memory card or a front panel.

4-Board System (& Mini-Mother)

The 3-Board configuration may also be supplied with the additional 8K Memory (for a total of 10K of RAM) which is referred to as the 4-Board System.

Additional Requirements

To make a Digital Group System fully operational, you need only add the following:

- 1. Power supply (+5V, -5V, +12V, -12V recommended)
- 2. ASCII Keyboard (full 128 character ASCII recommended)
- 3. Audio Cassette Recorder
- 4. Video Monitor or modified TV set
- 5. Miscellaneous hardware, cables, and cabinet

DIGITAL GROUP SYSTEMS - Standard Features, one board at a time:

CPU's: Choice of Zilog Z-80, 8080A, 6800, 6502, which are all interchangeable at the CPU card level.

Z-80 (Zilog/Mostek):
2K bytes 500ns static RAM
256 bytes EPROM Bootstrap loader
2 Direct Memory Access (DMA) channels
Hardware Interrupt Controller
Supports all 3 modes of interrupt
Mode 2 supports 128 different interrupt vectors
Data and Address bus lines drive 30 TTL loads
Z-80 runs at maximum rated speed
Single Step or Single Instruction step
EPROM de-selector for full 64K RAM availability (programs can start at address 0)

8080A (Intel/AMD):
2K bytes 500ns Static RAM
256 bytes EPROM Bootstrap loader
Direct Memory Access (DMA)
8-level Hardware Vectored Interrupt
Data bus lines drive 30 TTL loads
Can use 8080 plain (older design) without change

6800 (Motorola/AMI):
Features the same as with 8080A except Interrupt structure is 11-level software vectored priority.

6502 (MOS Technology):
Features the same as with 8080A except Interrupt structure is 11-level software vectored priority.



INPUT/OUTPUT (IO-F):

Four 8-bit Input Ports
Four 8-bit latching Output Ports
Full 16-bit port addressing - supports
memory oriented I/O structures (68/6500)

TV READOUT & AUDIO CASSETTE INTERFACE
(TVC-F):

TV Readout - Cursor under software control
512 Characters, 16 lines by 32 characters
7 x 9 character matrix - shifted
(effective 7 by 13)
Full 128 character ASCII
Upper and Lower case Alphabet
Math Symbols
Special Symbols
Greek Alphabet
Direct Video Output

Cassette Interface - Uses standard unmod-
ified audio cassette recorder
Extremely reliable FSK recording
Standard wide-shift teletype frequencies
Operates at 1100 baud or 100 characters
per second - 1K loads in 11 seconds

8K STATIC RAM - 500ns 2102's (MEM-8):

No wait states required for any Digital
Group CPU
Static RAM used for ease of maintenance
Buffered address lines
Applies only 1/20 TTL load to bus lines
Address decoding covers full 64K range
Power consumption = 2A of 5V per 8K

8K Fast, Low-Power Static RAM (MEM-8C):

300ns 91L02C
Same features as MEM-8
Power consumption: 1 Amp per 8K
Uses AMD 91L02C chips for best combination
of speed and power consumption

MOTHER BOARDS

Mini-Mother (MB-1):

Each Mini-Mother provides space for:
1 CPU card with 2K RAM
1 Input/Output Card
1 TV Readout & Cassette Interface
1 8K RAM Board

Mini-Mother (cont'd):

Size: 5 3/8" deep by 12" wide
Power: A fully populated Mini-Mother
will require about 4.5 Amps from the
+5V supply with standard devices.
Other currents are minimal.

Standard Mother (MB-2):

Each Standard Mother provides space for:
1 CPU card with 2K RAM
1 TV Readout and Cassette Interface
4 Input/Output cards or Peripheral
Interfaces
3 Memory cards or 2 Memory cards and
1 Front Panel (24K additional RAM)

Size: 10 3/8" deep by 12" wide
Power: A fully populated Standard Mother
will require about 10 1/2 Amps from
the +5V supply with standard devices.
Other currents are minimal. Total
current requirements will depend on
peripheral interface requirements.

Note: The Standard Mother may be substi-
tuted in any 3 or 4 board system
package for an additional \$15.00.

OTHER AVAILABLE ITEMS:

Mass Cassette Data Storage (up to
3,000,000 bytes per interface)
Prototyping cards (w/w)
Extender Cards
Cabling kits
Monitors
Cassette Recorders
Keyboards
Power Supplies
and more

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CABINET INFORMATION AND SPECIFICATIONS

General Information

PLEASE NOTE! - Expected delivery on cabinets is 8-10 weeks after receipt of Flyer #8.

All cabinets have the following characteristics:

- Heavy-duty aluminum is used throughout
- Front panels and side rails are anodized dark brown
- Logo is in white
- Heavy-duty commercial quality textured paint is used on all covers - color is tan
- Non-marring feet are supplied with each cabinet
- All assembly hardware is included

CPU Cabinet

The CPU cabinet is designed to contain a standard motherboard based Digital Group System plus power supply. There is expansion capability for 5 - 10 additional cards depending on size and placement of the power supply.

Items included with CPU cabinet:

<u>Qty</u>	<u>Item</u>
1	Standard 5" box fan
1	Lighted power switch - red w/legend
1	Lighted reset switch - blue w/legend
1	Card rack for standard mother
Back panel hardware:	
1	SO-239 video connector
1	Fan on-off switch
1	Grounded HD power cord
1	Power cord strain relief
2	Minature audio jacks
1	Fuseholder
1	Fuse
1	Set assembly hardware
1	Set feet
1	Dual 3-wire convenience outlet (standard wall-outlet type)

CPU cabinet (cont'd):

The 5" fan may be optionally eliminated for a \$10 savings. In addition, the backpanel hardware may also be optionally eliminated for a further \$20 savings.

<u>Order Code</u>	<u>Description</u>	<u>Price</u>
CB-CPU	Standard CPU cabinet	\$125.00
CB-CPU1	Same w/o fan	\$115.00
CB-CPU2	Same w/o fan or back-panel hardware	\$95.00

Monitor Cabinet

The monitor cabinet is designed to contain a 9" Javelin or a 9" Sanyo monitor. It is designed to replace the original cabinet and is strictly a dress option. All necessary hardware is included.

<u>Order Code</u>	<u>Description</u>	<u>Price</u>
CB-MON9	9" monitor cabinet	\$35.00

Cassette Storage System Cabinet

The cabinet for the cassette drives is designed to hold 2 drives and, optionally, the PHI-F interface card. All mounting hardware is included.

<u>Order Code</u>	<u>Description</u>	<u>Price</u>
CB-CAS2	Dual cassette storage system cabinet	\$45.00

NOTE: We are also offering some special prices on items purchased with a cabinet - please see price list



DIGITAL GROUP VIDEO-BASED SYSTEM OPERATION

Initiating operation on a basic Digital Group System consists of 4 steps:

1. Place a system cassette or saved program cassette in the audio cassette recorder and depress play.
2. Turn system power on.
3. After the cassette is read in, select an application code from the list displayed on the TV monitor.
4. Enter the code on the keyboard and the application begins operation.

DIGITAL GROUP VIDEO-BASED OPERATING SYSTEM

Each Digital Group System is supplied with a standard operating system on cassette for video-based operations. The functions supplied are:

1. Read cassette
2. Write cassette
3. Program from keyboard*
4. Dump storage
5. TV Monitor functional support routines

*These functions may be supplied in either Octal or Hexadecimal depending on system selected.

The storage requirement for the Operating System is 1.5K.



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DIGITAL GROUP PRICE LIST

effective 9/1/76

<u>Order Code</u>	<u>Description</u>	<u>Price</u>	
		<u>Kit</u>	<u>Assembled</u>
<u>Systems:</u>			
Z80-3BD	3 Board system with Z80 CPU, IO-F, TVC-F and MB-1 (2K total memory)	\$475.00	\$695.00
Z80-4BD	4 Board system with Z80 CPU, IO-F, TVC-F, MEM-8, and MB-1 (10K total memory)	\$675.00	\$945.00
<u>System options:</u>			
8080-SUB	Substitute 8080 CPU - deduct	(\$50.00)	(\$50.00)
6800-SUB	Substitute 6800 CPU - deduct	(\$50.00)	(\$50.00)
6500-SUB	Substitute 6500 CPU - deduct	(\$100.00)	(\$100.00)
MB-2-SUB	Substitute Standard Motherboard	\$15.00	\$15.00
<u>Individual Kits:</u>			
MEM-8	8K 500ns 2102-1	\$225.00	\$295.00
MEM-8C	8K 300ns Low Power	\$275.00	\$345.00
IO-F	Complete I/O card	\$65.00	\$95.00
TVC-F	TV Readout and Audio Cassette Interface	\$130.00	\$195.00
PHI-F	Cassette Storage Interface	\$135.00	\$195.00
PHI-1	Cassette Storage Drive	na	\$115.00
CAS&CB	2 Cassette Storage Drives and Cabinet w/o interface	\$270.00	\$295.00
KEY1	Capacitance Keyboard with Numeric Pad	na	\$150.00
KEY1&CB	KEY1 and Cabinet	\$180.00	\$205.00
MON-9J	9" Javelin monitor	na	\$175.00
MON9&CB	9" Javelin monitor with DG Cabinet	\$199.50	\$215.00
<u>Power Supplies:</u>			
PWR-6	5V 6A and PWR-Ø	\$95.00	\$125.00
PWR-12	5V 12A and PWR-Ø	\$135.00	\$165.00
PWR-18	5V 18A and PWR-Ø	\$175.00	\$205.00
PWR-Ø	-5V @ 1A, -12V @ 1A, +12V @ 1A	\$45.00	\$60.00
<u>Accessories:</u>			
PROT-IOC	Prototyping w/w card for I/O bus w/conn.	na	\$38.50
PROT-MC	Prototyping w/w card for Memory bus w/conn.	na	\$35.00
EXT-3	3 card Extender card set	\$55.00	\$75.00
CAS-1	Superscope C-104 Audio Cassette Recorder	na	\$119.50
CAB-1	Cabling kit and Crimp tool	\$43.95	na
<u>Total Systems Packages:</u>			
Z80-SYS1	Complete 4-Board Z-80 system including: 10K memory, 12A power supply (PWR-12), Standard Motherboard, Standard Cabinet	\$895.00	\$1295.00**
Z80-SYS2	As above, with 18K	\$1095.00	\$1545.00**

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