

the digital group inc.

flyer

NUMBER 6

Flyer Number 6 is one that the Digital Group has been quietly and diligently working toward for the last several months, and now, we can happily say that our efforts are paying off --- for us and for you.

To us, the most exciting part of what we're doing is our complete basic system that is now starting to add state-of-the-art input/output and software. The computer hobbyist can now begin adding commercial capabilities to his system at a price/value ratio that makes sense.

As we're fond of pointing out (and we never seem to tire of it), our offerings are not just "a gleam in our designers' eyes" --- they are in final production and should be ready to go well within our "off-the-shelf-to-3-week" delivery schedule. Our systems have been and are being delivered in three to four weeks instead of months. (Naturally, we can be affected by factors beyond our control and will continue to do our utmost to absorb their impact on our customers).

We've got some exciting news for you. On the hardware side, there is the first of a series of devices that will dramatically expand our system's capabilities as well as what the user can accomplish with a reasonable investment.

On the software side, we are announcing a number of packages we think will catch your interest fast, and in addition, there is some information on system accessories, more pictures and comments and, inevitably, our miscellaneous ramblings section. We even have cleverly come up with an all-new and separate section, Flyer News.

That about sums up what you'll discover inside. The Digital Group continues to grow at an ever-increasing rate and we feel that our growth demonstrates our customers' good will and faith in us.

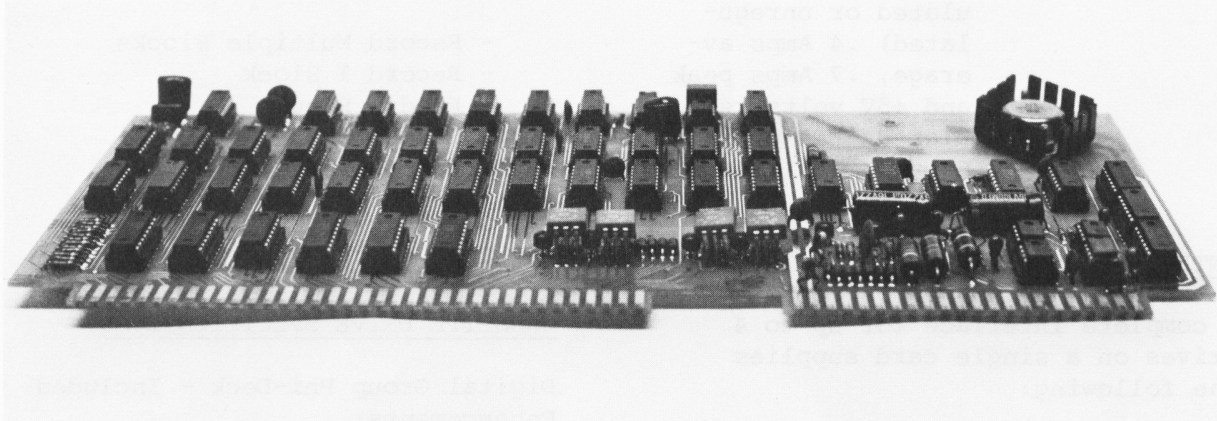
As always, thank you for your support and encouragement.

Sincerely,

the Digital Group

the digital group inc.
po box 6528, denver, colorado 80206 (303) 861-1686

THE DIGITAL GROUP CASSETTE STORAGE SYSTEM



apparently plugs into an I/O slot.

Storage System Interface

The Digital Group Cassette Storage System is a total magnetic tape data storage and retrieval system capable of controlling up to 4 Phi-Deck cassette transports and accessing any of over one-quarter million 8-bit bytes per drive within a worst case random access time of 20 seconds using standard C-30 Phillips cassettes.

The system is ideal for general purpose data and program storage, file copying, editing, and sorting operations. Each deck is fully controlled to prevent tape breakage. Electronic braking precisely controls tapes for fast forward, rewind, and search operations. A 4 to 5 bit translation scheme, called Group Coded Recording (60% more efficient than Phase-Encoding), allows higher packing densities with a soft error rate of less than one bit in 10^8 . This system operates at 1600 flux changes per inch, yielding a data transfer rate of 800 bytes per second at a tape speed of 5 inches per second.

MAJOR STORAGE SYSTEM COMPONENTS

- Controlling and Formatting Interface single card for 1 to 4 drives
- Software Operating System
- Computer-controlled Cassette Drive(s) enhanced Phi-Decks

GENERAL SPECIFICATIONS

- Data Rate: 800 Bytes per second (6400 baud) 8K loads in 10 seconds
- Media: High-quality standard audio cassettes
- Error Rate: Virtually zero when using software package supplied with deck and high quality audio cassettes
- Search Speed: 100 inches per second
- Recording Density: 1600 FCPI (Flux Changes Per Inch)
- Tape Speed: 5 inches/second
- Power Requirements: Either of two options:
 - OPTION 1 - +12V to +15V only (regulated or unregulated) 1.4 Amps average, 1.7 Amps peak

** the "std" interface loads 1K in 1 sec
1100 Bits/sec
baud = 8K in 8 sec*

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OPTION 2 - +12V to 20V (reg-
ulated or unregu-
lated) .4 Amps av-
erage, .7 Amps peak
and +5V volts reg-
ulated - 1A plus
60ma per drive at-
tached.

Functions Supplied:

- Record Multiple Blocks
- Record 1 Block
- Read 1 Block
- CRC Check
- Fast Reverse
- Fast Forward
- Search For Block

INTERFACE SPECIFICATIONS

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

- Data Formatting and Serializing
- Control Signals
- All power for four drives
- Status conditions
- Jam sensing
- Manual stop switch (optional)

PORT REQUIREMENTS (up to 4 drives)

Either of two options:

- OPTION 1: 1 Parallel Input Port plus
2 Parallel Output Ports
- OPTION 2: Bi-directional I/O data
bus plus four strobe lines

MISCELLANEOUS

- Card Size = 5" high X 12" wide
(excluding connector fingers)
- On-Board Regulation Provided
(+5V Reg. not used w/DG System)
- Plugs directly into Digital Group
System
- Uses Digital Group I/O Structure

SOFTWARE OPERATING SYSTEM - 8080 Based

- Requires 650 bytes
- Error Detection: Cyclic Redun-
dancy Check (CRC)
- Retries after soft errors
- Automatically bypasses hard errors
- Block Size = 1 to 256 bytes or
multiple of 256 bytes

*May not
work with
2-80*

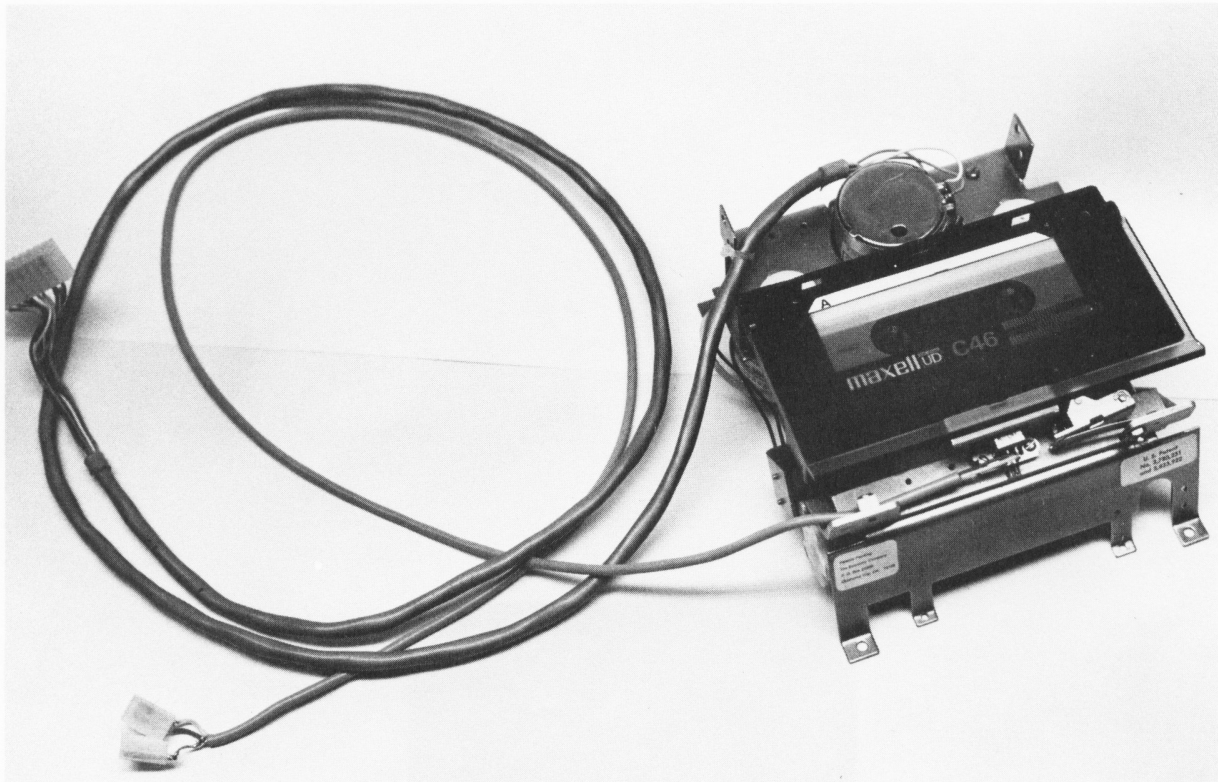
CASSETTE DRIVE SPECIFICATIONS

Digital Group Phi-Deck - Included
Enhancements:

- High Speed - 5 ips
- Digital Head - Enhanced cassette
interchangeability
- Cast Head Bar - Better tape head
alignment
- Stronger Capstan - No bending -
for improved tape alignment
- 4 foot cables with Molex Connect-
ors for easy connecting (see
picture)
- Motor power lines have been re-
oriented for best control
- 4 motor drive - no solenoids

DIGITAL GROUP DRIVE AVAILABILITY

The Economy Co. (manufacturers of Phi-Decks) is unable to commit significant production quantities of the enhanced drives until summer. However, we have obtained a commitment from them for 100 drives per month minimum, to our specifications. This means we are very likely to quickly be in a backordered situation until mid-summer and therefore may not be able to meet our "off-the-shelf-to-3-weeks" scheduled delivery for these drivers. Unfortunately, this situation is obviously out of our control. For latest status information, please give us a call. Orders will be processed sequentially.



Phi-Deck Drive With Cables As Delivered

PRICES:

	<u>Order Code</u>	<u>Kit</u>	<u>Assembled</u>
Interface Board (Full kit of all parts including software for 8080)	PHI-F	\$135	\$195
Digital Group Drive	PHI-1	-	\$115

Note: A complete storage system includes 1 interface kit and
1 to 4 drives.

ACCESSORIES :

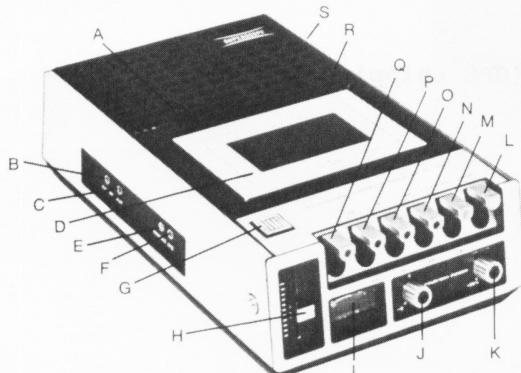
A number of our customers may have been interested in a high-quality monitor and an appropriately featured cassette recorder. The following two devices represent what the Digital Group feels are the best values in today's market.



Superscope C-104 Cassette Recorder

C-104 AC/DC Portable Cassette Recorder with Vari-Speed

For the musician, businessperson, or anyone who expects maximum performance we proudly introduce the Superscope C-104. It has features never before found on a portable recorder to provide more versatility for your recording needs ... which set this recorder apart from all others. And remember—the C-104, and all the other great Superscope portable cassette recorders are backed by a one-year warranty on parts and labor.



- A. 3-Digit Tape Counter with Reset
- B. External Speaker Jack
- C. Auxiliary Input Jack
- D. Cassette Compartment
- E. Remote Stop/Start Jack
- F. External Microphone Jack
- G. Built-in Electret Condenser Microphone
- H. Straight-Line Playback Volume Control
- I. Record Level Battery Strength Indicator
- J. Playback Tone Control
- K. Vari-Speed Pitch Control
- L. Locking Pause Control
- M. Stop/Eject Button
- N. Cue/Fast Forward Button
- O. Play Button
- P. Review/Rewind Button
- Q. Record Button
- R. AC Input Jack
- S. 6V DC Input Jack

- M. Stop/Eject Button
- N. Cue/Fast Forward Button
- O. Play Button
- P. Review/Rewind Button
- Q. Record Button
- R. AC Input Jack
- S. 6V DC Input Jack

ADDITIONAL FEATURES

1. Automatic Record Level
2. Dual Flywheel Mechanism
3. Automatic Total Mechanism Shut-off (TMS)
4. Built-in Recharging Circuitry
5. Optional Ni-Cad Battery Pack
6. Unique Lever Action Controls
7. Vari-Speed Pitch Control (for adjusting speed plus or minus 20%)

SPECIFICATIONS:

POWER REQUIREMENTS:

AC 120 Volts AC, 6 Watts 50/60 Hz
 DC 6 Volts
 Battery size & quantity: 4
 Size "C" batteries.
 Battery life: 6 hrs. continuous

TAPE SPEED:

1 7/8

REEL SIZE:

Cassette

RECORDING SYSTEM:

Half-track Mono

REWIND AND FAST FORWARD TIME:

100 seconds/C-60

FREQUENCY RESPONSE:

Standard Tape:
 60 Hz to 10 kHz @ 1 7/8 ips

SIGNAL-TO-NOISE RATIO:

LOW NOISE TAPE: 48 dB

INPUTS:

- 1 Auxiliary: (one)
 Plug type: Mini
 Impedance: 100 K Ohms.
 Input Sensitivity: 100 mV.
- 1 Microphone: (one)
 Plug type: Mini
 Impedance: Low
 Input sensitivity: -72 mV.

SPEAKER COMPLEMENT:

Built-in speaker, 3 3/4"

BIAS FREQUENCY:

65 kHz.

TYPE OF LEVEL INDICATION:

Record Level Battery Strength Meter

POWER OUTPUT:

1.4 Watts Max. @ 1 kHz

HEAD CONFIGURATION:

- 1 half track erase
- 1 half track record/playback

WOW & FLUTTER:

NAB 0.25% RMS @ 1 7/8 ips

NUMBER AND TYPE OF MOTOR:

1 DC Servo-Vari-Speed ± 20%

NUMBER OF SEMI-CONDUCTORS:

10 TRANSISTORS
 1 FIELD EFFECT TRANSISTORS (FET)
 6 DIODES

OUTPUTS:

- 1 Extension speakers: (one)
 Plug type: Mini
 Impedance: 8 Ohms.
 Unit Dimensions: 6" W x 2 1/2" H x 11" D.
 Unit Weight: 3 lbs., 9 ozs.

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FEATURES THAT WE CONSIDER SIGNIFICANT:

- Variable speed ("Vari-Speed") for matching cassettes which may have been recorded off-speed. Varies $\pm 20\%$.
- Index Counter
- Cue/Fast Forward control and Review/Rewind control; Aid in audibly searching tape for selecting program.

In addition, its a pretty nifty general purpose cassette recorder.

Each C-104 we provide will have been checked by the Digital Group for speed accuracy. In addition, we will modify the recorder by partially defeating the monitor jack cutoff switch so that you can hear the data (at reduced volume) while cable-connected to your computer. This modification consists of a single resistor and does not invalidate the warranty in any way.

<u>PRICE:</u>	<u>Order Code</u>	<u>Assembled</u>	
Superscope C-104	CAS-1	\$119.50	(UPS shipping included)

SANYO B&W 9" MONITOR

The Digital Group has tested a significant number of monitors of many different sizes (5" through 19") from Sony, Sanyo, Panasonic, Javelin, Conrac, and JVC. We feel that this monitor represents by far and away the best value. The display is very crisp with no "hot spots" in the letters. The DC Restoration is excellent. Viewing size is large enough to be easily seen while the monitor itself is of a size and weight that is truly portable. It was obviously designed as a high-resolution professional monitor - not an adapted TV set from the manufacturer's consumer line. We are obviously pretty fond of the little beasts. We think you'll like them too.

<u>PRICE:</u>	<u>Order Code</u>	<u>Assembled</u>	
Sanyo 9" Monitor	MON-9	\$175.00	(UPS shipping included)

digital group software systems inc.

QUESTION: What could almost be better than having your micro programs run correctly?

ANSWER: Having unique micro software to utilize to your hearts' content!! Whether to create some fantastic program(s) or to have the facility to entertain yourself and/or friends with programs and games requiring a bit of "think power"...especially for those days when your "think power" could stand a bit of bolstering!!

All this is possible thanks to the software packages now being provided by Digital Group Software Systems, Inc., (DGSS), which was recently established and is headed up by Chuck and Dianne Howerton. Software which is now available on cassette tapes, complete (for the most part) with documentation for each offering, is as follows:

1. TINY BASIC EXTENDED (TBX-TVCOS)
10K, VERSION 1

Created by Dick Whipple and John Arnold of Tyler, TX - Based upon design criteria published in September 1975 issue of "People's Computer Company" - Dr. Robert Suding of The Digital Group, Inc., designed and developed the software interfaces between TBX (TINY BASIC EXTENDED) and the TV-Cassette Operating System (TVCOS) for The Digital Group, Inc. 8080 micro-computer - A super-set of TINY BASIC as originally proposed - A limited and modified subset of the full BASIC language - Has 26 possible simple or dimensioned variables - Has 4 immediate commands

(LST,NEW,RUN and SZE) and 12 commands (DIM, DTA, END, FOR, GOTO, GOSUB, IF, IN, LET, NXT, PR and RET) which may be entered either as program statements or immediate execution commands - Also included is a RN or Random Number generator - Includes 14 page documentation which lets you do everything with TINY BASIC EXTENDED that is presently possible.

PRICE: \$5.00 @ cassette with documentation.

2. TINY BASIC GAMES, DGSS SET 1

Contains 5 games written in TBX language - 3 games are TBX versions of games listed in either 101 COMPUTER GAMES or WHAT TO DO AFTER YOU HIT RETURN - Other 2 games are original products of author Howerton - Games on Set 1 tape are:

- a. CHOMP: 2 or more players take turns biting into the poisoned cookie - Each trying to force one of the others to take the poisoned "byte"!!!
- b. CHECKERS: You against the computer in this classic board game - WARNING: The computer is as crafty as a 6-year old playing his first game!!
- c. TIC-TAC-TOE: The computer plays a fairly reasonable game with just enough randomness in its selection to make the game interesting - Can be beaten.
- d. DIGIGUESS: Try to guess a 4 digit number "think" up by the computer based upon clues it supplies.

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- e. BRAINTEASER: A strategy game - You against your own worst enemy...YOU! Try to create a pattern working with a set of rules to drive you nuts!!!

PRICE: \$5.00 @ cassette with documentation

NOTE: TINY BASIC GAMES, DGSS Set 1, and all TINY BASIC GAMES are read in AFTER "bootstrapping" TBX-TVCOS program into micro-computer.... and away (:RUNcr) you go!!

3. TINY BASIC GAMES, DGSS Set 2

All the games in this set were adapted to TBX-TVCOS by Dr. Robert Suding from 101 COMPUTER GAMES, PEOPLE'S COMPUTER COMPANY and WHAT TO DO AFTER YOU HIT RETURN.

- a. WAR-3: An artillery duel between 2 or 3 armies - OBJECT: To blast the opponent(s).
- b. THERAPY: Have a relaxing "conversation" with DR. THERAPY and investigate your inner problem(s).
- c. GOLF: 9 holes of championship play on the "micro-links" - Hooks and slices are rare and 1-putts from 40 feet are fairly common.
- d. REVERSE: Test your skills at arranging things in sequential order from a random beginning according to a fixed set of rules.
- e. BIORYTHM: Predict your "highs" and "lows" from a computer-produced chart based upon your personal statistics.

PRICE: \$5.00 @ cassette with documentation

4. TINY BASIC GAMES, DGSS Set 3

All the games in this set were adapted to TBX-TVCOS by Ted Holdahl from 101 COMPUTER GAMES.

- a. TAXMAN: Test your knowledge of factoring by trying to beat the TAXMAN!! It's tough but he can be beaten!!
- b. SNARK: Learn symbolic logic and the use of Ven diagrams while trying to find the SNARK.

- c. TRAP: Find the computers' number by trapping it between two guesses of your own.
- d. NUMBER: Learn binary-searching techniques while trying to pinpoint a randomly-generated number between 1 and 100.
- e. SQUARE-ROOTS: Computes the square root of any number from -32K to +32K.
- f. CLOCK: This bonus program keeps accurate time using looping techniques and displays on the screen to the nearest second.

PRICE: \$5.00 @ cassette with documentation.

5. TINY BASIC GAMES, DGSS Set 4

All the games in this set were adapted to TBX-TVCOS by Ted Holdahl from 101 COMPUTER GAMES.

- a. HAMURABI: Try governing ancient Sumaria successfully. The author says that the object of the game is to discover the rules.
- b. STARS: Guess the computers' number based on clues which tell you whether your warm, hot, or cold.
- c. 23-MATCHES: Outfox the computer by making it take the last match in the pile - You can beat it if you try hard enough.
- d. 20-QUESTIONS: Take-off on an old radio-TV game where the player guesses the computers' number by asking questions.
- e. BLACKJACK: From 1-9 players - Play against the house in this Casino game.
- f. FACTOR: A bonus program which will compute the factors of any number up to 32,767 or tell you if it is prime.
- g. BATUM: A super bonus game which is a variant of 23-MATCHES. Good selections will really make the computer think!!

PRICE: \$5.00 @ Cassette with documentation.

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6. KINGDOM; LIFE 1 & LIFE 2
(all on one tape)

- a. KINGDOM: Lets you be the "KING" of land/bushels/population of YOUR "KINGDOM" - Object of game is to accumulate 1 million acres and/or bushels which can only be accomplished by buying and selling land. Tests your ability to buy and sell these items and outwit the complications all KINGS have!!
- b. LIFE 1: Standard LIFE which will take a pattern and, with simple rules of LIFE, iterate until a stable situation is reached.
- c. LIFE 2: Bi-Symmetrical pattern generator based upon modified rules of LIFE but a stable situation is NEVER achieved - Will continue to run and never repeat pattern for approximately 10^{31} years!!

PRICE: \$5.00 @ cassette with documentation (sort of)!!

7. EDUCATOR 8080

Designed to assist the micro-computer user in understanding the effect that the execution of various instructions has on status and operation of micro-processor unit - Provides continuous real-time display of status flags, Accumulator, B and C registers which reflect their contents as changed and/or modified by instructions issued by user - Complete with EDUCATOR instruction set.

PRICE: \$10.00 @ cassette with documentation.

8. AMATEUR RADIO HAM CASSETTE FOR 8080

Amateur Radio (CW) Send and Receive
RTTY (Baudot) Send and Receive

CW Receive is automatically self-adjusting to any CW speed sent
CW Send has 8 100-character memories that may be individually called up
CW Send also features a 256-character software FIFO buffer

RTTY Receive can select 60, 66 and 100 Words per Minute (WPM); upper or lower case output to TV.

RTTY Send program can send at 60, 66, or 100 WPM.

All 4 programs are designed to reside simultaneously in a 10K Digital Group 8080 system.

PRICE: Documentation and cassette
HAM-1 \$5.00

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9. OPERATING GUIDE - TVT MONITOR 8
FOR 8008 BASED SYSTEMS

The TVT Monitor 8 is a modification and extension of the Monitor 8 published by MIL before their untimely demise. The original Monitor 8 was written to be used with teletype/paper tape input and output. The TVT Monitor 8 is designed to be used with a Digital Group TVT, ASCII keyboard and Digital Group Cassette tape interface as input and output.

Several features were added to the Monitor 8 to increase its usefulness. One of these is software scrolling of the TVT. This causes the TVT to simulate the format of a teletype by displaying the previous seven lines. Two other additions were the "Insert" (INS) and "Delete" (DEL) routines which allow one to insert or delete octal code at any point in your program. These routines move the following instructions in memory to make room for the new instructions or close up a space. In addition, the addresser of JMP and CAL instructions are modified as appropriate to maintain proper loop registration. A program to zero memory was added (ZRO). And a program to load ASCII directly into memory (helpful for TVT output) was also developed (TXT).

The use of this operating system in program development would typically involve the following steps:

- 1) ZRO - zero program storage area
- 2) Symbolic input of rough program draft

- 3) TXT - input of any ASCII characters needed
- 4) DPS - symbolic dump to verify program or DPO - octal dump to verify code
- 5) XQT - execute program as subroutine of monitor
- 6) SBP - set break point to print out register and flag status at any program step
- 7) EDT,INS,DEL - these functions can be used to change, insert, or delete, instructions at any location. A particular advantage of this monitor is that on deletion or insertion of instructions the code following is moved up or down in memory and all JMP and CAL instructions are modified to maintain registration.

ONCE THE PROGRAM IS RUNNING TO YOUR SATISFACTION;

- 8) CPY - moves blocks of data around in memory
- 9) TRN - changes JMP and CAL arguments to reflect new page numbers
- 10) TAS - can be used to store completed program on cassette tape
- 11) PRG - can be used (if one has the proper hardware) to program EPROM's.

Price: MONITOR-8

\$6.00

PLEASE NOTE: This package runs only on 8008-based systems - will not run on 8080.

All the above described programs and games can be obtained either by ordering through the Digital Group or, if your order is exclusively for software, you may order direct from:

Digital Group Software Systems
PO Box 1086
Arvada, CO 80001

Should you have any immediate questions, Chuck or Dianne may be reached at (303) 422-6197. Please try to restrict calls to 9 - 5pm Mon - Saturday.

Watch for the next Digital Group Flyer to find out what's new in the way of available programs and/or games and other interesting items for your microcomputer.

Saintimores melque

NOTE: All TINY BASIC EXTENDED (TBX-TVCOS) users are encouraged to develop additional programs and games which will run under the system. Users who submit programs and/or games to DGSS with appropriate documentation and who consent to permit DGSS to distribute copies will be paid a small royalty for each copy sold. Submissions must include a cassette tape containing the program or game and typewritten documentation as required. All submissions will be acknowledged but cannot be returned unless accompanied by a self-addressed stamped mailer. Obviously, if many users send in submissions, duplications will occur. In this event, date of receipt AND quality of work will determine which contributor's submission will be utilized. Royalties will be paid quarterly in cash or may be applied to the purchase of products at a discounted rate.

DIGITAL GROUP SOFTWARE SYSTEMS ORDER FORM

<u>Quantity</u>	<u>Package</u>	<u>Each</u>	<u>Amount Extended</u>
_____	TBX-TVCOS	5.00	_____
_____	TBX GAMES I	5.00	_____
_____	TBX GAMES II	5.00	_____
_____	TBX GAMES III	5.00	_____
_____	TBX GAMES IV	5.00	_____
_____	KINGDOM & LIFE	5.00	_____
_____	EDUCATOR - 8080	10.00	_____
_____	HAM-1	5.00	_____
_____	MONITOR-8 (8008)	6.00	_____

Amount Enclosed: _____

SHIP TO: _____

SEND THIS ORDER FORM TO:

DIGITAL GROUP SOFTWARE SYSTEMS
PO BOX 1086
ARVADA, CO 80001

digital group software systems inc.
po box 1086, arvada, colorado 80001