

(\*\* THIS IS THE FINAL ISSUE OF COLOR COMPUTING -- SEE INSIDE \*\*)

FEBRUARY 1992

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VOLUME 5  
NUMBER 4

# COLOR *Computing*

*The bi-monthly magazine for Tandy Color Computer users*

**It's been a good five years...**



**...never give up on the CoCo!**

# COLOR *Computing*

February 1992  
Volume 5  
Number 4

*formerly TRS-80 Computing*

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## TABLE OF CONTENTS

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**COLOR COMPUTING  
SINCE 1987**

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ENTIRE CONTENTS  
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OF MICROWARE SYSTEMS  
CORP. AND MOTOROLA, INC.

# The Programmer



THE PROGRAMMER      FEBRUARY 1992

*In this issue...*

1. PMODE 4 PICTURE SCRAMBLER  
(page 5)
2. USING ROM ROUTINES PART II  
(pages 6-7)
3. HSCREEN SNOWFALL SIMULATOR  
(pages 8-9)

# PMODE 4 PICTURE SCRAMBLER by David McNally

The CoCo Picture Scrambler allows you to encrypt CoCoMAX 2 pictures (or any single page PMODE 4 picture that is saved in binary format) so that other users will not be able to directly load in your pictures.

This is how it works. First you draw the picture you want protected and save it in binary format. You can use `SAVEM"name",PEEK(186)*256+PEEK(187),PEEK(183)*256+PEEK(184),PEEK(186)*256+PEEK(187)` to do this.

Next, type in or load listing one. At the prompt, enter the filename of the picture you just drew. Your picture is then loaded in to normal PMODE memory. The program then scrambles up the order of the pixels and transfers the picture to free memory. The picture is then resaved.

Listing two is the LOAD routine which does all of the above in reverse. The picture is loaded back into free memory, and then unscrambled and transferred back to the PMODE 4 memory page.

This program protects your pictures in two ways. First, if anyone tried to load in and view your picture, all they would see is a jumbled up mess. Second, since the picture is relocated to free memory, the picture will not display itself on the screen as it loads, therefore even the garbage will not be seen. A special thanks goes to Derek Snider for the ML code.

THE LISTING:

```

28 ' CONVERT PICTURE TO
    SCRAMBLED FORMAT
30 '
32 PCLEAR8
34 CLS
36 INPUT"FILENAME/EXT TO LOAD, (
PRESS [ENTER] IF PICTURE IS A
LREADY ON THE PMODE4 SCREEN";F
$
38 IF F$<>"" THEN LOADM F$
40 PMODE4:SCREEN1,1
42 DATA 8E,E,0,10,8E,26,0,CE,40,
0,A6,80,E6,A2,11,83,58,0,27,4,ED
,C1,20,F2,39
44 ST=&H6000
46 FORX=ST TO ST+24:READ A$:POKE
X,VAL("&H"+A$):NEXT X
48 EX=ST
50 EXEC EX
52 CLS:PRINT"FILE CONVERTED."
54 INPUT"SAVING FILENAME/EXT";F$
56 SAVEM F$,&H4000,&H57FF,&H6000
58 END
    
```

```

28 ' CONVERT SCRAMBLED PICTURE
    BACK TO ORIGINAL PICTURE
30 '
32 PCLEAR 8
34 CLS
36 DATA 8E,E,0,10,8E,26,0,CE,40,
0,EC,C1,8C,1A,0,27,18,A7,80,E7,A
2,1F,10,C4,1F,C1,1F,27,2,20,EB,C
C,0,64,83,0,1,26,FB,20,E1,39
38 ST=&H6000
40 FORX=ST TO ST+41:READ A$:POKE
X,VAL("&H"+A$):NEXTX
42 EX=ST:DL=ST+32
43 REM POKE AT DL TO CHANGE
    DISPLAY SPEED
44 INPUT"FILENAME/EXT TO LOAD";F
$
46 IF F$<>"" THEN LOADM F$
48 PMODE4:PCLS:SCREEN1,1:EXEC EX
50 IFINKEY$="" THEN50
52 END
    
```

## USING ROM ROUTINES PART II

### by David McNally

In the last issue I showed you how to call and use the JOYIN ROM routine. This month I will show you how to call and use the DSKCON ROM routine. The major advantage of this routine is that it is very easy to trap disk errors from within your programs (even on a CoCo 2).

But, like any routine, it has a major down side. Anything you want to save or load must be POKEd or PEEKed from the buffer area. If you want to load a sector, you must first call the routine and then PEEK the loaded material out of the buffer. If you want to save material, you must first POKE it all into the buffer. Another disadvantage of this routine is that it does not update the File Allocation Table or even the directory. When material is saved using the DSKCON routine, it is totally invisible to the computer, so it can be easily overwritten. The routine is really the same as the DSKI\$ and DSKO\$ commands. So, whenever you use these commands in your program, this routine is a great replacement.

It works quite simply. You POKE the necessary data into the computer's memory and call the routine. It's that easy! Here are the important memory locations you will need to know:

DCOPC (234) - Poke into this location to tell the drive what operation to perform. If you POKE a zero (0) into this location and execute the routine, the drive will return the head to track 0. If you POKE a one (1) into this location, no operation will take place. A two (2) in this location will instruct the drive to read a sector and a three (3) will write to a sector.

DCDRV (235) - Contains the current drive number. Poke the drive number (0-3) into this location.

DCTRK (236) - Contains the track number (0-34) of the disk. POKE here to indicate what track to read from or write to.

DCSEC (237) - Contains the sector number (1-18) of the track. POKE here to indicate what sector to write to or read from.

DCBPT PEEK(238)\*256+PEEK(239) - Returns the memory location of the 256 character disk data buffer. DSKCON returns information read from the disk to this buffer or writes the information stored in the buffer to disk, depending on what value is in DCOPC.

DCSTA - Contains the disk status. If after the routine is executed this location contains a zero (0), no error was found. If it contains a 128, then a Drive Not Ready error occurred. If it contains a 64, then the disk is write protected. A 32 indicates a write fault error. A 16 indicates an error in the seek routine or the specified record was not found. An 8 is an error in the Cycle Redundancy Check and a 4 indicates lost data. By PEEKing out the number returned to this location, you can find what error occurred. Actual error messages are not printed by the DSKCON routine.

Now that you know how it works, try writing a few programs using it. I came up with a few. The first listing (listing 1) reads in and displays each sector of a disk. It is a little slow, but it is a good example of how to use DSKCON.

The second listing (listing 2) is a bit more complex. It will determine all the bad spots on a disk. First, insert the disk to be checked. Then RUN the program. The program will read in each sector, erase (reformat) the sector, and write the information back on to the sector again. It WILL NOT erase the disk, but be warned, you could lose sections of the disk if you try to stop the program while it is running. DO NOT press <BREAK> or <RESET> during the operation of the program. If a sector was read and formatted and you pressed <BREAK> before the information was written back to the disk, you will lose that sector!

While we are on the subject of ROM routines, the DIR ROM routine can be executed by an EXEC &HCCA9. Use Disk Extended Color BASIC's DRIVE command to set the drive number.

#### THE LISTING: DSKCON

```
5 CLS
8 P=64
10 EX=PEEK(&HC004)*256+PEEK(&HC0
05)
12 BF=PEEK(238)*256+PEEK(239)
14 POKE 234,0:POKE 235,0:EXEC EX
16 POKE 234,2:POKE 235,0
18 FOR T=0 TO 34
20 FOR S=1 TO 18
22 POKE 236,T:POKE 237,S
28 EXEC EX
29 FOR GG=0 TO 256:PRINT@P+GG,CH
R$(PEEK(GG+BF));:NEXT GG:P=64
30 NEXT S:NEXT T

10 CLEAR 2000
20 CLS
30 PRINTTAB(8)"THE DISK CLEANER"
40 PRINT:PRINT"INSERT DISK TO BE
CLEANED! PRESS ANY KEY TO
START!"
50 IF INKEY$="" THEN 50
60 CLS
70 EX=55135:DR=0
90 ADR=PEEK(238)*256+PEEK(239)
100 FOR Y=ADR TO ADR+256:POKE Y,
255:NEXT Y
110 FOR T1=0 TO 34:FOR T2=1 TO 1
8
112 PRINT@12,"WORKING ON:"
113 PRINT@44,"TRACK: ";T1:PRINT@
75,"SECTOR: ";T2
120 GG=1:GOSUB 500
122 POKE 234,2:POKE 235,DR:POKE
236,T1:POKE 237,T2:EXEC EX:IF PE
EK(240)<>0 THEN PRINT@86,"bad!":
FOR JJ=1 TO 900:NEXT JJ:NEXT
123 IF T1>34 THEN CLS:PRINT"DONE
...":END
130 DSKI$ DR, T1, T2, A$, B$
140 GG=2:GOSUB 500
150 POKE 234,3:POKE 235,DR:POKE
236,T1:POKE 237,T2:EXEC EX
160 GG=3:GOSUB 500
170 DSKI$ DR, T1, T2, A$, B$
180 NEXT T2, T1
190 CLS:PRINT"COMPLETE..."
200 END
500 IF GG=1 THEN PRINT@141,"read
ing" ELSE PRINT@141,"READING"
502 IF GG=2 THEN PRINT@172,"form
ating" ELSE PRINT@172,"FORMATTI
NG"
504 IF GG=3 THEN PRINT@205,"writ
ing" ELSE PRINT@205,"WRITING"
506 RETURN
```

**HSCREEN Snowfall Simulator**  
*by David McNally*



# WHAT'S STILL AVAILABLE...

## **COLOR** *Computing*

Even though Color Computing magazine itself is ceasing publication, we will still always have a wide variety of material available that has always been available in the past. Below is a listing of everything you may still purchase and their final prices. Make checks/money orders payable to Color Computing and send all orders to: COLOR COMPUTING, 65 OAK ROAD, CANTON, MA. 02021-2605. You may want to use the order form following this article. Thank-you for your continued support of the CoCo!

### **I. TRS-80/COLOR COMPUTING PROGRAMS ON DISK**

You may order all the BASIC programs that appeared in TRS-80/Color Computing magazine from June '87 to February '92, on two (2) double-sided disks for \$14. You can also order Volume I - June '87 - April '90 or Volume II - June '90 - February '92 separately for \$8 each. Please add \$.75 shipping/handling per order.

### **II. TRS-80 COMPUTING MAGAZINE ON DISK**

TRS-80 Computing Magazine On Disk is all the articles, programs, and advertisements put together on disk for a certain issue. This product was advertised in the August '89 - June '90 issues for \$8.00 an issue. Since each issue required much effort to put together, we only made three. They are the 6/89, 10/89, and 12/89 issues. They are available for \$4.00 each plus \$.75 shipping/handling.

### **III. TRS-80/COLOR COMPUTING BACK ISSUES**

We are now selling every issue of TRS-80/Color Computing ever printed (including ones that are out-of-print). We will be in the process of making improvements to the older issues, as they are currently in poor condition and very unattractive and unprofessional looking. For individual prices of each issue, please use the order

form on the next page. For shipping/handling costs, add \$1.00 for the first issue and \$.25 each additional issue. Allow up to 3 weeks for delivery.

(NOTE: The following issues of TRS-80/Color Computing were never printed: August 1987, January-March 1988, May 1988, August 1991, and December 1991. The magazine was monthly up until June 1988; from then on it became bi-monthly.)

#### **IV. TRS-80/COLOR COMPUTING ARTICLE REPRINTS**

We are now offering a product at Color Computing never offered before. There are certain articles that appeared in past issues of TRS-80/Color Computing that many may consider to be of great value to them. Rather than ordering the back issue(s) in order to obtain the article(s) you can order article reprints instead. Please note that not all articles published are available. See the order form on the next page for a complete list of the articles we have available in reprint form. Articles are \$1.00 each if it runs under 3 pages, and articles over 3 pages are \$1.00 + \$.25 per page over 3 pages. For example, a 5-page article would be \$1.50. These prices include shipping/handling.

#### **V. COLOR COMPUTING SOFTWARE**

Color (TRS-80) Computing Software has been around selling programs for the CoCo since the magazine started. Please see the advertisement in this issue for its new releases. For the new complete catalog, please write for a free copy. We will continue to keep those who are on our mailing list updated with new software releases, as we are in the process of writing new programs.

# COLOR Computing

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Add \$1.00 for the first issue + \$.25 each additional issue for postage costs.

## TRS-80/COLOR COMPUTING ARTICLE REPRINTS

Check off articles desired:

001: Flippy, the Wonder Disk	4/89 pg.15	1 page
002: High-Resolution Graphics Tutorial	8/89 pg.16	3 pages
003: High-Resolution Graphics Tutorial II	10/89 pg. 15	3 pages
004: "	" III 12/89 pg. 12	4 pages
005: "	" IV 4/90 pg. 20	3 pages
006: Changing Binary to Decimal	10/89 pg. 4	1 page
007: Changing Decimal to Binary	12/89 pg. 4	1 page
008: Changing Binary to Hexadecimal	2/90 pg. 4	1 page
009: Facts About Disks	12/89 pg. 20	1 page
010: Computer Flowcharts	2/90 pg. 15	4 pages
011: Opening and Closing Data Files	2/90 pg. 20	6 pages
	(Includes FILER program 4/90 pg. 9)	
012: Direct Access Filing	4/90 pg. 13	2 pages
013: Refined Direct Access Filing	6/90 pg. 21	2 pages
014: Drawing Circles on the SET/RESET Screen	8/90 pg. 13	2 pages
015: Drawing Circles on the SET/RESET Screen II		

10/90 pg. 12	1 page
016: Drawing Lines on the SET/RESET Screen 12/90 pg. 14	2 pages
017: DSKI\$ or DSKO\$ 8/90 pg. 16	3 pages
018: " " II 10/90 pg. 15	2 pages
019: Computer Viruses 10/90 pg. 18	2 pages
020: Key Repeat 4/91 pg. 12	1 page
021: Color Computer Assembly Language Part I	2 pages
022: " " Part II	2 pages
023: Crashproofing your Programs	4 pages
024: 2 and 3-D Rotations	3 pages

All articles are: \$1.00 - under 3 pages; add \$0.25 per page over 3 pages.

\*NOTE: Articles 023-024 are newly written and never appeared in a past issue of TRS-80/Color Computing.

# BASIC Picture Merger

In this article I am going to show you how you can load a PMODE 4 picture along with your BASIC program without having to load each of them separately. This will save a lot of time when you want a title screen to appear with your program.

We want to trick the computer into thinking that your picture and your program is one file. To do this, follow the steps below:

1. Type PMODE 4,1:PCLS:LOADM"picture". This will load the picture that goes with the program into memory.
2. Load in the program you want the picture to go with. Then add the following lines to the very beginning of the program:

```
10 POKE 27,000:POKE 28,000
20 POKE 29,000:POKE 30,000
30 POKE 31,000:POKE 32,000
(the rest of your program should be here)
```

3. Now type PRINT PEEK(27),PEEK(28) <ENTER>. Two values will appear on your screen. Replace the 000's in lines 10-30 with these two values. The value on the left goes to the first POKE of each line and the right hand value goes with the second POKE of each line. Make sure you enter them as three digit values. For example, say the two numbers returned were 38 and 119. Lines 10-30 should look like this:

```
10 POKE 27,038:POKE 28,119
20 POKE 29,038:POKE 30,119
30 POKE 31,038:POKE 31,119
```

4. Now save the picture and the program as one file.

Disk users type:  
SAVEM"name",&HE00,PEEK(27)\*256+PEEK(28),44661

Tape users type:  
CSAVEM"name",&H600,PEEK(27)\*256+PEEK(28),44661

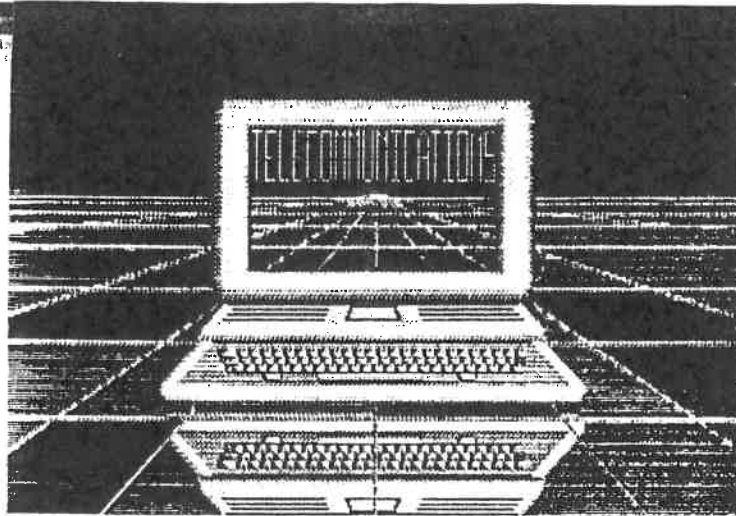
5. Now you can LOADM the program as one file. To run it, you can use either RUN or EXEC.

NOTE: If all you want to do is convert your BASIC program to binary, then use a starting address of PEEK(25)\*256+PEEK(26) instead of &HE00 or &H600.

by David McNally

# THE WORLD OF TELECOMMUNICATIONS

Column written by Michael Holtry



Modems come in two different types; direct connect and acoustic. Both of these work equally well, but most people purchase the direct connect type, as it is easier to use. I own a direct connect, as it is perfect for my requirements. Direct connect is just as the name implies; directly connected to the phone line and computer (via modems).

An acoustic modem uses rubber microphone and speaker cups that connect the modem to a conventional phone handset. If the handset is not like the old Bell phones in shape, it is almost impossible to use! One thing though, make sure that you get an intelligent one when you buy yours. This way, you will have autodialing, answering, redial, automatic parameter adjustments, and other important features. Also make sure that the modem has flexible communications parameter capabilities, for use with different makes of computers, just in case you ever buy an IBM, MAC, AMIGA, or one of those other computers. The Infotel 2400cp (purchased from Mid West Micro in Ohio) can be used with all of these computers, and lots more! Make sure that the modem you purchase has a speaker, so you can monitor the progress of your call. Make sure that you have the ability to change the volume settings on your modem, in case you ever need to adjust it for a noisy background. Most of the modern terminal software allows you to adjust the speaker volume through the software itself.

By now you should have an idea of what kind of modem is right for your purpose. Deciding on the features and modem speed is very important, as you should know from my earlier articles. You will be using this modem for years, so make sure that you have exactly what you want.

Make sure that the modem you are looking at is hardware and software compatible with our favorite computer, the great CoCo!!!! The best way, but not always possible, is to try all the hardware (computer, modem, etc) and the software together to make sure that everything is compatible. If this is not possible, call and talk to someone in the Customer Service of the place that you are thinking of purchasing it from. They should be able to answer all your questions on compatibility. Reading reviews on modems in computer magazines is one way to find that modem that is perfect for you! Some of the magazines that I found quite helpful was the Computer Shopper, PC Magazine, PC Computing, and the Computer Buyers Guide.

Make sure that the serial port on your CoCo and the one on the modem is compatible. Most modems will work with our CoCo, but it is better to ask questions first. It will save you a lot of headaches later on. As I said earlier, software compatibility is important too. It may seem obvious, but not all modems respond to the same set of commands. So if your software sends

commands that the modem doesn't have, you will have a hard time using them together. Fortunately, most modems use the same command set. This "STANDARD" command set is called the "AT" or Hayes set. Make sure that your chosen modem is AT or Hayes compatible. This makes the compatibility problem less of a headache. Most, if not all, current modems are Hayes Compatible!

The AT command set is called thusly because the command that is used to bring the modem online is "AT", which stands for "Attention", and wakes the modem up. Other commands are: D for Dial, T for "use tones when dialing", and P for pulse dialing. For instance, ATDT-tells a modem to go online, and dial a number using tones. There is also an "extended AT command set" that some manufacturers use today. These are for being able to access thier modems special features. Again, find out which AT command set your modem supports.

Here is the Standard AT Command Set:

- AT- Attention--- wakes or initializes the modem.
- A- Set modem to answer mode.
- C- Enable/Disable carrier signal.
- D- Dial number following.
- E- Enable/Disable character echo.
- F- Set Duplex.
- HO- Hang up.
- I- Query for information about modem.
- L- Speaker volume control.
- M- Speaker on/off control.
- O- Return online after entering command mode.
- Q- Enable/Diable result code display.
- Sxn- Set S-register x (number replaces x) to value n (number replaces n).
- SX?- Display value of internal register X.
- V- Specifies type of result code displayed.
- Xx- Enables call monitoring and detection features on your modem.
- Z- Modem is reset to default(factory) settings.
- (Return or Enter)- Implements commands entered before it.
- AT&- Prefix for advanced modem commands (not all modems have these)
- A/- repeat last entered command.
- +++ - Enter the modem command mode.

These last two commands do not require that you place a carriage return after them.

Terminal software is the next step. If you have a CoCo 1, 2 or 3, you will need to check with a local CoCo telecommunications fanatic for public domain terminal software, or contact a Shareware Terminal author for some really fantastic software. Here are a few of the terminal programs available for the Coco, and what computer it will work on. Mikeyterm and Grey-E-term are available for the CoCo 1, 2, or 3. Ultimaterm, Vterm, or Delphiterm are for the CoCo 3 only.

Mikeyterm was authored by Mike Ward, 1807 Cortez, Coral Gables, FL 33134. It is a shareware program. It will work on any of the Color Computers. If you are interested in obtaining this terminal program, send \$10.00, a blank diskette or tape, and a reuseable disk mailer to the above address. I used Mikeyterm for several months, on my old CoCo 2, and found it to be a well written program. It come with files that print out into a instruction manual.

Greg-E-Term, which I don't have an address for, is also shareware. Contact fellow CoCo users in your area, as someone will surely have a copy of this one. It is also usable on all the CoCo's, and is a nice terminal program.

V-Term is available from Gimmesoft, a Rainbow advertiser. Write or call



them at: Gimmesoft, P.O. Box 421, Perry Hall, MD. 21128, (301) 256-7558. This terminal program is one of the best available for the COCO 3, yet it is easy to use and well documented for new users!

Delphiterm wrote by Rick Adams, is a terminal program designed to make connecting with Delphi (a national information service) easy. It has lots of features, and can be used to connect to any remote computer system (BBS's, Information systems, ect.). The documentation is well written. Contact Rick Adams at: 702 Monroe Street, Santa Rosa, CA 95404. Send \$10.00, a disk, and a disk mailer.

Lastly, but of course not least, is Ultimaterm! It is my personal favorite, and a lot of others use it also. Ken Johnston is now in the process of a major rewrite of this great terminal program, so stay tuned for Ultimaterm version 5.0. From communications with the man himself, it sounds like a great state of the art terminal will be available in a few months. So keep your eyes open for this, but until then we will have to live with Ultimaterm 4.0, the current version. It has many powerful features and the manual is very well written. If you are interested in this program, write or call him at: Ken Johnston, H522 4020 37th Street S.W., Calgary, Alberta T3E 3C4, or call (403) 242-3485. In the evening is the best time to contact Ken.

Well, now that you have your modem and terminal software, it is time to connect everything together and get online. If you have a Multi-Pak, plug your RS-232C pak into slot 1. Plug the other end of the cable into the modem's serial port. If you don't have a multi-pak, purchase a Din plug to DB-25 plug cable. These are available from many Rainbow advertisers. Plug this cable into the CoCo's serial port and into the modems serial port. Using this setup you will only be able to send at 300 baud on the CoCo 1 and 2. On the CoCo 3, it is possible to send at 2400 baud, through the serial port.

Well, that is all for this one, so I hope to see you online in the near future. Keep on modeming!

# COLOR COMPUTING SOFTWARE PRESENTS...

## The Sound Library Vol. 1

The Sound Library Volume One contains five digitized sounds that you can add to your sound collection. The sounds include a trumpet call, an electric guitar solo, cannons firing, carolers wishing you a Merry Christmas, and some haunting vocals. Each sound is digitized in 6 bit quality which is the highest quality you can get without using hardware.

CoCo 3.....\$6.95

## The Sound Library Vol. 2

The Sound Library Volume 2 contains five more sounds to add to your collection. The sounds are action based and are in 6 bit quality.

CoCo 3.....\$6.95

## Puzzle Madness: Three Mind Twisting Puzzles

Three puzzles just for you! The first program, Wordsearch Generator, will create wordsearch puzzles from a word list that you enter in. The program also prints the answer keys.

The second program, Video Jigsaw, scrambles up PMODE 4 pictures and lets you put them back together.

The third program, FIND IT! is the hardest of all. The computer will display a word and you have to make as many words as you can from the letters in the given word. A dictionary is included with each word so that you can't cheat. The program comes with five word lists which are picked at random.

CoCo 3.....\$9.95  
IBM Wordsearch Puzzle Generator.....\$11.95

## Markbook V1.0

Markbook will keep track of all your grades! The program can hold 35 students, nine subjects, and up to 20 grades per student in each subject. The program can average all grades quickly and accurately. All menu driven!

CoCo 2 & 3.....\$9.95

## Deluxe Music Machine Plus

This program will allow you to create sound and music on your computer with ease! The program allows you to play your computer like a piano and then converts all the key presses into sound commands. A BASIC convert utility is included which will actually write the BASIC program that plays your song (not included on Apple version). Includes many editing features!

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# The Time has Come

Well, the time has come to say goodbye. For five long years we have dedicated many long hours to the production of Color Computing Magazine. I would like to take the time to thank those people who have helped us through these five years; the teachers at the Galvin Middle School, who encouraged us to write the magazine and who have stood behind us all these years, the contributors, who have spent countless hours of their own time writing articles and programs that all of us could benefit from, our advertisers, who trusted us to inform many CoCo users of their products, and the subscribers, who have stuck with us even when the times were tough.

If you have missed any of our issues, they are still available through back issue orders. We will continue to sell them along with our line of software products for as long as possible. See our ad. in this issue for a complete up to date list of products and prices. All orders can be sent to the normal address.

I am happy to announce that you will still be able to find my latest programs and articles listed in JWT Enterprises new newsletter UPTIMES. For more information on this newsletter, see the ad. in this issue.

Thanks again for all your support and help keep the faithful ol' CoCo alive! See you in UPTIMES!

- David McNally -

Color Computing  
Program Editor

# TRS-80 COMPUTING COLOR COMPUTING 1987 - 1992

A special thanks to all of  
those who have helped make  
this magazine possible  
through the years...

Albert Noah

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Ross Kramer

*Joe Ahern*

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