

RADIO SHACK COLOR COMPUTER MAGAZINE

Oct, 1987
Vol. 4 No. 8

\$1.95

DYNAMIC



LOOK NEWS

Ham Radio
ML Programming
Taking Control
+ Much More

DYNAMIC COLOR NEWS is published monthly by DYNAMIC ELECTRONICS, INC., P.O. Box 896, Hartselle, AL 35640, phone (205) 773-2758. Bill Chapple, BA, BSE President; Dean Chapple, Sec. & Treas. ; John Pearson, Ph. D. Consultant; Bob Morgan, Ph. D., Consultant.

Entire Contents (c) by DYNAMIC ELECTRONICS INC., 1987. DYNAMIC COLOR NEWS is intended for the private use of our subscribers and purchasers. All rights reserved. Contents of this magazine may not be copied in whole or in part without written permission from DYNAMIC ELECTRONICS INC. Subscriptions are \$15/yr for U.S.A. \$18 Canada & Mexico, \$30 other foreign.

The purpose of this magazine is to provide instruction on Basic & Machine Language programming, Computer theory, operating techniques, computer expansion, plus provide answers to questions from our subscribers.

The submission of questions, operating hints, and solutions to problems to be published in this magazine are encouraged. All submissions become the property of Dynamic Electronics if the material is used. We reserve the right to edit all material used and not to use material which we determine is unsuited for publication.

We encourage the submission of Basic and Machine Language Programs as well as articles. All Programs must be well documented so the readers can understand how the program works. We will pay for programs and articles based upon their value to the magazine. Material sent will not be returned unless return postage is included. Basic & ML programs should be sent on a tape or disk & comments should be sent as a DAT or BIN file.

```

*****
*
*   DYNAMIC COLOR NEWS   *
*
*   Oct 1987             *
*
*   Editor and Publisher *
*   Bill Chapple W4GQC  *
*
*   Secretary           *
*   Dean Chapple       *
*
*****

```

CONTENTS

Taking Control.	4
ML Programming (Part 17)	9
Disk Cataloger	12
Reformatting Data (Part 2)	17
Editor's Comments	22
Product Reviews	23
New Products.	26
Parachute	27
Ham Radio & Computers	30
Questions & Answers	33

CC-THERM (new)

CC-THERM is a digital thermometer for Radio Shack Color Computers. It consists of a thermistor wired to the end of a flat cable. The other end of the cable is wired to a joystick plug. The thermistor can be mounted on a wall, inside equipment, or outside for temperature measurements. It can be used to monitor the temperature inside a computer or other equipment where a remote temperature measurement is desired. The computer could be used to control a relay to turn on a heater or air conditioner for regulating temperature. A dual version is available for measuring temperature in two locations or for measuring both inside and outside temperatures. The outside temperature can be read from your screen for Ham Radio use. Basic software on tape or disk continuously prints the temperature in both Fahrenheit and Centigrade. The software could be merged with other programs to expand its usefulness.

CC-THERM \$12.95, CC-THERM 2 \$19.95

CC-LIGHT (new)

Similar to CC-TERM except photo cells are used in place of the thermistors. Use the computer to record relative light intensities or turn on lights at dark. CC-LIGHT uses one joystick port and has the photo cell attached to the end of a 10' flat cable. A dual version has photo cells on 10' and 20' cables.

CC-LIGHT \$12.95, CC-LIGHT 2 \$19.95

CC-LT (new)

We combined CC-TERM and CC-LIGHT to provide an assembly that measures both temperature and light. A joystick assembly includes a light and temperature sensor at the end of a 20' flat cable. Uses only one joystick plug.

CC-LT \$19.95

Specify tape or disk software for CC-LIGHT or CC-TERM.

INTRODUCING DYPRINT

BANNER

Now you can print **LARGE** signs for special occasions such as birthdays, parties, or yard sales. Even make your own **FOR SALE** signs when you need to sell that old car or lawnmower. Banner uses standard print characters and is compatible with any printer. The characters are formed by a 21 x 27 dot pattern and are printed sideways across the paper. The basic character can be expanded up to 4 times for making large characters up to a full page.

The printer parameters can be used to expand the size and quality of the signs. For example high density signs can be printed with printers that use compressed characters. Darker signs can be printed by using double strike.

MAXPRINT

MAXPRINT allows graphics to be blown up and printed on a standard printer. Any PMODE 4 picture generated by COCOMAX, MAGIGRAPH, VIDEO DIGITIZERS, or BASIC can be printed. This allows a large picture or poster to be made. The program supports all 8 graphics pages for a total of 12288 bytes. MAXPRINT prints 8 characters per byte for a total of 98304 characters.

The graphics picture is 256 characters wide and is printed with 2 passes for the 128 character per line mode or 8 passes for the 32 character per line mode using large characters. The results from each pass can be trimmed and taped together to form a large blown up picture.

Use MAXPRINT to blow up pictures of friends and family and make posters announcing sales or special events.

The DYPRINT package contains both BANNER and MAXPRINT. The cost is only \$19.95 plus \$3 shipping for tape or disk.

Checks, VISA & MC Cards
Add \$3 Shipping

DYNAMIC ELECTRONICS Inc.

Box 896 (205) 779-2758

Montgomery, AL 36104

TAKING CONTROL

Part 1

You have just received your driver's license and Dad is allowing you to drive the car. As you fasten your seat belt and turn on the ignition a feeling of accomplishment surrounds you. For many years you have waited for this moment and as you race the engine you know that you are in control. The vehicle will not do a thing without an input from you.

This is a series for beginners who want to learn about computers. You can learn to take control and make the computer obey your instructions. A computer can do many different tasks, but it needs instructions called programs. There are two ways to get programs. The first is to purchase them. This is advisable for complex programs. Programs such as music generators, ham radio controllers, word processors, and games can be very complicated requiring an experienced programmer.

However anyone can learn to write programs to do the simpler tasks. In this series programming terms will be defined and example programs will be given. By following these examples, anyone can learn to write programs.

What about computer terms? Rather than just giving instructions on programming, useful information about computers will be included. For example what is RAM, ROM, I/O, SERIAL, PARALLEL, BYTE, BIT, DOS, etc. These are computer terms which will be explained. Also expansion tech-

niques will be included. For example suppose you started with a 64K color computer 2 and a tape recorder. These are used for a few months and you decide you want more capability. Depending on the amount of cash available, a disk drive, printer, memory expander, hardware expander, or software could be added. All of these cost money so they could be added one at a time. If they are to be purchased one at a time, then your needs would determine which item would be next. For example a disk drive and printer cost about the same. If you do a lot of writing, you would probably need a printer before a disk drive. However if you do a lot of programming then you would probably want the disk drive first so programs can be loaded and saved quickly. While on the subject of saving programs, a cassette works great. Some people seem to think that a disk drive will do wonders for them. However for saving programs, a cassette does a good job although it is much slower.

COMPUTER ARCHITECTURE

An architect draws plans to show how a structure is to be constructed. Let's look at the construction of a computer. At the center is the central processing unit (CPU) or microprocessor. Color Computers use the 6809 series of microprocessors manufactured by Motorola. Surrounding the microprocessor are support devices. These can be memories or input/output (I/O) devices.

An input device is one that allows data to be sent to the microprocessor. An example is the keyboard.

An output device is one that receives information from the microprocessor. Examples are the television, a monitor, or a printer. Some devices are both input and output. The cassette and the disk drive both receive and send information.

MICROPROCESSOR

A microprocessor is a bus oriented device. This could be compared to a 4 party telephone line with separate ringing codes for each party. It is possible to ring any one of the 4 phones without ringing the others. Yet all phones are connected together and the line can be monitored at any time by any of the phones.

The microprocessor with support circuitry selects the appropriate I/O device depending upon the memory addressed. It has 16 address lines and 8 data lines. These are called the address bus and the data bus. Each device is connected to these buses.

A select line is also connected to each device. A device is inactive if this line is high (1). When the memory location the device uses is selected, the select line for the device goes low (0) and the device is enabled or activated. The operation of the microprocessor is quite complex and this is a very simplified explanation.

BITS & BYTES

The smallest memory cell is the bit. Eight bits make a byte. Memory is designated in terms of bytes. The data bus is 8 bits or one byte. The address bus is 16 bits or two bytes.

MEMORIES

There are two kinds of memories which are temporary and

permanent. Permanent memories are called read only memories (ROM). When the computer is turned on or reset, it is forced to go to an interrupt and perform instructions stored in the ROM. This process stores values into specified memory locations, writes the copyright notices on the screen and prints the OK prompt. It is now ready to accept basic commands. The ROMS program the computer to receive basic commands and to execute or carry out the instructions.

The other type of memory is called random access memory (RAM). It is the memory that is used when programs are loaded. There are two kinds of RAM. Static RAM is the simpler of the two but does not have as much memory capacity. Dynamic RAM is used in color computers because it has a very large memory capacity per chip. The earlier color computers used 4116 chips which were only 16,000 or 16K bytes. Memories are rated in terms of kilo or thousands of bytes. Actually 1K of memory is 1024 bytes. So 64K of memory would be 1024*64 bytes. The earlier 64K computers used 4164 chips. Each chip contained 64K of memory or 64K bits. Since a byte contains 8 bits, eight of these chips were required to give 64K of memory. The newer color computer 2 computers use 41464 chips. These are 64K by 4. It only takes two of these chips to give 64k x 8 or 64K of memory. The color computer 3 uses 4 of these chips for 128K of memory. The 512K upgrades for the color computer 3 uses 41256 chips which are 256K by 1 bit. These are 256K by 1 bit. For a 256K memory 8 of these are required and 16 are required for the 512K upgrade.

PROGRAMMING

Programming is the process of writing instructions for the computer. There are many programming languages but basic is perhaps the easiest to use. Examples of other languages are

ALL PROGRAMS COPIED

CHECKERBOARD FILESORT

32 OR 64K FILE PROGRAM - BOTH VERSIONS INCL.
 - \$16.95

13	80	54	17	21	75	18	36	63	9
62	Bakersfield KENO U1.2								41
3									33
72	49	11	29	44	38	55	27	16	1

32 OR 64K KENO SIMULATION

- \$12.95 - \$13.95

GRPH200 GRPH200GRPH200

ML GRAPHICS DUMP FOR DM 200
 16/32/64K 16/32/64K
 \$15.95 \$16.95

ML ROUTINES FOR DATA, EDIT, SORT, REVIEW, SEARCH, ERROR TRAPPING. MANY HARDCOPY OPTIONS.



PO BOX 6464
 BAKERSFIELD, CA
 93386

ENJOY A STIMULATING GAME OF KENO. A GRAPHIC DELIGHT FILLED WITH REALISTIC, EXCITING ACTION. PICK 1 TO 15 SPOTS. COMPLETELY RANDOM WINNERS. PREPARE FOR AN EXTREMELY CHALLENGING GAME. CAN YOU BREAK THE HOUSE?

CHECK OR MONEY ORDER.
 CALIF RESIDENTS ADD 6%
 WE WILL MODIFY PROGRAMS TO WORK WITH YOUR PRINTER - NO EXTRA!

ML GRAPHICS DUMP FOR THE DMP-200. POSITION GRAPHIC PAGES 1-4, 5-8, OR 1-8 ANY PLACE ON PAPER. MENU PROMPTS! STANDARD, CONDENSED, OR COMPRESSED. PRINTOUTS IN NORMAL, ELONGATED, DOUBLE-, OR TRIPLE-SIZE.

FORTRAN and COBOL. FORTRAN is used for scientific applications and COBOL is used in business. However basic can be used for both scientific and business applications.

INSTRUCTIONS

An instruction can be entered from the keyboard or from basic statements in a program. The keyboard entry method can be very useful so this will be presented first.

ARITHMETIC OPERATIONS

First let's look at the basic arithmetic operations such as those used in a calculator. They are as follows with examples:

- + Addition 2+3
- Subtraction 9-5
- * Multiplication 25*30
- / Division 100/2.5

PRINT COMMAND

The print command allows results to be displayed or printed on the screen. This can be used to print words or the results of a calculation. Either the word PRINT or the ? symbol can be used. The following is an example:

? "THIS IS AN EXAMPLE."

Notice that quotations are at the beginning and ending of the

sentence. This tells the computer that word characters are being printed. These are called STRINGS in computer terminology. To make the computer print the sentence it is necessary to type it in as shown and press the ENTER key. The ENTER key tells the computer to perform the task. After pressing the ENTER key the following will be printed on the screen:

```
? "THIS IS AN EXAMPLE."  
THIS IS AN EXAMPLE.  
OK
```

The characters within the quotation marks are printed. On the next line the OK prompt is printed indicating that the computer performed the task.

Now let's put this into a program. If there were a previous program in the computer then it would be necessary to type "NEW" and press the enter key. The NEW command erases any previous program and prints the OK prompt. Now enter the print command as follows:

```
10 ? "THIS IS AN EXAMPLE."
```

Notice a number precedes the command. This tells the computer that this is line number 10. Basic commands are executed in order of the line numbers. Any numbers can be used up to around 60000. Now press the CLEAR key to clear the screen. Then type "RUN" and press the ENTER key. Notice that the

instruction is not printed on the screen. Instructions in a basic program are not printed when the program is run. When instructions are entered from the keyboard the instruction is printed.

PRINTING NUMBERS

To print numbers just type ? and the number. Fortunately basic will print the result of a numeric calculation. Try the following example:

?25/3.5

To execute a command the ENTER key will need to be pressed. The screen will then display:

?25/3.5
7.14285715
OK

Now enter

?3.5+25-7.13+5*3

The computer displays

?3.5+25-7.13+5*3
36.37
OK

When mixed operations are entered from basic, the multiplication and division operations are performed before addition and subtraction.

CHECK BOOK BALANCE

The computer can be used for keeping a balance of your check book without any programs. Suppose you had the following data and want to verify your balance:

Beginning balance = 395.25
check 100 = 5.36
check 101 = 29.35
check 102 = 129.39
deposit = 259.00
check 103 = 275.00
check 104 = 25.18
check 105 = 121.15
Balance = ?

The computer can quickly find the balance if you enter the following:

?395.25-5.36-29.35-129.39+259
-275-25.18-121.15

The answer is 68.82. All of the print command should be entered without pressing the enter key. We printed it on two lines, but it would appear on only one line if we could display the characters. It is recommended that this procedure be practiced on your check book or a fake check book. This is very useful and easy to use. The computer is a powerful calculator. Notice that the command is printed on the screen as the numbers are typed in. This makes it easy to spot errors which is not possible with a calculator.

Next month more material will be presented. As stated in the beginning, these are tools that will allow basic programs to be written. Programming takes practice and it is recommended that the examples be practiced until learned. When new commands are presented, it will be assumed that this material is known.

BACK ISSUE
Back issues of Dynamic Color News are available for \$1.95 each, 3 for \$5 or 12 for \$15 pp.
Foreigners other than Canada add \$2 for Air Mail postage.

OPERATING HINT

For Deleting characters using the extended basic's editor just pres the "D" key for each character. This saves having to count the characters when using the multiple character delete method.

HI: 009900
 SCORE: 000250

LEVEL: 1
 ROUND: 1



Introduction

The pyramid has long been associated with mystery and power. Now, with PYRAMIX for your CoCo 3, the pyramid will be a source of countless hours of arcade fun that everyone can enjoy!

PYRAMIX is a 100% machine language arcade game written exclusively to take advantage of all the power in your 128K or higher CoCo 3. The colors are brilliant, the graphics sharp, and the action hot.

The object of PYRAMIX is deviously simple. All you have to do is hop Kubix - a short, roundish little guy with a long snout - on the tops of the blocks that make up a pyramid on the screen. When Kubix hops on a block it changes color. The idea is to get all the blocks to be the same as the cube in the upper left of the screen. When all the blocks match, you will advance to the next round.

NEW COCO-3 GAME

We know you will like this exciting arcade type game. The price is only ~~\$24.95~~ ^{19.95} and we will pay the shipping. Requires 128K plus a disk drive.

Checks, VISA or MC

Dynamic Electronics

Box 896

Hartselle, AL 35640

(205) 773-2758

SPECIAL DEAL ON 500 PROGRAMS!

GET 50 DISKS OR 50 CASSETTE TAPES FULL OF OVER 500 PROGRAMS. HERE IS WHAT YOU'LL RECEIVE:

- *Over 250 Utility/Home Application Programs including a Word Processor, DataBase, Spreadsheet, Account Manager, 2 Basic Compilers, Terminal Programs, ROM Copies, Mail List, Machine Language Tutorials, Plus Much More!
- *Over 200 exciting games including Warlords, Star Trek, Super Vaders, Solar Conquest, Horse Races, Football, Baseball, Frog Jump, Invader, Plus Much More! (Many machine language games)
- *Over 30 adventures including The College Adventure, Dungeon Master, Space Lab, Ice World, Ship Wreck, Zigma Experiment. Plus 32K Graphic Adventures.

EACH INDIVIDUAL ISSUE SOLD FOR \$9.00 EACH OR \$450 FOR ALL 50 ISSUES. WE SLASHED THE PRICE TO ONLY 149⁹⁹.

REG. \$450

NOW \$149⁹⁹

★ THIS MONTH ONLY ★

Buy this package of 500 programs and receive a free 6 month subscription. (A \$35 value)



- 16K-64K Co or Computer
- Over 4000 Satisfied Customers
- Back Issues Available From
- July '82 (Over 500 Programs)

OUR LATEST ISSUE CONTAINED

1. Accounts Receivable
2. Work Mate
3. Calendar
4. Invasion
5. Trip Adventure
6. Foot Race
7. PippitytheSeal
8. Screen Calculator
9. Able Builders
10. Super Error 2

Available on COCO 1, 2 and 3!
 All Programs Include Documentation!



THE GREATEST SOFTWARE DEAL ON EARTH JUST GOT BETTER!

THAT'S RIGHT! THIS MONTH WE'VE DROPPED OUR YEARLY SUBSCRIPTION RATE AN UNBELIEVABLE \$10.00 TO ENTICE YOU INTO SUBSCRIBING WITH US. GET 12 DISKS OR TAPES A YEAR CONTAINING OVER 120 QUALITY PROGRAMS. A SUBSCRIPTION TO T & D SOFTWARE CONSISTS OF 10 READY-TO-LOAD PROGRAMS DELIVERED BY FIRST CLASS MAIL EVERY MONTH.

NO WE ARE NOT THE SAME AS THE RAINBOW ON TAPE. IN FACT, MANY SUBSCRIBERS HAVE WRITTEN IN AND SAID THAT WE ARE MUCH BETTER THAN RAINBOW ON TAPE!



	PRICES	
	TAPE OR DISK	THIS MONTH ONLY
1 YEAR (12 Issues)	29.00	60.00
6 MO. (6 Issues)	18.00	35.00
1 ISSUE	2.00	8.00

Michigan Residents Add 4%
 Overseas Add \$10 to Subscription Price
 Personal Checks Welcome!

T&D SUBSCRIPTION SOFTWARE, 2490 MILES STANDISH DR., HOLLAND, MI 49424 (616) 399-9648

MIL PROGRAMMING

by

John Galus

PART 17

GRAPHICS

Whenever you turn on your Color Computer the Basic initialization routine sets the graphic screen at \$400 to \$5FF, which represents the normal text screen. This is accomplished by setting the correct registers that control the display starting address and the display mode. Addresses FFC6 to \$FFD6 control the screen start address and the display mode registers are located at \$FFC0 to \$FFC5. Two addresses control each register. Writing data to an even numbered register sets the register and writing data to an odd numbered register clears the register. For example, if all the address registers were cleared the video display would begin at \$0000. In order to cause the video screen to start at \$0400 the register at \$FFCB must be set, remember we are working with binary values. This starting address corresponds to the upper left display address. Another address that controls the video display modes is located at \$FF22. Bit 3 of \$FF22 controls the color set used for 2 or 4 color modes and bits 7-4 controls the video mode used.

Normally on setup all these bits are cleared and the computer is placed into the alpha/semi-graphic mode 4. For example, if we wanted to switch to semi-graphic mode 6 all we would have to do is set bit 3 of \$FF22 by storing 16 there. Try this short Basic program to examine

this mode, semi-graphic 6 mode is similar to the graphics used on the old Model 100 TRS-80 except with color.

```
10 X=128:POKE&HFF22,16
20 IF INKEY$=""THEN20
30 POKE&H423,X:X=X+1
40 GOTO20
```

I'm sure you are probably familiar with the Basic CLS command. This instruction clears the video screen starting at \$400 to any of the eight colors you choose. We can simulate a CLS0 in Assembly language with the following routine:

```
CLS LDX R#400 ;SCREEN START
    LDA R128 ;A BLACK CHAR
LOOP STA ,X+ ;PUT ON SCREEN
    CMPX R#5FF:END OF SCREEN
    BLO LOOP ;IF NOT LOOP
    SWI
    END
```

Another way of doing a CLS is to use the routines provided in the Color Basic ROM. To perform a normal text CLS we would execute the ROM subroutine located at \$A928. If we wish to clear the screen to a certain color we would need to perform the following two line routine placing the value of the color we wish to use (from 0 to 8) into the B register and then calling the ROM routine as follows:

```
LDB R3 ;BLUE
JSR $A918 ;ROM CLS ROUTINE
```

If we desired to place a character on the screen say, a green dot we could simply load a register with the correct value and store it on the video screen.

```
LDA #129 ;A GREEN DOT
LDX #422 ;VIDEO LOCATION
STA ,X ;PUT IT THERE
```

The Basic SET command does this for us and in any color we choose. Let's examine how this is accomplished. The SET command divides the screen into a 64 by 32 grid and places a dot of your chosen color on the video screen. Since on startup Basic is set into the correct video mode for this particular graphic mode, there is no need for us to worry. All we have to do is calculate the correct spot on the grid and place a dot there. It sounds easy doesn't it?

Let's see what's involved in this simple operation. First here is how this routine would look in Basic:

```
1 C=3:X=10:Y=10:CLS0:SET(X,Y,C)
```

Here is how it's done in Assembly language. I will use the ROM CLS routine to save some work.

```
COLOR RMB 1
XPOS RMB 1
YPOS RMB 1
MASK RMB 1
START LDB #3
      STB COLOR ;BLUE DOT
      CLRB
      $A918 ;CLS0
      LDA #10
      STA XPOS
      STA YPOS
      BSR SET
      SWI
SET   LDB YPOS
      LSRB ;Y/2
      LDA #32 ;32 ACROSS
      MUL ;OFFSET
      LDX #400 ;VIDEO
      LEAX D,X ;ADD Y
      LDB XPOS
      LSRB ;X/2
```

Color Computer 2 Kit *(Special Purchase)*

Now you can build your own Color Computer 2. These kits were designed for a school and are complete with a step by step instruction manual plus the normal Radio Shack operating manuals. They use 4164 memory chips and sockets are included for all integrated circuits. Upgrade to 128K, 256K or 512K with Banker RAMS. If you have an older CC1 or CC-2 then this is an excellent source for spare parts. Replacement parts would cost more than this kit. A fine gift for that teenager.

CC-2 Kit \$59.95

Telewriter 64 Word Processor

This excellent word processor will handle all of your writing requirements. With its full screen editor, any part of the text can be quickly accessed with the arrow keys. Phrases or paragraphs can be inserted, deleted, or copied to another part of the text. The completed writing can be saved to a cassette or disk or printed on any printer. Features include:

- 3 display formats of 51, 64, or 85 columns x 24 lines
- True lower case characters
- User-friendly full screen editor
- Right justification
- Drives any printer
- Runs in 64K or larger computers
- Menu driven disk and cassette I/O
- CoCo 3 Compatible with Poke for 32K mode or ULTRA-TELEPATCH.

Disk \$55.95, Tape \$49.95

Ultra - Telepatch

Telewriter 64 enhancer that adds features such as block transfer, autokey repeat, overstrike, visible carriage return, in memory disk I/O module, typeahead buffer, fast disk I/O, search & replace control codes, user definable defaults, word delete, disk spooling, key beep, multiple print copies. Modify the boot program for your parameters. Print to disk with TSPool or make multiple copies with TPRINT. Makes the Telewriter 64 completely compatible with the COCO-3.

\$16.95 disk

Add \$3 shipping

DYNAMIC ELECTRONICS
Box 896 (205) 773-2758
Hartselle, AL 35640

```

ABX          ;ADD XPOS          RES   JSR $A8B5 ;DO RESET
LDA YPOS
LDB XPOS
AND A R1     ;LEFT/RIGHT
RORB
ROLA
LDB R$10     ;MASK          POINT(10,10)
LOOP LSRB
DECA
BPL LOOP     ;LOOP BACK
STB MASK     ;NEW MASK
LDB COLOR
LDA R$10
MUL
PSHS B       ;SAVE COLOR
LDA .X       ;GET BYTE
AND A R$0F
ORA MASK
ORA .S+
ORA R$80     ;GRAPHIC ON
STA .X       ;SET IT
RTS
END

POINT JSR $A928
LDX RPO
PSHS X
LDX RPAR ;POINT TO )
LEAX -1,X ;BACK ONE
STX $A6 ;TRICK BASIC
JSR $9F ;TO TAKE CHAR
LDD R$0A0A
PSHS A
JMP $A8D7 PO
JSR $A8F7 ;DO POINT
JSR $B3ED ;GET FP VALUE
CLRA
JSR $BDCC ;PRINT R IN D
JSR $B958 ;PRINT <CR>
SWI
END

```

This seems like a lot of work to just put a dot onto the screen. To make our task easier we could use routines provided in the ROM to help us do some of the work. This is how we could perform a SET.

SET(10,10,1)

```

START CLR B
JSR $A918 ;CLSO
LDX RDOT
PSHS X ;SETUP RTS
LDD R$0A0A ;X/Y POS
PSHS A ;SAVE XPOS
JMP $A8D7 ;GOTO ROM
DOT LDA .X ;GET BYTE
ORA $86 ;MASK IT
STA .X ;SET IT
SWI
END

```

We could also use ROM routines to perform a RESET or POINT command as follows:

RESET(10,10)

```

START JSR $A928 ;CLS
LDX RRES
PSHS X
LDD R$0A0A
PSHS A
JMP $A8D7

```

Notice in the Point routine how I "tricked" Basic into accepting the required ")" for this instruction. Why do all the work involved with these routines if the code has been so thoughtfully provided for us in the Basic ROM? It takes quite a bit of work to program any average size Assembly language program and a wise programmer always uses every trick and bit of knowledge he has to accomplish the task at hand creating a working useful Assembly language program or routine. Remember the final results are the most important thing, no matter how it is done. It's not being lazy, just resourceful. Next time we will look at High resolution Graphics. See you then.

RENEWAL TIME?

The date beside your name on the address label indicates the last issue you will receive. Send in your renewal if you want to continue receiving technical information on Color Computers. This is the last issue for those with 10/87.

Disk Cataloger

As more and more disk programs are accumulated, it becomes difficult to find the disk containing a specified program. This program reads the directories for disks and makes the information available. The files can be sorted or any one file can be searched. The disk containing the file can quickly be found. All files can be printed to the screen or a printer. The program is menu oriented and easy to use. It is supplied as a courtesy of T & D Subscription software (See their advertisement on page 8) and is used by permission.

```

10 GOTO1420
20 GOSUB1280
30 'do not renum!
40 'print codes and variables
50 CLEAR12000:POKE150,1 '9600 BD
60 NM$="" " 'NAM.COMMNT
70 T2=20 'COLM SPCNG
80 XO$=CHR$(27)+"W1" 'EXPND ON
90 XF$=CHR$(27)+"W0" 'EXPND OFF
100 CO$=CHR$(15) 'CMPRSD ON
110 CF$=CHR$(18) 'CMPRSD OFF
120 FF$=CHR$(12) 'FORM FEED
130 MR$=CHR$(27)+"@" 'MASTR RSET
140 WI=40'WIDTH FOR TITL CENTRNG
150 D=500:DIMN$(D+10):M9=0:DV=1
'DEVICE=DSK
160 CLS:PRINT:GOSUB1030:PRINT@71
'***the cataloger***:GOSUB10
30:GOSUB1050
170 GOSUB970:ONINSTR("LSVPCDE",I
$)GOTO200,780,240,830,700,124
0,1410
180 SOUND100,2:GOTO170
190 'appnd/load/ld dir
200 X=M9:CLS:PRINT@196,"<L>OAD D
IRECTORY":PRINT@228,"<A>PPEND
/LOAD FILE":PRINT@320,"YOUR
CHOICE OR <ENTER> TO EXIT:"
210 GOSUB970:IFI$=CHR$(13)THEN16
0
220 IFI$="A"THEN730ELSEIFI$="L"
T
HEN1140ELSE SOUND100,2:GOTO21
0
230 'view/chg/del/find/add

```

```

240 X=1:GOTO260
250 GOSUB1080:PRINT@64,"ARW=MV S
HFTD=PG <E>XIT <A>DD";:PR
INT"<S>ORT <C>HANGE <D>ELETE
<F>ND";:PRINT@487,"TOTAL EN
TRIES:";M9::GOSUB1100:GOSUB51
0:RETURN
260 GOSUB1080:CLS:GOSUB490:GOSUB
250
270 GOSUB280:GOTO320
280 L=170:PRINT@L-10,X:PRINT@L-3
' "-->" +N$(X):IF M9=0THEN RETU
RN ELSE L=L+32:TC=X+5:IF TC>M
9 THEN TC=M9
290 IFX=M9 THEN310
300 FORY=X+1 TO TC:PRINT@L-10,Y:
PRINT@L,N$(Y):L=L+32:NEXTY
310 IF TC-X<>5THEN PRINT@L-10,ST
RING$(32," "):RETURN:ELSE RE
TURN
320 I$=INKEY$:IFI$="E"THENGOSUB1
080:GOTO160
330 IFI$=CHR$(94)THENGOSUB450:GO
TO270
340 IFI$=CHR$(10)THENGOSUB460:GO
TO270
350 IFI$=CHR$(95)THENGOSUB470:GO
TO270
360 IFI$=CHR$(91)THENGOSUB480:GO
TO270
370 IFI$="A"THENGOSUB650:GOTO260
380 IF M9=0THEN320
390 IFI$="C"THENGOSUB530:GOTO260
400 IFI$="S"THENGOSUB940:GOTO260
410 IFI$="D"THENGOSUB550:GOTO260
420 IFI$="F"THENGOSUB600:GOTO260
430 GOTO320
440 'upd bfr ptr
450 IFX>1 THEN X=X-1:RETURN:ELSE
RETURN
460 IFX<M9 THEN X=X+1:RETURN:ELS
E RETURN
470 IFX-10>0 THEN X=X-10:RETURN:
ELSE X=1:RETURN
480 GOSUB510:IFX+10<M9 THEN X=X+
10:RETURN:ELSE X=M9:RETURN
490 PRINT@10,"-VIEW/EDIT-":GOSUB
1020:RETURN
500 'ers
510 FORY=160TO320STEP32:PRINT@Y,
STRING$(32," "):NEXTY:RETURN
520 'chg name

```

```

530 PRINT@384," CHANGE:";N$(X)
:PRINT" TO:";PRINT@426,
"";:LINEINPUT I$:IF LEN(I$)>2
OTHER PRINT@416,"TOO LONG! RE
DO!":SOUND100,10:GOTO530ELSE
IF I$=""THEN RETURN ELSE N$(X
)=I$:RETURN
540 'delete
550 PRINT@384," Y=DELETE:";N$(X)
:GOSUB970:IFI$<>"Y"THEN580
560 IF M9=1THEN N$(M9)="" :M9=0:G
OTO580:ELSE PRINT@384,"
UPDATING FILE..."
570 FORY=X TO M9:N$(Y)=N$(Y+1):N
EXTY:N$(M9)="" :M9=M9-1:IF X>M
9 THEN X=M9
580 RETURN
590 'find
600 PRINT@384,"":PRINT@384,"FIND
STR$:";:LINEINPUT S$:IF LEN(
S$)>20THEN PRINT@384,"TOO LON
G!":SOUND50,10:GOTO600
610 FOR X=1TO M9:IF INSTR(N$(X),
S$)<>0THEN PRINT@384," fou
nd:";N$(X):GOSUB510:GOSUB280:
ELSE NEXT X:PRINT@416,"
end reached!":SOUND100,3:G
OSUB970:GOTO630
620 PRINT@416," <S>TOP OR <ENTE
R>=CONTINUE":GOSUB970:IF I$=C
HR$(13)THEN SOUND100,2:NEXT X
630 IF X<=M9 THEN RETURN:ELSE X=
M9:RETURN
640 'add entry
650 IF M9=>D THEN PRINT@384,"BUF
FER FULL!":SOUND50,10:GOSUB9
70:RETURN
660 PRINT@384," ADD:";PRINT
@394,""::LINEINPUT I$:IF I$=""
THEN RETURN ELSE IF LEN(I$)>
20THEN PRINT@384," ":PRINT@39
5,"TOO LONG!":SOUND50,10:GOT
O660
670 X=M9-3:M9=M9+1:N$(M9)=I$:IF
X<1THEN X=1
680 GOSUB280:GOTO650
690 'erase buffer
700 IF M9=0THEN710ELSE CLS:PRINT
@160," ERASE BUFFER(Y/N
):":GOSUB970:PRINT@186,I$:IF
I$<>"Y"THEN 160
710 CLS:PRINT@160," BUF
FER EMPTY!":SOUND70,10:RUN50
720 'appnd/load <f>ile
730 GOSUB990:IFPEEK(136)*256+PEE
K(137)=1024THENPRINT@160,"NO
CATALOG FILES ON DISK!":GOSUB
970:GOTO200
740 PRINT:PRINT"APPEND WHICH FIL
E:";:LINEINPUT I$:IF I$=""THE
N200:ELSE IF LEN(I$)>8THEN PR
INT:PRINT" TOO LONG(8
MAX)!":SOUND50,15:GOTO740
750 I$=I$+"/CAT":PRINT@358,"LOAD
ING NUMBER:";M9+1::OPEN"I",RD
V,I$
760 IF EOF(DV)THENCLOSE#DV:GOTO1
60:ELSE M9=M9+1:PRINT@373,M9;
:INPUT#DV,N$(M9):IF M9=>500TH
ENGOSUB1260:CLOSE#DV:GOTO160:
ELSEGOTO760
770 'save
780 IF M9=0THEN710ELSE CLS:PRINT
@9,"-SAVE CATALOG-":GOSUB1020
:PRINT:PRINT:PRINT:PRINT"PRES
S <ENTER> TO EXIT OR TYPE F
ILENAME(NO EXT):";:LINEINPUT
I$:IF I$=""THEN160
790 IFLEN(I$)>8THENPRINT:PRINT"
TOO LONG(8 MAX)!":SOUN
D50,15:GOTO780
800 I$=I$+"/CAT":CLS:PRINT@167,"
SAVING ";I$;:VERIFYON:SOUND15
0,1
810 OPEN"O",#DV,I$:FORX=1TO M9:W
RITE#DV,N$(X):NEXT X:CLOSE#DV
:GOTO160
820 'print
830 IF M9=0THEN710 ELSE IF (PEEK
(65314)AND1)=0THEN 840ELSE PR
INT@421,"PRINTER NOT READY!":
:SOUND100,10:SOUND50,10:GOTO1
60
840 CLS:PRINT:PRINT:PRINT"TITLE
OF CATALOG:";:LINEINPUT TI$:I
F LEN(TI$)>32 THEN PRINT"TOO
LONG!":SOUND10,20:GOTO840:EL
SE IF TI$=""THEN160
850 PRINT:PRINT"DATE:";:LINEINPU
TDT$:PRINT"NUMBER OF COPIES:"
;:LINEINPUT CP$:CP=VAL(CP$):I
F CP<1THEN CP=1
860 PRINT:PRINT"PRESS <ENTER> TO
PRINT OR ANY OTHER KEY TO
EXIT...":GOSUB970:IF I$<>CHR$(
13)THEN160
870 PRINT@487,"PRESS 'S' TO STOP
":SOUND100,5:Z=INT((M9/7)+.9
):PRINT#-2,MR$ 'INIT FORM/MST
R RSET
880 T=WI-(LEN(TI$)+8):PRINT#-2:P
RINT#-2,TAB(T);XO$;TI$;" CATA
LOG";XF$;CO$:PRINT#-2:PRINT#-
2
890 FORX=1TOZ:PRINT#-2,TAB(1);N$(
X)::FORY=1TO6:PRINT#-2,TAB(T
2*Y+1);N$(X+Z*Y)::NEXTY:PRINT
#-2:IFINKEY$="S"THEN920ELSENE
XTX
900 PRINT#-2:PRINT#-2,TAB(3)"QUA
NTITY=";M9;TI$:" ";NM$;"
";DT$

```

```

910 IF CP>1 THEN PRINT#2,FF$::CP
    =CP-1:PRINT#2,CF$::GOTO880
920 PRINT#2,CHR$(18):GOTO160
930 'sort
940 PRINT@384,"          NOW SORTING!"
950 I=0:N$(0)=CHR$(9):T$=N$(1):N
    =VARPTR(N$(0)):POKE&H200,INT(
    N/256):POKE&H201,N-INT(N/256)
    *256:EXEC&H202:RETURN
960 'getkey
970 I$=INKEY$:IFI$="" THEN970ELSE
    RETURN
980 'do dir of dat files
990 CLS:FORW=3TO11
1000 DSKI$0,17,W,A$,B$:IFA$=B$TH
    EN RETURN ELSE C$=A$+LEFT$(B$
    ,127):FORZ=0TO7:NAM$=MID$(C$,
    Z*32+1,8):EXT$=MID$(C$,9+Z*32
    ,3):IFEXT$="CAT" AND LEFT$(NA
    M$,1)<>CHR$(0) THENPRINT"  "NA
    M$,.:NEXTZ,W:RETURN ELSE NEXT
    Z,W:RETURN
1010 'prt dashed ln
1020 GOSUB1030:SOUND150,2:RETURN
1030 PRINTSTRING$(32,"-")::RETUR
    N
1040 'prt menu
1050 PRINT@169,"<L>OAD/APPEND":P
    RINT"          <S>AVE":PRINT"
          <V>IEW/EDIT":PRINT"
          <P>RINT":PRINT"
          <C>LEAR BUFFER":PRINT"
          <D>IRECTORY":PRINT"
          <E>XIT"
1060 GOSUB1220:PRINT@448,"":GOS
    UB1020:RETURN
1070 'invrs video on
1080 POKE&H200,1:RETURN
1090 'invrs video off
1100 POKE&H200,0:RETURN
1110 'error trap
1120 PRINT"!!!":GOSUB1100:PRINT"
    -ANY KEY TO CONTINUE-":G
    OSUB1080:GOSUB970:GOTO160
1130 'load directory
1140 CLS:PRINT@8,"-LOAD DIRECTOR
    Y-":GOSUB1020:PRINT@71,"<E>XI
    T          <D>IR":GOSUB1220:PRIN
    T@160,"":
1150 PRINT"DRIVE NUMBER(0-3,CR=0
    ):::LINEINPUT I$:IF I$="E"TH
    EN160ELSE IF I$="" THEN I$="0"
    :ELSE IF I$="D" THEN DIR:GOSUB
    970:GOTO1140
1160 T=VAL(I$):IFT<0OR T>3 THEN11
    50
1170 PRINT"ENTER DISK NAME/NUMBE
    R:::LINEINPUTZZ$:IFZZ$="E"TH
    EN200ELSE IFLEN(ZZ$)>5 THEN CL

```



A TRS-80 Color Computer users magazine

Sell or trade your unwanted programs or hardware in this monthly mazazine. Find great buys. List your Club or BBS. Full of Tips, articles, reviews and programs all for your COCO. A HELP column for you to get quick help with a problem. Classified ads are only \$.15 per word, and it will be read by over 8000 new COCO owners.

Yes I would like to subscribe to COCO ADS.
___ 1 Year basic third class mail \$10.00
___ 1 Year First Class Mail \$16.00

Name _____

Addr _____

City _____

Zip _____

Please send all orders to

P D SOFTWARE
P O BOX 13256
HOUSTON, TX 77256

POLYTINT converts your disk-saved CoCo 1 or 2 pictures to CoCo 3 format and gives you a fast friendly way to recolor them in any 16 colors of your choice. Your new masterpieces will be saved in far less disk space than usual. The reviewer says "POLYTINT unlocks the CoCo 3 rainbow". "The fine online help it offers". "One of the CoCo 3 bargains". "The manual is very clear". Requires CoCo 3, disk drive, RGB monitor preferred.

Order from: **Boiling Spring Lakes Software,**
 P.O. Box 2536 B.S.L., Southport, NC 28461
 (919) 845-2881



Money order or check. \$17.50 plus \$1.50 postage and handling.
 NC residents please add 5% sales tax.

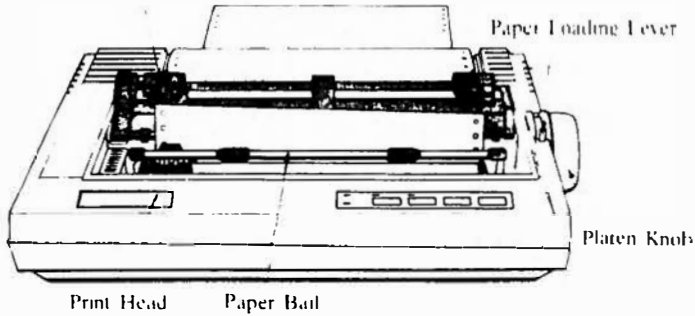


```

S:PRINT:PRINT"NAME TOO LONG(5
  MAX)!" :SOUND10,30:GOTO1170
1180 PRINT@358,"LOADING NUMBER:"
  ;M9
1190 FORS=3TO11:DSKI$T,17,S,A$,B
  $:C$=A$+LEFT$(B$,120):FOREN=0
  TO7:NA$=MID$(C$,EN*32+1,8):IF
  LEFT$(NA$,1)=CHR$(0)THEN1200E
  LSEIFLEFT$(NA$,1)=CHR$(255)TH
  EN1140ELSE M9=M9+1:N$(M9)=NA$
  +" "+ZZ$:PRINT@373,M9;:IFM9=
  >D THENGOSUB1260:GOTO160
1200 NEXT EN,S:GOTO1140
1210 'prt totl ent
1220 PRINT@486,"TOTAL ENTRIES:"
  M9::RETURN
1230 'dir
1240 DIR:PRINT"FREE="::PRINTFREE
  (0):GOSUB970:GOTO160
1250 'prt bfr full
1260 PRINT:PRINT"          BUFFER
  IS FULL!!":SOUND10,50:RETURN
1270 'poke in sort rout
1280 CLS:PRINT@103,"**the catal
  oger**":PRINT:PRINT:PRINT"
  -FILE CATALOGING SYSTEM-":PR
  INT:PRINT"          BY R.D.
  SMITH"
1290 I$="BE02003410EEE4AE5E301F4
  F3412A6C4272AA6C4E645A0452402
  E6C43401AE4210AE476D452604326
  12029A680A0A02704326120055A26
  F335012318AE4210AE47AF4710AF4
  2A6C4E645E7C4A745EA45EAE4E7E4
  3345AE61301FAF6126B0A6E432632
  6A1326239"
1300 DATA190,1,104,49,141,0,46,1
  6,188,1,104,39,39,175,141,0,1
  35,16,191,1,104
1310 I=0:FORX=1TO LEN(I$)STEP2:P
  OKE&H202+I,VAL("&H"+MID$(I$,X
  ,2)):I=I+1:NEXTX
1320 IF PEEK(&HE00)=190THEN RETU
  RN ELSE FORI=&HE00 TO &HEEC:R
  EADX:POKEI,X:NEXTI:EXEC&HE00
  'invrs
1330 DATA190,1,131,175,141,0,158
  ,48,141,0,141,191,1,131,158,1
  69,175,141,0,182,48,141,0,143
  ,159,169,134,1,183,2,0,57,125
  ,2,0,39,93,13,111,38,89,50,98
  ,52,22,158,136,129,8,38,13,14
  0,4,0,39,72,134,32,167,132
1340 DATA167,130,32,33,129,13,38
  ,12,134,32,167,128,31,16,197,
  31,38,246,32,17,129,32,37,44,
  77,43,8,129,96,37,2,128,96,13
  2,191,167,128,159,136,140,6,0
  ,37,24,142,4,0,236,136,32,237
  ,129,140,5,224,37,246,159,136
  ,134,32,198,32,167,128,90,38,
  251,53,150,126
1350 DATA255,255,52,22,204,32,32
  ,142,4,0,159,136,237,129,140,
  6,0,37,249,53,150,125,2,0,39,
  7,129,12,38,3,141,226,79,126,
  255,254,125,2,0,39,29,129,158
  ,38,25,175,227,158,166,48,1,1
  41,20,77,39,8,129,58,39,4,134
  ,158,32,4,141,192,134,32,174,
  225,126,255,25
1360 DATA 166,132,129,32,38,4,48
  ,1,32,246,57,0
1370 FORI=&HF00 TO &HF7D:READX:P
  OKEI,X:NEXTI:EXEC&HF00 'err t
  rp
1380 DATA 190,1,146,175,141,0,11
  7,48,141,0,4,191,1,146,57,167
  ,226,150,104,76,39,99,166,224
  ,50,98,15,111,134,13,173,159,
  160,2,193,54,37,16,142,194,90
  ,166,141,0,80,129,90,39,15,14
  2,194,66,32,10,142,136,217,19
  3,50,36,3,142,171,175,58,189,
  172,160
1390 DATA 189,172,160,142,171,22
  4,189,185,156,189,189,197,204
  ,255,255,221,104,142,2,221,15
  9,166,204,71,79,237,132,204,8
  4,79,237,2,204,49,49,237,4,20
  4,50,48,237,6,111,8,142,2,220
  ,198,9,79,126,172,127,166,224
  ,126,255,255
1400 RETURN
1410 CLS:PRINT"TYPE<GOTO160>FOR
  RE=ENTRY...BYE.":PRINT:END
1420 PCLEAR1:GOTO20
    
```

SEIKOSHA & BROTHER PRINTERS

We now have two printers that we can recommend for color computers that do not require an interface and have excellent features at a reasonable price. Both are Epson and IBM compatible and work on popular software such as COCO MAX. Both tractor and friction feed are included for printing single sheets or continuous paper or address labels. As a special we are including our DYPRINT package at no extra charge. This will allow you to print banners or blown up graphics pictures.



SEIKOSHA SP-1000AS

FEATURES

- * Impact dot matrix method of printing.
- * 100 (Draft mode), 20 cps (Near Letter Quality) print speed
- * Functions include Underline, Bold Print & Double Strike.
- * Many print character sets including Pica, Elite, Elongated, Proportional, Condensed, Italics, Super/Subscript & Italic Super/Subscripts.
- * Adjustable tractor and friction feed.
- * Automatic paper loading function.
- * Paper empty detector.
- * Right, left margin set function.
- * Self-test and Automatic printing.
- * 2 year warranty.
- * COCO Cable is included.
- * List \$299

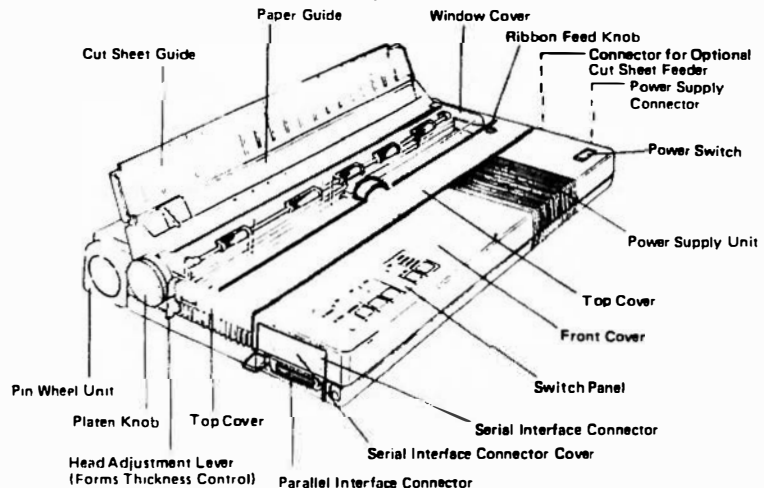
Order SP- 1000AS for COCO & specify tape or disk software for DYPRINT. **\$229.95**

BROTHER M-1509

This is a wide carriage high speed dot matrix printer with both a serial and parallel interfaces. Features include:

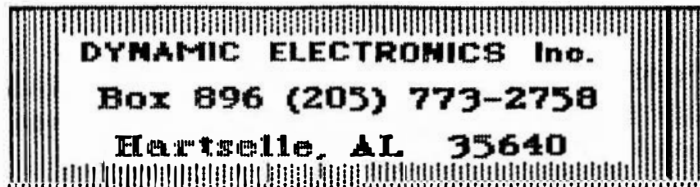
- * 180 cps draft mode
- * 9 Pin Print Head
- * Both Serial & Parallel Interfaces
- * 3K Buffer expandable to 19K
- * Automatically loads single sheets
- * Contains 18 character sets
- * Accepts user defined characters
- * Friction & Tractor Feed
- * Epson FX & IBM Graphics Compatible (works with IBM clones using parallel interface)
- * Uses cassette ribbons
- * Font Cartridges available
- * One year warranty
- * CoCo cable is included
- * List price \$549.

Order M-1509 for COCO & specify tape or disk software for DYPRINT. **\$429.95**



NOTE: We can get other printers. Contact us for all of your printer needs.

Give street address for UPS. Add \$5 shipping. Checks VISA & MC.





REFORMATTING DATA

Part 2

Last month the problem of reformatting data for printing a PMODE4 graphics picture was presented. Pictures are a very powerful means of presenting a concept or idea. With a video camera or CAMCORDER pictures can be taken that can be digitized and stored within the computer's memory. These pictures can be printed on a graphics printer. By reformatting data, special print routines can be written that will allow large posters or billboards to be made. How would you like a 6ft by 8ft picture of yourself or your favorite person?

To reformat data, it is necessary to rearrange the bits of each byte. The discussion will be limited to a PMODE 4 picture which has 256h by 192v pixels. A pixel is a dot which can be either on or off. Let's consider using standard print on a printer. A printer will print 64 characters which would be a fourth of the picture. It would take 4 passes for the printer to print a complete picture. The 4 sections could be taped together to form a large poster. This could be very useful for advertising social events or products to sell.

PRINTING GRAPHICS

PMODE 4 disk pictures start at 3584. Each horizontal line requires 32 bytes with each byte

containing 8 pixels. The easiest way to print the graphics would be to print only one dot at a time. This can be done with a normal print character to give a blown up picture. It could also be printed with a graphics printer by printing one dot at a time. However it would be very slow because there are 8 print strikers with most printers and 8 dots at a time could be printed. To print eight dots at a time, 8 bits from 8 different bytes must be combined into a new printer byte as was shown last month.

Let's look at printing one pixel at a time using standard print for a blown up picture. The first byte contains 8 pixels. The pixels can be removed from basic by a subroutine as follows:

```

900 'PRINT ROUTINE
910 A=PEEK(M)
920 X=256
930 FOR J=1 TO 8
940 X=X/2:B=A AND X
950 IF B=0 THEN PRINT#-2,"*";
    GOTO970
960 PRINT#-2." ";
970 NEXT J
980 RETURN
    
```

The memory for the byte must have been defined before entering the subroutine. A is the value of the byte in line 910. X is a variable which is used in

the FOR-NEXT loop to mask or remove the individual bits. The FOR-NEXT loop in lines 930-970 removes each bit with the AND operator. Notice that X is 256/2 or 128 for the first pass. ANDING the byte with 128 removes the most significant bit. On the next pass through the loop X will be 128/2 or 64 and the next bit will be removed by the AND operation. If the bit is a "0" then a "*" is printed. If it is 1 or greater then a space will be printed.

If the printer will print 64 characters then only a fourth of the picture can be printed in one pass. Most graphics printers have condensed or compressed print which will allow 128 characters to be printed in a pass. This will print 16 bytes which is half of a line.

Let's look at how the bytes would be broken down for printing. If we represent each memory location by an "X" then the memory we will be concerned with is shown in Figure 1.

```

M      Line 1      M+16
:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:
M+32   Line 2     M+32+16
:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:
M+64   Line 3     M+64+16
:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
:
+96    Line 4     M+96+16
:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
    
```

FIGURE 1

Let's go through the steps for printing the first half. Notice that the first byte is taken from memory location M. The subroutine we presented will remove and print the 8 pixels for each byte. After the first byte, M will be increased and the next 8 pixels can be printed by

These are collections of programs from Dynamic Color News.

DCN-1

1. * 64K all RAM
2. * 2- bank address file
3. Alarm Clock
4. Loan Interest
5. Character Generator
6. * Bank Switching
 - * Won't work on CC-3
 - CC-2 Memory managers

DCN-2

1. Check Book Program.
2. Ball Team Sort Program.
3. Card Shuffling
4. Student Study Program
5. Address File

DCN-3

1. Restore-Recover program lost after NEW command.
2. Fast Food
3. Bar Graph
4. Memory Peek & Poke
5. Graphics draw

DCN-4

1. Address File with Sort
2. Morse Code Generator
3. Star Constellations
4. Dueling Cannons

DCN-5

COLOR COMPUTER 3 PROGRAMS

1. CC-3 Memory Manager
2. CC-3 Error Trapping
3. CC-3 Graphics
4. CC-3 Graphics Save

DCN-6

1. Accounts Payable
2. Dog Race
3. Compound Interest
4. Address File Disk Sort
5. Invoice Program

Programs are \$5.95 each tape or disk. Add \$1 shipping. Checks, VISA & MC.

the subroutine. The procedure is repeated until the 15th byte is printed. Then it is necessary to skip over the rest of the bytes in the first line. This is done by adding 16 to M.

The procedure is repeated for the second line, third line, and the rest of the lines.

For printing the second half the same procedure is used except the first 16 bytes of each line are skipped.

PROGRAM DEVELOPMENT

The powerful FOR-NEXT loops will facilitate writing the program. Let's note the loops that will be needed.

- 1 Loop for two passes
- 2 Loop for 192 lines
- 3 Loop for the 16 bytes on a line
- 4 Print subroutine

PRINT PROGRAM

```

5 ?"PMODE 4 GRAPHICS PRINT PRO
  GRAM USING STANDARD COMPRESS
  PRINT. REQUIRES 2 PASSES. SET
  PRINTER FOR COMPRESSED LINE
  FEED AND COMPRESSED
  CHARACTERS.
10 ?"COPYRIGHT (c) 1987
15 ?"DYNAMIC eLECTRONICS INC.
20 FOR W = 0 TO 1
25 P$="PASS NUMBER ":G=W+1
27 PRINTP$;G:PRINT#-2,P$;G
30 FOR L=0 TO 191
40 FOR H=0 TO 15
50 M=3584+16*W+32*L+H
60 GOSUB 900
70 NEXT H
75 PRINT#-2,CHR$(13):
80 NEXT L
90 PRINT#-2,CHR$(10),CHR$(10)
100 NEXT W
110 END
890 '
900 'PRINT ROUTINE
910 A=PEEK(M)
920 X=256
930 FOR J=1 TO 8
940 X=X/2:B=A AND X
950 IF B=0 THEN PRINT#-2,"*":
      GOTO970

```

```

960 PRINT#-2," ";
970 NEXT J
980 RETURN

```

Notice the first loop is from line 20 to line 100. This is for the two passes and W is the loop variable. The line loop is from 30 to 80 with L as the loop variable. It is contained within the W loop. The byte loop uses H as the variable and is contained within the L loop.

This is just the print portion. Actually a complete program would allow graphics pictures to be loaded and viewed before printing. Also printer codes could be included within the program.

Since this is a complete basic program, it will be slow in printing. Machine language subroutines can be used to greatly speed up the process. Also the double speed poke could be used for parts or possible all of the program.

Pictures can be taken with a video camera and digitized. The program will allow a blown up copy of the picture to be made. Any PMODE 4 graphics picture can be printed with this program.

Next month more information will be presented. We will show how to develop a graphics print program using the graphics print mode of a dot matrix printer.

OPERATING HINT

Protect Bad Disk Files: If your computer latches up while saving a file to disk, reset the computer. All programs can be recovered except the one that was being saved before the computer latched up. Remove the disk and put a write protect tab on it. This will prevent writing to it which will destroy some or all of the files. Now you can copy the files one by one onto another disk using the extended disk basic copy command.

DYNAMIC ELECTRONICS INC.

PUBLIC DOMAIN SOFTWARE

This large collection of programs will allow you to quickly expand your library. All programs are on disk and programs with a * can be supplied on tape. Some programs require a joystick. Instructions are included in some collections as DAT or TXT files

* PD-1 GAMES

```
MENU      BAS 0 B 1
BEAST     BAS 0 B 1
BEAST     DAT 1 A 1
BOBO      BAS 0 B 3
GUNNER    BAS 0 B 2
HOW       BAS 0 B 3
LANDER    BAS 0 B 3
LIFE      BAS 0 B 3
MAX       BAS 0 B 3
POKER     BAS 0 B 2
BIORITHM BAS 0 B 3
BLACKBOX  BAS 0 B 2
BLOCKADE  BAS 0 B 1
BUSJUMP   BAS 0 B 1
CHUTE     BAS 0 B 2
GO        BAS 0 B 3
HANGMAN   BAS 0 B 2
OTHELLO   BAS 0 B 2
TARTUS    BAS 0 B 1
TARTUS2   BAS 0 B 1
```

* PD-2 GAMES

```
MENU      BAS 0 B 1
RUBIC     BAS 0 B 5
FRACTAL   BAS 0 B 1
KALSCOPE  BAS 0 B 2
TARTUS    BAS 0 B 1
TARTUS2   BAS 0 B 1
WORLD3D   BAS 0 B 4
LIFE      BAS 0 B 2
ADVENT    BAS 0 B 4
ADVENT    DOC 1 A 2
HURKLE    BAS 0 B 2
REVERSE   BAS 0 B 2
GUESSFR   BAS 0 B 2
SCRAMBLE  BAS 0 B 3
PIZZA     BAS 0 B 2
CINQUAIN  BAS 0 B 2
```

* PD-3 GAMES

```
MENU      BAS 0 B 1
AANDAN    BAS 0 B 2
STARTREK  BAS 0 B 9
TREKINST  BAS 0 B 3
SEQUENCE  BAS 0 B 2
ALPHABET  BAS 0 B 3
GEOGRAPH  BAS 0 B 4
FLASH     BAS 0 B 4
BAGELS    BAS 0 B 3
OREGON    BAS 0 B 9
MULTIPLY  BAS 0 B 2
```

* PD-4 ML GAMES

```
MENU      BAS 0 B 1
PONG      BIN 2 B 1
SQUASH    BIN 2 B 2
BLOCKADE  BIN 2 B 2
GERM      BIN 2 B 1
WIGWORM   BIN 2 B 2
GRID      BIN 2 B 2
```

```
GRID      BIN 2 B 2
ZEROG     BIN 2 B 2
3DTICTAC  BIN 2 B 7
HOPBOP    BIN 2 B 5
ICEWAR    BAS 0 B 6
CIVILWAR  BAS 0 B 4
TICTACTO  BIN 2 B 7
```

* PD-5 GAMES

```
MENU      BAS 0 B 1
CAVE      BAS 0 B 4
WARGAME   BAS 0 B 2
WARGAME   BIN 2 B 1
WARGAME2  BAS 0 B 5
WARROOM   BIN 2 B 3
NORAD     BAS 0 B 3
ANDREA    BAS 0 B 5
CURSE     BAS 0 B 4
GARGOYLE  BAS 0 B 6
KINGTUT   BAS 0 B 7
TAIPAN    BAS 0 B 6
```

DSK-6

SPELL & FIX
FIND SPELLING ERRORS
IN TXT DISK FILES

```
MENU      BAS 0 B 1
MANUAL    TXT 1 A 12
SPELLFX2  BAS 0 B 1
SPELLFX2  BIN 2 B 6
SPELLFIX  BAS 0 B 1
DICT      TXT 1 A 33
COREDICT  TXT 1 A 1
SAMPLE    TXT 1 A 1
BUILD     BAS 0 B 1
LIST      BAS 0 B 1
RESET     BAS 0 B 1
APPEND    BAS 0 B 1
ADDWORDS  BIN 2 B 3
```

PD-7 DISK UTILITIES

```
MENU      BAS 0 B 1
BASIC64   BIN 2 B 1
BSEARCH   BIN 2 B 1
DISKCOMP  BIN 2 B 1
DISKTEST  BIN 2 B 3
DISKWASH  BAS 0 B 1
DOS64K    BAS 0 B 2
DSDBOOT   BIN 2 B 1
LIST      BIN 2 B 2
PRINT     BIN 2 B 3
PRINTDIR  BAS 0 B 1
RECOVER   BIN 2 B 1
ROMBACK   BAS 0 B 1
ROMFIX    BIN 2 B 1
```

PD-8 DISK UTILITIES

```
SCRN51    BAS 0 B 1
SCRN51    BIN 2 B 1
SCRNDEMO  BAS 0 B 2
```

```
SDC       BIN 2 B 1
SQUEEZE   BIN 2 B 1
SSDBOOT   BIN 2 B 1
TAPE2DSK  BAS 0 B 1
TIMER     BIN 2 B 2
UNLOCK    BIN 2 B 1
BACKUP    BIN 2 B 1
BACKUP1   BIN 2 B 1
MORE      BIN 2 B 3
SPEAK     BIN 2 B 3
PCLEARFX  BIN 2 B 1
MULTBACK  BIN 2 B 1
MULTBACK  DOC 1 A 1
```

PD-9

TERMINAL PROGRAMS

```
MENU      BAS 0 B 1
TELETERM  BIN 2 B 3
TELETERM  CAS 2 B 3
TTHelp    DAT 1 A 4
MTERM     BIN 2 B 6
MTERM     VIP 1 A 19
MTCONFIG  BAS 0 B 3
MTERM+    BIN 2 B 6
DATATRDE  BIN 2 B 3
KERMIT    BAS 1 A 1
KERMIT    BIN 2 B 2
HAYESAE   BIN 2 B 4
HAYESAE   DOC 1 A 6
```

PD-10

COLOR COMPUTER FORTH

```
MENU      BAS 0 B 1
FORTHMAN  UL1 2 B 7
FORTHMAN  UL2 2 B 7
FORTHMAN  UL3 2 B 1
FORTH     BIN 2 B 3
EDIT      DAT 1 A 3
FRTHDOC1  TXT 1 A 7
FRTHDOC2  TXT 1 A 7
FRTHDOC3  TXT 1 A 1
FRTHDOC4  TXT 1 A 7
32KFORTH  BIN 2 B 4
NEWFORTH  BIN 2 B 3
WE        BAS 0 B 1
```

PD-11 MCPAINT

A COMPLETE GRAPHICS
DEVELOPMENT PROGRAM
WITH INSTRUCTIONS

```
RUN-ME    BAS 0 B 1
MCPAINT   BIN 2 B 11
ICONS     SYS 2 B 3
MCDOC     DOC 1 A 11
PRINTDOC  BAS 1 A 1
GLASDEMO  BIN 2 B 6
STARS     BIN 2 B 2
1940S     SET 2 B 1
BLOON     SET 2 B 1
BOLD      SET 2 B 1
```

```
FANCY     SET 2 B 1
GREEK     SET 2 B 1
GREEKU    SET 2 B 1
HEBREW    SET 2 B 1
OLDENG    SET 2 B 1
TYPING    SET 2 B 1
EPSON     DRV 2 B 1
EPSON2    DRV 2 B 1
ANIMATE   BAS 0 B 1
ANIMAT    BIN 2 B 1
BANNER    BAS 0 B 2
MCUTIL    BIN 2 B 1
```

* PD-12

PMODE 4 PICTURES

CHURCH, ROSES, HOUSE
RUN "PIXFILES"
JOYSTICK IS REQUIRED

```
XIXCMP    BAS 0 A 3
OUTPOST   BAS 0 A 3
OUTPOST   BIN 2 B 3
SFIELD    BAS 0 A 2
SFIELD    BIN 2 B 3
PIXFILES  BAS 0 B 3
TRUCK     BIN 2 B 3
MODEM     BIN 2 B 3
HORSE     BIN 2 B 3
MISSION   BIN 2 B 3
CLOISTER  BIN 2 B 3
RAIN      BIN 2 B 3
EAGLE     BIN 2 B 3
ROSES     BIN 2 B 3
CHURCH    BIN 2 B 3
GARDEN    BIN 2 B 3
PRES      BIN 2 B 3
LONI4     BAS 0 A 3
```

PD-13

GRAPHICON PICTURE
DISK-1. REQUIRES
PIXFILES/BAS FROM
PD-12 & JOYSTICK

PICTURES GCM 1 B 68

PD-14

GRAPHICON PICTURE
DISK-2. REQUIRES
PIXFILES/BAS FROM
PD-12 & JOYSTICK

PICTURES GCM 1 B 68

PD-15

GRAPHICON PICTURE
DISK-3 REQUIRES
PIXFILES/BAS FROM
PD-12 & JOYSTICK

PICTURES GCM 1 B 68

PD-16

GRAPHICON PICTURE
DISK-4 REQUIRES
PIXFILES/BAS FROM
PD-12 & JOYSTICK

PICTURES GCM 1 B 68

PD-17 DISK UTILITIES

64KBHW BAS 0 A 1
AUTOSTRT BAS 0 B 1
BAKDIR BAS 0 A 3
BIN>BAS BAS 0 A 1
CASSLABL BAS 0 B 1
CURSOR BAS 0 B 1
CUSTOM BAS 0 B 3
CUSTOMIZ BAS 0 B 1
DIR BIN 2 B 1
DIR32 BAS 0 A 2
DIR32C DOC 1 A 3
DIRLISTR BAK 0 B 1
DIRLISTR BAS 0 B 1

PD-18 TAPE TO DISK
DISK UTILITIES

DIRSORT BAS 0 A 1
DISK-DIR BAS 0 A 1
DISKLABL BAS 0 A 1
LOADSOLU BAS 0 B 1
MENU BAS 0 B 1
PDIR BAS 0 A 1
SORT BAS 0 B 1
SORTPRT BAS 0 B 1
SORTSAVE BAS 0 A 1
SOULTION BIN 2 B 1
SUPERBAC BIN 2 B 1
T2D BIN 2 B 2
TIMER BAS 0 B 1
TPTODSK BIN 2 B 1

* PD-19 GAMES

3DMAZE BAS 0 A 2
BOXES BAS 0 B 1
CLOSE EN BAS 0 B 2
CRITICAL BAS 0 B 1
GAMMON BAS 0 B 3
GOLDMINE BAS 0 A 3
HOCKEY BAS 0 A 1
HOGJOWL BAS 0 A 8
HORSERAC BAS 0 A 3
JUMPING BAS 0 B 1
KALIDESC BAS 0 B 1
MASTMIND BAS 0 B 1
MEMORY BAS 0 B 1
MOONBASE BAS 0 B 2
NAMES BAS 0 B 4
OTHELLO BAS 0 B 4

* PD-20 GAMES

PEG BAS 0 B 3
RABBIT BAS 0 B 1
SAFE BAS 0 B 2
SAUACER BAS 0 B 1
SHOOTEM BAS 0 B 2

SIMMON BAS 0 A 1
SLITHER BAS 0 A 2
SPACE WA BAS 0 B 4
STAR TRE BAS 0 B 1
SUBCHASE BAS 0 B 2
SUBDESTR BAS 0 B 2
SUNDANCE BAS 0 B 2
TANKS BAS 0 B 2
TOWER BAS 0 B 2
UNDROVER BAS 0 B 1

PD-21 MUSIC

PLAY MUSIC THROUGH
YOUR TV OR MONITOR.
COMPOSE & EDIT MUSIC.

ORCH BIN 2 B 8
ORCH DOC 1 A 3
OCNVRT BIN 2 B 2
GHOSBUST MUS 4 M 3
STELMO MUS 4 M 2
MASH MUS 4 M 2
BOND1 MUS 4 M 2
2001 MUS 4 M 2
ARIA MUS 4 M 2
INVENTI MUS 4 M 1
BATTSTAR MUS 4 M 2
BOND2 MUS 4 M 2
CLOSENCT MUS 4 M 2
SCARBORO MUS 4 M 1
FUGUEINC MUS 4 M 1
MINUET MUS 4 M 1
LONGTIME MUS 4 M 2
MESSIAH MUS 4 M 3

* PD-22 MUSIC-1

LOADM "NAME/MUS"
EXEC TO PLAY MUSIC
THROUGH TV OR MON.

ADDPLAY BAS 0 B 1
DEPLAY BAS 0 B 1
MSQUEZ BAS 0 B 2
ALSOSPAK MUS 2 B 5
BOOGIE MUS 2 B 5
CIRCUS MUS 2 B 5
CLOWN MUS 2 B 2
CLOWNS MUS 2 B 4
HAYDEN MUS 2 B 8
JBGGOOD MUS 2 B 4
PEACE MUS 2 B 2
PEACH MUS 2 B 5
PUFF MUS 2 B 6
GOODDIEY MUS 2 B 4

* PD-23 MUSIC-2

LOADM "NAME/MUS"
EXEC TO PLAY MUSIC
THROUGH TV OR MON.

ADDPLAY BAS 0 B 1
DEPLAY BAS 0 B 1
MSQUEZ BAS 0 B 2
RAIN MUS 2 B 2
SONATA3 MUS 2 B 3
STRAV MUS 2 B 4
FOGGY MUS 2 B 4

FUNERAL MUS 2 B 3
HARDDAY MUS 2 B 2
INVENT MUS 2 B 2
INVENT11 MUS 2 B 3
INVENT15 MUS 2 B 3
INVENT7 MUS 2 B 3
INVENT8 MUS 2 B 2
JOPLIN MUS 2 B 4
KHAN MUS 2 B 6

* PD-24 MUSIC-3

LOADM "NAME/MUS"
EXEC TO PLAY MUSIC
THROUGH TV OR MON.

ADDPLAY BAS 0 B 1
DEPLAY BAS 0 B 1
MSQUEZ BAS 0 B 2
PEANUTS MUS 2 B 3
ROCK MUS 2 B 5
ROXANNE MUS 2 B 5
SCHERZO MUS 2 B 2
TEACH MUS 2 B 2
PIANOMAN MUS 2 B 5
STRANGER MUS 2 B 5
CAMELOT MUS 2 B 4
CHACONNE MUS 2 B 6
DIAMOND MUS 2 B 3
DOWNROAD MUS 2 B 4
FANTASY1 MUS 2 B 2

* PD-25 MUSIC-4

LOADM "NAME/MUS"
EXEC TO PLAY MUSIC
THROUGH TV OR MON.

FANTASY2 MUS 2 B 3
GRENGRAS MUS 2 B 4
HUMOR MUS 2 B 4
INCROW MUS 2 B 3
STARWARS MUS 2 B 2
SUITEGM MUS 2 B 6
SUPERMAN MUS 2 B 2
WHENIM64 MUS 2 B 4
ROOTBEER MUS 2 B 7
WAYUARE MUS 2 B 3
AXELF MUS 2 B 2
TOCATA MUS 2 B 3

* PD-26 LAST WILL

LOAN BAS 0 B 1
LASTWILL BAS 0 B 6
IMEGA BAS 0 B 3
AWARI BAS 0 B 1
BACARAT BAS 0 B 2
BAGELS BAS 0 B 1
BLACKJAC BAS 0 B 1
CHUCK BAS 0 B 1
CONCENTR BAS 0 B 1
CUBES BAS 0 B 2

* PD-27 GAMES

DEFUZE BAS 0 B 1
DR ZEE BAS 0 B 1
FLIPFLOP BAS 0 B 1

GO-FISH BAS 0 B 2
HANGMAN BAS 0 B 2
HIGHLOW BAS 0 B 1
JACKPOT BAS 0 B 1
KEYS BAS 0 B 1
L E M BAS 0 B 3
LUNARLD BAS 0 B 2
NUMBERS BAS 0 B 1
OBSTACLE BAS 0 B 1
POOLGAME BAS 0 B 4
RETURN BAS 0 B 1
REVERSI BAS 0 B 2
STARTREK BAS 0 B 2
TTREK BAS 0 B 3

PD-28 COMM. CC-TALK,
BBS, TERM

BBS'S DAT 1 A 1
CCT IO 2 B 1
CCTALK BAS 0 B 1
CNFG40V1 BAS 0 A 5
CNFG40V2 BAS 0 A 4
CTLKEY BAS 1 A 1
MTERM1 DOC 1 A 11
MTERM2 DOC 1 A 8
MTERM40 BIN 2 B 8
REDIAL BAS 0 A 1
PACREDIA BAS 0 A 1

PD-29 COMM, WORD
PRO, GAMES

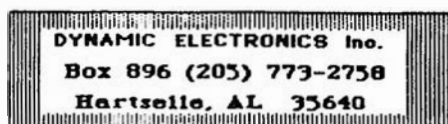
GOSTSHIP BAS 0 B 8
INT RATE BAS 0 B 2
INSTANL PC 0 B 4
MENU BAS 0 B 4
MOTOJUMP BAS 0 B 3
SCREEN MAX 2 B 6
SCREEN1 BIN 2 B 3
SCREEN2 BIN 2 B 3
SCREEN2 MAX 2 B 6
STRINGTU BAS 0 B 4
TTERM DSK 2 B 4
TTHelp DAT 1 A 4
USING BAS 0 B 3
WF-DOC JP 0 B 2
WORDFILE JP 0 B 4
PARM1 DAT 1 A 1

PD-30 CHECK BOOK,
UTILITIES

CHECKBOK BAS 0 B 4
CHECKBOK DOC 1 A 9
DIRR CMD 2 B 1
DVIEW BAS 0 B 1
FILEMAID BAS 0 B 2
LISTER BAS 0 B 1
PAINTPOT BAS 0 B 4
SCREEN MAX 2 B 6
SCREEN1 BIN 2 B 3
SCREEN2 BIN 2 B 3
SCREEN2 MAX 2 B 6
SPECZAP BAS 0 B 5
TAPETYPE BIN 2 B 1
TTERM DSK 2 B 4
DVIEW DSK 0 B 1
MENU BAS 0 B 4

All program collections are available on disk. Collections with a * are also available on tape.

1-4 \$4.95
5-9 \$4.50
10- \$4.00



Add \$1 shipping
Specify Tape or Disk
Checks, Visa, or MC

EDITOR'S COMMENTS

Organization and planning are very important. I know some people who never plan anything and then wonder why things turn out the way they do. Habits can be used with plans to aid in obtaining our objectives. If you are still in school, your plan is to attend classes and eventually graduate. You are forced into certain routines to achieve your objective. You must go to bed at a reasonable hour so that you can get up at a predetermined time in order to meet your classes. Also you must prepare for your classes by studying.

It takes planning to run a successful business. Decisions must be made on product lines, inventory, personnel, salaries, and advertising. If a certain situation arises then what must be done? It helps to consider problems before they happen. Make a schedule of tasks that need to be completed and put a completion date with each one. Plan for emergencies that will disrupt the schedule. The best cushion is to be ahead of the schedule.

Many of our readers are new to computers and programming. We are starting a new series on writing programs. Now is your chance to learn how to write your own programs. Our suggestion is to spend as much time as is needed each month until the material is learned. Write practice programs using the examples given. Each month more material will be added. It will be assumed that the previous material is understood. Many of our readers are retired and have learned to write programs. Computers are not hard to program, but require information in a certain format. Programming means to write instructions that the computer can process or execute.

We need your help in promot-

ing Dynamic Color News. If you know of someone with a color computer, we would like for you to send us their name so we can send them a sample. Also if you are a member of a computer club, we can send you a sample copy for each member to pass out. By the way we give discounts for group subscriptions. See the insert in the magazine. The more subscribers we have the more we can offer. Another way you can help is when you write or call a dealer for information, tell them you saw their advertisement or product review in Dynamic Color News. We appreciate your support in these areas.

We have received several programs to review. Many of them are for the color computer 3 and make use of the extra 512K of memory. I want to thank each of the dealers for their support in this program.

Dean and I had a good time white water rafting in North Carolina. We are going back in October to enjoy the mountains and to try some white water canoeing. I am sure the water will be cold then so we will have to dress for colder weather. The Smoky Mountains are very pretty in the Fall as the leaves begin to turn. There are many beautiful places and we are finding the state parks to be very good and economical. We had to go to a wedding in Baton Rouge and camped at Gulf State park at Gulf Shores. The beach was very nice and clean. Dean got her first taste of salt water. There were not many people on the beach in the middle of September.

Keep the letters coming as we are very much interested in your comments. I can usually be reached in the evenings if you want to call.

PRODUCT REVIEWS

This section is open to all producers and dealers of color computer products. We will review your product free of charge and write an editorial on the product. We do not use a rating system but will explain what the product does, and what can be expected from it. Any comments about the review from the firm submitting the product will be printed in a later issue.

MINI LEDGER

Mini ledger is a disk program that allows a general ledger for a small business or home. It creates a disk file for the data and allows information to be printed to the screen or a printer. To run the program insert the disk and type run "MLEDGER". The program loads and runs and displays the name of the program and a copyright notice. It then asks for a command.

To insert data press I. The computer then asks for the file name. After the file is opened, the starting total is entered. If this is a file that already has data then press the enter key. Next the computer requests the date, credit or debit (C or D), amount, and a description of up to 32 characters. After pressing enter, more data can be entered or return to the menu by pressing the enter key. When the enter key is pressed the data is saved to the disk and the file is closed. The previous entry can be deleted by typing "X" in place of the date.

The ledger can be printed to a printer. The printer baud rate, lines per page, and form feed can be selected. The program is available on disk only and the cost is \$6.00 including shipping. Drayon Software, P.O. Box 2516, Renton, WA 98056.

TW-80

TW-80 is an 80 column Telewriter enhancer for the color computer 3. The Telewriter 64 is a very popular word processor which was written before the color computer 2 was introduced. TW-80 expands the capabilities of the Telewriter word processor to allow an 80 column screen plus many additional features.

An original Telewriter disk, two formatted disks, and the TW-80 disk are required. Make a backup copy of the TW-80 disk on one of the formatted disks and put the original in a safe place. Put the backup copy into the disk drive and RUN "PATCHER". The programs on the disk are copied into a ramdisk. A prompt appears to insert an original Telewriter disk. Next an unformatted disk is inserted and the installation of TW-80 is completed on that disk.

After making the working TW-80 disk, type LOADM"T". The program automatically loads and displays copyright notices. The menus have a different format and are very easy to use. The program comes up with the Main Menu which has the following options: New File, Edit, Disk I/O, Format Menu, Chars/line:0, & Quit. At the bottom are printed WORDS:0, LINES:0, FILE:& FREE MEM:45056. A very impressive feature is the 45056 free memory which is about twice that available with Telepatch. This will allow about 9 pages of text to be stored.

The operation is similar to Telewriter except menus are not loaded from disk. Press "D" for the disk menu and the options will be displayed in two columns. The F1, F2, ALT, and CTRL keys are used. The directories are alphabetized and remain on the screen until a key

is pressed. The same happens when reading in a file. The files are displayed and the one selected is indicated by a shaded background. Files are selected with the up and down arrow keys. When the desired file is selected press the ENTER key to load it. The disk menu can be accessed directly from the text editor by pressing CTRL D. A very useful feature is the inclusion of two ramdisks as drives 4 and 5. Files can quickly be saved to or loaded from the ramdisks. Before shutting down the computer, the files should be saved to a disk. There is no direct method for saving ramdisk files to a disk. They have to be loaded into the computer and then saved to the disk. A nice feature would be to allow backing up disks into the ramdisk and ramdisks into the disks the disk drive.

In the text edit mode features similar to Telepatch are included. Auto key repeat, Overstrike, Word yank, Keyboard buffer, and a 32K Printer spooler are included. Several print fonts are included and any of these can be configured with the program.

TW-80 is an excellent enhancer for the color computer 3. Its 80 columns make it easy to see exactly what will be printed on a printer. The cost is \$39.95 + \$3 S/H. Spectrum Projects, P.O. Box 264, Howard Beach, NY 11414.

**HI-RESOLUTION JOYSTICK
INTERFACE**

Joysticks are used mainly for graphics to move dots across the screen. The normal joystick ports only have a resolution of 1/64. This does not allow many positions to be selected on a high resolution screen. The resolution is limited because a 5 bit analog to digital (A/D) conversion routine is used.

**COLOR COMPUTER 3
(Reduced)
512K MEMORY**

Upgrade your Color Computer 3 to 512K. Our plug in board is easy to install and will give you the maximum addressable memory. With 512K you can have two ramdisks with the included ramdisk disk software. Complete assembly ME-30 \$89.95

Wired 512K board with disk software. ME-30B \$32.95.

512K RAMDISK

A ramdisk operates from memory just like a disk drive except it is many times faster. The 512K ramdisk allows drive 2 and 3 to be ramdisks. You can backup a disk to either ramdisk or select either ramdisk for quickly loading programs. Also included is a memory test program. \$17.95

**MEMORY SAVER 2
For all Color Computers**

Now you can save your computer's memory when power fails. Assembly consists of a small rechargeable battery that mounts under the keyboard and an enable switch. When power fails the electronic control circuit connects the battery to the memories saving all data or programs for about an hour depending upon current requirements and accessories. Easy installation with only one wire to solder.

MS-2 \$39.95

Checks, Visa, or MC
Add \$3 shipping

DYNAMIC ELECTRONICS Inc.
Box 896 (205) 773-2758
Hartselle, AL 35640

The Radio Shack High Resolution Joystick Interface increases the resolution 10 times to 640 x 640. It uses a joystick port and the cassette port. Special software is required to utilize the interface.

We tried the interface with a graphics demo program from Color Venture software. The speed and resolution were very good. The cost is only \$9.95 and the interface is available at Radio Shack Stores.

**HI-RES JOYSTICK
INTERFACE DRIVER
& COCOMAX PATCH**

ColorVenture software has produced software for using the Tandy High Resolution Joystick Interface. The program provides a patch to allow the standard joystick commands to operate with the interface. To install the patch LOADM"HJOYSTK" and then EXEC.

The joystick values can be obtained from basic by the JOY-
STK(X) command. The values will be from 0 to 639. The inexpensive joysticks will work to give the high resolution. The patch is transparent after it is installed. To kill the patch the computer has to be hard reset by turning it off or POKE 113,0 and then pressing the rear reset button.

One of the problems when the CoCo 3 was introduced was software compatibility. Some of the popular programs would not work with the new computer. One of these was COCOMAX. ColorVenture Software has designed a patch that uses the Radio Shack High Resolution Joystick Interface instead of the COCOMAX cartridge.

Plug the Joystick Interface into the cassette port and one joystick port. Then make a backup copy of an original COCOMAX disk. Next kill the pro-

gram "MAXTITLE/SYS". Then insert the patcher disk and run "HIRESMAX". Place the new formatted disk into drive 0 and answer the prompts. In about a minute the new disk will be completed.

To run COCOMAX type RUN "NEWMAX". The COCOMAX menu appears and the joystick works with the HI-RES interface. The operation is very smooth and appears to be as fast as the COCOMAX joystick. The installation is nice because a "Y" cable is not required making a cleaner installation. However it does tie up the cassette port. The left joystick port can be used when configuring the patch freeing the right joystick port for programs written using one joystick.

A patch is also included for MAX EDIT. We did not review it.

The interface driver and COCOMAX patches are produced by ColorVenture software and licensed to Spectrum Projects. The package cost is \$24.95 +\$3 s/h. Spectrum Projects, P. O. Box 264, Howard Beach, NY 11414.

MEMORY MANAGER
for the Color Computer 2

Did you know that the 64K Color Computer 2 and earlier computers have an extra 32K that is generally not used? Our Memory Manager allows basic or machine language programs to be run in either 32K bank. Banks are exchanged with an EXEC command. Also the second bank can be used as a ramdisk to store programs. This makes cassette operation faster than a disk. A third option configures the computer for the all ram mode allowing data or programs to be stored in the upper memory. The Memory Manager software is available on either cassette or disk and costs only \$19.95 +\$2 ship.

DYNAMIC ELECTRONICS Inc.
Box 896 (205) 773-2758
Hartselle, AL 35640

NEW PRODUCTS

This section is available free for producers and dealers of color computer products. These products have not been reviewed by us but are included for our reader's information.

OS-9™ DEVELOPMENT SOFTWARE for the Color Computer 3™

Radio Shack has released an OS-9 Development System for the Color Computer 3. It is a complete editor/assembler with full-screen editing and specialty I/O drivers. The development system gives serious as well as novice color computer programmers tools to develop software programs for their own customized applications. The OS-9 Level Two operating system (Cat. No. 26-3031) is required to take advantage of programming tools provided by the development system. The price is \$99.95 and it is available at your Radio Shack dealer.

Color Computer 3 is a trademark of Tandy Corporation.

OS-9 is a trademark of Micro-ware Systems Corporation.

HI-RES JOYSTICK INTERFACE

Radio shack has also introduced a high resolution joystick interface that has 10 times the resolution of the standard joystick port. It plugs into one joystick port and the cassette port. A standard or deluxe joystick plugs into the interface. It has resolutions of 640 x 640 and requires special software. The cost is only \$9.95 at your Radio Shack dealer. See our review in this issue.

MENTAL FREEDOM

This is a program that works with the Radio Shack Biofeedback

Monitor (\$12.95) to bring you Preble's thoughtware. Thoughtware tests your ability to handle stress and to remain calm in adverse circumstances. This program has been received and will be reviewed soon. \$19.95 + \$2.50 s/h. Dr. Preble's Programs, 6540 Outer Loop, Louisville, KY 40228 (502) 966-8281.

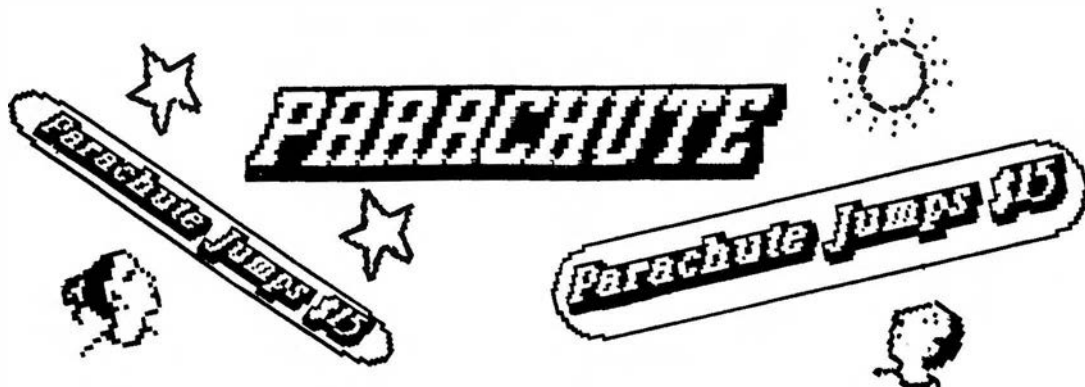
BASIC FREEDOM

Basic Freedom is a full screen editor produced by ColorVenture Software for all of the color computers. A lowercase interpreter and auto key repeat are included. The program resides in upper memory freeing the computer's normal memory. It works with a cassette or disk. This gives the editing features of a word processor without leaving basic. A special version is available for the CoCo 3. These have been received for review. \$29.95 + \$2.50 s/h. Dr. Preble's Programs, 6540 Outer Loop, Louisville, KY 40228 (502) 966-8281

**There are certain people
in life who think they
know everything which
is particularly irritating
to those of us who do.**

OPERATING HINT

You can disable the cartridge port with POKE 65314,54. Enable it with POKE 65315,52.



Have you ever wished you could jump from an airplane, free fall, and then pull the rip cord on your parachute? Do you think you could maneuver it so that you could land on a target? With this exciting game you can develop your skills. When is the best time to jump and when should the chute be opened? There are 3 landing pads below. Try to land on one of them and not hit a cliff or the sea. Instructions are included within the program for using the keyboard keys or a joystick. If you miss the pad it may be your last jump.

```

1 'parachute
2 'ALAN SCHWARTZ
3 'mainline
4 GOSUB 55 'title
5 GOSUB 155 'message
6 GOSUB 78 'setup
7 GOSUB 81 'setup1
8 GOSUB 115 'flag
9 GOSUB 104 'airplane
10 GOSUB 15 'man
11 GOSUB 39 'land
12 IF MORE = 1 THEN GOSUB 134:GO
    TO 7
13 GOTO 9 'repeat
14 RETURN
15 'man
16 IF MAN = 1 THEN 19
17 IF PEEK(65280)=126 OR PEEK(65
    280)=254 OR INKEY$="J" THEN
    MAN=1:C=A:D=B+10
18 IF MAN=0 THEN RETURN
19 LINE(C-10,D-15)-(C+11,D+18),P
    RESET,BF
20 IF FFLAG =1 THEN D=D+PSV:GOTO
    22
21 D=D+10-CHUTE
22 IF FLAG=5 THEN 25
23 C=C-(FLAG-2)*2

```

```

24 IF INKEY$="C" THEN CHUTE=5
25 E=JOYSTK(0):F=JOYSTK(1)
26 SCORE=SCORE-CHUTE
27 IF Z$="K" THEN 32
28 IF F<12 THEN CHUTE=5
29 IF E<24 THEN C=C-1:IF E<12 TH
    EN C=C-2
30 IF E>42 THEN C=C+1 : IF E>50T
    HEN C=C+2
31 GOTO 34
32 IF PEEK(343)=247 THEN C=C-2
33 IF PEEK(344)=247 THEN C=C+2
34 IF CHUTE =0 THEN 36
35 CIRCLE (C,D-4),10,5,1,.6,.9
36 DRAW "BM"+STR$(C)+","+STR$(D)
    "+";N;G1;N;L1;N;H1;N;U1;N;E1;N
    ;R1;N;F1;D3;N;R3;N;L3;D7;N;G3
    ;F3"
37 '
38 RETURN
39 'land
40 IF CRAS = 1 THEN 53
41 IF MAN = 0 THEN RETURN
42 FFLG = 0
43 FOR CECK = 12 TO 30
44 CPT = PPOINT(C,D+CECK)
45 IF CPT = 7 THEN 50
46 IF FFLG = 1 THEN 50
47 PSV = CECK-13
48 FFLG = 1
49 PVAL = CPT
50 NEXT
51 IF PSV<2 THEN CS= 1 ELSE RETU
    RN
52 IF CHUTE = 0 AND CS= 1 THEN P
    SV = 10:CRAS = 1:SOUND 100,10
53 MORE =1
54 RETURN
55 'title
56 CLS
57 PRINT @ 10,"chute"
58 PRINT "Y=YES N=NO"
60 PRINT "J=JOYSTICK K=KEYBOARD
    "
62 PRINT
63 PRINT "JOYSTICK"

```

```

64 PRINT " LEFT OR RIGHT MOVEM
ENT"
65 PRINT " UP OPEN CHUTE"
66 PRINT " BUTTON JUMP"
67 PRINT "KEYBOARD"
68 PRINT " LEFT AND RIGHT ARRO
W"
69 PRINT " C=OPEN CHUTE"
70 PRINT " J=JUMP":PRINT
71 PRINT "USE THE (K)EYBOARD
OR (J)OY STICK
?"
72 Z$=INKEY$:IF Z$="" THEN 72
73 IF Z$="J" OR Z$="K" THEN CLS:
PRINT "please wait":RETURN
74 IF A$="Y" THEN CLS:PRINT "JOY
STICK OR KEYBOARD":GOTO 72
75 IF A$<>"N" THEN 72
76 END
77 RETURN
78 'setup
79 PMODE 3,1
80 RETURN
81 'setup1
82 PCLS 7
83 MORE =0
84 B=20
85 A=230
86 MAN=0
87 PSV = 5
88 FFLAG = 0
89 CRAS = 0
90 CS = 1
91 SCORE=200
92 CHUTE=0
93 'mountains
94 DRAW "BM0,150;C6;E10;U5;R2;E5
;R8;E3;U2;E4;F10;D3;F2;R20;F6
;D6;F3;D9;R90;E3;U5;R2;U2;E2;
R1;U3;E2;U3;R2;U2;E2;R1;E1;U2
;R10;F5;R2;D2;F3;R1;D2;F2;R3;
D2;F3;R4;F2;D2;F3;R2;D3;R3;R3
2"
95 PAINT(0,160),6,6
96 COLOR 8,7
97 LINE(0,161)-(295,161),PSET
98 COLOR 5,7
99 LINE(102,159)-(132,157),PSET,
BF
100 LINE(43,135)-(63,133),PSET,B
F
101 LINE(177,134)-(188,132),PSET
,BF
102 SCREEN 1,1
103 RETURN
104 'airplane
105 A=A-6
106 LINE(A-20,B-10)-(A+26,B+10),
PRESET,BF
107 IF A<30 THEN A=230
108 IF MAN=0 THEN 110
109 A=230:RETURN
110 A$="BM"+STR$(A+13)+", "+STR$(
B-2)+";"
111 CIRCLE(A,B),23,5,.12,.05,.85
112 DRAW A$+"C5;E5;U1;R1;D8"
113 PAINT(A,B),5,5
114 RETURN
115 'flag
116 DRAW "BM20,130;C5;U40"
117 FLAG = RND(5)
118 ON FLAG GOSUB 120,123,130,12
7
119 RETURN
120 'rnd1
121 DRAW "F10;G10"
122 GOTO 125
123 'rnd2
124 DRAW "F5;D8;G5"
125 PAINT(22,100),5,5
126 RETURN
127 'rnd3
128 DRAW "G10;F10"
129 GOTO 132
130 'rnd4
131 DRAW "G5;D8;F5"
132 PAINT(19,100),5,5
133 RETURN
134 'score
135 Z=RND(9)
136 CLS
137 FOR A=1 TO 20000
138 PRINT
139 IF CHUTE=0 THEN PRINT C$(Z)
:SCORE=-1000:GOTO 148
140 IF PVAL<> 5 THEN 146
141 IF D<130 THEN 145
142 SCORE=SCORE+200
143 PRINT B$(Z)
144 GOTO 148
145 IF C<100 THEN PRINT E$(Z):SC
ORE=SCORE+300:GOTO 148 ELSE P
RINT F$(Z):SCORE=SCORE+400:GO
TO 148
146 PRINT D$(Z)
147 SCORE=0
148 PRINT:PRINT"YOUR SCORE WAS";
SCORE:PRINT @ 448,"DO YOU WIS
H TO TRY AGAIN"
149 SCREEN 0,0
150 A$=INKEY$:IF A$="" THEN 150
151 IF A$="N" THEN END
152 IF A$<> "Y" THEN 150
153 CLS:PRINT"please wait"
154 RETURN
155 'message
156 'low
157 B$(1)="SO YOU WHERE ABLE TO
LAND"
158 B$(2)="LANDED ON THE EASY PA
D HA!!"

```

159 B\$(3)="TRY THE HARD PAD"
 160 B\$(4)="FAIR"
 161 B\$(5)="SEE IF YOU CAN DO IT AGAIN"
 162 B\$(6)="GOOD"
 163 B\$(7)="SAFE AT HOME"
 164 B\$(8)="GOOD TRY AGAIN"
 165 B\$(9)="SAFE"
 166 'nochute
 167 C\$(1)="I FEEL SORRY FOR YOU"
 168 C\$(2)="BY"
 169 C\$(3)="NO CHUTE"
 170 C\$(4)="TRY AGAIN"
 171 C\$(5)="I'LL CALL YOUR FAMILY"
 172 C\$(6)="IT WAS NICE KNOWING YOU"
 173 C\$(7)="TRY THE CHUTE NEXT TIME"
 174 C\$(8)="MAYBE NEXT TIME"
 175 C\$(9)="BACK TO SCHOOL"
 176 'off
 177 D\$(1)="WAS THE SUN IN YOUR EYES"
 178 D\$(2)="GO BACK TO SCHOOL"
 179 D\$(3)="TRY AGAIN"
 180 D\$(4)="WAS THE WIND TO STRONG"
 181 D\$(5)="BETTER LUCK NEXT TIME"
 182 D\$(6)="YOUR IN THE WRONG SPORT"
 183 D\$(7)="DID YOU FALL ASLEEP"
 184 D\$(7)="DID YOU FALL ASLEEP"
 185 D\$(9)="MAYBE NEXT TIME"
 186 '2hard
 187 E\$(1)="YOUR GETTING BETTER"
 188 E\$(2)="TRY THE HARD PAD"
 189 E\$(3)="VERY GOOD"
 190 E\$(4)="YOU MADE IT "
 191 E\$(5)="GOOD JOB"
 192 E\$(6)="TRY TO DO IT AGAIN"
 193 E\$(7)="GLAD YOU MADE IT"
 194 E\$(8)="LUCKY"
 195 E\$(9)="TRY THE HARD PAD"
 196 'hard
 197 F\$(1)="YOU MADE IT TO THE TOP"
 198 F\$(2)="NOW TRY TO GET DOWN"
 199 F\$(3)="GOOD JOB"
 200 F\$(4)="SEE IF YOU CAN DO IT AGAIN"
 201 F\$(5)="LUCKY"
 202 F\$(6)="GOOD"
 203 F\$(7)="TRY AGAIN"
 204 F\$(8)="THAT WAS CLOSE"
 205 F\$(9)="NOW WHAT"
 206 RETURN

HAM RADIO PROGRAMS

MORSE - This program allows a key to be pressed and then sounds the Morse equivalent. It also will send random characters. This is an excellent tool for developing code speed for the the Novice, Technician, or General class licenses.

DX - Consists of two parts. The first part allows notes to be typed onto the screen. The second part allows the countries for a letter or number prefix to be displayed.

ANTENNA - An antenna design program that calculates the dimensions for a wide spaced Yagi antenna of up to 4 elements.

Order **HR-1** (3 programs) \$11.95

MORSE TERMINAL

When used with an interface this converts your color computer into a Morse Terminal. To transmit just type the Morse characters and the computer keys your transmitter. In the receive mode the computer decodes and displays the Morse characters on the screen. Instructions are included for building an interface with off the shelf parts. **HR-2** \$12.95

STATION LOG

Keep a record of your contacts. Just enter the information as it is requested. Items that are the same such as date, frequency, and type of emission need only be entered once and changed as needed. Save and load records to tape or disk. Add to the log and quickly find stations. **HR-3** \$9.95

THERMOMETER

Now your computer can give you the temperature in both Fahrenheit and Centigrade. Assembly plugs into a joystick port and consists of a thermistor on a 10' cable for the single unit and a second thermistor on a 20' flat cable for the dual unit. The dual unit can be used to measure inside and outside temperature. **CC-THERM** \$12.95, **CC-THERM 2** \$19.95.

MEMORY SAVER 2

A battery backup for all color computers. Leave programs in your computer and the Memory Saver will preserve them in case of a power failure. A real time saver for cassette systems. \$39.95

HAM RADIO TERMINAL

Uses the cassette port. Requires simple interface to connect cassette audio into the Mic jack and receiver audio into the cassette port. Interface instructions are included. 60 WPM Baudot. \$6.95.

All programs are color computer 3 compatible unless indicated and are on tape or disk. Please specify tape or disk software.

Checks, VISA or MC, Add \$3 shipping.

DYNAMIC ELECTRONICS
 Box 896 (205) 773-2758
 Hartselle, Al 35640

HAM RADIO & COMPUTERS

by

Bill Chapple W4GQC

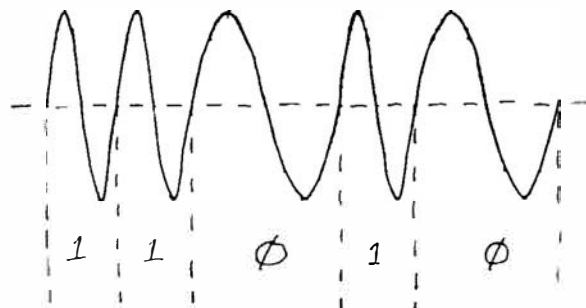
Teletype

In this series I have discussed using the computer for various ham radio applications. Software has been presented for Morse Code, a Station Log, DX Stations, and Antenna Design. Also details were given for constructing a serial interface using the printer port.

Last month I discussed using the cassette port. The signals from a cassette are audio which is similar to the audio from a communications receiver. To save programs to a cassette, the computer also sends audio to the cassette. This is similar to the audio that is processed by microphone circuits in a single sideband (SSB) transmitter. Due to this similarity it seems feasible to use the cassette port to directly connect to the microphone and speaker of an SSB transceiver.

Cassette Audio

Let's look at the audio the computer generates to save programs to a cassette. This audio consists of a cycle for each bit that is sent. One cycle of 2400 hertz audio is sent for a "1", and one cycle of 1200 hertz is sent for a "0". See Figure 1. This is very efficient because each cycle is used. The computer's audio could be sent through the microphone circuits of a transmitter. This type modulation is not acceptable for use on the ham bands below 30 MHz. The cassette audio is a type of frequency shift keying



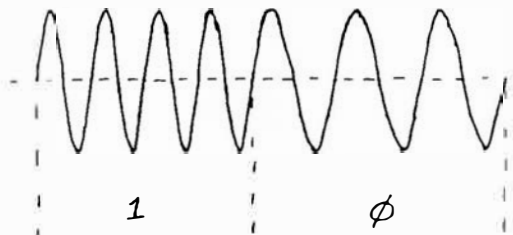
*Each cycle represents a bit
CASSETTE PORT
Figure 1*

(FSK) with a shift of 1200 hertz and a baud rate of approximately 1500.

The FCC authorizes shifts up to 1000 hertz and a maximum baud rate of 300 for frequencies below 30 MHz. The color computer's cassette audio fails both of these requirements. However it is feasible to modify the audio produced by the computer to meet the FCC's requirements.

On the high frequency (HF) band from 3 to 30 MHz, frequency shift keying is used for radio teletype (RTTY). A shift of 170 hertz is generally used with the higher frequency representing a mark or "1" and the lower frequency representing a space or "0". RTTY has an advantage over Morse Code or CW in that the signal is always present on one of the two frequencies. This can be used to process the signal and eliminate errors caused by static or other types of interference. For a SSB transceiver the audio can be connected to the microphone connector. As the audio frequency shifts, the transmitter's output frequency shifts by the same amount. However there are se-

veral cycles of audio for each "1" or "0" that is transmitted. Refer to Figure 2. The time to send a "1" or "0" can be about the same whereas for the color computer there is a 2 to 1 time relation since each cycle represents a data bit.



*Several cycles per bit
TYPICAL AFSK WAVEFORM
Figure 2*

Making an Interface

A Radio Shack cassette cable assembly can be used to connect the computer to the transceiver with a microphone and earphone plug plus miniature jacks for the cassette cable. The cassette cable assembly has an audio out, audio in, and remote cable. I wired my FT-757 with the computer by wiring the following pins on the microphone plug:

Pins for FT-757 microphone

- 7 ground
- 8 Mic in
- 6 PTT

Connect center of audio out cable to pin 8 and the shield to pin 7. Connect the center of the motor on cable to pin 6 and the shield to pin 7. I wired jacks to the microphone plug so I could plug in the cassette cables. The audio end was wired to a jack on the end of a standard phone plug. Plugging this plug into the audio out jack disables the speaker, but the audio can be heard through the television. Type "AUDIO ON" from the computer. In the future I will want to make a switch box so cables will not

have to be unplugged or use two cassette cables. With the interface completed it was time to try a program.

RTTY PROGRAM

I have a public domain program that allows the computer to receive and transmit 60 WPM Baudot. It has a tuning meter on the top right hand corner of the screen which allows stations to be properly tuned in. It also has a type ahead buffer so messages can be composed while receiving. The program has to be run to generate a machine language program. The machine language program is saved and loaded when the program is needed.

A lot of stations do not use Baudot or 60 words a minute. I found WIAW and copied a news bulletin to verify that the program works. I also had my first QSO with a station in Brazil and heard stations from Germany and France. I didn't think that was bad for a first contact on 14090 KHZ. To switch to the transmit mode press the "CLEAR" key. This turns on the motor relay switching the transceiver to the transmit mode.

Reduce your output power by turning down the microphone gain control because RTTY leaves your transmitter on all of the time and could damage it. Start out with about 25% of your output power. A solid state rig will handle the power better than a tube rig, but be careful. I ran 100% with my YAESU but did not use the Heath SB-200 amplifier. If you have a speech process then turn it off.

Next month I will have more to report on this. Until then 73's and enjoy BAUDOT RTTY - Bill.

```
10 REM THIS PROGRAM IS PUBLIC DO
   MAIN
20 PCLEAR4
30 CLS
```

```

40 PRINT"    RADIO TELETYPE TRANS
CEIVER"
50 PRINTSTRING$(32,"-");
60 PRINT
70 PRINT"NOW GENERATING MACHINE
LANGUAGE"
80 PRINT
90 PRINT"PLEASE WAIT..."
100 ST=&HE00:AD=ST:LI=900
110 READA$,CS
120 IF A$="X" THEN 200
130 FOR I=1 TO 64 STEP 2
140 A=VAL("&H"+MID$(A$,I,2))
150 POKE AD,A:CS=CS-A:AD=AD+1
160 NEXT
170 IF CS THEN PRINT"DATA ERROR
IN LINE";LI:END
180 PRINT@174,938-LI
190 LI=LI+1:GOTO 110
200 IF PEEK(&HC000)=68 AND PEEK(
&HC001)=75 THEN B$="DISK" ELS
E B$="TAPE"
210 PRINT@96,"PROGRAM IS NOW IN
MEMORY AND"
220 PRINT"READY TO BE SAVED. INS
ERT ";B$
230 LINEINPUT"AND PRESS ENTER ";
A$
240 IF B$="DISK" THEN 280
250 CSAVEM"RTTY",ST,AD-1,CS
260 LINEINPUT"PRESS ENTER TO SAV
E AGAIN ";A$
270 GOTO 250
280 SAVEM"RTTY/BIN",ST,AD-1,CS
290 END
900 DATAACC343CF7FF01B7FF03B7FF21
F7FF231A500F42CCFEF8DD408E12D
ADD44DD46DD,4625
901 DATA480F4A0F4B8E12029F4E9F5F
0F530F588E0400CE12B2A6C0A7808
C042025F7CC,2970
902 DATA6060ED818C060025F98E05E0
9F4C86BFA7848E05A09F5D869FA78
48D568D0220,3773
903 DATAFA9E5FA6862B30816026028D
409E5DA7808C05C0251A8E0420EC8
820ED818C05,3403
904 DATAA025F6CC6060ED818C05C025
F98E05A09F5D869FA784394C26088
660A79F005D,3807
905 DATA20D44C26058E122220064C26
058E12029F5F39965327031700EF0
F590F5A0F56,2034
906 DATAC6138D78DC558152250721FE
5A2A0A20E25C2B022003CC007FD75
64FD655D359,3207
907 DATADD598305202406AC01AC0120
D3DD598605975BCC0013975697578
D404FD655D3,3292

```

```

908 DATA59DD59830520240FDC558152
C900D7560C5712C61220E3DD59D65
658D157065C,3320
909 DATA0A5B26CFAC94C6088D124FD6
55D359DD5983029025EE965C44444
4398D4C4FD3,3581
910 DATA59DD59CC00028D42CB028D3A
CB028D36D755C059502B022003CC0
000C10F2202,2805
911 DATA2003CC000FD15826063D3DAC
8B20138E0410A68584BFA7859658D
758E686CA40,3334
912 DATAE78617012639AC01AC018601
5CC1602504A1012005B5FF2027F25
CC1602504A1,2918
913 DATA012005B5FF2026F2398E0405
CE12D2A6C0A7808C040D25F7CC343
CF7FF21B7FF,3811
914 DATA018602B7FF200F590F5A9E46
9C442724CC0F61DD518605975BE68
09F46D75C5F,3331
915 DATA8D54AC94CC00085A26FD045C
8D480A5B26F2EC9B3DAC8BCC15ACD
D51538D3796,3719
916 DATA5326C7CC343CB7FF21F7FF01
8E0405CE12B7A6C0A7808C040D25F
739B6FF208A,3926
917 DATA02B7FF20862A975039B6FF20
84FDB7FF20862797503924048DE22
0048DEB2000,3572
918 DATA801D4A26FDB6FF2088FCB7FF
20D6504FD359DD59935124088D0F9
650802320E2,3911
919 DATADD5939AC943DAC0139964226
7CDC40C037498A0124022003CCFEF
8DD408E0152,3388
920 DATA3AB7FF02B6FF008A801F89E8
84E48421FEA7848607DD429E449C4
626C69C4826,4061
921 DATAC48E12DA9F469F489F443996
42263ADC40C037498A0124022003C
CFEF8DD408E,3579
922 DATA01523AB7FF02B6FF008A801F
89E884E48426BEA78496414C27088
B37974121FE,3738
923 DATA20818607DD4216FF7A4A9742
D641CB08D74104432475867FB7FF0
2B6FF008440,3607
924 DATA27058E124220058E127A2000
A685E6852B289E44984AD74A84602
609C41FE780,2968
925 DATA3D21FE2012C5402604861B20
04861F2000C41FED81A1019F44399
E445C260E96,2654
926 DATA4A8440974ACC0004E7803D20
EA5C260BCC0802A780ED81A18B20D
C5C26040353,3177
927 DATA20055C273AA1843DA18B39D6
4B273EC004D74B8E05E03AEC84ED8
8E0CC6060ED,3840

```


should work. Maybe some of you disagree with me, and if so I would like to hear from you. I am sure there is enough interest for OS-9 and we would like to hear what you have in mind for articles. Thanks for the subscription and your support.

+ + +

Dear Bill,

I am not sure if the \$6.95 purchases all of DCN-4 or parts but I would like to receive number one for sure "Address File with Sort". I really like this program if it is the same one that was published in the February 1987 issue. I worked my buns off trying to make that one work but couldn't. For example, my computer would not accept line 6, I always receive a "sn error" on line 7000, it always showed that I did not have enough room to save the file, etc, etc. I have a new CoCo 2 64K with dmp 105 printer. Here's hoping your version works.

Keep up the good work, Bill. You do have a super publication. We COCO freaks need you desperately. We may gripe a lot but we sure appreciate your excellence in this field. Few really get into programming and do not realize how tough it is.

Enclosed you will find a check for \$6.95 for the tape that can be used for TRS-80 CoCo 2 64K with DMP-105 printer.

Also, I am another ham that is impatiently looking forward to your future programs involving the cassette port. I purchased a RTTY program that operates through the cassette port and it works great. If you could get your version of CW, RTTY, AMTOR and Packet going, you could make a mint. The price on interfacing those is holding many back from using those modes. Hang tight, Bill, and, again keep up the good work. -Bill Crowley.

Bill thank you for the letter. We updated the address file on the DCN-4 collection of programs so you will have the latest version. I don't worry about gripes because I have found that if you deal with anyone long enough there will be times when you will disagree.

In this issue I covered the RTTY program. It is public domain and probably the same as you are using. I am going to concentrate on the cassette port and write other programs. Most of the commercial interfaces use microprocessors. Since we have the powerful cassette port, we can use the microprocessor inside our computer and not require the expensive interfaces. Thanks for your letter and I hope the address file works OK for you.

+ + +

Bill -I have made a patch for the HPRINT command for your Coco 3 Graphics demo program in the 4-5 issue of your magazine. Line 240 should read:

```
240 IF X$="T"THEN HSCREEN 0:
      INPUT "ENTER MESSAGE";T$:
      HSCREENS: HPRINT (X/8, Y/8),
      T$:GOTO110 'WRITE TEXT TO
      SCREEN
```

The reason it did not work and I divided the position by eight is because the HPRINT command has a different grid on the same screen than the other Hi-res commands, instead of horizontal pixel, vertical pixel.

I would also like to say that I like your magazine a lot and it has many interesting articles and programs. Keep up the good work!- Joshua Wangel

Joshua I appreciate your correcting the error. Thanks for taking the time to write us. Your words of encouragement are very much appreciated.

DYNAMIC COLOR NEWS SUBJECT INDEX

We have listed our subjects by Volume and Issue. Our first issue, Vol 1-1, was February 1984. The first and second year we printed 11 issues each. This listing is complete through Volume 4-8 or October 1987.

Basic Programming

Imm. mode, Vectors 1-1
Variables 1-2
Arrays, Read, Data 1-3
Data Handling Tech. 1-8
Memory Searching 1-9
Random Numbers 1-10, 1-11
FOR- NEXT Loops 2-5
DIM, Arrays, IF-THEN 2-7
Branching, ASCII, 2-8
Word Processor Dev. 2-9
LEFT\$, RIGHT\$, etc. 2-10
Seperate Data Files 3-1
EXEC Command 3-2
Data in Files 3-3
Editing Statements 3-4, 5
Seperate files 3-5
Print Using, Sorting 3-7
Tracing Programs 3-8
Disk Commands 3-9,10,11
Sorting Data 3-11
STR\$, Arrays 4-2
Reformat data 4-6,7
Taking Control 4-8

ML Programming

Microprocessor, EXEC 1-1
Indexed Addressing 1-2
Data Rel. & Branching 1-3
Sound Subroutine 1-10,1-11
Bank Switching Sub. 2-2
Block Move Subroutine 2-3
64K All RAM 2-6
2-Bank Subroutines 2-9
Upper Mem. 3-3
ML Pgm. (Part 1) 3-4
ML Addition 3-5, 3-6
ML Subtraction 3-7
Disk Disassembler 3-7
ML Data Move 3-8
ML ASCII Subs. 3-8
Cursor Move Subs 3-9
Assembly Language Pgm 3-10
through 4-8

Articles

Memory Expansion 1-2
ASCII & BASIC 13,1-4,
Infac. ASCII Devices 1-5
Remarks-Word Proc. 1-5
Uninterrupted Power 1-5
Word Processing 1-6
Computer Sound 1-9, 1-10
Lrg. Mem. Pgms. 2-1 th 3-4
Computer Graph. 2-1 th 3-5
Writing Programs 2-2
CoCo Heat Problem 2-6
graphics, Lines, etc. 2-8
Using Page -1 2-9
Circle Command 2-10
Draw Command 3-1
Interfac. Comp.3-2 to 3-11
Basic Basic 3-1, 3-2

Graphics Scalling 3-2
Ramdisk Improvements 3-2
Page -1 Progs. 3-4, 3-5
Dev. Drawing Program 3-4
Intro. to OS-9 3-9,3-11
Ham Radio & Computers
Each issue since 3-7
Color Comp.3 3-10,11,
4-2,3,4,5
Joysticks 3-12,4-1,2,3
EPROMS 4-2,3,4,5
Thermometer 4-3,4
Computer Terminology 4-6

Programs

Multiprogram Manager 1-1
Utility 1-4
Remark Print Word Pr. 1-5
Check Book 1-6
Memory Search 1-8
Ball Team Sort 1-4
Sound Generator 1-10
Card Shuffling 1-10
Sound Learning 1-11
Bank Switching Program 2-3
Gas Mileage 2-4
Graphics Demo 2-4
Grade Book 2-5
Character Generator 2-6
Alarm Clock 2-6
Address File 2-7
Student Study 2-7
Line Demo 2-7
Vector Corrector 2-8
Fast Food 2-8
Draw Bar Graphs 2-8
Word Processing 2-9
Bar Graph & Ch. Gen. 2-9
Ram Disk 2-10
Recipe 2-10
Electric Cost 2-10
Circle Demo 2-10
Check Book 2-10
Inventory 2-11
ARC & Circle Demo 2-11
Ship War Game 2-11
Ram Delete Subroutine 3-1
Draw Demo 3-1, 3-2
Bouncing Ball Game 3-1
File Demo 3-1
Electronic Billboard 3-2
RamDisk Subroutines 3-2
Tanks (game) 3-3
Draw Demo (GET & PUT) 3-3
Programs in Upper RAM 3-3
ROULETTE (game) 3-4
RESTORE -Restores pgms 3-4
Graphic Draw 3-4, 3-5
Memory Peek 3-5
Chords (Music Program) 3-5
Inventory 3-5, 3-6
Graphics zoom, ASCII Demo,
Astro Dodge Game 3-5
Organize VCR Tapes 3-7
Morse Code (Ham) 3-7
Disk File 3-8
Antenna Design (Ham) 3-8
Money Chase (Game) 3-4
Multiple Choice Test 3-9
Dueling Cannons 3-10
DX Program (Ham) 3-10
Star Constellations 3-10
Dyterm Terminal Pgm 3-11
Lucky Money 3-11
Jungle Adventure 3-12
Morse Code Keyer 3-12
Address File (sort) 3-12
Gallows (game) 4-1
Scrolling Around 4-1
Dware (game) 4-2

Invoice Program 4-2
Diver (game) 4-3
CC-3 Error Trapping 4-3
Temperature Program 4-4
CC-3 Memory Manager 4-4
Accounts Payable 4-4
Improved Sort 4-4
Geneology 4-5
Graphics Demo Program 4-5
Calendar 4-5
Morse Terminal Prog. 4-5
Job Costing 4-6
Compound Interest 4-6
Dog Race 4-6
CC-3 Graphics Save 4-6
Convert 4-7
Meteors 4-7
Astro-Dodge 4-7
Disk Cataloger 4-8
Graphics Print 4-8
Parachute (Game) 4-8

Hardware Projects

Interrupt Switch 1-4
Video Reverser 2-1
Add a Second Port 2-9
Interfacing Computers 3-9
Hardware ASCII Int. 3-10
Cassette Switch 3-12
Morse Code Keyer 3-12
Joystick Voltmeter 3-12
Joystick Ohmæter 4-2
Tone Decoder 4-2,4-4
Digital Thermometer 4-4
Measuring Light 4-5
Relay Interface 4-7

Product Reviews

Spectrum DOS 1.0 2-6
Thunder RAM 2-7
Telepatch 2-8
Lowercase C.G. 2-8
Basic + 2-9
COCO Calendar 2-11
Assembly Language Pro-
gramming (Book) 3-2
Schematic Drafting 3-3
Equation Solver 3-4
Programming Aid 3-5
Super Programming Aid,
CoCo Keyboard 3-6
Checkers -32K 3-7
TX Word Processor 3-8
Banner 3-9
CoCo Max II 3-10
Ultra Telepatch 3-11
Van CoCo 3-11
DS-69, A Digitizers 3-12
Diskman & Chess-32 4-1
Super Ramdisk 4-2
Hi-Res Font Modifier 4-2
Art Gallery 4-2
DC-4 Disk Controller 4-3
CC-3 512K ramdisks 4-3
FKEYS III, MAGIGRAPH,
CC3 DRAW 4-4
Assembly Language Pgm
for CoCo 3 (Book) 4-5
Pyramix, Life 4-6
CoCo 3 Secrets, Word Pro-
cessor 2, Draw Poker 4-7
Hi-RES Joystick, Hi-Res
Joystick Interface, TW-
80, Mini-Ledger 4-8

DISPLAY ADS

(Rate sheet 2 - March 1986)
Closing 1st of preceeding month.

Pages	1 time	2 times	3 times
*2	25	23	22
1	30	27	25
1/2	23	20.	18
1/3	19	17	15
1/4	15	13	12

CLASSIFIED ADS

1. 10 cents a word, \$3 minimum.
2. Name, Address, & Telephone listed free.
3. Send payment with ad.
4. Closing date 1st of the preceeding month. Ex. Nov ad closing is Oct. 1.
5. No X-Rated ads.

PREMIUM QUALITY DISKS. You don't have to pay a lot for QUALITY disks. Our disks are boxed in tens complete with labels, sleeves, and write protect tabs. Don't confuse these with cheaper disks as they carry a lifetime warranty and will be replaced should they become defective. DSK-1 SSDD for CoCo \$6.95 /box, DSK-2 DSDD for MSDOS \$7.95 /box. Add \$1.50 S/H. Dynamic Electronics, Box 896, Hartselle, AL 35640. (205) 773-2758

MATTHEW ON DISK. King James Version of the first gospel. ASCII format for loading by any word processor (or by other software capable of inputting from ASCII Files). 5.25" SS/DD. Send \$10.00 (includes s/h) to LDS Software, PO Box 485, Glenview, IL 60025-0425

* We can use colored paper at no extra charge if ads are on both sides.

We can do ads in Red, Blue, or Brown. No all one color ads will be accepted. For color ads send artwork for each color. Add 40% for each color. Example: One page black and red for 3 times costs \$25 + 10.00 = \$35.00 each month.

Artwork must be camera ready and can be enlarged or reduced at no extra cost. Rates are per page or fraction thereof. Enclose payment with ad copy. No X-Rated ads.

ADVERTISER'S INDEX

We would appreciate it if you would let these advertisers know that you saw their advertisement in **Dynamic Color News**.

Seibyte Software	6
Boiling Spring Lakes Software .	15
Dynamic Electronics Inc. 3,8 ,10	16,18,20,21,24,25,28
P D Software	14
LDS Software	Classified
T & D Subscription Software .	8

DYNAMIC ELECTRONICS INC.
P. O. Box 896 (205) 773-2758
Hartselle, AL 35640

BULKRATE
U.S. POSTAGE
PAID
HARTSELLE, AL
35640
PERMIT NO. 21