DYNAMIC COLOR NEWS

Radio Shack Color Computer
Magazine

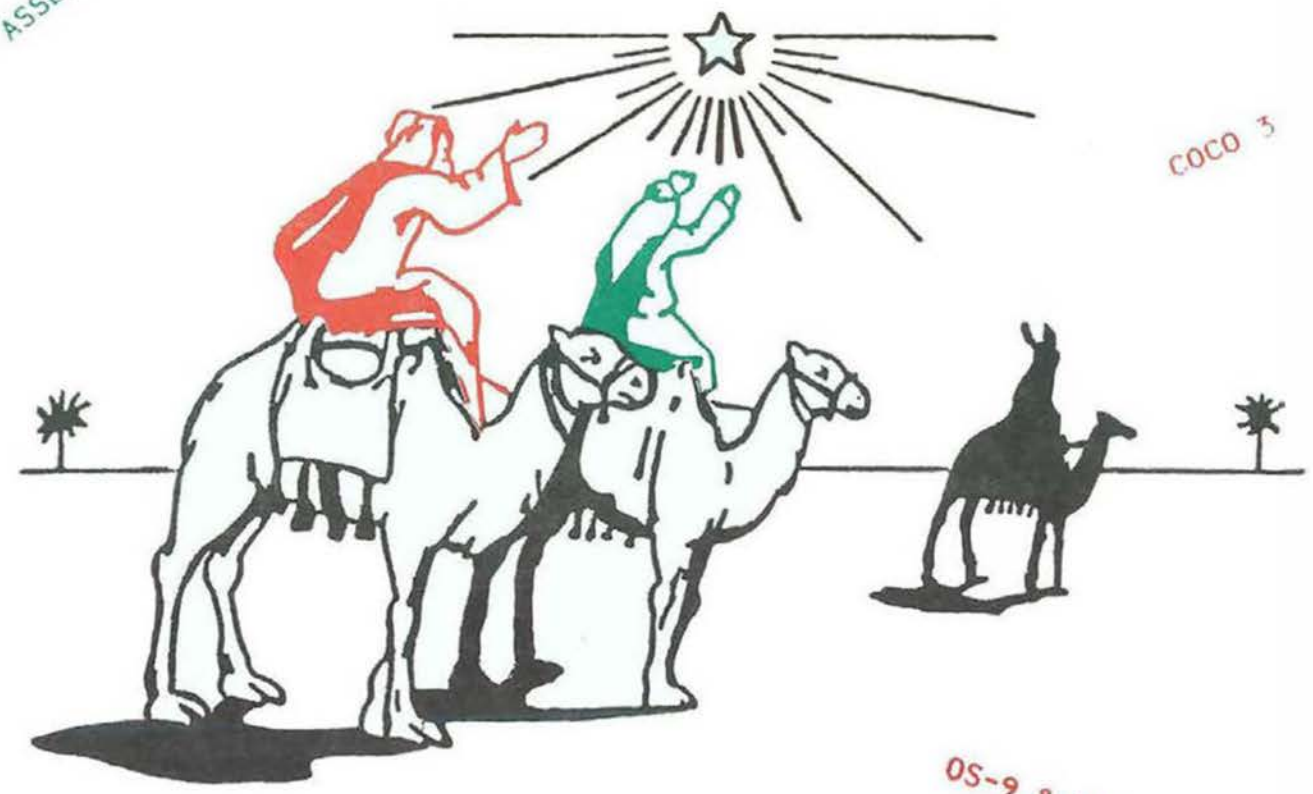
Dec 1988
Issue #56

$2.25

PROGRAMS

ASSEMBLY LANGUAGE

BASIC PROGRAMMING



COCO 3

OS-9 & BASIC 09

HAM RADIO

LUKE 2:11
11. For unto you is born this day
in the city of David a Saviour,
which is Christ the Lord.

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.

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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

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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 TXT file.

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CONTENTS

Most programs and editorials are available on disk or tape.

OS-9 & Basic 09 4
(Using Multiuser Feature)

* Screen Dump Pgm 7
(For the DMP-105)

* COCO III (part 5) 10

* Assembly Language .(NEW) . 12

* Basic Programming-Dsk I/O . 15

* ML Address Finder Pgm . . . 17

* Editor's Comments 22

* Ham Radio & Computers . . . 23

* SWR & Power Pgm 24

* Hangman (Word Game) 27

* Questions & Answers 30

Product Reviews 33

* TIC-TAC (game) 36

* Cummulative Index 39

Bulletin Boards, Clubs, Advertizer's Index 40

* Included on Disk or Tape.
# OS-9 Procedures are included on DCN on DISK.

This month we will look at the multiuser abilities of OS-9. By multiuser we mean hooking a terminal on to our system. That would allow another person to work at the terminal while you work on your computer, but you will have access to the same disk drive(s) and memory.

This articles will confine itself to the hooking up of two color computers to each other through OS-9. This will by far be the more prevalent occurrance. I suspect many CoCo III owners are former CoCo I or II owners and may still have two computers. Also many CoCo I or II owners may own more than one computer due to the low price of CoCos.

To hook two color computers together you will need two four pin din plugs. These are available at your local Radio Shack store, part number 274-007. You will also need three wires to run between the two plugs. The type of wire isn't important, but multi-strand may be a bit easier to work with. If you aren't a handy person with a soldering iron get some help from a friend who is.

The plugs should be wired as follows, wire pin 2 of plug 1 to pin 4 of plug 2. Wire pin 3 of plug 1 to pin 3 of plug 2, and wire pin 4 of plug 1 to pin 2 of plug 2. It doesn't matter which plug you designate as 1 and which you call 2, just be consistent.

These plugs will now plug into the serial I/O jacks on the backs of your color computers. What we have accomplished with this patch cord is to connect the two grounds of the color computers together, put the RS232 out of one to the RS232 of the other and vice versa.

You will need one last thing to get started and that is a terminal program. I used the videotex cartridge that Radio Shack used to (and still may) sell, but almost any terminal program will do. Load the terminal program into the computer you are going to use as a terminal (logical).

We will refer to the computer on which the system is running as the host computer. At this time you are ready to load OS-9 into your host computer. There will be some slight difference between level I and level II OS-9. We will cover level I first.

On the level I system there is a command for using a terminal. Type in the following command line:

```
TSMON /T1&
```

This will send a message to the terminal. It will also make the terminal prompt you for a login. If you just push the enter key the system will log you on as the superuser. This will give you complete access to the whole system.

There is a file in your SYS directory of the system disk. This can be modified for your own logins and passwords if you

so desire. It will have to be edited. If you don't want to do that you can assign the people that will be using your terminal the logins of user1 through user4. The logins are already in the system. There are no passwords with these logins, but they can be modified to include them. Loging in under these logins gives the user limited permissions. This will improve the security of your systems. Although the user will be able to use much of the system as it is now setup, you can modifiy the permissions on any files you want to keep away from the user.

For the level II system there is no TSMON on your system disk. To get that module you have to buy the OS-9 Level Two Development System, from Radio Shack. This program cost $99.95. If your budget won't allow for that, never fear there is a way around it. If you do get TSMON for the level II system it will work the same way the level I system does. I tried transporting the level I commands to level II (something Radio Shack discourages) and found that that didn't work. My machine locked up and I had to shut it down and start over.

But I said earlier there is a way around this problem. You simply have to send a shell out to the terminal. The following command will do the job:

SHELL I=/T1&

This will allow a shell to open up at the terminal. The only difference between this approach and the use of TSMON is a lack of security. Whoever is on the terminal will have the same permissions and privileges as the superuser. If you trust the person on the terminal then this is no real concern. By that I mean trust them not to erase important files or crash programs that could intrude on your own computing.

One of the odd things I have found with the level II system is that the addition of a terminal slows the host down quite noticeably. In fact the terminal seems to have a better response than the host.

Next month we will take a look at a way to help alleviate that problem, by setting priorities and attributes. For now it will take some time and toil to get yourself setup for a multi-user system.

BASIC09

BASIC09 has the ability to allow one program to run another program from it. The two programs below are both executed from just one command. You tell BASIC09 to run the first program and the first program will tell it to run the second program. It will pass the variables the second program needs to it.

This is a very powerful feature. It allows for modular programming. You can write small stand alone programs and then link them together as needed. This will break a big job down into a series of smaller subjobs. The magic command that will allow this is the PARAM command.

The way it works is it notifies the second program what the incoming variable names and types are. Certainly for these to be known they have to be defined in the first program and a command has to be used to send them on to the second program. This is accomplished when the first program runs the second program.

As you an see below the first program looks like an ordinary program until the last line. On the last line the first program tells BASIC09 to RUN the second program and also lists the variables to be passed. This command does not have to occur on the last line, it can come anywhere in the program after

the variables have been assigned a type and given a value.

The order in which the variables are to be passed is important. You can pass them in any order you want, so long as the second program is set up to receive them in the same order. For instance, when I was originally writing these two procedures, I used the line

```
RUN AVG(WORD,B,C).
```

This resulted in an error when I tried to run SUM. If you look at the second program you will notice that it looks for 2 real numbers to start with and then a string variable.

When I used the reverse order the second program tried to turn the string into a real number and use it to complete its mission. The answer was very strange indeed. Also note in the second program the variable AVG is not passed into the program. It therefore had to be defined with the DIM statement.

For the curious I passed the word average from the first program to the second just to show this feature wasn't confined to the variables with numeric values. For more information you can refer to page 11-108 of the BASIC09 portion of your OS-9 manual.

```
PROCEDURE SUM
SHELL "DISPLAY C"
DIM A,B,C:REAL
DIM WORD:STRING[7]
WORD="AVERAGE"
C=-1
B=0
PRINT"ENTER 0 TO END THE SUMMATION"
REPEAT
INPUT "NUMBER? ",A
B=B+A
C=C+1
UNTIL A=0
PRINT "THE TOTAL IS "; B
RUN AVG(B,C,WORD)

PROCEDURE AVG
DIM AVG:REAL
PARAM B,C:REAL
PARAM WORD:STRING[7]
AVG=B/C
PRINT "THE "; WORD; " IS "; AVG
```


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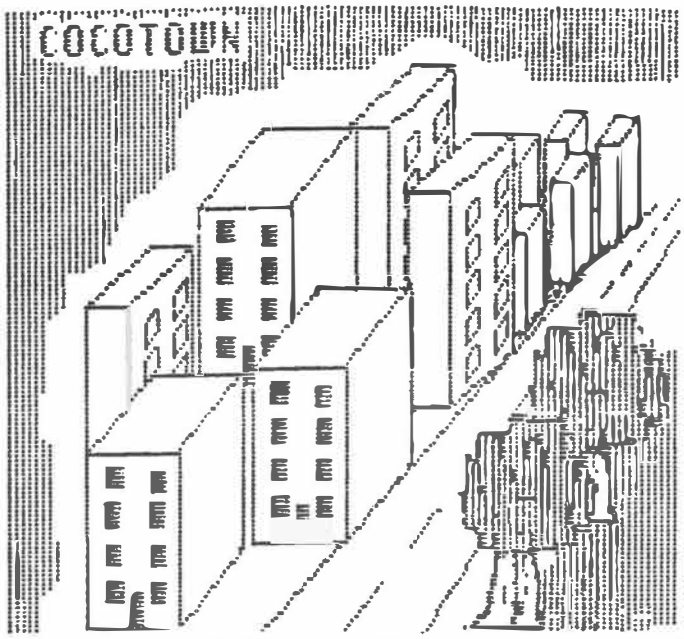

SCREEN DUMP PROGRAM

DMP 105

by
Doug Canfield

In our December 1987 issue we presented a screen dump program with instructions for using it with any dot matrix printer. However the program assumed that the dot matrix printer printed 8 dots in a pass. The DMP 105 only prints 7 dots. The program is modified for a 7 dot printer. It will print any PMODE 4 graphics picture in normal or reversed graphics. The sample picture "COCOTOWN" is reduced byt shows how the printed graphics looks.

```
10 PCLEAR8:CLEAR 200,31000
15 X=31000:GOSUB 370:RESTORE
18 X=31033:GOSUB 370
20 POKE 31040,&H25:POKE 31047,&H
   25
22 PRINT#-2,CHR$(30);CHR$(27);CH
   R$(19) 'TURN OFF GRAPHIC AND
   CONDENSED PRINTING
24 PRINT#-2,CHR$(27);CHR$(22) 'S
   ETS TO LINE FEED W/CARRIAGE R
   ETURN
26 PRINT#-2,CHR$(27);CHR$(32) 'T
   URN OFF BOLD PRINTING
30 CLS:PRINT"GRAPHICS PRINT PROG
   RAM"
40 PRINT"cOPYRIGHT (c) 1988
50 PRINT"dYNAMIC eLECTRONICS iNC
   ."
60 PRINT
70 PRINT"1 LOAD OR VIEW PICTURE"
80 PRINT"2 PRINT THE PICTURE"
90 PRINT"PRESS NUMBER"
100 X$=INKEY$:IF X$=""THEN100 'W
   AIT FOR KEY TO BE PRESSED
110 X=VAL(X$):IF X>2 THEN 70' CH
   ANGE X$ TO X
120 IF X=0 THEN 70
130 'REMOVE VALUES OF X=0 AND X>
   2
140 IF X=2 THEN 480
150 'THIS HANDLES THE PICTURE
160 CLS:INPUT"ENTER D FOR DISK D
   IRECTORY OR C TO LOAD FROM A
   CASSETTE OR PRESS ENTER TO BY
   PASS LOADING";D$
170 IF D$="D" THEN DIR:GOTO200 '
   DISK
180 IF D$="C" THEN CLOADM 'CASSE
   TTE
190 GO TO 220 'SKIP DISK PART
200 INPUT"ENTER NAME OF PICTURE
   TO LOAD    ";N$:IF N$="" THEN
```

```
    170
210 LOADMN$
220 CLS:PRINT"TO SAVE PRINTING T
   IME SCROLL":PRINT"THE PICTURE
    UP AND DOWN USING":PRINT"THE
    U AND D KEYS.  MOVE THE"
230 PRINT"PICTURE UNTIL THE BOTT
   OM OF THE":PRINT"PICTURE IS J
   UST ON THE SCREEN":PRINT"THEN
    PRESS THE 'E' KEY TO MARK":P
   RINT"THE NUMBER OF LINES. PRE
   SS Q TO"
240 PRINT"RETURN TO THE PROGRAM.
    THIS WILL ALLOW PICTURES UP
   TO 8 GRAPHICS PAGES TO BE PRI
   NTED."
250 PRINT:INPUT"PRESS ENTER TO C
   ONTINUE";C
260 X=1 'X IS THE STARTING GRAPH
   ICS PAGE.  WE CAN SCROLL PAGE
   S BY VARYING X TO MARK THE EN
   D OF THE PICTURE WHICH CAN BE
    UP TO 8 GRAPHICS PAGES
270 PMODE 4,X:SCREEN 1,1
280 X$=INKEY$:IF X$="" THEN 280
290 IF X$="U" THEN X=X+1 'SCROLL
    UP A PAGE
300 IF X$="D" THEN X=X-1 'SCROLL
    DOWN A PAGE
310 IF X$="E" THEN GOSUB 350 'MA
   RK THE NUMBER OF LINES
320 IF X$="Q" THEN 30 'RETURN TO
    MAIN MENU
330 IF X<1 THEN X=1 ELSE IF X>5
   THEN X=5
340 GOTO 270
350 CLS:EL=6144+1536*(X-1):EL=EL
   /32:PRINT"THERE ARE "EL" LINE
   S":INPUT"PRESS ENTER TO CONTI
   NUE THEN    PRESS Q FOR MENU"
   ;P
360 MS=INT(EL/256):LS=EL-256*MS:
   POKE497,MS:POKE498,LS:RETURN
370 FOR I=0 TO 32
380 READ V$
390 POKE X+I,VAL("&H"+V$):NEXT I

400 DATA C6,08,86,80,79,01,F4,24
   ,02,8B,03,79,01,F5,24,02,8B,1
   8,BD,A2,BF,BD,A2,BF,86,80,BD,
   A2,BF,5A,26,E2,39
410 RETURN
480 PRINT"THIS PRINTS DOT PATTER
   NS"
482 PRINT#-2,CHR$(27);CHR$(20):'
   SELECTS CONDENSED MODE
485 'PRINT#-2,CHR$(27);CHR$(31)
   'START BOLD PRINTING
490 PRINT#-2,CHR$(27);CHR$(21):'
   SETS CARRIAGE RETURN TO NO LI
   NE FEED
492 PRINT#-2,CHR$(18):'TURNS ON
   GRAPHICS MODE
500 BE=3584:L1=256*PEEK(497)+PEE
   K(498)-1
510 INPUT"ENTER 1 FOR REVERSED P
   RINT";RP
520 PMODE 4,1:SCREEN 1,1
530 FOR J=0TO L1 STEP 2
540 'J REPRESENTS THE LINE NUMBE
   R
560 FOR K=0 TO 31
570 'K IS THE BYTE NUMBER ON A L
   INE
580 M=BE+J*32+K
590 'M IS THE MEMORY FOR THE PIC
   TURE ELEMENT
600 B(1)=PEEK(M):B(2)=PEEK(M+32)
610 POKE 500,B(1):POKE501,B(2)
620 IF RP=1 THEN EXEC 31000 ELSE
    EXEC 31033
630 NEXT K:PRINT#-2,CHR$(13)
640 'PRINT CARRIAGE RETURN
642 PRINT#-2,CHR$(27);CHR$(90);C
   HR$(6):'PRINT LINE FEED OF 6/
   72 INCHES (SIX GRAPHIC DOTS)
650 NEXT J
660 GOTO 22
```


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COCO III

Part 5

by
John Galus

In this part, we will examine how the COCO III places information on its Hi-resolution graphic screens. First, let's review how the computer controls the graphic memory. If you recall from an earlier part of this series we examined the memory management in the COCO III and discovered that memory was divided into 8K pages which are controlled by two sets of eight registers that contained the page that the computer was using at any time. These two eight register sets controlled 64K of RAM each, thus making the computer in essence a 128K computer. The computer usually uses one half of this 128K for the system, which contains things like Basic and application programs.

The other "secondary" 64K is often used for the hi-res graphic screens among other things. When placing data in this second 64K, the computer has to "switch it in" to perform the desired function that places the information on the screen and then return to the primary 64K that is used by Basic. All the commands, such as HGET, HPUT, HLINE, etc. perform this switching to place information on the screen. This is why, even though a hi-res screen may take up to 30K of memory, it doesn't get into the way of your Basic program. The only thing that is necessary is that certain pages of memory are mapped into each set of registers so that when the switching takes place the computer doesn't get lost and crash. This is similar to the old "bank switching" technique used in the older Color Computers.

During "normal" Basic operation, the "Primary" MMU register set, located from $FFA0 to $FFA7, is in control of the computer's memory operations. When a Basic command that uses the Hi-resolution screen is needed, it will "switch" the Secondary 64K of memory into the Primary set, perform it's function, and then switch back. We have commands in Basic that can place or get information from a graphic screen. These commands are the LPOKE and LPEEK commands. These commands are similar to the POKE and PEEK instructions except that you must supply them with a "virtual" address.

The graphic screen normally starts at $60000 and extends to $67FFF. Try LPOKEing theses areas with different values and see what you come up with. Be sure to place the computer into an HSCREEN mode so you can see your results. Let's look at how this LPOKE was accomplished. First the routine in Super Extended ROM converts the virtual value into a number that it can handle between 0 and $FFFF. Since the 6809 has only 16 address lines, the comma seperating the address and number is a check for the correct syntax of the instruction. Then the value that is to be poked into memory is converted and placed in the "A" register.

Now comes the "bank" switching. First the interrupts are turned off to prevent one from occuring during the switch. Then a routine located at $E0A1

switchs the "secondary" memory into the primary memory area and the value held in the "A" register is placed on the screen. After this the primary RAM is switched back in. Then the interrupts are turned back on and the routine returns to Basic. All of this takes place without anything appearing to happened.

Here is a Assembly language version of a LPOKE like routine. I use ROM routines were possible to save space and work.

```
     ORG $A880    ;PLACE ORIGIN
                   IN ROM AREA
POKE LDX #$3119   ;POSITION
     LDA #255     ;A BYTE
     PSHS A,X     ;SAVE THEM ON
                   STACK
     ORCC #$50    ;TURN OFF
                   INTERRUPTS
     JSR  $E0A1   ;SWITCH IN
                   SECOND 64K
     PULS A,X     ;GET DATA BACK
     STA  ,X      ;PUT IT ON
                   SCREEN
     JSR $E097    ;BACK TO
                   PRIMARY MEMORY
     ANDCC #$AF   ;INTERRUPTS
                   BACK ON
     RTS          ;RETURN
```

Notice that I place the origin of the routine in a ROM area used by the SET routine. This is important because when we switched to the other 64K the code would no longer be there and the system would crash! As you can see it takes quite a bit of work just to get some data onto a screen.

Now I'll show you how to access the HSET ROM routine so that you can use it without too much work. The HSET command is located at $E761. This is where Basic enters the routine. We find that at $E785 we can enter the routine and use it if the correct parameters for this routine are setup. The HSET, fortunately, uses the same zero page memory area to hold its X/Y coordinates and the SET/ RESET byte. The color desired is placed in $FE0A which holds the current Foreground color.

```
X - COORDINATE     $BE
Y - COORDINATE     $C0

HSET/HREST         $C2
 1    0

COLOR:            $FE0A
```

Here is an example of a HSET(10,10,3) command in Assembly language.

```
STAR LDB #2   ;HSCREEN2
     JSR $E6A5 ;INTO HSCREEN
                ROM ROUTINE
HSET LDA #1   ;HSET ON
     STA $C2
     LDA #10  ;POSITION
     STA $BE  ;X POS
     STA $C0  ;Y POS
     LDA #3   ;COLOR 3
     STA $FE0A ;INTO FORE
                GROUND COLOR
     JSR $E785  ;DO HSET ROM
                 ROUTINE
LOOP JSR $A1C1  ;INKEY ROM
                 ROUTINE
     BEQ LOOP   ;NO KEYPRESS
                 LOOP
     JSR $E690  ;HSCREENO
     SWI        ; BACK TO
                  MONITOR
     END
```

Notice how I use the HSCREEN2 and HSCREENO ROM routines to get us in and out of the hi-resolution mode. If we didn't the program would probably crash the Editor Assembler. There are other rountines that you can access from ROM on the COCO III. See the table of ROM routines that I gave in part one of this series. If you missed it back issues are available. Semd for information or look through magazines to find more information about this. Next time we will look at how the HPRINT routine operates and examine the new "scrolling" features. See you later!

NEW SERIES

ASSEMBLY LANGUAGE

by
Bill Chapple

Perhaps the term "ASSEMBLY LANGUAGE" is a mystery to you. Many computer terms are vague to a new computerist. An assembler is a device that writes machine codes generating machine language programs or subroutines. You may wonder why anyone would want to use machine language when Basic, and Basic 09 are available.

First of all let's compare these. Basic is an easy language with which we can program the computer. However it is relatively slow for some tasks but is easy to learn and use. Basic 09 requires the OS9 operating system but is faster than Color Basic. Machine language is the fastest mode of operation for the computer. This is why we are interested in learning to write machine language codes.

All color computers use Motorola's 6809 microprocessor. The color computer 3 uses a higher speed version of the 6809. However the internal structure is the same.

An assembler allows us to write machine language programs and include comments similar to what we do in basic. Some assemblers have routines for debugging the program. A very powerful combination is to write programs in basic and use machine language subroutines when speed is required. I use this technique quite often. Machine language codes can be placed into memory by using the basic "PEEK" command. You may have noticed data being read and poked into memory in basic programs. This is one method used to load machine language subroutines. To acces a machine language subroutine from basic the USR or EXECUTE commands can be used. This month we want to look at the structure of the microprocessor and save assembling until later.

6809 STRUCTURE

A microprocessor has internal registers that hold values. A register can operate on another register or external memory. As an example, the A and B registers are generally used for calculations. These are 8 bit registers and can hold a value up to 256. We will be using binary and hexadecimal arithmetic. Hexadecimal consists of 4 binary bits and has a decimal value from 0 to 15. It uses the numbers from 0 to 9 and the letters from A to F to indicate values from 10 to 15 respectively. Other 8 bit registers are the direct page register and the conditional code register. Each of these registers contains useful information which I will explain later. There are five 16 bit registers. These are generally used as pointers and are labeled PC,X,Y,U, and S. PC stands for Program Counter. The PC points to the memory that contains the next instruction. X and Y are index registers. We can use them as a reference for doing an operation. As an example for moving a block of data, the X register can point to the next data byte to get and the Y can point to the memory location to which the byte is going. U and S are called stack registers. A stack is a portion of RAM reserved for the microprocessor. The following is a summary of the microprocessor's registers.

X-Index Register
Y-Index Register
U-User Stack Pointer
S-Hardware Stack Pointer
PC-Program counter
A-Accumulator Register
B-Accumulator Register
DP-Direct Page Register
CC-Conditional Code Register

The 6809E microprocessor was developed by Motorola. The instructions are confusing if you are not familar with microprocessor terminology. I want to explain what the terms mean so that you can read the data sheet and have a good idea of what it says. The registers contain the important information that the microprocessor uses. The microprocessor either uses the information in the registers or goes to a location designated by a register. The next machine code to which the PC is pointing determines what is to happen next.

It is not hard to write simple routines with a 6809E microprocessor. However it is necessary to understand how the microprocessor operates and the tools we have available. One thing that will be required is the use of hexadecimal numbers. These are numbers with a base of 16. The advantage of using hexadecimal or hex is that binary is a subset of hex. At times we will need to determine the bit value of a byte. A byte contains 8 bits and all values can be expressed by two hex characters ranging from 00 to FF. This represents decimal values from 0 to 255. The HEX$ and &H basic operators convert basic and hex numbers as follows:

```
(1)     A$=HEX$(A)
```

A is the decimal value and A$ is the hex equivalent.

To convert from hex to decimal use the following extended basic command:

```
(2)          A=&HFF09
```

A will be the decimal equivalent of $FF09.

Notice that the $ sign is used to indicate a hex number.

If you are interested in learning assembly language then you will need an assembler. I have our DISASM and Radio Shack's EDTASM programs. Next month I will continue and take a few commands with examples.

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BASIC PROGRAMMING

DISK I/O Part 2

Basic is a very powerful programming language. Color computers use a version of Microsoft basic that is friendly compared to other versions. For example we can write any of the following to go to line 10.

(1) GOTO10
(2) GO TO10
(3) GO TO 10
(4) GOTO 10

This makes it very easy to write programs. If we use (3) then the program is easy to read. If we use (1) we use the least amount of memory. If you are programming a model 100 or a computer using GW Basic then you will need to use (4).

The concepts we are presenting in this column are applicable to all computers that use Microsoft Basic. The methods of handling data are similar with different computer languages. The FOR-NEXT loop is similar to the DO loop in FORTRAN. Therefore basic is a good language to master as a first step towards learning to program computers.

DISK COMMANDS

We have been looking at disk commands and last month gave a program for using the DSKI and DSKO commands. These commands allow us to directly access the information on the tracts. The program from last month allowed us to read the information on a track into memory. We could then modify the data in memory and write it back to a track.

There are many uses for this. Suppose it is desired to make a master disk that contains the directories of many disks. This would make it easy to find the disk with a desired program. The program directory starts at track 17, sector 3. Each program occupies 32 bytes. These are allocated as follows:

Bytes	Purpose
0-7	File name
8-10	Extension
11	File Type
	0= Basic Program
	1= Basic Data File
	2= Machine Lang. Prog.
	3= Text Editor file
12	ASCII Flag
	0= Binary format
	256 ($FF)= ASCII
13	Number of first granule in the file (0-67).
14-15	Number of bytes in last sector

File Name

Let's look at the first 8 bytes that represent the file name. The first byte gives information in addition to just representing the first character of the name. If the value is a 0 then the file has been deleted. If it as a 255 or hex FF then the entry and all following entries have not been used.

Let's look at a technique for just removing the name from the string created by using DSKI$. Remember from last month two strings are required to remove the data from a track and sector. Suppose one of these is A$ and contains 128 bytes. Then we can write the following:

```
500 FOR J=1 TO 128 STEP 32
```

```
510 N$=MID$(A$,J,8)
520 PRINT N$
530 NEXT J
```

The preceeding program segment will remove the 8 bytes from the string as J goes from 1 to 128 in 32 step increments. The variable N$ is the name of a file. This can be stored in memory or written to another file on a different disk or a ramdisk. Although each file is 32 characters long, we remove the first 8 characters with this procedure.

The Extension

The extension is used by programs to look for certain kinds of files. Text files usually have extensions like TXT, DOC, or DAT. Picture files have extensions such as PIC, MAX, or BIN. The extension can be used for storing additional information about the title. For example suppose you want to keep monthly records on your check book. Then the extension could contain 3 characters representing the month of the year. Consider the following examples:

```
CHECKS/JAN
CHECKS/FEB
CHECKS/MAR
```

If these are basic program files then to load one enter:

```
LOAD "CHECKS/FEB"
```

To save a basic program with an extension just enter the name and extension.

```
SAVE "CHECKS/APR"
```

File Type

Byte 11 tells the file type and byte 13 tells if it is ASCII or binary. These two bytes can be changed to allow ASCII data to be saved as a machine language program and then be converted to an ASCI disk file. Lets suppose that we have ASCII data in memory starting at 15000 and ending at 21377. We can do a machine language save with the following:

```
SAVEM "FILE", 15000,21377,15000
```

We can convert the file to an ASCII format by changing bit 11 to a 3 for a text file and bit 12 to a 255 for an ASCII FORMAT. Since the data was ASCII it does not have to be changed. The file can be loaded into memory with a word processor or read with the OPEN and INPUT # commands.

First Granule

Bit 13 tells us where the first granule starts. Part of the program we had last month converted a granule to a track and sector. This allows us to go to the start of the program directly on disk.

File Allocation Table

This table is located on track 17 sector 2. The first 68 bytes correspond to the 68 granules on the disk. These bytes contain values of 255, 0-67, or 192-201. These have the following interpretations:

255- The granule is free.

0-67 - The granule is part of a disk file and the value points to the next granule in the file.

192-201 The individual bits have to be removed and bits 0-5 tell how many sectors in the granule are part of the disk file.

ML DATA PROGRAM
by
Bill Bernico

Have you ever wished that you

could determine how long a machine language program is or where it begins and ends without loading it? Bill Bernico has provided us with a program that uses the principles covered to display the addresses of a machine language program stored on disk. After loading this program you could list it and go through the various parts. See if you can figure out how Bill determines the addresses.

```
1 'ML ADDRESS FINDER
      (C) 1988 FROM
         BILL BERNICO SOFTWARE
2 'LOAD THIS PROGRAM, THEN PUT
     DISK CONTAINING ML PROGRAM
   S     IN DRIVE AND TYPE 'RUN'
     TO     GET ADDRESSES OF ML
   FILES.
3 CLEAR 1500:DIM GR(68):CLS
4 PRINT"  OUTPUT TO sCREEN OR pR
   INTER?
5 IX$=INKEY$:IF IX$=""THEN5
6 IF IX$="S"THEN DZ=0:GOTO9
7 IF IX$="P"THEN DZ=-2:GOTO11
8 GOTO 5
9 CLS:PRINT"MACHINE LANGUAGE ADD
   RESS FINDER":FORX=1024TO1055:
   POKEX,PEEK(X)-64:NEXT:PRINT
10 PRINT@32,STRING$(32,191);:PRI
   NT@64,"filename/ext   start
   end  exec":PRINT@96,STRING$(3
   2,45);
11 DSKI$ 0,17,2,A$,B$:FB$=LEFT$(
   A$,68)
12 FOR I=1 TO 68:GR(I-1)=ASC(MID
   $(FB$,I,1)):NEXT I
13 FOR X=3 TO 11
14 DSKI$ 0,17,X,AA$,BB$
15 AA$=AA$+LEFT$(BB$,120)
16 FOR N=0 TO 7
17 NA$=MID$(AA$,N*32+1,8):EX$=MI
   D$(AA$,N*32+9,3):GR=ASC(MID$(
   AA$,N*32+14,1))
18 FG=GR
19 FT$=MID$(AA$,N*32+12,1):AF$=M
   ID$(AA$,N*32+13,1)
20 IF LEFT$(NA$,1)=CHR$(0) THEN
   28
21 IF LEFT$(NA$,1)=CHR$(255) THE
   N 29
22 AF=ASC(AF$)AND 1
23 FOR I=1 TO 68
24 IF GR(GR)<128 THEN GR=GR(GR):
   NEXT I
25 IF ASC(FT$)=2 THEN 34
26 IF ASC(FT$)=2 THEN PRINT#DZ,N
   A$+"/"+EX$;"  ";
27 IF ASC(FT$)=2 THEN PRINT#DZ,;
   :PRINT#DZ, USING "#####";BP;:
   PRINT#DZ,",";:PRINT#DZ,USING"
   #####";EP;:PRINT#DZ,",";:PRIN
   T#DZ,USING"#####";EA
28 NEXT N,X
29 PRINT:PRINT"another"+CHR$(128
   )+"run? (Y/N)"
30 IQ$=INKEY$:IFIQ$=""THEN30
31 IF IQ$="Y"THEN RUN
32 IF IQ$="N"THEN CLS:END
33 GOTO 30
34 LG=GR(GR):LS=LG AND 31:LL=GR
35 LB=ASC(MID$(AA$,N*32+16,1))
36 IF FG<34 THEN TN=INT(FG/2) EL
   SE TN=INT(FG/2)+1
37 SN=1+(FG AND 1)*9
38 DSKI$0,TN,SN,A$,B$
39 BP=ASC(MID$(A$,4,1))*256+ASC(
   MID$(A$,5,1))
40 BP$=HEX$(BP):BP$=STRING$(4-LE
   N(BP$),"0")+BP$
41 EP=BP+ASC(MID$(A$,2,1))*256+A
   SC(MID$(A$,3,1))-1
42 EP$=HEX$(EP):EP$=STRING$(4-LE
   N(EP$),"0")+EP$
43 IF LL<34 THEN TN=INT(LL/2) EL
   SE TN=INT(LL/2)+1
44 SN=(LL AND 1)*9+LS
45 DSKI$0,TN,SN,A$,B$:A$=A$+LEFT
   $(B$,127)
46 EA=ASC(MID$(A$,LB-1,1))*256+A
   SC(MID$(A$,LB,1))
47 EA$=HEX$(EA):EA$=STRING$(4-LE
   N(EA$),"0")+EA$
48 GOTO 26
```

OPERATING HINT

Checking Tape Programs-- You can check the programs on a cassette tape by using the SKIPF command. Load the tape and rewind it. Then type SKIPF"X where X is a file name that is not on the tape. The name of each file will be displayed on the screen as they are found on the tape. If there is an error message the computer will give an error messsage and stop the recorder. All files or programs before the recorder stopped are good. If the recorder goes to the end of the tape without indicating an error then all of the files are good. Press the rear reset button to reset the computer.

PUBLIC DOMAIN SOFTWARE

* 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
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 COMP. 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,
RUN"PIXFILES"JOY-
STICK 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 UT.

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
SUBCMASE	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
JBGOOD	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
TOCATTA	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

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* 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
INVSTANL	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

PD-31

PIRATES TREASURE.As you explore the cave looking for the treasure, a picture appears on the screen as you go from room to room. These pictures are loaded from disk. A computer with disk drive is required.

PD-32

Color Computer 3 moving pictures. Consists of a beautiful waterfall and a colorful bouncing ball.

WATRFALL	BAS	0	B	1
WATRFALL	BIN	2	B	1
WATRFALL	MGE	1	B	
BALL	BAS	0	B	1
BALL2	BAS	0	B	1
BOUNCE	BIN	2	B	1
BALL2	HR1	2	B	4
BALL2	HR2	2	B	4
BALL2	HR3	2	B	4
BALL2	HR4	2	B	4

---

* PD-33

EDUCTIONAL PROGRAMS

ABBREV	BAS	0	B	4
ABCPOP	BAS	0	B	3
ALPHAAL	BAS	0	B	1
EDUCATE	BAS	0	B	1
HANGP	BAS	0	B	1
HOMONYM	BAS	0	B	1
SPELWORD	BAS	0	B	1
MATH	BAS	0	B	2
DRILL	BAS	0	B	2
MLTP	BAS	0	B	1
ROUND	BAS	0	B	2
AREA	BAS	0	B	5
METCONV	BAS	0	B	3
NUMBERS	BAS	0	B	2
SIEVE	BAS	0	B	1

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* PD 35

ADDRESS FILES AND
FINANCE PROGRAMS

PHONE	BAS	0	B	1
LABELPRT	BAS	0	B	1
LETTER	BAS	0	B	3
MAILLST	BAS	0	B	2
PHONLST	BAS	0	B	1
MINIWORD	BAS	0	B	2
LNWIDTH	BAS	0	B	1
CHKWRITE	BAS	0	B	2
CHKANAL	BAS	0	B	4
PRNTCHK	BAS	0	A	1
CHECKS	BAS	0	B	4
CHCKSTUB	BAS	0	B	1
TOTALS	DAT	1	A	1
CHECKS	DAT	1	A	1
GRAPH	BAS	0	B	4
LOAN	BAS	0	B	3
CALC	BAS	0	B	1
PAYMENT	BAS	0	B	1
CASHJNL	BAS	0	B	3
AMORT	BAS	0	B	3

---

* PD 36

COMP.SCIENCE PGMS 1
These programs are tutorials on basic programming.

COMPSC1	BAS	0	B	8
COMPSC2	BAS	0	B	3
COMPSC3	BAS	0	B	9
COMPSC4	BAS	0	B	5
COMPSC5	BAS	0	B	9
COMPSC6	BAS	0	B	5
GETPUT	BAS	0	B	2

---

* PD 37

COMP.SCIENCE PGMS 2

These programs are tutorials on basic programming.

IFTHEN	BAS	0	B	9
EXTENDED	BAS	0	B	2
GETPUT	BAS	0	B	2
COMPSCI8	BAS	0	B	8
COMPSCI9	BAS	0	B	5
COMPSCI7	BAS	0	B	7
EXTDEMO	BAS	0	B	3

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* PD 38

EDUCATIONAL PGMS
These programs are excellent learning tools for school children.

ABBREV	BAS	0	B	4
ABCPOP	BAS	0	B	3
ALPHAAL	BAS	0	B	1
EDUCATE	BAS	0	B	1
HANGP	BAS	0	B	1
HOMONYM	BAS	0	B	1
SPELWORD	BAS	0	B	2
MATH	BAS	0	B	2
DRILL	BAS	0	B	2
MLTP	BAS	0	B	1
ROUND	BAS	0	B	2
AREA	BAS	0	B	5
METCONV	BAS	0	B	3
NUMBERS	BAS	0	B	2

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* PD 39

ADDRESS FILES AND
FINANCE PROGRAMS

PHONE	BAS	0	B	1
LABELPRT	BAS	0	B	1
LETTER	BAS	0	B	3
MAILIST	BAS	0	B	1
WORDPROC	BAS	0	B	3
MAILLST	BAS	0	B	2
PHONLST	BAS	0	B	1
MINIWORD	BAS	0	B	2
LNWIDTM	BAS	0	B	1
CHKWRITE	BAS	0	B	2
CHKANAL	BAS	0	B	4
PRNTCHK	BAS	0	A	1
CHECKS	BAS	0	B	4
CHCKSTUB	BAS	0	B	1
TOTALS	DAT	1	A	1
CHECKS	DAT	1	A	1
GRAPH	BAS	0	B	4
LOAN	BAS	0	B	3
CALC	BAS	0	B	1
PAYMENT	BAS	0	B	1
CASHJNL	BAS	0	B	3
AMORT	BAS	0	B	3

PD-40

TAPE-DSK & DSK-TAPE
With these programs you can copy a disk to tape or a tape to disk.

T2D	BIN	2	B	2
DTCOPY	BIN	2	B	1
DSK-TP	BAS	0	B	1
DISKLIST	BAS	0	B	1
DIRLIST	BAS	0	B	2
DISKDUMP	BAS	0	B	1
CASSDIR	BAS	0	B	1

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* PD-41
Picture files

STAMPS	MAX	2	B	3
STARTREK	MAX	2	B	3
SJ-TREK2	MAX	2	B	3
SCHOOL	MAX	2	B	3
SATURN	MAX	2	B	3
ESCHER	MAX	2	B	3
LABOR	MAX	2	B	3
MASK	MAX	2	B	3
BUG BOX	MAX	2	B	3
SPACE	MAX	2	B	3
EASTER	MAX	2	B	3
SPACE 2	MAX	2	B	3
POPEYE	MAX	2	B	3
GARFIELS	MAX	2	B	3
BEETLE B	MAX	2	B	3
POLO	MAX	2	B	3
HAGAR	MAX	2	B	3
X-PAD	MAX	2	B	3
CASTLE	MAX	2	B	3
MUSIC TV	MAX	2	B	3
COCO	MAX	2	B	3

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* PD-42
Picture files

TITLES	MAX	2	B	3
PIXFILES	BAS	0	B	3
THOLIAN	MAX	2	B	3
3001AD	MAX	2	B	3
F15	MAX	2	B	3
QUEEN	MAX	2	B	3
BRONCOS	MAX	2	B	3
STARTREK	MAX	2	B	3
ROOM	MAX	2	B	3
RAMBO	MAX	2	B	3
OWL	MAX	2	B	3
ENTERPR	MAX	2	B	3
STAR-T3	MAX	2	B	3
NCC-1701	MAX	2	B	3
SAT-2	MAX	2	B	3
ATMOSP	MAX	2	B	3
STARWARS	MAX	2	B	3
ORIENTAL	MAX	2	B	3

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* PD-43
Picture files

STAMP	MAX	2	B	3
STRIPE	MAX	2	B	3
WOMAN	MAX	2	B	3
BLUEJAY	MAX	2	B	3
LUCY	MAX	2	B	3
OLD ENG	MAX	2	B	3
MENU1	MAX	2	B	3
OWL	MAX	2	B	3
VAN GOG	MAX	2	B	3
WOMAN1	MAX	2	B	3
PSH	MAX	2	B	3
DUCKPOND	MAX	2	B	3
RANGER	MAX	2	B	3
PLANET	MAX	2	B	3
CHRSTMAS	MAX	2	B	3
PEACE	MAX	2	B	3
WOMAN3	MAX	2	B	3
HAWK	MAX	2	B	3
PHASER	MAX	2	B	3
PIXFILES	BAS	0	B	3

PD-44
Terminal pgm with documentation. This will work with the CoCo-3. Instructions are included.

MTRM43	BIN	2	B	8
CONFIG43	BAS	0	B	4
MTSTART	BAS	0	B	4
MTERM1	DOC	1	A	11
MTERM2	DOC	1	A	8
MTERM3	DOC	1	A	7
DOS BOOT	DAT	1	A	1
*	*	0	B	1
**	*	1	A	1
READDOC	BAS	0	B	1

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* PD-45
Picture Files

DRAGON	MAX	2	B	3
HOT LIPS	MAX	2	B	3
ANIMALS	MAX	2	B	3
CLOWN F	MAX	2	B	3
FISH	MAX	2	B	3
3 MEN	MAX	2	B	3
S MAP	MAX	2	B	3
BUGS	MAX	2	B	3
CFISH	MAX	2	B	3
HERO	MAX	2	B	3
WMAP	MAX	2	B	3
GSCOTT	MAX	2	B	3
STATES	MAX	2	B	3
HORSE	MAX	2	B	3
CROSS	MAX	2	B	3
FOODW	MAX	2	B	3
RSTONE	MAX	2	B	3
COCO	MAX	2	B	3
ALIEN	MAX	2	B	3
PIXFILES	BAS	0	B	3

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* PD-46
Talk and Music Files (C)LOADM "FILE" then EXEC.

TALK	BIN	2	B	11
TALK2	BIN	2	B	11
WILLTELL	BIN	2	B	9
MUSICBOX	BIN	2	B	1
BEATLES	BIN	2	B	4
JUMP	BIN	2	B	5
GRELN	BIN	2	B	5
GHOST	BIN	2	B	4
JINGLE	BIN	2	B	3
WORLD	BIN	2	B	5
CTRYROAD	BIN	2	B	2

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* PD-47

Miscellaneous Pgms

T	BAS	0	B	2
SANTEE2	BAS	0	B	1
MILEAGE	BAS	0	B	1
M	BAS	0	B	1
DIGITS	BAS	0	B	1
NUMBLIST	BAS	0	B	1
COUNT	BAS	0	B	1
SC	BAS	0	B	1
DRAWTEXT	BAS	0	B	1
SAMPLE	BAS	0	B	1
GRSCRWRT	BAS	0	B	2
HRTEXT2	BAS	0	B	3
DRAW	BAS	0	B	2
WRITER	BAS	0	B	1
TYPEBET	BAS	0	B	2
WRITEBET	BAS	0	B	2
TEXT2	BAS	0	B	2
SANTEE	BAS	0	B	2
SHUTTLE	BAS	0	B	1
AJOCK	BAS	0	B	1
PLATFORM	BAS	0	B	1
MAZE	BAS	0	B	4
DISKZAPR	BAS	0	B	2
ZAP	BAS	0	B	3
DETHSHIP	BAS	0	B	3
BACKUP35	BAS	0	B	1
BOOT	BAS	0	B	1
SCRNLIST	BAS	0	B	1
DOSSTART	BAS	0	B	1
LABEL	BAS	0	B	2
DSKDSABL	BAS	0	B	1
NOFREEG	BAS	0	B	1
FORMATER	BAS	0	B	1
ROMRAM	BIN	2	B	1
SUPDUP	BIN	2	B	1
TESTTEXT	BAS	0	B	1

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* PD-48

Miscellaneous Pgms

EXTBAS	BAS	0	B	3
DISAPEAR	BAS	0	B	1
PAINT	BAS	0	B	1
DATA	BIN	2	B	1
DATA2	BIN	2	B	1
SCRDATA	BIN	2	B	1
FILL2	BIN	2	B	2
QUADDRAW	BAS	0	B	1
CELTIC	BAS	0	B	2
ALL RAM	BAS	0	B	1
CHARGEN	BIN	2	B	1
ROMRAM	BIN	2	B	1
OBSTACLE	BAS	0	B	1
64K RAM	BAS	0	B	1
COLORSEL	BAS	0	B	1
TRIG	BAS	0	B	4
ALGEBRA	BAS	0	B	4
PLAY	BAS	0	B	1
STATECAP	BAS	0	B	2
MLSOUNDS	BAS	0	B	1
ROTATION	BAS	0	B	2
PARABOLA	BAS	0	B	2
INSTAPIC	BAS	0	B	1
CLOVER	BAS	0	B	1
HAT-PLOT	BAS	0	B	1
WHEEL 1	BAS	0	B	1
LETTER-R	PAR	1	A	1
3-LINES	ROT	1	A	1
TRAPZOID	ROT	1	A	2
PYRAMID	ROT	1	A	2
CUBE	ROT	1	A	3
51X24	BAS	0	B	2
WINDOW	BAS	0	B	5
GGPRTSU	BAS	0	B	1
KALEIDO	BAS	0	B	1
OK83APRT	BAS	0	B	1
NUMCNVTR	BAS	0	B	1
ADVRTN	BAS	0	B	1

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* PD-49

Miscellaneous Pgms.

BC	BIN	2	B	10
PEDRO	BIN	2	B	11
BLOCKADE	BAS	0	B	3
REPEAT	BAS	0	B	1
AIRPLANE	BAS	0	B	1
BUSTOUT	BAS	0	B	1
GOLF	BAS	0	B	7
CITY	BAS	0	B	2
AIR-RAID	BAS	0	B	2
MAZE	BAS	0	B	4
DUALDUP	BIN	2	B	2
DIRMAP	BAS	0	B	3
CHESS	BAS	0	B	5
WHATZIT	BAS	0	B	4
BATLSHIP	BAS	0	B	3
SP*ROCKS	BAS	0	B	1

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* PD-50
Miscellaneous PGMS

GOBBLER	BAS	0	B	2
PYTHON	BAS	0	B	2
LUNAR	BAS	0	B	2
LUNALANA	BAS	0	B	1
AMAZING	BAS	0	B	2
BALLOON	BAS	0	B	1
VAPORWRM	BAS	0	B	2
ABM	BAS	0	B	3
BULLSEYE	BAS	0	B	1
CRASH	BAS	0	B	1
DOTS	BAS	0	B	3
F-16	BAS	0	B	3
KRYPTON	ART	2	B	3
KRYPTON	BAS	0	B	1
KRYPTON	GAM	0	B	1
NUKEATTK	BAS	0	B	2
ASTEROID	BAS	0	B	1
PRIX	BAS	0	B	2
ONE	BIN	2	B	3
TWO	BIN	2	B	3
THREE	BIN	2	B	3
FOUR	BIN	2	B	3
TEMPEST	BAS	0	B	2
SNAKE	BAS	0	B	2
SCORE	DAT	1	A	1
OTHELLO	BAS	0	B	4
ROCKS	BAS	0	B	3
LANDER	BAS	0	B	2

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* PD-51
Games & Programs

DRAGRACE	BAS	0	B	1
WORMER	BAS	0	B	2
SIMON	BAS	0	B	2
RIDER	BAS	0	B	2
MISSILE	BAS	0	B	3
LETSHOOT	BAS	0	B	2
SHOOTGAL	BAS	0	B	2
MISSILE2	BAS	0	B	3
FENCE	BAS	0	B	3
BANDIT	BAS	0	B	1
CHICKEN	BAS	0	B	2
MAXIMUM	BAS	0	B	3
FLIGHT	BAS	0	B	2
COVERUP	BAS	0	B	2
WORLDMAP	BAS	0	B	4
POUNCE	BAS	0	B	1
MARTIANS	BAS	0	B	2
FINDIT	BAS	0	B	3
SCRAMBLE	BAS	0	B	5
BOUNBABY	BAS	0	B	2
CHICK	BAS	0	B	3
BOBO	BAS	0	B	3
RUBIC	BAS	0	B	4
MCJUMP	BAS	0	B	3

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* PD-52
Picture files

COCO	MAX	2	B	6
COL COCO	MAX	2	B	6
MOOSHEAD	MAX	2	B	6
COKE	MAX	2	B	6
CUBS	MAX	2	B	6
REDS	MAX	2	B	6
BREAKERS	MAX	2	B	6
USFL	MAX	2	B	6
SPACE	BIN	2	B	3
GIZMO	MAX	2	B	3
DINASOUR	MAX	2	B	3

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* PD 53
Picture Files

INDIAN	MAX	2	B	6
HOMECOME	MAX	2	B	6
GRIN	BIN	2	B	3
TARD	BIN	2	B	3
STUD	BIN	2	B	3
COMET	BIN	2	B	3
DESERT	BIN	2	B	3
FOOD	BIN	2	B	3
SMIRK	BIN	2	B	3
PLAYA	BIN	2	B	3
HELLO	BIN	2	B	3
GROVER	BIN	2	B	3
DRIVE IN	BIN	2	B	3
TIME	BIN	2	B	3
KOALA	BIN	2	B	3
PATTERN	BIN	2	B	3
HAGAR	BIN	2	B	3
CHIPS	BIN	2	B	3

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* PD 54
Picture Files

PENTAGON	PIC	2	B	3
GRID 2	PIC	2	B	3
SNOWFLAK	PIC	2	B	3
CONETUNL	PIC	2	B	3
4-POINT	PIC	2	B	3
BALTSTR	MAX	2	B	3
CARTOON	MAX	2	B	3
HUELEWIS	MAX	2	B	3
STARTREK	MAX	2	B	3
HOUSE1	MAX	2	B	6
HOUSE2	MAX	2	B	6
LIFECYCL	MAX	2	B	6
COCOMAG	MAX	2	B	3
MASCASTL	MAX	2	B	3
COLUMBIA	MAX	2	B	3
POLO	MAX	2	B	3
ET	BAS	0	B	7
WHEEL 1	PIC	2	B	3

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* PD-55
Picture Files

PARKERPT	MAX	2	B	3
TOWER	PIC	2	B	3
TOWER2	PIC	2	B	3
SCREEN	PIC	2	B	3
BOMB	PIC	2	B	3
ANDRON	PIC	2	B	3
SALE	PIC	2	B	3
CHIPS	PIC	2	B	3
TUNLROAD	BIN	2	B	3
LONEROAD	BIN	2	B	3
CITYROAD	BIN	2	B	3
LAKEROAD	BIN	2	B	3
CROSROAD	BIN	2	B	3
BLACK	BIN	2	B	3
CAL1	BIN	2	B	3
CAL2	BIN	2	B	3
CAL3	BIN	2	B	3
3-LEAF	PIC	2	B	3
5-STARS	PIC	2	B	3
SPHERE	PIC	2	B	3
15-LEAF	PIC	2	B	3

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* PD-56

Glossary, Memory Maps, Programs

COCO	VIP	1	A	4
VIP ON 3	VIP	1	A	1
BEEF	VIP	1	A	1
MCTRM3	VIP	1	A	1
GLOSSARY	VIP	1	A	7
POKEPEEK	VIP	1	A	17
WIDTH	VIP	1	A	1
COCO 3	VIP	1	A	17
MISSLES	BAS	0	B	2
CLOCK	BAS	0	B	1
JET	BAS	0	B	4

---

* PD-57
Picture Files

VAMPIRE	PIC	2	B	3
ATLANTA	BAS	0	B	3
NOGHOST	PIC	2	B	3
AIRPORT	BAS	0	B	4
S EASTON	BAS	0	B	4
1SMLSTEP	BAS	0	B	4
HAGAR	PIC	2	B	3
SUNSET	BAS	0	B	3
S NICKS	BAS	0	B	4
SNOOPY1	BAS	0	B	3
MICKEY	BIN	1	B	8
DONALD	BIN	2	B	8
SNOOPY2	BAS	0	B	4
SNOOPY3	BAS	0	B	4
SNOOPY4	BAS	0	B	4

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* PD-58
Miscellaneous Pgms

DISKLIST	BAS	0	B	1
DIRLIST	BAS	0	B	2
ML ADDR	BAS	0	B	1
DISKDUMP	BAS	0	B	1
PRINUTIL	BAS	0	B	2
CALPRINT	BAS	0	B	3
ALPHSONG	BAS	0	B	1
PAINT	BAS	0	B	1
DOGPICT	BAS	0	B	2
EVADER	BAS	0	B	1
NUKATTC	BAS	0	B	2
BASICMAP	BAS	0	B	3
JOYPAINT	BAS	0	B	1
PUMPKIN	BAS	0	B	1
HOMOYMS	BAS	0	B	1
ABBREV	BAS	0	B	4
CONVERT	BAS	0	B	3
CASSDIR	BAS	0	B	1
CVERT	BAS	0	B	1
FLASCARD	BAS	0	B	1
MESSAGE	BAS	0	B	1
RELOCAT	BAS	0	B	1
COUNT	BAS	0	B	1
CALENDAR	BAS	0	B	1
DOGS	BAS	0	B	1
DOGFIGHR	BAS	0	B	1
BEAST	BAS	0	B	1

---

* PD-59
GAMES, UTILITIES

64X64F	BAS	0	B	1
RND#'S	BAS	0	B	1
SCROLLER	BAS	0	B	1
COCOBUG	BAS	0	B	2
DRWBOARD	BAS	0	B	1
SPACE	BAS	0	B	1
DIR-ADDR	BAS	0	B	1
BACKGAMN	BIN	2	B	2
CHESS	BIN	2	B	3
BATTLE	BIN	2	B	2
GERM	BIN	2	B	1
BLEEP	BAS	0	B	2
TICKER	BAS	0	B	3
LEAKYTAP	BAS	0	B	3
UTOPIAN	BAS	0	B	4
COLORDOT	BAS	0	B	3
STAYALIV	BAS	0	B	2
TIMEFLT	BAS	0	B	3
NAVYGUNS	BAS	0	B	2
ATACMAN	BAS	0	B	3
CALENDAR	BAS	0	B	1
POKER25	BAS	0	B	1
VIEWER5	BAS	0	B	1
STUFF	BAS	0	B	1

---

* PD 60 Basic Pgms

S NICKS	BAS	0	B	4
1SMLSTEP	BAS	0	B	4
SUNSET	BAS	0	B	3
3DTTT	BAS	0	B	4
BATTSHIP	BAS	0	B	2
CRACE	BAS	0	B	2
FLY	BAS	0	B	3
KINGS	BAS	0	B	6
KINGTUT	BAS	0	B	7
OREGON	BAS	0	B	9
POKER	BAS	0	B	2
ROBOTS	BAS	0	B	3
ROLLON	BAS	0	B	2
SORCERER	BAS	0	B	6

* PD-61 Pictures

HAGAR	PIC	2	B	3
SHIPS	BAS	0	B	2
SIGNS	BAS	0	B	1
SPACE	BAS	0	B	8
3GUYS	MAX	2	B	3
AIRPORT	BIN	2	B	6
BIGCAT	MAX	2	B	3
CUBE	BIN	2	B	3
DOGPICT	BAS	0	B	2
EARTH	MAX	2	B	3
GARFIELD	PIX	2	B	3
GIRL	MAX	2	B	3
NEWWAVE	MAX	2	B	3
OLIVER	MAX	2	B	3
OWL	MAX	2	B	3
PEANUTS	PIX	2	B	3
SHUTTLE	MAX	2	B	3
SR-71	MAX	2	B	3
ZEBCHESS	MAX	2	B	3
ZIGGY	PIX	2	B	3

---

* PD- 62 Basic Pgms

ALARM	BAS	0	B	2
BIBLE	BAS	0	B	2
BINGOCD	BAS	0	B	1
CHECKS	BAS	0	B	3
CLOCK	BAS	0	B	1
DATA3	BAS	0	B	3
DATES	BAS	0	B	2
DECIDE	BAS	0	B	3
EXREF	BAS	0	B	3
FILES	BAS	0	B	4
FLIPPAGE	BAS	0	B	3
LABELPRT	BAS	0	B	1
MESSAGE	BAS	0	B	1
OFFSET	BAS	0	B	1
PHONE	BAS	0	B	1
PHONEDIR	BAS	0	B	2
PILOT	BAS	0	B	2
PROJEVAL	BAS	0	B	4
SPELWORD	BAS	0	B	1
VALENCE	BAS	0	B	2

---

* PD-63 Basic Pgms

ANIMALS	BAS	0	B	3
BALOONS	BAS	0	B	3
BATSHIP	BAS	0	B	4
BUGS	BAS	0	B	6
CONNECT4	BAS	0	B	4
DIGGEM	BAS	0	B	3
FACTORS	BAS	0	B	4
GEOGAME	BAS	0	B	4
KINGDOM	BAS	0	B	6
MAZE3	BAS	0	B	3
MISSILES	BAS	0	B	2
POKER	BAS	0	B	4
SLOTS	BAS	0	B	2
TROLL	BAS	0	B	6

---

* PD-64 Basic Pgms

OHMSLAW	BAS	0	B	1
POWER UP	BAS	0	B	1
ROMPACK	BAS	0	B	1
ROMRAM	BAS	0	B	1
SCRDUMP	BAS	0	B	1
SLOSKROL	BAS	0	B	1
SORT	BAS	0	B	1
SPEDMATH	BAS	0	B	3
SPOOLER	BIN	2	B	1
UPPER32K	BAS	0	B	1
STRIKE	BAS	0	B	1
SHIPS	BAS	0	B	2
WILLSADV	BAS	0	B	5
RACEWAY	BAS	0	B	4
TREK	BAS	0	B	4
TXTCNVRT	BAS	0	B	1

---

* PD-65 Music

MUSIC	BIN	2	B	7
MUSIC1	BAS	0	B	1
SOUND	ASM	1	A	1
SOUNDDEM	BAS	0	B	1
SOUNDS	BAS	0	B	3
SOUNDS2	BAS	0	B	1
SWAN	BIN	2	B	1
SYNMUSIC	BIN	2	B	4
DEEPPURP	BIN	2	B	5
ALFEX	BIN	2	B	2
BACH	BIN	2	B	4
BUMBLE	BIN	2	B	3
CANON	BIN	2	B	3
DIAMOND	BIN	2	B	3
ENTAIN	BIN	2	B	1
FUNERAL	BIN	2	B	3
GRENGRSS	BIN	2	B	4
HILLST	BIN	2	B	4

---

* PD-66 Basic Pgms

64KMEMT	BAS	0	B	2
AUTODIAL	BAS	0	B	2
FINDAWRD	BAS	0	B	2
FLASHCRD	BAS	0	B	2
PHONEWRD	BAS	0	B	1
64KTEST	BAS	0	B	1
ABBREV	BAS	0	B	4
BASECONV	BAS	0	B	1
BIORYTHM	BAS	0	B	3
BOWLSUM	BAS	0	B	2
BOXLABEL	BAS	0	B	1
CALENDAR	BAS	0	B	2
CALENDR2	BAS	0	B	1
CAR CALC	BAS	0	B	1
CASSDIR	BAS	0	B	1
CONTOUR	BAS	0	B	1
CONVERGE	BAS	0	B	1
CONVERT	BAS	0	B	3
COUNT	BAS	0	B	1
CVERT	BAS	0	B	1
DEC<>HEX	BAS	0	B	1
FUELCOST	BAS	0	B	1
HEXLOAD	BAS	0	B	1
HEXTODEC	BAS	0	B	1
IN-OUT	BAS	0	B	1
HOMONYMS	BAS	0	B	1
JOYPAINT	BAS	0	B	1
KALVOS	BAS	0	B	1
LINES	BAS	0	B	1
MACDATA	BAS	0	B	1
MISSLETT	BAS	0	B	1

---

* PD-67 Basic Pgms

LOAN	BAS	0	B	3
LOANAMOR	BAS	0	B	1
64KLOOK	BAS	0	B	8
ASSEMBLR	BAS	0	B	3
DISASSY	BAS	0	B	4
FINANCE	BAS	0	B	8
ROMDUMP	BAS	0	B	1
WEREWAND	BAS	0	B	5
CHECKS	BAS	0	B	4
MONEYHLP	BAS	0	B	4
CHKBOOK	BAS	0	B	3
STAT-LOG	BAS	0	B	3
WORDPRC	BAS	0	B	5
WORDSCAR	BAS	0	B	2
TYPING	BAS	0	B	2

---

* PD-68 Basic Pgms

ART	BAS	0	B	1
BARGRAPH	BAS	0	B	1
BEGIN	BAS	0	B	1
BWDUMP	BIN	2	B	1
CHAR	BAS	0	B	2
COM	BAS	0	B	2
DISMON	BAS	0	B	7
DOT	BAS	0	B	1
EDITOR	BAS	0	B	3
EXTNDKYB	BAS	0	B	4
EXTNDKYB	DOC	1	A	7
FREE	BAS	0	B	1
GRADBOOK	BAS	0	B	1
GRNDSTFF	BAS	0	B	1
INSTR	BAS	0	B	1
LET	BAS	0	B	3
STOCKS	BAS	0	B	5
TWOLINER	BAS	0	B	1
ATOMS	BAS	0	B	2
BEAST	BAS	0	B	1

PD-69 Disk Utilities

DIRPBR	BAS	0	B	2
DISKLOOK	BAS	0	B	1
DKTODK	BAS	0	B	3
DSK2TP	BAS	0	B	2
DSKLIBRY	BAS	0	B	3
DSKMSTER	BAS	0	B	4
DSKSPEED	BAS	0	B	1
DTOD	BAS	0	B	2
D UTIL	BAS	0	B	2
DDCOPY	BAS	0	B	2
DIRGET	BAS	0	B	1
DIRLIST	BAS	0	B	2
DIRSAVE	BAS	0	B	1
DISK FIX	BAS	0	B	1
DISKDIRE	BAS	0	B	3
DISKDUMP	BAS	0	B	1
DISKEDIT	BAS	0	B	4
DISKLIST	BAS	0	B	1
DISKSORT	BAS	0	B	1
DISKTEST	BAS	0	B	1
DISKTIME	BAS	0	B	1
DSKCLEAN	BAS	0	B	1
MASTRDSK	BAS	0	B	4

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* PD-70 Basic Pgms

MLADFND	BAS	0	B	2
BIGHILL	BAS	0	B	1
BLACKJK	BAS	0	B	4
CIA	BAS	0	B	6
CIPHER	BAS	0	B	1
CUBES	BAS	0	B	1
DOGFIGHT	BAS	0	B	1
FISH	BAS	0	B	1
FLIP	BAS	0	B	2
FOOTBALL	BAS	0	B	4
GOLDMINE	BAS	0	B	3
HANGMAN	BAS	0	B	2
HILOW	BAS	0	B	3
HOBBIT	BAS	0	B	2
HUSTLE	BAS	0	B	1
JUMP	BAS	0	B	1
MEMORY	BAS	0	B	2
PROTECT	BAS	0	B	2
QUEST	BAS	0	B	4
SLITHER	BAS	0	B	1
STOCK	BAS	0	B	3

---

* PD-71 Basic & Machine Lang. Pgms

DISASSEM	BAS	0	B	2
PAYMENT	BAS	0	B	1
STATCAP	BAS	0	B	2
TEMPCONV	BAS	0	B	1
ECHOSONG	BAS	0	B	1
MUSCONV	BAS	0	B	1
FUGUE	BIN	2	B	3
JETI	BIN	2	B	3
MOONLIT	BAS	2	B	3
RONDO	BIN	2	B	4
LOOKLOVE	BIN	2	B	1
MENU	BAS	0	B	1
WE	BAS	0	B	1
MESSAGE	BAS	0	B	1
OBJECTS	BIN	2	B	2
ODIE	PIX	2	B	3
TANK	BIN	2	B	4
TRIANGLE	BIN	2	B	2
WORLDMAP	BIN	2	B	4
PAINT	BAS	0	B	1
SCRDATA	BIN	2	B	1
RES	BAS	0	B	1
SCAN	BAS	0	B	1

---

* PD 72 Basic and Machine Lang. Pgms

FIND	BAS	0	B	1
LOCFIND	BAS	0	B	1
ML ADDR	BAS	0	B	1
MLFINDER	BAS	0	B	1
MLTTD	BAS	0	B	1
READBIN	BAS	0	B	1
RELOCAT	BAS	0	B	1
CHKBOOK	BAS	0	B	3
FINANAD	BAS	0	B	6
GRAPHICS	BAS	0	B	5
HOMEUTIL	BAS	0	B	6
LIFE	BAS	0	B	4
MCONVERT	BAS	0	B	2
METCONV	BAS	0	B	1
JOYLIST	BAS	0	B	1
CLOCK	BIN	2	B	1
CAMELOT	BIN	2	B	2
FIRE	BIN	2	B	6
CLOCK	DAT	1	A	1

---

* PD 73 Basic Pgms

CARTEL	BAS	0	B	7
DODGE-EM	BAS	0	B	2
DOGS	BAS	0	B	1
DOORS	BAS	0	B	1
PINGPONG	BAS	0	B	1
CACAPHON	BAS	0	B	1
SUB	BAS	0	B	5
SURVIVAL	BAS	0	B	5
TREK	BAS	0	B	5
TYCOON	BAS	0	B	2
SCRAMBLE	BAS	0	B	5
SIMON	BAS	0	B	2
WHERISIT	BAS	0	B	2
WALLHIT	BAS	0	B	1
TICTACT	BAS	0	B	2
CHBASIC	BAS	0	B	1

PUBLIC DOMAIN SOFTWARE

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

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Editor's Comments

We are all concerned with costs. Recently I talked to a person who wanted to upgrade his color computer 3 to 512K of RAM. He said that the cost would be more than the price he paid for his computer. This may be the case for other computers too since memory chips have gone up in price from 3 to 4 times their value at the beginning of the year. The question is "How much is it worth to you to have 512K of memory"? I have noticed that memory chips have decreased in price. They are now in the $10 to $12 range depending upon the speed of the chips.

While on the subject of costs, memory chips are the only computer accessory that I readily recall going up in price. Disk drives, hard drives, printers, and modems have come down in the last couple of years. Radio Shack has their disk drives on sale now for $199. A good printer can be purchased for less than $200 and a 1200 hertz modem for less than $100. Compare these prices with those 2 years ago and you can see that they are much lower now.

This month I am starting a series on Assembly Language Programming. We have previously covered this subject but I am starting it again for the benefit of those who want to learn to write Assembly Language Programs. It is possible that someone else will continue this section, but I wanted to introduce it. I like to program in basic and use machine language subroutines when I need speed. An assembler is a program that allows machine language codes to be written. Machine language is the fastest mode of operation for the computer.

We are putting the King James' version of the Bible in our Public Domain Collection. We hope to have the Old Testament finished this month and the New Testament next month.

Let me say a little about cassette tapes. We have had some returned that were good or at least ran on our cassette recorders. First of all the cassette routines are very good for saving and loading programs. However there is a problem with tapes. Never use the bargain 3 for $1 tapes. These may work well at first, but will not work correctly after a long time. Use computer tapes or high quality audio tapes. The level on your recorder is important. Experiment with several level settings and leave the volume control at the best level. I have found that the minimum level works best for me. Too high a level lets too much noise through that can give errors.

Disk drives seem to work better than tapes but can cause problems too. My first disk drive became so unreliable that I had to buy a new one. Cleaning the head ocasionally is a good idea. You can purchase a cleaning kit that has a disk with a cloth material. A chemical is put on the cloth and then you are instructed to give a disk command to move the head to the cloth. This causes the chemical to rub on the heads and clean them.

Dean and I want to thank each of you for your support and wish you a Merry Christmas and a Happy New Year.

ham radio & computers by bill chapple w4gqc

In this section I show how to use color computers for ham radio applications. This should also be of interest to those interested in experimenting with radio and communications equipment.

I have always wanted a tri-band antenna for 20, 15, and 10 meters. A 40 meter add on kit would be desireable too. The ham frequencies are usually designated in terms of bands. The ones I am interested in are as follows:

Band	Frequencies
10 meters	28.0 to 29.7 Mhz
15 meters	21.0 to 21.45 Mhz
20 meters	14.0 to 14.35 Mhz
40 meters	7.0 to 7.4 Mhz

In the past when I looked at the costs and considered that a tower would be needed plus a good rotator, I would usually drop the idea. However I began reconsidering my antenna dream before Thanksgiving and decided too order the antenna with the 40 meter add on kit and an inexpensive rotator. Since I did not want to invest in a tower, I bought a tri-pod roof mount and a 10' and a 5' section of steel mast. The antenna arrived the week before Thanksgiving.

Each night I would spend 30 minutes or an hour looking at the instructions and assembling the antenna. On the Monday of Thanksgiving week, I called my Son in Georgia and found out that he was not working that week. He agreed to come up and help me put up the antenna.

The weather was nice and we carefully measured each element, comparing the measurements with the instructions. Finally we got it assembled and began looking at putting it on the roof. We purchased some hardware and mounted the tri-pod. Next we put up the 5' mast and mounted the rotator. Then we ran the cable into my shack. The rotator worked fine and now it was time to bring up the antenna. Surprisingly we did not have much trouble mounting the antenna. I connected the coax cable to the antenna and measured the SWR. It was all right except for 40 meters. We adjusted the driven element until the SWR was acceptable on 40 meters.

The antenna works very well at a height of about 25' from the ground. I have never had an antenna that was very hight and figured I could put it on a tower later. The results have had have been very rewarding. I have talked to Russia, South America, Japan, and Europe all on single sideband (SSB).

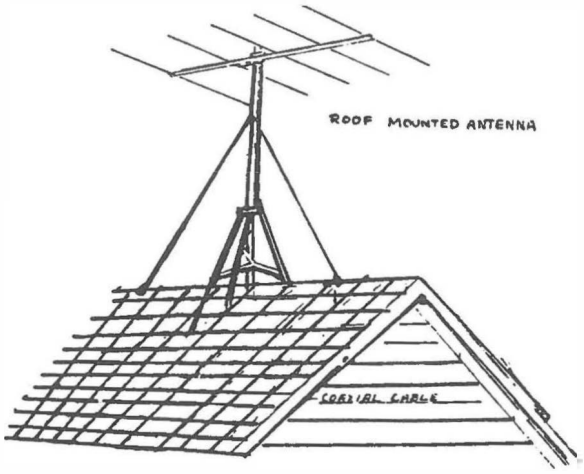
There was only one thing that bothered me. The SWR is high on 40 meters on parts of the band. This inspired me to look at SWR and formulas. I have always been of the opinion that an SWR of less than 2 to 1 is acceptable. A high SWR with one of the solid state transceivers will cause

the power output to drop. An antenna tuner will restore the match to the transceiver. The following program will allow various powers and SWRS to be used to determine the relationships. My SWR was less than 2.5 to 1 over the 40 meter band. It performs well and the following program verifies that most of the power goes to the antenna.

SWR & POWER PROGRAM

```
10 'THIS CALCULATES SWR AND REFL
   ECTED POWER
20 'BY BILL CHAPPLE W4GQC
30 CLS:PRINT@3,"DO YOU WANT TO D
   ETERMINE:"
40 PRINT@40,"1 SWR?"
50 PRINT@72,"2 REFLECTED POWER?"
60 PRINT:INPUT"ENTER NUMBER YOU
   WANT";M
70 IF M=1 THEN 100
80 IF M=2 THEN 200
90 IF M>2 <1 THEN 60
100 CLS:PRINT"DETERMINE THE SWR
   FROM THE      FORWARD AND THE
    REFLECTED POWER."
110 PRINT:PRINT:INPUT"WHAT IS TH
   E FORWARD POWER IN    WATTS";
   FF
120 PRINT:INPUT"WHAT IS THE REFL
   ECTED POWER IN  WATTS";FR
130 F1=1+SQR(FR/FF)
140 F2=1-SQR(FR/FF)
150 PRINT:PRINT"THE SWR IS ";
160 PRINT USING"##.##";F1/F2;
170 PRINT" TO 1"
180 INPUT"PRESS ENTER TO CONTINU
   E";XX
190 GOTO30
200 CLS:PRINT"DETERMINE THE REFL
   ECTED POWER   FROM THE SWR AN
   D FORWARD POWER"
210 PRINT:INPUT"THE SWR IS: (
    ) TO 1";R
220 PRINT:INPUT"FORWARD POWER IN
    WATTS";FP
230 P=(R-1)/(R+1)
240 PS=PR
250 PR=PS*FP
260 PC=PR/FP*100
270 K=1-(PR/FP)
280 P4=FP/K
290 P5=P4-FP
300 PRINT:PRINT"REFLD POWER IS "
   ;
310 PRINT USING"#,###.##";PR;
320 PRINT" WATTS"
330 PRINT"OR EQUAL TO    ";
340 PRINT USING"#,###.##";PC;
350 PRINT" PERCENT"
360 LP=FP-PR
370 PRINT:PRINT"POWER IN LOAD= "
   ;
380 PRINT USING"#,###.##";LP;
390 PRINT" WATTS"
400 PRINT:PRINT:PRINT:PRINT:INPU
   T"PRESS R TO RETURN TO MENU";
   E$
410 IF E$="R" THEN RUN
420 CLS:PRINT:INPUT"WHAT IS THE
   COAX Z IN OHMS";CZ
430 PRINT:PRINT"WITH SWR OF "R"
   TO 1"
440 Z1=R*CZ
450 V=SQR(FP*Z1)
460 PRINT"COAX MAX. VOLTS=";
470 PRINT USING"###,###.##";V;
480 PRINT" RMS"
490 VP=V*1.414
500 PRINT TAB(16);
510 PRINT USING"###,###.##";VP;
520 PRINT" PEAK"
530 Z2=CZ/R
540 A=SQR(FP/Z2)
550 PRINT"COAX MAX.  AMPS=    ";
560 PRINT USING"###.##";A;
570 PRINT" RMS"
580 A2=A*1.414
590 PRINT TAB(20);
600 PRINT USING"###.##";A2;
610 PRINT" PEAK"
620 PRINT"WHEN LOAD WATTS=  ";
630 PRINT USING"#,###.##";FP;
640 PRINT" RMS"
650 PRINT"THEN FRWD WATTS=  ";
660 PRINT USING"#,###.##";P4;
670 PRINT" RMS"
680 PRINT"AND REFLD WATTS=  ";
690 PRINT USING"#,###.##";P5;
700 PRINT" RMS"
710 PRINT:PRINT:INPUT"PRESS <ENT
   ER>";E$
720 CLS
730 PRINT:PRINT:PRINT"---" CZ"OH
   M,"FP"WATT VALUES ---"
740 V1=SQR(FP*CZ)
750 A1=SQR(FP/CZ)
760 PRINT"COAX VOLTAGE=   ";
770 PRINT USING"###,###.##";V1;
780 PRINT" RMS"
790 V2=V1*1.414
800 PRINT TAB(16);
810 PRINT USING"###,###.##";V2;
820 PRINT" PEAK"
```

```
830 PRINT"COAX AMPERES=       ";
840 PRINT USING"###.##";A1;
850 PRINT" RMS"
860 A3=A1*1.414
870 PRINT TAB(20);
880 PRINT USING"###.##";A3;
890 PRINT" PEAK"
900 PRINT:INPUT"SELECT: 1 MAIN M
   ENU                    2 SWR
    MENU                    3
   CHANGE COAX Z
    4 HARD COPY
       ENTER NUMBER";M
910 IF M=1 THEN 30
920 IF M=2 THEN 30
930 IF M=3 THEN 420
940 IF M=4 THEN 960
950 IF M>4 <1 THEN 900
960 PRINT#-2,"* * * * * * * * *
   * * * * * * * *"
970 PRINT#-2,TAB(4)"---SWR CALCU
   LATIONS---"
980 PRINT#-2,"-"
990 PRINT#-2,TAB(3)">>>>> SWR="R
   "TO 1 <<<<<"
1000 PRINT#-2,"FORWARD PWR=  ";
1010 PRINT#-2,USING"#,###.##";FP
   ;
1020 PRINT#-2," WATTS"
1030 PRINT#-2,"REFL'D PWR=   ";
1040 PRINT#-2,USING"#,###.##";PR
   ;
1050 PRINT#-2," WATTS"
1060 PRINT#-2,"WHICH IS ";
1070 PRINT#-2,USING"###.##";PC;
1080 PRINT#-2,"% OF FWD PWR"
1090 PRINT#-2,"POWER IN LOAD=";
1100 PRINT#-2,USING"#,###.##";LP
   ;
1110 PRINT#-2," WATTS"
1120 PRINT#-2,"- - - - - - - - -
    - - - - - - -"
1130 PRINT#-2,"WITH A COAX Z OF=
   "CZ"OHMS"
1140 PRINT#-2,"COAX MAX. VOLTS="
   ;
1150 PRINT#-2,USING"##,###.##";V
   ;
1160 PRINT#-2," RMS"
1170 PRINT#-2,TAB(16);
1180 PRINT#-2,USING"##,###.##";V
   P;
1190 PRINT#-2," PEAK"
1200 PRINT#-2,"COAX MAX. AMPS=
    ";
1210 PRINT#-2,USING"####.##";A;
1220 PRINT#-2," RMS"
1230 PRINT#-2,TAB(19);
1240 PRINT#-2,USING"###.##";A2;
1250 PRINT#-2," PEAK"
1260 PRINT#-2,"WHEN LOAD WATTS=
   ";
1270 PRINT#-2,USING"#,###.##";FP
   ;
1280 PRINT#-2," RMS"
1290 PRINT#-2,"THEN FORW'D PWR=
   ";
1300 PRINT#-2,USING"#,###.##";P4
   ;
1310 PRINT#-2," WATTS"
1320 PRINT#-2,"AND REFL'D PWR=
   ";
1330 PRINT#-2,USING"#,###.##";P5
   ;
1340 PRINT#-2," WATTS"
1350 PRINT#-2,"- - - - - - - - -
    - - - - - - - -"
1360 PRINT#-2,CZ"OHM,"FP"WATT VA
   LUES"
1370 PRINT#-2,"COAX VOLTAGE=   "
   ;
1380 PRINT#-2,USING"##,###.##";V
   1;
1390 PRINT#-2," RMS"
1400 PRINT#-2,TAB(16);
1410 PRINT#-2,USING"##,###.##";V
   2;
1420 PRINT#-2," PEAK"
1430 PRINT#-2,"COAX AMPERES=
    ";
1440 PRINT#-2,USING"###.##";A1;
1450 PRINT#-2," RMS"
1460 PRINT#-2,TAB(19);
1470 PRINT#-2,USING"###.##";A3;
1480 PRINT#-2," PEAK"
1490 PRINT#-2,"* * * * * * * * *
    * * * * * * * *"
1500 GOTO30
```



HAM RADIO PROGRAMS
For Radio Shack Color Computers

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 - Type in a prefix for a foreign country and have the country 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. Print the log to a printer.HR-3 $9.95

THERMOMETER

Now your computer can give you the temperature in both Fahrenheit and Centigrade. Assembly plugs into a joystick port & 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. MS-2 $39.95

WEATHER FACSIMILE (WEFAX)

Draw weather maps on the screen. Feed transceiver's audio into the cassette port. Requires a joystick. WEFAX $6.95.

HAM RTTY 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, 75, & 100 WPM Baudot.

RTTY $6.95.

* MORSE KEYER (new) *

Send characters direct from the keyboard or select up to 10 preprogrammed messages to automatically call CQ, CQ DX, First Transmission, Weather, DE your call, etc. Also allows entering the call letters of the station worked and his name which can automaticaly be sent by pressing only one key. Order the cable below for a super keyer for less than $25. M-KEYER $12.95

* KEYER INTERFACE (new) *

Interface cable that connects to the printer port of the color computer & the KEY input of solid state transceivers. Wired for 2 or 3 conductor 1/4 inch plug (state type). Maximum key up voltage is 15 volts. Will not work on vacuum tube transmitters. 6' long, KEY-IN $12.95

Dynamic Color News on Tape or Disk
$6.95 each or 6 for $35 including ship.

AUDIO GENERATOR - Generates exact digital audio frequencies using your computer's crystal as a standard. Audio signal is on the cassette cable. DCN #44.

FREQUENCY COUNTER - Accurately measure audio frequencies up to 12000 hertz. Feed unknown frequencies in on the cassette cable. DCN #45.

TUNING METER- Indicates proper tuning for RTTY and Slow Scan Television. Excellent for use with hardware decoders. DCN #48.

HAM MATH - Solves most problems with circuits, antennas, decibels, etc. An excellent program for studying for ham licenses. DCN #50.

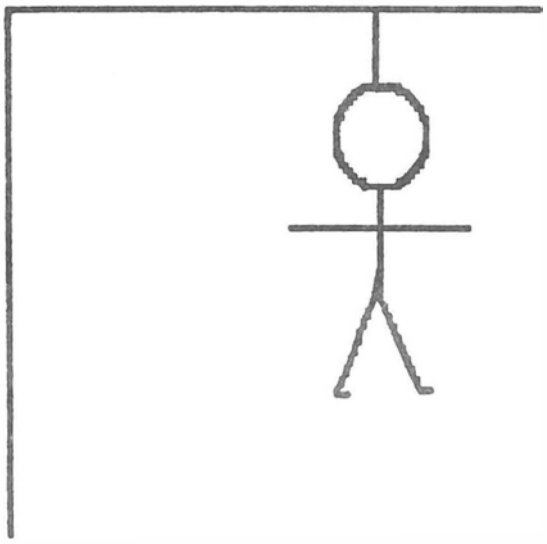
See Dynamic Color News on tape or disk index for additional support programs.

All programs are color computer 3 compatible unless indicated and are on tape or disk. Please specify tape or disk software. A 32K minimum computer is required.

Checks, VISA or MC, Add $3 shipping.

Dynamic Electronics Inc.
P. O. Box 896 (205) 773-2758
Hartselle, AL 35640

HANGMAN



A WORD GAME

This is a game in which you try to guess a word one letter at a time. If you do not gess the word before a man is drawn you loose. The word is given to you if you loose. The vocabulary can be changed by changing the words in the data statements.

```
1 CLS
2 PRINT @ 266,~  HANGMAN~
3 FOR D=1 TO 1500:NEXT D
4 CLS

5 DIM P$(12,12),L$(20),D$(20),N$
   (26),U(100)
6 INPUT~SKILL LEVEL (0-3)~;SK

7 IF SK<0 OR SK>3 THEN 6
8 C=1:N=80

9 FOR I=1 TO 20:D$(I)=~-~:NEXT I
   :M=0

10 FOR I=1 TO 26:N$(I)=~~:NEXT I

11 FOR I=1 TO 12:FOR J=1 TO 12:P

   $(I,J)=~ ~:NEXT J:NEXT I
12 FOR I=1 TO 12:P$(I,1)=~X~:NEX

   T I
13 FOR I=1 TO 7:P$(1,I)=~X~:NEXT
    I:P$(2,7)=~X~

14 IF C<N THEN 16
15 PRINT~YOU DID ALL THE WORDS!!
   ~:END
16 Q=INT(N*RND(0))+1
17 IF SK=0 ANO Q>20 THEN 16
18 IF SK=1 AND Q>40 THEN 16
19 IF SK=2 AND Q>60 THEN 16
20 IF U(Q)=1 THEN 16
21 U(Q)=1:C=C+1:RESTORE:T1=0
22 FOR I=1 TO Q:READ A$:NEXT I
23 L=LEN(A$):FOR I=1 TO LEN(A$)
   L$(I)=MID$(A$,I,1):NEXT I
24 PRINT @ 0,~HERE ARE THE LETT
   RS USED:~
25 FOR I=1 TO 26:PRINT N$(I);:I
    N$(I+1)=~~ THEN 27
26 PRINT~,~;:NEXT I
27 PRINT:FOR I=1 TO L:PRINT D$(I

   );:NEXT I:PRINT:PRINT
28 FOR D=1 TO 300:NEXT D
29 PRINT @ 128,~~;:INPUT~WHAT IS

    YOUR GUESS~;G$:R=0
30 FOR I=1 TO 26:IF N$(I)=~~ THE

   N 33
31 IF G$=N$(I) THEN FOR G=1 TO 2

   75:PRINT @ 256,~YOU GUESSED T

   HAT LETTER BEFORE~:NEXT G:CLS

   :GOTO 24
32 NEXT I:CLS:PRINT~PROG ERR. RU

   N AGAIN~:STOP
33 N$(I)=G$:T1=T1+1
34 FOR I=1 TO L:IF L$(I)=G$ THEN

    37
35 NEXT I:IF R=0 THEN 38
36 GOTO 39
37 D$(I)=G$:R=R+1:GOTO 35
```

```
38 M=M+1:GOTO 52
39 FOR I=1 TO L:IF D$(I)="-" THE
   N 41
40 NEXT I:GOTO 51
41 PRINT:FOR I=1 TO L:PRINT D$(I
   );:NEXT I:PRINT:PRINT
42 PRINT @ 224,"";:INPUT"WHAT IS
    YOUR GUESS FOR THE      WORD
   ";B$
43 IF A$=B$ THEN 48
44 CLS
45 PRINT"WRONG..TRY ANOTHER LETT
   ER."
46 FOR O=1 TO 1500:NEXT D
47 GOTO 24
48 CLS:PRINT"RIGHT!! IT TOOK";T1
   ;" GUESSES"
49 INPUT" WANT ANOTHER WORD";W$:
   CLS:IF LEFT$(W$,1)="Y" THEN 8

50 PRINT:PRINT"IT'S BEEN FUN!!":
   GOTO 103
51 PRINT"YOU FOUND THE WORD!":GO
    TO 49
52 FOR O=1 TO 300:NEXT D:CLS:PRI
   NT@O,"SORRY,LETTER ISN'T IN T
   HE WORD"
53 ON M GOTO 54,55,56,57,58,59,6
   0,61,62,63
54 PRINT"FIRST, WE DRAW A HEAD":
   GOTO 65
55 PRINT"NOW WE DRAW A BODY.":GO
   TO 65
56 PRINT"NEXT WE DRAW AN ARM.":G
   OTO 65
57 PRINT"THIS TIME IT'S THE OTHE
   R ARM":GOTO 65
58 PRINT"NOW,LET'S DRAW THE RIGH
   T LEG":GOTO 65
59 PRINT"THIS TIME WE DRAW THE L
   EFT LEG":GOTO 65
60 PRINT"NOW WE PUT UP A HAND":G
   OTO 65
61 PRINT"NEXT THE OTHER HAND":GO
   TO 65
62 PRINT"NOW WE DRAW ONE FOOT":G
   OTO 65
63 PRINT"HERE'S THE OTHER FOOT--
   YOU'RE    HUNG!!!!"
64 FOR D=1 TO 1000:NEXT D
65 ON M GOTO 66,68,69,70,71,72,7
   3,74,75,76
66 P$(3,6)="-":P$(3,7)="-":P$(3,
   8)="-":P$(4,5)="[":P$(4,6)=".
   "
67 P$(4,8)=".":P$(4,9)="]":P$(5,
   6)="-":P$(5,7)="-":P$(5,8)="-
   ":GOTO 77
68 FOR I=6 TO 9:P$(I,7)="!":NEXT
    I:GOTO 77
69 FOR I=4 TO 7:P$(I,I-1)="!":NE
   XT I:GOTO 77
70 P$(4,11)="!":P$(5,10)="!":P$(
   6,9)="!":P$(7,8)="!":GO TO 77
71 P$(10,6)="!":P$(11,5)="!":GOT
   O 77
72 P$(10,8)="!":P$(11,9)="!":GOT
   O 77
73 P$(3,11)="Y":GOTO 77
74 P$(3,3)="Y":GOTO 77
75 P$(12,10)="!":P$(12,11)="-":G
   OTO 77
76 P$(12,3)="-":P$(12,4)="!"
77 FOR I=1 TO 12:PRINT"
   ";:FOR J=1 TO 12:PRINT P$(I,J
   );:NEXT J
78 '
79 PRINT:NEXT I:IF M<>10 THEN GO
   SUB 104:CLS:GOTO 24
80 PRINT"SORRY,YOU LOSE. THE WOR
   D WAS":PRINT A$
81 FOR O=1 TO 1000:NEXT D
82 PRINT"YOU MISSED THAT ONE OO
   YOU";:GOTO 49
83 INPUT"TYPE YES OR NO";Y$:IF L
   EFT$(Y$,1)="Y" THEN 9
84 DATA "GUM","SIN","FOR","CRY",
   "LUG","BYE","FLY"
85 DATA "UGLY","EACH","FROM","WO
   RK","TALK","WITH","SELF"
86 DATA"RACE","TYPE","BOAT","FLO
   W","LIKE"
87 DATA "PIZZA","THING","FEIGN",
   "FIEND","ELBOW","FAULT","DIRT
   Y"
88 DATA"BUDGET","SPIRIT","QUAINT
   ","MAIDEN","ESCORT","PICKAX"
89 DATA"EXAMPLE","TENSION","QUIN
   INE","KIDNEY","REPLICA","SLEE
   PER"
90 DATA "TRIANGLE","KANGAROO","M
   AHOGANY","SERGEANT","SEQUENCE
   "
91 DATA "MOUSTACHE","DANGEROUS",
   "SCIENTIST","DIFFERENT","QUIE
   SCENT"
92 DATA"LIMERICK","ASSURANCE","M
   INSTREL","ATROCIOUS"
93 DATA"HYDROCYST","PRIMARY","EN
   COURAGE","WINSOME"
94 DATA"BENZEDRINE","CANTICLE","
   DIHEDRAL"
95 DATA "MAGISTRATE","ERRONEOUSL
   Y","LOUDSPEAKER","PHYTOTOXIC"
96 DATA "MATRIMONIAL","PARASYMPA
   THOMIMETIC","THIGMOTROPISM"
97 DATA"ASYNCHRONOUS","BELLIGERE
   NCE","CIRCUMNAVIGATE"
98 DATA"DISSATISFACTION","ELECTR
   OTHERAPEUTUCS","FRANKINCENSE"
99 DATA "GASTROENTERITIS","HYMEN
   OPTERDUS"
100 DATA"IRRECONCILABILITY","JUS
   TIFICATION","KINAESTHESIA"
101 DATA"LAISSEZFAIRE","MYRMECOL
   OGY"
102 PRINT"BYE NOW"
103 END
104 PRINT@482,"HIT ANY KEY TO CO
   NTINUE";
105 Q$=INKEY$:IF Q$=""THEN 105
106 RETURN
```

"The WIZARD'S CASTLE" is a very special 'TANDY' 'Color Computer' magazine. We devote our entire magazine to the 'CoCo family'. Our articles include columns like: "Wizard's Corner", "Letters to the Editor", "Questions for the Wizard", "Pencil-Pals","Wizard's Castle Scoreboard","Word Search", "Post-It-Notes", "Programmers Corner", "Software Reviews", "Hardware Reviews", "Doctor CoCo", "Hardware Modifications", "Adventure Hints", and "BBS UpDates". If you have been looking for a smaller more 'PERSONAL' version of a CoCo 'MAG' then we're 'EXACTLY' what you've been looking for. Remember we're exclusively for owners of any of Tandy's Color Computers. We support CoCo's 1, 2, and 3.

```
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*   of:  "The WIZARD'S CASTLE" magazine      *
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*..... Overseas     for only $30.00 per yr*
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Phone:.(.....).....-.....
```

```
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```

```
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# 'Uploading' articles into our #
# offices.  You can place orders #
# here also.  BBS# (704)434-2629 #
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Are you always running out of disks???? Do you dread paying $1.50 or more per disk? Now, the answer to all of your disk problems can be answered here at the 'CASTLE'. We are offering only premium quality DSDD diskettes at under $1.00 each. These are 'TOP QUALITY' guaranteed disks. If you ever get a bad one, just send it back for replacement. We will sell these disks in quantities of 10, 25, 50, or even 100 per pk. Prices each will be cheaper depending upon amount purchased. This brand of disks is one all of our members have used for over four years. We hardly ever find '1' bad disk for every purchase we make. If you are tired of paying top dollar for disks then try just one order from us. You don't have anything to lose and only $$MONEY$$ to save.

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*                                            *
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        *  1737 Farmville Road   *
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        *                        *
TODAY!! **************************
```

```
NOTICE!
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# offices.  You can place orders #
# here also.  BBS# (704)434-2629 #
####################################
```

Questions and Answers

These are questions we have received and our answers. If you have a question or a solution to a problem you would like to share with our readers, then we would like to hear from you.

+ + +

Dean,

The Dynamic Color News I received, as a sample copy seems to be a fairly nice publication. I have been thinking about getting it on a regular basis, but would like some information first, not directly related to the news magazine.

Many years ago, I had the Coco I which I used rather extensively. I now have two CoCo III units, but still have many of the programs in my inventory. One of these, the "Artist" program was most enjoyable, but I have progressed to the Cocomax III program, which I use very frequently. Now the problem--I used to have a poke statement which I used, along with the pix copy program called "Convert" and this in turn would change the extension and also the pix to a degree where I could use the "Artist" programs in the Cocomax configuration, but have lost track of the information.

Although I am retired, I still draw cartoons and pix for a couple of ham radio club newsletters . The Artist program used the extension of PIC and the Cocomax III used the extension of CM3. I have conveerted some of the extensions but the problem lies in the starting and/or ending address, which I was able to by-pass with that poke statement. For a lack of that, and using the conversions, the screen turns blue and the Coco III locks up, instead of loadimg the converted pix. In the course of making these cartoons, I would like to use some of the pix from the older programs but haven't been able to do so. Is such information available, some where and how can I go about obtaining such information? A programmer I definitely am not!

I am enclosing an S. A.S.E. for your convenience. Being retired disabled, and on a fixed income means that I shall be able to send in a subscription on the first of the month, but that is the best I can do, for the present.

Sincerely,

M. L. Braun

ANSWER: Mr. Braun I do not know of a conversion program. We are publishing your letter in Dynamic Color News and maybe someone has an answer that will solve your problem. Files with the "PIC" extension can be renamed with a "MAX" extension and will load with COCOMAX. However COCOMAX3 uses a different format. I believe there is a file conversion routine with COCOMAX3 for loading in regular COCOMAX files. You might look into using it. Thanks for your letter.

+ + +

Dear Bill,

I have not received my November copy of Dynamic Color News.

I'm having problems with the Morse Terminal. I've completed all the boards and I have tied them to the power supply as the diagram. Also the cable--all these have been double checked.

The problem-- is power supply voltages. I've purchased the Radio Shack mult. voltage source as suggested. My question is "where do I obtain the nine volt source from?? That has been the hold up for me in completing the Morse Terminal and putting it in operation.

I am a 20 W.P.M. operator and don't really need it but I enjoy trying out these programs.

The RTTY programs works real good, and I enjoy it with using my old 28 machine to copy--when I desire. Also I was surprised how much memory can be saved from the incoming RTTY--"the whole QST Broadcast and lengthy ones too!!

Thanks Bill

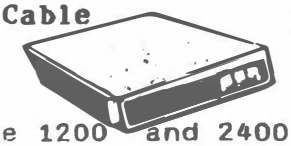
Ken Leseney

ANSWER: Ken thanks for your letter. The 9 volts was included in the power supply we recommended in the instructions. You may have to add another supply. To solve your problem, any positive voltage from 5 to 12 volts should work. The RS-232 requires a plus and minus voltages from 5 to 12 volts. Thanks for your letter. If you can't get it working give me a call. I am usually available at nights or on weekends. I am glad you like the RTTY program. I just put up a new tri-band beam during the Thanksgiving week and am really enjoying it.

Brother M-1109

This is the neatest printer we have seen. It is small enough to fit in a briefcase yet prints like a larger printer. Both serial and parallel ports are included for use with most computers. Features included a 2K printer buffer, tractor & friction feed,High Density Graphics, and the ability to Download Characters. It also prints text in Enlarged, Condensed, Emphasized, Double Strike, Italic, & Superscript/ Subscript. Works with Tandy Color, IBM and most other computers. This is an excellent printer for a student or professional. Best of all our price is only $199.

CA-1 COCO Cable	$9.95
CA-2 IBM Cable	9.95



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Dynamic Electronics Inc.
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Hartselle, AL 35640

Dear Sir;

Enclosed is my check for 19.95. $18.00 is for my subscription renewal for one more year. The other $1.95 is to ask you to please send a copy of your next issue to a friend.

I press the ~ALT~ & ~CTRL~ keys simultaneously then the ~RESET~ button in the back of my CoCo 3. I get a picture of the ~Three Wise Men?~ on my screen. Then I press the ~reset~ botton again for a cold start. Is this harmful to my Coco 3 in anyway? Is it a complete cold start?

I use the cheaper DS/DD disks. When I format them, a couple of them will not verify on the first try, but will on the second try. Why is this? Are they O.K. to use. So far I have not had any trouble with them. When a disk will format but on Verify shows an error in track #--, Can I use around that track? How?

Is there a BASIC Program that can be put in front of Bin programs that will Auto Load and Auto Exec them? I would then shorten the file name on my most use programs and would only need to type RUN ~FN instead of LOADM ~FILENAME then EXEC? I am sure a line or two would have to be edited for each different BIN program it proceeds.

I like your programs, they are basic and easy to work and experiment with. I have learned a lot by doing that. Your REM statements help a lot. Your basic articles are easy to understand. The harder ones are still way out there for me, but I will get to them in time.

I have other questions but I feel like I already write to often and ask to much.

Do not print my name, please respect my privacy.

Best Wishes

ANSWER: Thanks for your letter. Write as often as you like because the questions you asked are of interest to others.

Pressing the ALT and CTRL keys to bring up the picture of the 3 men should not harm your computer.

If you have a new disk with an error on a track I would suggest you discard it. However I have had disks to fail to format the first time and then format the second time. They did not give any problems when I used them. One of our public domain disks PD8 will allow you to skip sectors with errors. This disk also has a utility that will allow copying of copy protect disks.

A basic program can be tailored to load machine language programs similar to the following:

```
10 LOADM"MLPGM":EXEC
```

The basic program can have a simple name. I use this technique often. The only problem is that the machine language must not use the same memory as the basic program.

I am glad you like the basic programming series. We have readers at all levels of ability and try to offer something challenging to all. Thanks for your letter and please write as often as you like.

OPERATING HINT

You can print your Disk directory to a printer by POKE 111 ,254:DIR <ENTER>

Product Reviews

VIP DATABASE III

by Norm Matice

for the Color Computer 3

The VIP Database III is an update of the tried and true VIP Database. This Color Computer III version takes advantage of the upgrades in the CoCo III hardware while retaining the properties of one of the best database programs for a computer.

The major changes in VIP Database III over its predecessor are the screen default menu, in memory sorting and a print spooler. The new screen default menu allows you to set the screen colors (background, foreground, highlight and cursor), to whatever combination suits your fancy. If you prefer no color, because of the limitations of a composite monitor, you also have a toggle switch to turn the color off. Also included in this menu is the ability to pick a 40, 64 or 80 column screen.

Due to the fact that a 64 column screen isn't touted as being one that is available on the CoCo III, I was curious as to how it would look in relation to the other two screens. It came through looking like it was standard on the CoCo III, just like the 40 and 80 column screens.

The in memory sort and print spooler features are an offshoot of the expanded memory of a CoCo III over previous CoCos. The in memory sort will speed up the sorting of files, by virtue of the fact, that you don't have to wait for disk drive access. The print spooler is another time saver if you want to print one set of files while you work on another set.

The database program itself allows for setting up any type of files you need, from very rigid to free form. It will let you sort or search by any file attribute you wish. It also allows for printing the sections of a file you want. If there is some part of a file you don't want printed it can be left out.

The menus of the VIP Database III are very complete. While I was testing the program I noticed that I very seldom had to refer to the manual to get the program to do what I wanted. This would tend to indicate that with very little memory work you will be able to use this program without the need to keep referring back to the operator's manual. This is a nice feature in any piece of software.

The program also includes a math menu which will let you set up math formulas in your files. If you have files that need to add totals or figure percentages or any number of math functions, the program can do them.

If your looking for a database program, VIP Database III, will satisfy your needs. It is fast, easy to learn, easy to use, full featured and sells for a price that will make you glad you own a CoCo. The price is $69.95 and is available from SD Enterprises, P.O. Box 1233, Gresham, Oregon 97030.

MULTI-VUE

by Norm Matice

Multi-vue is an operating environment. So states the explanation on the back of the Multi-vue package. Its main function is to provide the user with access to the OS9 operating system without the need for remembering the commands of OS9.

This is accomplished through the use of pull down menus and icons. The program can use a mouse, joystick or keyboard for direction from the user. It will open and close windows for you without the bother of memorizing the commands to accomplish that task. Obviously if it does windows you will need OS9 level II, to run it.

One of the first things you have to do when you get Multi-vue is make a copy of the two disk set. Once your copies are made you have to make them bootable. The instructions to do that are included with the documentation. As I was doing that I noticed a small error on page 1-7. Instruction 4 tells you to type: chx d0/cmds it should read type: chx /d0/cmds. Anyway once you , have finished this little task Multi-vue will allow you to get OS9 up and running from it.

Once in Multi-vue you are in what is known as the gshell (for graphics shell). From that point on all commands are entered by pointing to and picking graphic representations of what you want to do. Although Multi-vue won't make you an OS9 wizard if you are not familiar with the way the system operates, it may make OS9 a little easier to use. Without knowing how to change screen colors with OS9 commands, Multi-vue will allow you to adjust them with a simple graphics representation on one pull-down menu. It will help you set up the type of monitor you are using or which joystick port you want to use.

In addition Multi-vue has a group of programs connected with it. Among them are clock, calendar and calc. They allow you to run an analog clock of the system time, pull up a calendar of any month from January 1901 to January 2100, and use the computer as you would a handheld calculator. In addition there are commands to set up printer and serial port drivers on your Color Computer.

Also included in the package is a C language graphics library support. This will allow C programmers to use the power of the Color Computer III to open windows. It allows for high resolution graphics in C also.

If your an OS9 programmer Multi-vue would make a good addition to your programming tools. If you are a casual consumer of software you may not find that many uses for the package. All of your software would have to be adapted to it for you to use it.

Multi-vue is available at Radio Shack stores and cost $49.95.

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Merry CHRISTMAS

BASIC UTILITY DISKETTE

by

Doug Canfield

"Basic Utility Diskette", offered by T.E.M. of California, gives the Coco user a set of five useful programs on disk to help make his programming tasks a bit easier. Included on the disk are utilities to print a disk directory, print an exact copy of the text screen, and print a listing of the numeriacl contents of a disk file. The other two programs off the disk-- one will give a complete cross reference of all of the jump type instructions and the line numbers to which they branch, while the other will compare two programs and list all of the differences between the two.

DUMPDIR: What is the first thing you type when you put a new disk in the drive? As the listing from DUMPDIR fits nicely into the disk jacket you can keep it with the disk and save hunmdreds of "DIRs".

DUMPCRT: When this is run whatever is on the screen goes to the printer; very useful for s aving "TRON" data. The manual suggests calling the program from off of the disk with a RUN "DUMPDIR" command within the program, but this wipes out your program to save the screen. I renumbered it, changed the three variable names, and saved it as an ASCII program which could be "MERGED" with my program, and then called at the right time with a "GOSUB" instruction.

DUMPFILE: You can now see exactly what the computer puts on your disk. DUMPFILE prints, sector by sector, in either hex of decimal, a table with all of the values that comprise your disk file.

CROSSREF: With this program, all of the line numbers containing "GOTO", "GOSUB", etc. are listed along with the line numbers to which they branch; a real time saver.

COMPARE: If the need arises to see all of the differences between a program and its last revision, CROSSREF will list all of the lines between the two which contain discrepencies.

Obviously, all of these utilities require a printer and a disk drive. They will run on a Coco 2, and have special routines for the Coco 3. Also included are versions of CROSSREF and COMPARE with compiled code, which run much faster, but must be on the same disk as the utility program.

For more information contact: T.E.M. of California, Box 4311, Fullerton, CA 92634-4311 (714) 871-8210.

NEW PRODUCTS

When you release a new product send us a copy of your new product release. We will print it in our NEW PRODUCTS SECTION.

MEMORY MANAGER
for
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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 super fast because programs can be saved to the ramdisk. A third option configures the computer for the all ram mode allowing data or programs to be stored in the upper memory. Our Memory Saver 2 allows your programs to be saved even with power failures. The Memory Manager Software is available on either cassette or disk.

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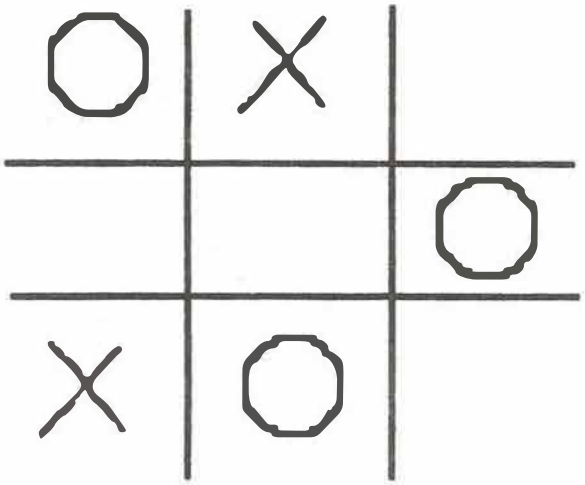

TIC - TAC

This is an exciting version of TIC-TAC-TOE for one or two players. The squares are numbered from 1 to 9 like a telephone key pad. You select a number on which to place your X and your challenger selects a number for his "O". If you do not have a challenger then press the space bar and the computer will select a number. Be careful or the computer will beat you.

```
5 CLS:PRINT"TURNS ARE INDICATED
   BY A RED OR BLUE CURSOR AT BO
   TTOM LEFT OR RIGHT.SQUARES AR
   E NUMBERED(1-9) FROM TOP LEFT
    TO LOWER RIGHT.TAKE TURN BY
   PRESSING NUMBER KEY."
7 PRINT"COMPUTER WILL TAKE TURN
   IF YOU PRESS SPACEBAR.PRESS A
   NY KEY TO CONTINUE"
10 IFINKEY$=""THEN10
15 R=0:B=0
20 P=1:K=0
25 A=0:B=0
30 C=0:D=0
35 E=0:F=0
40 G=0:H=0
45 I=0:V=0
50 CLS(0)
100 FOR X=5 TO 58
105 Y=10
110 SET(X,Y,1)
115 NEXT X
120 FOR X=5 TO 58
125 Y=20
130 SET(X,Y,1)
134 NEXT X
135 FOR Y=1 TO 29
140 X=21
145 SET(X,Y,1)
149 NEXT Y
150 FOR Y=1 TO 29
155 X=42
160 SET(X,Y,1)
165 NEXT Y
170 PRINT@480,"  X WON:"R"      O
    WON:"BL
180 X=6:Y=0
200 C$=INKEY$
201 IF P=10 THEN 205
202 RESET(31,31)
203 SET(0,31,4)
204 GOTO 209
205 RESET(0,31)
206 SET(31,31,7)
209 IF C$="1" THEN 300
210 IF C$="2" THEN 320
215 IF C$="3" THEN 330
220 IF C$="5" THEN 350
225 IF C$="4" THEN 340
226 IF C$="6" THEN 360
230 IF C$="7" THEN 370
235 IF C$="8" THEN 380
240 IF C$="9" THEN 390
245 IF C$=" " THEN 800
246 IF C$="0" THEN 20
249 GOTO 200
300 X=9:Y=1
301 A=P
302 IF P=1 THEN 500
305 GOTO 550
320 X=25:Y=1
```

```
321 B=P
322 GOTO 400
330 X=48:Y=1
331 C=P
332 GOTO 400
340 X=9:Y=11
341 D=P
342 GOTO 400
350 X=25:Y=11
351 E=P
352 GOTO 400
360 X=48:Y=11
361 F=P
362 GOTO 400
370 X=9:Y=21
371 G=P
372 GOTO 400
380 X=25:Y=21
381 H=P
382 GOTO 400
390 X=48:Y=21
391 I=P
392 GOTO 400
400 IF P=1 THEN 500
402 GOTO 550
500 T=1
505 SET(X,Y,4)
510 X=X+1
515 Y=Y+1
520 T=T+1
525 IF T=8 THEN 535
530 GOTO 505
535 X=X-8
536 Y=Y-1
540 SET(X,Y,4)
542 X=X+1
544 Y=Y-1
546 T=T-1
547 IF T=1 THEN 599
548 GOTO 540
550 SET(X,Y,3)
552 SET(X,Y+5,3)
554 X=X+1
556 T=T+1
558 IF T=5 THEN 562
560 GOTO 550
562 SET(X,Y+4,3)
564 SET(X-5,Y+4,3)
566 Y=Y-1
568 T=T-1
570 IF T=1 THEN 574
572 GOTO 562
574 SOUND 200,1
575 GOTO 600
599 SOUND 50,1
600 Q=A+B+C
605 GOSUB 700
610 Q=D+E+F
615 GOSUB 700
620 Q=G+H+I
625 GOSUB 700
630 Q=A+D+G
635 GOSUB 700
640 Q=B+E+H
645 GOSUB 700
650 Q=C+F+I
655 GOSUB 700
660 Q=A+E+I
665 GOSUB700
670 Q=C+E+G
675 GOSUB 700
676 K=K+1
677 IF K=9 THEN 20
680 IF P=1 THEN 695
685 P=1
690 GOTO 200
695 P=10
696 GOTO 200
700 IF Q>23 THEN 1000
705 IF Q=3 THEN 2000
710 IF Q=13 THEN 2000
715 IF Q=23 THEN 2000
720 RETURN
800 GOTO 805
805 Q=A+B:S=C
806 C$="3"
807 GOSUB 885
808 Q=A+C:S=B
809 C$="2"
810 GOSUB 885
811 Q=B+C:S=A
812 C$="1"
813 GOSUB 885
814 Q=D+E:S=F
815 C$="6"
816 GOSUB 885
817 Q=E+F:S=D
818 C$="4"
819 GOSUB 885
820 Q=D+F:S=E
821 C$="5"
822 GOSUB 885
823 Q=G+H:S=I
824 C$="9"
825 GOSUB 885
826 Q=H+I:S=G
827 C$="7"
828 GOSUB 885
829 Q=G+I:S=H
830 C$="8"
831 GOSUB 885
832 Q=A+D:S=G
833 C$="7"
834 GOSUB 885
835 Q=D+G:S=A
836 C$="1"
837 GOSUB 885
838 Q=A+G:S=D
839 C$="4"
840 GOSUB 885
841 Q=B+E:S=H
842 C$="8"
843 GOSUB 885
844 Q=B+H:S=E
845 C$="5"
846 GOSUB 885
847 Q=E+H:S=B
848 C$="2"
849 GOSUB 885
850 Q=C+F:S=I
851 C$="9"
852 GOSUB 885
853 Q=C+I:S=F
854 C$="6"
855 GOSUB 885
856 Q=F+I:S=C
857 C$="3"
858 GOSUB 885
859 Q=A+E:S=I
860 C$="9"
861 GOSUB 885
862 Q=A+I:S=E
863 C$="5"
864 GOSUB 885
865 Q=E+I:S=A
866 C$="1"
867 GOSUB 885
868 Q=C+E:S=G
869 C$="7"
870 GOSUB 885
871 Q=C+G:S=E
872 C$="5"
873 GOSUB 885
874 Q=E+G:S=C
875 C$="3"
876 GOSUB 885
877 V=V+1
878 IF V=2 THEN 1499
879 GOTO 800
885 IF P=10 THEN 950
886 IF V=1 THEN 915
887 IF Q=2 THEN 893
888 IF Q=12 THEN 893
889 IF Q=22 THEN 893
890 RETURN
893 IF S=0 THEN 201
895 RETURN
915 IF Q=20 THEN 931
930 RETURN
931 IF S=0 THEN 201
935 RETURN
```

```
950 IF P=1 THEN 800
955 IF V=1 THEN 978
965 IF Q=20 THEN 970
966 RETURN
970 IF S=0 THEN 201
975 RETURN
978 IF Q=22 THEN 985
979 IF Q=12 THEN 985
980 IF Q=2 THEN 985
981 RETURN
985 IF S=0 THEN 201
990 RETURN
1000 BL=BL+1
1005 FOR N=1 TO 60
1010 SOUND N,1
1011 NEXT N
1014 P=1
1015 GOTO 20
1499 V=0
1500 W=RND(9)
1502 C$=STR$(W)
1505 IF W=1 THEN 1550
1510 IF W=2 THEN 1555
1515 IF W=3 THEN 1560
1520 IF W=4 THEN 1565
1525 IF W=5 THEN 1570
1530 IF W=6 THEN 1575
1535 IF W=7 THEN 1580
1540 IF W=8 THEN 1585
1545 IF W=9 THEN 1590
1548 GOTO 1500
1550 IF A>0 THEN 1500
1551 C$="1"
1552 GOTO 201
1555 IF B>0 THEN 1500
1556 C$="2"
1557 GOTO 201
1560 IF C>0 THEN 1500
1561 C$="3"
1562 GOTO 201
1565 IF D>0 THEN 1500
1566 C$="4"
1567 GOTO 201
1570 IF E>0 THEN 1500
1571 C$="5"
1572 GOTO 201
1575 IF F>0 THEN 1500
1576 C$="6"
1577 GOTO 201
1580 IF G>0 THEN 1500
1581 C$="7"
1582 GOTO 201
1585 IF H>0 THEN 1500
1586 C$="8"
1587 GOTO 201
1590 IF H>0 THEN 1500
1591 C$="9"
1592 GOTO 201
1600 IF P=1 THEN 1500
1605 W=RND(9)
1610 IF W=1 THEN 1650
1615 IF W=2 THEN 1655
1620 IF W=3 THEN 1660
1625 IF W=4 THEN 1665
1630 IF W=5 THEN 1670
1635 IF W=6 THEN 1675
1640 IF W=7 THEN 1680
1645 IF W=8 THEN 1685
1648 IF W=9 THEN 1690
1650 IF A=0 THEN 550
1651 GOTO 1600
1655 IF B=0 THEN 550
1656 GOTO 1600
1660 IF C=0 THEN 550
1661 GOSUB 1600
1665 IF D=0 THEN 550
1666 GOTO 1600
1670 IF E=0 THEN 550
1671 GOTO 1600
1675 IF F=0 THEN 550
1676 GOTO 1600
1680 IF G=0 THEN 550
1681 GOTO 1600
1685 IF H=0 THEN 550
1686 GOTO 1600
1690 IF I=0 THEN 550
1691 GOTO 1600
2000 R=R+1
2005 FOR N=195 TO 255
2010 SOUND N,1
2011 NEXT N
2014 P=1
2015 GOTO 20
```


ORIGINAL RADIO SHACK SOFTWARE

We purchased these from a local customer and are offering them at reduced prices. They are slightly used but are in good condition.

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DYNAMIC COLOR NEWS CUMULATIVE INDEX

Editor's Comments, Questions and Answers, and Operating Hints are included in all issues. Product reviews are in issues since #17. Numbers in Parentheses indicate the part of a series. A N indicates the issue is not available on disk or tape. All issues except #1,2,3, 16, & 17 are available on disk or tape.

#1 Feb 84 N
Basic Programming
Programming Theory
Multiprogram Manager
MPM Program Listing
Machine Lang. Prog.

#2 Mar 84 N
Basic Programming
Memory Expansion
Machine Lang. Prog.

#3 Apr 84 N
ASCII Part 1
Basic Programming
Machine Lang. Prog.

#4 May 84
ASCII Part 2
ML Programming-
Interrupts
Installing an
Interrupt Switch
Utility Program

#5 June/July 84
Powerful Remarks
(Remarks for data)
ASCII Part 3
Uninterrupted Power
Machine Lang. Prog.

#6 Aug 84
Powerful Remarks (2)
Data in Remarks
Check Book Program
Word Processor
Machine Lang. Prog.

#7 Sept 84
Machine Lang. Prog.
Writing Position
Independent Code
Powerful Remarks (3)

#8 Oct 84
Basic Programming
(Data Handling Tech)
Machine Lang. Prog.
(Memory Searching)

#9 Nov 84
Computer Sound (1)
Basic Programming
(Sorting)
Ball Team Sort Pgm

#10 Dec 84
Random Numbers
Computer Sound (2)
Sound Learning Pgm
Sound Demo Program

#11 Jan 85
Random Numbers (2)
Card Shuffling
Computer Sounds (3)
Machine Language Subs
Sound Program Disc.

#12 Feb 85
Large Memory Pgms (1)
Computer Graphics (1)
Video Reversar (hard)

#13 Mar 85
Large Memory Pgms (2)
Computer Graphics (2)
Writing Programs (1)

#14 Apr 85
Large Memory Pgms (3)
Computer Graphics (3)
Graphics Demo Program
Writing Programs (2)
Print Demo Pgm

#15 May 85
Writing Programs (3)
Gas Mileage Program
Large Memory Pgms (4)
Data Move Program
Computer Graphics (4)
Graphics Demo Program

#16 June 85 N
Writing Programs (4)
Grade Book Program
Computer Graphics (5)
Character Gen. Pgm
Large Memory Pgms (5)
Address File Program

#17 July 85 N
Large Memory Pgms (6)
64K RAM Program
Writing Programs (5)
Alarm Clock Program
Computer Graphics (6)
Character Gen. Pgm.
CoCo Heat Problem

#18 Aug 85
Writing Programs (6)
Address File Program
Large Memory Pgms (7)
Study Program
Computer Graphics (7)
Line Demo Program

#19 Sept 85
Writing Programs (7)
Fast Food Program
Computer Graphics (8)
Bar Graph Prosram
Vector Correction Pgm
Large Memory Pgms (8)

#20 Oct 85
Writing Programs (8)
Word Processor Pgm
Bar Graph with
Character Generator
Second Port
Page -1 for 32K + MEM
Large Memory Pgms (9)

#21 Nov/Dec 85
Writing Programs (9)
Check Book Program
Computer Graphics(10)
Circle Demo PGM
Recipe Progras
RAM Disk Program
Electric Cost Program

#22 Jan 86
Writing Programs (10)
Inventory Program
Computer Graphics(11)
ARC & Circle Demo PGM
Large Memory Pgms(11)
Ship War (Game)

#23 Feb 86
Writing Programs (11)
File DEMO Program
Basic Basic (1)
Computer Graphics(12)
Draw Demo Program
Interfacing Comp. (1)
Bouncing Ball (Game)

#24 Mar 86
Interfacing Comp. (2)
Electronic Billboard
Writing Programs (12)
Basic Basic (2)
Computer Graphics(13)
Draw Program
(Scaling)
Large Memory Pgms(12)
Ramdisk Subroutines

#25 Apr 86
Interfacing Comp. (3)
Writing Programs (13)
Basic Basic (3)
Tanks (Game)
Large Memory Pgms(13)
Upper Memory Program
Computer Graphics(14)
Graphics Programing
(GET & PUT)

#26 May 86
Writing Programs (14)
ML Programming (1)
Interfacing Comp. (3)
Roulette (Game)
Page -1 Pgm Dev.
Basic Program Restore
Large Memory Pgms (F)
Computer Graphics(15)
Graphics Draw Program

#27 June 86
ML Programming (2)
ML Program (Addition)
Page -1
Mem. Peek & Poke Pgs
Writing Programs (15)
Inventory Program
Interfacing Comp. (5)
Chords (Music Pgm)
Computer Graphics(16)
Graphics Draw Program

#28 July 86
ML Programming (3)
ML Add with Carry
Graphics Zoom Program
Writing Programs (16)
File Program
Interfacing Comp. (6)
ASCII Demo Program
Astro Dodge Game
Computer Graphics (F)

#29 Aug 86
ML Programming (4)
ML Subtract Program
Interfacing Comp. (7)
Organize VCR Tapes
Ham Radio & Comp. (1)
Morse Code Program
Disk Disassembler
Basic Prog. (17)

#30 Sept 86
ML Programming (5)
ML Data Move Program
Disk File Utility
Basic Programing
File Program
Ham Radio & Comp. (2)
Antenna Design Pgm
Interfacing Comp. (8)
ML Output Subroutines

#31 Oct 86
Money Chase (Game)
ML Programming (6)
Multiple Choice Test
Basic Programming
Address File Pgm (1)
Introduction to OS-9
Interfacing Comp. (9)
Ham Radio & Comp. (3)

#32 Nov 86
Star Constellations
ML Programming (7)
CoCo 3 (1)
Basic Programming
Address File (2)
Duelling Cannons
Ham Radio & Comp. (4)
DX Program (Ham)
Interfacing Comp.(10)
Hardware Interface

#33 Dec 86
ML Programming (8)
CoCo 3 (2)
OS-9
Lucky Money (Game)
Interfacing Comp.(11)
DYTERM Terminal Pgm
Basic Programming
(Sorting)
Ham Radio & Comp. (5)

#34 Jan 87
Cassette Control Sw.
ML Programming (9)
Jungle Adventure
Interfacing Comp.(12)
Ham Radio & Comp. (6)
Morse Code Keyer Pgm
CoCo 3 (3)
Basic Programming
Address File & Sort

#35 Feb 87
ML Programming (10)
Interfacing Computers
(Joystick Voltmeter)
Ham Radio & Comp. (7)
Scrolling Around
Basic Programming
Address File

#36 Mar 87
OWARE (Game)
Joystick Ohmmeter
EPROMS (1)
ML Programming (11)
CoCo 3 (Lowercase
Char & Rev.Video)
Ham Radio & Comp. (8)
Basic Programming
Invoice Program

#37 Apr 87
Diver (Game)
EPROMS (2)
ML Programming (12)
Using Joystick Port
for Measuring Temp.
Ham Radio & Comp. (9)
CoCo 3 (Error Trap)
Basic Programming

#38 May 87
Joystick Digital
Thermometer
Accounts Payable
(Business Pgm)
EPROMS (3)
ML Programming (13)
CoCo 3 Memory Manager
Ham Radio & Comp.(10)
Basic Programming
(Fast Sorting)

#39 June/July 87
Geneology Program
ML Programming (14)
Measuring Light with
Joystick Ports
EPROMS (4)
CoCo 3 Graphics Demo
Ham Radio & Comp.(11)
Morse Terminal Pgm.
Calendar Program

#40 Aug 87
Job Costing Program
ML Programming (15)
Basic Programming
Ham Radio & Comp.(12)
Ham Radio Log
Compound Interest Pgm
CC-3 Hi-Res Graphics
Save Program
Dog Race Program

#41 Sep 87
Astro Dodge Game
ML Programming (16)
Reformatting Data (1)
Meteors Program
Computer Terminology
Ham Radio & Comp.(13)
Relay Interface
(Hardware Project)

#42 Oct 87
Taking Control (1)
(Basic Programming)
ML Programming (17)
Disk Cataloger Pgm
Reformatting Data (2)
Parachute (Game)
Ham Radio & comp.(14)
HAM RTTY Program
Print Program

#43 Nov 87
Save the Maiden (G)
Taking Control (2)
ML Programming (18)
Reformatting Data (2)
Music Program
HAM Radio & Comp.(15)
(Packet Radio)

#44 Dec 87
Kingpede (Game)
Taking Control (3)
Printer Utilities
Ham Radio & Comp.(19)
Audio Generator Pgm
Reformatting Data (3)
Screen Dump Program

#45 Jan 88
Living Maze (Game)
ML Programming (20)
Ham Radio & Comp.(17)
Frequency Counter Pgm
Taking Control (4)
Reformatting Data (6)
FANTASY2 Music Pgm
Pmode 4-HRES

#46 Feb 88
Using ROM Routines
Taking Control (5)
OS-9 (New Series)
BARRACAT (Card Game)
Ham Radio & Comp.(18)
Improved Ham Log Pgm

#47 Mar 88
Using ROM Rout. (2)
Taking Control (6)
OS-9 & Basic 09
Coast-Coast (Game)
Logic (Ed. Game)
Forth Prog. Lang.
ML Loader Pgm.
Ham Radio & Comp.(18)
WEFAX -Weather Pgm.

#48 Apr 88
Marriage of ML & Bas
Area Code (Program)
OS-9 & Basic 09
Taking Control (7)
(Basic Programming)
Forth Progamming (2)
Fast Dir (Disk Pgm)
Ham Radio & Computers
Tuning Meter Program
Atlanta (Picture)

#49 May 88
Advance (Game)
Marriage of ML & Bas
Superspell (Ed. Pgm.)
OS-9 & Basic 09
Sink the Ships (Game)
Basketball Math (G)
Taking Control (8)
Ham Radio & Computers
Ham Math Program

#50 June 88
OS-9 & Basic 09
Media Master (Pgm)
Mysterious Island (G)
Taking Control (9)
Basic Prog.
Improved Word Proc.
Forth & Forth-Editor
Ham Radio & Computers
Improved RTTY Program
Airplane (Game)

#51 July 88
Using Interrupts
Maze (ML Game)
Forth Background
Taking Control (10)
Player Guitar (Prog)
Kwik Kopyur (Disk Ut)
Ham Radio & Computers
Audio Squelch Prog
Hardware
Motor Jump (game)
Bustout (game)

#52 Aug 88
Trio (Three Prog)
COCO III (new series)
HI-Res Screen Saving
With Prog
EDT-MAC (AL Ut.)
Taking Control (11)
Teacher Grade Prog
Ham Radio & Computers
Handy Ham Prog
Hardware (RS-232 Switch)
U.S. States (Prog)
Loan Program

#53 Sept 88
OS-9 & Basic 09
CoCo III (part 2)
Educational TRIO
Neighboring States
Basic Programming
(Direct Access Files)
Direct Access File Pgm
Alien (CoCo 3 game)
Ham Radio & Computers
Bible Quiz

#54 Oct 88
OS-9 & Basic 09
COCO III (Part 3)
(High Resolution Graph)
Squares (game)
Basic Programming
(Using Disk Files)
Grade Program
Flashcard (ED. Prog)
Ping Pong (game)
Ham Radio & Computers
Improved Morse Keyer Pgm
World Map (Pgm)

RAMDISK
for the 512K COCO 3

A **ramdisk** operates similar to a disk drive except it is many times faster. The **512K ramdisk** allows drives 2 and 3 to be ramdisks. You can backup a disk to either ramdisk or select either one for quick program or data loading. **OS-9** is not required. A memory test program is also included. **$15**

DYPRINT

Now you can print **LARGE** signs for special occassions 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.

MAXPRINT allows graphics to be blown up and printed on a standard printer. Any PMODE 4 picture can be printed. 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. Blow up pictures of friends and family generated by the DS-69B digitizer or make posters announcing sales or special events.

The DYPRINT package contains both **BANNER** and **MAXPRINT**. The cost is only **$19.95**

NEW TERMINAL PROGRAM

DYTERM 2 - Allows a Color Computer to interface with **Modems, Terminals**, or other **Computers** using the ASCII port. 300-2400 baud, 1 or 2 Stop bits, 7 or 8 bit words, variable parity. Download programs from bulletin boards or other computers or upload your ASCII programs. Supports **CoCo 2 and CoCo 3 Disk or Tape computers.** Basic program with machine language subroutines is easily modified.

Tape or Disk $19.95.

DECIMAL ML ASSEMBLER

DISASM is a 6809 **Assembler-Disassembler** that allows machine codes to be assembled using English mnemonics & decimal arithmetic. It supports all 6809 codes and is especially useful for beginners. Learn Assembly programming without using hex. Disassemble machine language programs and print them to a printer. **$9.95**

DS-69B DIGITIZER

Capture pictures from your VCR or video camera. Then print them on your graphics printer. Have your friends over for an evening of fun and digitize and print their pictures. Supports all color computers. The picture can be displayed on the COCO 3's high resolution screen. Pictures can be Labeled with **COCO MAX** and printed on a graphics printer or saved on disk. 256 x 256 resolution, 64 levels of grey, & 8 images per second. Plug in ROM pack requires a multipack expander. Works with all color computer disk systems.

DS-69B $149.95 including shipping.

CC-THERM 2

CC-THERM 2 is a **dual digital** thermometer for Radio Shack Color Computers. It consists of two thermistors wired to the end of 10' and 20' flat cables for measuring inside and outside temperatures. The other end of the cable is wired to a joystick plug. The thermistors can be mounted on a wall, inside equipment, or outside for temperature measurements. Basic software on tape or disk continuously prints the temperature in both Fahrenheit and Centigrade. T or D software. **$19.95**

CC-LT

Now you can measure both **temperature** and light. The joystick assembly includes a light and temperature sensor at the end of a 20' flat cable. Uses one joystick plug. T or D Software 19.95.

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. **$19.95.**

MEMORY SAVER 2

Have you ever had a **power failure** or brownout to wipe out your program? The **Memory Saver II** is a **battery** backup assembly that prevents loss of programs due to power failures. It mounts under the keyboard and works with all color computers. Consists of gel recharageable battery, control circuit, & miniature toggle switch. Will **power** a color computer for up to a **couple of hours** during a power failure.

Special sale price. $29.95.

Add $3 S/H. Specify Tape or Disk Software. Checks, VISA, & MC.

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

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 complete with labels, sleeves, and write protect tabs and work on COCO's and MSDOS computers. These are double sided double density disks and will be replaced if defective. DSK-2 $4.95 for package of 10. Add $1.00 S/H. Dynamic Electronics Box 896, Hartselle, AL 35640. (205) 773-2758

THE COLOR JOB DIARY: A Color Computer 3 program that keeps track of customer accounts for any type of business. There is no limit to the number of files. As long as you have the disk space, THE COLOR JOB DIARY can accomodate another file. Epson-compatible printers are suported and a mouse or joystick is required. Cost: $20 plus $3 S/H. Color Alley Coco 3 Products, 1124 Denny Drive, Duluth, MN 55805

Dynamic Color News is now available on tape or disk for $6.95 for 1 month, $35 for 6 months, $60 for 12 months.

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(Rate sheet 3 - March 1988)
Closing 1st of preceeding month. Example: Ad for March issue should be received by Feb. 1.

Pages	1X	3X	6X	12X
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1/2	30	27	25	23
1	40	37	35	33
2	70	65	60	55

We can do titles for your ad in Red, Blue, Green, or Brown. No all one color ads will be accepted. For color ads send artwork for each color and add 30% per color. Example: One page black and red for 3 times costs $37 + 11.20 = $48.20 each month for the three monthss.

Artwork must be camera ready and can be enlarged or reduced at no extra cost. Rates are per page or fraction thereof. We can set up your ad for a reasonable price. Enclose payment with ad copy. Contracts are available. Call or write for a contract form. No X-Rated ads.

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DYNAMIC COLOR NEWS
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Disk or Tape

Now you can have all of our editorials and programs for your tape or disk library. Programs are ready to load and run. We have a variety of programs such as games, geneology, home management, business, and utility programs. The editorials are saved with a 32 column width as a word processor file so you can review them on your screen or print them on your printer. Software is included for viewing the editorials. Combine each part of a series to form a booklet on each subject.

If you are interested in programming then study the examples given in our programming series. Example programs are included on disk or tape. We are covering both basic and assembly (machine language) programming. Suppose you want to use the extra memory in a 64K color computer. Then review the editorials and examples on managing the extra memory and run the memory manager programs.

Do you want to learn to interface your computer using the joystick port? We had a series on this with example programs for making a voltmeter, thermometer,ohmmeter, and light meter.

If your interest is ham radio then we have articles each month since August 1986. We covered Morse code, Antenna design, DX stations, Morse Keyer, Morse Terminal, and Radio Teletype with support programs.

We support the color computer 3 and have given programs for using the memory manager, graphics and error trapping.

All programs are ready to run and complement the editorials in the magazine. We have covered many subjects and there is much more to come. All of our back issues are available on disk or tape. See our cummulative index for a list of subjects. We also have program collections of key programs from past issues. See our advertisement in this issue.

COST

	USA & Can.	Foreign (Air)
1 year	$60.00	$75.00
6 months	35.00	49.00
1 month	6.95	8.95

Back issues are at the same rate. See our Cummulative index for subjects.

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