

RADIO SHACK COLOR COMPUTER  
MAGAZINE

Aug. 1987  
Vol. 4 No. 6

\$1.95

*Games*  
*COCO 3*  
DYNAMIC

*Ham Radio*  
*ML Programming*  
COLOR

*Questions & Answers*  
NEWS  
*Basic Programming*

Ham Radio  
ML Programming  
Color Computer 3

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

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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 our subscribers.

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

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

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*****
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*      DYNAMIC COLOR NEWS      *
*
*      Aug. 1987                *
*
*      Editor and Publisher     *
*      Bill Chapple W4GQC      *
*
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*
*****
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# INTRODUCING DYPRINT

## Color Computer 2

These accessories work on the color computer 2 and the earlier color computers.

## Memory Manager

A 64K computer can only access 32K. The MEMORY MANAGER contains a complete set of software for managing the second 32K memory bank in 64K computers. Run Basic programs in each bank or use the Ramdisk for program storage. Available free with our memory upgrades. \$21.95 Disk or Tape.

## Memory Saver

Battery backup prevents loss of programs due to power failures. Mounts under keyboard. Consists of dry rechargeable battery, control circuit, & miniature toggle switch. Will power a color computer for an hour or more during a power failure. For all models \$39.95

## 128K Memories

Doubles the memory in a 64K computer. Its like having two 64K computers. Select either memory with a small toggle switch. Memory Manager Software is included to allow using the extra 32K for each memory.

ME-10A: Upgrades the new CoCo-2 Computers to 128K. \$39.95

ME-12: Upgrade 8-chip 4164 type 64K computers to 128K. \$39.95

## Distro Ramdisk

A 256K Ram that plugs into a slot on a Multi-Pak expander. Works with all color computers. Copy a disk into the Ram or make multiple copies from the Ram to disks. No modifications to the computer are required. Software is included \$119.95.

## Software

Color Computer 3 Compatible

Dyterm-Terminal Program \$9.95

Disasm-Decimal Assembler/ Dis. \$9.95

## BANNER

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

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

## MAXPRINT

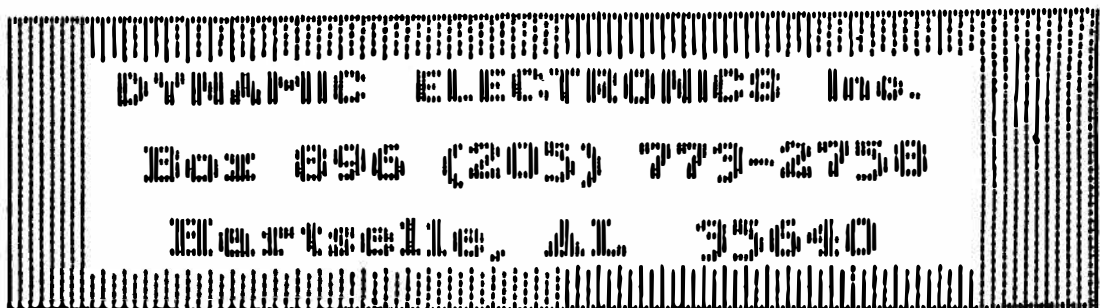
MAXPRINT allows graphics to be blown up and printed on a standard printer. Any PMODE 4 picture generated by OOCOMAX, MAGIGRAPH, VIDEO DIGITIZERS, or BASIC can be printed. This allows a large picture or poster to be made. The program supports all 8 graphics pages for a total of 12288 bytes. MAXPRINT prints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

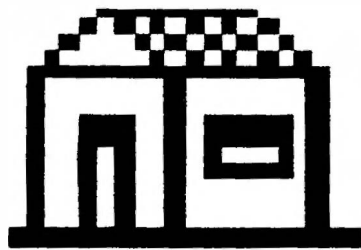
The graphics picture is 256 characters wide and is printed with 2 passes for the 128 character per line mode or 8 passes for the 32 character per line mode using large characters. The results from each pass can be trimmed and taped together to form a large blown up picture.

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

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

Checks, VISA & MC Cards  
Add \$3 Shipping





## How Much ?

# JOB COSTING

Job Costing is a complete job estimating program right down to calculating time and material for different jobs and amounts. A printer is almost essential for this program since it can produce detail estimate reports. All job and materials data can be saved to tape or disk for continued use. The program will automatically dimension itself for 16K or 32K or more. When you get to the main menu, enter 'M' for editing materials. Then enter in all the costs of your materials along with the code #'s. Do the same with the job costing by entering the price of the simple jobs. Enter 'E' to estimate larger jobs and enter 'P' to print the results.

This program is provided by T & D Subscription Software (See their advertisement on page 8) and is used by permission.

```
1 REM COPYRIGHT (C) T&D SOFTWARE
  1987      job costing
2 PMODE0:GOTO60000
50 IFPEEK(116)=&H7F THEN CLEAR80
  00:MM=400:MJ=100 ELSECLEAR150
  0:MM=50:MJ=20
52 DIM MN$(MM),MD$(MM),MU$(MM),M
  C(MM)
54 DIM JN$(MJ),JD$(MJ),JU$(MJ),J
  C(MJ)
55 DIM EQ(14),EC$(14),ET(14)
56 IFPEEK(&HC000)=68 THEN DN=1 E
  LSEDN=-1
57 F1$="%      % ### ##.## $###
  #.##"
58 F2$="% % %      % %
      % #### %      % ###
  #.## $#####.##"
60 CLS:PRINT:PRINT"      job
  costing":PRINT
62 PRINT" THIS BUSINESS PROGRAM
  WILL      ALLOW YOU TO ENTER
  MATERIAL      DESCRIPTIONS, CO
  DE NUMBERS,      AND COSTS INT
  O THE COMPUTER.      YOU CAN AL
  SO ENTER JOB CODE      NUMBERS
  , JOB DESCRIPTIONS,      AND
  JOB COSTS INTO THE      C
  OMPUTER.
64 PRINT" ALL OF THIS DATA MAY B
  E SAVED, LOADED, EDITED, AND
  PRINTED      ON THE PRINTER."
65 GOSUB9000:CLS:PRINT@96
66 PRINT" AFTER ENTERING THE MAT
  ERIALS      AND JOB DATA, YOU C
  AN HAVE THE COMPUTER QUICKLY
  TOTAL UP      AN ESTIMATE.
  ALL YOU HAVE TO      TELL THE C
  OMPUTER IS THE JOB      OR MATE
  RIAL CODE NUMBER, AND      THE
  QUANTITY. ":GOSUB9000
67 CLS:PRINT@128," YOU MAY PUT U
  P TO 13 LINES ON      EACH ESTIM
  ATE. WHEN YOU ARE      DONE EN
  TERING THE JOBS AND      MATE
  RIALS, PRESS 'P' AND THE      C
  OMPLETE ESTIMATE WILL BE
  PRINTED ON YOUR PRINTER IN
  EXPANDED FORM."
68 GOSUB9000
100 CLS:PRINT"      time & mat
  erials      job
  costing
102 PRINT"      menu
104 PRINT
106 PRINT"      I/O DEVICE = "
  ;:IF DN=1 THEN PRINT"disk" EL
  SE PRINT"tape"
108 PRINT
110 PRINT"      C. CHANGE I/O DEV
  ICE      L. LOAD DATA F
  ILE      S. SAVE DAT
  A FILE      M. EDIT
  MATERIALS      J. ED
```

```

IT JOB CODES
ESTIMATE JOB COSTS
Q. QUIT
112 PRINT
114 PRINT"          your choice?
120 K$=INKEY$:IFK$="M" THEN200
121 IF K$="C" THEN 130
122 IFK$="J" THEN 300
123 IF K$="L" THEN 140
124 IFK$="E" THEN 400
125 IF K$="S" THEN 170
126 IF K$="Q" THEN 990
129 GOTO 120
130 IFDN=1 THEN DN=-1 ELSEDN=1
131 GOTO100
140 GOSUB10000:IFF$="" THEN100
142 OPEN"I",#DN,F$:INPUT#DN,NM
144 IF NM=0 THEN 150
145 FOR I=1 TO NM
146 LINE INPUT#DN,MN$(I)
147 LINE INPUT#DN,MD$(I)
148 LINE INPUT#DN,MU$(I):INPUT#D
N,MC(I)
149 NEXT I
150 INPUT#DN,NJ
152 IF NJ=0 THEN 169
154 FOR I=1 TO NJ
156 LINE INPUT#DN,JN$(I)
157 LINE INPUT#DN,JD$(I)
158 LINE INPUT#DN,JU$(I)
159 INPUT#DN,JC(I)
168 NEXT I
169 CLOSE:GOTO100
170 GOSUB10000:IFF$="" THEN100
172 OPEN"O",#DN,F$:PRINT#DN,NM
174 IF NM=0 THEN 180
175 FOR I=1 TO NM
176 PRINT#DN,MN$(I)
177 PRINT#DN,MD$(I)
178 PRINT#DN,MU$(I):PRINT#DN,MC(
I)
179 NEXT I
180 PRINT#DN,NJ
182 IF NJ=0 THEN 199
184 FOR I=1 TO NJ
186 PRINT#DN,JN$(I)
187 PRINT#DN,JD$(I)
188 PRINT#DN,JU$(I)
189 PRINT#DN,JC(I)
198 NEXT I
199 CLOSE:GOTO100
200 CLS:PRINT@64
202 PRINT"          materials menu
"
204 PRINT
206 PRINT"          # OF ENTRIES = ";
NM
208 PRINT
210 PRINT"          A. ADD A MATERIAL
V. VIEW/EDIT M
ATERIALS          P. PRINT LI
ST              R. RETUR
N TO MAIN MENU"
E.
220 K$=INKEY$:IFK$="R" THEN100
222 IF K$="A" THEN 230
224 IF K$="V" THEN 240
226 IF K$="P" THEN 280
229 GOTO 220
230 PF$="MATERIAL":IF NM=MM THEN
220
232 NQ=NM+1:CLS:PRINT@64
234 PRINT"          THIS IS MATERIAL EN
TRY #";NQ
236 PRINT
238 GOSUB 1000:NM=NM+1:MN$(NM)=C
D$:MD$(NM)=DS$:MU$(NM)=UN$:MC
(NM)=CS:GOSUB2000:IFK$="Y" TH
EN 232
239 GOTO 200
240 IF NM=0 THEN 220
241 PT=1
242 CLS:CD$=MN$(PT):DS$=MD$(PT)
243 UN$=MU$(PT):CS=MC(PT)
244 PF$="MATERIAL":GOSUB 3000:GO
SUB 3080
245 IF K$="U" THEN 250
246 IF K$="D" THEN 255
247 IF K$="E" THEN 260
248 IF K$="M" THEN 200
250 IF PT=NM THEN 242
251 PT=PT+1:GOTO242
255 IF PT=1 THEN 242
256 PT=PT-1:GOTO242
260 GOSUB 4000
265 MN$(PT)=CD$:MD$(PT)=DS$
270 MU$(PT)=UN$:MC(PT)=CS
271 GOTO 242
280 IF NM=0 THEN 220
281 PD=-2:GOSUB 7000:GOSUB8000
282 FOR I=1 TO NM:CD$=MN$(I):DS$
=MD$(I):UN$=MU$(I):CS=MC(I):G
OSUB 5000:NEXT
289 GOTO 200
300 CLS:PRINT@64
302 PRINT"          jobs menu
304 PRINT
306 PRINT"          # OF ENTRIES = ";
NJ
308 PRINT
310 PRINT"          A. ADD A JOB TYPE
V. VIEW/EDIT J
OBS          P. PRINT LI
ST              R. RETUR
N TO MAIN MENU
320 K$=INKEY$:IFK$="R" THEN100
322 IF K$="A" THEN 330
324 IF K$="V" THEN 340
326 IF K$="P" THEN 380
329 GOTO 320
330 PF$="JOB":IF NJ=MJ THEN 320
332 NQ=NJ+1:CLS:PRINT@64
334 PRINT"          THIS IS JOB ENTRY #
";NQ
336 PRINT
338 GOSUB 1000:NJ=NJ+1:JN$(NJ)=C
D$:JD$(NJ)=DS$:JU$(NJ)=UN$:JC

```

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ORDERING INFORMATION

Please make check or money order payable to Drayon Software. Washington state residents include 7.5% sales tax.

DRAYON SOFTWARE  
P.O. Box 2516  
Renton, WA 98056

(NJ)=CS:GOSUB2000:IFK\$="Y" TH  
EN332

```
339 GOTO 300
340 IF NJ=0 THEN 320
341 PT=1
342 CLS:CD$=JN$(PT):DS$=JD$(PT)
343 UN$=JU$(PT):CS=JC(PT)
344 PF$="JOB":GOSUB 3000:GOSUB 3
    080
345 IF K$="U" THEN 350
346 IF K$="D" THEN 355
347 IF K$="E" THEN 360
348 IF K$="M" THEN 300
350 IF PT=NJ THEN 342
351 PT=PT+1:GOTO342
355 IF PT=1 THEN 342
356 PT=PT-1:GOTO342
360 GOSUB 4000
365 JN$(PT)=CD$:JD$(PT)=DS$
370 JU$(PT)=UN$:JC(PT)=CS
371 GOTO 342
380 IF NJ=0 THEN 320
381 PD=-2:GOSUB7500:GOSUB8000
382 FORI=1 TO NM:CD$=JN$(I):DS$=
    JD$(I):UN$=JU$(I):CS=MC(I):GO
    SUB 5000:NEXT
389 GOTO 300
400 TL=0:NE=0
402 CLS:PRINT"   time & material
    s estimate":PRINT
410 PRINT@488,USING"TOTAL $####
    .##";TL;:PRINT@448," <J>OB,
    <M>ATERIAL, <P>RINT";
412 K$=INKEY$:IFK$="M" THEN420
414 IF K$="J" THEN 440
416 IF K$="P" THEN 500
419 GOTO 412
420 NQ=NE+1:PP=NQ*32
421 IF NQ=14 THEN412
422 PRINT@448,STRING$(31,32);:PR
    INT@448,"ENTER MATERIAL CODE:
    ";:LINE INPUT L$:PRINT@448,S
    TRING$(31,32);
423 IF L$="" THEN 410
424 PRINT@448,"ENTER QUANTITY: "
    ;:LINE INPUT Q$
425 NE=NE+1:EC$(NE)=L$
426 EQ(NE)=VAL(Q$):ET(NE)=0
430 EC$=EC$(NE):GOSUB 6000
432 IF F=0 THEN NE=NE-1:GOTO410
433 PRINT@PP,USING F1$;MN$(F);EQ
    (NE);MC(F);EQ(NE)*MC(F)
434 TL=TL+EQ(NE)*MC(F)
439 GOTO410
440 NQ=NE+1:PP=NQ*32
441 IF NQ=14 THEN412
442 PRINT@448,STRING$(31,32);:PR
    INT@448,"ENTER JOB CODE: ";:L
    INE INPUT L$:PRINT@448,STRING
    $(31,32);
443 IF L$="" THEN 410
444 PRINT@448,"ENTER QUANTITY: "
    ;:LINE INPUT Q$
445 NE=NE+1:EC$(NE)=L$
```

```

446 EQ(NE)=VAL(Q$):ET(NE)=1
450 EC$=EC$(NE):GOSUB 6500
452 IF F=0 THEN NE=NE-1:GOTO 410
453 PRINT@PP,USING F1$;JN$(F);EQ
    (NE);JC(F);EQ(NE)*JC(F)
454 TL=TL+EQ(NE)*JC(F)
459 GOTO 410
500 TL=0:IF NE=0 THEN 100
510 PD=-2
520 PRINT#PD:PRINT#PD,"
    TIME & MATERIALS
    ESTIMATE"
530 PRINT#PD
532 PRINT#PD,"      CODE NO.
    DESCRIPTION      QTY.      UNIT
    COST/UNIT      TOTAL"
533 PRINT#PD,"      -----
    -----
    -----"
540 FOR II=1 TO NE
550 EC$=EC$(II):T=ET(II)
560 IF T=0 THEN GOSUB6000 ELSE G
    OSUB 6500
565 IF F=0 THEN 590
570 IF T=0 THEN TQ=MC(F)*EQ(II):
    PRINT#PD,USING F2$;"MAT";MN$(
    F);MD$(F);EQ(II);MU$(F);MC(F)
    ;TQ ELSE TQ=JC(F)*EQ(II):PRIN
    T#PD,USING F2$;"JOB";JN$(F);J
    D$(F);EQ(II);JU$(F);JC(F);TQ
580 TL=TL+TQ
590 NEXT II
595 PRINT#PD
597 PRINT#PD,"
    TOTAL ";:PRINT#PD,USING
    "$#####.##";TL
599 PRINT#PD:GOTO 100
990 CLS:PRINT@230,"ok to quit? y
/n"
991 K$=INKEY$:IFK$="N" THEN 100
992 IFK$<>"Y" THEN 991
999 END
1000 PRINTPF$;:LINE INPUT " CODE
: ";CD$:PRINTPF$;:LINE INPUT
" DESCRIPTION: ";DS$
1010 PRINTPF$;:LINE INPUT " UNIT
: ";UN$:PRINTPF$;:LINE INPUT
" COST PER UNIT: ";Q$:CS=VAL(
Q$)
1099 RETURN
2000 PRINT
2010 PRINT"      enter another?
y/n"
2020 K$=INKEY$:IFK$<>"Y" AND K$<
>"N" THEN 2020
2099 RETURN
3000 PRINT@32
3010 PRINT "      ";PF$;" #P
T:PRINT:PRINT
3020 PRINT
3030 PRINT" CODE      : ";C
D$

```

```

3040 PRINT" DESCRIPTION : ";D
S$
3050 PRINT" UNIT : ";U
N$
3060 PRINT" COST PER UNIT : ";:
PRINT USING"$ #####.##";CS
3070 PRINT
3075 PRINT
3079 RETURN
3080 PRINT" <U>P/<D>OWN/<E>DIT
/<M>ENU"
3090 K$=INKEY$:IFK$<>"U" AND K$<
>"D" AND K$<>"E" AND K$<>"M"
THEN 3090
3099 RETURN
4000 PRINT@384,STRING$(31,32);
4010 PRINT@384," PRESS 1-4 TO
EDIT. <Q>UIT"
4020 FORI=1TO4:PRINT@160+I*32,US
ING"##";I;:NEXT
4030 K$=INKEY$:IFK$="Q" THEN4090
4035 K=VAL(K$):IFK<1 OR K>4 THEN
4030
4040 PRINT@160+K*32+18,"";:LINE
INPUT L$
4045 ON K GOTO 4046,4047,4048,40
49
4046 CD$=L$:GOTO 4050
4047 DS$=L$:GOTO 4050
4048 UN$=L$:GOTO 4050
4049 CS=VAL(L$):GOTO 4050
4050 CLS:GOSUB3000:GOTO4000
4090 RETURN
5000 PRINT#PD,USING"% % %
% %
% $#####.##";CD$;DS$;UN$;CS
5099 RETURN
6000 F=0:IF NM=0 THEN RETURN
6010 FOR I=1 TO NM
6020 IF MN$(I)=EC$ THEN F=I:I=10
00
6099 NEXT:RETURN
6500 F=0:IF NJ=0 THEN RETURN
6510 FOR I=1 TO NJ
6520 IF JN$(I)=EC$ THEN F=I:I=10
00
6599 NEXT:RETURN
7000 PRINT#PD:PRINT#PD,"
MATERIALS LIST":PRIN
T#PD:RETURN
7500 PRINT#PD:PRINT#PD,"
JOBS LIST":PRINT#
PD:RETURN
8000 PRINT#PD," CODE      DES
CRIPTION      UNIT      C
OST/UNIT"
8099 RETURN
9000 PRINT@484,"press [enter] to
continue";
9010 IFINKEY$<>CHR$(13) THEN 901
0 ELSE RETURN
10000 CLS:PRINT@232,"filename: "
;:LINE INPUT F$:RETURN
60000 PCLEAR1:GOTO 50

```

HI: 009900  
SCORE: 000250

LEVEL: 1  
ROUND: 1



JUMP <PAUSING> CMP

Introduction

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

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

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# ML Programming

by  
John Galus

## Part 15

### Floating Point Math

We can use the math routines contained in the Color Computers Basic ROM in our Assembly language program and in this part of the series I will show how this is done. Basic math operations are all performed in what is called a Floating Point (FP) format. Before any number is placed into a Basic variable or mathematically worked on, it is placed into a FP format. A FP formatted number is a five byte number consisting of a one byte Exponent or magnitude of the number and four bytes called the mantissa that represent the number itself. A FP number is something like the Scientific notation that we use except the numbers are in binary (1 or 0) and not decimal. For example the number 10 to the second power equals  $10 \times 10$  or 100 while, the value 2 to the second power is  $2 \times 2$  or 4. The most significant bit of the most significant byte of the mantissa holds the sign of the FP number. If this bit is on (it is one) then the number is negative, if not the number is positive or zero. The Exponent has \$80 added to it. For example the number +2 is represented in FP notation as follows:

```
$82 00 00 00 00
```

While the number -2 would look like this:

```
$82 80 00 00 00
```

Here is a short Basic program that will allow you to examine FP numbers held in Basic variables.

```
10 CLS
20 INPUT"NUMBER ";N
30 PRINT"FP NUMBER IS : "
40 I=VARPTR(N)
50 FOR X=I TO I+4
60 PRINTHEX$(PEEK(I));" ";:NEXT
70 GOTO20
```

All numbers before they are worked on are placed in a zero page area known as the FP Accumulators. These FP accumulators are used when Basic performs one of its math functions. As you know the Color computer can perform addition, subtraction, multiplication, and division. It performs these functions at the follow addresses in the Basic ROM:

ADDITION:	\$B9C2
SUBTRACTION:	\$B9B9
MULTIPLY:	\$BACA
DIVISION:	\$BB8F

Basic performs an operation by pointing the "X" index register to one of the numbers it wants to work with and performs the operation with the other number held in the FP accumulator. To use this method the numbers we work with must be in FP notation. You can use the Basic listing above to get the FP value of a number needed. Here is an example in which we will

convert a number expressed in radians into degrees:

DEG=2 RAD=57.29577951

```
LDX #RAD ;POINT TO RAD
JSR $BC14 ;BUT IN FPAC1
LDX #NUM ;POINT TO NUM
JSR $BACA ;MULTIPLY
LDX #NUM ;POINT TO VAR
JSR $BC35 ;SAVE NEW NUM
JSR $BDD9 ;CHANGE TO STR$
JSR $B516 ;TO STR$ STACK
JSR $B99F ;PRINT IT
JSR $B958 ;PRINT A <CR>
SWI RAD FDB $8665 ;FP NUMBER
RAD
FDB $2EE0
FCB $D5 NUM FDB $8200 ;
NUMBER TWO
FDB 0
FDB 0
END
```

Notice that after the calculation I place the result back into the area reserved for the FP number using the ROM subroutine located at \$BC35. The answer to any math operation is always left in the FP accumulator. You could use this fact to perform any number of math operations one after another. It is not always convenient to convert numbers to FP notation and work on them in that form, we can use these math routines with numbers held in the 6809's registers but, here we will be restricted to integer or whole numbers. Here we will do a simple division using this method:

150/10

```
LDD #150
JSR $B4F4 ;D INTO FPAC1
JSR $BC2A ;PUT IN SCRATCH
LDD #10
JSR $B4F4
LDX #$0045 ;POINT - SCRATCH
JSR $BB8F ;DIVIDE
JSR $B3ED ;GET # INTO D
JSR $BDCC ;PRINT # IN D
JSR $B958 ;PRINT <CR>
SWI
END
```

Here is an example of how we could use the Basic Input ROM routine to input numbers into a Assembly language program.

```
JSR $A390 ;LINE INPUT
LDX #$2DD ;POINT TO BUFFER
STX $A6 ;BASIC POINTER
JSR $B73D ;GET VALUE INTO X
TFR X,D ;PUT IN D
JSR $BDCC ;PRINT IT
JSR $B958
SWI
END
```

I will leave it up to you to use the above input routine to combine with the other routines to perform a math operation. As you can see from the listing we use a number of ROM subroutines to help us perform these operations. Below is a table that explains these ROM subroutine functions.

BC14 - PLACES VALUE POINTED TO BY X REGISTER INTO FPAC1  
B4F4 - PLACES VALUE IN D REGISTER INTO FPAC1  
B3ED - GETS VALUE IN FPAC1 AND PLACES IT INTO D REGISTER  
BDCC - PRINTS VALUE IN D REGISTER (ALL REGISTERS VALUES DESTROYED)  
BDD9 - CONVERT NUMBER IN FPAC1 TO ASCII  
BC2A - MOVE NUMBER INTO SCRATCH MEMORY AT \$45  
B516 - STORE NUMBER IN STRING STACK FOR PRINT  
B99F - PRINT STRING  
B73D - GET BASIC NUMBER INTO X REGISTER  
A390 - LINE INPUT  
BC35 - STORE NUMBER IN FPAC1 INTO FIVE BYTE MEMORY POSITION  
B958 - PRINT A CARRIAGE RETURN

Look for more information on other ROM subroutines in future issues of the DYNAMIC COLOR NEWS.

### OPERATING HINT

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

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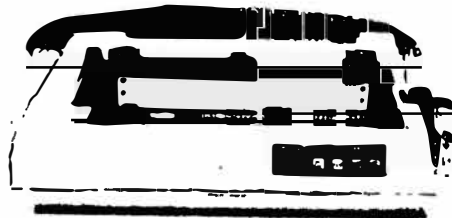
# SEIKOSHA PRINTERS

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# BASIC PROGRAMMING

## *Sorting Disk Files*

In this series we have been showing how to write basic programs. There is much interest in programs for 256K and larger memories. The Banker, Thunder and Disto Rams allowed the earlier computers to be upgraded to 256K and 512K. With 256K there is enough memory to support one ramdisk and two ramdisks can be obtained with 512K of memory. A ramdisk works just like a disk drive except it is about 20 times faster. You can store and quickly load programs with a ramdisk. The color computer 3 can easily be upgraded to 512K.

Unfortunately the newer color computer 2 uses 4464 chips and will not accept the Banker ram. However the Disto ram is in a plug in cartridge and can be used with any color computer with a multi-pak interface. This is what we use with our color computer 2. Our color computer 3 has 512K of ram which can be used as two ramdisks.

To be consistent with all computers, the extra memory can be used for storing files. Back in February we presented an address file program and had plans to expand it so that we could store files in a ramdisk or disk. This month we have worked out the bugs and have a program that will allow 10 files to be stored in a ramdisk. Each file contains 100 names. The program automatically loads the files one at a time and sorts them. New files are created on the disk during the procedure. The program works with a disk drive or ramdisk. So if you need a large address file, then the program we presented in February can be used to create the files, and the program this month will sort and chain print all of them.

### *Disk File Sort Program*

This program requires machine language subroutines. These are contained in data statements and use memory from 510 to 570. The data is placed into memory by line 70. When the program is run a menu appears as follows:

- 1 SORT FILES
- 2 PRINT FILES
- 3 INSTRUCTIONS
- 4 COLOR COMPUTER 2

For the color computer 3 select 4 and the menu will again be printed with COLOR COMPUTER 3 for the fourth selection. This stores a value in memory 499 which is used to switch to the high speed mode when files are sorted.

When 3 is selected from the menu, instructions are printed on the screen. These explain the format for the files. Files should be on the disk or ramdisk as X0, X1, X2, up to X9. Options 1 and 2 are used for sorting or printing the files.

Line 170 gives the branch locations for the menu options. Sorting starts at line 470. After selecting the item on which to sort, the files are compressed by the subroutine starting at line 820. In the compression process, files of less than 100 names are combined with other files. The resulting files will all contain 100 names except the last one.

The sorting takes place from 560 to 800. We put print commands in the program to show what is happening. Notice the two FOR-NEXT loops starting at 570 and 590. We compare X0 with each of the other files and end up with X0 containing the smallest values in ascending order.

Next we compare X1 with the remaining files and generate a new X1. This continues until all files are sorted.

Each file contains 100 names. We combine 2 files and sort the combination. The lower file will contain the lowest order names. We exchange the files and save the lower file. We then load another file, exchange them, and sort both. Again exchange files and save the lower with the upper containing the smallest ordered names. This procedure continues until the last file is sorted.

Subroutines are as follows:

- 1160 Exchange files
- 1210 Move file to lower memory
- 1260 Move file to upper memory
- 1300 Sort both files (high using high speed mode)

The lower file occupies memory from 9999 to 19999 and the value in 9999 is the number for the number of files. The upper file occupies memory from 20000 to 29999 and the value in 9998 is the number of upper files.

The print routine is designed to print the files on address labels. This starts in line 200. After entering the print parameters, the files are chain loaded and printed. Some addresses take 3 lines and some take 4 lines. The program allows for this and adds line feeds as required so that each address requires 6 lines which is standard for address labels.

```

10 'THIS IS SORT 7-16
20 CLS
30 POKE14*256,0:IF PEEK(25)<>14
  THEN POKE25,14:RUN"SORTA
40 PRINT"ADDRESS FILE SORT PROGR
  AM
50 PRINT"COPYRIGHT (c) 1987
60 PRINT"DYNAMIC ELECTRONICS INC
70 FOR XA=510 TO 570:READ A:POKE
  XA,A:NEXT XA 'LOAD ML SUBROU
  TINE
80 NF=PEEK(9999)
90 CLS:PRINT"1 SORT FILES
100 PRINT"2 PRINT FILES

```

```

110 PRINT"3 INSTRUCTIONS
120 X=PEEK(499):IF X=2 THEN X$="
  3" ELSE X$="2
130 PRINT"4 COLOR COMPUTER "X$
140 PRINT"PRESS NUMBER
150 Z$=INKEY$:IF Z$=""THEN 150
160 Z=VAL(Z$)
170 ON Z GOTO470,200,1530,180
180 X=X+2:IF X>3 THEN X=0
190 POKE 499,X:GOTO80
200 PRINT"THIS PRINTS THE FILES
  ON 6 LINES FOR LABELS
210 INPUT"ENTER 1 FOR DIRECTORY"
  ;D:IF D=1 THEN DIR
220 INPUT"NUMBER OF FILES";W
230 FOR Q=0 TO W-1:Q$=RIGHT$(STR
  $(Q),1):Q$="X"+Q$:LOADM Q$:PR
  INT"LOADING "Q$
240 CLS:F=PEEK(9999):PRINT"THERE
  ARE "F "FILES IN "Q$
250 '
260 FOR R=0 TO F-1 'BEGINNING OF
  PRINT LOOP
270 PRINT:PRINT:PRINT
280 PP=0:M=10000+100*R:PRINT"THI
  S IF FILE #"R:X=45:J=0:W=1
290 CR=0:FOR PQ=M TO M+44:A=PEEK
  (PQ):IF A=13 THEN CR=CR+1
300 NEXT PQ:GOSUB 410:PRINT#-2,"
  "
310 X=15:FORJ=3TO4:W=J+1:GOSUB 4
  10
320 IF J=3 THEN PRINT#-2,", "":;G
  OTO350
330 IF J=4 THEN PRINT#-2," "":;GO
  TO350
340 PRINT#-2," "
350 NEXT J
360 X=10:M=M+75:J=0:W=6:GOSUB 41
  0:PRINT#-2," "
370 J=0:W=7:M=M+10:IF TN>0THENGO
  SUB 410
380 PRINT#-2,CHR$(13):IF CR=1 TH
  EN PRINT#-2," "
390 NEXT R:NEXTQ
400 PRINT"LAST FILE IS PRINTED":
  END
410 PRINTW;:FOR K=0 TO X-1:AX=M+
  X*J+K
420 A=PEEK(AX):B=PEEK(AX+1):IF A
  =32 AND B=32 THEN 450
430 A$=CHR$(A):PRINTA$;:PRINT#-2
  ,A$;
440 NEXT K
450 PRINT:RETURN
460 '
470 PRINT"THIS SORTS THE FILES":
  PRINT"N NAME SORT":PRINT"TE
  LEPHONE SORT":PRINT"Z ZIP COD
  E SORT":PRINT"PRESS M FOR MEN
  U

```

```

480 S$=INKEY$:IF S$="" THEN 480
490 S=10000
500 IF S$="N" THEN OS=0:N$="NAME
S
510 IF S$="T" THEN OS=85:N$="TEL
EPHONE NUMBERS
520 IF S$="Z" THEN OS=60:N$="ZIP
CODES
530 PRINT"SORTING ON "N$:DIR
540 INPUT"ENTER THE NUMBER OF TH
E FILES ON THE DISK";LF
550 GOSUB 820 'COMPRESS DISK FIL
ES
560 FOR QQ=0 TO W
570 LOADM J$(QQ): GOSUB1260 'PUT
IN UPPER MEM
580 'J1$ IN UPPER MEMORY
590 FOR K=QQ+1 TO W
600 PRINTJ$(QQ),J$(K)
610 LOADM J$(K): GOSUB 1160 'EXC
HANGE FILES
620 PRINT"EXCHANGING FILES
630 '
640 PRINT"SORTING BOTH FILE
S
650 A=PEEK(9999):B=PEEK(9998):NF
=A+B:GOSUB 1300
660 '
670 PRINT"BREAKING INTO 2 F
ILES
680 A=PEEK(9999):B=PEEK(9998): '
BREAK INTO 2 FILES
690 PRINT"THERE ARE"A" LOWE
R FILES AND "B" UPPER FILES
700 PRINT"EXCHANGING FILES
710 GOSUB 1160 'EXCHANGE FILES
720 POKE 9999,B:POKE9998,A
730 EN=10000+100*B-1:BE=9999
740 PRINT"BE="BE" EN="EN" T
HERE ARE "B" FILES. NAME OF F
ILE IS "J$(K)
750 SAVEM J$(K),BE,EN,BE:PRINT"S
AVING "J$(K)
760 NEXT K
770 EN=9999+100*PEEK(9999):BE=99
99:SAVEM J$(QQ),BE,EN,BE:PRIN
T"SAVING "J$(QQ)
780 NEXT QQ
790 PRINT"SORTING IS COMPLETED
800 END
810 '
820 PRINT"THIS CHECKS AND COMPRE
SS THE FILES
830 POKE 9998,0:W=0:FOR J=0 TO L
F-1
840 'ESTABLISH NAMES OF DISK FIL
ES
850 J$=RIGHT$(STR$(J),1):J$(J)="
X"+J$:PRINTJ;J$(J)" 5310":NEX
TJ
860 FOR J=0 TO LF-1

```

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sor will handle all of your  
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```

870 LOADM J$(J):A=PEEK(9999):PRI
NT"5312 THERE ARE "A"LOWER FI
LES
880 PRINT"LOADING "J$(J)
890 IF A=0 THEN 870
900 A=PEEK(9999):B=PEEK(9998)
910 PRINT"THESE ARE "B "UPP
ER AND "A" LOWER FILES
920 P$=J$(J)+"/BIN":KILL P$:PRIN
T"KILLING" P$
930 IF A=100 THEN 1010
940 PRINT"THESE ARE "A" LOWER
FILES AND "B" UPPER FILES
950 PRINT"COMBINE FILES
960 GOSUB 1080
970 A=PEEK(9999):IF A=100 THEN 1
010
980 PRINT"<100 COMBINED FILES
990 PRINT"MOVING FILE TO UPPER M
EM
1000 GOSUB 1270:GOTO 1030
1010 BE=9999:EN=9999+100*A:SAVEM
J$(W),BE,EN,BE
1020 PRINT"SAVING "J$(W):W=W+1
1030 NEXT J
1040 GO SUB 1220:LF=W 'MOVE UPPE
R TO LOWER
1050 A=PEEK(9999):BE=9999:EN=999
9+100*A:SAVEM J$(W),BE,EN,BE:
PRINT"THESE ARE "A" FILES IN
"J$(W):RETURN
1060 '
1070 'COMPRESS FILES
1080 A=PEEK(9999):IF A=100 THEN
RETURN
1090 XX=20000:GOSUB1520:POKE500,
MS:POKE501,LS:B=PEEK(9998):XX
=20000+100*B:GOSUB1520
1100 POKE502,MS:POKE503,LS:XX=10
000+100*A:GOSUB1520:POKE504,M
S:POKE505,LS:EXEC531:C=A+B:D=
C-100
1110 IF D<=0 THEN POKE 9998,0:PO
KE 9999,C:GOTO1130
1120 POKE 9998,D:POKE 9999,100
1130 PRINT"THESE ARE"(A+B)"FILES
COMBINED":RETURN
1140 '
1150 'EXCHANGE FILES
1160 XX=10000:GOSUB 1520:POKE500
,MS:POKE501,LS:XX=19999
1170 GOSUB 1520:POKE502,MS:POKE5
03,LS:XX=20000:GOSUB 1520
1180 POKE 504,MS:POKE505,LS:A=PE
EK(9998):B=PEEK(9999)
1190 POKE9998,B:POKE9999,A:EXEC5
10:RETURN
1200 '
1210 'MOVE FILE TO LOWER MEM
1220 NF=PEEK(9998):XX=20000:GOSU
B1520:POKE500,MS:POKE501,LS

```

```

1230 XX=29999:GOSUB 1520:POKE502
,MS:POKE503,LS:XX=10000
1240 GOSUB1520:POKE504,MS:POKE50
5,LS:EXEC531:POKE9999,NF:POKE
9998,0:RETURN
1250 '
1260 'MOVE FILE TO UPPER MEMORY
1270 NF=PEEK(9999):XX=10000:GOSU
B 1520:POKE500,MS:POKE501,LS:
XX=19999:GOSUB 1520:POKE502,M
S:POKE503,LS:XX=20000:GOSUB15
20:POKE504,MS:POKE505,LS
1280 EXEC 531:A=PEEK(9999):POKE
9998,A:POKE9999,0:RETURN
1290 '
1300 'SORT ROUTINE
1310 POKE 65495+PEEK(499),0:PRIN
T"HIGH SPEED
1320 X=NF-1:Y=X
1330 Y=INT(Y/2):V=X-Y:CC=0:B1=1
1340 AA=0:B1=1
1350 FOR J=CC TO V:P=10000+100*J
+OS:Q=10000+100*(Y+J)+OS
1360 PRINTJ:J+Y
1370 FOR L=0 TO 8
1380 M1=P+L:M2=Q+L:A=PEEK(M1):B=
PEEK(M2)
1390 IF A<B THEN GOTO 1430
1400 IF A=B THEN 1420
1410 GO SUB 1470:AA=AA+1:GOTO 14
30
1420 NEXT L
1430 NEXT J:IF AA>0 THEN GOTO 13
40
1440 IF Y>1 THEN 1330
1450 PRINT"DISABLING HIGH SPEED"
:POKE65494+PEEK(499),0
1460 RETURN
1470 PRINT"EX "J" AND "(J+Y)
1480 IF B1=1 THEN CC=J:B1=0
1490 P1=P-OS:Q1=Q-OS
1500 XX=P1:GOSUB 1520:POKE500,MS
:POKE501,LS:XX=P1+99:GOSUB 15
20:POKE 502,MS:POKE503,LS:XX=
Q1:GOSUB 1520:POKE 504,MS:POK
E505,LS
1510 EXEC 510:RETURN
1520 MS=INT(XX/256):LS=XX-256*MS
:RETURN
1530 '
1540 CLS:PRINT"THESE ARE INSTRU
CTIONS. FILES":PRINT"SHOULD BE
LABELLED X0,X1,...X9.
1550 PRINT"EITHER A DISK DRIVE O
R RAMDISK":PRINT"CAN BE USED.
ONLY USE A BACKUP
1560 PRINT"COPY AS FILES ARE REW
ITTEN ON":PRINT"THE DISK OR
RAMDISK. ALL FILES
1570 PRINT"CAN BE CHAIN LOADED A
ND PRINTED":PRINT"BY USING TH
E PRINT OPTION.

```



```

1580 PRINT"THIS PROGRAM IS CC-3
      COMPATIBLE
1590 INPUT"PRESS ENTER FOR MENU"
      ;P:CLS:GOTO90
1600 END
1610 '
1620 DATA190,1,244,16,190,1,248,
      166,132,230,164,167,160,231,1
      28
1630 '

```

```

1640 DATA 188,1,246,35,243,57
1650 '
1660 DATA 190,1,244,16,190,1,248
      ,166,128,167,160,188,1,246,45
      ,247,57,57,57
1670 'EXG DATA
1680 DATA 190,1,244,16,190,1,248
      ,166,132,230,164,167,160,231,
      128,188,1,246,45,236,57,

```

# HAM RADIO & COMPUTERS

by

**Bill Chapple W4GQC**

Each month we look at software or hardware that can be used for ham radio applications. Last month we finished a Morse code terminal. There is quite a demand for software for color computers especially for packet radio.

The Radio Shack Color Computers can easily be adapted to various modes of operation for ham radio use. The cassette port inputs audio similar to the level obtained at the earphone jack of a transceiver. It also outputs audio that can be fed into the microphone jack of a transmitter. Our next hardware approach will be to use this port for interfacing. Our previous efforts were directed toward using the printer port. This had the advantage that the interface would work with any computer that had an RS232 port.

Some of the software we have previously developed is useful for jumping from one program to another. This software allows programs to be retained in memory. As we add more software this may be of interest. We presented 2 methods of doing this. In our very first issue we presented the MULTIPROGRAM MANAGER. This allowed up to 5 programs to be stacked within a 32K memory bank. Later we developed a ramdisk which used the

second 32K bank in a 64K computer for storing programs. Either of these will allow you to quickly jump from one program to another and both were developed and presented in Dynamic Color News.

I want to thank each of you who have shown an interest in this section. As stated last month I am going to adjust my schedule so that I will have more time for this section. As I have stated before, the information we are presenting is about color computers but is directed toward ham radio applications. We have readers who are not hams and this is the reason I explain the ham terms as they are used.

As an example a radio log is a history of information regarding a radio contact. The program could be modified to provide a personnel summary of employees. We could just rearrange our titles and have a different application for the program.

While on the subject of versatility, our RS232 interface port could be used for many other applications beside Morse code. As an example the presence of a tone could keep a device turned on. The interface circuit changes the tone to a voltage which the computer can

use to turn on the cassette relay which can control a device.

Also the information we are presenting could be applied to other computers. Last month we started handling IBM clones. They have RS-232 serial ports and our interface circuit could be used with them.

This month we have a log program. The program will work on a color computer 3. In fact all of our programs will work on the color computer 3 unless stated otherwise. A log contains information about stations contacted. With a log we would like to look back and see when or if we have contacted or worked a certain station. As an example suppose you hear a German station DL7FF sending CQ. You use the log's search feature to find the station's call letters. If the station is in your log, then information about the station will be displayed.

We would also like to load and save data to a cassette or disk. These options are included in the program. Also stations can be added to the log and all of the stations can be reviewed.

To make it easy items such as the date, your power, frequency band, and type emission may remain the same from one contact (QSO) to another. The computer asks for the name of the item to enter. If there is no change from the previous entry, then press the ENTER key and the previous values will be entered.

When the program is run the following menu appears:

- 1 ERASE ALL INFORMATION
- 2 SEARCH FOR A STATION
- 3 ADD A STATION
- 4 REVIEW LOG
- 5 LOAD OR SAVE LOG

To initialize the log select "1". When "2" is selected, you will be prompted for the call letters of the station for which you want to search. After pressing enter, the information about the station will be printed on the screen if it is in the log.

To add a station select "3" and enter the information as it is asked. Selecting "4" allows all stations in the log to be displayed one at a time. Press ENTER for the next station. When "5" is selected you will be presented another menu that allows loading and saving data to a cassette or disk. Just answer the questions as they are asked.

## Ham Radio Log

```
2 PCLEAR1:CLS
4 FOR J=510 TO 528:READ A:POKEJ,
  A:NEXTJ 'ML SUB
6 DIM X$(13),Y$(13):FOR J=1 TO 1
  2:READ X$(J):NEXT J 'LABELS F
  OR ITEMS
10 PRINT:PRINT"HAM RADIO LOG
20 PRINT"COPYRIGHT (c) 1987
30 PRINT"dYNAMIC eLECTRONICS iNC
40 PRINT
50 PRINT"1 ERASE ALL INFORMATION
  ""800
60 PRINT"2 SEARCH FOR A STATION"
  '2000
70 PRINT"3 ADD A STATION""4000
75 PRINT"4 REVIEW LOG""6000
77 PRINT"5 LOAD OR SAVE LOG""800
  0
80 X$=INKEY$:IF X$=""THEN80 'WAI
  T FOR PRESSED KEY
90 X=VAL(X$):ONX GOTO 800,2000,4
  000,6000,8000
100 GOTO80
800 POKE 9998,39:POKE9999,16 'PU
  T ENDING VECTOR TO=10000
810 PRINT"INFORMATION IS ERASED"
  :GOTO40
1999'
2000 PRINT"THIS SEARCHES FOR A S
  TATION
2010 INPUT"ENTER STATION CALL":Y
  $(1):V$=Y$(1):Q$=LEFT$(V$,1):
  Q=ASC(Q$):POKE500,Q
2020 L=LEN(V$):M=10000:E=256*PEE
  K(9998)+PEEK(9999):POKE 9996,
  39:POKE9997,16
2022 EXEC510:M=256*PEEK(9996)+PE
  EK(9997)-1:IFM<E THEN 2030
2023 IF M>=E THEN 2200
2024 M=M+2:MS=INT(M/256):LS=M-25
  6*MS:POKE9996,MS:POKE9997,LS:
  GOTO2022
2030 V=M:GOSUB 2500:IF U=0 THEN
  2024
2040 IF U=1 THEN M=V:CLS:GOSUB 6
  020 'PRINT THE DATA
```

```

2050 PRINT:PRINT"1 FOR NEXT OCCU
RRANCE"
2060 Z$=INKEY$:IF Z$=""THEN2060
2070 Z=VAL(Z$):IF Z=0 THEN GOTO
10
2080 M=M+L:GOTO2022
2200 PRINT"THIS IS THE END OF DA
TA":INPUT"PRESS ENTER";E:GOTO
10
2499 '
2500 FOR J=1 TO L 'THIS CHECKS F
OR A MATCH
2510 A$=MID$(V$,J,1):A=ASC(A$)
2520 B=PEEK(M):IF A<>B THEN 2550
2530 M=M+1:NEXT J
2540 U=1:RETURN
2550 U=0:RETURN
3999 '
4000 PRINT:PRINT"THIS ADDS A STA
TION TO THE LOG
4002 PRINT"ENTER NEW DATA OR PRE
SS ENTER TO PRESERVE THE OLD
DATA
4003 M=256*PEEK(9998)+PEEK(9999)
+1'MARK BEG OF NEW DATA
4009 '
4010 FOR J=1 TO 12
4020 PRINTX$(J)": "Y$(J)
4030 LINE INPUT P$
4040 IF P$="" THEN 4055
4050 Y$(J)=P$
4055 GOSUB 4410:POKE M,58:M=M+1
'SEPERATE ITEMS WITH A :
4060 NEXT J
4070 M=M-1:POKE M,0:MS=INT(M/256
):LS=M-256*MS:POKE 9998,MS:PO
KE 9999,LS:GOTO10 'ERASE : &
PUT 0 FOR END
4399 '
4400 'THIS BREAKS STRINGS DOWN &
STORES IN MEMORY
4410 L=LEN(Y$(J))
4420 FOR AA=1 TO L:A$=MID$(Y$(J)
,AA,1):A=ASC(A$)
4430 POKE M,A:M=M+1:NEXT AA:RETU
RN
5999 '
6000 PRINT"THIS REVIEWS THE LOG
6010 M=10000:E=256*PEEK(9998)+PE
EK(9999)
6015 FOR K=1 TO 13:Y$(K)="" :NEXT
K
6016 GOSUB 6020:GOTO6065
6020 PRINT:FOR J=1 TO 12:P$=""
6025 IF M>=E THEN 6100 'CHECK FO
R END OF DATA
6030 A=PEEK(M):A$=CHR$(A):IF A$=
"" THEN 6050
6035 IF A=0 THEN 6050

```

## ***Ham Radio Programs***

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

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

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

Order HR-1 (3 programs) \$11.95

## ***Morse Terminal***

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

## ***Station Log***

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

## ***Thermometer***

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

## ***Memory Saver 2***

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

## ***Memory Manager***

Allows using the second 32K memory bank for 64K color computer 2 and earlier computers. Configure the second bank for a ramdisk and quickly load and run programs. Not for the COCO 3 \$19.95

All programs are color computer 3 compatible unless indicated and are on tape or disk. Please specify tape or disk software. Checks, VISA or MC, Add \$3 ship.

DYNAMIC ELECTRONICS Inc.

Box 896 (205) 773-2758

Hartselle, AL 35640

```

6040 P$=P$+A$:M=M+1:GOTO 6030
6050 Y$(J)=P$:PRINTX$(J)": "Y$(J
)
6060 M=M+1:NEXT J:RETURN
6065 PRINT"PRESS ENTER FOR MORE,
E TO END";
6070 Z$=INKEY$:IF Z$="" THEN 607
0
6080 IF Z$="E" THEN 10
6090 PRINT:GOTO 6016
6100 PRINT:PRINT"LAST ENTRY PRES
S ENTER";
6110 Z$=INKEY$:IF Z$="" THEN 611
0
6120 GOTO10
7999'
8000 CLS:PRINT"THIS LOADS OR SAV
ES FILES
8010 EN=256*PEEK(9998)+PEEK(9999
):BE=10000:EX=BE
8020 PRINT"1 LOAD CASSETTE FILE
8030 PRINT"2 SAVE CASSETTE FILE
8040 PRINT"3 LOAD DISK FILE
8050 PRINT"4 SAVE DISK FILE
8060 PRINT"ENTER NUMBER
8070 Z$=INKEY$:IF Z$="" THEN 807
0
8080 Z=VAL(Z$):ON Z GO SUB 8200,
8300,8400,8500
8090 GOTO10
8199 'LOAD CASSETTE FILE
8200 CLS:PRINT"LOADING A CASSETT
E FILE":INPUT"FILE NAME OR EN
TER";X$
8210 CLOADM X$:RETURN
8299 'SAVE CASSETTE FILE
8300 CLS:PRINT"SAVING FILE TO A
CASSETTE":PRINT"MAKE SURE CAS
SETTE IS READY.
8310 INPUT"NAME";X$:CSAVEM X$,BE
,EN,EX:RETURN
8399 '

```

```

8400 PRINT"LOAD A DISK FILE":INP
UT"1 FOR DIRECTORY";X:IF X=1
THEN DIR
8410 INPUT"ENTER FILE TO LOAD";X
$
8420 LOADM X$:RETURN
8499 '
8500 PRINT"THIS SAVES THE FILE T
O DISK":INPUT"ENTER 1 FOR DIR
ECTORY";X
8510 IF X=1 THEN DIR
8520 INPUT"ENTER NAME OF FILE TO
SAVE";X$
8530 SAVEM X$,BE,EN,EX:RETURN
9500 'DATA STARTS HERE
9900 DATA 190,39,12,188,39,14,36
,10,166,128,177,1,244,38,244,
191,39,12,57
9999 '
10000 DATA STATION,DATE,BEGINNIN
G,ENDING,MY SIG,HIS SIG,FREQU
ENCY,EMISSION,POWER,HIS WEA
THER,HIS RIG,COMMENTS,,,,,
12000 PRINT"THIS PEEKS MEMORY
12010 INPUT"MEMORY STARTING";G
12020 F=PEEK(G):F$=CHR$(F):PRINT
G;F;F$
12030 G=G+1:GOTO 12020

```

### OPERATING HINT

You can do memory peeks or pokes, or list part of your program, and then continue the program by typing "CONT ENTER". You do not loose your variables with this procedure.

## LOTZALUK IS HERE!

LOTZALUK, machine language program for COCO 1, 2, & 3. Studies history of LOTTO game as a handicapper studies horses. Arizona 6/39, California 6/49, Iowa 6/36, Missouri 6/39, New York 6/40, New York 6/48, Oregon 6/42, Tri-State (Maine, New Hampshire, & Vermont) 6/36, & Washington State 6/44 available. Others to follow. Requires 64K. Specify game desired with order.

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# *Compound Interest*

*by*

*Tom Garcia*

\*\*\*\*\*

As J.P. Morgan (or someone) once replied when asked the best way of becoming a millionaire - "The secret is simple - Compound interest!"

\*\*\*\*\*

You have probably seen a number of programs for computing various kinds of interest. Some are short and simple and a few are long, complicated and geared towards those needing print-outs for 20 and 30 year time payment calculations. Wanting a customized version of an interest program for my own use I decided to start from scratch in order to end up with just what I needed, no more and no less. The program isn't too long and it is easy to modify for your own particular requirements.

INT/BAS is designed to produce information concerning the return on money that you have on deposit at fixed rates of interest. The three most common types of deposits are: (1) Funds at a savings and loan, compounded daily. (2) Funds being held by a commercial bank, compounded quarterly on March 31st, June 30th, September 30th, and December 31st. (3) Money at either of the institutions mentioned above, in one of the so-called "T-Bill" related instruments, at simple interest, for a six month term. This last type of plan is often in the form of a certificate of deposit that is \$10,000 or more in value although competition has recently made such investments available in lesser amounts. Interest on these

certificates is usually paid monthly and, as there is no compounding, the interest should not be left on deposit with the principle.

The program will compute monthly, quarterly, semi-annual and annual interest appreciation. There are many more possibilities, such as "in by the tenth earns interest from the first", etc., but I will leave those for you to develop on your own.

The usual convention or practice in the banking industry is to consider that every month has 30 days and that each day is 1/360th of a year. The program uses this form in its calculations. Also, I have elected to request information from the user in the form of monthly units. A change to LINE 230 could adjust this to your needs if monthly savings periods are not satisfactory.

You may be surprised (as I was) when you run a few comparisons based on daily compounding of interest vs. monthly or quarterly compounding. There is not much difference in your return. However, it is nice to be able to withdraw funds from an account on the next to last day of the month (or quarter) and not lose any interest. You might want to take that into consideration when selecting a savings institution. The depositor usually gets a better break on withdrawals at places that compound daily, such as savings and loans.

10 ' INT/BAS  
20 'TOM GARCIA TUCSON AZ 1985

```

30 'COPYRIGHT (c) 1987
40 'DYNAMIC eLECTRONICS INC.
50 CLS
60 PRINT
70 PRINT"   ENTER AMOUNT OF MONE
   Y ON           DEPOSIT
                   (NO COMM
                   AS)"
80 PRINT"           $";:LINE INP
   UT M$
90 M=VAL(M$)
100 M1=M
110 PRINT
120 PRINT"   ENTER INTEREST RATE
   "
130 PRINT"   (EXAMPLE: 7.5 FOR S
   EVEN AND     ONE HALF PER-C
   ENT)
140 PRINT"           % ";:LINE I
   NPUT I$
150 I=VAL(I$)
160 I1=I
170 I=I/100
180 PRINT
190 PRINT"   TIME IN DEPOSIT IN
   MONTHS?"
200 PRINT"           ";:LINE I
   NPUT MM$
210 MM=VAL(MM$)
220 M2=MM
230 MM=MM*30
240 CLS:PRINT
250 PRINT"IS THIS INTEREST COMPO
   UNDED   1. DAILY
           2. MONTHLY
           3. QUARTERLY
           4. 6 MO. (
           T-BILLS)   5. YEAR
           LY
260 PRINT
270 PRINT"   (PRESS A NUMBER NOW
   )"
280 C$=INKEY$:IF C$=""THEN 280
290 C=VAL(C$)

```

```

300 ON C GOTO 320,350,380,410,46
   0
310 GOTO 270
320 I=I/360+1
330 M=M*I^MM
340 GOTO 480
350 I=I/12+1
360 M=M*I^(MM/30)
370 GOTO 480
380 I=I/4+1
390 M=M*I^INT(MM/90)
400 GOTO 480
410 I=I/2+1
420 MM=180:M2=6   'T-BILL ERROR TRAP
430 M=M*I^INT(MM/180)
440 MT=1
450 GOTO 480
460 I=I+1
470 M=M*I^INT(MM/360)
480 M=M*100
490 B=INT(M)
500 IF ABS(M-B)>.5 THEN B=B+1
510 B=B/100
520 M=B
530 CLS:PRINT:PRINT
540 IF MT>0 THEN PRINT"   FOR T
   -BILL INTEREST":PRINT
550 PRINT"   YOUR $"M1" WILL BE:
   "
560 PRINT
570 PRINT"           +++$"M"+++"
580 PRINT
590 PRINT"           AT"I1"% INTEREST
   "
600 PRINT
610 PRINT"   ON DEPOSIT FOR"M2"MO
   NTH(S)"
620 M6=(M-M1)/6
630 M6=M6*100:M6=INT(M6):M6=M6/1
   00
640 PRINT
650 IF MT>0 THEN PRINT " MONTHLY
   INTEREST: $"M6


```

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# EDITOR'S COMMENTS

The heat wave has hit Alabama and the temperature in the high 90s makes it easy for someone to modify his routine. Water type activities are very comfortable with high temperatures. However higher temperatures cause insects which can make outside activities unpleasant. I like to go camping and have found that the higher elevations are a little cooler and acceptable for this time of the year.

To escape the heat some people resort to inside activities. We have noticed an increase in computer activity and guess that the temperature is the reason. With the school season starting soon this interest should increase even more.

I am sorry to announce that Spectrogram Magazine has folded. As I look back over the past few years, I remember Color Computer News, Color Computer Weekly, Color Computer Magazine, and Hot CoCo. All of these were color computer magazines and all have ceased publication. I like to see as much support as possible for the color computers and am very disappointed when we loose a publication.

Our support is increasing and we appreciate each one of our subscribers. We have kept our price at \$15 since our first issue. As we get larger we will have to make some changes. Our bulk postage rate is 12.5 cents each. However there will be extra postage charges as we expand. We are planning on adding more programs and articles. We have several options available. One option is to go to 3 columns and reduce the print size. We would prefer this over raising our rates. We may have to revise our advertising rates but will try to retain our low subscription rate.

Good software is a must for any computer application. There is a lot of software available

for the IBM PC and its clones. Also the color computers are not lacking in the software area. Just about any software application is covered by someone. It takes time to develop software and the color computers have been around long enough to allow development of good software.

What about the color computer 3? Some people seem to think that they should dispose of their older computers and purchase a color computer 3. I think Radio Shack did a good job of retaining compatability with the earlier computers. Most 32K programs will work on the color computer 3 with the computer in the 32 character mode. There are some special programs being produced for the color computer 3, but there are many programs that are compatabile with all of the color computers. I look at the color computer 3 as an enhanced version of the color computers. If you do not need its enhanced features, then continue with what you have.

Our ham radio response is continuing. Software is mainly what is needed for ham radio applications.

I want to thank each of you who wrote a letter. Keep them coming as they let us know about your problems.

## ***BACK ISSUES***

**Back issues of Dynamic Color News are available for \$1.95 each, 3 for \$5 or 12 for \$15 pp.**

**Foreigners other than Canada add \$2 for Air Mail postage.**

# COLOR COMPUTER 3

The color computer 3 is a very interesting computer. If upgraded to 512K, it has as much memory as most other computers including the IBM clones. How can we utilize this memory? This is a question that has been asked many times. The easiest way to use extra memory in any computer is to configure it for one or two ramdisks and load and save programs and data using conventional disk drive commands. Most 512K upgrades provide a ramdisk or one is available at a reasonable price.

The 6809 series of microprocessors have 16 address lines and 8 data lines. This means that they can address 64K bytes of memory and handle 1 byte of data at a time. To address extra memory, some form of memory management is required. The memory manager in the color computer 3 allows memory blocks of 8K bytes to be switched by doing memory pokes. We demonstrated this in our May issue and gave a memory manager for program this purpose. This is much faster than a ramdisk because with a few memory pokes we can move 8K of data. A ramdisk would have to move 1 byte at a time.

```

+ ++ + ++ + ++ ++ ++ + ++ + ++ +
+
+      RENEWAL TIME?
+
+ The date beside your name on
+ the address label indicates
+ the last issue you will re-
+ ceive. Send in your renewal
+ if you want to continue re-
+ ceiving technical informa-
+ tion on Color Computers.
+ This is the last issue for
+ those with 8/87 .
+
+ + ++ + ++ + ++ ++ ++ + ++ + ++

```

### SAVING HIRES GRAPHICS

Is it possible to utilize the memory manager to provide a simple procedure for saving high resolution graphics pictures? First let's look at the memory manager registers:

Operating 64K Reg.	Value	Extra 64K Reg.	Value
65440	120	65448	120
65441	121	65449*	112
65442*	122	65450*	113
65443	123	65451*	114
65444	124	65452*	115
64445	125	65453	116
65446	126	65454	117
65447	127	65455	127

Register 65442 is the third 8K memory block in the normal operating area. The graphics registers are 65449-65452. If we can move each graphics register into the normal operating area then we can save an 8K block using conventional methods. We can set up a FOR-NEXT loop and repeat the procedure four times to save the complete HIRES picture.

For loading the graphics picture, we reverse the procedure. If we create a FOR-NEXT with J going from 0 to 3, then we can load or save files from a 4 element dimensioned array. It is possible to save two 8K banks at once having two files to contain the picture data. This could be done by moving graphics banks into the normal third and fourth 8K memory banks. We did not explore this procedure but it seems feasible.



## HIGH RES GRAPHICS SAVE PROGRAM

This program can be merged with the graphics draw program we presented last month. It saves 32K bytes in four files named X0, X1, X2, and X3. The program should also work with cassette systems by changing the save and load commands to CSAVEM and CLOADM in lines 530 and 620.

```

10 'GRAPHICS SAVE PROGRAM
20 'FOR THE COLOR COMPUTER 3
30 'COPYRIGHT (c) 1987
40 'DYNAMIC eLECTRONICS INC.
500 PRINT"THIS SAVES HIGH RESOLU
TION GRAPHICS TO A DISK
510 AA=112:A$(0)="X0":A$(1)="X1"
:A$(2)="X2":A$(3)="X3
515 BE=16384:EN=24576
520 FOR J=0 TO 3
530 POKE 65442,J+112:SAVEM A$(J)
, BE, EN, BE
540 PRINT"SAVING X"J:NEXT J
550 END
600 PRINT"THIS LOADS GRAPHICS FR
OM THE DISK
605 A$(0)="X0":A$(1)="X1":A$(2)=
"X2":A$(3)="X3
610 FOR J=0 TO 3
620 POKE 65442,112+J:LOADM A$(J)
630 PRINT"LOADING X";J
640 NEXT J
    
```

## OPERATING HINT

### RS-232 BAUD RATES

By poking appropriate values into memory locations 149 and 150 the RS-232 port can handle a variety of baud rates.

149	150	Rate
4	88	50
2	227	75
1	246	110
1	153	134.5
1	110	150
0	180	300
0	87	600
0	40	1200
0	25	1800
0	23	2000
0	18	2400
0	10	3600
0	7	4800
0	3	7200
0	1	9600

## Color Computer 3

### 256K MEMORY

(new)

Add another 128K of memory to your color computer 3. It's like having two computers in one package. ME-31 \$49.95.

### 512K MEMORY

Upgrade your Color Computer 3 to 512K. Our plug in board is easy to install and will give you the maximum addressable memory. With 512K you can have two ramdisks with the included ramdisk disk software. Complete assembly ME-30 \$99.95

(REDUCED)

Wired 512K board with Ramdisk software. ME-30B \$39.95.

### 512K RAMDISK

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

\$17.95

### MEMORY SAVER 2

Now you can save your computer's memory when power fails. Assembly consists of a small rechargeable battery that mounts under the keyboard and an enable switch. When power fails the electronic control circuit connects the battery to the memories saving all data or programs for at least 30 minutes.

MS-2 \$39.95

Checks, Visa, or MC  
Add \$3 shipping

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Hartselle, AL 35640

# PRODUCT REVIEWS

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

## PYRAMIX

PYRAMIX is an Arcade Game for the Tandy Color Computer 3. The object of the game is to move a short round guy on the top of blocks that make up a pyramid. The idea is to get all the cubes to match the color of the cube in the upper left of the screen. There are obstacles. Falling bolders, a snake, a death square, and the possibility of falling off the pyramid make the game very challenging.

There are some helps. Two elevators can take you to the top as you lure the snake off. Also there are green time stopper balls that freeze time for everyone except you allowing you to get on with your work.

There are 6 levels of difficulty. For higher levels the blocks must be changed twice. Also hopping on a block that has been changed changes it back to its original color.

As the game is played the score is displayed on the screen. At the end of a game the 5 high scores are displayed. If you exceeded one of the high scores then the computer will ask for your name which will be displayed by your score.

The game can be played with either a joystick or the arrow keys. The arrow keys seemed to be the easiest to use. The colors can be adjusted for either a composite or RGB color monitors. The type monitor is displayed on the screen. Press

"C" to change to composite and "R" to change to RGB.

After finishing a game, another game can be played by pressing the space bar or the joystick fire button. After a few seconds if there is no response, the computer begins playing a demo game. This is interesting because it shows how the game works.

A help screen is available if you need instructions. Just press the "H" key and instructions will appear on the screen.

The game can be played individually or by several players. The five top high scores are displayed at the end of a game. It requires a color computer 3 and color television or color monitor.

PYRAMIX was produced by Color Venture Industries and is distributed by authorized dealers. It sells for \$24.95. For more information contact GIMMESOFT, P. O. Box 421 Perry Hall, MD 21128 or Dynamic Electronics Inc., P. O. Box 896, Hartselle, AL 35640.

## LIFE

LIFE is a simulation game. Its fascination derives from its resemblance to real life interactions and from the beautiful patterns and structures it forms. There are three rules for survival.

(1) Each cell with two or three neighboring cells will survive to the next generation.

(2) Each cell with four or more neighbors will die due to overpopulation and each cell with less than two neighbors will die from isolation.

(3) Each empty cell adjacent to exactly three live cells is going to be a birth cell in the next generation.

The program is easy to run. After making a backup copy then RUN "LIFE". A menu appears from

which you can select the options LOAD, EDIT, SAVE, PRINT, CHECK, WATCH, and CLEAR. The generation and the upper limit is displayed. Patterns can be loaded or saved on the disk. The patterns can be watched through each generation and printed on a DMP 105 printer. A single step option allows you to change the generations one at a time or use the automatic mode. You can edit the patterns and save them to the disk. You can press a "D" from the menu and review the files on the disk.

If the program hangs up it can be reset and restarted by typing GOTO 50. Many patterns are included as files on the disk. It is interesting to watch the patterns they change from generation to generation. The cost is \$20 on disk. For more information contact Prometheus Software, 14684 Joshua Tree Ave., Moreno Valley, CA 92388.

## NEW PRODUCTS

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

### HAM LOG

HAM LOG provides a means of keeping a record of your radio contacts. It is user friendly and asks for information. Data that remains the same such as the date and frequency are repeated for new stations by pressing the ENTER key. Quickly find stations in the log and load and save entries to a disk or cassette. Review all entries and add to the log at any time. The cost is \$9.95 + \$2 shipping for tape or disk. Dynamic Electronics Inc., P. O. Box 896, Hartselle, AL 354640

## QUESTIONS & ANSWERS

These are some letters we have received. Most have a question and our answer appears at the end of each question. If you have a question you would like for us to answer send it to us at Box 896, Hartselle, AL 35460. We will send you a quick personal reply to your question for \$10. The letters this month are from hams.

Dear Sirs;

Please enter my subscription for DYNAMIC COLOR NEWS for one year. Enclosed check in amount of \$15.00 for same. I am glad to find a publication devoted entirely to Radio Shack Color Computer.

I have both the Color II and Color III computers and the DMP 130 printer. Also have Kantronics All Mode "KAM" that I use on Packet.

I have been unable to use my TNC and Printer at the same time, and wonder if you can give

me information on how that I can make connections to do this. I would like to print messages received on the TNC. I have a Multipak Interface and the Delux RS-232 Program Pak with the 4 pin RS-232 cable to connect the program pak to the printer running thru the Multipak.

Would appreciate any help that you can give, or what you have available to connect this printer while using the TNC.

Respectfully yours, S.R. Duncan

ANSWER: S. R. your problem is software. The software must be able to read the RS-232 byte at the program pak and transfer it to the printer port. The software you are using will require a patch before the printer will work with your TNC.

+ + +

Dear Sirs;

I am an Advanced class amateur radio operator and am interested in your magazine. I have 2 COCO's, one an old gray original, upgraded with extended basic, 32K ram, which was a 4K 'D' board. The second is a Japanese COCO II, 64K 2 disk drives, CCR-82 cassette, and DMP-130 printer, and a COCO III keyboard.

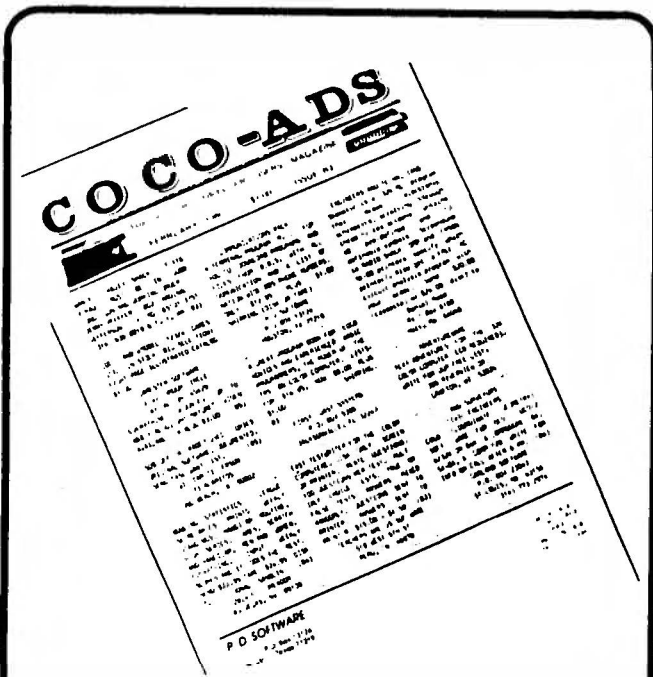
I built my first 8080 CW keyboard just after the 8080 was introduced. Then I built a 6502 based S100 24K homebrew with 8K basic in ram. I used the KIM as the heart of the system. Next I got a OSI C1P, my first desk-top micro. So you can see I have been around a while. I am now retired with a disability so computering has been my main interest for the last couple of years.

I would like a free sample of your magazine please. If it is interesting I plan on subscribing to it. I saw your ad in the 'SPECTROGRAM' magazine. I write a lot of programs, and am looking for a place to 'air' my software.

I am mainly interested in utility programs, with my second interest in ML Programming. I am presently just finishing an easy word processor, which is both basic and ML, using the ease and speed of that format. If you have an interest, I am starting a packet radio program which will be all software, using the COCO's cassette port for direct connection to the radio. No additional hardware will be required other than a couple of resistors and capacitors to interface it to the radio.

Thanking you in advance,  
Bob Pruett

ANSWER: Bob thank you for your letter. We are very much interested in your packet radio program and other programs. We are now able to purchase more programs than we previously were. You have been involved with computers longer than I have. We will be looking at using the cassette port for ham radio applications soon.



A TRS-80 Color Computer users magazine

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

-----  
Yes I would like to subscribe to COCO ADS.

- 1 Year basic third class mail \$10.00
- 1 Year First Class Mail \$16.00

Name \_\_\_\_\_

Addr \_\_\_\_\_

City \_\_\_\_\_

Zip \_\_\_\_\_

Please send all orders to

P D SOFTWARE  
P O BOX 13256  
HOUSTON, TX 77256

Dear Bill,

I was reading in the Ham Radio & Computers column about the question of your marketing ham radio interface hardware. I want to add my' two cents' worth to the discussion.

Support for the Color Computer would be welcome, be it hardware or software, and special products for ham radio for use on the coco will have a limited market. I would lean towards making the hardware useable on lots of different computers (like the UTU-XT/P and TAPR TNC's are) and market the program for the hardware device with the purchase of the hardware.

I have purchased the Kantronics UTU-XT/P and a MFJ-1274, and use them on the CoCo. They could also be used on the IBM, clones or any machine with a RS-232 port. I feel that is the way to go.

Also consider making interfaces to work with programs already in use by CoCo Hams. An example that comes to mind are the programs which Clay Abrams used to market for the CoCo. Perhaps a deal can be made with Abrams to market his CoCo programs again.

On the Subject of software, I would like to find a terminal program for the CoCo that is made to operate a TNC, not a telephone modem. I know that most terminal programs operate TNC's very well. I miss features on "RTTY CW" when working

Packet. How about a terminal program with those "RTTY CW" features like split-screens, and type ahead buffers for packet TNC's like the Kantronics UTU-XT/P & KAM and TAPR units? How about a CoCo terminal program with features similar to the Pakratt-64 operation? I know the CoCo can do it.

Then how about making these programs on EPROM's to plug into a Deluxe RS-232 Pak? This may cut down on illegal copies and could be a worthwhile product to market.

Thanks for your kind attention:

73 Dave

ANSWER: Dave thanks for your suggestions. Your comments reinforce my belief that the need for the CoCo is better software. It is very easy to do the hardware interfacing for a CoCo. Software can be written to do the split screen and other nice things you suggested. We recently covered putting programs in EPROMS. This is a good idea and has the advantage that it will work with either a disk or cassette computer. I kind of got burned out on hardware around 1980 when microprocessors started taking over circuit design. Now all you need is a computer and an interface for your circuit design. We now design with software which makes it cheaper and easier. We have more ham software coming for the CoCo.

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

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CERTIFICATION**

SEAL



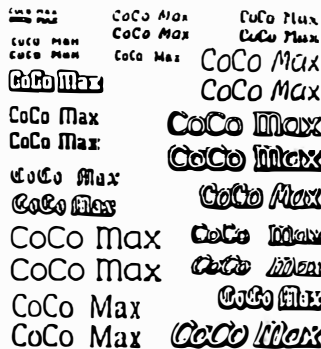
# CoCo Max II™

The whole family will enjoy CoCo Max. Here are a few examples of the possibilities.

All these pictures are unretouched screen photos or printouts (on an Epson RX-80).



1 Publish a newsletter or bulletin



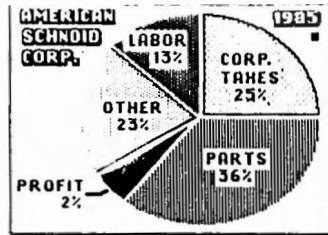
5 Over 200 typestyles to choose from! generate flyers.



2 Fun for children while stimulating creativity.



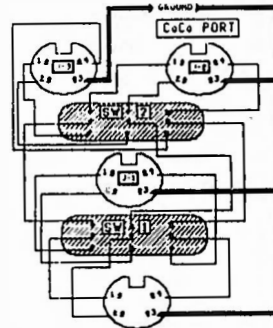
6 A new way to express your imagination.



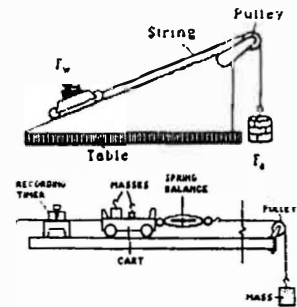
3 Business graphs, charts, diagrams. Also memos



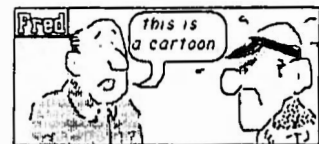
7 Video portrait (with optional digitizer).



9 schematics and floor plans.



4 Junior's homework and science projects. Term papers too!



8 This is a cartoon.

CoCo Max II  
CoCo Max II  
CoCo Max II  
CoCo Max II

10 Logos and letterheads.

## System Requirements:

Any 64K CoCo and a standard joystick or mouse. (The koala pad and the track ball work, but are not recommended.)

Disk systems need a Multi-Pak or our Y-Cable. CoCo Max is compatible with any Radio Shack DOS and ADOS.

Note: the tape version of CoCo Max includes almost all the features of CoCo Max II except *Shrink*, *Stretch*, *Rotate*, and *Glyphics*. Also, it has 5 fonts instead of 14.

CoCo Max is not compatible with JDOS, DoubleDOS, MDOS, OS-9, the X-pad, and Daisy Wheel Printers.

## Printers Supported:

Epson MX, RX, FX and LX series, Gemini, Star, Micronix, Delta 10, 10X, 15, 15X, SG-10, Okidata 82A, 92, 93, C. Itoh Pro-writer, Apple Image-writer, Hewlett-Packard Thinkjet, Radio Shack DMP 100, 105, 110, 120, 200, 400, 500, Line Printer 7, Line Printer 8, TRP-100, CGP-220. (DMP-130 use Line Printer 8), PMC printers, Gorilla Banana. Color printing: CGP-200, CGP-115

## Pricing

CoCo Max on tape ..... \$69.95  
with Hi-Res Pack and manual  
CoCo Max II (disk only) ..... \$79.95  
with Hi-Res Pack and manual  
Upgrade: CoCo Max to CoCo Max II  
New disk and manual ..... \$19.95  
New features of CoCo Max II: 14 fonts and glyphic font, dynamic shrink and stretch, rotate, multiple drive capability, 68 page scrapbook, point and click file load, color printer drivers, full error reporting.  
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Y-Cable: Special Price ..... \$19.95  
Super Picture Disks #1, #2, and #3  
each: \$14.95  
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CoCo MAX II now works with the CoCo 3. State computer type when ordering.

Checks, VISA & MC Cards  
Add \$3 Shipping

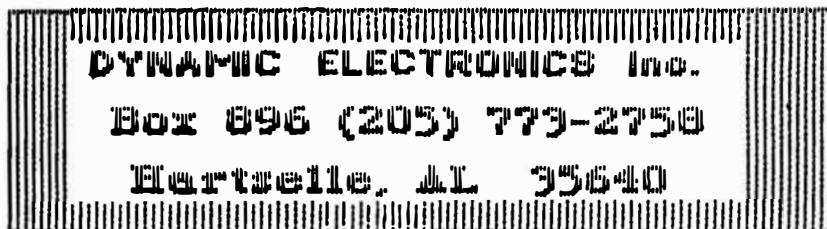
## Font Editor Option

A font is a set of characters of a particular style. CoCo Max includes 15 fonts. You can create new fonts of letters, or even symbols or graphics with the font editor. Examples: set of symbols for electronics, foreign alphabets, etc. .... \$19.95

## Video Digitizer DS-69

This new Low Cost Digitizer is the next step in sophistication for your CoCo Max system. With the DS-69 you will be able to digitize and bring into CoCo Max a frame from any VCR, camera, tuner or other video source. Comes complete with detailed manual and C-SEE software. Requires Multi-Pak or "Y" cable.

DS-69 for CoCo 2 ..... \$ 99.95  
DS-69A Faster (closeout) 129.95  
DS-69B for CoCo 3 ..... 149.95



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3. Send payment with ad.
4. Closing date 1st of the preceeding month. Ex. Nov ad closing is Oct. 1.
5. No X-Rated ads.

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

Quality, Educational, Public Domain Programs for Color Computers. Send \$1.00 for catalog to: Computer Learning, Attention :Nathan Vargo, R.D. 3, Box 376-B, Valencia, PA 16059.

## DISPLAY ADS

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

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1/3	19	17	15
1/4	15	13	12

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

We can do ads in Red, Blue, or Brown. No all one color ads will be accepted. For color ads send artwork for each color. Add

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

These are collections of programs from Dynamic Color News.

### DCN-1

1. \* 64K All RAM Program.
  2. \* 2-Bank address file Pgm.
  3. Alarm Clock Program
  4. Loan Interest Program
  5. Character Generator pgm.
  6. \* Bank Switching Program
- \* Won't work on CC-3

### DCN-2

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

### DCN-3

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

### DCN-4

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

### DCN-5

Color Computer 3 Programs

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

Programs are \$7.95 each on tape or disk. Add \$2 s/h. Checks, VISA & MC.



# DOG RACE

This short program can provide some interesting entertainment. There are 9 dogs and you try to guess which one will win the race. The number of right guesses will be displayed after each run along with the number of times the dogs raced. Can you beat the odds?

```

10 'DOG RACE
20 'PUBLIC DOMAIN SOFTWARE
30 D(1)=465:D(2)=466:D(3)=467:D(
  4)=468:D(5)=469:D(6)=470:D(7)
  =471:D(8)=472:D(9)=473
40 W=0
50 ET=465
60 ' FORMAT
70 CLS
80 PRINT" YOUR SCORE IS "S"/"SS
90 PRINT@258,"o
          o
          u          ooc
          u          oooooo
oooo      u          uuuuuu
uuu      uO          oo
          oo          ooo
oo      oo          Ooooooo
          oo      oo          o  o"
100 PRINT@94,""
110 LINE INPUT"WHICH DOG(1-9)";D
    $
120 IF VAL(D$)<1 OR VAL(D$)>9 TH
    EN 130 ELSE 140
130 GOTO 30
140 '
150 'SCREEN
160 CLS:PRINT"DOG RACE FINISH":P
    RINT@457,"START"
170 FOR A=1 TO 31:SET(17,A,3):SE
    T(31,A,3):NEXT A
180 PRINT@465,"123456789"
190 FOR R=31 TO 0 STEP-1:SET(63,
    R,5):SOUND200,1:SET(63,R,1):S
    ET(62,R,1):NEXT R
200 SET(62,1,1):SET(63,1,1)

```

```

210 '
220 PRINT@D(1),"1":PRINT@D(2),"2
    ":PRINT@D(3),"3":PRINT@D(4),"
    4":PRINT@D(5),"5":PRINT@D(6),
    "6":PRINT@D(7),"7":PRINT@D(8)
    ,"8":PRINT@D(9),"9"
230 D(1)=D(1)-(RND(2)*32)
240 D(2)=D(2)-(RND(2)*32)
250 D(3)=D(3)-(RND(2)*32)
260 D(4)=D(4)-(RND(2)*32)
270 D(5)=D(5)-(RND(2)*32)
280 D(6)=D(6)-(RND(2)*32)
290 D(7)=D(7)-(RND(2)*32)
300 D(8)=D(8)-(RND(2)*32)
310 D(9)=D(9)-(RND(2)*32)
320 'WINNER
330 IF D(1)<10 THEN W=1
340 IF D(2)<10 THEN W=2
350 IF D(3)<10 THEN W=3
360 IF D(4)<10 THEN W=4
370 IF D(5)<10 THEN W=5
380 IF D(6)<10 THEN W=6
390 IF D(7)<10 THEN W=7
400 IF D(8)<10 THEN W=8
410 IF D(9)<10 THEN W=9
420 PRINT@ET,"":ET=ET-32
430 IF W>0 THEN 440 ELSE 210
440 IF VAL(D$)=W THEN 490
450 PRINT@64,"DOG "W;:PRINT@100,
    "WON";
460 FOR A=255 TO 1 STEP -10:SOUN
    D A,1:NEXTA
470 SS=SS+1
480 GOTO 30
490 PRINT@64,"DOG "W;:PRINT@99,"
    WON";:FOR A=1 TO 200:PLAY"O3A
    L1T255V31":SET(RND(11)+18,RND
    (25)+2,RND(8)):NEXT A
500 FOR A=465 TO 10 STEP-32:PRIN
    T@A,"":NEXTA
510 PRINT@180,"YOU WIN!!!"
520 S=S+1
530 SS=SS+1
540 SOUND 200,30
550 GOTO 30

```



**DYNAMIC COLOR  
NEWS SUBJECT  
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# MULTIPROGRAM MANAGER (MPM)

The MPM allows up to 5 programs to be loaded into any 32K or larger color computer. Run, Delete, or Add programs to the menu. Quickly jump from one PGM to another. Save all PGMS at once. Excellent for tape users. Tape or Disk \$9.95 +\$2 s/h.

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