

ENGINEERING NOTES  
on  
Radio Shack Color Computers

October 1986  
Vol. 3 No. 9

\$1.95

DYNAMIC

COLOR

NEWS

PROGRAMS

- \* MONEY CHASE (Game)
- \* MULTIPLE CHOICE TEST
- \* ML CURSOR MOVE
- \* ML ASCII OUTPUT

INSTRUCTIONAL SERIES

- \* HAM RADIO & COMPUTERS (Part 3)
- \* ML PROGRAMMING (Part 6)
- \* WRITING PROGRAMS (Part 19)
- \* INTERFACING COMPUTERS (Part 9)
- \* OS-9 INTRODUCTION

SERVICES

- \* NEW PRODUCTS
- \* PRODUCT REVIEWS
- \* QUESTIONS & ANSWERS
- \* OPERATING HINTS
- \* HARDWARE PROJECT

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 newsletter 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 newsletter 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 newsletter. 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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*   DYNAMIC   COLOR   NEWS   *
*
*           October 1986      *
*
*   Editor and Publisher     *
*   Bill Chapple W4GQC      *
*
*           Secretary        *
*           Dean Chapple     *
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## 256K & 512K MEMORY UPGRADES

If you have a 64K computer with sockets for the SAM and 4164 chips then you can update it to 256K or 512K. The ramdisk allows programs to be retained within your computer and loaded as needed. Features include:

- \* 40 Track Single Disk Swap Can serve as second drive.
- \* Fast 35/40 Track Ramdisk (2 Ramdisks with 512K).
- \* 32K to 200K printer spooler (400K with 512K RAM).
- \* More than 30 PMODE 4 screens at once.
- \* Pager configures computer for 8 (16 with 512K) 32K pages.
- \* OS-9 Ram Disk 35-40 track single sided or 40 track double sided with 512K.
- \* Memory is protected when the computer is reset.
- \* Solderless installation.
- \* Miniature toggle switch can force computer into 64K mode.
- \* Compatible with all software.

Software is supplied on tape or disk except OS-9 is not available on tape. Specify your choice when ordering. Assemblies are complete ready to install with memories and 64K mode switch. Order ME-16 for 256K assembly, ME-14B provides extra 256K for ME-16. ME-16A for 512K assembly.

ME-16 - 256K RAM	\$99.95
ME-14B - Second 256K for ME-16	79.95
ME-16A - 512K RAM	169.95

## 128K UPGRADES

ME-10A Upgrades 64K Korean Computers to 128K. \$49.95

ME-12 - Upgrades all 64K computers with 4164 memory chips to 128K. \$49.95

## VIDEO REVERSER

An integrated circuit that mounts on the 6847 and reverses the video reducing eye strain. Minor soldering for CC-2. \$9.95

## MEMORY SAVER (Uninterrupted Power Source)

Our UPS saves your programs from being lost due to power failures by providing power to the memories from its battery. The assembly consists of a control circuit, battery, miniature toggle switch and a light emitting diode (LED). The control circuit and battery mount under the keyboard or can be mounted outside. The switch enables the UPS and the LED glows when power is available. For all computers with 5 volt memories. \$59.95

## MEMORY MANAGER (New Product)

A complete set of software for managing the second 32K memory bank for 64K and larger computers. Run Basic programs in both banks, continue a basic program from one bank to the other, use the second bank for a RAM DISK, configure the computer for the all RAM mode and store programs in the upper memory. \$27.95 cassette, \$29.95 disk.

24 hr phone. Checks, VISA & MC cards. Add \$3 ship.

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HARTSELLE, AL 35640

## MONEY CHASE

This is an interesting game for 1 to 4 players. You start with a lump sum and have many choices for investing all or part of the money. The result of each decision is printed on the screen along with your cash balance. See if are smarter than your partners by accumulating more cash than them. Practice by yourself so that you will be experienced when your partners arrive. This program is provided by T & D Software and is used by permission. See their advertisement on page 7.

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Ø CLS:GOTO46' COPYRIGHT (C) T&D
  SOFTWARE 1986 MCHASE
2 G$="":FORG=1 TOLEN(T$):A=ASC(M
  ID$(T$,G,1)):IFA=32 THENG$=G$
  +LD$(27):NEXT:RETURNELSEIFA<6
  5 THENC=2Ø ELSEC=64
3 G$=G$+LD$(A-C):NEXT:RETURN
5 PRINTTAB(3)"PRESS ANY KEY TO C
  ONTINUE";
6 I$=INKEY$:IFI$=""THEN6 ELSERET
  URN
8 PRINTTAB(2);:INPUT"Q=QUIT:M=ME
  NU:OR ENTER #";I$:IFI$="Q"THE
  NPLAYA$:POKE65494,Ø:ENDELSEIF
  I$="M"THEN6ELSEI=VAL(I$):IFI
  <1 ORI>HN THEN8
9 PLAYA3$:RETURN
12 PRINT"PLAYER:"PT$(PL):RETURN
13 DRAWPG$(PL):RETURN
15 PC=RND(Ø):IFPC<LP ORPC>HP THE
  N15ELSERETURN
17 G=RND(1Ø):IFG>CH THENGL=1:GL$
  ="GAINED":RETURNELSEGL=-1:GL$
  ="LOST":RETURN
19 H(Ø)=H(PL):IFPL>2 THENLH(PL)=
  32+(H(PL)*2Ø)ELSELH(PL)=22+(H
  (PL)*2Ø)
2Ø IFPL/2=INT(PL/2) THENLV(PL)=3
  2+(V(PL)*2Ø)ELSELV(PL)=23+(V(
  PL)*2Ø)
21 PLAYA4$:PUT(LH(PL),LV(PL))-(L
  H(PL)+6,LV(PL)+6),PØ,PRESET:R
  ETURN
23 COLOR1:LINE(2Ø,5)-(16Ø,15),PS
  ET,BF:LINE(9Ø,18Ø)-(24Ø,17Ø),
  PSET,BF:COLOR4:DRAW"BM2Ø,15":
  GOSUB13:T$=MID$(STR$(MU),2):G

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OSUB2:DRAW"BM2Ø,18Ø"+LD$(24)+
G$:SCREEN1,Ø
24 FORL=1 TONL:MH=RND(5):HC=22+(
  (MH-1)*28):MV=RND(5):VC=22+(
  (MV-1)*28):PUT(HC,VC)-(HC+24,V
  C+24),MS,PRESET:SOUNDMV*2Ø,MH
25 PUT(HC,VC)-(HC+24,VC+24),MS,P
  SET:T$=MID$(STR$(MH+MV),2):GO
  SUB2:DRAW"BM"+STR$(HC+6)+", "+
  STR$(VC+1Ø)+G$:NEXTL:MT=MU*(M
  H+MV):T$=MID$(STR$(MT),2):GOS
  UB2:MT$=G$:RETURN
27 IFM(PL)<1 THEN111 ELSECOLOR5:
  LINE(2Ø,5)-(16Ø,15),PSET,BF:C
  OLOR7:DRAW"BM2Ø,15":GOSUB13:D
  RAW"BM19Ø,2Ø"+K1$:DRAW"BM19Ø,
  35"+K2$:DRAW"BM19Ø,5Ø"+K3$:SC
  REEN1,1:GOSUB6:DRAW"BM19Ø,1ØØ
  "+RM$
28 FORX=1 TO2Ø:IFGL=1 THENRB=RND
  (6)ELSERB=RND(3)
29 COLOR5:LINE(21Ø,12Ø)-(225,11Ø
  ),PSET,BF:COLOR7:T$=MID$(STR$
  (RB),2):GOSUB2:DRAW"BM21Ø,12Ø
  "+G$:NEXT
3Ø PLAYA5$:PUT(LH(PL),LV(PL))-(L
  H(PL)+6,LV(PL)+6),PØ,PSET
31 H(PL)=H(PL)+RB:IFH(PL)>7 THEN
  V(PL)=V(PL)+1:IFV(PL)>7 THEN1
  51 ELSEH(PL)=H(PL)-8
32 NY(PL)=NY(PL)+1:GOSUB19:GOSUB
  6:GOSUB34:GOTO66
34 IFNQ=Ø THEN16Ø ELSEPL=PL+1:IF
  PL>NP THENPL=1
35 IFM(PL)=Ø THEN34 ELSERETURN
37 LP=.ØØ1:HP=.1:GOSUB15:IN=PC*M
  (PL):PRINT"INFLATION CLAIMED:
  ";:PRINTUSINGU$;IN;:PRINTLN$;
  :M(PL)=M(PL)-IN:PRINT"CASH RE
  MAINING: ";:PRINTUSINGU$;M(PL)
  :PRINTLN$;:RETURN
39 PRINT"YOU HAD: ";:PRINTUSINGU$
  ;M(PL):PRINTLN$:RETURN
41 PRINT"YOU HAVE: ";:PRINTUSINGU
  $;M(PL):PRINTLN$;:RETURN
43 PRINT"YOU "GL$": ";:PRINTUSING
  U$;LG:PRINTLN$;:IFGL=1 THENPL
  AYA2$:PLAYA3$:PLAYA4$:RETURN
  ELSEPLAYA$:RETURN
45 PRINT"CASH REMAINING: ";:PRINT
  USINGU$;M(PL):PRINTLN$;:RETUR
  N
46 CLEAR:CLEAR15ØØ:DIMLD$(38),MS
  (Ø,9),PØ(Ø,1):U$="$$#,###,###
  .##":NL=5:GL=1:MU=1ØØØØ:LN$=S
  TRING$(32,45):GOSUB112
47 T$="PRESS":GOSUB2:K1$=G$:T$="
  ANY":GOSUB2:K2$=G$:T$="KEY":G

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OSUB2:K3$=G$:T$="MOVE":GOSUB2
:RM$=G$:AK$=K1$+LD$(27)+K2$+L
D$(27)+K3$
48 A$="L55;O1V31BV30FV29DV28GV27
EV25CV23FV21CV19GV17BV15;L210
;O2;D#V13C#V11F#V9DV7AV5BV3EV
1G":A1$="V30L3002GAGAO1FBFBO2
ECECO1DD"
49 A2$="V30L5002GAGAGA":A3$="V30
L5003AGAGAG":A4$="V30L10001AO
2GO3BO4FO3CO2EO1D":A5$="V30O4
AO3GO2BO1FO2CO3EO4D"
50 INPUT"NUMBER OF PLAYERS (1-4)
: ";NP:NQ=NP:IFNP<1 ORNP>4 THE
N50 ELSEPLAYA1$
51 FORX=1 TONP:PRINT"PLAYER #\"X\"
NAME (6 CHR. MAX):":INPUTPT$(
X):IFLEN(PT$(X))>6 THENX=X-1
:NEXTELSEIFPT$(X)=""THENPT$(X
)=STR$(X)
52 T$=PT$(X):GOSUB2:PG$(X)=G$:PR
INTLN$;:NEXT:DIMIP(NP,10),CI(
NP,10)
54 FORX=1 TO10:READIP$(X),CI$(X)
:VA(X)=RND(0):NEXT
55 DATA"TANDY CANDY","78 RPM REC
ORD          AMAZING
GRACE BY BELA LUGOSI","RADIO
SNACK COOKIE CO.,"1ST EDITI
ON, 'CAPTAIN BLUBBER VS. TH
E DIET MONSTER',"FLY-BY-NIGH
T SOLAR CELL CO.,"FUNNY LOOK
ING OLD BOTTLE"
56 DATA"MICRO-MATE COMPU-DATING"
,"AN ORIGINAL MR. POTATO HEAD
","RESURECT HARRY TRUMAN BUMP
ER STICKER CO.,"FRANKLIN
PIERCE AUTOGRAPH","BEFORE-ITS
-TIME WINERY","A BLACK FALCON
STAMPED 'MADE IN MALTA'"
57 DATA"IRANIAN WAR BONDS","MING
DYNASTY BEER MUG","PAN LAKE
ERIE SHIPPINR LINE","ENIAC","
WEAK LINK CHAIN LETTER CO.,"
A UNICORN HORN","BEST NORTHER
N ROACH MOTELS","LEONARD NIMO
Y'S REAL EARS"
59 PMODE1,1:PCLS:GET(10,10)-(24,
24),MS,G:COLOR2:FORX=20 TO160
STEP28:LINE(20,X)-(160,X),PSE
T:LINE(X,20)-(X,160),PSET:NEX
T
61 PMODE1,3:PCLS:GET(22,22)-(28,
28),P0,G:COLOR6:FORX=20 TO180
STEP20:LINE(X,20)-(X,180),PSE
T:LINE(20,X)-(180,X),PSET:NEX
T:FORPL=1 TONP:GOSUB19:NEXT
63 PMODE1,1:SCREEN1,0:FORPL=1 TO
NP:GOSUB23:M(PL)=MT:M$(PL)=MT
$:DRAW"BM180,"+STR$(Y+20)+PG$(
PL):DRAW"BM180,"+STR$(Y+35)+
LD$(38)+M$(PL):Y=Y+35:NEXT:DR
AW"BM90,180"+AK$:GOSUB6
64 CLS:PRINT"THIS IS THE AMOUNT
OF MONEY WITHWHICH EACH PLAYE
R BEGINS THE...":GOSUB5:CLS(
0):PRINT@234,"MONEY CHASE";:P
LAYA$:PL=1
66 IFIA(PL)=1 THEN71 ELSECLS:GOS
UB12:GOSUB41:PRINTTAB(14)"MEN
U":PRINTTAB(12)STRING$(8,45):
PRINT"1. INVEST ALL":PRINT"2.
INVEST %":PRINT"3. BUY COLLE
CTOR'S ITEM":PRINT"4. GAMBLE"
:PRINT"5. BROTHER-IN-LAW'S AD
VICE":PRINT"6. SELL STOCK"
67 PRINT"7. SELL COLLECTOR'S ITE
M":PRINT"8. SEE PORTFOLIO":PR
INT"9. SEE COLLECTION":HN=9:G
OSUB8:IFI=5 ANDBA=1 ORI=6 AND
SS=1 ORI=7 ANDSI=1 THEN66 ELS
EIFI<>8 ANDI<9 THENBA=0:SS=0:
SI=0
68 CLS:ON I GOTO 70,74,79,86,89,
95,95,106,106
70 IA(PL)=1:GOSUB12:PRINT@192,"Y
OU HAVE INVESTED ALL THE MONE
Y YOU HAVE AND MUST SLEEP IN
AN ARMY SURPLUS PUP TENT, E
AT DAY OLD BREAD AND WATCH T
V AT THE Y FOR ONE ROUND":PRI
NT:GOSUB5:PMODE1,3:GOTO27
71 CLS:IA(PL)=0:GOSUB12:PRINT"LA
ST ROUND YOU INVESTED:":PRINT
TAB(11);:PRINTUSINGU$;M(PL):P
RINTLN$;:PRINT"THE RESULTS AR
E:":CH=5:GOSUB17:LP=.1:HP=.5:
GOSUB15
72 LG=PC*M(PL):GOSUB43:M(PL)=M(P
L)+(GL*LG):GOSUB37:PRINT:GOSU
B5:GOTO66
74 INPUT"ENTER THE % YOU WANT TO
INVEST OR 0 TO CANCEL AND R
ETURN TO THEMENU";PI:IFPI=0 T
HENCLS:GOTO 74 ELSEIFPI>75 TH
ENPRINT"YOU MUST SAVE AT LEAS
T 25% TO LIVE ON":PRINT:GOS
UB5:GOTO66 ELSEPI=PI/100
75 MI=PI*M(PL):CLS:GOSUB12:PRINT
:PRINT"THAT WILL BE:":PRINTU
SINGU$;MI:PRINTLN$;:GOSUB5:IF
M(PL)<100000 THENHN=5 ELSEIFM
(PL)<500000 THENHN=8 ELSEHN=1
0
76 CLS:PRINTTAB(8)"YOUR OPTIONS
ARE:":PRINTLN$;:FORI=1 TOHN:P

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RINTI;IP$(I):NEXT:PRINT:GOSUB
8:M(PL)=M(PL)-MI:IP(PL,I)=IP(
PL,I)+MI:CLS:GOSUB12:PRINTLN$
:PRINT"INVESTED:";:PRINTUSING
U$;MI;:PRINT"IN":PRINTIP$(I
):PRINTLN$;
77 GOSUB45:GOSUB37:PRINT:GOSUB5:
PMODE1,3:GOTO27
79 PRINTTAB(8)"YOUR OPTIONS ARE:
":FORX=1 TO10:IFIS(X)<>0 THEN
PRINTX;"SOLD"
80 IFIS(X)=0 THENPRINTX;CI$(X):I
FX<6 THENCO(X)=VA(X)*10000 EL
SEIFX<9 THENCO(X)=VA(X)*20000
ELSECO(X)=VA(X)*50000
81 NEXT:HN=10:GOSUB8:IFIS(I)<>0
THENPRINT"IT HAS ALREADY BE
EN SOLD":PRINT:GOSUB5:CLS:GOT
O79
82 CLS:GOSUB12:GOSUB41:PRINT"THE
COST OF":PRINTCI$(I):PRINT"I
S:";:PRINTUSINGU$;CO(I):PRINT
LN$.
83 INPUT"BUY IT (Y/N):";Y$:IFY$="
N" THEN66 ELSEIFY$<>"Y" THEN
83
84 CLS:GOSUB12:GOSUB39:PRINT"YOU
NOW OWN:";PRINTCI$(I):PRINTLN
$;:CI(PL,I)=CO(I):M(PL)=M(PL
)-CO(I):IS(I)=PL:GOSUB45:GOSU
B37:PRINT:GOSUB5:PMODE1,3:GOT
O27
86 CH=RND(10):GOSUB17:NL=20:MU=C
H*1000:PMODE1,1:COLOR1:LINE(1
70,10)-(250,200),PSET,BF:LINE
(20,180)-(90,170),PSET,BF:GOS
UB23
87 CLS:GOSUB12:GOSUB39:PRINT"YOU
GAMBLED:";:PRINTUSINGU$;MT:P
RINTLN$;:LG=MT:GOSUB43:M(PL)=
M(PL)+(GL*LG):GOSUB45:GOSUB37
:PRINT:GOSUB5:PMODE1,3:GOTO27
89 GOSUB12:PRINTSTRING$(32,36);"
YOUR BORTHER-IN-LAW HAS A HOT
TIP ON A 'SURE THING'":PRI
NTSTRING$(32,36):GOSUB41:LP=.
5:HP=.9:GOSUB15:LG=PC*M(PL):P
RINT"YOUR SHARE OF THE INVEST
MENT CAPITOL IS:";:PRINTUS
INGU$;LG:PRINTLN$
90 INPUT"WILL YOU TAKE YOUR BROT
HER-IN-LAW'S ADVICE (Y/N):";
Y$:IFY$="N" THENBA=1:GOTO66 EL
SEIFY$<>"Y" THEN90
91 CLS:GOSUB12:GOSUB39:CH=5:GOSU
B17:M(PL)=M(PL)+(GL*LG):PRINT
:IFGL=1 THENPRINT"YOUR BROTHE
R-IN-LAW IS SMARTER THAN HE
LOOKS. YOU DOUBLED YOUR INVES
TMENT.":PLAYAA2$:PLAYA3$:PLAY
A4$:PLAYA$
92 IFGL=-1 THENPRINT"YOU SHOULD
KNOW BETTER THAN TO LISTEN T
O SOMEONE DUMB ENOUGH TOMARRY
YOUR SISTER. YOU LOST YOUREN
TIRE INVESTMENT.":PLAYA$
93 PRINTLN$;:GOSUB45:GOSUB37:GOS
UB5:PMODE1,3:GOTO27
95 W=I:GOSUB12:PRINTLN$;:FORX=1
TO10:IFW=6 THENPRINTX;IP$(X)E
LSEPRINTX;CI$(X)
96 NEXT:HN=10:GOSUB8:CLS
97 IFW=7 THEN101 ELSEIFIP(PL,I)=
0 THENPRINT"YOU DO NOT OWN ST
OCK IN":PRINTIP$(I):PRINT:GO
SUB5:I=6:GOTO95
98 PRINTIP$(I):PRINTLN$;:PRINT"B
UYING PRICE:";:PRINTUSINGU$;I
P(PL,I):PRINTLN$;:CH=RND(10):
PRINT"YOUR CHANCE OF TURNING
A PROFIT IS:";100-(CH*100)"%":
PRINTLN$
99 INPUT"SELL (Y/N):";Y$:IFY$="N
" THENSS=1:GOTO66 ELSE IFY$<>
"Y" THEN99
100 CLS:GOSUB12:LP=.1:HP=VA(I):G
OSUB15:GOSUB17:LG=PC*IP(PL,I)
:GOSUB34:IP(PL,I)=IP(PL,I)+(G
L*LG):M(PL)=M(PL)+IP(PL,I):GO
SUB45:GOSUB37:IP(PL,I)=0:SI=0
:PRINT:GOSUB5:PMODE1,3:GOTO27
101 IFIS(I)<>PL THENPRINT"YOU DO
NOT OWN:";PRINTCI$(I):PRINT:
GOSUB5:I=7:GOTO95
102 PRINTCI$(I):PRINTLN$;:PRINT"
BUYING PRICE:";:PRINTUSINGU$;
CI(PL,I):PRINTLN$;:CH=RND(10)
:GOSUB17:LP=.01:HP=.5:GOSUB15
:LG=PC*CI(PL,I):CP=CI(PL,I)+(
GL*LG):PRINT"CURRENT VALUE:";
:PRINTUSINGU$;CP:PRINTLN$
103 INPUT"SELL (Y/N):";Y$:IFY$="
N" THENSI=1:GOTO66 ELSEIFY$<>
"Y" THEN103
104 CLS:IS(I)=0:CI(PL,I)=0:GOSUB
12:GOSUB39:GOSUB43:M(PL)=M(PL
)+CP:GOSUB45:GOSUB37:PRINT:GO
SUB5:PMODE1,3:GOTO27
106 TT=0:W=I:NC=1:GOSUB12:PRINTL
N$;:FORX=1 TO10
107 IFW=8 THENPR=IP(PL,X):PR$=IP
$(X) ELSEPR=CI(PL,X):PR$=CI$(
X)
108 IFPR>0 THENPRINTPR$:PRINT"AM
OUNT INVESTED:";:PRINTUSINGU$
;PR:TT=TT+PR:PRINT:GOSUB5:PRI

```

# SPECTROGRAM

MAGAZINE FOR COLOR COMPUTER USERS.

- \* Programs for business, home management, self-improvement, games, and utilities
- \* Reviews of Color Computer products
- \* Tutorials on programming in Assembly, C, Pascal, and Basic
- \* Contests

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COMPUTER TYPE:

- 64K Color Computer
- 32K Color Computer
- 16K Color Computer
- 4K Color Computer
- Other--Specify \_\_\_\_\_

PERIPHERALS:

- Printer Type \_\_\_\_\_
- Modem Type \_\_\_\_\_
- Disk Drive  (0)  (1)  (2)  (3)
- Multi-Pak Interface \_\_\_\_\_
- Other--Specify \_\_\_\_\_

LANGUAGES:

- Extended Basic
- Color Basic
- Disk Basic
- Basic09
- Pascal
- C Compiler

PROGRAM PREFERENCE:

- Business
- Games
- Graphics
- Tutorials
- Utilities
- Home Management
- Self-Improvement

# BEST

WE'VE CHOSEN THE BEST OF OVER 450 PROGRAMS AND PACKAGED THEM FOR YOU! 10 TO 12 PROGRAMS EACH PACKAGE. COLOR COMPUTER ONLY.

#1 Home Management I    #2 Home Management II    #3 Education

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- Checkbook Balancer
- Cost of Living
- Trycalc
- Electronic Datebook
- Account Manager
- Stock Market
- Word Processor
- Lottery Analyst
- Coco Database
- Coco Terminal
- BarTender



- Video Cassette Organizer
- Home Product Evaluation
- Electric, Gas & Water Cost
- Baseball Manager
- Car Manager
- Hair Radol Log
- Home Inventory
- Personal Directory
- Recipe Machine
- Disk Labeler
- Password Scrambler
- Disk Directory Print

- Flash Card
- Spanish Lessons
- Typing Tutor
- Creativity Test
- Arithmetic Football
- Cost of Living
- Math Tutors 1, 2
- Trigonometry Tutor
- Typing Game
- Word Tests
- Talking Alphabet
- Clown Dunk Math



#4 Adventures

- Treasures of Barsoom
- Killer Mansion
- College Adventure
- Coco-Terrestrial
- Escape
- Zector
- Skid Flaw
- Quest
- Naughtie
- Haunted House

#5 Games

- Trek
- Galactic Conquest
- Warlords
- The Power Sword
- Steps
- Robot Bomber
- Force Field
- Rat Attack
- Caterpillar Cave
- Meteor

#6 Utilities

- Disk Dr Prot
- Dr Pack & Sort
- Disk Zapper
- Roll Out
- Oss Boss
- Disk Backup
- 51'24 Editor
- 51'24 Screen
- Autocopy
- Fastsort
- I/O Error Ignorer
- Test Screen Print

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```

NT:PRINT
109 NEXT:PRINT:PRINT"TOTAL INVES
TED: ";:PRINTUSINGU$;TT:PRINT:
GOSUB5:GOTO66
111 NQ=NQ-1:SCREEN0,1:CLS:FORX=1
TO3:PLAYA$:NEXT:CLS:PRINT"SO
RRY "PT$(PL):PRINT"YOU ARE OU
T OF MONEY AND OUT OF THE GAM
E":PRINTLN$:PMODE1,3:PUT(LH(P
L),LV(PL))-(LH(PL)+6,LV(PL)+6
),P0,PSET:M(PL)=0:GOSUB5:GOSU
B34:GOTO66
112 LD$(1)="U8R8D4L8BR8D4BR4":'
A
113 LD$(2)="U8R6F2D2L8BR8D2G2L6B
R12":' B
114 LD$(3)="U8R8BD8L8BR12":' C
115 LD$(4)="U8R6F2D4G2L6BR12":'
D
116 LD$(5)="U8R8BD4L8BD4R8BR4":'
E
117 LD$(6)="U8R8BD4L8BD4BR12":'
F
118 LD$(7)="U8R8BD4L4BR4D4L8BR12
":' G
119 LD$(8)="U8BR8D8BU4L8BD4BR12"
:' H
120 LD$(9)="BU8R8BL4D8BL4R8BR4":
' I
121 LD$(10)="U4BU4BR8D8L8BR12":'
J
122 LD$(11)="U8BR8G4L4BR4F4BR4":
' K
123 LD$(12)="U8BD8R8BR4":' L
124 LD$(13)="U8F4E4D8BR4":' M
125 LD$(14)="U8F8U8BD8BR4":' N
126 LD$(15)="U8R8D8L8BR12":' O
127 LD$(16)="U8R8D4L8BD4BR12":'
P
128 LD$(17)="U8R8D8H4BG4R8BR4":'
Q
129 LD$(18)="U8R8D4L8BR4F4BR4":'
R
130 LD$(19)="BU4U4R8BD4L8BR8D4L8
BR12":' S
131 LD$(20)="BU8R8BL4D8BR8":' T
132 LD$(21)="U8BR8D8L8BR12":' U
133 LD$(22)="BU8D4F4E4U4BD8BR4":
' V
134 LD$(23)="U8BR8D8H4G4BR12":'
W
135 LD$(24)="E8BL8F8BR4":' X
136 LD$(25)="BU8F4E4BG4D4BR8":'
Y
137 LD$(26)="BU8R8G8R8BR4":' Z
138 LD$(27)="BR12":' SPACE
139 LD$(28)="U8R4D8L4BR8"
140 LD$(29)="R4L2U8G1BD7BR7"

```

```

141 LD$(30)="U4R4U4L4BD8R4BR4"
142 LD$(31)="R4U4L3R3U4L4BD8BR8"
143 LD$(32)="BU8D4R4L2U2D6BR6"
144 LD$(33)="R4U4L4U4R4BD8BR4"
145 LD$(34)="R4U4L4D4U8R4BD8BR4"
146 LD$(35)="BU8R4D8BR4"
147 LD$(36)="U8R4D4L4R4D4L4BR8"
148 LD$(37)="BR4U8L4D4R4BD4BR4"
149 LD$(38)="BU4U4R8BD4L8BR8D4L4
U8BD8L4BR12"
150 RETURN
151 NQ=NQ-1:SCREEN0,1:FORX=1 TO4
:CLS(X):PLAYA3$:NEXT:CLS:PRIN
TTAB(8)"CONGRATULATIONS":PRIN
TTAB(6)STRING$(19,62):PRINT:P
RINTTAB(3)"YOU HAVE FINALLY R
ETIRED"
152 PRINT:GOSUB12:PRINT"NUMBER O
F YEARS: ";NY(PL)+1:PRINT"NEST
EGG: ";PRINTUSINGU$;M(PL):PRIN
TSTRING$(32,61)
153 FM(PL)=M(PL):M(PL)=0:PRINT:G
OSUB5:GOSUB34:GOTO66
160 CLS:PRINT"ALL PLAYERS ARE BR
OKE OR RETIRED":PRINTSTRING$(
32,36):FORX=1 TO4:PRINTTAB(1)
X;TAB(2)". ";TAB(4)PT$(X);TAB(
10)NY(X)"YRS. ";TAB(16);:PRINT
USINGU$;FM(X):NEXT:PRINT
162 INPUT"PLAY AGAIN (Y/N):";Y$:
IFY$="N" THENPOKE65494,0:END
ELSEIFY$="Y" THENRUN ELSE162

```

```

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# ML PROGRAMMING

## (Part 6)

Machine language programming is the fastest and most efficient method of programming. For a machine language program, the machine operates directly upon the instructions in the machine language program. However it is not as easy to write machine language programs as it is to write programs using some of the other languages. Basic was written with the programmer in mind. We can use basic for our program structure and call machine language subroutines when we need speed.

Last month we developed a program for moving data. We showed how to use the X and Y index registers as pointers. Our procedure was to load the "A" register with a byte indexed to X and then store the byte indexed to Y. We also incremented the registers as we did the operations. We used the compare operation to determine when we had finished.

### NEW MATERIAL

Each month we want to give a few new commands and a useful program. When possible we will give a basic equivalent for the command or instruction. If you have an assembler, we suggest you use it to assemble our example programs and compare your results with ours. Also we recommend purchasing a book on assembly language programming. Let's look at some instructions.

**INCREMENT** - This is used to increase the value in a register by one. In basic we would use  $A=A+1$  or  $B=B+1$ . The ML commands are INCA and INCB. These operations are generally used before a conditional test.

**DECREMENT** - This is the opposite of increment. It reduces

the value stored in a register by 1. The ML commands are DECA and DECB. This is similar to  $A=A-1$  in basic.

These commands can be used to perform count operations. As an example let's suppose we want to use the B register to count a number of operations (N) performed on the A register. We can load the number N into the B register. Everytime we do the operation on the A register, we will decrement B. Then we will branch if not equal to the beginning of the routine and continue until  $B=0$ . This will be similar to the FOR-NEXT operations in basic.

Another example would be for a ML delay routine. We can load B with a number representing the delay time. Then go through a subroutine where we decrement B and then test for a zero. We will continue until the result is zero. This is similar to the results obtained from the following basic statement.

```
100 FOR X=1 TO 500:NEXT X
```

For ML programming it is easier to load the values into the register and use the decrement operation. This is because we can test for a zero or branch on a zero. With basic we can start at the beginning and count up for the required number of cycles.

### TEST COMMAND (TST)

The TEST command causes certain bits in the conditional code register to change. The TEST command actually compares the value in a register with 0. When we encounter the command TSTA, then we want to know is  $A=0$ ? If the result of the TST operation is 0, then the Z bit in the conditional code register will be set. If a bit is set then it is made to equal 1. If it is cleared then it is made

equal to 0.

### BRANCH INSTRUCTIONS

One of the most powerful features of the 6809 microprocessor is its branch capability. A branch instruction forces the program to go forward or backward a number of steps. The byte following the branch instruction contains the number of locations to branch. This is similar to the basic GO TO command except there are many options. A branch is always relative to the present location in memory and can be used after a TST command. In our register decrement example, we can TST the register and then enter a branch command. We can either branch forward or backward. Let's look at some of the branch commands.

BEQ (\$27) - Branch on Equal

A branch occurs if the Z (zero) bit of the conditional code register is set.

BNE (\$26) - Branch Not Equal

Causes a branch if the Z bit is cleared.

BRA (\$20) - Branch Always

This is similar to basic's GO TO command. The BRA command always causes a branch.

We will only consider these three commands this month. They will handle most branching requirements.

### BRANCH POSTBYTE

The byte following the branch instruction gives the relative number of memory locations to branch. The program counter(PC) points to the next instruction after the branch instruction. The branch instruction will move the program counter to the new

memory location.

### CALCULATING the POSTBYTE

Branching can be + 127 or - 128 locations from the program counter. If the number in the postbyte is 0-127 then the PC will advance the number in the postbyte. Numbers from 128 to 255 tell the PC to move backwards in the program's memory.

For negative branching the number to put in the postbyte can be calculated by subtracting the number of memory locations from 256. To branch backwards 100 locations the postbyte would contain 256-100 or 156.

### BRANCH EXAMPLE

Let's look at a timing routine. We will load the A register with 235, decrement A (DECA) until A=0. We will use the BNE command to return to the DECA instruction. The memory relations will be as follows:

#### DEC-HEX

M	134-86	LDA I 'Load A immediate
M+1	235	The value to put into A
M+2	74-4A	DECA 'A=A-1
M+3	38-26	BNE 'Branch if A<>0
M+4	253	Branch postbyte
M+5	57-39	RTS

Notice the 253 in M+4. When the branch instruction is reached, the program counter points to M + 5. We want to move it back to M+2 which is 3 bytes. So we subtracted 3 from 256 to get the 253.

### ML PROGRAM

This month we have a couple of useful subroutines you can use with your basic programs. Have you ever wished you could write something at the top of the screen without disturbing the normal display and then

return to the normal write position? This can be accomplished if you move the cursor vector which is located in memory locations 136-7. The top left position on the screen is location 1024. So we will need to save the values in 136-7 and POKE 136 with 4 and 137 with 0. We get the values 4 and 0 from the vector component equations:

MS=INT(V/256):LS=V-256\*MS

To summarize, we will EXEC 510 when we want to go to the top left corner of the screen. We will EXEC 525 when we want to return to the previous cursor location. This makes moving the cursor easy. We will use the "D" register which is the "A" and "B" combined. Remember we use "D" for direct addressing and "E" for extended addressing. Our machine language subroutines will be as follows:

Mem	Val-HEX	Function
*510	220-DC	LDD D 'Put 136-7
511	136-88	into D
*512	253-FD	STD E 'Put the
513	1	cursor in
514	244-FD	500
*515	204-CC	LDD I 'Put 1024
516	4	into D
517	0	
*518	221-DD	STD D'Store D
519	136-88	direct in 136
*520	57-39	Return from sub.
*521	18-12	These are no-op
*522	18-12	commands to
*523	18-12	reserve spaces
*524	18-12	
*525	252-FC	LDD E 'Load D
526	1	with old cursor
527	244-F4	value in 510
*528	221-DD	STD D' Store D
529	136-88	direct in 136
530	57-39	Return from sub.

The commands in 521-524 are non-operational instructions. These can be used to leave space in memory so that additional instructions can be inserted later if needed. It also fills in the

spaces so that the second subroutine can start at 525. The \* precedes the beginning of an instruction.

### CURSOR MOVE ML SUBROUTINES

```

10 ?"ML CURSOR MOVE PROGRAM
20 ?"cOPYRIGHT (c) 1986
30 ?"dYNAMIC eLECTRONICS iNC.
40 ?"PROGRAM 10-1-86
50 ?"LOADING THE ML SUBROUTINES
60 FOR J=510 TO 531: READ A
70 POKE J,A: NEXT J
80 ?"EXEC 510 TO MOVE CURSOR
90 ?"TO TOP OF SCREEN &
100?"EXEC 525 TO RETURN TO
110?"PREVIOUS LOCATION
120 DATA 220,136,253,1,244,204
130 DATA 4,0,221,136,57,18,18
140 DATA 18,18,252,1,244,221
150 DATA 136,57,0

```

+ + +

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This program is provided by Microcom Software and is used by permission.

```

10 POKE 243,&H5F:POKE 244,126:PO
  KE 245,&H96:POKE 246,&H95:POK
  E &HB7,14:EXEC 243
20 X=RND(-TIMER):CLEAR 23000:DIM
  Q$(50),A$(50,5)
30 CLOSE #-1:CLOSE #1:CLS:PRINT@
  1,"multiple choice test desig
  ner"
40 PRINT:PRINT:PRINT:PRINT:PRINT
  "      (1) DESIGN TEST":
  PRINT"      (2) EDIT TEST":
  PRINT"      (3) SAVE TE
  ST": PRINT"      (4) LO
  AD TEST": PRINT"      (
  5) PRINT TEST":PRINT:LINEINPU
  T" ";A$
50 ON VAL(A$) GOTO 70,170,340,29
  0,410
60 GOTO30
70 REM CREATE TEST
80 CLS:PRINT@224-32,"";:PRINT"(1
  ) CREATE NEW TEST":PRINT"(2)
  ADD TO CURRENT TEST":PRINT:LI
  NEINPUT" ";TK$:IF T
  K$="1" THEN QP=1 ELSE QP=QP+1
90 CLS:PRINT@224,"# OF QUESTIONS
  (MAX 50)";:INPUTQ
100 FORI=QP TO Q
110 CLS:PRINT:PRINT"question #"I
  ;CHR$(8)":":LINEINPUT Q$(I)
120 PRINT:PRINT"5 choices":PRINT
  "-----":PRINT:FOR J=1 TO

```

```

5:PRINT"choice #"J;CHR$(8);":
  ";:LINEINPUT A$(I,J):NEXT
130 NEXT I:DQ=Q
140 CLS:PRINT@224-64,"multiple c
  hoice answers":PRINT:PRINT"(1
  ) letter format":PRINT"(2) nu
  mber format":PRINT:INPUT"
  ";MA
150 CLS:PRINT@224-96,"title info
  rmation":PRINT:LINEINPUT TI$
160 GOTO 30
170 REM EDIT TEST
180 CLS:PRINT@224-32," (1) EDI
  T QUESTIONS/ANSWERS":PRINT"
  (2) EDIT TITLE INFORMATION":
  PRINT" (3) EDIT LETTER FORM
  AT":PRINT" (4) EXIT EDIT OP
  TION":PRINT:LINEINPUT"
  ";A$
190 ON VAL(A$) GOTO 210,250,270,
  30
200 GOTO 180
210 CLS:INPUT"question #";QN:CLS
  :PRINT"question:":PRINT Q$(Q
  N):QQ$(QN)=Q$(QN):PRINT:PRINT
  "answers":PRINT:FORI=1 TO5:PR
  INT A$(QN,I):B$(QN,I)=A$(QN,I
  ):NEXT:PRINT:PRINT"enter new
  information":PRINT:LINEINPUT"
  question:":Q$(QN):PRINT:PRINT
  "answers":PRIN
220 FOR I=1 TO5:PRINT"answer #"I
  ":":LINEINPUTA$(QN,I):NEXT:I
  F Q$(QN)="" THEN Q$(QN)=QQ$(Q
  N)
230 FORI=1 TO 5:IF A$(QN,I)="" T
  HEN A$(QN,I)=B$(QN,I)
240 NEXT:GOTO 180
250 CLS:PRINT@0,"previous title
  information was":PRINT:PRINT
  TI$:IT$=TI$:PRINT:PRINT"enter
  new title information":PRINT
  :LINE INPUT TI$:IF TI$="" THE
  N TI$=IT$
260 GOTO 180
270 CLS:PRINT@0," (1) lette
  r format": PRINT" (2
  ) number format":PRINT:PRINT"
  previous format was";MA:PRINT
  :AM=MA:INPUT"new letter forma
  t";MA:IF MA=0 THEN MA=AM
280 GOTO 180
290 CLS:PRINT@224,"load from (1)
  cassette OR (2) disk:":LI
  NEINPUT A$:A=VAL(A$):IF A=1 T
  HEN K=-1 ELSE K=1
300 PRINT:LINEINPUT "FILENAME:":
  F$:OPEN"I",#K,F$

```

```

310 INPUT #K,Q,MA,TI$:PRINT:PRINT
  T Q"QUESTIONS ...":PRINT
320 FORI=1 TO Q:LINEINPUT #1,Q$(
  I):FORJ=1 TO 5:LINEINPUT #1,A$(
  I,J):NEXT J,I:QP=Q
330 GOTO 30
340 REM SAVE TEST
350 CLS:PRINT@224,"save to (1) c
  assette OR (2) disk:":LINEIN
  PUT A$:A=VAL(A$):IFA=1 THEN K
  =-1 ELSE K=1
360 PRINT:LINEINPUT"FILENAME: ";F
  $:OPEN"O",#K,F$
370 PRINT #K,Q,MA,TI$
380 FORI=1 TO Q:PRINT #K,Q$(I):F
  ORJ=1 TO 5:PRINT #K,A$(I,J):N
  EXT
390 NEXT I
400 CLOSE #K:PRINT:PRINT"SAVED .
  ....":EXEC 42961:EXEC:EXEC:E
  XEC:GOTO30
410 REM PRINT
420 CLS:PRINT:PRINT"printer baud
  rate (600/1200)":LINEINPUT
  A$:IF A$="600" THEN POKE 150
  ,88 ELSE IF A$="1200" THEN PO
  KE 150,41
430 PG=0:I=1
440 REM
450 PG=PG+1:PRINT#-2,TAB(35);PG:
  PRINT#-2:PRINT#-2:C=3:K=-2:IF
  PG=1 THEN B$=TI$:TB=0:GOSUB
  530:C=C+1:PRINT #-2
460 GOTO 480
470 I=I+1:IF I>Q THEN 30
480 B$=Q$(I):K=0:GOSUB 530:IF TL
  +7+C>62 THEN FORJ=1 TO 66-C:P
  RINT #-2:NEXT:GOTO 440
490 TB=4:A$=STR$(I):A$=MID$(A$,2
  ,LEN(A$))+ " ":PRINT #-2,A$;:K
  =-2:GOSUB 530:GOSUB 590:PRINT
  #-2:C=C+1:FORJ=1 TO 5:PRINT
  #-2," ";:IF A$(I,A(J))<>" "
  THEN IF MA=1 THEN PRINT #-2,
  CHR$(64+J)". ";:C=C+1 ELSE PR
  INT #-2,CHR$(48+J)". ";:C=C+1
500 IF A$(I,A(J))<>" " THEN PRINT
  #-2,A$(I,A(J))
510 NEXT:PRINT #-2:C=C+1
520 GOTO 470
530 REM WORD WRAP
540 PT=1:Z=1:L=74:TL=0:B$=B$+" "
550 Z=INSTR(Z+1,B$," "):IF Z=0 T
  HEN RETURN ELSE IF Z<=PT+L AN
  D (INSTR(Z+1,B$," ")>PT+L OR
  INSTR(Z+1,B$," ")=0) THEN 560
  ELSE 550
560 TL=TL+1:IF K=-2 THEN PRINT #

```

```

  K,TAB(TB);MID$(B$,PT,Z-PT):C=
  C+1
570 IF Z<=LEN(B$) THEN PT=Z+1:GO
  TO 550
580 RETURN
590 M=1
600 M=M+1:IF M>5 THEN 620
610 IF A$(I,M)<>" " THEN 600
620 M=M-1:FOR N=1 TOM:A(N)=0:NEX
  T
630 FORN=1 TO M
640 A=RND(M):IF A(A)<>0 THEN 640
  ELSE A(A)=N
650 NEXT
660 IF M<>5 THEN FORN=M+1 TO 5:A
  (N)=N:NEXT
670 RETURN

```

#### DCN PROGRAMS on Tape or DISK

This is our second collection of programs from Dynamic Color News. This collection includes:

1. Check book program.  
Data in remark statements.  
Prints to screen or printer.
2. Ball Team Sort Program.  
with information on sorting.
3. Card Shuffling Program.  
(Using Random Numbers)
4. Student Study Program.  
Randomly picks questions and answers.
5. Address File Program.  
Print mailing labels, search for address by name, zip code, city, or state.

Order DCN-2

Tape or Disk \$11.95  
Add \$2 shipping, Foreign \$3

# Introducing

# CoCo Max<sup>TM</sup> II

There is absolutely nothing else on the Color Computer that is comparable to CoCo Max's power and ease of use. The most enjoyable time with a computer I ever had.  
- *Computerware Review* May 1985

I never expected to see anything like it on my CoCo screen. There isn't a single command to remember. Even a person who has no drawing ability like myself can create a presentable picture. I've spent hours just doodling enjoying all the things from silly to the serious. Fascinating experience. Buy it, you won't be sorry.  
- *6809 Express* May 1985

CoCo Max puts fun back into computing, offering a state of the art environment you find on much more expensive machines. Colorware has invested the kind of time and research that virtually secures its success, and that shows up on your screen.  
- *Hot CoCo* July 1985

CoCo Max is the most incredible product ever marketed for the CC. No review can do it justice. I've never given any product a 10...I give Colorware's CoCo Max (Hardware, Software and Documentation) a 10!  
- *Color Chronicle Vol III #6*

An outstanding program that almost turns your CoCo into a replica of the Macintosh. Terrific hi-res color, very easy to learn and use.  
- *Family Computing* February 1986

The pack is well constructed, the user's manual is complete with illustrations and well organized. An outstanding buy for the performance. Colorware's advertisement accurately describes the product. Their delivery was timely as promised.  
- *Rainbow* June 1985

**These were reviews of CoCo Max I.  
CoCo Max II will blow your socks off  
with even more power !**

- New bidirectional shrink and stretch
- New rotate function
- 9 new fonts (for over 200 timesteps)
- A new "Glyphic font" of small pictures
- A 68 page scrapbook
- Point and click to load files (no typing)
- Full error reporting, crash proof
- Custom patterns can be saved
- Printing in color (with CGP 115 or 220)
- Much more. (Note: CoCo Max II is available on disk only)

The reviews are nice, but see it for yourself\* and draw your own conclusion.

\*If you are not delighted with your CoCo Max II, we will immediately refund your purchase, including postage back.

**distributed by  
dynamic electronics inc**

## BASIC PROGRAMMING

In this series we are showing how to write basic programs. Each month we give a few commands and then concentrate on writing programs. Learning to write programs requires practice. We give comments with our programs so that each section can be understood.

### DISK COMMANDS

Let's look at some disk commands. A disk drive is used to store programs on a disk. The disk storage system has some advantages over storing programs on tape, although tape storage works quite well. One of the problems with a tape system is finding the files or programs. The tape has to be rewound and the beginning of a program found before it is loaded. Also the tape is very slow when compared to a disk.

### DIR

The DIR command lists the programs on the disk to the screen. You can then select a program to load and run. A program can be loaded and run by typing RUN "PROGRAM" where PROGRAM is the name of the program to run. This is a combination of the "LOAD" and "RUN" commands. For a cassette we would enter CLOAD "PROGRAM" and after the program is loaded we would enter "RUN".

### SAVING PROGRAMS

Saving programs to a disk is similar to saving them to a cassette except the beginning "C" is not needed. For example to save the program "FIRST" we would enter SAVE "FIRST". For machine language (ML) programs we need to enter the beginning, ending, and execution address-

ses. If we had a program named "SECOND" that started at 510, ended at 535, and was executed at 510 then we would enter:

```
SAVEM "SECOND",510, 535, 510
```

### DSKINI COMMAND

To use a disk, it must be formatted for your computer. Color computers use single sided double density (SSDD) disks. These disks are used on other computers. An example is the Commodore. To format a disk in drive 0, insert the disk into the drive and type "DSKINI0". This takes about a minute and the familiar OK will appear after the formatting takes place. After a disk is formatted you can type DIR and no programs will be listed because none have been saved. Typing DIR with an unformatted disk will give an error.

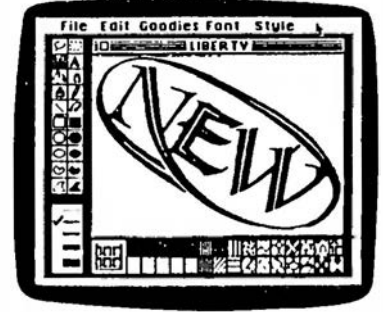
Let's comment on cassettes and make some comparisons with disks. Cassettes and disks are just used for storing data and programs. Although a disk is easier to use, a tape system does an excellent job at the expense of speed. The information on a disk can be destroyed by the computer. This is not possible with a tape because data previously recorded can not be erased until the tape is rewound. If you have a tape system make sure you have good quality tapes. The 3/\$100 tapes that you can find at some discount stores are unreliable for computer work. Next month we will continue with new commands.

### PROGRAMMING

Last month we looked at file organizations and introduced sorting. We have been considering an address file. There are at least two ways we would want to present the information. The first would be to place the



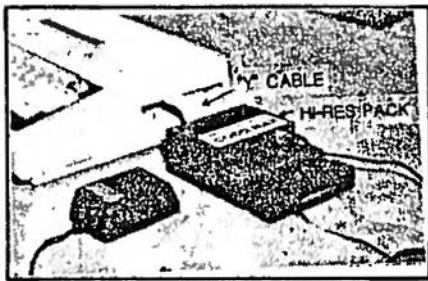
# CoCo Max II<sup>TM</sup>



**You'll use it all the time and love using it.**

## What is CoCo Max ?

Simply the most incredible graphic and text creation "system" you have ever seen. A Hi-Res Input Pack (more on the pack later) is combined with high speed machine language software. The result will dazzle you.



CoCo Max disk system, with Y-cable.

## Is CoCo Max for you ?

Anyone who has ever held a pencil or a crayon for fun, school or business will love it. A 4 year-old will have fun doodling, a 15 year-old will do class projects and adults will play with it for hours before starting useful applications (illustrations, cards, artwork, business graphics, flyers, charts, memos, etc.) This is one of the rare packages that will be enjoyed by the whole family.

## What made CoCo Max an instant success ?

First there's nothing to learn, no syntax to worry about. Even a child who can't read will enjoy CoCo Max. Its power can be unleashed by simply **pointing** and **clicking** with your mouse or joystick. With **icons** and **pull down menus**, you control CoCo Max intuitively; it works the same way you think.

Don't be misled by this apparent simplicity. CoCo Max has more power than you thought possible. Its blinding speed will astound you.

It lets you work on an area 3.5 times the size of the window on the screen. It's so friendly that you will easily recover from mistakes: The **undo** feature lets you revert to your image prior to the mistake. As usual, it only takes a single click.

Later, we will tell you about the "typesetting" capabilities of CoCo Max II, but first let's glance at a few of its graphic creation tools:

With the **pencil** you can draw free hand lines, then use the **eraser** to make corrections or changes. For straight lines, the convenient **rubber-banding** lets you preview your lines before they are fixed on your picture. It's fun and accurate. Lines can be of any width and made of any color or texture.

The **paint brush**, with its 32 selectable brush shapes, will adapt to any job, and make complicated graphics or calligraphy simple. For special effects, the **spray can** is really fun: 86 standard colors and textures, all available at a click. It's like the real thing except the paint doesn't drip.

CoCo Max will instantly create many shapes: circles, squares, rectangles (with or without rounded corners), ellipses, etc. Shapes can be filled with any pattern. You can also add hundreds of custom patterns to the 86 which are included.

The **Glyphics** are 58 small drawings (symbols, faces, etc.) that can be used as rubber stamps. They're really great for enhancing your work without effort.



Pull down menus



Zoom in!

## Control Over Your Work

CoCo Max's advanced "tools" let you take any part of the screen, (text or picture) and perform many feats:

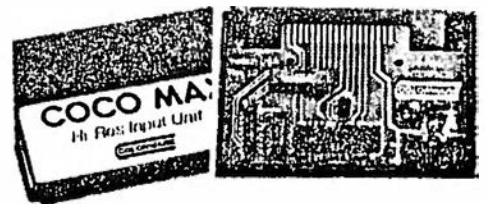
- You can move it around
- Copy it
- Shrink or enlarge it in both directions
- Save it on the electronic **Clipboard**
- Flip it vertically or horizontally
- Rotate it
- Invert it
- Clear it, etc. etc.

All this is done instantly, and you can always **undo** it if you don't like the results.

For detail work, the **fat bits** (zoom) feature is great, giving you easy control over each pixel.

To top it all, CoCo Max II works in color. Imagine the pictures in this ad in color. If you own a Radio Shack CGP-220 or CGP-115, you can even print your work in full color!

There is so much more to say, such as the capability to use CoCo Max images with your BASIC programs, the possibility to use CoCo Max's magic on any standard binary image file. There are also many advanced features such as the incredible **lasso**.



Inside the Hi-Res Input Pack

## Why a Hi-Res Input Pack ?

Did you know that the CoCo joystick input port can only access 4096 positions (64x64)? That's less than 10% of the Hi-Res screen, which has 49152 points! (256x192). You lose 90% of the potential. The Hi-Res Input Pack distinguishes each of the 49152 distinct joystick or mouse positions. That's the key to CoCo Max's power. The pack plugs into the rom slot (like a rom cartridge). Inside the pack is a high speed multichannel analog to digital converter. Your existing joystick or mouse simply plugs into the back of the Hi-Res Pack.

## Electronic Typesetting...

You'll be impressed with CoCo Max's capability. Text can be added and moved around anywhere on the picture. (You can also rotate, invert and flip it...) At a click, you can choose from 14 built in **fonts** each with 16 variations. That's over 200 typestyles!



Examples of printouts

## Printing Your Creations

There are a dozen ways to print your work. All are available with a click of your joystick (or mouse) without exiting CoCo Max. Your CoCo Max disk includes drivers for over 30 printers!

names in alphabetical order and the second would be to order them in numerical order of their zip codes.

Last month we looked at ordering the zip codes. Let's look at placing the names in alphabetical order. We will have the names stored in memory in ASCII. If we use one of the methods of organizing files we presented last month, then we will know exactly the location in memory where the names start. Let's consider a few names.

1. Jones, JW
2. Allen, RS
3. Smith, PL
4. Jones, BC
5. Lane, CW

How would we place these names in alphabetical order? If we used the method we used last month we would assume the first name should be first and compare it with the rest, exchanging names when we find one that should be higher in the list.

First let's look at the first letter of the first name and compare it with the first letter of the second name. We will be comparing a J with an A. Since the A is smaller then we will exchange the first and second names and we will have the following:

1. Allen, RS
2. Jones, JW
3. Smith, PL
4. Jones, BC
5. Lane, CW

Now we can compare the first name with the third through the fifth. After this the first name will be the first on our final list. Next we repeat and compare the second with the rest. This will place Jones, BC in the second position. Next we will compare the third name with the rest and continue until we finish the names. If there are

a lot of names then this could be time consuming. This will be much slower than sorting zip codes because we have to compare each letter of the names instead of comparing a numerical value.

## PROGRAM DEVELOPMENT

We have covered enough material to write an address program that will sort. Let's also consider merging files. For example suppose we have files stored on disk and we want to enter new names. If we had 10 files arranged in zip code blocks on a disk, then we would want the program to place the new names into the proper file.

Let's design an address file program that will be arranged into the following parts:

1. First line (15) M+0
2. Second line (15) M+15
3. Third line (15) M+30
4. City (15) M+45
5. State (15) M+60
6. Zip Code (10) M+75
7. Phone # (10) M+85

This will take a total of 95 bytes so we will reserve blocks of 100 bytes for each address to give 5 extra bytes incase we need to expand an entry. We will want our program to allow data to be entered, modified, saved, sorted, and merged with other files.

This month we want to show how to enter data and print it. We will look at some other features next month. The following is the first part of our address file program.

```
*****
*                                     *
*           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 Can-      *
* ada add $2 for Air Mail         *
* postage.                         *
*                                     *
*****
```

# 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).

**Jenison Report** 254  
From with the Big Bang

**NO MAJOR NEWS TODAY**  
Reporters Desperate

They always say we have a good news/bad news thing going on today. Well, today I happen to be a reporter and I'm not reporting any good news. I'm reporting that the world is in a state of confusion. I'm reporting that the world is in a state of confusion. I'm reporting that the world is in a state of confusion.

**Why is this long heading?**  
The heading of this report is long because it is a long report. The heading of this report is long because it is a long report. The heading of this report is long because it is a long report.

**Life in the fast lane not all it's cracked up to be**  
So you think you want to go into the fast lane? Well, you better think twice. Life in the fast lane is not all it's cracked up to be. Life in the fast lane is not all it's cracked up to be. Life in the fast lane is not all it's cracked up to be.



1 Publish a newsletter or bulletin

CoCo Max CoCo Max CoCo Max  
CoCo Max CoCo Max CoCo Max  
CoCo Max CoCo Max CoCo Max  
CoCo Max CoCo Max CoCo Max  
CoCo Max CoCo Max CoCo Max  
CoCo Max CoCo Max CoCo Max  
CoCo Max CoCo Max CoCo Max  
CoCo Max CoCo Max CoCo Max  
CoCo Max CoCo Max CoCo Max  
CoCo Max CoCo Max CoCo Max  
CoCo Max CoCo Max CoCo Max

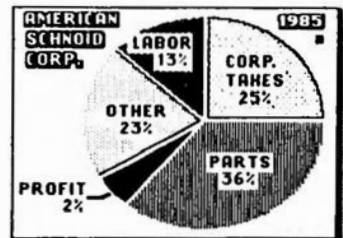
5 Over 200 typestyles to choose from! generate flyers.



2 Fun for children while stimulating creativity.



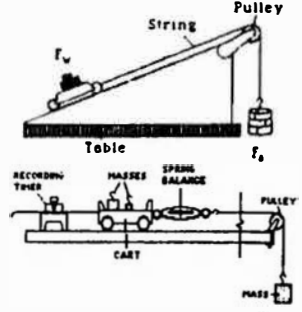
6 A new way to express your imagination.



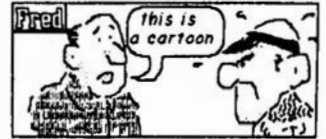
3 Business graphs, charts, diagrams. Also memos



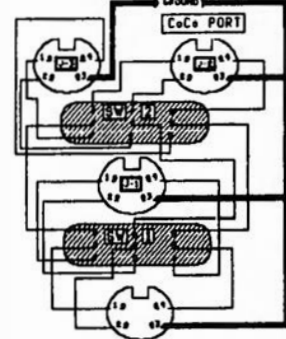
7 Video portrait (with optional digitizer).



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



8 This is a cartoon.



9 schematics and floor plans.

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.  
Upgrade: CoCo Max tape to disk  
manuals, disk and binder ..... \$24.95  
Y-Cable: Special Price ..... \$19.95  
Super Picture Disks #1, #2, and #3  
each: \$14.95  
All three picture disks ..... \$29.95

**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 video source: VCR, tuner, or video camera. Comes complete with detailed manual and C-SEE software on disk. Multi-Pak is required.  
New Low Price Save \$50 ..... \$99.95  
New: faster DS-69A ..... \$149.95

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Checks, VISA & MC  
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Foreign \$5

**ADDRESS FILE  
PROGRAM  
(Part 1)**

This program will be continued next month. Data can be entered and printed with the program.

```

5 CLS:PCLEAR1
10 PRINT"aADDRESS file pPROGRAM
20 PRINT"coPYRIGHT (c) 1986
30 PRINT"dyNAMIC eLECTRONICS iNC
35 PRINT"PGM 10-2-86
40 POKE 500,39:POKE501,16:POKE50
2,0 'SET START OF FILE
50 BE=256*PEEK(500)+PEEK(501):NF
=PEEK(502) 'GET THE START OF
FILE & NUMBER OF FILES
55 'SET UP MENU OF OPTIONS
60 PRINT"1 ADD TO FILE
70 PRINT"2 MODIFY FILE
80 PRINT"3 PRINT FILES
90 PRINT"4 CLEAR ALL FILES
100 PRINT"5 SORT FILE
110 INPUT"ENTER NUMBER";X
115 'BRANCH ON X
120 ON X GOTO 1000,2000,3000,400
0,5000
1000 CLS:PRINT"THIS ADDS TO FILE
S
1010 NF=PEEK(502):POKE 502,NF: B
E=256*PEEK(500)+PEEK(501):BF=
BE+100*Nf 'SET UP MEMORY FOR
START OF NEXT FILE
1015 PRINT"THIS IS FILE #NF
1017 INPUT"PRESS Y FOR A DIFFER
FILE NO TO START";Y$:IF Y$="Y
" THEN INPUT"ENTER NEW NUMBER
";NF:POKE 502,NF:GO TO 1000
1018 PRINT"FILE NUMBER "NF
1020 M=BF:FOR J=0 TO 99:POKE M+J
,32:NEXT J 'CLEAR MEMORY FOR
NEW DATA
1030 PRINT"ENTER FIRST LINE":NC=
15:GOSUB 1900
1040 PRINT"ENTER SECOND LINE":M=
BF+15:GOSUB 1900
1050 PRINT"ENTER THIRD LINE":M=B
F+30:GOSUB 1900
1060 PRINT"ENTER CITY":M=BF+45:G
OSUB 1900
1070 PRINT"ENTER STATE":M=BF+60:
GOSUB 1900
1080 PRINT"ENTER ZIP":M=BF+75:NC
=10:GOSUB 1900
1090 PRINT"ENTER PHONE NUMBER":M
=BF+85:GOSUB 1900
1100 POKE 502, NF:INPUT"PRESS EN
TER FOR MORE ADDRESSES, PRESS
1 TO RETURN TO MENU.";V
1105 NF=NF+1:POKE 502,NF
1110 IF V=0 THEN 1000 ELSE RUN
1900 'THIS STORES CHARACTERS IN
MEMORY
1905 C=0:X=M 'COUNT CHARACTERS B
EING ENTERED AND MARK THE BEG
INNING OF MEMORY
1910 FOR K=0 TO NC
1915 W1=PEEK(136):W2=PEEK(137):P
RINT@0,"NO CHARACTER USED="K;
" M="M:POKE 136,W1:POKE137,W2
1920 A$=INKEY$:IF A$="" THEN 192
0
1925 PRINTA$;
1930 A=ASC(A$):IF A=13 THEN RETU
RN
1935 IF A=8 THEN K=K-1:GO TO 192
0
1940 POKE M+K,A:NEXT K
1945 FOR AA=0 TO NC-1:POKE M+AA,
32:NEXT AA
1950 PRINT"TOO MANY CHARACTERS -
REDO"
1960 GO TO 1910
2000 '
3000 PRINT"THIS PRINTS THE FILES
3010 NF=PEEK(502):BE=256*PEEK(50
0)+PEEK(501):INPUT"ENTER FILE
NUMBER OR PRESS RETURN FOR A
LL FILES";N
3015 IF N>0 THEN NF=N
3020 M=BE+100*Nf
3030 X=15:FOR J=0 TO 4
3040 GOSUB 3900
3070 NEXT J
3080 X=10:M=M+75: FOR J=0 TO 1
3090 GOSUB 3900:NEXT J
3095 XX=PEEK(136):YY=PEEK(137)
3100 PRINT@0,"THIS ENDS FILE NUM
BER"NF
3110 INPUT"PRESS RETURN TO CONTI
NUE";PP
3112 POKE 136,XX:POKE137,YY
3115 PRINT
3120 NF=NF+1:GO TO 3020
3899 '
3900 FOR K=0 TO X-1
3910 A=PEEK(M+X*J+K):A$=CHR$(A):
PRINTA$;:IF P=1 THEN PRINT#-2
,A$;
3920 NEXT K:PRINT:RETURN
3999 END
4000 '

```

## OS-9

Tandy Corporation is marketing OS-9 for their Radio Shack Color Computers. In this series we will look at OS-9 and explain how to use it. There are two questions we want to answer. The first is what is OS-9, and the second is what can it do for us?

OS-9 is an operating system. It requires a 64K computer and at least one disk drive. Some other popular operating systems are CP/M and MSDOS. CP/M was considered the standard for microcomputers until the IBM personal computers began to become popular. MSDOS is the operating system for IBM personal computers and their clones. OS-9 is structured after the famous UNIX operating system.

### GETTING STARTED

To make it easier to get started we suggest going through the book "Getting Started with OS-9" which is included with the OS-9 package. The first thing is to learn how to backup disks. The disk formatting is different for OS-9 so keep your OS-9 disks separated from the other disks.

Two disks are included with the package. The first is the OS-9 Boot. This can be used to test the disk drive speed or to boot OS-9 for disk drives with disk basic before version 1.0. To boot OS-9 for these earlier version of disk basic, enter "RUN \*" and select the BOOT OS-9 option. Then you will be prompted to insert the SYSTEM MASTER disk to continue.

For versions later than 1.0 you can insert the SYSTEM MASTER disk and enter "DOS" from the keyboard. When the system comes up, you are asked to enter the date. The OS-9 prompt appears and the computer is waiting for a command. Type DIR and the directory will be printed the



A TRS-80 Color Computer users magazine

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

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

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class mail \$10.00  
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Addr \_\_\_\_\_

City \_\_\_\_\_

Zip \_\_\_\_\_

Please send all orders to

P D SOFTWARE  
P O BOX 13256  
HOUSTON, TX 77256

same as with extended disk basic.

### **FORMATTING DISKS**

With the SYSTEM MASTER disk still installed type "FORMAT /DØ" and press the enter key. A space is required after FORMAT. A message will be displayed and you will be instructed to remove the SYSTEM MASTER disk and insert the blank disk to be formatted.

### **BACKUP DISK**

The original disks should be copied onto other disks and put away. To do this use the backup command. This is similar to normal disk operation. Insert the SYSTEM MASTER disk into the drive and type "BACKUP /DO". Again leave a space after BACKUP. You will then be prompted to make the disk swaps as is the case with extended disk basic. The backup disk can now be used to save files. We will look at this next month.

### **EDITOR'S COMMENTS**

While reading through a new computer magazine I saw an article on computer software. Do you know what software has had the highest sales over the past 5 years? According to the article word processors top the list. The second best seller is spread sheets. Since many microcomputers are used in businesses, it is not surprising that word processors top the list.

While on the subject of word processors, I believe that most people do not realize their capabilities. We all know that we can write a letter, edit it, and then print it without errors. It would be impossible for us to produce Dynamic Color News without a good word processor. We

also use our word processor for our mailing list. We list each subscriber in order of zip codes. We can use the global search command for finding a name or zip code. We enter a new subscriber by finding the location of the zip code block. Then we insert the information at the proper location. We can also add hidden comments where needed.

For our basic programs, we first write them on our word processor. With the full screen editor, it is easy to modify the program. Then we save the program as an ASCII file with a BAS extension. When we return to basic we can then load and run the program. To enter a basic program into the word processor, it is necessary to save the program as an ASCII file. It can later be loaded into the word processor.

We have not been able to locate a Color Computer 3. The local stores say the information they have is that they are being held up for FCC approval.

This month we are starting our OS-9 series. If you have a subject you want us to cover let us know. This is in response to requests from our readers.

Also we have an article on hardware. This is for readers who are interfacing in building accessories. The information presented is not just for Radio Shack computers but for all computers.

### **OPERATING HINT**

Disk Programs - You can quickly remove disk programs from a disk by typing "DIR" to display the programs. Then chain kill commands for the programs you don't want. Example: KILL "FIRST/BAS":KILL"PGM/BIN": KILL"LAST/DAT:<ENTER>. This saves having to type DIR after deleting each program.

## INTERFACING COMPUTERS

In this series we have been discussing using the serial ASCII or RS-232 port for interfacing computers and other devices. For computers, modems, and terminals, the signals on the RS-232 ports are compatible. For interfacing with devices such as relays, motors or logic circuits, some electronic circuitry will be needed.

This month we are deviating from our serial ASCII terminal program development to present some ideas for making a hardware interface. We will return next month with our series.

### Hardware Interface

In this article we want to explain what will be needed to interface a microcomputer with other devices. Most of the articles in Dynamic Color News are devoted to writing software programs. This is because software is required for every computer task. However some hardware is required for some applications, and we want to give some advice on constructing hardware interfaces.

### VOLTAGE

Voltage is defined as the potential difference between two points. For a 12 volt storage battery, the voltage from the negative terminal to the positive terminal should be about 14 volts for a fully charged battery. Microprocessors and their support circuitry require 5 volts. A family of logic circuits called Transistor-Transistor Logic (TTL) also requires 5 volts. These circuits can interface and support microprocessors. A low power Shotky version has the letters "LS" prefixing their part numbers. Examples of these chips in color

## TELEWRITER 64 WORD PROCESSOR

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computers are 74LS138 and 74LS-02. These are generally considered to be digital circuits because they have two states a "0" and a "1". The voltage available at the color computer's ASCII or printer port varies from about +12 volts to -12 volts. This is standard for ASCII. These voltage variations have to be converted to logic levels of 0 to 5 volts to work with TTL or microprocessor circuits. When two similar devices are connected together, then they have circuitry that does this converting.

### NEGATIVE VOLTAGES

The other type of circuits are called linear circuits. A linear circuit can go through an infinite number of levels between its limits. An audio amplifier is an example of a linear circuit. Its output can vary from very soft to extremely loud. Linear circuits require plus and minus voltages. The earlier color computers required plus and minus voltages for the dynamic RAM chips.

### BUILDING AN INTERFACE

We are going to describe what is required in building an interface for the serial port. With this interface you can control any number of devices. We will also show how to send a signal back to the computer. This can be used with our ham radio, model railroad, burglar alarms, etc.

Also the joystick ports require analog voltages and convert them into digital words that can be stored within the computer. They have 64 bits which is adequate for many applications.

We are going to suggest some parts giving Radio Shack part numbers. The actual layout will be left to our readers. The first thing you will need will

be a power supply. You will then need a circuit board, and it is good practice to put a filter capacitor from each voltage to ground or the common.

A good power supply value is catalog # 277-1022 which sells for \$4.95. This is a tripple power supply with 5VDC 0.9A, -5VDC 0.1A, and 12V .03A. This has a non standard plug. We removed the connector and soldered the wires to a 14 pin header that would plug into a 14 pin socket which we soldered to a circuit board. The wires could be soldered directly into the circuit board. Measure and mark the voltages so you will know which voltage is which when we need them. Verify these voltages by measuring them with a voltmeter.

You will need a circuit board on which to build your circuits. There are many varieties, and we usually purchase the one that is on sale. Solder a filter capacitor between each of the voltages and ground. This capacitor should be at least 1 microfarad and have a voltage rating larger than the voltage it is placed across. A good type would be RS part number 272-1012 which is 4.7 uF at 35 volts. Electrolytic capacitors must be placed in the proper direction. Look for a + or - mark and orient the capacitor to agree with the polarity of the voltage it will be placed across. The capacitors will reduce noise.

Next month we will continue and show how to use the power supply and circuit board to construct circuits.

### OPERATING HINT

To clear 0 Pages, POKE 25,6: NEW for extended basic or POKE 25,14: POKE 14\*256,0:NEW for disk basic.



# HAM RADIO & COMPUTERS

by  
Bill Chapple W4GQC

In this series we are looking at using computers for ham radio applications. In the last two issues we gave a Morse code program and an antenna design program. This month we want to look at hardware interfacing.

Recently I was able to purchase a new Yaesu FT-757 high frequency transceiver. It requires 12 volts at about 2 amperes for receiving and 20 amperes for transmitting. I purchased a 12 volt car battery and use it for my power source. The transceiver is designed to be computer controlled. This means that a new frequency for the transceiver can be sent through the serial ASCII port. This works at 4800 baud and requires a 5 volt TTL signal. How do you convert the ASCII from the computer to TTL? A commercial adapter is available to do this job for about \$70. I plan to build my own interfaces and will show how you can build your own in this series.

What about transmitting and receiving Morse code? Interface units are available also for these tasks. What about teletype, AMTOR, and packet? For teletype the computer can send ASCII which is now legal on the ham bands. A tone generator is required to generate the two tones required from the ASCII voltages. These tones are then sent through the microphone circuitry to frequency shift key a single sideband transmitter. Baudot used to be the only type teletype code that could be used by hams. The computer can be programmed to send Baudot should this be desired. We will look at AMTOR and packet later.

## Computer Controlled Repeaters

There is a lot of interest in repeaters for 2 meters and other banks. A repeater receives a signal on one frequency and transmits it on another frequency. Of course a repeater can be purchased, but what hardware is required for a repeater. A lot of the functions of a repeater can be accomplished with a computer. First a repeater needs to identify itself. This can be done by Morse code or voice. The computer can be used to generate either of these.

If you want to use an auto-patch then touch tones will have to be decoded. The \* is used to take the phone off of the hook and the # is used to hang it up. If you have touch tone phones, then the tones can be connected directly into the telephone lines for dialing.

A repeater needs to be timed. The computer can be used for the timing function and can be reset at the beginning of a transmission.

## OTHER APPLICATIONS

Besides controlling things, computers make excellent devices for containing information. For example a clock could display the local time in key cities around the world. This could be controlled by the computer.

Another example would be to keep records of contacts. The name, call letters, type equipment used, and date of last contact could immediately be accessed.

What about call letters of DX stations. Many times I have looked for my DX chart to determine the country of a station. It would be nice if I could type in the call letters of the station and have the country displayed on the screen. This is not too hard to do and could be a subject for a future issue.

For those of you who want to build your own computer to ham radio interfaces, we suggest you begin by building an interface breadboard. Refer to our hardware interface project in this issue for details. These interfaces can save you money plus give you the satisfaction of building your own. Next month we will continue and have a program or hardware project for ham radio.

73's - Bill

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## 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.

### BANNER

Banner is a program that prints large characters horizontally on a printer. They can be used for large signs or banners for special events. The characters are about 7 inches high and are printed in ROMAN style.

Banner is a machine language program that completely takes over the computer. It is on disk and is loaded by typing "LOADM BANNER". A menu comes up and you have the option of setting the printer baud rate. This just accepts baud rates from 110 to 2400. The program will not work with higher baud rates such as 9600. You can also select line feed after carriage - return which is required of some printers.

The main menu appears next. From this you can enter your message, print the banner, display your message, change the background, print test, enter and display printer codes. These options are selected by pressing a number key. The change background option allows any character to be used as the printer element. For example the default character is a "\*". Another character such as a "\$" or "%" can be selected by using this option.

The printer code option allow you to vary the size of the

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- \* Ramdisk in each bank. Basic or machine language programs can be stored in the second 32K bank for any of the selected 64K memory banks. You can have special programs in one or two banks and your basic programs in the other banks. The ramdisk quickly loads and runs the programs from the computer's memory.

- \* Independent banks. Each of the 4 banks is completely independent allowing any combination of programs to be entered. The unselected banks are protected and the data can not be altered until the bank is again selected.

For example one bank can contain a word processor, the second a machine language game program, the third a terminal program, and the fourth a spread sheet. When banks are switched all variables are preserved allowing the program to run or continued when the banks are reselected.

- \* Plug in installation. For 64K computers, installation involves removing the two memory chips and inserting the assemblies into the empty sockets. Two small holes are required for the switches to complete the installation. For 16K computers a jumper must be soldered to upgrade the computer to 256K.

- \* Low cost. ME-18 \$119.95

## 128K UPGRADES

ME-10A Similar to the ME-18 except upgrades 2-chip 64K computers to 128K for 2-64K bank operation. Ramdisk software is included. \$49.95

ME-12 Upgrades 8-chip 4164 type 64K computers to 128K. Ramdisk software is included. \$49.95.

## 64K UPGRADE

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characters by entering codes to change the printer to print compressed characters or select different printer formats.

We found the program to be easy to use and produce very nice looking banners. For more information contact:

B. Erickson Software  
P. O. Box 11099  
Chicago, IL 60611

+ + + DCN STAFF + + +

### 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.

#### CoCo III Graphics

Spectrum Projects Inc. has produced a CoCo III Graphics Program. It requires a 128K CoCo III with a disk drive. Its features include 320 X 192 graphics, 16 of any 64 colors, ability to save and load 32K screens, and dual joystick button. The program sells for \$19.95 + shipping. For more information contact:

Spectrum Projects Inc.  
93-15 86th Dr. Box 21272  
Woodhaven, NY 11421

Note: We have not been able to purchase a CoCo 3 and will review this product as soon as we obtain one.

### QUESTIONS & ANSWERS

**Question:** I have one of your 96KX modules and would like to have other modules with software in them. How difficult is it to put a latch in this address and

have some other modules with different software?

**ANSWER:** The 96KX module uses the upper 8K of memory. The disk ROM uses the 8K below this. Circuitry is included to disable the disk ROM or the cartridge port when the 96KX is being used. Other programs can be placed in EPROMS by using a similar scheme. This is a good subject for a future article.

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