

# the RAINBOW

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## LINE JUSTIFIER

Last month we said that we'd have a line Justification Program ready for this month's issue. The listing is included below.

We were writing the RAINBOW last month with a simple word Processor that let us enter a whole line and make corrections before it was committed to the print buffer on a Printer. That was an improvement over the Program that the manual had, mainly because it allowed us to backspace for corrections. In the case of the RAINBOW, where we want to have lines which are right-Justified, that worked only to a degree -- mainly because we had to type the line and then go back and add spaces to make the lines come out even on the right-hand side. While there was easier than typing the RAINBOW on a typewriter (which would have required two typings) it was still a hassle. Thus was born the Mini-Word Processor below.

What happens here is that, using the INSTR Command, we search for spaces in a line and then "peel off" spaces from the end of each line and add them to the spaces which are already between the words. Each line is entered as ASCII and then pulled apart. Spaces are inserted, and then the line is put back together. There are two variations, one for a full-length line and the other for a half-length one.

The Program requires the typist to space to a certain spot on the line, in effect, to fill up the line with spaces (a Printer might call these space bands). Those spaces are then repositioned in the line to make it come out evenly.

The screen display is set up so that there is a little black block for the typist to "aim" at. Once the typist gets close to the block, he or she just spaces in blanks until the cursor covers the black block. Then, the line is entered into the print buffer and printed on the line Printer.

As an added aid, the last line typed is shown on the bottom of the screen. One of the reasons for this is because we felt it would be easier for the typist to begin the next line knowing what was on the previous line -- without the need of having to look at the Printer.

For short lines, just hit ENTER when the line ends. However, a bug may -- but will not always -- appear if you type a VERY short line. What can happen is that the one or two words in the line will repeat themselves. If that does occur, just space down and retype the same line. It will go away.

The remainder of the Program is devoted to the display and the graphic signature for the Program and the software.

THE LISTING . . . . .

```
10 CLS
20 CLEAR1000
30 GOSUB410
40 GOSUB380:GOSUB390:GOSUB400:PRINTSTRING$(32,45)
50 PRINT:PRINT"SELECT MODE:"
60 PRINT"      (1) ONE-COLUMN FORMAT":PRINT"      (2) TWO-COLUMN FORMAT":PRINT:INPUT"
      ENTER NUMBER";ZZ
65 ON ZZ GOTO100,240
70 PRINT:INPUT "ENTER ONLY 1 OR 2 PLEASE";ZZ
80 ON ZZ GOTO100,240
90 IF ZZ<>1 OR ZZ<>2 THEN 70
100 CLS
110 N$=" " :L=4
120 GOSUB380:GOSUB390:GOSUB400:PRINT"      ONE-COLUMN FORMAT"
130 PRINT@160,STRING$(32,45);:PRINT@271,CHR$(128);"<--SPACE TO HERE":PRINT@288,STRING$(32,45);:PRINT@322,"...LAST LINE...":PRINTA$:PRINT@192,"";:LINE INPUT A$
140 IF RIGHT$(A$,1)=" " THEN R$=RIGHT$(A$,1):A$=LEFT$(A$,79):GOTO170
150 PRINT#-2,A$
160 GOTO100
170 B=INSTR(L,A$,N$)
180 C$=LEFT$(A$,B)
190 E$=RIGHT$(A$,79-B)
200 D$=C$+N$
210 A$=D$+E$
220 L=LEN(D$)+4
230 GOTO140
240 CLS
250 N$=" " :L=4
260 GOSUB380:GOSUB390:GOSUB400:PRINT"      TWO-COLUMN FORMAT"
270 PRINT@160,STRING$(32,45);:PRINT@230,CHR$(128);"<--SPACE TO HERE":PRINT@256,STRING$(32,45);:PRINT@320,"...LAST LINE...":PRINTA$:PRINT@192,"";:LINE INPUT A$
280 IF RIGHT$(A$,1)=" " THEN R$=RIGHT$(A$,1):A$=LEFT$(A$,37):GOTO310
290 PRINT#-2,A$
300 GOTO240
310 B=INSTR(L,A$,N$)
320 C$=LEFT$(A$,B)
330 E$=RIGHT$(A$,37-B)
340 D$=C$+N$
350 A$=D$+E$
360 L=LEN(D$)+3
370 GOTO280
380 F1$=CHR$(129)+CHR$(131)+CHR$(135):F2$=CHR$(132)+CHR$(141):F3$=CHR$(133):F4$=CHR$(128+15):RETURN
390 CLS:PRINT@34,F1$:PRINT@66,F2$:PRINT@98,F3$:RETURN
400 PRINT@99,"ALSOFT MINI-WORD PROCESSOR":RETURN
410 PRINT@198,"(C) FALSOFT, 1981":FORX=1TO200:NEXT
420 GOSUB380
430 FORX=376TO34STEP-32:GOSUB460:NEXTX
440 FOR X=51TO34STEP-1:GOSUB460:NEXTX
450 RETURN
460 Y=X+32:Z=Y+32:Q=Z+32
470 PRINT@X,F1$:PRINT@Y,F2$:PRINT@Z,F3$:PRINT@Q,F4$:RETURN
```

**CBUG MONITOR**

CBUG, available on either tape or an EPROM from THE MICROWORKS, is a full-scale monitor Program which also allows you to use your Color Computer as a terminal.

For instance, you can use it to hook up with CompuServe -- and you can do it for the same price as the VIDEO-TEX Program put out by Radio Shack. Since you also get a very powerful monitor as well (in fact, you will be much more interested in the monitor than in the terminal capabilities), CBUG is a real bargain at \$29.95 on tape or \$39.95 on the EPROM.

All in all, there are 19 commands in CBUG. By far the most important one is the "M" command, which stands for memory examine and change. With it you just type in "M" and a lmal address, and the display shows you a full eight bytes of memory at the location you specify. The line numbers are shown, and, if the location is within eight bytes of the line the cursor positions itself right in front of the byte you specified. And, to change that byte, all you have to do is type in the new hexadecimal number. No deleting or anything like that. CBUG then positions the cursor in front of the next byte, and you can change that, too.

By simply moving the up, down, left and right arrows, you can examine the memory contents above and below the one you originally specified. It is a real nice way to manipulate memory.

CBUG also makes it easy to examine the contents of the CPU, or to go back and forth between BASIC and itself. And, you don't have to worry about those hexidecimals, either, because there are simple commands that allow you to convert hex to decimal and decimal to hex. In fact, its a pretty easy way to get used to hex notation.

Of course, you can also run your Programs and you can save them to tape as well. CBUG also has commands to transfer memory blocks, load hexes in a quick fashion and change the CPU registers.

You can also move a display page, upload or download, and an auto mode

Computer as an intelligent terminal to a host system.

CBUG is a fine Program. It is easy to use and gives a good look into the inner workings of the Color computer. There are a number of helpful hints in the documentation and its easy to get CBUG up and going quickly. On the other hand, it is a powerful tool that will continue to prove very useful no matter how sophisticated you may be.

Although I have the tape version, the directions supplied by THE MICROWORKS are very clear in getting the EPROM version installed -- either in the Extended Color Basic socket inside the case or in a ROM Pack. Using the EPROM means, of course, that you don't give up any RAM for CBUG.

CBUG is available by mail from THE MICROWORKS, P.O. Box 1110, Del Mar, CA 92014 in either tape or EPROM version.

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## THANKS FOR THE MEMORIES

Yes, we do love the Color Computer, but we get somewhat unhappy when we get right on the edge of usable memory and realize there is some 1.5K being "eaten" up by high-res graphic screens we're not planning to use.

There is a way. . .

Just **POKE 256:NEW** when you power up, and you will have an additional 1.5K of bonafide memory to use. We aren't exactly sure what this does, but it seems to remove the high-res graphic screen from memory. It stays gone so long as you don't PCLEAR the Color Computer.

You have to plan in advance. The POKe doesn't work if you leave off the :NEW, and, if you have a program residing in memory, the :NEW will wipe

One way to avoid this problem if you did not plan ahead would be to CSAVE the program, reset the memory and then CLOAD the program back in.

As Bob Hope said. . .

## PRINTER STATUS

Although there is no way to count line automatically on the COLOR computer, there are a few things you can do with printer information.

A lot of that information is in the manual you received with your COLOR computer, although there is one typographical error. That error is on page 209 of the Extended Color Basic documentation, which says you can set the line printer width at decimal 115. The correct address to set the width is decimal 155. That's pretty obvious to anyone who is looking at the other addresses.

However, you can also peek into the PIA at decimal 65314 to check the status of your line printer. If the peek returns a 4 or a 6, then the printer is on line. If it returns a 5 or a 7, then it is off line.

Try some of the addresses at the decimal 149 - 156 addresses. The one which shows up right away is 153, the comma field width. In short, you do not have to have 16-space comma fields and can use any number you want.

## CONTEST FOR RAINBOW READERS

In cooperation with JARB SOFTWARE, all readers of the RAINBOW are invited to participate in a break - the - code contest. The winner, or winners, will receive a free copy of the JARBCODE program reviewed on these pages. All you have to do is decode the message below and send it to: Joe Bennett, Senior Programmer, JARB Software, 1169 Florida St., Imperial Beach, CA 92032. If you break the code, Bennett will send you a free copy of JARBCODE.

But, you can be a winner anyway. Just mention the RAINBOW when placing an order for JARBCODE and you will get a \$2 discount off the retail price of

JARBCODE. Orders can be sent to the address listed above.

And now the code . . .

2014-	2656-!	206-B	3899-'
866-M	3899-8	.015-W	16-#
62-8	1-2	.015-+	2656-2
4-U	2656-W	97-X	7777-2
4444-X	2014-I	4444-	2014-M
263-Y	62-U	4444-/	

Have fun decoding!

## TANDY DISC-O

According to a "very highly Placed source" in a Texas location which will herein go unnamed, the long-awaited Color Computer disc will make its appearance in August or September.

We Pass along this information so you can -- if you are of such mind -- go ahead and Place your order for one of the disc systems now.

In connection with the disc, Radio Shack will announce a memory upgrade for the Color Computer. We're not in on what form it will take, but it be UPPING the memory to 32K.

What we DO know is that four disc drives will be available. Drive "0" will have a ROM-based DOS, so it will use UP a minimum of that all - to - precious memory. It'll Plug into the ROM Cart Port on the right side of the Color Computer. Word is the DOS will be about the same as TRSDOS, except no Debug and Clock functions. The reason for this, we understand, is because of basic differences between our 6809E and their Z-80.

The Projected Price for Drive "0" is about \$595. The other three are to be in the \$300-\$400 area. Tandy expects the waiting period to be 30 to 60 days, so, if you want one quick, we understand you can Place an order now.

By the way, 32K is about it as far as the Color Computer is concerned. The way we hear it, there IS another 16K in there, but BASIC can't use it. You CAN Poke into it -- if you have the memory -- and its a good Place machine language. But you can't just write a Program in BASIC and use that additional 16K.

Frankly, the way we see it, Tandy is changin9 its tune a little on the Color Computer. It was originally Planned to be a "home" and "entertain-

## SOFTWARE REVIEW... JARBCODE

If the Japanese had had Joe Bennett and H. D. Stow on the side in World War II, there's a good chance that the United States never would have cracked their code ... the act which did lead to the end of the war.

Bennett, chief Programmer for JARB SOFTWARE, and Stow have created a very nice code-writing Package that anyone who likes -- or is interested -- in code would be Proud to own. The Program is called JARBCODE and is available for \$14.95. Address is 1169 Florida St., Imperial Beach, CA, 92032.

JARBCODE allows you to send code at three different levels: almost impossible to break, impossible to break, and "are you kidding"! The excellent documentation says that you would most likely need special equipment to break the top code level -- and we believe it.

The Program is also fun to use and if you are at all interested in codes JARBCODE is Just what you need.

In addition to the Program's main Purpose, it has some very interesting graphics (although in low res) to get things going. We think the graphics are a bonus to the Program itself and are quite creative ... Proving, of course that you don't HAVE to have Extended Color Basic to enjoy your Color Computer.

We liked JARBCODE.

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ment" machine and that was sort of a company line. We don't hear that so much any more. All we do seem to hear is that because if (1) the screen and (2) the keyboard, the Color Computer isn't going to be very good as a word processing device. Well, we'll see.

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## SOFTWARE REVIEW . . . SIGMON

SIGMON from DataSoft, Inc., is a very well thought-out machine language monitor, mini-assembler, disassembler and debugger all rolled into a single tape. It was designed especially for the Color Computer and shows some well thought out ideas.

In effect, there are a total of 18 commands you can use to access the memory of your computer, allowing you to do everything from reading the contents of the memory locations to setting breakpoints and examining the contents of the registers in the 6800 CPU. Moreover, after you do all these things, you can run the assembly language program you create ... either on a real-time basis or step - by - step. The last option gives you the chance to examine the contents of the CPU registers and see how your program is affecting them.

A really nice feature of SIGMON is its ability to turn your printer on or off so that you can trace your program and have a record of what happened. By keeping the printer on all the way through the process, you will be able to see what you did and what the result of it was.

You can also set SIGMON up to operate in either decimal or hexadecimal modes, as far as input is concerned. For those trying to cope with both assembly language and hexidecimals for the first time, that can be a bonus. However, SIGMON's output is always in hex, so it can be confusing if you don't remember what you are using to input.

The DataSoft people have put together a very nice package, and a very attractive booklet of documentation. The little drawings of "Sigmon" do help the novice assembly language programmer understand the text a little better.

I would say SIGMON is a perfect program to help someone get into the complicated area of assembly language. One of the reasons for this is simply because it is a helpful-type program that sort of guides you. However, in view of that, I do with the documen-

tation were a little more complete for the novice. A couple of short programs worked through step - by - step using the SIGMON commands would go a long way toward helping the beginner understand a little more about all the mysterious stuff.

With that one complaint, it's really a fine program. And, with a \$29.95 price tag, it's in the perfect spot for someone who wants to see what all this assembly language stuff is all about.

Remember, though, SIGMON is a MINI-assembler and disassembler. In short, it tries to be -- and succeeds -- in being a lot of things packed in one tape. Because of that, it's not like a full-blown assembler, and doesn't pretend to be. But it is a good place to start and the price is certainly right for anyone who wants to see what assembly language is all about.

SIGMON is available from DataSoft, Inc., 19519 Business Center Drive, Northridge, CA 91324.

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## DRIVER BACKUP

This month's edition of the Tandy Newsletter carries some excellent information on making backups of disc files and information. As a rule, it is always a good idea to make a backup of everything so you don't lose it due to the various problems that crop up with magnetic media.

In order to make a backup of a machine language tape, you need to use CSAVEM, but you also need some other information that isn't always easily available.

In the case of the Graphics Printer Driver we mentioned last month, you need this information to make the backup. That information, as in all CSAVEM's is the program's start, end and transfer addresses. To save you the trouble of looking for it, the proper command for the 16K Driver is CSAVEM"FTFX16",15744,16376,15744. If you use that, you can make backup copies of the Driver.

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## SCREEN PRINTER

Of course a Printer will help you a great deal in debugging Program, because, for one thing, you don't have to scroll your display back and forth to trace the workings of a Program.

But there can be other problems, too -- such as remembering the value of variables and working with displays where it would be good to be able to print out the alphanumeric contents of the screen's display.

The following Program will do just that. And it will give you the exact relationship of the display to the screen, since it prints out the screen on a one-for-one basis to the Printer.

It will not, however, display the graphics symbols on the screen, nor will it give a lower case printout. The reason there is no lower case ability is shown in line 40 below. In order to deal with the character set it is necessary to convert the CHR# references found in the PEEKs. That is no big problem, and we expect that most of you don't use lower case on the screen anyway, because the reverse graphic nature of lower case makes the screen look peculiar. Despite these problems, we think you will find the screen Printer will be a good utility you can use.

The Program:

```
10 FOR X=0 TO 16
20 FOR Y=1 TO 32
30 Q=PEEK ((X*32)+Y)+1023)
40 IF Q=>96 AND Q<=127 THEN Q=Q-64
50 PRINT#-2,CHR$(Q);
60 NEXT Y
70 PRINT#-2,""
80 NEXT X
90 END
```

We suggest using very high line numbers for this Program, so that it can just sit up "on top" of whatever Program you happen to be working on. Then, when you want to do a print of the screen, simply GOTO the line number where the screen Printer is

## USING THE EDITOR

If you have Extended Color Basic, you will be happy to know that there have been a few things left out of the Radio Shack documentation on using the editor. And, if you have a good knowledge of Level II Basic, you might have felt cheated that all the editing commands in Level II were not included in Extended Color.

Not to worry. They are all there, the manual just "forgets" to mention three of them. The "missing" editing commands are "A", "E" and "Q". For those of you not familiar with Level I we will present a short rundown of the changes below:

A (Cancel and Restart):

This command moves the cursor back to the beginning of the program line and cancels the editing changes you have made.

E (Save Change and Exit):

This one makes the computer end the editing process and save all the edits you have made. It is much the same as hitting ENTER.

Q (Cancel and Exit):

When you decide you didn't really want to make those edits, "Q" is the command command d command to use.

For "A" and "E" you cannot be in a subcommand mode. If you are, you must exit the subcommand (by hitting the up arrow and SHIFT at the same time) before they will work.

-----  
set up.

Finally, you might wish to place an END instruction before the screen Printer Program -- to make sure that whatever you are working on does not "spill" into the screen Printer.

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# AN EDUCATIONAL PROGRAM FOR EVERYONE

Here is a Program that can really be of use to just about everyone in the family. It is called AMORT and it deals with money at interest.

On one level, it can be used as a regular interest program that will help you figure out such things as how much it will cost you a month to buy the new disc drives for your COLOR computer. That's not a bad thing to know.

On the other level, however, there are some explanations built in to help teach those unfamiliar with the terms involved with money at interest just what the terms mean. And there is a "cute" little default if you don't make the proper response to the amount of time the loan has to run question.

AMORT is written for non-Extended Color Basic, which -- as you know -- does not have the ability to raise numbers to powers. There is a way around that limitation of course, and it can be found in lines 50 and 60. For those of you who do have Extended Color Basic, you might wish to change those lines. The result will be a slightly more accurate result -- especially on the more complicated calculations for longer periods of time.

However, non-Extended Color users will have to change the PRINT USING commands in lines 140-146, 310 and 340. Just take out the reference to USING and the pound- and dollar-signs. That way, the program will run without any modification on your part.

Finally, notice the use of the variable PD to send output to the printer. If you want, you can eliminate the references to PD, but you would probably be better off leaving them in -- in anticipation of the time when you might get a printer. Just answer "No" to the question in line 32 and no harm is done.

Here is the listing:

```
3 ' *****
4 ' * AMORT PROGRAM *
5 ' * (c) FALSOFT, 1981 *
6 ' *****
10 C=0:CLS
12 PRINT " THIS PROGRAM WILL GENERATE AN AMORTIZATION SCHEDULE FOR MOST
COMMON LOANS."
13 PRINT:PRINT ">PLEASE FOLLOW DIRECTIONS BELOW<"
14 PRINT STRING$(32,"=")
15 INPUT "FIRST, WE NEED TO KNOW HOW MUCH YOU WANT TO BORROW. THIS IS CAL
LED THE PRINCIPAL. WHAT IS THE PRINCIPAL";P
16 CLS:PRINT:PRINT
17 PA=P
20 INPUT "NOW, WE MUST KNOW THE NUMBER OF PERIODS THE LOAN WILL RUN. IF
YOU WISH TO ENTER THE PERIODS BY MONTH, TYPE IN THE WORD 'MONTH.' I
F ITS YEARS, TYPE IN 'YEAR.' WHICH IS IT";A$
21 IF LEFT$(A$,1)="M" THEN 270
22 IF LEFT$(A$,1)="Y" THEN 260
23 GOTO250
30 CLS:PRINT:PRINT
31 INPUT "LASTLY, WE NEED TO KNOW WHAT INTEREST RATE YOU WILL BE CHA
RGED ON THE LOAN. WHAT IS THE RATE";R
32 INPUT " DO YOU WANT A PRINTOUT";PO$:IF LEFT$(PO$,1)="Y" THEN PO=1
35 CLS
40 I=R/12:I=I/100
```



```

30 T=1:FOR X=1 TO L
60 T=T*(1+I):NEXT X:T=1/T
70 T=1-T
80 M=P*I/T
90 GOSUB200
100 FOR Z=1 TO L
120 A=(INT(P*I*100+.5))/100
130 B=M-A:P=P-B
140 PRINTTAB(0):PRINTUSING"###";Z:IF PD THEN PRINT#-2,TAB(0):PRINT#-2,USING"###";Z;
142 PRINTTAB(3):PRINTUSING"###,###,##";P:IF PD THEN PRINT#-2,TAB(3):PRINT#-2,USING"###,###,##";P;
144 PRINTTAB(14):PRINTUSING"#,###,##";B:IF PD THEN PRINT#-2,TAB(14):PRINT#-2,USING"#,###,##";B;
146 PRINTTAB(23):PRINTUSING"#,###,##";A:IF PD THEN PRINT#-2,TAB(23):PRINT#-2,USING"#,###,##";A;
160 Q=Q+1:C=C+1:AT=AT+A:NEXT Z
165 GOTO300
170 END
200 CLS:MA=M+.005:MA=INT(MA*100)/100:IF PD THEN PRINT#-2,TAB(4)"AMORITIZATION SC HEDULE"
201 IF PD THEN PRINT#-2,"PAYMENTS ARE $";MA -
202 IF PD THENPRINT #-2,TAB(4) "BALANCE";
204 IF PD THEN PRINT #-2,TAB(14) "PMT/PRIN";
206 IF PD THEN PRINT #-2,TAB(24) "PMT/INT"
208 PRINT"PAYMENTS ARE $";MA
210 PRINTTAB(4)"BALANCE"TAB(14)"PMT/PRIN"TAB(24)"PMT/INT"
220 RETURN
250 CLS(5):PRINT @82,"NO!";
252 PRINT @162,"NEIN!";
254 PRINT @249,"NYET!";
255 PRINT @289," NO NO NO NO NO NO NO NO NO NO";
257 PRINT@352," ":PRINT " YOU DID NOT FOLLOW THE DIRECTIONS PROPERLY. E
NTER ONLY THE WORD 'YEAR' OR THE WORD 'MONTH.' NOW, TRY AGAIN.
"
258 FOR WN=1 TO 3200:NEXT WN:CLS:PRINT:PRINT:GOTO20
260 PRINT
261 INPUT "O.K., NOW WILL YOU PLEASE ENTER THE NUMBER OF YEARS BEFORE YO
U PAY OFF THE LOAN";YR
265 L=YR*12:GOTO 30
270 PRINT
271 INPUT "ALL RIGHT, NOW WILL YOU PLEASE ENTER THE NUMBER OF MONTHS IT
WILL TAKE TO PAY OFF THE LOAN";L
275 GOTO 30
300 IF PD THEN PRINT#-2," ":PRINT#-2,TAB(10)"LOAN SUMMARY":PRINT#-2,TAB(10)"====
===="
310 IF PD THEN PRINT#-2,TAB(5) "PRINCIPAL:":PRINT#-2,USING"#####,###,##";PA
320 IF PD THEN PRINT#-2," PERIODS:"L:PRINT#-2," RATE: ":PRINT#-2,USING"###
.##";R:PRINT#-2,"%"
330 IF PD THEN PRINT #-2,STRING$(31,"-")
340 IF PD THEN PRINT #-2,"TOTAL INTEREST: ":PRINT#-2,USING"#####,###,##";AT
350 IF PD THEN PRINT#-2," ":PRINT#-2," ":PRINT#-2," "

```

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Address:-----  
City:----- State:----- Zip:-----