■ Test Your Cultural Literacy. See p. 4.

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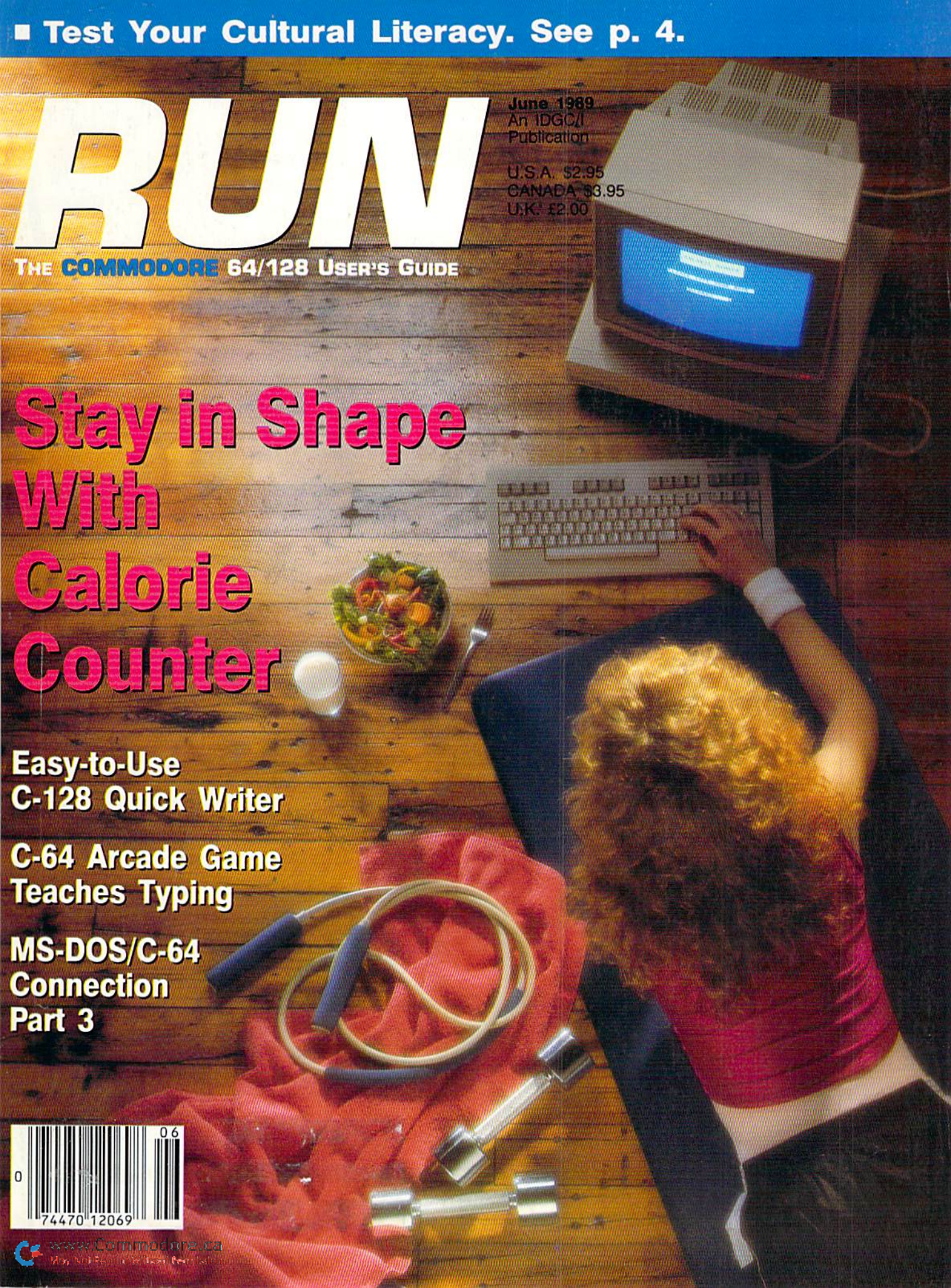

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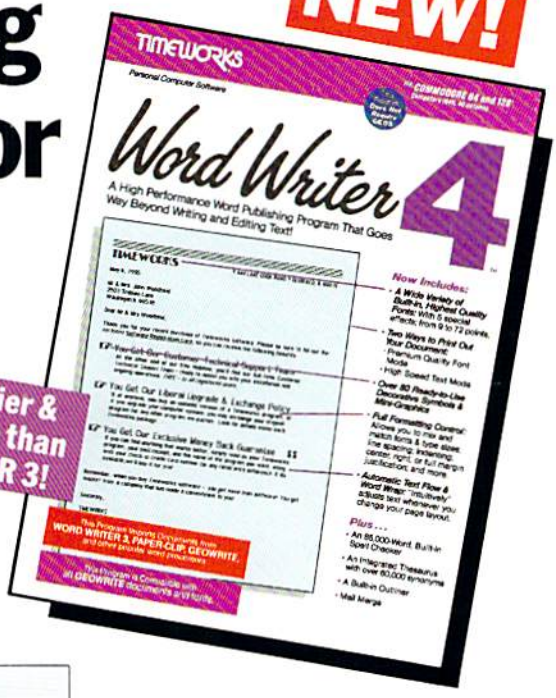

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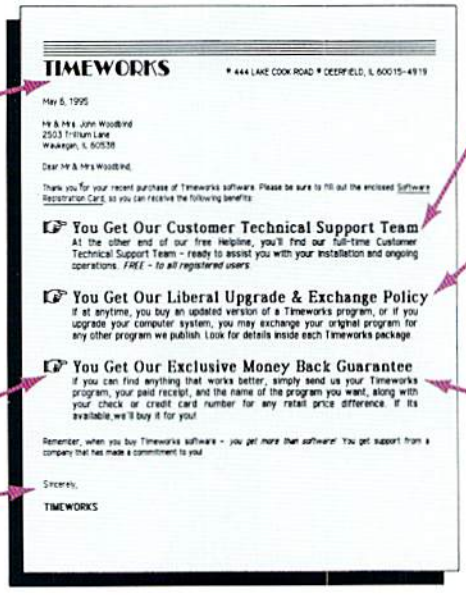
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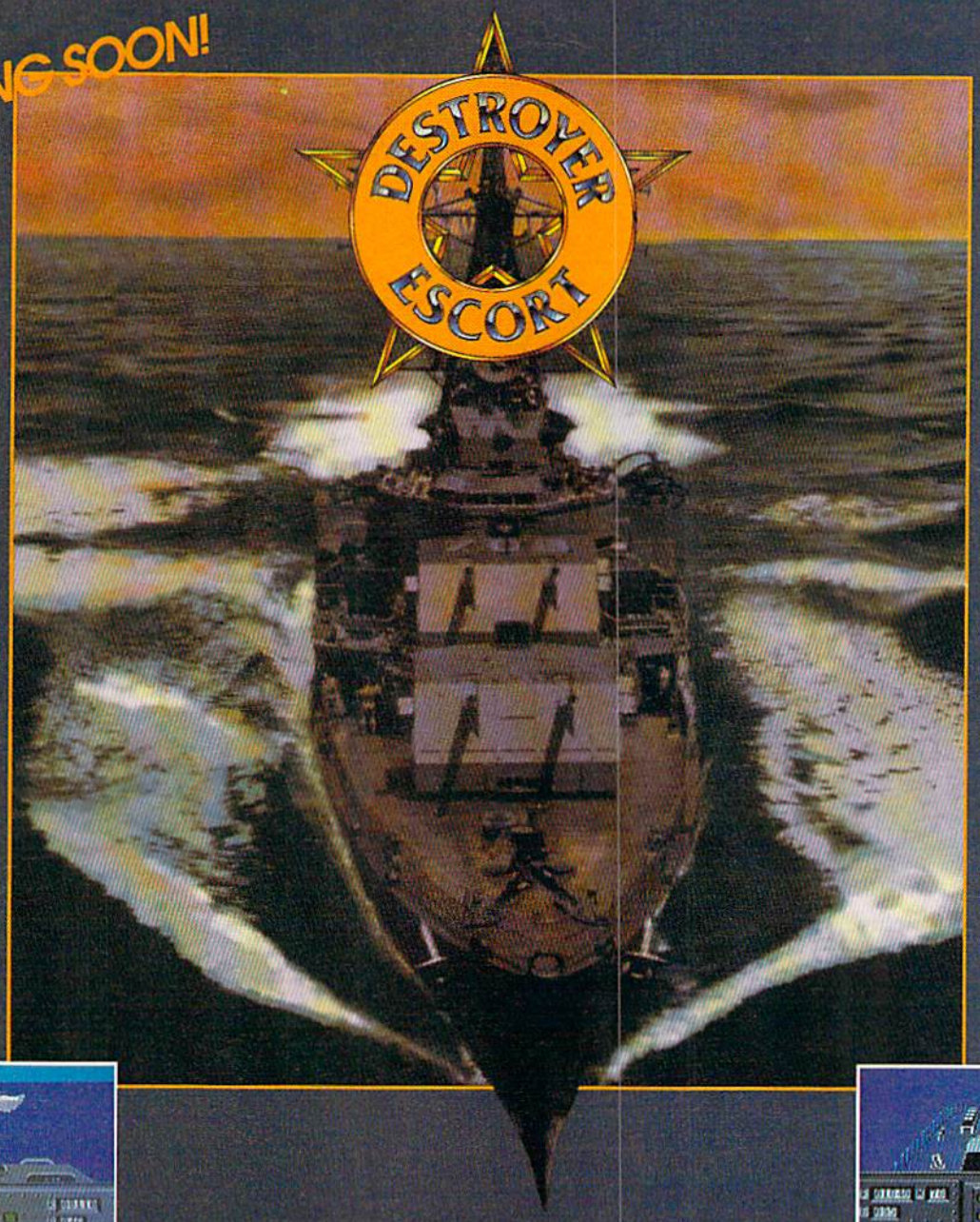

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C O N T E N T S

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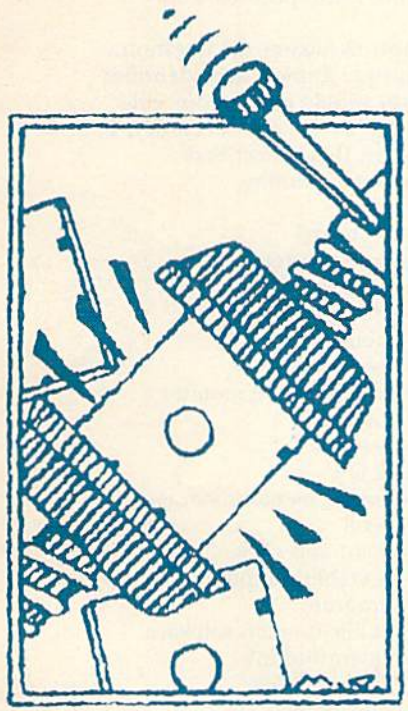

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* If you'd rather not type in the listings for these articles, they're available on the May–June 1989 ReRUN disk. To order, see page 52.

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RUNning Ruminations

In his best-selling book, *Cultural Literacy*, E. D. Hirsch, Jr. includes an index of information—famous people, places, phrases, terms, dates—that literate Americans should be acquainted with.

The book, which makes interesting and challenging reading, is Hirsch's response to declining American literacy and, as he says, "focuses sharply on the background knowledge necessary for functional literacy and effective national communication." Hirsch, an English professor, teamed up with an historian and scientist to compile this index to American literate culture, aimed at the common reader with a high school level of literacy. His list tests the reader's knowledge on a broad range of topics—from Aphrodite to Zeus, agnosticism to Zionism, Athens to Zurich.

Cultural literacy today requires knowledge of computers.

◇

While he makes no claims that his is a definitive list, noticeably absent are terms relating to computer technology. The *RUN* staff identified the following as the only computer-related terms on the list: bit, byte, computer, data, magnetic tape, mainframe, megabyte, microchip, personal computer (PC), RAM, ROM, software.

The following supplemental list attempts to answer the question, "What computer terms should literate people know?" and identifies computer terms and phrases that are now widely used in our culture. It's not trivia; it's part of living in the late twentieth century. I invite readers to submit additions to this list that reflect basic knowledge shared by the computer-literate community.

—640×400 high-resolution
—arcade game
—artificial intelligence
—ASCII
—Basic
—BBS (bulletin board system)
—boot up
—C-128
—C-64
—computer simulation
—computer virus
—CP/M
—database
—desktop publishing
—dot matrix
—download
—electronic services
—file
—firebutton
—floppy disk
—GEOS
—GIGO (garbage in, garbage out)
—hacker
—hardware
—input
—integrated software
—interface
—joystick
—K of memory
—keyboard
—laser printer
—letter quality
—listing
—menu
—modem
—monochrome monitor
—mouse
—network
—online
—optical memory storage
—pixel
—point and click
—portable computer
—program
—public domain software
—QuantumLink
—Silicon Valley
—spelling checker
—spreadsheet
—troubleshoot
—user-friendly
—user group
—vaporware
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```
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                                        :REM*174
1Ø POKE 5328Ø,Ø:POKE 53281,Ø:PRINTCHR$(147
   )                                    :REM*252
2Ø FOR CL= 1 TO 15:WT=1:SC=1Ø24+(12*4Ø)+19
   :CH=16Ø:FORHT=1 TO 24 STEP4          :REM*49
3Ø GOSUB 6Ø                             :REM*166
4Ø WT=WT+4:SC=SC-2*41:NEXT:NEXT         :REM*31
5Ø GOTO 1Ø                              :REM*172
6Ø FOR LX=SC TO SC+WT:POKE LX,CH:POKE LX+5
   4272,CL:NEXT                         :REM*211
7Ø FOR LX=SC+HT*4Ø TO SC+HT*4Ø+WT:POKE LX,
   CH:POKE LX+54272,CL:NEXT             :REM*95
8Ø FOR LX=SC TO SC+HT*4ØSTEP4Ø:POKE LX,CH:
   POKE LX+54272,CL:NEXT                :REM*78
9Ø FOR LX=SC+WT TO SC+WT+HT*4ØSTEP4Ø:POKE
   LX,CH:POKE LX+54272,CL:NEXT          :REM*251
1ØØ RETURN                              :REM*242
```

—BRET M. TIMMINS, DRAPER, UT

$52E NEW CHARACTERS FOR 80-COLUMNS

This short program puts a custom character set in the C-128's 80-Column mode. Run the program, then enter this statement:

GRAPHIC 1<return>
BLOAD"SAMPLE FONT",P8192<return>
BOOT"BOOT 80"<return>

or

BLOAD"BOOT 80":SYS2816<return>

Use your own C-64 or C-128 font file to replace "Sample Font" in the BLoad command. The Boot 80 Character program, shown below, makes the Boot 80 program, which installs the character set.

```
Ø REM BOOT 8Ø-COLUMN CHARACTERS - JIM DERR
   Y                                    :REM*1Ø5
1Ø FORX=2816TO2879:READQ$:POKEX,DEC(Q$):NE
   XT:BSAVE"BOOT 8Ø",BØ,P2816TOP288Ø
                                        :REM*253
2Ø DATA A9,ØØ,AØ,2Ø,85,DA,84,DB,A2,12,A9,2
   Ø,2Ø,CC,CD,E8,A9,ØØ,2Ø,CC,CD,AØ,ØØ,A2,Ø
   E,A9,DA,2Ø,74,FF,2Ø,CA               :REM*98
3Ø DATA CD,C8,CØ,Ø8,9Ø,F1,A9,ØØ,2Ø,CA,CD,8
   8,DØ,FA,18,A5,DA,69,Ø8,85,DA,9Ø,EØ,E6,D
   B,A5,DB,C9,3Ø,9Ø,D8,6Ø               :REM*44
```

—JIM DERRY, EAST DETROIT, MI

$52F BLISS-FUL RUN PAINT SPACE FINDER

After I typed in the seemingly interminable listings for RUN Paint (*RUN*, March 1989), the program refused to work when I ran it. I found the cause: spaces I'd neglected to enter properly in the Data statements.

Since *RUN*'s Checksum doesn't check for spaces except for those between quotation marks, I've written an enhancement that you can put in any *RUN* listing that uses the hex loader format. Just add this routine to the hex loader and run it. Any lines where you've mistyped spaces print to the screen for you to fix. Delete lines 1, 2 and 1000–1060 when you've finished typing in the listing.

```
1 GOSUB 1ØØØ{23 SPACEs}:REM*51      :REM*129
2 PRINT"DELETE LINES 1 & 2, AND LINES 1ØØØ
  -1Ø6Ø                             :REM*111
1ØØØ PRINT"{SHFT CLR}CHECKING FOR MISSING
     SPACES...                      :REM*85
1Ø1Ø FOR Q= 1Ø1 TO (N): REM N = LAST FULL
     (6Ø-CHAR) LINE NUMBER          :REM*181
1Ø2Ø READ A$: B$=MID$(A$,1)         :REM*237
1Ø3Ø IF LEN(B$)<62 THEN 1Ø5Ø        :REM*235
1Ø4Ø NEXT: PRINT "SPACING IS OK!":RETURN
                                    :REM*176
1Ø5Ø PRINT"SPACING INCORRECT IN LINE ";Q
                                    :REM*71
1Ø6Ø GOTO 1Ø2Ø                      :REM*8Ø
```

—PETE BLISS, MELBOURNE, FL

$530 DON'T LET YOUR FINGERS DO TOO MUCH WALKING

The next time you type in a hex loader program, such as RUN Paint (*RUN*, March 1989), give your fingers a break. Use the C-128's numeric keypad to quickly and easily type in numbers, and your right hand will stay in one place on the keyboard. My program helps you further by redefining the F1, F3, F5, F7, + and − keys to type in the letters A–F, and the period key to type in spaces. It also removes the need to use the shift key for hexadecimal entries.

In addition, the F2 key places the word DATA and a space after a line number; F4 lists the directory; pressing F6 with the cursor in front of a filename in a directory automatically loads that program; and F8 saves a listing. ►

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```
10 REM 128 NUMERIC KEYPAD REDEFINED - HUGH
    MCMENAMIN                          :REM*87
20 KEY1,"A":KEY3,"B":KEY5,"C":KEY7,"D":KEY
   2,"DATA ":KEY4,"DIRECTORY"+CHR$(13)
                                       :REM*56
30 KEY6,"DLOAD{18 CRSR RTs}:"+CHR$(13):KEY
   8,"DSAVE"+CHR$(34)                  :REM*204
40 FORI=0TO88:POKE6912+I,PEEK(64128+I):NEX
   T                                   :REM*221
50 POKE830,0:POKE831,27:POKE6994,32:POKE69
   85,69:POKE6986,70                   :REM*183
```

—Hugh McMenamin, Peoria, IL

$531 Two Computers and a Television

If you use a television as a monitor (this trick doesn't work with a computer monitor), share it with two computers at the same time. You need two RF modulators. Connect one of the modulators to the television and plug the first computer's RF cable into that modulator. Then attach the two UHF wires of the second modulator to the two screws on the bottom of the first modulator. Finally, plug the RF cable of the second computer into the second modulator. (Still with me?) The sliding switch on the first modulator toggles between computer displays, and the switch on the second modulator toggles between the second computer and the television.

—Catherine Stefko, Rochester, NY

$532 Line Number Elimination

If you need to take line numbers out of Basic programs, just type in one of these Pokes:

C-64: POKE 22,35
C-128: POKE 24,37

To get the line numbers back, type in one of these Pokes:

C-64: POKE 22,25
C-128: POKE 24,27

—Jeff Koester, Waterman, IL

$533 The Uncommon Comma

With Commodore Basic and the Print statement, you can use the comma in uncommon ways. My program puts the comma to work by printing four columns of three items each. To make two columns of six items each, beginning at column 10, change line 40 of the program to:

```
40 FOR I=1 TO 12:PRINT A$(I),,:NEXT
```

The comma also indents lines in printer output. Try this command on your printer:

```
10 OPEN 4,4,7
20 PRINT#4,,"THIS LINE IS INDENTED 10 SPACES"
30 PRINT$4:CLOSE4
```

```
0 REM THE UNCOMMON COMMA - MARY WILSON
                                       :REM*187
10 PRINTCHR$(147)                      :REM*220
20 DIM A$(12)                          :REM*109
30 FOR I=1 TO 12:READ A$(I):NEXT       :REM*230
40 FOR I=1 TO 12:PRINT A$(I),:NEXT:REM*150
50 END                                 :REM*178
60 DATA APPLES,PEACHES,PEARS,PLUMS,ORANGES
   ,LEMONS                             :REM*25
70 DATA LIMES,GRAPES,BANANAS,CHERRIES,COCO
   NUTS,GRAPEFRUIT                     :REM*6
```

—Mary E. Wilson, Clearwater, FL

$534 64/128 Vertical Tabs

Here's an all-purpose 64/128 vertical tabbing routine not available in Commodore Basic. Place the commands listed in line 10 of 64/128 Vertical Tabs into your own programs. The rest of the lines in the program show the Vertical Tab command in action.

```
0 REM 64/128 VERTICAL TABS - JEROME REUTER
                                       :REM*171
10 DIM VTAB$(24):DN$=CHR$(19):FORJ=1TO24:D
   N$=DN$+CHR$(17):VTAB$(J)=DN$:NEXT J
                                       :REM*155
20 PRINTCHR$(147):FORT=24 TO 1STEP-1:PRINT
   VTAB$(T)"VERTICAL TAB ="T:NEXT      :REM*153
30 GETA$:IF A$=""THEN 30               :REM*254
40 PRINT VTAB$(22)                     :REM*152
```

—Jerome E. Reuter, Moncks Corner, SC

$535 Getting the Row To Print

Magic Trick $511 (March 1989) shows one way to clean the print head when a row of dots refuses to print. I own Okidata 120 and 180 printers, and both use ribbon cartridges. From time to time, the plastic protect tabs on them go out of alignment so that misprinting results. Realigning the protect tab gives a print head that prints like new.

—Joseph Christie, New York, NY

$536 Cooling Off the Power Supply

Most C-64 users have their own ways of keeping their computer's power supply cool, such as pointing a fan at it, leaving space around all sides of the unit for circulation, and so on. Append my program, Short Circuit 64, to your programs, and your computer automatically lets you know, audibly and visually, of an impending "meltdown."

```
0 REM 64 SHORT CIRCUIT - RICHARD PENN
                                       :REM*150
10 PRINTCHR$(147):FORT=1TOD:NEXT:PRINT"{5
   CRSR DNs}"TAB(10)"POWER SUPPLY TOO HOT!
   "                                   :REM*57
20 FOR T= 1 TO RND(1)*9                :REM*241
30 POKE 54296,15:POKE 54296,0:NEXT:REM*166
40 FOR D=1 TO RND(1)*5:POKE646,D:NEXT:GOTO
    10                                 :REM*81
```

—Richard Penn, Montreal, Quebec, Canada ■

Magic is a forum for RUN*'s imaginative and inventive readers to share their programming tips, brief software or hardware modifications, shortcuts or items of general interest. If you have an idea to make computing easier, faster, more exciting and enjoyable, send it to: Magic, RUN Magazine, 80 Elm St., Peterborough, NH 03458.*

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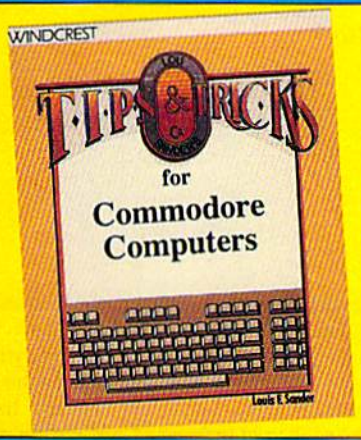

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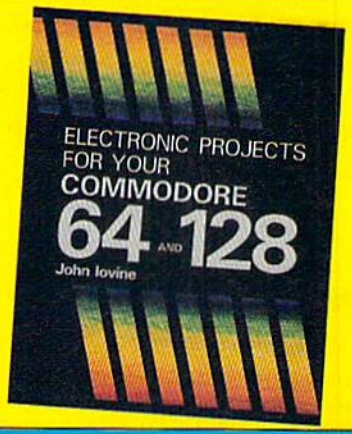

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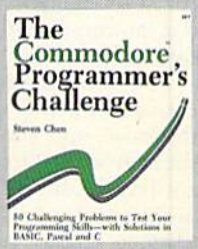

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NEWS AND NEW PRODUCTS

For a change, this column can present announcements for new products other than just games.

Compiled by HAROLD R. BJORNSEN

SAVAGE FISH!

MENLO PARK, CA—Rainbird (3885 Bohannan Drive, Menlo Park, CA 94025) has announced the release of two games for the C-64.

In **Savage**, you must use all your skill, determination and lightning-fast reactions to battle the onslaught of seedy monsters and menacing skulls, then rescue your maiden and recover the special powers imprisoned deep in the castle's labyrinth. $29.95.

The Seven Deadly Fins, an interdimensional group of anarchists, are on the loose, and you're a goldfish. From the rain-soaked forests and London recording studios to the farthest reaches of time and space, **Fish!** will eventually confuse, dazzle and, perhaps, kill you. $39.95.

Check Reader Service number 409.

"EMPTY-V" ET AL

NEW YORK—Hi Tech Expressions (584 Broadway, Suite 1105, New York, NY 10012) presents three new C-64 games.

Remote Control, based on MTV's parody of prime-time game shows, tests your knowledge of rock and roll and junk trivia from the 60s, 70s and 80s. Players answer up to three questions in nine categories to win points and advance to the End Game Round. Single- and multiple-player options are included. $12.95.

Working alone or in teams, **Fun House** players start out by answering trivia questions and move on to contests, such as Bobbing for Bagels, The Ping Pong Palace and Fun House Grand Prix. After accumulating points, players win the chance to enter the three-story Fun House, filled with obstacles. $12.95.

Jim Henson's **Muppet Adventure**, an interactive mystery adventure, challenges you to solve a series of puzzles, riddles and clues and get past obstacles and road blocks, making selections based on the individual personality of each Muppet, such as Miss Piggy, Kermit, Gonzo and Fozzie Bear. $12.95

Check Reader Service number 410.

THREE FROM BRODERBUND

SAN RAFAEL, CA—Broderbund Software (17 Paul Drive, San Rafael, CA 94903) is distributing three new titles for the C-64.

Hydlide presents a fantasy scenario that carries you from medieval villages into outer space, where you confront everything from dragons to robots. As you battle, you must think fast, choosing the correct weapon and the best strategy. $34.95.

SimCity lets you control an entire city or design your own from scratch. Seven international cities are simulated in detail, animated with traffic, construction, planes and boats. It's your job to improve the quality of life by taking action against natural disasters, pollution, crime, land values and traffic. $29.95.

As Luke Skywalker in **Star Wars**, you must maneuver an X-wing fighter through attack waves in an attempt to destroy the most evil weapon ever conceived—the Death Star. $29.95.

Check Reader Service number 405.

FOUR-WARD TO ADVENTURE

REDWOOD CITY, CA—Epyx (PO Box 8020, Redwood City, CA 94063) has released four new adventure games for the C-64.

In **Devon Aire in "The Hidden Diamond Caper"**, players assume the role of Devon Aire, a friendly, reformed felon who has been hired by a wealthy widow to find her priceless jewel collection, which has been stashed by her late husband in many different places in the maze-like manor. Finding the jewels won't be easy: Guarding the gems are monstrous mutants, pig-mice and killer canaries. And, even when you do manage to find all the jewelry, you'll still need to figure a way out of the manor. $29.95.

Plotting to rule the depths, the insidious Yellow Shadow has spread its network across the ocean floor. As a top-secret government agent, you must seek and destroy these venomous villains. Using sophisticated sensory devices, you'll scan the deep in your state-of-the-art submarine to locate the enemy base. Then, as the **Undersea Commando**, you must deploy a deadly arsenal of weaponry to blast the enemy out of the water. $29.95.

The Barbarian has defeated the warriors of Drax, freeing Princess Mariana from their evil spell. Drax has fled to the dungeons beneath his castle, vowing vengeance. As either the Barbarian or Princess Mariana in **Axe of Rage**, you must hack your way through three levels before entering the fourth level, the Inner Sanctum of Drax. The various levels require different fighting skills as you encounter new breeds of monsters before the final confrontation. $34.95.

In **Curse Buster**, an evil sorcerer has put a curse on the prince and princess, turning them into most pitiable creatures who are doomed forever to hop through the murky depths of his dungeon. As the prince and princess, the only way players can regain their royal personages is to find their way back to the palace, facing dragons, evil spirits and poisonous snakes on the way. $29.95.

Check Reader Service number 412.

LAND HO!

HEROD, IL—**Eight Bells Voyager** is a voyage-planning, dead-reckoning aid software package for the navigator who wishes to use it for coastal or offshore voyages, for students of navigation and the armchair navigator as well. With it, users may determine rhumb-line and great-circle courses and distances between any two geographical points. Users may also type in the latitude and longitude of a series of up to 50 passage waypoints, calculating all true courses and distances between each successive waypoint, cumulative distances at each waypoint, distance to go at each waypoint and total distance. It also calculates times of arrival.

Waypoint files can be printed (dot

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matrix and daisywheel printers) and saved to disk for future reference.

Also, the program caculates and prints steaming times for any speed entered, in days, hours and minutes. Available for the C-64 for $39.95 (plus $2.00 postage and handling) by mail order only. Heartland Maritime Software, PO Box 25-RU, Herod, IL 62947.

Check Reader Service number 401.

Sony's color 3½-inch disks let you color-code your filing system.

Compute in Color

NEW YORK—Sony Corp. (9 West 57th St., New York, NY 10019) has 3½-inch floppy disks in several colors for Commodore's 1581 disk drive. The **MFD 2DD** double-sided, double-density disks come in red, yellow, blue, green and white to allow you to devise your own color-coded filing system. Disks are available in packs of ten and retail for $39.99.

Check Reader Service number 406.

Now, *That's* a Word Processor!

DEERFIELD, IL—Timeworks (444 Lake Cook Rd., Deerfield, IL 60015) has released **Word Writer 4**, a word processor for the C-64 and the C-128 in 40-Column mode. The package now includes eight built-in fonts in sizes 9 to 72 points; over 90 ready-to-use symbols and mini-graphics; a text-layout feature that allows you to mix and match fonts and type sizes, modify margins and vary line spacing anywhere in a document; continuous formatting and word wrap; an 85,000-word spelling checker with integrated thesaurus containing over 60,000 synonyms; a built-in outliner; and an 80-Column Print Preview mode. It's available for $39.95.

Check Reader Service number 400.

GEOS Upgrade

BERKELEY, CA—Berkeley Softworks (2150 Shattuck Ave., Berkeley, CA 94704) has released **GEOS 128 2.0**, an upgrade to the original graphic environment operating system for the C-128. Included is geoWrite 2.1, a word processor with options to mix text and graphics, expand margins to eight inches, search and replace phrases and create multiple columns, headlines and borders. Also included are geoSpell, an 80-column spelling checker; and geoPaint, a high-resolution graphics workshop that utilizes 14 graphics tools, 32 brush shapes and 32 painting patterns to stretch, scale and overlay images, edit graphics pixel by pixel, and stop pattern fills in progress.

The deskTop supports two disk drives (1541, 1571 or 1581 drives) and a RAM expansion unit that offers multiple file selection and displays the date and time. Its geoMerge feature creates customized form letters and labels, Text Grabber imports text from any Commodore word processor, and the Desk Accessories—including a calculator, note pad, alarm clock, screen preference manager and photo and text managers—are accessible from within any application. $69.95.

Check Reader Service number 403.

Crankin' 'Em Out

IRVINE, CA—BDT Products (17152 Armstrong Ave., Irvine, CA 92714) introduces a four-bin sheet-feeding system that automatically feeds paper and envelopes into laser printers such as the Commodore-compatible Epsons, Okidatas and Stars. The **Model 890 LaserFeeder** features three paper bins, each storing up to 220 sheets, and a bin for up to 60 envelopes. You can feed three different types of paper, such as letterheads, second sheets, memos, miscellaneous forms (invoices, call reports, purchase orders), or 660 sheets of one paper type, offering over one and one-half hours of continuous printing. The system retails for $1795.

Check Reader Service number 404.

It Was a Dark and Stormy Night. . .

LIGONIER, IN—Country Road Software (70284 C.R. 143, Ligonier, IN 46767) offers **StoryWriter 128** to help you write better stories. With the program, you put your ideas into one of six windows (Setting, Plot, Protagonist, Antagonist, Conflict and Climax). You are prompted throughout the process with questions to help you structure your story plan. You may jump from window to window, scrolling the contents to add, edit or delete. Nine help screens are provided, including Figurative Language, Theme, Dialogue, Humor and Irony, and Paragraph Construction. Available for the C-128 for $12.

Check Reader Service number 408.

Read My Mind

KUTZTOWN, PA—Free Spirit Software (PO Box 128, Kutztown, PA 19530) introduces **ESP Tester** for the C-64 and the C-128 in 80-Column mode. The program uses the methods developed by the Foundation of Research on the Nature of Man to test human subjects' powers of extrasensory perception. Results are then displayed on the screen or may be printed with a Commodore-compatible printer. It's available for $24.95.

Check Reader Service number 402.

A Search to Remember

MIAMI—In **Search for the Titanic**, a simulation for the C-64, you begin as an inexperienced oceanographer, gaining a reputation by finding and exploring lost vessels, and thus earning the resources needed for the Titanic search. After earning points by exploring ten or more wrecks, you can search, locate and dive for the Titanic shipwreck. Successful exploration will reveal digitized pictures from actual photos of the Titanic as it appears on the ocean floor today. The game features about 75 wrecks for you to explore; a choice of four ships, more than 100 crew members and a complete range of technical and scientific equipment with which to outfit an expedition; 47 points of call; over 100 navigational maps and charts; realistic weather patterns and currents; weather radar, sonar, magnetometers and minisubs; and real-time action with a "time warp" feature. Available from Intracorp (14160 SW 139th Court, Miami, FL 33186) for $34.95.

Check Reader Service number 411. ■

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MAIL RUN

Our technical editors offer some simple solutions to help users type in RUN Paint.

THE SMELL OF RUN PAINT, THE ROAR OF THE CROWD

I'm a *RUN* subscriber, and I thoroughly enjoy your magazine. When I received the March issue, I typed in the listing for RUN Paint. The program runs perfectly, and I'm impressed with its versatility.

—JEFF BASKOFF
DELTONA, FL

You've finally come up with a truly superb program in your March 1989 issue—RUN Paint! It created the four new programs just like the article said it would.

However, when I ran them, I got an error message.

I called your editorial offices and expected to get the brush-off, but after several helpful phone conversations with Technical Manager Lou Wallace, I found my errors, and the program now works beautifully. Thanks to Lou and the *RUN* staff for being so helpful.

—PASTOR DONALD FROMER
CLEAR BROOK, VA

I've entered the RUN Paint program from the March 1989 issue of *RUN*, and it is terrific! Please extend my compliments and appreciation to programmer Robert Rockefeller.

—HUGH MCMENAMIN
PEORIA, IL

Thanks for you letter, Hugh. Many of our readers have had some trouble entering the RUN Paint listing, since it's so long. Readers just have to be patient and enter the program precisely, being especially careful not to omit or add any spaces, which seems to be the problem in most cases. Also refer to last May's edition of RUN *for further information on typing in listings in the article "Troubleshooting Troublesome Type-ins."*

Readers who'd rather receive the RUN Paint listing already on disk can get it on the March–April edition of ReRUN and also on the RUN Works disk, both of which include additional programs. To order, remit $16.67 for ReRUN or $24.97 for RUN Works to IDG Communications/Peterborough, Attn: Special Products, 80 Elm St., Peterborough, NH 03458.

—EDITORS

OFF TO A RUNNING START

For a long time I've tried entering programs from *RUN* without much success until I read your "Learn To Walk Before You RUN" tutorial that you publish from time to time (see February 1989). And the biggest help to me is your Checksum program. It sure saves me time finding my typing errors. Thank you and Checksum programmer Bob Kodadek for it. Now, for the first time, the programs in *RUN* actually *run* for me.

—ROY T. COLLEY
HUGHESVILLE, PA

RUN SCRIPT ALERT

Queries from several new RUN *readers who received the RUN Script promotional disk for subscribing to the magazine prompt us to clarify the instructions, which state: "Load and run either version of RUN Script, then load in the documentation by pressing F1, followed by the 'l' key." The "l" key is a lowercase L (not the number 1), an abbreviation for "load."* RUN *regrets that this has been misunderstood.*

—EDITORS

NOT SO "AMAZING"

The "Amazing" program (*RUN*, April 1989) looked interesting, so I took some time to type in its fairly long listing. When I ran it, I was greeted with a joke that was in bad taste. I do have a sense of humor, but my time is valuable. Please don't do this again.

—LUIS GONZALES
WOODLANDS, TX

Although it took me eight days to type in the April Fool's program, Amazing! (*RUN*, April 1989), and a great deal of hair pulling, primal screaming and tear shedding, I finally got it to run.

My wife and children have been trying unsuccessfully for 12 years to "get" me on April Fool's day. However, I have to replace pride with chagrin, embarrassment and humiliation—you got me! It was a lot of work (and good practice) typing in the listing, and it was a good learning experience.

Thank your brilliant programmer, Harold Bjornson, for lightening my load and making me laugh, and thanks to *RUN* for being the kind of magazine that's not above a good joke now and then.

—CHESTER O. COOK
WINDHAM, ME

While the program is functional and runs as published, its too-good-to-be-true claims should not be taken seriously. Some readers did enjoy the April Fool's program, but we concede that, for a joke, it was much too long to type in. Rest assured that programs of this nature will never again be published in RUN.

—EDITORS

MORE STUFF ON OLD STUFF

The March 1989 Mail RUN was certainly entertaining. While I'm not an anti-gamer, I'm not particularly interested in games, either. I do wish, however, that you'd publish more articles on established productivity programs. I bet there are readers like myself who'd appreciate hints and tips on older productivity software.

—WILLIAM J. KEEN
HARLEYSVILLE, PA

VALUES AND RESPONSIBILITY

The November 1988 issue of *RUN* has a program listing called "Hail to the Chief," which is both a trivia game and a gambling game. As the father of two young children, I am aware of how impressionable they are. If you teach a person that gambling is harmless, then that person will rely on Lady Luck for his or her success.

Since your magazine is read by adults and children, you have a responsibility for what happens to those who use your

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product. All of us are accountable for how we influence others. Please consider the values your applications are teaching, for they do teach values.

—DAVID E. PAUL, D.MIN.
ASHLAND, KY

SOMETHING TO BEEF ABOUT

It did my old heart good to read the "RUNning Ruminations" editorial in the March 1989 issue of *RUN* about the shortage of Commodore peripherals. I've tried to find a 1750 RAM expansion unit since last October without success. It makes me laugh when Commodore claims enough units were manufactured to meet the demand. I have my name on five waiting lists, so maybe I'll get one yet.

—DONA PRUDHOMME
NEWPORT, NH

NOTHING TO BEEF ABOUT

With regard to David Dunson's letter in the March 1989 issue of *RUN* (Mail RUN, "C-128 R.I.P."), I recently bought a C-128 locally, and a few weeks later I bought two 1571 disk drives from the same dealer. He told me that he can "get all he wants" of the C-128 and 1571 drive. Mr. Dunson should look around his area a bit. I could have bought three used systems, and the 128 and drive are still available, at least in this area.

—JAMES LAMBERT
HASTINGS, NE

KEEP 'EM RUNNING

I've a few things to say to readers who put down games and say we have no need for them ("Down with Games," Mail RUN, March 1989).

The hours of enjoyment and the wide choice of C-64 games lured me into getting a C-64 computer at age ten. Since then, I've learned about the world's fighter planes, weather, nuclear submarines, battleships and aircraft carriers.

My biggest accomplishment with computers, though, has to be the user group I founded with a friend. The group started around games and game playing, and it's now ten members strong, with half of them over the age of 30. The topics now discussed at the meetings range from games to word processors to programming, and I have the computer gaming industry to thank for my beginning interest in computers.

So I hope you'll keep the games running in *RUN*.

—JOSEPH NEVINS
HACKETTSTOWN, NJ

For other readers wishing to expand their computing horizons, please see "Flight of the Condors," for gamers; "Type Invaders," for typing practice; "Calorie Counter," for watching your weight; and "Quick Writer 128," for those in need of an 80-column word processor. There's something for everyone in this issue of RUN.

—EDITORS

A CALL TO READERS

This page is your stage, so stand up and say a few words. Extend praise, air grievances or offer hands-on advice and information.

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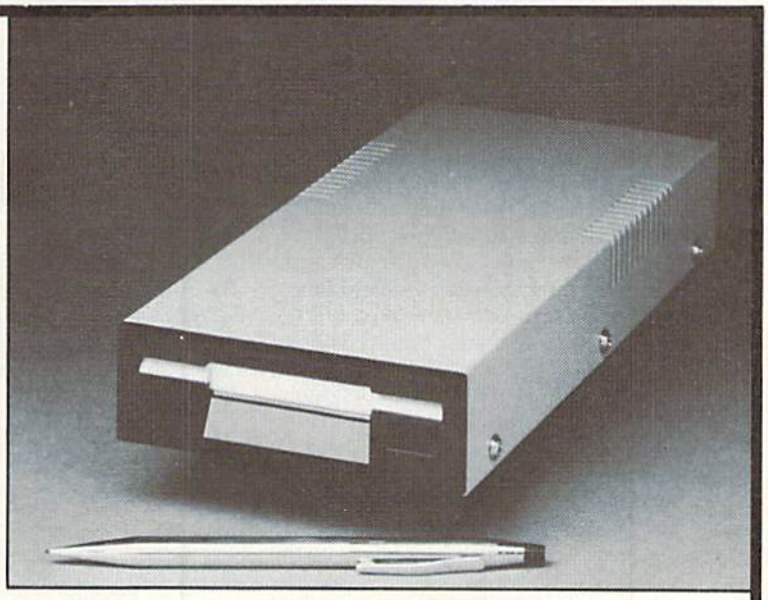

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SOFTWARE GALLERY

School's out for the summer: keep yourself and the kids busy with some arcade, racing, adventure or shoot-'em-up games!

Compiled by BETH S. JALA

RAMPAGE ..... A+

Monster Movie Madness

If you quietly cheered during Godzilla's stroll through Tokyo or shed a tear when King Kong took his big dive in New York, then Rampage is for you. The C-64 version of the coin-op hit has all the building-stomping and people-chomping you could ask for.

Playing alone or with a friend, you control one of the game's three gigantic "heroes"—Lizzie the Lizard, Ralph the Wolf or George the Ape. Although they have slightly different talents, mayhem and destruction are their trademarks.

Guided by either a joystick or the keyboard, your monster climbs up and down city skyscrapers, punching holes in walls. Eventually the structures weaken and crumble to dust. Once all the buildings on a screen have been leveled, you're transported to the next city.

Unfortunately, the life of Lizzie and her friends is not without some major headaches. Many of the buildings, for instance, have electrical appliances that automatically turn on and off. If one of these devices is touched at the wrong time, you receive a nasty shock. The cities' residents, who don't take kindly to the creatures' adventures, drop grenades from windows and dispatch tanks and helicopter gunships. The damage they inflict saps your strength, and the game ends when your vitality ebbs to zero. Restoring energy, however, comes from gobbling the towns' defenders and other "goodies" that appear during your reign of terror.

Although Rampage is indeed filled with violence, it isn't necessarily mindless. In fact, some thought is needed to earn big point totals and advance to the game's higher levels.

Game play is embellished by excellent sound and graphics, and even better animation. Especially well done are the beasts' constantly changing facial expressions, which add humorous touches to the program.

Rampage is a very entertaining software package. It offers great sensory effects, mental challenges and simultaneous two-person play. But perhaps the game's greatest attraction is the guilty pleasure that it provides the legions of moviegoers who secretly love those magnificent cinema monsters of old. *(Activision; distributed by Mediagenic, 3885 Bohannon Drive, Menlo Park, CA 94015. C-64/$34.95.)*

George the Ape doesn't look too pleased; get ready for more building bashing in Rampage!

—WALT LATOCHA
OAK PARK, IL

REPORT CARD

A Superb!
An exceptional program that outshines all others.

B Good.
One of the better programs available in its category. A worthy addition to your software library.

C Average.
Lives up to its billing. No major hassles or disappointments here.

D Poor.
This program has some problems. There are better on the market.

E Failure.
Many problems; should be deep-sixed!

1581 TOOLKIT ..... B+

Software that Pays Attention to 1581 Owners

The subtitle of this program is "Ten Essential Utilities for Commodore 1581 Owners." This is, perhaps, an overstatement. Useful, yes; but essential only for those who are into heavy-duty disk editing or programming on the 1581.

The ten utility programs on the disk are: a data copier, file copier, directory editor, track and sector editor, track and sector tracer, pattern searcher, partition creator, formatter, error scanner, and relocatable fast loader. All of the utilities can be used with up to four 1581 drives that are assigned device numbers 8 through 11.

The track and sector tracer in my review copy failed to operate. Of the other nine, only the file copier can be used in conjunction with drives other than the 1581. That's too bad, because most 1581 owners I've met are more interested in moving programs from the 5¼-inch to the 3½-inch format than they are in transferring data between two 1581s.

However, other than my problem with the track and sector tracer, the utilities worked flawlessly. The data copier can duplicate a disk in about two minutes using two 1581s. For single drive owners, the program requires approximately ten minutes and 16 disk swaps.

The track and sector editor is similar in function to what's found on the 1581 demo disk. Among its features are a disassembler that displays the sector under examination in disassembly code, and a printer output that dumps the current buffer contents to any printer capable of emulating the Commodore 801/1525.

For me, one of the program's high- ►

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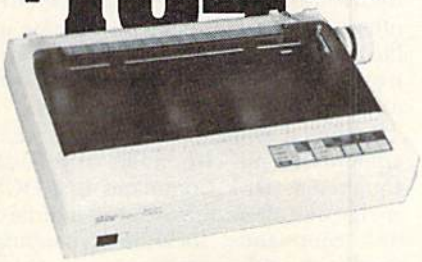

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NX-1000 Speedy 144cps draft mode, 36cps near-letter-quality. Features include front panel controls and multiple NLQ fonts. Friction and tractor feed, plus convenient single sheet feed mode.

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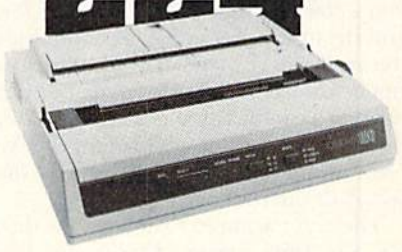

OKIDATA 180

Features include mode selection, pitch selection, 180 cps in high speed draft mode and 120cps in utility mode. Near-letter-quality text prints at 30cps. Includes both friction feed and fixed tractor for standard width perforated edge. Both Commodore and standard parallel input.

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AMIGA 500

The 500 includes 512K bytes internally and is expandable to 8 MB, two joystick ports, a serial port, a parallel port, an external disk drive port, and a built-in 3.5" disk drive. It even includes a 2-button mouse!

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lights is the partition creator. When loaded, all 80 tracks and their sectors are shown on a four-color track marker bar at the top of the screen. When open, available tracks are yellow, those in use by the DOS or files are red, and current partitions are blue. The cursor, which can be slid across the bar, is black. Current partitions hang down, like icicles, from the track marker. There's even a level indicator to show whether you're currently examining the root directory or a partition level. Creating a partition is fast, clear and painless.

Another great idea in the Toolkit is the pattern searcher. Somewhat like searching for a record in a database file, you enter the data you're looking for, and the utility checks the disk and finds the areas where matches occur. Patterns can be entered as hex, decimal or ASCII data, or a combination of all three. After the bytes matching your entry have been located, you can view or edit the sector in question.

The error scanner examines the disk for any DOS errors. Errors are displayed on the screen or sent to the printer. The fast file copier, directory editor and fast formatter worked without any problems.

The relocatable fast loader, designed for use with the C-64 or 128 in 64 mode, offers up to a 900 percent increase in file loading speed. What sets it apart from other fast-load utilities is that you can change its location in memory.

Included in the 1581 Toolkit is what amounts to an 11th utility—the Disk Command. Disk Command is a DOS wedge that allows the use of all standard disk commands, including changing partitions, without having to resort to the Open command.

The documentation, *The 1581 DOS Reference Guide*, is an in-depth examination of the 1581. Although technical in nature, it's easy to read and covers everything from drive commands to known bugs in the 1581 design (and how to correct them).

As I mentioned earlier, this package isn't for everyone. Owners of 1581s who only use their devices for file storage, and who have no intention of editing their disks or writing programs with it, can easily live without this package. However, for those who can't look at a device without wanting to know how it works, who reach for a technical manual and screwdriver whenever they get a new piece of hardware, this program is a must. *(Software Support International, 2700 NE Andresen Rd., Vancouver, WA 98661. C-64, C-128/$39.95.)*

—MICHAEL CAVANAUGH
LEVITTOWN, PA

GRAND PRIX CIRCUIT ..... A+

Automotive World Racing At Its Best

Computer drivers become your competitors on the international circuit in this racing simulation. Each computer opponent has its own style of racing, so you're guaranteed a challenge every time you hit the track.

GET MAXIMUM OUTPUT

Since you've put in a few hard earned paychecks into a Commodore system, how can you be sure you'll ever get more than just a few video games out?

Well, you could start by booting up GEOS 2.0. The hard working software that's easy to use and easy on your wallet.

You see, with GEOS 2.0 you don't need to memorize complicated keyboard commands. All you need to remember is this:

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GEOS 2.0 shows you options, and you point to your selection. Then all you do is click your mouse or joystick.

Pretty simple, huh? Pretty simple, but a

WE PUT A LOT MORE IN, SO YOU COULD GET A LOT MORE OUT.

GEOS 2.0 squeezes the absolute maximum out of Commodore 64's and 128's with an array of applications you can use millions of ways. In fact, millions of people do.

The important thing is that with GEOS 2.0, you can create outstanding documents with outrageous graphics. That's because GEOS 2.0 includes geoWrite (an advanced, full-featured word-processor), and geoPaint, a graphic workshop with over 32 different tools and patterns.

With geoPaint, you can draw almost anything. Invert, mirror or rotate it. Then stretch and scale and save it in your GEOS 2.0 Photo Album for use later. You can mix text and graphics. Or trade them back and forth.

GEOS 2.0 even comes with its own deskTop, which lets you manage your files and disks easily and efficiently. There's a calculator, note pad and alarm clock, too. And GEOS 2.0 is LaserWriter™ compatible. Which means you get a better looking document and a harder working system that's easier to learn

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After selecting which team to drive for (McLaren, Ferrari or Williams), you're off to qualify for races in Brazil, Germany, Italy, Canada, Monaco, Britain, Japan or Detroit. Qualification serves two purposes: it determines your starting lineup position in the pack and lets you familiarize yourself with the track's layout. Even if you qualify, however, blown tires, engine problems, aggressive drivers or murderous curves could force you out of competition. If you do finish in the top six, your team is awarded points, and just as on the real Grand Prix Circuit, the team with the highest point total at the end of the year claims the title of World Driving Champion.

Your view of the action is from the cockpit, where instrumentation includes a tachometer and speedometer. An active gear box and rearview mirrors mean that you must focus your attention both inside and outside the car. Another indicator, the damage gauge, gives clues as to when you should pull into the pits for maintenance.

Your view from behind the wheel in Grand Prix Circuit: notice the car on your right!

Grand Prix Circuit is probably the best of its genre. From your viewpoint directly behind the wheel, the graphics and sense of movement and speed seem to push the C-64 to its limits. However, you won't have much time to enjoy the scenery. As the white lines of the road start coming at you and your competitors begin jockeying for position, you'll find it difficult keeping the car out of the ditches. If you're prone to motion sickness, you may want to find another game: Once you hit 140 mph and spin out on a curve, you'll think you're on somebody's perverted idea of a merry-go-round.

Each of the available three cars has its own performance characteristics and quirks. The higher performance cars can be a real chore to handle, especially without the automatic shifting offered at lower levels of play. In fact, if you're used to other racing games, you might find yourself spending more time off the road than on it, because the Grand Prix vehicles are *too* responsive.

The documentation supplied with the game is concise, easy to read and quick to get you into the action. Also, thankfully, you can save your current circuit to disk, because racing for up to 100 laps per game can take a few hours.

Grand Prix Circuit is much more than just another racing simulation. It's a game that manages to capture the feel, excitement and competitive spirit of racing. I believe that this program will be- ►

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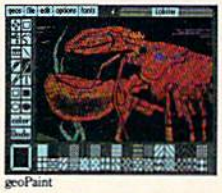

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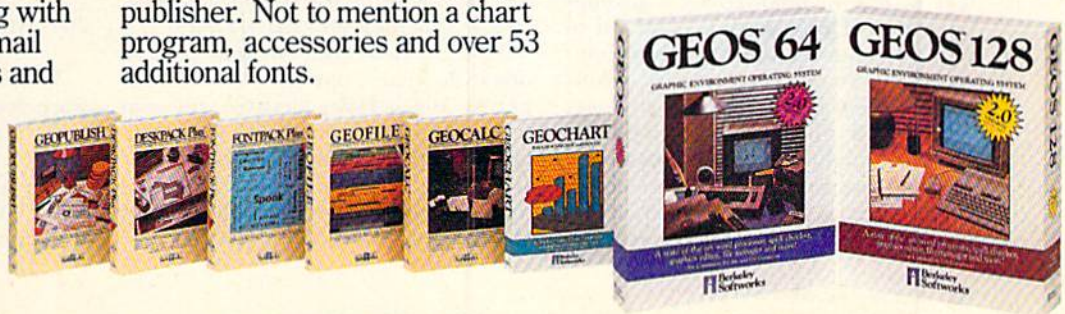

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come the standard against which all others in the car-racing pack are measured. *(Accolade, 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128. C-64/$29.95.)*

—JOHN RYAN
BILOXI, MS

POCKET AUTHOR ..... B

Create Your Own Teaching Applications, And More!

Advertised as a "professional authoring language" for the C-64, Pocket Author can be used to write interactive teaching programs. Also a creativity tool that adds over 160 commands to Basic, Pocket Author makes it easier for the user to program music and sprites, modify character sets, create screen graphics and access disk files—the sort of things that can be used to turn a scrolling text lesson into an interesting learning experience. Even if you're not a fan of writing teaching software, these new Basic-level commands mean you no longer have to resort to machine language programming to make use of sprites or sound on the C-64.

Pocket Author features statements that support structured programming not found in regular Basic, including branches to named labels (instead of line numbers), labeled subroutine calls, repeat/while loops and block conditionals. Most of these control structures are standard in the C-128's Basic 7.0; Pocket Author brings them to the 64.

Facilities for displaying application menus and commands for inputting menu choices using the keyboard, mouse, joystick or light pen are included. Menus can overlap, and overlays can be stored away and retrieved with simple commands.

Pocket Author also provides a system that retrieves help screens from disk at the touch of a function key. A Help Maker utility lets you create such screens for your own applications.

To design lesson software with Pocket Author, you write a dialogue module—text (a lesson) followed by a prompt (question). The learner is expected to type a response, which is then compared to a list of correct answers. Hints may be given if the response is wrong. At the end of the module, optional feedback might be provided based on the learner's response. Pocket Author keeps track of the time spent in the module, the number of attempts made to answer the question, matched responses, and so on. This information can be saved as a statistical record of the learner's progress.

Pocket Author's documentation is thorough and well written, with each chapter referencing a different feature. This makes it easy to look up particular features, but doesn't give the prospective buyer a good overall view of the package's power. Sample programs provided on the disk are helpful in demonstrating how to integrate Pocket Author into Basic programs, but these short examples still suffer from limited viewpoints. The package would be much improved by a sophisticated demo program that explores as many different features as possible.

Although Pocket Author adds a number of powerful functions to standard 64 Basic, the package is not magic. In order to realize the program's full potential, you must still understand programming fundamentals. Moreover, since Pocket Author programs are interpreted and not compiled, you must first load Pocket Author into the computer before you can use a Pocket Author program. This means that if you wish to write teaching software or other applications in the Pocket Author environment, the end user must also have a copy of Pocket Author. However, if you're willing to cope with this requirement, Pocket Author provides a powerful program-development environment that is sure to increase your productivity. *(Digital Solutions, Inc., PO Box 345, Station A, Willowdale, Ontario, Canada M2N 5S9. C-64/$59.95.)*

—MICHAEL BROUSSARD
HERNDON, VA

ZOOM! ..... B+

Addictive, Animated Arcade Action!

Zoom! resembles the classic maze arcade game, PacMan. However, this software's maze of crisscrossing lines is like latticework. Your goal is to complete the trek over the maze while avoiding nasties like Jaggernauts, Wormlets, Angleheads, Spheroids and Black Holes.

Most of these critters climb up and down the maze, trying to thwart your moves. Black Holes destroy your on-screen character immediately upon contact, while the other monsters try to wear you down. You score points by gliding over the money bags and cash registers shown on the interlocking paths.

Zoomers: On your marks, get set, go! And watch out for that Anglehead!

When you successfully complete a maze, another one appears. There are 20 difficulty levels in all. You're given one-player, two-player and competition game options.

A special feature of Zoom! is its ability to drop bombs and blow up sections of the maze. Pressing your firebutton temporarily creates a crack in the area you occupy and prevents any travellers (including yourself) from crossing that segment. You can strategically plant these booby traps to help you defeat the enemy.

Additional goodies you can harness in your favor are Candy to speed you up; Glue to retard monsters; and Magic Potions to make you ghostly. And there are also the mysterious Question Marks, which can do almost anything—good or bad. Eat one; you'll see!

This game offers tingly music and sound effects, but I especially liked the graphics. The spirited characters throw a party for your eyes, and the animation flows smoothly.

Though not a PacMan clone, Zoom! obviously shares similarities with the yellow gulper. But Zoom! runs on its own two feet. *(Discovery Software, 163 Conduit St., Annapolis, MD 21401. C-64/$29.95.)*

—JOHN DIPRETE
CRANSTON, RI

DESIGNASAURUS C

Plodding Prehistorics Prevail On-Screen

With Designasaurus, Britannica Software successfully brings exotic prehistoric creatures to life on the C-64. Unfortunately, Britannica was less successful in the more mundane task of effectively merging education and entertainment into one software package.

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Designasaurus has three major sections. Its Build-A-Dinosaur activity takes place in a natural history museum, where you can assemble the fossilized bones of different animals into new and unique creatures. One possible combination, for example, is the head of a Stegosaurus, a Brontosaurus's neck, the body of a Triceratops and a Tyrannosaurus Rex's tail.

The software also has a Walk-A-Dinosaur segment, in which you use either a joystick or the keyboard to guide one of three prehistoric beasts through five different screens. Survival—finding food and avoiding predators—is your goal. This area teaches the ecological interdependence of carnivores, herbivores and vegetation.

With a Commodore, Epson or compatible printer, the program's Print-A-Dinosaur activity generates hard copies of preprogrammed dinosaur pictures in three different sizes, including one for T-shirt transfers. You can also make printouts of your Build-A-Dinosaur creations, as well as completion diplomas for Walk-A-Dinosaur.

Learning about creatures like the Triceratops is just one of the segments of Designasaurus.

Although it has very good graphics, nice sound effects and a control system that's extremely easy to use, Designasaurus does have some shortcomings. The most obvious is its packaging, which states that there are multiple skill levels in Walk-A-Dinosaur; the program, however, doesn't contain this feature.

Also, while the box broadly claims that Designasaurus is for "dinosaur lovers of all ages," some individuals won't be completely comfortable with one or more sections of the software. For instance, although some preschoolers can easily make pictures for coloring with Print-A-Dinosaur, these same children will probably be frustrated by the many technical terms in Build-A-Dinosaur.

A more serious difficulty is the lack of accuracy or completeness of some information that's conveyed to users. Although Walk-A-Dinosaur, for example, contains battles between a Brontosaurus and a Tyrannosaurus Rex, the instruction manual fails to mention that these creatures didn't live during the same time period. In addition, the software's use of the name "Brontosaurus" is highly questionable; a far more suitable term is "Apatosaurus."

Nevertheless, Designasaurus can provide educational benefits. If the discrepancies between a few of its contents and scientific knowledge are recognized, the ►

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program can entertain and teach general lessons about extinct creatures that continue to fascinate modern man. *(Britannica Software, 345 Fourth St., San Francisco, CA 94107. C-64/$29.95.)*

—WALT LATOCHA
OAK PARK, IL

TECHNOCOP ..... A–

Futuristic, Hi-Tech Mod Squad

In Technocop, you assume the role of an elite law enforcement officer, armed with futuristic electronic devices. Your ultimate goal is to smash a ruthless band of crooks.

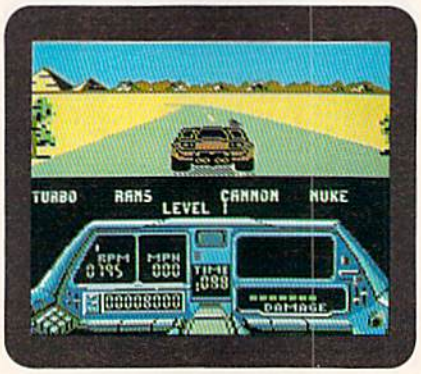
You begin by entering VMAX, a computerized automobile that can travel at over 150 mph. You're not out for a pleasure jaunt, however, because enemy vehicles constantly attack you. Fortunately, VMAX has a machine gun as standard equipment, and fast driving can upgrade your armament to include cannons and even nuclear weapons.

If you survive the dangerous highway, you reach the seedy, multistory lair of a mob kingpin. You're aided by a wrist computer that indicates the general direction of the crime chieftain's hiding place. While avoiding deadly traps and fending off surprise assaults by petty thugs, you try to free kidnapped hostages, recover stolen goods and capture or eliminate the gang boss within a predetermined time limit. If successful, you receive a promotion and move on to the next of 11 missions. Fortunately, the software has a Save feature that lets you split up the playing of one game into a number of different sessions.

Every aspect of Technocop reflects a great deal of programming skill. The graphics are first rate, and the sound effects are equally good. The animation is also excellent, and players shouldn't experience any problems with the software's control system.

The game play in the buildings is especially interesting. It beautifully recreates the suspense and thrills of a policeman's search for an arch-criminal in mysterious and hazardous surroundings. Surviving requires not only the quick use of your revolver, but also some sound strategy.

In fact, this part of the game is so enjoyable that it tends to overshadow the driving sequences, which, though well done, demand far less thought and a much greater reliance on reflexes.



If you survive attacks from bad guys, be prepared for more in higher levels of Technocop.

Because of this, a few players may eventually come to consider the road segments as merely chores to be endured before reaching the real "meat" of the program.

Yet, ever since the movie *Bullitt* was released, most people have come to expect fast driving to be a part of every fictional manhunt. These individuals will have no complaints with any part of Technocop. *(Epyx, 600 Galveston Drive, PO Box 8020, Redwood City, CA 94063. C-64/$39.95.)*

—WALT LATOCHA
OAK PARK, IL

RACK 'EM ..... A

You can play all of your favorite billiard games with Rack 'Em—straight pool, eight ball, nine ball and even the somewhat complex English game of snooker. Best of all, the table can be set up to play virtually any other pool game you can think of.

The view of the table is from directly overhead. Balls impact upon each other with a convincing "click" and rotate realistically as they roll. The speed and angle of the balls as they bounce off one another and the bumpers also seem true to life.

Although the game's playing procedure seems complicated at first, once you've done it a few times, setting up and executing your shots become almost automatic. Ultimately, the ability to adjust its variables adds to the game's authenticity and challenge. There is an amateur setting if you find playing at the professional level too challenging.

Perhaps the best feature of Rack 'Em is its "Save Last Shot" option. If you're practicing alone and manage three balls in three different pockets with a single shot, select this option to store the shot and prove to friends that you really did make it. Just remember to say that you planned to pocket all three balls from the outset! *(Accolade, 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128. C-64/$29.95.)*

—BOB GUERRA

PREDATOR ..... B+

Move over, Sylvester. Arnold's coming. Ex-terminator Schwarzenegger not only out-shoots his Rambo rival, he gets a starring role in a computer game!

Your screen shows a graphic version of an armed, animated, dangerous and tight-lipped warrior. He's the last survivor of a guerrilla squad that's been wasted by Predator—the alien who kills for fun. Equipped with night vision and spine-ripping energy, Predator hunts our hero through enemy installations in a South American jungle.

Movements like jumping, running, shooting and punching initially require practice. Later, however, these actions flow more smoothly.

The screen reveals 30 different detailed scenarios. Explosions, weapons, rivers, barracks and tropical greenery all come alive, and Arnold runs with a nifty little shadow at his heels. Because the screen scrolls to the left as you go into the jungle, the moving scenery reveals foreground and background depth and texture.

Despite the fact that you represent a human killing machine, you still get a chance to think. You can choose several strategies to outwit your opponent, and certain weapons work best in particular situations. You must also keep track of your time, not overspend your ammo and learn the correct distance to throw a grenade.

If you like Rambo-type action on your computer, then Predator should "blitz" you! *(Activision; distributed by Mediagenic, 3885 Bohannon Drive, Menlo Park, CA 94025. C-64/$29.95.)*

—JOHN DIPRETE

ANNALS OF ROME ..... A–

Annals of Rome is as much a lesson in Roman history as it is a war simulation. Your object is to build one of the greatest empires the world has ever known—the Roman Empire. However, not being bound to the actual growth pattern of Rome, you can set up an interesting and brave new world of your own.

A handy reference card and map of the world are provided, but players should also use paper and pen to take

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notes and keep tabs on the various commanders, tribes and provinces, as well as the financial state of the Republic and her enemies.

An interesting aspect of the game is watching the face of the world change as various empires (Egypt, Gaul, Germania, and so on) rise and fall. The manual offers insights into these different peoples, with descriptions of their strengths and weaknesses.

One of the flaws of the game is that the manual doesn't provide a visual depiction of the onscreen happenings. Another annoyance is that much of the onscreen fighting occurs between other countries, and has little to do with Rome, often giving the player the feeling of being an observer. Still, these are minor, and the real challenge is to get the Republic up and running smoothly as you attempt to unite the whole world under one rule.

I recommend Annals of Rome, especially to anyone studying the time period who's in need of a diversion from textbooks. *(Datasoft; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$24.95.)*

—ROBERT SODARO

JOHN ELWAY'S QUARTERBACK ..... C–

This game has its good points. It's fun to play, and, typical of a program that began life as an arcade game, its very simple command structure makes it easy to learn.

Unfortunately, it's not very realistic. Proportionally, the football is much larger than it should be, which makes it difficult to judge exactly where the ball is going. Consequently, trying to figure out where or when to move is usually a guessing game.

The ball might be a bit easier to track if the perspective between it and its shadow were a little more life-like. Also, while the field looks the way it would if viewed from directly overhead, the players and goal posts appear as if seen from high in the stands behind one end zone.

Player movement, while fairly fluid, is agonizingly slow in Quarterback. Players also seem to fall the wrong way many times after being tackled.

Joystick response isn't crisp or precise enough, which makes throwing a pass difficult.

Playability also suffers from what I call a distortion of football probability: It's easier to run 95 yards on a quarterback sneak than it is to kick an extra point.

The points I've mentioned may be okay for the arcade, where plenty of action is more important than realism. It's harder to swallow in the home version, however, which is likely to be played more often and at a leisurely pace. Football fanatics may enjoy John Elway's Quarterback as an action game, but many might be turned off by its lack of realism. *(Melbourne House; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$29.99.)*

—SCOTT WASSER ■

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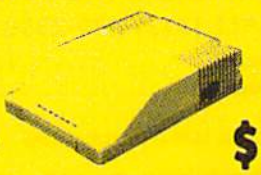

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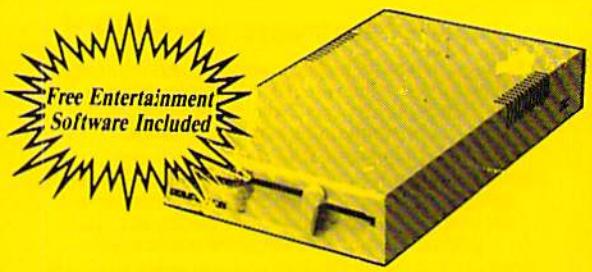

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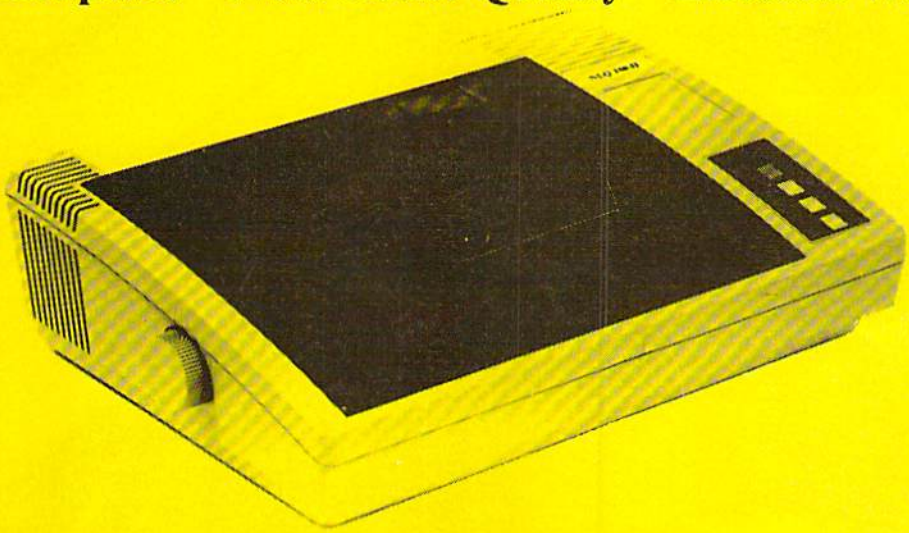

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Standard enlarged	5 cpi	40 cpl
Elite:	12 cpi	96 cpl
Elite Enlarged:	6 cpi	48 cpl
Condensed:	17 cpi	132 cpl
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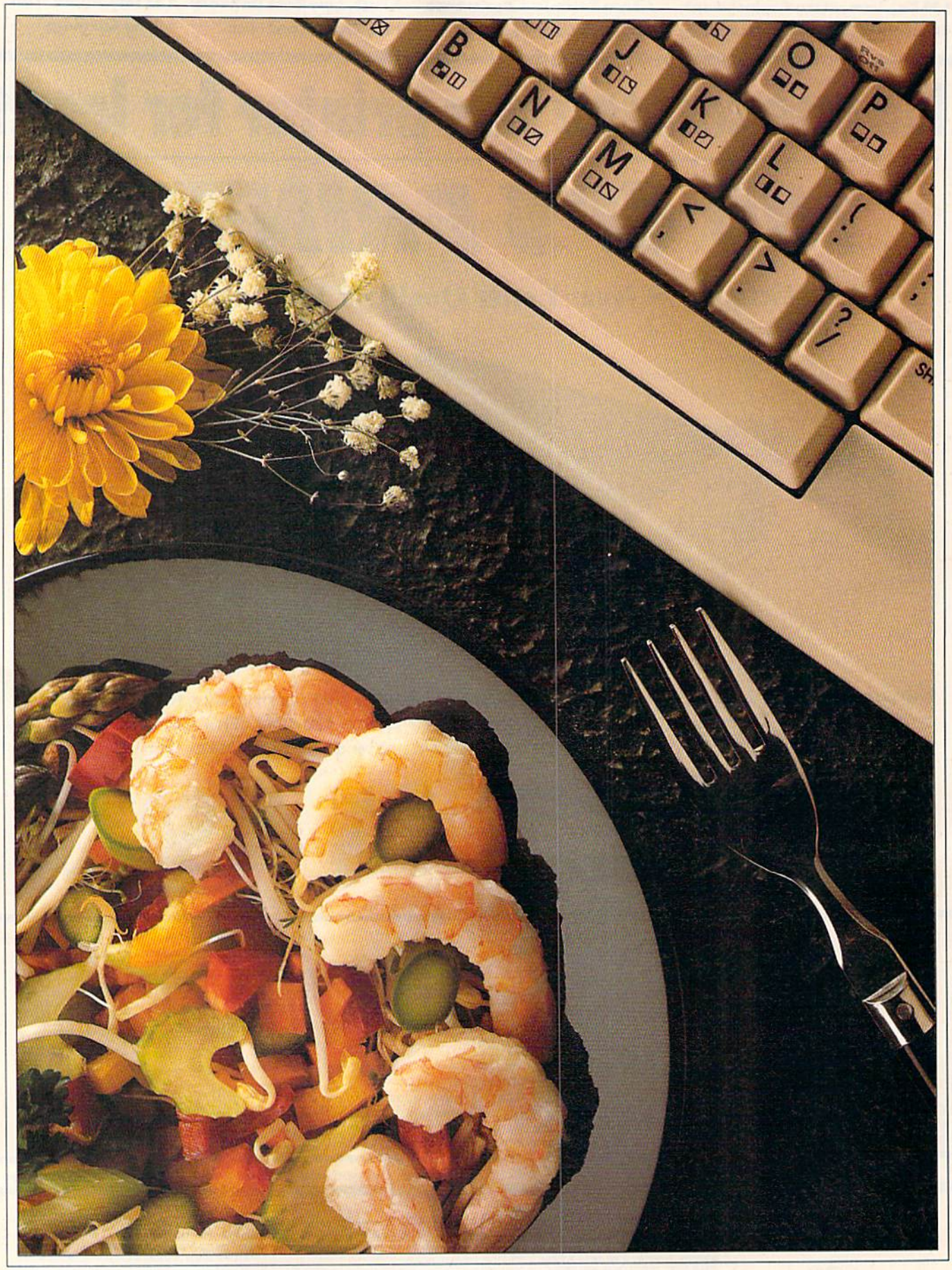

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Calorie Counter

What's on the menu? Anything you like, as long as you use C-64/C-128 Calorie Minder to watch your weight.

By MICHAEL BROUSSARD

WHAT COULD BE A MORE WEIGHTY SUBJECT than dieting? If changing your eating habits weren't enough, you also have to count calories and continually monitor your progress. However, Calorie Minder can help. This Basic program for the C-64 and C-128 calculates your "ideal" weight and keeps a daily record of your weight and calorie intake. It also reports on your progress, showing how your weight loss (or gain!) compares to your expected weight change, based on the amount you claim to eat.

Before describing how the program works, I'll take a moment for a few cautions. First, don't embark on any weight-loss program without checking with your doctor, especially if you're pregnant. (If you're pregnant, you probably shouldn't be using the computer!) Second, the calculations of ideal weight and the gain/loss analyses provided by Calorie Minder are based on "average" metabolism, so don't be surprised if you don't lose at exactly the rate predicted. Finally, research has shown that dieting alone is not the best way to maximize weight loss. You should also engage in some form of aerobic exercise, such as walking briskly for 20 minutes a day, riding a bicycle or taking an aerobics class.

The Food List

In order to operate, Calorie Minder needs to have a sequential file of calorie data for the foods you eat available on disk. My version of the file, which you will use for starters, is created by the Calorie Data program in Listing 2. Type in Calorie Data, save it to an empty formatted disk and then run it to create the file, called CAL.DATA. The program expects your disk drive to be device 8, but you may alter this by changing the value assigned to variable D in line 100.

The foods and calorie values known by Calorie Data are defined in Data statements beginning in line 1000. If you don't eat some of the foods I've included, just omit those Data statements. Conversely, if I left out any of your favorite foods, add Data statements describing them. I purposely omitted some foods, such as celery and lettuce, because they have so few calories; go ahead and add them, too, if you're determined to count every single calorie. Just be careful that each statement you add is in the proper format: a food description of up to 29 characters, a comma, then the number of calories associated with that food. Also make sure there are no commas or semicolons embedded within the food descriptions, or Calorie Data will abort with an error. For example,

```
1450 DATA ONIONS/SLICED 1 CUP,110
```

is acceptable, while

```
1450 DATA ONIONS, SLICED, 1 CUP,110
```

is not.

The last Data statement in the program, containing DATA ***, is the "end-of-data" indicator. You may add as many Data statements to Calorie Data as you like; just be sure this one comes last.

There's also a special indicator, DATA !!!, dividing the Data statements into two groups. All the foods before this indicator appear at the beginning of CAL.DATA in the same order as in the Data statements; the foods after the indicator are sorted alphabetically. This arrangement lets you keep foods you eat all the time at the top of the list, where you can find them quickly.

Listing 2 has only three foods—the "miscellaneous" entries described below—in the first group. If you want all the foods sorted in a single group, just omit the Data statement containing the !!!. Or, if you want the data completely unsorted, change the value of variable SF in line 100 of Calorie Data to 0 and rearrange the Data statements in any order you wish.

After using Calorie Minder for a while, you may decide you want to alter the food list. No problem. Just load Calorie Data, change the Data statements as desired and run it again; it will create and save a revised CAL.DATA file. Be sure to save your modified version of Calorie Data, as well.

Note that the values in Calorie Data assume plain preparation of foods, with no other foods added in. For example, pasta means boiled pasta with no sauce, and carrots means boiled carrots with no butter.

A book that lists calorie values would be a wise investment for use with Calorie Data. It can be a handy reference when you're adding foods to the list.

Using Calorie Minder

Now type in Calorie Minder (Listing 1) and save it to disk; for convenience, I'd suggest using the same disk that contains Calorie Data and CAL.DATA. When you run Calorie Minder, it starts the initialization process by reading in the food and calorie information from CAL.DATA, so be sure the disk containing that file is in the drive. ►

RUN it right: **C-64 or C-128 (in 40-Column mode); printer optional**

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Next, it displays a window containing my name, Mike, and inviting you to enter your name instead. If you're Mike, too, just press return; otherwise, delete my name, enter your's (up to 12 characters) and press return. Your name will appear in the file copy you then save, but to change the default name in the program, insert your name in place of Mike as the value of variable NM$ in line 10. Your name will then appear as the default the next time you run the program.

Once you've entered your name and pressed return, Calorie Minder searches the disk for a file called <your name>.DAT containing your calorie profile. Of course, when you first run the program, it doesn't find such a file, so it asks for information to use in creating one when you exit the program. Enter one or two digits for the year, month and day at the appropriate prompts, or, if you've used Calorie Minder before, enter the parts of the date that have changed and press return for the rest. Next, enter your height, sex,

body-frame type and exercise level, and the program computes your ideal weight, lets you set a weight goal for yourself, derives a recommended daily calorie intake and predicts how long it should take to reach your goal.

When initialization is complete, Calorie Minder's main menu display appears, offering the options shown in Figure 1 and showing your profile information at the bottom of the screen. To choose a menu option, just press the appropriate number.

Count Calories

Select option 1 to track your daily calorie intake. It starts by displaying a window containing the first ten CAL.DATA foods and their calorie counts, with the first item highlighted.

Figure 1. Calorie Minder Main Menu.

1 COUNT CALORIES
2 ANALYZE CALORIE LOG
3 IDEAL WEIGHT ANALYSIS
4 CHANGE DATE
5 EXIT PROGRAM

Figure 2. Count Calories submenu.

1 ADD CALORIES
2 NEXT SCREEN
3 PREV SCREEN
4 SUBTRACT CALORIES
5 SAVE CALORIE DATA
6 MAIN MENU

Beneath the window is the submenu shown in Figure 2. Also note the current calorie count, 0 at this time, and your target count for each day at the right end of the profile area.

To add the calories for the highlighted food to the count, press 1 at the submenu. You can use the cursor-up and -down keys to scroll through the food list, the 2 key to go to the next food screen, the 3 key to back up one screen and the home key to return to the top of the list. You can also navigate the list by pressing a letter key. For example, P takes you directly to the first food beginning with P. Of course, the latter option won't work if you didn't have Calorie Data sort the food list alphabetically. To subtract the calories for a highlighted food, press 4.

When you're done logging calories for a session, press 5 to save the data you've entered for later analysis. Option 5 also sets the calorie counter back to 0. If you suddenly remember a snack you forgot to include for the day, no problem. Just add up the extra calories and access option 5 again; the weight-analysis portion of Calorie Minder (described below) can handle multiple calorie counts for the same day.

Be sure you add calorie data in chronological order; once you've logged data for one date, the program ignores any you add for an earlier date. If you get behind and add data for several days in one session, use main menu option 4 (also described below) to change dates as you proceed.

There are two ways to record the calorie value for a food not known by CAL.DATA. First, look up the value in your reference book. Then, either look through the food list for an item with the same value and record it instead, or press the home key to return to the top of the list, where the following entries appear:

10 MISCELLANEOUS-010
50 MISCELLANEOUS-050
100 MISCELLANEOUS-100

These entries are specifically designed to help you log extraneous calorie amounts. For example, suppose you eat an unlisted food that has a calorie value of 230. You can add that number to the day's total by choosing two "portions" of MISCELLANEOUS-100 and three "portions" of MISCELLANEOUS-010. Of course, if you're likely to eat that food again, you should also add it to CAL.DATA later.

Analyze Calorie Log

Main menu option 2 issues a report on your diet progress. The report includes your current and target weights, the number of days of calorie data in your log file, your average daily calorie intake, your weight loss (or gain) and a prediction, based on current progress, of how long it will take to reach your goal. The report also features a dot graph that shows your weight change.

When using option 2, first specify the beginning and ending dates for the report by either entering dates of your own or pressing return at all the prompts to choose the default, the last six months. If you've been logging calorie data for less than six months, you can still use the default; Calorie Minder will just process the entire log.

Next you must enter a time interval, in days, for the graph. With the interval set at the default of 7, the graph will show weekly progress, while an interval value set at 1 will chart daily progress. The graph only has room to record data for 30 intervals, however, so if you choose an interval of 1, and the log contains data for more than 30 days, dots for only the first 30 will appear.

The program also asks whether you want the report output

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to the screen or printer. After you make your choice, there's a brief pause as it reads the entries in your calorie log and prepares the report. Calorie Minder expects your printer to be device number 4, but you can alter this by changing the value assigned to variable PD in line 10 of the program.

Change Date

Use main menu option 4 to change dates when logging calorie data for several days at once. As I mentioned before, it's important to start with the earliest date and work forward.

Exit Program

When you finish using Calorie Minder, leave the program by pressing 5 at the main menu. This option updates your disk profile and, if you've tallied some calorie data but not stored it, asks whether the data should be saved. Don't just press the stop key or turn the computer off to exit the program, or these things won't happen and you'll lose the day's data.

If all this seems like a heavy set of instructions, never mind. Calorie Minder is really easy to use when you get the hang of it, and it will surely lighten your dieting burden. R

Michael Broussard, a systems engineer, enjoys cooking everything from soup to nuts—except for terrapin soup, which he avoids at the request of Jake, his pet tortoise.

Listing 1. Calorie Minder program. (Available on ReRUN disk. See page 52.)

```
10 NM$="MIKE":D=8:PD=4:DT$="??/
   ??/??":WT=0:SF=1:P=65520:H=1
   0:DZ$="0"                :REM*10
20 CT=64:QM=212:CB=204:IFPEEK(6
   5532)=61THENCT=128:QM=244:CB
   =2599                    :REM*158
30 POKE53280,6:POKE53281,6:PRIN
   T"{CTRL 2}":FORK=1TO40:BL$=B
   L$+" ":NEXT              :REM*141
40 DIM M$(100),N$(500),N(500),T
   %(26),ML%(12),WA(30):REM*130
50 FORK=1TO12:READML%(K):NEXT:K
   =0                       :REM*252
60 K=K+1:READM$(K):IFM$(K)<>"FI
   NI"THEN60                :REM*193
70 X1=2:X2=3:CF=1:X$="":GOSUB22
   60                       :REM*123
80 CLOSE3:CLOSE15:OPEN15,D,15:O
   PEN3,D,3,"CAL.DATA,S,R"
                            :REM*49
90 INPUT#15,E,E$:IF E=0 THEN 11
   0                        :REM*68
100 X$="CAN'T FIND CALORIE DATA
    FILE CAL.DATA":GOSUB1690:E
   ND                       :REM*64
110 INPUT#3,X$:IFX$<>"***"THENN
   $(CX)=X$:INPUT#3,N(CX):CX=C
   X+1:GOTO110              :REM*175
120 CLOSE3:CLOSE15:CX=CX-1
                            :REM*209
130 FOR K=N(0)TOCX:T$=LEFT$(N$(
   K),1):J=ASC(T$)-64:IF T%(J)
   =0 THEN T%(J)=K          :REM*13
140 NEXTK:T%(0)=1:FORK=1TO26:IF
    T%(K)=0 THEN T%(K)=T%(K-1)
                            :REM*139
150 NEXTK                   :REM*175
160 GOSUB2000:SF=0          :REM*213
170 X$="":GOSUB1330:X1=13:X2=17
   :CF=0:GOSUB2270          :REM*134
180 ON K GOTO 190,550,2450,1820
   ,2730                    :REM*31
190 JX=1:LX=1               :REM*60
200 PRINT"{SHFT CLR}{CRSR DN}":
   GOSUB 500                :REM*181
210 IFJX<=0THENJX=1         :REM*122
220 X$="":GOSUB410:JX=JX+1:LX=L
   X+1:IF(LX<>H+1)AND(JX<=CX)T
   HEN220                   :REM*60
230 IFLX<H+1 THENFORX=LX+1TOH+1
   :PRINT"{2 SPACEs}{SHFT -}"L
   EFT$(BL$,34):NEXT        :REM*1
240 JX=JX-LX+1:LX=1:IF LF THEN
   JX=JX+H-1:LX=H:LF=0      :REM*64
250 X$="{CTRL 9}":GOSUB410
                            :REM*59
260 T$="":GETT$:IFT$=""THEN260
                            :REM*135
270 T=ASC(T$):IFT=17THENX$="":G
   OSUB410:X$="{CTRL 9}":LX=LX
   +1:JX=JX+1:GOTO450       :REM*183
280 IFT=145THENX$="":GOSUB410:X
   $="{CTRL 9}":LX=LX-1:JX=JX-
   1:GOTO450                :REM*37
290 IF(T$>="A")AND(T$<="Z")THEN
   JX=T%(T-64):LX=1:GOTO210
                            :REM*123
300 IF T=19 THEN LX=1:JX=1:GOTO
   210                      :REM*172
310 T=T-48:IFT<1 THEN210
                            :REM*235
320 ON T GOTO 370,340,360,380,4
   00,170                   :REM*2
330 GOTO260                 :REM*154
340 T=JX+H-LX+1:IF T<=CX THEN J
   X=T:LX=1                 :REM*83
350 GOTO 210                :REM*157
360 JX=JX-H-LX+1:LX=1:GOTO210
                            :REM*24
370 CC=CC+N(JX):MD=1:GOSUB1460:
   GOTO260                  :REM*66
380 CC=CC-N(JX):MD=1:IF CC<0 TH
   EN CC=0                  :REM*209
390 MD=1:GOSUB1460:GOTO260
                            :REM*187
400 GOSUB1600:JX=INT(JX/10)*10+
   1:LX=1:GOTO200           :REM*251
410 T$=LEFT$(N$(JX),29):T2$=MID
   $(STR$(N(JX)),2):Z=29-LEN(T
   $):IF Z<0 THEN Z=0       :REM*18
420 T2$=LEFT$(BL$,4-LEN(T2$))+T
   2$                       :REM*169
430 PRINT"{HOME}{CRSR DN}"LEFT$
   ("{12 CRSR DNs}",LX);TAB(3)
   X$T2$"{SHFT -}"T$"{CTRL 0}"
   LEFT$(BL$,Z)"{SHFT -}"
                            :REM*135
440 RETURN                  :REM*68
450 IFLX>H THEN IFJX<=CXTHENLX=
   1:GOTO210                :REM*29
460 IFLX<=0THENIFJX>H-1THENJX=J
   X-H+1:LF=1:LX=1:GOTO210
                            :REM*2
470 IFJX<=0THENJX=1:LX=1
                            :REM*122
480 IFJX>CXTHENJX=CX:LX=LX-1
                            :REM*110
490 GOSUB410:GOTO260        :REM*69
500 PRINT"{SHFT CLR}":GOSUB1460
   :PRINT"{2 SPACEs}{COMD A}{3
   4 SHFT *s}{COMD S}":REM*191
510 FORK=1TOH:PRINT"{2 SPACEs}{
   SHFT -}"SPC(34)"{SHFT -}":N
   EXT                      :REM*220
520 PRINT"{2 SPACEs}{COMD Z}{34
    SHFT *s}{COMD X}"       :REM*135
530 X1=18:X2=23:CF=0:SP=1:GOSUB
   2270:SP=0                :REM*90
540 RETURN                  :REM*168
550 CLOSE3:CLOSE15:OPEN15,D,15:
   OPEN3,D,3,NM$+".LOG,S,R":IN
   PUT#15,E,E$              :REM*246
560 IF E=0 THEN 600         :REM*127
570 IF E<>62 THEN 1690      :REM*185
580 M$(0)="CAN'T FIND FILE "+NM
   $+".LOG":X1=0:X2=1:CF=1:PK=
   1:GOSUB2270              :REM*210
590 CLOSE3:CLOSE15:GOTO170
                            :REM*150
600 X1=VAL(LEFT$(DT$,2)):X2=VAL
   (MID$(DT$,4,2))-6:IFX2<1THE
   NX2=X2+12:X1=X1-1        :REM*42
610 X$=MID$(STR$(X1),2):IFLEN(X
   $)<2THENX$="0"+X$        :REM*93
620 Y$=MID$(STR$(X2),2):IFLEN(Y
   $)<2THENY$="0"+Y$        :REM*251
630 D1$=X$+"/"+Y$+MID$(DT$,6):X
   1=2:X2=2:CF=1:X$="INPUT STA
   RT DATE":D$=D1$          :REM*95
640 GOSUB1710:D$=DT$:X$="INPUT
   END DATE":GOSUB1710:D2$=D$
                            :REM*132
650 Y1=VAL(LEFT$(D1$,2)):M1=VAL
   (MID$(D1$,4,2)):D1=VAL(MID$
   (D1$,7,2))               :REM*206
660 Y2=VAL(LEFT$(D2$,2)):M2=VAL
   (MID$(D2$,4,2)):D2=VAL(MID$
   (D2$,7,2))               :REM*86
670 PRINT"{2 CRSR DNs}"TAB(7)"{
   CTRL 9}REPORT INTERVAL (IN
   DAYS)":R=20:C=18:W=2:S$="7"
                            :REM*163
680 GOSUB1860:IN=VAL(S$):IF IN<
   1 THEN 650               :REM*240
690 PRINT"{2 CRSR DNs}{3 SPACEs
   }{CTRL 9}OUTPUT TO SCREEN O
```

Continued on p. 66.

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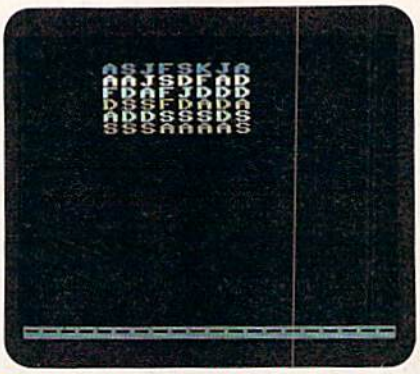
Type Invaders

Hone your typing skills and sharpen your shooting eye at the same time.

By TONY BRANTNER

Sound the alert and prepare for battle! Those unruly characters from planet Keebord have launched an attack. Platoons of loathsome letters, nasty numbers and pugnacious punctuation marks are descending toward Earth, threatening to inundate it with gobbledygook. You have the firepower, but do you have the skill to save our endangered planet?

Well, if not at first, you will after practicing with Type-N-Fire, an entertaining way to hone your typing skills. Written for the C-64 entirely in Basic, Type-N-Fire is straightforward to play. First you select a skill level from 1, the easiest, to 9. Then the game screen appears and a block of ten rows containing eight characters each begins to move down the screen. Starting with the lowest row, type the characters from left to right—without looking at the keyboard, of course. When you hit a correct key, a laser beam will fire upward and blast the corresponding character. You win two points for each hit and lose a point for each miss.



Zap those characters before they land.

The first platoon contains only a small assortment of Type-N-Fire's large, colorful characters, but the variety increases in succeeding attacks. A round is over when you've eliminated all the characters. Then a scorecard appears, showing your score, shots fired, hits and accuracy percentage for that round, along with your high score for the session. Press any key to advance to the next round.

Once you've mastered all the keys, the characters will begin their descent from a lower position. If they reach the bottom, a final scorecard will appear and you can quit or play again.

If you're serious about improving your typing skills, you may wish to keep a notebook handy for recording your level and high score for each session. Then you can try to better that score next time.

Now, ready at the keyboard and type R-U-N! R

Tony Brantner, a carpenter by trade, is also a self-taught computer programmer who chose the C-64 because of its excellent graphics potential.

Listing 1. Type-N-Fire program. (Available on ReRUN disk. See page 52.)

```
1Ø REM---TYPE-N-FIRE - T. BRANT
   NER                    :REM*89
2Ø POKE52,56:POKE56,56:CLR
                          :REM*127
3Ø TT$="TYPE-N-FIRE"      :REM*88
4Ø KY$="ASDFJKL:HEITC.ORNZUWB,Y
   XVPQMG?/4738295618$';"+CHR$(
   34)                    :REM*157
5Ø KY$=KY$+"(!)+<@>-#%=[&]*{LEF
   T ARROW}{LB.}{UP ARROW}"
                          :REM*2Ø4
6Ø TC=646:SC=1Ø24:V=53248:S1=54
   272:S2=S1+7:Z=RND(-TI)
                          :REM*227
7Ø DEFFNTB(A)=28-LEN(STR$(A)):D
   EFFNHT(A)=LY+INT((8Ø-KN)/8)
                          :REM*187
8Ø DIMCH(15),HZ$(1)       :REM*172
9Ø FORA=ØTO15:READCH(A):NEXT
                          :REM*31
1ØØ FORA=1TO22:L1$=L1$+"{COMD D
   }{COMD F}{CRSR UP}{2 CRSR L
   Fs}":L2$=L2$+"{2 SPACEs}{CR
   SR UP}{2 CRSR LFs}":REM*126
11Ø HZ$(Ø)=HZ$(Ø)+CHR$(13)+CHR$
   (148):HZ$(1)=HZ$(1)+CHR$(13
   )+CHR$(29)+CHR$(2Ø):REM*196
12Ø NEXT                  :REM*25Ø
13Ø GOSUB81Ø              :REM*2Ø8
14Ø FORA=S1TOS1+23:POKEA,Ø:NEXT
                          :REM*21
15Ø POKES1+1,9:POKES1+5,7:POKES
   2+6,24Ø:POKES1+24,15
                          :REM*2Ø4
16Ø REM---NEW GAME        :REM*2Ø9
17Ø GOSUB69Ø:KR=1:NY=2:KP=Ø:KC=
   Ø                      :REM*21
18Ø REM---NEW ROUND       :REM*135
19Ø IFKR=LEN(KY$)THENA=NY+1:IFA
   <13THENNY=A            :REM*114
2ØØ LY=NY:LX=12:LA=1:KN=1:MC=GS
   *3                     :REM*114
21Ø GOSUB44Ø:POKE198,Ø    :REM*19Ø
22Ø REM---MAIN            :REM*124
23Ø MC=MC+1:IFMC<28THEN27Ø
                          :REM*19
24Ø MC=GS*3:POKES1+4,16:POKES1+
   4,17                   :REM*226
25Ø A=LX+LA:IFA>3ANDA<21THENLX=
   A:PRINT"{HOME}"HZ$(ABS(LA<Ø
   )):GOTO27Ø             :REM*121
26Ø POKE218,132:PRINT"{HOME}";:
   SYS59749:LY=LY+1:LA=-LA:IFF
   NHT(A)=23THEN38Ø       :REM*18Ø
27Ø GETA$:IFA$=""THEN23Ø
                          :REM*143
28Ø KP=KP+1:IFA$=MID$(KB$,KN,1) ►
```

RUN it right: **C-64**

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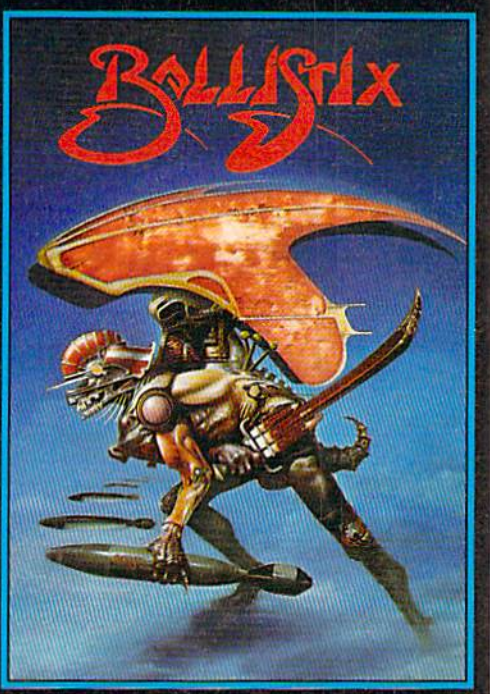

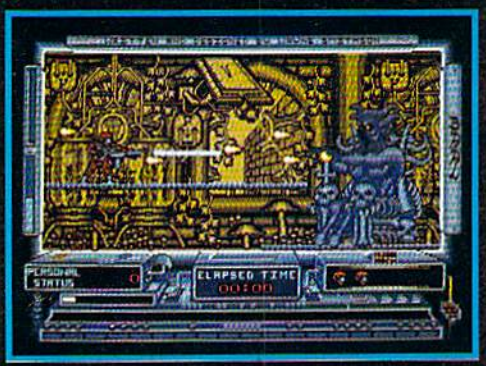

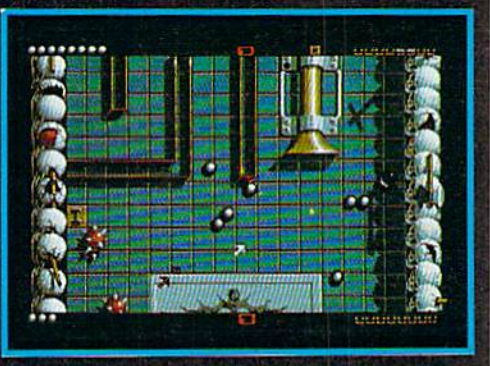

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Can you succeed? There is no option . . . the alternative is literally 'Hell on Earth'.

Screen Shots from the Atari ST version

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CAPTAIN FIZZ
Meets The Blaster-Trons

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It's double fun and double trouble all the way in Captain Fizz, the most exciting simultaneous two-player game you and a friend are ever likely to play. It's a whole new world of split-screen, high-speed action, as both of you take on the nasty Blaster-Trons infesting the planet Icarus.

Yup, it's a tough mission alright, but you might just win out with the right blend of co-operation, courage, laser-hot reflexes, tactical sense. . , and brains. The action is fast and furious in Captain Fizz, but if you can't work out the right tactics you'll both be dead meat.

There are 22 levels of savage and relentless action to battle through before you reach your objective, the central computer that's causing the evil infestation. You'll never get there, though, unless you put your heads together and co-operate; your buddy can't do it on his own, and neither can you. This is one program where even the easy games are hard. So remember — united you stand, but divided you fall. . .

Warning: this game is impossible to beat on your own.

Two joysticks required for two-player game.

Screen shots taken from the Atari ST version

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BALLISTIX
Its a whole new ball game!

Sick of silly old soccer ? Tired of pathetic pinball? Then you need a dose of *Ballistix* - the fastest, wackiest, toughest ball game yet to appear on a computer. *Ballistix* just explodes with excitement, puzzles and an amazing **130 different screens** of frenetic action.

The aim of the game is simple; score more goals than your opponent to win the match. Doing it is a different matter as **splitters** fill the screen with dozens of balls, **tunnels** hide them from view, **bumpers** bounce balls all over the show, fiendish **red arrows** speed them up to almost impossible velocity, **magnets** pull them away from your control, and much, much more.

Ballistix is incredibly flexible, too. You can play against the computer or another player, set the speed if you can't stand the pace, define where the balls are fired and their velocity, rack up bonuses that will get you extra goals and then, at the end of an exhausting game, set your name in pride of place on the high-score table. And it's all played to the accompaniment of a throbbing sound-track and a crowd that applauds your every goal.

Ballistix is definitely not a game for wimps. It's tough, fast, challenging and incredibly competitive - in fact, it's just the kind of game you like.

Two joysticks required for two-player game

Screen Shots are from the Amiga version

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ReRUN
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Peterborough, NH 03458

TYPE INVADERS

```
    THEN3ØØ                 :REM*22
29Ø POKES2+1,5:POKES2+4,33:FORA
    =1TO5Ø:NEXT:POKES2+4,32:GOT
    O23Ø                    :REM*114
3ØØ KC=KC+1:POKES2+1,8:POKES2+4
    ,33                     :REM*51
31Ø POKETC,13:CY=23:CX=(KN-1AND
    7)*2+LX:GOSUB67Ø:HT=(24-FNH
    T(A))*5                 :REM*76
32Ø PRINTLEFT$(L1$,HT):GOSUB67Ø
    :PRINTLEFT$(L2$,HT):POKES2+
    4,32                    :REM*1Ø1
33Ø KN=KN+1:IFKN<81THEN23Ø
                            :REM*231
34Ø REM---END OF ROUND      :REM*173
35Ø GOSUB56Ø:CY=11:CC=3:A$="PRE
    SS ANY KEY":GOSUB74Ø
                            :REM*1Ø1
36Ø POKE198,Ø:WAIT198,15:GOTO19
    Ø                       :REM*149
37Ø REM---END OF GAME       :REM*33
38Ø POKES2+4,33:FORA=2ØTOØSTEP-
    .Ø5:POKES2+1,A:NEXT:POKES2+
    4,32                    :REM*52
39Ø GOSUB56Ø:CY=11:CC=3:A$="PLA
    Y AGAIN? (Y/N)":GOSUB74Ø:PO
    KE198,Ø                 :REM*239
4ØØ GETA$:IFA$="Y"THEN17Ø
                            :REM*48
41Ø IFA$<>"N"THEN4ØØ        :REM*144
42Ø POKE832,Ø:SYS832        :REM*184
43Ø REM---SCREEN            :REM*242
44Ø PRINTCHR$(147):POKEV+21,127
                            :REM*31
45Ø CY=Ø:CX=Ø:CC=14:A$=TT$:GOSU
    B75Ø                    :REM*3
46Ø CX=26:CC=8:A$="LEVEL"+STR$(
    GS):GOSUB75Ø            :REM*43
47Ø KB$="":FORA=1TO1Ø       :REM*55
48Ø IFKR<LEN(KY$)THENKR=KR+1
                            :REM*73
49Ø FORZ=1TO8:AA=INT(RND(1)*KR)
    +1                      :REM*31
5ØØ KB$=KB$+MID$(KY$,AA,1)
                            :REM*237
51Ø NEXT:NEXT               :REM*126
52Ø FORAA=ØTO9              :REM*225
53Ø CC=INT(RND(1)*7)+2:A$=MID$(
    KB$,1+(9-AA)*8,8):CY=LY+AA:
    GOSUB74Ø                :REM*239
54Ø NEXT:RETURN             :REM*184
55Ø REM---SCORECARD         :REM*77
56Ø CY=3:CC=2:A$="SCORECARD":GO
    SUB74Ø:CY=5:CX=12:GOSUB67Ø
                            :REM*131
57Ø A=KC*2-(KP-KC):IFA<ØTHENA=Ø
                            :REM*125
58Ø POKETC,15:PRINT"SCORE"TAB(F
    NTB(A))A                :REM*1Ø9
59Ø IFA>HSTHENHS=A          :REM*1Ø6
6ØØ PRINTTAB(CX)"HIGH"TAB(FNTB(
    HS))HS                  :REM*171
61Ø PRINTTAB(CX)"SHOTS"TAB(FNTB
    (KP))KP                 :REM*126
62Ø PRINTTAB(CX)"HITS"TAB(FNTB(
    KC))KC                  :REM*131
63Ø A=Ø:IFKPTHENA=INT(KC/KP*1ØØ
    )                       :REM*191
64Ø PRINTTAB(CX)"ACCURACY"TAB(F
    NTB(A))A                :REM*111
65Ø RETURN                  :REM*27
66Ø REM---PLOT              :REM*213
67Ø POKE214,CY-1:PRINT:PRINTTAB
    (CX);:RETURN            :REM*15Ø
68Ø REM---GET LEVEL         :REM*2Ø9
69Ø PRINTCHR$(147):POKEV+21,Ø
                            :REM*125
7ØØ CY=12:CC=8:A$="SELECT LEVEL
    (1-9)":GOSUB74Ø:POKE198,Ø
                            :REM*244
71Ø GETA$:IFA$<"1"ORA$>"9"THEN7
    1Ø                      :REM*234
72Ø GS=VAL(A$):RETURN       :REM*26
73Ø REM---PRINT WIDE STRING
                            :REM*124
74Ø CX=2Ø-LEN(A$)           :REM*167
75Ø SL=SC+CY*4Ø+CX          :REM*93
76Ø FORA=1TOLEN(A$)         :REM*141
77Ø Z=(ASC(MID$(A$,A,1))AND63)*
    2                       :REM*216
78Ø POKESL+S1,CC:POKESL+S1+1,CC
    :POKESL,Z+128:POKESL+1,Z+12
    9:SL=SL+2               :REM*39
79Ø NEXT:RETURN             :REM*179
8ØØ REM---REDEFINE CHARACTERS
                            :REM*1ØØ
81Ø POKE5328Ø,Ø:POKE53281,Ø:PRI
    NTCHR$(8)CHR$(147):POKEV+21
    ,Ø                      :REM*243
82Ø CY=12:CX=14:GOSUB67Ø:PRINT"
    {COMD 7}SETTING UP..."
                            :REM*33
83Ø POKE56334,PEEK(56334)AND254
    :POKE1,PEEK(1)AND251
                            :REM*225
84Ø POKE781,5:POKE782,1:POKE91,
    212:POKE9Ø,Ø:POKE89,6Ø:POKE
    88,Ø                    :REM*252
85Ø SYS41964:POKE1,PEEK(1)OR4:P
    OKE56334,PEEK(56334)OR1
                            :REM*156
86Ø POKE53272,(PEEK(53272)AND24
    Ø)OR14                  :REM*94
87Ø N1=14336:N2=N1+1Ø24:N3=N2+8
                            :REM*2Ø1
88Ø FORA=ØTO63:FORZ=ØTO7:REM*19
89Ø CN=PEEK(N1+A*8+Z):AA=CH((CN
    AND24Ø)/16):ZZ=CH(CNAND15)
                            :REM*1Ø4
9ØØ POKEN2+A*16+Z,AA:POKEN3+A*1
    6+Z,ZZ                  :REM*91
91Ø NEXT:NEXT               :REM*12
92Ø REM---SPRITES           :REM*238
93Ø FORA=832TO895:POKEA,255:NEX
    T                       :REM*227
94Ø FORA=838TO843:POKEA,129:NEX
    T                       :REM*241
95Ø FORA=ØTO6               :REM*11
96Ø POKEV+A*2,24+A*48AND255:POK
    EV+1+A*2,242:POKEV+39+A,11:
    POKE2Ø4Ø+A,13           :REM*1Ø2
97Ø NEXT                    :REM*72
98Ø POKEV+16,96:POKEV+23,Ø:POKE
    V+28,Ø:POKEV+29,127:RETURN
                            :REM*157
99Ø DATAØ,3,12,15,48,51,6Ø,63,1
    92,195,2Ø4,2Ø7,24Ø,243,252,
    255                     :REM*32 ■
```


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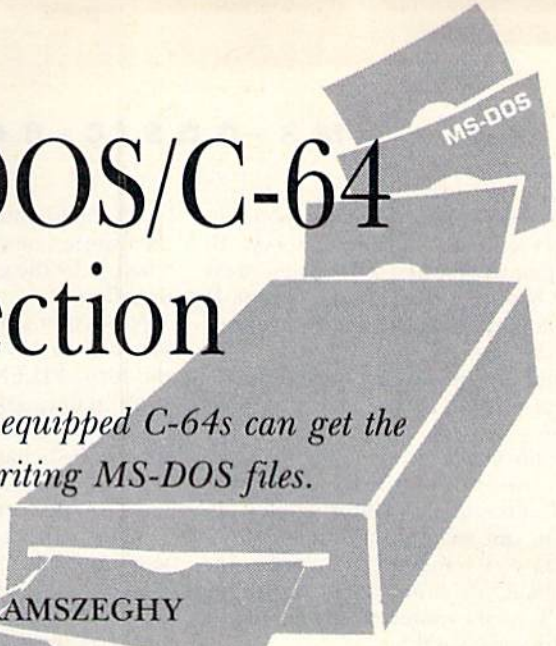
The MS-DOS/C-64 Connection



Now owners of 1571- or 1581-equipped C-64s can get the benefits of reading and writing MS-DOS files.

By MIKLOS GARAMSZEGHY

We're now at the final installment in the three-part series on exchanging text and data files between MS-DOS and Commodore computers. Part 1, in the April issue of *RUN*, presented a program that lets a C-128 read from and write to MS-DOS disks. Last month, Part 2 added a program for formatting MS-DOS disks with either a C-128 or C-64. This month, I complete the picture with a program that enables a C-64 to read and write MS-DOS disks, providing a quick and easy way to transfer files between machines.

Although primarily intended for use with 3½-inch, 720K MS-DOS disks in a 1581 drive, the program also works with 5¼-inch MS-DOS disks in a 1571 drive. Note that you cannot use the program with a 1541 drive, due to that drive's different method of recording data.

You can move files of up to about 30K (120 disk blocks) in size in either of two modes: Translation mode, which converts the file from PETSCII (Commodore ASCII) to true (standard) ASCII, or Binary mode, which creates a straight byte-for-byte copy. Commodore files can be sequential (SEQ), program (PRG) or user (USR); relative (REL) files and GEOS user-type files won't work. Menus and screen prompts make the MS-DOS/C-64 Connection easy to use.

The Programs

The program in Listing 1, which consists mostly of Data statements, generates the machine language portion of MS-DOS/C-64 and saves it in a special file called M64.ML3. This file is automatically loaded into memory when you run the main program (Listing 2). If the computer detects a mistake when you run the machine language generator, it displays an error message and automatically scratches the bad file from the disk.

The machine language generator assumes that you will be using a device 8 disk drive. If you want to use a drive with a different device number, change the value of variable DV in line 10 of Listing 1 accordingly.

You must run Listing 1 only once. Then store it in a safe place, in case you ever lose your copy of M64.ML3.

Listing 2 is the main Basic MS-DOS/C-64 Connection program. The background and border screen colors are set to blue by the Pokes in line 30, but you can change them as you see fit. The character color is set to white by the Print statement in line 50.

Type in both Listing 1 and Listing 2, and be sure to save them to disk before running them.

In this article and the program, the terms "source" and "target" refer to disks being copied from and to, respectively. "MS-DOS" means any IBM-PC-type disk operating system, and "Commodore DOS" means the normal operating system in Commodore disk drives, including the 1571 and 1581.

When you first run MS-DOS/C-64, it loads the M64.ML3 file from drive 8, assuming that file isn't already in memory. (If you want to load the file from another drive, change the 8 in the Load statement in line 40 of Listing 2.) When the opening menu appears, you can remove the disk containing M64.ML3 from the drive if you wish.

The Source

The opening menu asks for information about your source disk, starting with its type—MS-DOS or Commodore. Enter 1 or 2 accordingly, or 3 to quit the program.

Press the return key after making your selection, then choose the device number, 8–12, of the source drive. A number outside that range will be rejected, and you'll be returned to the source-disk prompt.

Having entered a proper device number, insert the source disk into the source drive and press return to proceed. Any other key will take you back to the opening menu, should you want to change your choices.

Assuming that you press return, MS-DOS/C-64 will read the directory of the source disk. In the case of an MS-DOS disk, it will also automatically determine the disk's type (number of sides, number of sectors per track, and so forth) and decode its file allocation table (FAT), which is similar in function to the Commodore BAM (block allocation map). Watch the screen to keep track of what's happening. This process may take a couple of minutes, mostly due to the slow speed of the serial data transfer.

On the screen, the directory takes the form of a ten-entry menu. MS-DOS subdirectories are identified by <dir> under the file-size field, while 1581 partitions are identified by the filetype CBM.

At the top of the directory screen, you'll see the disk's name and ID (Commodore DOS) or volume label (MS-DOS), along with the number of files in the directory and the total number of bytes used by these files. Note that the file sizes are expressed in bytes, not in the blocks to which Commodore users are accustomed. As a result, the sizes indicated for Commodore files are only approximate (block count times 254), while the sizes of MS-DOS files, taken right from the directory entries, are exact.

As I mentioned earlier, the program won't work with relative files or GEOS-type user files. However, these files will still be listed in a Commodore DOS directory.

To select a file to read or a subdirec- ►

RUN it right: **C-64; 1571 or 1581 disk drive**

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tory to view, press the corresponding number and then the return key. To see the next group of ten entries, press either N and return, or just return. If you want to go back to the previous group of ten, press P and return. To quit and go back to the opening menu without making a choice, press Q and return.

The file you select need not be in the group currently on the screen. For example, if the menu is showing files 11–20, you can still choose number 6, as long as you remember that's the one selected. Only numbers in the range from 1 to the number of files in the directory are valid.

Don't remove the source disk from the drive until you're prompted to insert another disk. Otherwise, your file may be copied incorrectly or files on the disk you insert may get damaged. MS-DOS/C-64 won't prompt you to insert a disk before it starts to read a file appearing on the on-screen directory, because it will assume that you haven't removed the disk containing the file.

After selecting the file to transfer, you must specify either Binary or Translation mode. Binary creates a new file that's identical to the original. In Translation mode, the conversion between PETSCII and ASCII occurs while the file is being read into memory.

The Target

Once the file has been read into the memory buffer, it's time to specify the target disk characteristics. At the prompt for filetype, press 1 for MS-DOS, 2 for Commodore DOS or 3 to return to the directory menu.

Assuming you want to proceed with the transfer, next select the target drive. This can be the same as the source drive or different.

Now enter a filename for your target file. For an MS-DOS file, it must take the form FILENAME.TYP, where the main name, containing up to eight characters, is followed by a period and then a 0–3-character filename extension or type. Commodore filenames can have up to 16 characters.

When writing to a Commodore disk, you must also choose the Binary or Translation transfer mode and the file type—SEQ, PRG or USR. Most text-file transfers use sequential files.

Now insert the target disk in the drive and press return to write the file to it.

With an MS-DOS target, because a real MS-DOS operating system is not present, the program must perform several housekeeping tasks during the write operation. These include reading the MS-DOS directory and decoding the FAT, writing the file, and updating the directory and FAT on the target disk. With a Commodore target, all this is done automatically by the DOS.

After it has written the file, the program rereads the source directory and redisplays the directory menu. If your source and target disks are in the same drive, you'll be prompted to reinsert the source disk before the directory read.

Subdirectories

MS-DOS/C-64 lets you transfer files from any MS-DOS subdirectory or 1581 directory partition. When you select an MS-DOS entry marked <dir> or a Commodore 1581 CBM file from the directory menu, the new directory is read and displayed on the screen. You can get back to the previous directory level in MS-DOS by selecting the first entry in the new directory. That entry should be <parent> <dir>. With a 1581, you can't go back through a directory chain; you must return to the root directory and follow the chain forward. All files you write will appear in the root directory only; subdirectories are not supported in file writes.

The program recovers unused and scratched directory and data space on MS-DOS disks, but the Commodore DOS does this job automatically when writing to sequential or program files.

Other Types of Transfers

While MS-DOS/C-64 is designed primarily for transferring files between MS-DOS machines and the C-64, it can be used for other purposes. One is transferring normal Commodore SEQ, PRG and USR files between a 1581 and a 1571, 1541, C-64-compatible hard drive or even an IEEE-bus type drive.

In addition to doing transfers, the program is handy for converting text files between true ASCII and PETSCII using any Commodore-compatible drive. For ASCII to PETSCII, read the file in Binary mode, then write it in Translation mode. For PETSCII to ASCII, read the file in Translation mode, then write it in Binary mode. R

Miklos Garamszeghy is a Toronto-based writer and software developer with numerous public domain, shareware and commercial programs for Commodore and MS-DOS computers to his credit.

Listing 1. Machine language generator program. (Available on ReRUN disk. See page 52.)

```
5 REM CREATE MS-DOS 64 ML
                        :REM*38
1Ø DV=8 : REM DISK DRIVE DEVICE
    NUMBER              :REM*11
2Ø PRINT "CREATING FILE M64.ML3
   ":OPEN15,DV,15       :REM*22
3Ø OPEN 8,DV,8,"M64.ML3,P,W"
                        :REM*223
4Ø PRINT#8,CHR$(Ø);CHR$(1ØØ);
                        :REM*162
5Ø FOR I=256ØØ TO 26423:READ X:
   CS=CS+X              :REM*238
6Ø PRINT#8,CHR$(X);:NEXT:PRINT#
   8:CLOSE 8:IF CS=95675 THEN 9
   Ø                    :REM*73
7Ø PRINT#15,"S Ø:M64.ML3"
                        :REM*176
8Ø PRINT "ERROR IN DATA STATEME
   NTS":CLOSE 15:END    :REM*171
9Ø PRINT "DONE":CLOSE 15:END
                        :REM*54
1ØØ DATA 245,76,65,1ØØ,76,92,1Ø
    Ø,76,83,1Ø1,76,2Ø1,1Ø1,76,2
    31,1ØØ,76,36,1Ø1    :REM*223
11Ø DATA 76,21,1Ø1,76,36,1Ø2,Ø,
    Ø,12Ø,166,1,142,25,1ØØ,162,
    Ø,134,1,177,25Ø     :REM*143
12Ø DATA 174,25,1ØØ,134,1,88,96
    ,12Ø,166,1,142,25,1ØØ,162,Ø
    ,134,1,145,25Ø      :REM*56
13Ø DATA 174,25,1ØØ,134,1,88,96
    ,173,12,3,133,251,174,13,3,
    32,198,255,16Ø,Ø    :REM*244
14Ø DATA 132,25Ø,32,2Ø7,255,32,
    46,1ØØ,2ØØ,2Ø8,247,76,2Ø4,2
    55,173,12,3,133     :REM*216
15Ø DATA 251,16Ø,Ø,132,25Ø,16Ø,
    2,132,252,174,13,3,32,2Ø1,2
    55,16Ø,Ø,32,27      :REM*221
16Ø DATA 1ØØ,153,182,1ØØ,2ØØ,19
    2,32,2Ø8,245,16Ø,Ø,185,176,
    1ØØ,32,21Ø,255      :REM*64
17Ø DATA 2ØØ,192,38,2Ø8,245,32,
    2Ø4,255,24,173,179,1ØØ,1Ø5,
    32,141,179,1ØØ      :REM*182
18Ø DATA 133,25Ø,144,2Ø8,198,25
    2,24Ø,8,238,18Ø,1ØØ,23Ø,251
    ,76,1Ø5,1ØØ,169     :REM*Ø
19Ø DATA 3,141,18Ø,1ØØ,169,Ø,14
    1,179,1ØØ,96,77,45,87,Ø,3,3
    2,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø   :REM*1Ø9
2ØØ DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,
    Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
    ,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,2   :REM*16Ø
21Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,255,17
    3,12,3,133,251,174,13,3,32,
    198,255,16Ø,Ø       :REM*156
22Ø DATA 132,25Ø,24Ø,5,32,183,2
    55,2Ø8,19,32,2Ø7,255,32,46,
    1ØØ,2ØØ,192,Ø       :REM*178
23Ø DATA 2Ø8,24Ø,23Ø,251,169,25
    5,197,251,2Ø8,232,132,25Ø,3
    2,2Ø4,255,164       :REM*135
```


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```
24Ø DATA 25Ø,169,Ø,133,25Ø,169,
    32,32,46,1ØØ,2ØØ,2Ø8,25Ø,96
    ,172,14,3,14Ø          :REM*58
25Ø DATA 22Ø,1ØØ,238,22Ø,1ØØ,17
    3,12,3,133,251,16Ø,Ø,132,25
    Ø,174,13,3,32          :REM*2Ø4
26Ø DATA 2Ø1,255,32,27,1ØØ,32,2
    1Ø,255,2ØØ,192,Ø,2Ø8,245,23
    Ø,251,173,22Ø          :REM*178
27Ø DATA 1ØØ,197,251,2Ø8,236,76
    ,2Ø4,255,173,12,3,133,251,1
    74,13,3,32,198         :REM*169
28Ø DATA 255,16Ø,Ø,132,25Ø,32,1
    83,255,24Ø,3,76,15Ø,1Ø1,32,
    2Ø7,255,141,216        :REM*212
29Ø DATA 1ØØ,41,127,2Ø1,13,2Ø8,
    4Ø,32,46,1ØØ,2ØØ,2Ø8,8,23Ø,
    251,169,255,197        :REM*225
3ØØ DATA 251,24Ø,18,169,1Ø,32,4
    6,1ØØ,2ØØ,192,Ø,2Ø8,212,23Ø
    ,251,169,255,197       :REM*163
31Ø DATA 251,2Ø8,2Ø4,132,25Ø,32
    ,2Ø4,255,76,21,1Ø1,2Ø1,9,24
    Ø,228,2Ø1,32,144       :REM*198
32Ø DATA 188,24Ø,222,173,216,1Ø
    Ø,2Ø1,65,144,215,2Ø1,91,144
    ,17,2Ø1,123,144        :REM*2Ø6
33Ø DATA 4,2Ø1,128,144,242,41,9
    5,2Ø1,32,144,161,76,134,1Ø1
    ,9,32,76,134,1Ø1       :REM*151
34Ø DATA 172,14,3,14Ø,22Ø,1ØØ,2
    38,22Ø,1ØØ,173,12,3,133,251
    ,174,13,3,32,2Ø1       :REM*217
35Ø DATA 255,16Ø,Ø,132,25Ø,32,2
    7,1ØØ,2ØØ,41,127,141,216,1Ø
    Ø,2Ø1,1Ø,24Ø,38        :REM*87
36Ø DATA 2Ø1,13,24Ø,31,2Ø1,9,24
    Ø,27,2Ø1,32,144,26,2Ø1,65,1
    44,19,2Ø1,91,144       :REM*135
37Ø DATA 13,2Ø1,97,144,11,2Ø1,1
    23,176,7,41,95,76,17,1Ø2,9,
    128,32,21Ø,255         :REM*171
38Ø DATA 192,Ø,2Ø8,2Ø1,23Ø,251,
    173,22Ø,1ØØ,197,251,2Ø8,192
    ,76,2Ø4,255,173        :REM*215
39Ø DATA 12,3,133,251,169,Ø,133
    ,25Ø,168,153,72,3,2ØØ,192,1
    Ø,2Ø8,248,169,32       :REM*183
4ØØ DATA 153,72,3,2ØØ,192,64,2Ø
    8,248,174,13,3,32,198,255,1
    6Ø,Ø,32,19,1Ø3         :REM*216
41Ø DATA 144,3,76,23Ø,1Ø2,2Ø1,3
    4,2Ø8,244,32,19,1Ø3,2Ø1,34,
    24Ø,249,153,84,3       :REM*188
42Ø DATA 2ØØ,192,22,2Ø8,241,169
    ,32,16Ø,Ø,32,46,1ØØ,2ØØ,192
    ,32,2Ø8,248,32         :REM*134
43Ø DATA 19,1Ø3,176,217,2Ø8,249
    ,32,19,1Ø3,32,19,1Ø3,176,2Ø
    7,32,19,1Ø3,141        :REM*44
44Ø DATA 226,1ØØ,16Ø,22,32,46,1
    ØØ,2ØØ,32,19,1Ø3,141,227,1Ø
    Ø,32,46,1ØØ,2ØØ        :REM*162
45Ø DATA 24,173,226,1ØØ,1Ø9,8Ø,
    3,141,8Ø,3,144,3,238,81,3,1
    73,81,3,24,1Ø9         :REM*159
46Ø DATA 227,1ØØ,141,81,3,16Ø,1
    ,32,19,1Ø3,176,5Ø,2Ø1,Ø,24Ø
    ,46,2Ø1,34,2Ø8         :REM*12Ø
47Ø DATA 243,32,19,1Ø3,176,37,2
    Ø1,34,24Ø,247,32,46,1ØØ,2ØØ
    ,192,22,2Ø8,239        :REM*117
48Ø DATA 16Ø,18,32,27,1ØØ,16Ø,Ø
    ,32,46,1ØØ,2ØØ,32,3Ø,1Ø3,23
    8,72,3,2Ø8,3,238       :REM*63
49Ø DATA 73,3,76,99,1Ø2,32,2Ø4,
    255,173,8Ø,3,56,237,226,1ØØ
    ,141,8Ø,3,173,81       :REM*134
5ØØ DATA 3,237,227,1ØØ,141,81,3
    ,162,Ø,16Ø,22,32,27,1ØØ,2ØØ
    ,157,76,3,232          :REM*212
51Ø DATA 192,24,2Ø8,244,169,255
    ,16Ø,Ø,76,46,1ØØ,24,32,183,
    255,2Ø8,3,76,2Ø7       :REM*146
52Ø DATA 255,56,96,165,25Ø,24,1
    Ø5,32,133,25Ø,144,2,23Ø,251
    ,96,Ø,Ø,Ø,Ø,Ø,Ø         :REM*8
53Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
                           :REM*243
```

Listing 2. MS-DOS/C-64 main program. (Available on ReRUN disk. See page 52.)

```
1Ø REM{2 SPACEs}MSDOS <-> 64{2
   SPACEs}BY M. GARAMSZEGHY
                           :REM*199
2Ø :                       :REM*78
3Ø POKE 5328Ø,6:POKE 53281,6
                           :REM*37
4Ø IF PEEK(256ØØ)<> 245 THEN LO
   AD"M64.ML*",8,1         :REM*3Ø
5Ø PRINT"{SHFT CLR}{CTRL 2}{3 C
   RSR DNs}INITIALIZING...PLEAS
   E WAIT"                 :REM*194
6Ø POKE 56,99:CLR          :REM*115
7Ø DIM FA(8ØØ),DI$(144),LE$(144
   ),FM(112)               :REM*136
8Ø MØ$="READING...":M1$="WRITIN
   G...":M2$=" DIRECTORY":M3$="
    FAT"                   :REM*59
9Ø T2$="MSDOS <-> 64{2 SPACEs}B
   Y M. GARAMSZEGHY"       :REM*139
1ØØ M6$="MS-DOS":M7$="CBM-DOS"
                           :REM*14
11Ø BL$="{8 SPACEs}":DB=1Ø4*256
   :TB=DB+5376             :REM*247
12Ø AR=78Ø:XR=781:YR=782:ML=256
   Ø1                      :REM*1Ø4
13Ø GOSUB 81Ø:PRINT "SELECT SOU
   RCE DISK TYPE:{CRSR DN}":PR
   INT"1 = ";M6$           :REM*247
14Ø PRINT "2 = ";M7$:PRINT"{CRS
   R DN}3 = QUIT":TC=Ø:SD=Ø
                           :REM*19Ø
15Ø PRINT:INPUT "YOUR CHOICE [1
   , 2, OR 3]";TC          :REM*2Ø7
16Ø IF TC<1 OR TC>2 THEN END
                           :REM*31
17Ø PRINT:PRINT:INPUT"SELECT SO
   URCE DEVICE [8 TO 12]";SD
                           :REM*51
18Ø IF SD<8 OR SD>12 THEN 13Ø
                           :REM*1Ø3
19Ø T$=M6$:IF TC=2 THEN T$=M7$
                           :REM*191
2ØØ DK$="(SOURCE)":DR=SD:GOSUB
   2ØØØ                    :REM*14Ø
21Ø XF=Ø:IF X$<>CHR$(13) THEN 1
   3Ø                      :REM*223
22Ø GOSUB 81Ø:PRINT MØ$ M2$;:EF
   =Ø                      :REM*82
23Ø DX=1:ON TC GOSUB 82Ø,142Ø
                           :REM*86
24Ø IF EF THEN GOTO 191Ø :REM*3
25Ø Y1=Ø:YC$="N"           :REM*87
26Ø IF Y1<Ø OR Y1>DC THEN Y1=Ø
                           :REM*232
27Ø GOSUB 81Ø:PRINT "DISK NAME
   = ";TT$                 :REM*56
28Ø PRINT US;"BYTES USED;{2 SPA
   CEs}";DC;"ENTRIES"      :REM*43
29Ø PRINT:PRINT TAB(5);"FILENAM
   E";TAB(26);"SIZE":GOSUB 199
   Ø                       :REM*176
3ØØ FOR I=Y1+1 TO Y1+1Ø:IF I<=D
   C THEN PRINT I;TAB(4);DI$(I
   );TAB(25);LE$(I)        :REM*1Ø4
31Ø NEXT:GOSUB 199Ø        :REM*82
32Ø PRINT "SELECT NUMBER FOR FI
   LE TO READ;"            :REM*29
33Ø PRINT "'N' FOR NEXT PAGE; '
   P' FOR PREVIOUS;"       :REM*4
34Ø PRINT "OR 'Q' TO QUIT":INPU
   T "YOUR CHOICE ";YC$:REM*86
35Ø IF YC$="N" THEN Y1=Y1+1Ø:GO
   TO 26Ø                  :REM*7
36Ø IF YC$="P" THEN Y1=Y1-1Ø:GO
   TO 26Ø                  :REM*44
37Ø IF YC$="Q" THEN 13Ø:REM*216
38Ø Y2=VAL(YC$):IF Y2<Ø OR Y2>D
   C THEN 27Ø              :REM*48
39Ø XF=Ø:ON TC GOSUB 154Ø,162Ø
                           :REM*16Ø
4ØØ IF XF THEN 24Ø         :REM*178
41Ø WC=Ø:TD=Ø:GOSUB 81Ø:REM*178
42Ø PRINT "FILE LOADED = ";DI$(
   Y2):PRINT LE;"BYTES":PRINT
                           :REM*157
43Ø PRINT "{CRSR DN}SELECT TARG
   ET DISK TYPE:{CRSR DN}":PRI
   NT"1 = ";M6$            :REM*229
44Ø PRINT "2 = ";M7$:PRINT"{CRS
   R DN}3 = RETURN TO SOURCE D
   IRECTORY"               :REM*135
45Ø PRINT:INPUT "YOUR CHOICE [1
   , 2, OR 3]";WC          :REM*68
46Ø IF WC<1 OR WC>2 THEN 24Ø
                           :REM*57
47Ø PRINT:PRINT:INPUT"SELECT TA
   RGET DEVICE [8 TO 12]";TD
                           :REM*25
48Ø IF TD<8 OR TD>12 THEN 24Ø
                           :REM*18Ø
49Ø DX=Ø: DR=TD:T$=M6$:IF WC=2
   THEN T$=M7$             :REM*97
5ØØ PRINT:PRINT:INPUT"TARGET FI
   LENAME";TA$             :REM*127
51Ø GOSUB 81Ø:DK$="(TARGET)": I
   F WC =1 THEN 54Ø        :REM*194
52Ø GOSUB 181Ø:IF EF THEN 27Ø
                           :REM*214►
```

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```
53Ø GOTO 168Ø              :REM*1Ø6
54Ø P=1                    :REM*1Ø3
55Ø IF P<=LEN(TA$) AND MID$(TA$
    ,P,1)<>"." THEN P=P+1:GOTO
    55Ø                    :REM*214
56Ø IF P>LEN(TA$) THEN TA$=TA$+
    "."                    :REM*196
57Ø F1$=LEFT$(LEFT$(TA$,P-1)+BL
    $,8)+LEFT$(MID$(TA$,P+1,3)+
    BL$,3)                 :REM*26
58Ø GOSUB 2ØØØ:PRINT MØ$;M2$
                           :REM*6Ø
59Ø GOSUB 82Ø:GOSUB 81Ø:PRINT M
    1$;F1$                 :REM*123
6ØØ FOR Z=DB TO FB STEP 32:IF P
    EEK(Z)=Ø OR PEEK(Z)=229 THE
    N BZ=Z:Z=FB+1          :REM*18Ø
61Ø NEXT:IF BZ>FB THEN 191Ø
                           :REM*197
62Ø FOR Z=1 TO 11:POKE BZ-1+Z,A
    SC(MID$(F1$,Z,1)):NEXT
                           :REM*151
63Ø FOR Z=11 TO 31:POKE BZ+Z,Ø:
    NEXT                   :REM*96
64Ø POKE BZ+28,LE-INT(LE/256)*2
    56:POKE BZ+29,LE/256
                           :REM*162
65Ø FC=3:GOSUB 79Ø:FC=J    :REM*4
66Ø POKE BZ+26,FC AND 255:POKE
    BZ+27,FC/256           :REM*4
67Ø FOR AD=TB TO TP-1 STEP 512
                           :REM*126
68Ø GOSUB 132Ø:GOSUB 79Ø:FA(FC)
    =J:FC=J:NEXT:FA(FC)=4Ø95
                           :REM*189
69Ø PRINT "ENCODING";NC;M3$;" C
    LUSTERS"               :REM*149
7ØØ FOR I=Ø TO NC:P=FB+INT(1.5*
    I)                     :REM*238
71Ø IF I AND 1 THEN POKE P,((FA
    (I) AND 15)*16) OR PEEK(P):
    POKE P+1,FA(I)/16      :REM*67
72Ø IF (I AND 1)=Ø THEN POKE P,
    FA(I) AND 255:POKE P+1,FA(I
    )/256                  :REM*12
73Ø NEXT:PRINT M1$;M3$:AD=FB
                           :REM*226
74Ø FOR LS=1 TO P3:GOSUB 134Ø:A
    D=AD+512:NEXT          :REM*2Ø2
75Ø AD=FB:FOR LS=P3+1 TO P3*2:G
    OSUB 134Ø:AD=AD+512:NEXT
                           :REM*163
76Ø PRINT M1$;M2$          :REM*2Ø3
77Ø AD=DB:FOR LS=F1 TO F1+P4-1:
    GOSUB 134Ø:AD=AD+512:NEXT
                           :REM*174
78Ø GOTO 2Ø6Ø              :REM*87
79Ø FOR Z=FC+1 TO NC :IF FA(Z)=
    Ø THEN J=Z:Z=NC+1      :REM*96
8ØØ NEXT:RETURN            :REM*197
81Ø PRINT "{SHFT CLR}";T2$;"{2
    CRSR DNs}":RETURN      :REM*21
82Ø CLOSE 15:TX=1:OPEN 15,DR,15
                           :REM*26
83Ø PRINT#15,"UØ>BØ":INPUT#15,A
    :IF A=Ø THEN TX=2:GOTO 86Ø
                           :REM*247
84Ø PRINT#15,"UØ>M1"       :REM*159
85Ø PRINT#15,"UØ"+CHR$(1Ø):INPU
    T#15,A:IF A THEN EF=1:TX=Ø:
    RETURN                 :REM*6
86Ø TT$="<NO LABEL>"       :REM*187
87Ø B1=192:SI=1:S=1:T=Ø:AD=DB:P
    =AD:GOSUB 115Ø:PØ=PEEK(P+13
    )                      :REM*146
88Ø P1=PEEK(P+14):P2=PEEK(P+16)
    :P3=PEEK(P+22):P4=PEEK(P+17
    )/16                   :REM*11
89Ø P5=PEEK(P+19)+PEEK(P+2Ø)*25
    6:P6=PEEK(P+24):P7=PEEK(P+2
    6)-1                   :REM*129
9ØØ FS=P1+P2*P3+P4:NC=(P5-FS)/P
    Ø:PRINT                :REM*163
91Ø AD=DB:F1=P1+P2*P3:FOR LS=F1
     TO F1+P4-1:GOSUB 114Ø:NEXT
    :FB=AD                 :REM*3Ø
92Ø IF DX=Ø THEN 1Ø6Ø      :REM*225
93Ø I=DB:DC=Ø:US=Ø         :REM*67
94Ø IF PEEK(I)=Ø THEN 1Ø5Ø
                           :REM*226
95Ø X$="":FOR J=Ø TO 1Ø:X$=X$+C
    HR$(PEEK(I+J)):NEXT:REM*172
96Ø IF LEFT$(X$,2)=". "THEN 1Ø4
    Ø                      :REM*154
97Ø IF(PEEK(I+11) AND 8)=8 THEN
     TT$=X$:GOTO 1Ø4Ø      :REM*217
98Ø LE=PEEK(I+28)+PEEK(I+29)*25
    6+PEEK(I+3Ø)*256*256:REM*69
99Ø FM=PEEK(I+26)+PEEK(I+27)*25
    6                      :REM*157
1ØØØ DC=DC+1:DI$(DC)=X$:FM(DC)=
     FM                    :REM*188
1Ø1Ø US=US+LE:LE$(DC)=STR$(LE)
                           :REM*15Ø
1Ø2Ø IF(PEEK(I+11) AND 16)=16 T
    HEN LE$(DC)="<DIR>":REM*13
1Ø3Ø IF LEFT$(X$,2)=".." THEN D
    I$(DC)="<PARENT>{3 SPACEs}
    "                      :REM*128
1Ø4Ø I=I+32:GOTO 94Ø       :REM*117
1Ø5Ø IF XF THEN RETURN :REM*13Ø
1Ø6Ø PRINT:PRINT MØ$;M3$;" ..."
    ;NC;"CLUSTERS"         :REM*223
1Ø7Ø FOR LS=1 TO P3:GOSUB 114Ø:
    NEXT                   :REM*116
1Ø8Ø FOR I=Ø TO NC :P=FB+INT(1.
    5*I):X1=PEEK(P):X2=PEEK(P+
    1)                     :REM*189
1Ø9Ø IF I AND 1 THEN FA(I)=X2*1
    6+INT(X1/16)           :REM*3
11ØØ IF (I AND 1)=Ø THEN FA(I)=
    X1+256*(X2 AND 15) :REM*31
111Ø NEXT:RETURN           :REM*24Ø
112Ø LS=(SC-2)*PØ+FS:GOSUB 114Ø
    :IF PØ=1 THEN RETURN
                           :REM*85
113Ø LS=LS+1               :REM*155
114Ø GOSUB 126Ø            :REM*198
115Ø ON TX GOSUB 119Ø,12ØØ
                           :REM*113
116Ø B=3:GOSUB 117Ø:B=4 :REM*75
117Ø PRINT#15,"M-R"+CHR$(Ø)+CHR
    $(B)+CHR$(Ø)           :REM*146
118Ø POKE AR,AD/256:POKE XR,15:
    SYS ML:AD=AD+256:RETURN
                           :REM*159
119Ø PRINT#15,"UØ"+CHR$(B1)+CHR
    $(T)+CHR$(S)+CHR$(1)+CHR$(
    T):RETURN              :REM*212
12ØØ PRINT#15,"M-W"CHR$(2Ø6)CHR
    $(1)CHR$(1)CHR$(SI)
                           :REM*2Ø7
121Ø PRINT#15,"M-W"CHR$(11)CHR$
    (Ø)CHR$(2)CHR$(T)CHR$(S)
                           :REM*224
122Ø PRINT#15,"M-W"CHR$(2)CHR$(
    Ø)CHR$(1)CHR$(164):REM*181
123Ø PRINT#15,"M-R"CHR$(2)CHR$(
    Ø)CHR$(1)              :REM*214
124Ø GET#15,A$:IF ASC(A$+" ")>1
    27 THEN 123Ø           :REM*19
125Ø RETURN                :REM*117
126Ø SP=(P7+1)*P6          :REM*161
127Ø SI=INT((LS-INT(LS/SP)*SP)/
    P6) AND P7             :REM*153
128Ø T=INT(LS/SP):S=LS-INT(LS/P
    6)*P6+1                :REM*149
129Ø B1=192:IF SI THEN B1=2Ø8
                           :REM*158
13ØØ IF TX=2 THEN SI=(SI-1) AND
     1                     :REM*114
131Ø RETURN                :REM*169
132Ø LS=(FC-2)*PØ+FS:GOSUB 134Ø
    :IF PØ=1 THEN RETURN:REM*7
133Ø AD=AD+512:LS=LS+1     :REM*66
134Ø GOSUB 126Ø:B1=B1+2:REM*14Ø
135Ø POKE AR,AD/256:POKE XR,15:
    SYS ML+3               :REM*116
136Ø IF TX=2 THEN 138Ø :REM*235
137Ø PRINT#15,"UØ"+CHR$(B1)+CHR
    $(T)+CHR$(S)+CHR$(1)+CHR$(
    T):RETURN              :REM*139
138Ø PRINT#15,"M-W"CHR$(2Ø6)CHR
    $(1)CHR$(1)CHR$(SI):REM*24
139Ø PRINT#15,"M-W"CHR$(11)CHR$
    (Ø)CHR$(2)CHR$(T)CHR$(S)
                           :REM*189
14ØØ PRINT#15,"M-W"CHR$(2)CHR$(
    Ø)CHR$(1)CHR$(166):REM*178
141Ø GOTO 123Ø             :REM*183
142Ø CLOSE 15:OPEN 15,SD,15,"IØ
    "                      :REM*13
143Ø CLOSE 1:OPEN 1,SD,Ø,"$Ø":I
    NPUT#15,DS:IF DS THEN 191Ø
                           :REM*62
144Ø DC=Ø:POKE AR,TB/256:POKE X
    R,1:SYS ML+21          :REM*52
145Ø CLOSE 1:FR=(PEEK(844)+PEEK
    (845)*256)*254     :REM*152
146Ø US=(PEEK(848)+PEEK(849)*25
    6)*254                 :REM*69
147Ø TT$="":FOR Z=852 TO 872:TT
    $=TT$+CHR$(PEEK(Z)):NEXT
                           :REM*1Ø7
148Ø Z=TB                  :REM*131
149Ø DC=DC+1:DI$(DC)="":LE=PEEK
    (Z+22)+PEEK(Z+23)*256
                           :REM*188
15ØØ LE$(DC)=STR$(LE*254)
                           :REM*231
151Ø FOR Z1=1 TO 21:DI$(DC)=DI$
    (DC)+CHR$(PEEK(Z+Z1)):NEXT
                           :REM*218
152Ø Z=Z+32:IF PEEK(Z)=255 THEN
     RETURN                :REM*165
153Ø GOTO 149Ø             :REM*92
154Ø SC=FM(Y2):AD=TB:GOSUB 81Ø:
```

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```
    PRINT MØ$;DI$(Y2) :REM*149
155Ø IF LE$(Y2)="<DIR>" THEN AD
    =DB:XF=1:GOSUB 192Ø
                      :REM*157
156Ø IF SC=Ø THEN 91Ø  :REM*111
157Ø GOSUB 112Ø: SC=FA(SC):IF S
    C>4Ø9Ø OR AD>254*256 THEN
    159Ø               :REM*5
158Ø GOTO 157Ø         :REM*139
159Ø LE=VAL(LE$(Y2)):IF LE>6528
    Ø-TB THEN LE=6528Ø-TB
                      :REM*148
16ØØ TP=TB+LE:IF XF THEN 92Ø
                      :REM*31
161Ø GOTO 167Ø         :REM*17Ø
162Ø GOSUB 188Ø:IF MID$(DI$(Y2)
    ,18,3)="CBM" THEN GOSUB 18
    7Ø:GOTO 143Ø       :REM*1Ø2
163Ø EF=Ø:GOSUB 81Ø:PRINT "CBM
    FILE = "DI$(Y2):GOSUB 176Ø
    :IF EF=1 THEN RETURN
                      :REM*219
164Ø CLOSE 1:OPEN 1,SD,2,Z$:INP
    UT#15,DS:IF DS THEN EF=1:C
    LOSE 1:RETURN     :REM*184
165Ø GOSUB 81Ø:PRINT MØ$;Z$:ZZ=
    12/MO:POKE AR,TB/256:POKE
    XR,1              :REM*2Ø6
166Ø SYS ZZ+ML:TP=PEEK(25Ø)+PEE
    K(251)*256:LE=TP-TB:REM*59
167Ø CLOSE 1:SYS ML+18:RETURN
                      :REM*1Ø1
168Ø GOSUB 2ØØØ:IF X$<>CHR$(13)
     THEN 42Ø          :REM*24
169Ø EF=Ø:TA$=LEFT$(TA$,16)+","
    +FT$+",W":PRINT M1$;TA$
                      :REM*16Ø
17ØØ CLOSE 1:CLOSE 15:OPEN 15,T
    D,15,"IØ":OPEN 1,TD,8,TA$
                      :REM*44
171Ø INPUT#15,DS:IF DS THEN 174
    Ø                 :REM*14Ø
172Ø POKE AR,TB/256:POKE XR,1:P
    OKE YR,(TP+1)/256:ZZ=15:IF
     MO=2 THEN ZZ=9   :REM*17
173Ø SYS ML+ZZ:INPUT#15,DS
                      :REM*18
174Ø IF DS THEN PRINT DS$:EF=1
                      :REM*39
175Ø CLOSE 1:GOTO 2Ø6Ø :REM*177
176Ø PRINT:PRINT "SELECT COPY M
    ODE:{CRSR DN}"    :REM*146
177Ø PRINT "1 = BINARY":PRINT"2
     = TRANSLATE PETASCII <> A
    SCII{CRSR DN}"    :REM*181
178Ø INPUT "SELECT MODE [1 OR 2
    ]";MO             :REM*1Ø9
179Ø IF MO<1 OR MO>2 THEN EF=1
                      :REM*123
18ØØ RETURN           :REM*145
181Ø GOSUB 176Ø:PRINT:PRINT
                      :REM*61
182Ø PRINT"SELECT TARGET FILE T
    YPE:{CRSR DN}"    :REM*83
183Ø PRINT "S = SEQ":PRINT "P =
     PRG":PRINT "U = USR{CRSR
    DN}"              :REM*87
184Ø INPUT "SELECT [S, P, OR U]
    ";FT$             :REM*153
185Ø IF FT$<>"S" AND FT$<>"P" A
    ND FT$<>"U" THEN EF=1
                      :REM*188
186Ø RETURN           :REM*213
187Ø GOSUB 81Ø:PRINT MØ$;DI$(Y2
    ):CLOSE 15:OPEN 15,SD,15,"
    /Ø:"+Z$:XF=1:RETURN:REM*46
188Ø Z=16:AD=TB        :REM*7
189Ø IF MID$(DI$(Y2),Z,1)=" " T
    HEN Z=Z-1:GOTO 189Ø
                      :REM*232
19ØØ Z$=LEFT$(DI$(Y2),Z):RETURN
                      :REM*1Ø2
191Ø GOSUB 81Ø:PRINT "DISK ERRO
    R":GOSUB 2Ø8Ø:GOTO 13Ø
                      :REM*6
192Ø IF LEFT$(DI$(Y2),2)="<P" T
    HEN 196Ø          :REM*178
193Ø FOR Z=LEN(TT$) TO 1 STEP-1
    :IF MID$(TT$,Z,1)=" " THEN
     195Ø             :REM*114
194Ø Z1=Z:Z=Ø         :REM*127
195Ø NEXT:TT$=LEFT$(TT$,Z1)+"/"
    +DI$(Y2):RETURN   :REM*212
196Ø FOR Z=LEN(TT$) TO 1 STEP-1
    :IF MID$(TT$,Z,1)<>"/" THE
    N 198Ø            :REM*144
197Ø Z1=Z-1:Z=Ø       :REM*237
198Ø NEXT:TT$=LEFT$(TT$,Z1):RET
    URN               :REM*2Ø
199Ø PRINT "+-----------------
    --------------+":RETURN
                      :REM*168
2ØØØ GOSUB 81Ø:PRINT"{2 CRSR DN
    s}INSERT "T$" DISK "DK$
                      :REM*245
2Ø1Ø PRINT"IN DRIVE" DR :REM*48
2Ø2Ø PRINT "{CRSR DN}THEN PRESS
     <RETURN> TO CONTINUE"
                      :REM*248
2Ø3Ø PRINT "{CRSR DN}OR ANY OTH
    ER KEY FOR MENU"  :REM*2
2Ø4Ø GET X$:IF X$="" THEN 2Ø4Ø
                      :REM*57
2Ø5Ø GOTO 81Ø          :REM*68
2Ø6Ø DR=SD:IF SD<>TD THEN 22Ø
                      :REM*1Ø8
2Ø7Ø GOTO 19Ø          :REM*1Ø2
2Ø8Ø POKE198,Ø:PRINT:PRINT"{CRS
    R DN}PRESS A KEY TO CONTIN
    UE"               :REM*172
2Ø9Ø GET A$:IF A$="" THEN 2Ø9Ø
                      :REM*25Ø
21ØØ RETURN           :REM*2Ø2 ■
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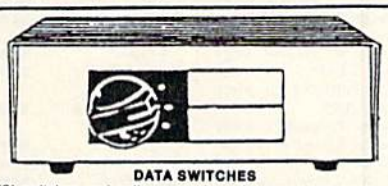

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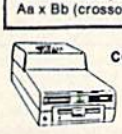

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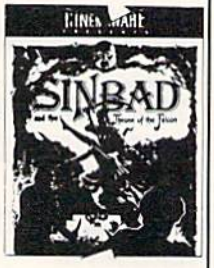

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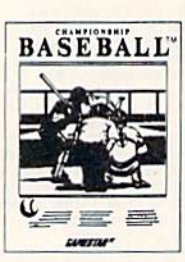

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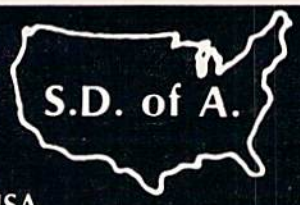

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Flight of the Condors

Attention all fighter pilots! Report to your stations immediately.

By BEHZAD JAMSHIDI

CLASSIFIED: TOP SECRET. 21 December, 2021.

To: Agent A.C.E.–049832, code name Sky Runner, Earth Defense Institute.

Message: Intelligence reports that the Artificial Satellite Couriers, code name Condors, have run rampant.

Report to spacestation Strata immediately for full-scale launch of T-Wing fighters against the Condor ships.

Instructions

The object of Space Condors is to shoot as many of the courier ships as possible from your T-Wing fighter, all the while avoiding collisions with them. The two Condors with distinctly red wings cannot be destroyed; the rest, with wings shown in flashing colors, are worth ten points each. You get three fighters, one at a time, for each game.

The game consists of three programs. Listing 1 is a Basic boot program that loads and runs the sprites and the game. Type it in and save it under the name Boot. Listings 2 and 3 are hex loaders. Type them in and save them to disk, using the filenames Listing 2 and Listing 3, respectively. Run them individually to create "+Condor Sprites" and "+Space Condors". To play, just load and run the Boot program.

Press the F1 key to start play, then use a joystick in port 2 to fly your fighter. Holding down the joystick fire-button launches a steady stream of laser fire at the Condors. Some of the courier ships will detect your fighter's location and try to ram it, so keep moving. Also, avoid the screen borders, because the Condors wrap around. As you play, you'll develop some strategy and your score will soar.

Space Condors is fast fun. Heard from a recent Sky Runner: "I'm glad I'm not paying for all these games!" Ⓡ

Behzad Jamshidi, a graphics-design student with an interest in computer graphics, enjoys programming for the C-64.

Listing 1. Boot program. (Available on ReRUN disk. See page 52.)

```
10 POKE53280,0:POKE53281,0:PRIN
   T"{SHFT CLR}{CTRL 8}"TAB(15)
   "{2 CRSR DNs}LOADING"
                          :REM*243
20 PRINTTAB(12)"{CRSR DN}{CTRL
   5}SPACE CONDORS{2 CRSR DNs}"
                          :REM*202
30 ONAGOTO 100,110        :REM*254
90 A=1:LOAD"+CONDOR SPRITES",8,
   1                      :REM*84
100 A=2:LOAD"+SPACE CONDORS",8,
   1                      :REM*48
110 SYS50064              :REM*9
```

Listing 2. Sprites program. (Available on ReRUN disk. See page 52.)

```
0 REM CREATE MAIN SPACE CONDORS
   PROGRAM                :REM*211
5 OPEN 8,8,8,"+SPACE CONDORS,P,
  W"                      :REM*2
10 READ A$:IF A$="-1" THEN CLOS
   E8:END                 :REM*78
15 IF LEN(A$)<62 THEN 55
                          :REM*254
20 B$=MID$(A$,1,20)+MID$(A$,22,
   20)+MID$(A$,43,20)     :REM*242
25 FOR I=1 TO 30          :REM*181
30 C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                          :REM*209
35 H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55              :REM*85
40 L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55              :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*67
50 NEXT:GOTO 10           :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
   O 70                   :REM*184
60 IF LEN(A$)<42 THEN B$=LEFT$(
   A$,20)+RIGHT$(A$,(LEN(A$)-21
   )):GOTO 70             :REM*176
65 B$=LEFT$(A$,20)+MID$(A$,22,2
   0)+RIGHT$(A$,LEN(A$)-42)
                          :REM*140
70 FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                          :REM*140
80 H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55              :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55              :REM*84
90 BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*148
95 NEXT:GOTO 10           :REM*160
100 REM HEX DATA FOR SPACE COND
   ORS                    :REM*153
101 DATA 50C34C56C34C74A4A913 A
   2002000D2FFA900D200D2FF ADA802A
   EA9021869000AA8        :REM*208
102 DATA 8A690000AA988DA8028EA9 0
   2A91D200D2FFADA802AE A9002862
   2AAA5222000CDBD        :REM*156
103 DATA A900D200D2FF600A9000D21 D
   008DD100B8D200D008DDC00B 8DF200B8
   DFE00B8D008C8D         :REM*61
104 DATA A8028DA9028D1200C8D09 0
   C8D00A00CA9018D15D08D 26D08DD
   200B8DBE00BA981        :REM*155
105 DATA 8DF907A9038DD00BA993 2
   00D2FFA9C18D1803A984 8DFA078
   DFB078DFC078D          :REM*200 ►
```

RUN it right: **C-64; joystick**

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1541 RAMBOard*

Byte The Copy Protection bullet!

Let's face it - war is hell. And in the Commodore world, one of the ugliest wars of all is being waged by the copy protection industry. They're tough. They're clever. And they're very, very determined. If you've seen some of the current ice out there, you know just how determined they are. Well, we're just as determined. And we've got a way to walk right through the coldest ice out there.

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Now Includes Parameter Modules 1, 2, & 3!

***Maverick Was Formerly Known As "Renegade" From Kracker Jax Not To Be Confused With The Game Of The Same Name**

THE 1581 TOOLKIT

Without It, You Don't Know What You 1581 Is Capable Of

It blew people away at the "World Of Commodore Show" held in Pennsylvania in November 1988. It's power and scope astonish anyone who sees it work. And, if you have a 1581 drive, it is the single most important piece of software that you can own. It is The 1581 Toolkit-and it will transform your 1581 into something remarkable.

We know the market, and we know that if you've bought any other 1581 utility in the past, you've probably been disappointed. But while other companies rushed ill-conceived and poorly executed products to market to "cash in" on the new 1581 drive, we did things differently. Our programmers took the time to become experts on the 1581 before they even looked at a drawing board. So when they finished the Toolkit project a full year later, they had accomplished what no one else had - the creation of a tight, integrated package of essential utilities that make the 1581 more than the sum of its parts. Take a look at these Toolkit utilities and see why we're so excited about it:

- Fast Disk Copier
- Directory Editor
- File Track & Sector Tracer
- Fast File Copier
- Byte Pattern Search
- Ultrafast Formatter
- Partition Creator
- Track & Sector Editor
- Error Scanner
- Relocatable Fast Loader

All 10 of these custom utilities use extremely fast read/write routines. Wherever appropriate, they allow full access to partitions. It's obvious we created The 1581 Toolkit to be the finest set of utilities available for the 1581 drive. But we didn't stop there. Order now, and we'll also send you the 1581 DOS Reference Guide FREE! With over 100 pages of concise, valuable information, you'll quickly find this book indispensable! Written by David Martin (INFO Magazine's Copy Corner reviewer), this manual represents a year's worth of research and investigation into the inner workings of the 1581 drive. We've also added extra utilities, including such handy items as a machine language monitor with DriveMon, the perfect companion for the 1581 DOS Reference Guide.

We've spent a lot of time working hard to make sure that nobody knows more about the 1581 than we do. Don't sell your 1581 short. Get the 1581 Toolkit today, and let us show you just what it's really capable of. We'll take your 1581 absolutely as far as it was designed to go. And then we'll take it farther.

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ALL NEW

ALL NEW

THE 1750 CLONE

Thanks For The Memory

Most Commodore users are content to use their computers within the constraints placed on them by a limited amount of RAM. But some people want more. More speed. More power. And that means just one thing - more memory.

Power users have long known that the ideal solution to their memory problems is out there in the form of Commodore's incredible 1750 RAM expansion module. Just plug it in and you've got a whopping 512k of onboard RAM - the same amount of memory found on most IBM computers! This is the memory cartridge that all serious Commodore power users want. There's only one problem.

You can't find them.

That's right. These RAM units are almost impossible to buy. We've always specialized in finding solutions to Commodore related problems - here's what we came up with.

First, we bought brand new Commodore 1764 RAM expansion units, the ones with only 256k of RAM onboard. Next, we had Chip Level Design engineer and produce a custom upgrade that takes a 1764 to a full 512k! That's the same half meg of RAM as a regular 1750! Finally, we tested each and every cartridge, and warranteed them to be free from defects.

Now there's nothing to stop you from taking your Commodore 64 or 128 to levels of power and sophistication that the original designers never even dreamed of! If you're using programs like GEOS from Berkeley; the Pocket Series from Digital Soutions; future versions of Maverick from Kracker Jax; Fleet System IV from Professional Software; or the potent PaperClip III from Batteries Included; if you're using ANY of these programs, you won't believe the difference that the extra memory makes!

IMPORTANT NOTES - READ CAREFULLY

*C-64/64c (but NOT C-128/128D) owners MUST buy a heavy-duty power supply to use these units. The power supply is NOT included - it is available from us seperately.

* If you ALREADY own a 1764 RAM cartridge, we can upgrade it for you. Your unit MUST be in perfect working order for us to upgrade it. The turnaround time on upgrades is approx. 2 weeks. It will NOT be necessary for you to purchase a new power supply - the one that came with your 1764 will still work fine.

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1764 UPGRADE
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ATTENTION C-128 OWNERS

Solderless 64K Video RAM Upgrade

Now that Commodore has released the C-128D with 64K of video RAM, we should be seeing 128 programs address this fantastic new feature soon.

BASIC 8 already has the capability of using all 64K of video RAM. If you own the C-128 in stock condition, you own all 16K of video RAM that Commodore felt was necessary. Using Basic 8 format and the full 64K of video RAM provides you with the ability to scroll through video memory as well as enhanced color resolution.

Up until now, to upgrade the C-128 to 64K of video RAM you would have to first search out the components, then find a competent repair outlet to desolder and install the parts. **What a hassle!**

SOLUTION — We have developed a module that simply plugs in to the mother board of your C-128. **No splattered solder — No heat damage — No hassle.**

This package is available in two different forms. Model A has all parts necessary to complete your upgrade, and Model B is identical except that you supply the RAMs. Again, no soldering is necessary. If you have access to low cost RAMs, we suggest Model B.

Both models include easy to follow installation instructions, a test program to verify proper installation, and the plug in Video RAM Upgrade.

Model A (complete) only $49.95
Model B (no RAMs) only $29.95

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Sorry about that. Actually, it's no laughing matter. Our technicians tell us that the majority of Commodore computer problems can be traced back to an inadequate power supply. When the power supply fails, it can (and often does) cause additional damage to the computer itself - and a computer meltdown is no joke.

This doesn't have to happen to you. We are now selling a heavy-duty power supply that will greatly diminish your fear of a power supply failure. These are NOT aftermarket units - they are made by Commodore, and are ideal for use with RAM expanders. They will provide you with a more stable, dependable source of power. This unit will work on ALL C-64's and 64c' on the market.

If your system is important to you, take the extra step to safeguard your investment by getting a Commodore Heavy-Duty Power Supply today. Power you can depend on - with no unexpected shocks.

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CONDORS

```
10 DATA FD078DFE078DFF078DF3 0
   BA98DF8078DB90BA9 FF8D1CD
   A90B8D25DA9          :REM*254
20 DATA 28D27D8D2DD8D2ED0 A
   9928DD0D8DBB0B8DC1 0B8D02D
   A9E88D01D8D          :REM*38
30 DATA BC0BA9DE8DC00BA9F58D B
   D0BA9648DC40BA9108D 05D4A9F
   08D06D4A9888D        :REM*39
40 DATA CF0B8DC70B8DC80B8DC9 0
   B8DCA0BA9138D0004A9 038D010
   4A90F8D0204A9        :REM*214
50 DATA 128D0304A9058D04A9 0
   48D00D88D01D88D02D8 8D03D88
   D04D8A90D8D14        :REM*215
60 DATA 04A9058D1504A90E8D16 0
   4A9078D14D88D15D88D 16D8A93
   38D1804A9A08D        :REM*232
70 DATA 4804807004804980480C0 0
   48DE8048D10058D3805 8D60058
   D880580B0058D        :REM*81
80 DATA D805800068D2806805 0
   68D7806DA0068DC806 8DF0068
   D18078D4D078D        :REM*30
90 DATA 6807809078DB8078D20 0
   48DE00720 3DC8ACCE0B C001D00
   34C8EC6AE00DC        :REM*131
100 DATA 8EB80BACBB0BC0FFF01F E
   077D0034C0CC5E067D0 14A9018
   DBE0BACBB0BC8        :REM*109
110 DATA 8CBB0B8C00D0A9838DF8 0
   7ACBB0BC019F01FE07B D0034C3
   2C5E06BD014A9        :REM*50
120 DATA 018DBE0BACBB0B888CBB 0
   B8C00D0A9828DF807AC BC0BC0E
   9F026ACBC0BC0        :REM*184
130 DATA E9F01FE07DD0034C5FC5 E
   06DD014A9018DBE0BAC BC0BC88
   CBC0B8C01D0A9        :REM*102
140 DATA 808DF807ACBC0BC02EF0 1
   FE07ED0034C85C5E06E D014A90
   18DBE0BACBC0B        :REM*189
150 DATA 888CBC0B8C01D0A9808D F
   807E07FD005A9808DF8 07ACBB0
   BC0FFF030ACBC        :REM*185
160 DATA 0BC02EF029E066D008A9 0
   18DBE0B4CBBC5E076D0 19ACBB0
   BC88CBB0B8C00        :REM*228
170 DATA D0ACBC0B888CBC0B8C01 D
   0A9838DF807ACBC0BC0 E9F030A
   CBB0BC0FFF029        :REM*169
180 DATA E065D008A9018DBE0B4C F
   2C5E075D019ACBB0BC8 8CBB0B8
   C00D0ACBC0BC8        :REM*85
190 DATA 8CBC0B8C01D0A9838DF8 0
   7ACBB0BC019F030ACBC 0BC02EF
   029E06AD008A9        :REM*55
200 DATA 018DBE0B4C29C6E07AD0 1
   9ACBB0B888CBB0B8C00 D0ACBC0
   B888CBC0B8C01        :REM*103
210 DATA D0A9828DF807ACBC0BC0 E
   9F030ACBB0BC019F029 E069D00
   8A9018DBE0B4C        :REM*231
220 DATA 60C6E079D019ACBB0B88 8
   CBB0B8C00D0ACBC0BC8 8CBC0B8
   C01D0A9828DF8        :REM*230
230 DATA 07E06FD005A9018DBE0B A
   EBE0BE001D005A9018D BF0BAEB
   F0BE001D06DA9        :REM*57
240 DATA FF8D15D0A9818DF907A0 0
   0AEC00BCA8EC00B8E03 D0E028F
   04BC8C005D0ED        :REM*30
250 DATA AEC50BE001D0034C05C7 A
   EC30BE001F00AA9648D C20BA90
   18DC30BAEC40B        :REM*159
260 DATA CA8EC40BE000D010A900 8
   D04D4A9018DC50B8D28 D04C05C
   720860CBACC60B       :REM*161
270 DATA C88C28D08CC60B4C05C7 2
   0C4C7A9FD8D15D020DF C7AEB80
   BE067D005A901        :REM*27
280 DATA 8DBE0BE06BD005A9018D B
   E0BE06DD005A9018DBE 0BE06AD
   005A9018DBE0B        :REM*59
290 DATA E066D005A9018DBE0BE0 6
   5D005A9018DBE0BE069 D005A90
   18DBE0BE06ED0        :REM*75
300 DATA 05A9018DBE0BAE1ED08E C
   D0BA9022DCD0BC902D0 0320C4C
   7ACCE0BC001D0        :REM*46
310 DATA 09207 6CA20F2C74CBBC7 A
   E0A0CE001F010AE09C E88E090
   CE014D018A901        :REM*28
320 DATA 8D0A0CA9012DCD0BC901 D
   00AA9018DCE0BA21E8E D30BACD
   00BC002D005A9        :REM*32
330 DATA 328D1804C001D005A931 8
   D1804C000D0062030DC8 4C90C32
   088C82017CC4C        :REM*38
340 DATA A5CBA9008DC30B8D04D4 8
   DBE0B8DBF0B8DC50BA9 648DC40
   BA9FD8D15D0AC        :REM*115
350 DATA BB0B8CC10B8C02D0ACBC 0
   B8CC00B8C03D060AED1 0BE88ED
   10BE00AD03FA9        :REM*82
360 DATA 008DD10BACCF0BC88CCF 0
   B8CF807C08CD02CA988 8DCF0BA
   9008DCE0BACD0        :REM*10
370 DATA 0B888CD00BA9928DBB0B 8
   D00D0A9E88DBC0B8D01 D0A9808
   DF8072F0CB20         :REM*146
380 DATA C4C760AC120CB97CC899 2
   105C8C00CD0F5A9008D 0BD48D1
   2D48D04D48D12        :REM*104
390 DATA 0CA9018D15D020F0CBA0 0
   0A6C5E004D0FAA92099 2105992
   804C8C014D0F3        :REM*185
400 DATA A2FF8E15D06010120513 1
   32060312000B05192 0B3 CBAEDB0
   BE001D0034CC6        :REM*41
410 DATA C8AED50BE001F010A23C 8
   ED60BA0018CD50B8C04 D08CD70
   BAED60B8E05D0        :REM*130
420 DATA AED70BE88E04D08ED70B E
   CBB0BD019A9018DDB0B AED60BE
   88E05D08ED60B        :REM*188
430 DATA ECBC0BD005A9008DDB0B A
   EDF0BE001D0034C17C9 AEE00BE
   001F012A25A8E        :REM*150
440 DATA DD0BA0FE8C06D08CDE0B A
   9018DE00BAEDD0B8E07 D0AEDE0
   BCA8E06D08EDE        :REM*121
450 DATA 0BECBB0BD019A9018DDF 0
   BAEDD0BCA8E07D08EDD 0BECBC0
   BD005A9008DDF        :REM*185
460 DATA 0BAEE10BE001D0034C68 C
   9AEE20BE001F012A278 8EE30BA
   0018C08D08CE4        :REM*216
470 DATA 0BA9018DE20BAEE30B8E 0
   9D0AEE40BE88E08D08E E40BECB
   B0BD019A9018D        :REM*89
480 DATA E10BAEE30BE88E09D08E E
   30BECBC0BD005A9008D E10BAEE
   50BE001D0034C        :REM*25
490 DATA B9C9AEE60BE001F012A2 9
   68EE70BA0FE8C0AD08C E80BA90
   18DE60BAEE70B        :REM*22
500 DATA 8E0BD0AEE80BCA8E0AD0 8
   EE80BECBB0BD019A901 8DE50BA
   EE70BCA8E0BD0        :REM*69
510 DATA 8EE70BECBC0BD005A900 8
   DE50BAEEA0BE001D003 4C0ACAA
   EEB0BE001F012        :REM*221
520 DATA A2B48EEC0BA0018C0CD0 8
   CED0BA9018DEB0BAEEC 0B8E0DD
   0AEED0BE88E0C        :REM*196
530 DATA D08EED0BECBB0BD019A9 0
   18DEA0BAEEC0BE88E0D D080EEC0
   BECBC0BD005A9        :REM*52
540 DATA 008DEA0BAEEE0BE001D0 0
   34C5BCAAEEF0BE001F0 12A2D28
   EF00BA0FE8C0E        :REM*7
550 DATA D08CF10BA9018DEF0BAE F
   00B8E0FD0AEF10BCA8E 0ED08EF
   10BECBB0BD019        :REM*144
560 DATA A9018DEE0BAEF00BCA8E 0
   FD08EF00BECBC0BD005 A9008DE
   E0B20ACCA20F1        :REM*47
570 DATA CA60AED30BCA8ED30BE0 1
   4D013A9008D0BD48D0C D4A9158
   DD30BA90F8D18        :REM*26
580 DATA D4608E18D4A9818D0BD4 A
   90F8D0CD4A9648D08D4 A9C88D0
   7D460A9062DCD        :REM*164
590 DATA 0BC906D008A20180EDA0B 2
   0D5CBA90A2DCD0BC90A D008A20
   18EF40B20D5CB        :REM*254
600 DATA A9122DCD0BC912D008A2 0
   18EF50B20D5CBA9222D CD0BC92
   2D008A20180EF6       :REM*31
610 DATA 0B20D5CB60AEDA0BE001 D
   01EAEC70BE88EFA078E C70BE08
   BD010A9008DD5        :REM*231
620 DATA 0B8DDA0B8DDB0BA9888D C
   70BAEF40BE001D01EAE C80BE88
   EFB078EC80BE0        :REM*103
630 DATA 8BD010A9008DE00B8DDF 0
   B8DF40BA9888DC80BAE F50BE00
   1D01EAEC90BE8        :REM*86
640 DATA 8EFC078EC90BE08BD010 A
   9008DE20B8DE10B8DF5 0BA9888
   DC90BAEF60BE0        :REM*80
650 DATA 01D01EAECA0BE88EFD07 8
   ECA0BE008BD010A9008D E60B8DE
   50B8DF60BA988        :REM*77
660 DATA 8DCA0B60A90F8D18D4A9 1
   08D05D4A9F08D06D4A9 818D04D
   4ACC20B888CC2        :REM*93
670 DATA 0B8C01D4600A228ACBD0B C
   AD0FDC8D0FA4CE5C4A9 288D14D
   4A9818D12D4AE        :REM*227
680 DATA DC0BE88EDC0B8E0FD48E 0
   ED4E00AF0016 0A9008D DC0B60A
   EFE0BE88EFE0B        :REM*224
690 DATA E03CD00CA9008DFE0BAE B
   D0BE88EBD0B2050C360 A9008DD
   50B8DE00B8DE2        :REM*128
```


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```
175 DATA ØB8DE6ØB8DEBØB8DEFØB 8
    DDBØB8DDFØB8DE1ØB8D E5ØB8DE
    AØB8DEEØB6ØAE       :REM*22Ø
176 DATA F2ØBE88EF2ØB8E2ADØ8E 2
    CDØ8E29DØ8E2BDØEØØD DØ27A2Ø
    Ø8EF2ØBAEF3ØB       :REM*218
177 DATA E88EF3ØB8EFAØ78EFBØ7 8
    EFCØ78EFDØ78EFEØ78E FFØ7EØ8
    8DØØ5A2848EF3       :REM*166
178 DATA ØB6ØØB         :REM*22
179 DATA -1             :REM*33
```

Listing 3. Space Condors program. (Available on ReRUN disk. See page 52.)

```
Ø REM CREATE SPACE CONDORS SPRI
  TES                   :REM*222
5 OPEN 8,8,8,"+CONDOR SPRITES,P
  ,W"                   :REM*66
1Ø READ A$:IF A$="-1" THEN CLOS
  E8:END                :REM*78
15 IF LEN(A$)<62 THEN 55
                        :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
  2Ø)+MID$(A$,43,2Ø)    :REM*242
25 FOR I=1 TO 3Ø        :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                        :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55             :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55             :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                        :REM*67
5Ø NEXT:GOTO 1Ø         :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
  O 7Ø                  :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
  A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
  )):GOTO 7Ø            :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
  Ø)+RIGHT$(A$,LEN(A$)-42)
                        :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                        :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55             :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55             :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                        :REM*148
95 NEXT:GOTO 1Ø         :REM*16Ø
1ØØ REM HEX DATA FOR SPACE COND
    OR SPRITES          :REM*1
1Ø1 DATA ØØ2ØØØØØØØØØØØØØØØØ Ø
    ØØØØØØØØ1ØØØØ1ØØØ ØØ54ØØØ
    Ø54ØØØ54ØØØ         :REM*128
1Ø2 DATA 54ØØØ155ØØØ155ØØØ155 Ø
    Ø11751Ø1775Ø3F77FØ FF77FCØ
    ØØØØØØØØØØØØ       :REM*25Ø
1Ø3 DATA ØØØØØØØØØØØØØ2ØØØØØ 2
    ØØØØØØØØØØØØØØØØØ ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*245
1Ø4 DATA ØØØØØØØØØØØØØØØØØØØ Ø
    ØØØØØØØØØØØØØØØØØØ ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*4Ø
1Ø5 DATA ØØØØØØØØØØØØØØØØØØØ Ø
    ØØØØØØØØØØØØØØØØØØ ØØØØØØ1
    ØØØØ1ØØØØ54         :REM*183
1Ø6 DATA ØØØØ54ØØØ54ØØØ54ØØ Ø
    154ØØØ154ØØØ154ØØØ1 D44ØØ1D
    D4ØØDDFCØ3DDF       :REM*1Ø9
1Ø7 DATA DØØØØØØØØØØØØØØØØØØØ Ø
    ØØØØØØØØØØØØØØØØØØ ØØØØØØØ
    ØØØØØØØ1ØØØØ       :REM*2Ø5
1Ø8 DATA 1ØØØØ54ØØØ54ØØØ54 Ø
    ØØ54ØØØ55ØØØ55ØØ ØØ55ØØØ
    45DØØØ5DDØØØF       :REM*88
1Ø9 DATA DDCØ1FDDFØØØØØØØØØØ Ø
    ØØØØØØØØØØØØØØØØØ ØØØØØØØ
    ØØØØØØ8Ø3ØØ8        :REM*77
11Ø DATA AØFC28A8CCA82A32AØ2A F
    EAØØAFE8ØØØFCØØØØ74 ØØØ145Ø
    ØØØØØØØØØØØØ       :REM*163
111 DATA ØØØØØØØØØØØØØØØØØØ Ø
    ØØØØØØØØØØØØØØØØØ ØØFFØØØ
    ØØØØØØØØØØØØ       :REM*146
112 DATA ØØØØ3ØØØØFCØØ2ØCC2Ø A
    83ØA8AAFEA8ØAFE8ØØØ FCØØØØ7
    4ØØØ145ØØØØØØ      :REM*166
113 DATA ØØØØØØØØØØØØØØØØØØ Ø
    ØØØØØØØØØØØØØØØØØ ØØØØØØØ
    ØØØFFØØØØØØØØ      :REM*54
114 DATA ØØØØØØØØØØØØØØØØØ3Ø Ø
    ØØØFCØØØØCCØØØØ3ØØØ 2AFEAØA
    8FCA88145Ø8ØØ       :REM*252
115 DATA ØØØØØØØØØØØØØØØØØØ Ø
    ØØØØØØØØØØØØØØØØØØ ØØØØØØØ
    ØØØØØØØØØØFF        :REM*2Ø9
116 DATA ØØØØØØØØØØØØØØØØØØ Ø
    ØØØØ3ØØØØFCØØØØCC ØØØØ3ØØ
    ØAAFEA8ØØFCØØ       :REM*99
117 DATA Ø145ØØØØØØØØØØØØØØ Ø
    ØØØØØØØØØØØØØØØØØ ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*231
118 DATA ØØØØØFFØØØØØØØØØØØ Ø
    ØØØØØØØØØØØØ3ØØØ2Ø FC2ØA8C
    CA8AA32A8ØAFE       :REM*1Ø4
119 DATA 8ØØØFCØØØØ74ØØØ145ØØ Ø
    ØØØØØØØØØØØØØØØØØ ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*214
12Ø DATA ØØØØØØØØØØØØØFFØØØØ Ø
    ØØØØØØØØØØØØØØØØØ ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*87
121 DATA 28ØØØ2A8ØØØ2AAØØØ2A2 8
    ØØ2228ØØØAAØØØØA8ØØ ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*78
122 DATA ØØØØØØØØØØØØØØØØØØ Ø
    ØØØØØØØØØØØØØØØØØ ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*62
123 DATA ØØ28ØØØ22AØØØA2AØØØA 8
    88ØØA228ØØA228ØØ8A2 8ØØ2A8Ø
    ØØØA8ØØØØØØØ       :REM*66
124 DATA ØØØØØØØØØØØØØØØØØØ Ø
    ØØØØØØØØØØØØØØØØØ ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*6Ø
125 DATA ØØØØ28ØØØ22AØØØAØA8Ø 2
    AØA8Ø2AØØØØ2AØØAØ28 22AØØØ2
    2AØØØAØAØØ2A8       :REM*129
126 DATA ØØØ2A8ØØØØØØØØØØØØ Ø
    ØØØØØØØØØØØØØØØØØ ØØ
                        :REM*1Ø7
127 DATA -1             :REM*238
```

■

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Flight notes # 8A

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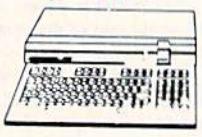

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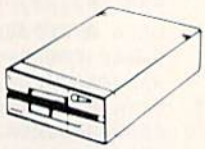

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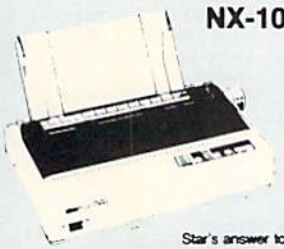
NX-1000



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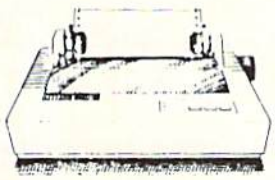
Citizen 120D



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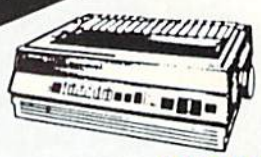

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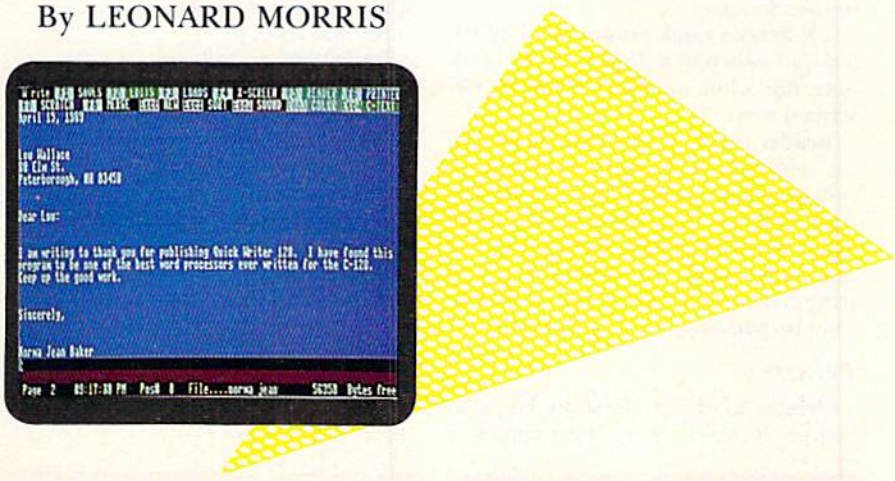
Quick Writer 128

Haven't settled on an 80-column word processor for your C-128? Then you're in luck with this easy-to-use, menu-driven program.

By LEONARD MORRIS



If you're looking for a word processor with speed rather than frills, Quick Writer for the C-128 may well fill the bill. Designed to work in 80-Column mode, it offers basic editing features for both text and keyboard graphics. Moreover, it's completely menu-driven, so there's no need to memorize commands.

When you run Quick Writer, it first prompts you to enter the date and time for use in uniquely identifying the files you save for future reference. A flashing checkered cursor indicates where text or graphics will be displayed on the screen, and all typing appears above a line of reference numbers, so you can see your current character position in the screen line. The bottom screen line continuously displays the filename (if you've specified one), the time, the screen page number and the number of free bytes left in memory.

Program Modes

Write mode, the mode Quick Writer comes up in, is used for entering text. The program works on a line-by-line basis, so each line must be followed by a return to place it in memory. If you exceed 78 characters in a line, a return will be issued automatically. Word wrap occurs if the 79th character is not a punctuation mark or blank space. This means that the last word on the line is placed on the next line, thus avoiding word breaks. As you type, a tone sounds at the 72nd character in a line to warn you of the approaching end.

Save mode, activated by pressing the F1 key, displays a list of filenames already on disk and prompts you to enter a filename for the document you're working on. If you specify a filename that currently exists, the program displays a warning that the old file will be replaced if you proceed with the save. To intiate the option to cancel the save, you just need to press the asterisk (*) or return key.

Editing

Edit mode, activated by F2, provides numerous options for editing your text, with the option currently in effect indicated in the bottom portion of the screen. The cursor becomes a solid block in Edit mode. To exit this mode, press the asterisk key.

The Edit options are as follows. To activate an option, press the first letter of its name.

SPage lets you select a new screen page to work on.

Advance is used to identify the screen line you want to edit by placing a highlight window on it. Only whatever line is in the window is affected by other Edit options used.

The next line of text is highlighted each time you use the Advance option, until you reach the end of the page. At that point, the highlight wraps around to the top line.

Delete erases the highlighted line from your text. However, the line isn't permanently lost until you do a save with the same filename.

Change lets you actually edit the highlighted text, using the cursor, insert and delete keys.

Insert enables you to insert text above the highlighted line.

Next Page displays the next page on the screen for editing. If the last page of your document is currently on the screen, then wraparound takes you back to the first page.

The ***Relocate*** option is used in conjunction with the Here option, below. When you select Relocate, the highlighted text is removed from your work file and stored at the bottom of the screen, in the same color as its screen color option. You can relocate up to 40 lines at a time, last line first.

Lines that you select with Relocate are placed in new positions by using the ***Here*** option. They slip into the work file just above the highlighted line. Remember, it's first in, last out when you're using these options.

You can also use Relocate and Here to remove lines from your current work file, load a different file to work on, and then insert the lines in the new file.

Get and ***Unget*** work like Relocate and Here, except the highlighted line is copied, not removed. ►

RUN it right: **C-128; printer optional**

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Find highlights a particular word throughout your work file.

Exchange lets you change any word or phrase to any other throughout your work file. However, the exchange won't work in any line where it makes the character count exceed 78.

Other Modes

Load mode, called by F3, lists all the files in Quick Writer's directory and prompts you for a filename to load. To load other text files from a disk, rename them by adding the prefix (£),CHR$(92) to the filename.

TX-Screen mode, summoned by F4, lets you switch to a display of the read-only file while in Reader mode, described next.

Reader mode, F5, loads a file to view for reference, but not to work on. To redisplay your work file, press the return key; to view the read-only file again, press F4, as described above. The read-only display can be scrolled and wrapped around from end to beginning by pressing any key but return.

Printing

Printer mode, activated by F6, is, of course, for generating hard copies of your work files. I use a Star NX-10 printer with Quick Writer; with other printers you may find it necessary to do some experimentation to get the desired results.

When printing, you can include a headline at the top of your document and a header and page number on every page. You can also select from ten type and formatting options and enter any special character codes your printer is able to handle.

The type and formatting options are selected by pressing the following keys while in Printer mode:

Normal type, 0.
Italic type, 1.
Condensed type, 2.
No space between lines, 3.
Letter Quality, 4.
Small (subscript) type, 5.
Medium (double height and width), 6.
Large (quadrupled height and width), 7.
Centered text, 8.
Business (margin set), 9.

And More Modes

Enter **Scratch** mode, F7, if you want to remove a file from Quick Writer's directory.

Merge mode, F8, lets you combine two different files into one work file. This comes in handy especially for printing. Merge doesn't disturb the disk files, but you can save the combined document as a new file.

Escape Key Options

Quick Writer includes the following five options that are activated by pressing the escape key and then the indicated number key:

New—escape, 0—clears work file.
Sort—escape, 1—sorts disk directory.
Sound—escape, 2—toggles the keyboard beep on and off.
Color—escape, 3—is used to change the background color of the work screen.
C-Text—escape, 4—is used to change the background color of the line you're working on.

All of these functions make Quick Writer suitable for many word processing needs, while its menus and speed make it easy to use. Try it; I think you'll like it. R

Leonard Morris is an electronic technician by trade and a free-lance Commodore programmer by avocation.

Listing 1. Quick Writer program. (Available on ReRUN disk. See page 52.)

```
1 REM QUICK WRITER 128 - LEONAR
  D MORRIS              :REM*136
7 FAST:GRAPHIC5,1:A$="X":PRINT"
  {CTRL N}":P=56331:OPEN8,8,8,"
  .WORD PROC.":IFDS=62THENDCLOS
  E:OPEN8,8,8,"@Ø:.WORD PROC.,S
  ,W":PRINT#8,"XXXX":DCLOSE:ELS
  EDCLOSE               :REM*149
8 WINDOW1Ø,9,6Ø,15,1:M8$="NO EN
  TRY":INPUT" {SHFT E}NTER DATE
  : FORMAT(MM/DD/YY) ";M8$:IFLE
  N(M8$)<>8THEN8:ELSEFORT=1TO8:
  POKE512Ø+T,ASC(MID$(M8$,T,1))
  :NEXT:K$="12"         :REM*116
9 INPUT" {SHFT S}ET HOUR{2 SPAC
  Es}(1-12)";K$:POKEP,DEC(K$):K
  $="ØØ":INPUT" {SHFT S}ET MINU
  TES{2 SPACEs}(Ø-59)";K$:POKEP
  -1,DEC(K$):POKEP-2,Ø:PRINT" {
  CTRL 9}A{CTRL Ø}M{2 SPACEs}OR
  {2 SPACEs}{CTRL 9}P{CTRL Ø}M
  ":GETKEYY$            :REM*157
1Ø POKEP-3,Ø:IFY$="P"THENPOKEP,
   PEEK(P)OR128:POKEP-3,Ø
                        :REM*192
11 CLR:FAST:GRAPHIC5,1:DIMA$(12
   ØØ),ZH$(4Ø),LT$(8Ø),RR$(4Ø),
   RL$(4Ø),TP$(12):NF=1:PRINTCH
   R$(14);CHR$(27);"R{SHFT CLR}
   ":A6=64ØØØ:II=49176:PK=56331
   :TRAP17              :REM*74
12 GOSUB22Ø:PRINT"{SHFT CLR}":G
   OSUB221:FORT=1TO8:M5$=M5$+CH
   R$(PEEK(512Ø+T)):NEXT:M6$=CH
   R$(PEEK(5132))+CHR$(PEEK(513
   3)):PF$="..":NAME$=".WORD PR
   OC.":BG=12:BT=1      :REM*1Ø5
13 FORT=1TO4:X$=X$+CHR$(13):NEX
   T:CR$=X$:COLOR6,2:COLOR5,BG:
   GOSUB2Ø9             :REM*223
14 PRINTCHR$(27)"R{CTRL N}";:GO
   SUB1ØØ:PRINTIL$"{CTRL Ø}{CTR
   L 3} {SHFT W} RITE "OL$"{COM
   D 5}{CTRL 9} {SHFT F}1 {CTRL
    Ø} {SHFT S}{SHFT A}{SHFT V}
   {SHFT E}{SHFT S} {CTRL 6}{CT
   RL 9} {SHFT F}2 {CTRL Ø} {SH
   FT E}{SHFT D}{SHFT I}{SHFT T
   }{SHFT S} {CTRL 7}{CTRL 9} {
   SHFT F}3 {CTRL Ø} {SHFT L}{S
   HFT O}{SHFT A}{SHFT D}{SHFT
   S} {CTRL 3}{CTRL 9} {SHFT F}
   4 {CTRL Ø} {SHFT X}-{SHFT S}
   {SHFT C}{SHFT R}{2 SHFT Es}{
   SHFT N} {COMD 4}{CTRL 9} {SH
   FT F}5 {CTRL Ø} {SHFT R}{SHF
   T E}{SHFT A}{SHFT D}{SHFT E}
   {SHFT R} {COMD 7}{CTRL 9} {S
   HFT F}6 {CTRL Ø} {SHFT P}{SH
   FT R}{SHFT I}{SHFT N}{SHFT T
   }{SHFT E}{SHFT R} "; :REM*5Ø
15 PRINT"{COMD 1}{CTRL 9} {SHFT
    F}7 {CTRL Ø} {SHFT S}{SHFT
   C}{SHFT R}{SHFT A}{SHFT T}{S
   HFT C}{SHFT H}{2 SPACEs}{CTR
   L 1}{CTRL 9} {SHFT F}8 {CTRL
    Ø} {SHFT M}{SHFT E}{SHFT R}
   {SHFT G}{SHFT E}{2 SPACEs}{C
   OMD 2}{CTRL 9}{SHFT E}SCØ{CT
   RL Ø} {SHFT N}{SHFT E}{SHFT
   W} {COMD 5}{CTRL 9}{SHFT E}S
   C1{CTRL Ø} {SHFT S}{SHFT O}{
   SHFT R}{SHFT T} {COMD 3}{CTR
   L 9}{SHFT E}SC2{CTRL Ø} {SHF
   T S}{SHFT O}{SHFT U}{SHFT N}
   {SHFT D} {COMD 8}{CTRL 9}{SH
   FT E}SC3{CTRL Ø} {SHFT C}{SH
   FT O}{SHFT L}{SHFT O}{SHFT R
   } {CTRL 6}{CTRL 9}{SHFT E}SC
   4{CTRL Ø} {SHFT C}-{SHFT T}{
   SHFT E}{SHFT X}{SHFT T} {CTR
   L 9}"CHR$(13Ø);:COLOR5,3
                        :REM*45
16 GOSUB1Ø6:GOSUB163:GOSUB159:G
   OSUB157:GOSUB43:IFZX=1THENGO
   SUB35:PP=INT((A-1)/19)+1:GOS
   UB163:RETURN         :REM*242
17 GETA$:GOSUB16Ø:IFINSTR("{CRS
   R UP}{CRSR DN}{CRSR LF}{CRSR
    RT}",A$)THEN17      :REM*51
18 ONINSTR(YS$,A$)GOTO28,44,55,
   64,2Ø,73,86,1Ø9,116,21,21,22
   ,23,23               :REM*239
19 IFA$<" "THEN17:ELSE24
                        :REM*13Ø
2Ø MS=2:GOSUB22Ø:GOSUB1Ø8:GOTO3
```


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```
   3:ELSEIFA$=CHR$(27)THENGOTO1
   1                          :REM*37
21 GOSUB39:GOTO17             :REM*232
22 A$="'":GOTO24              :REM*122
23 LN=LEN(T$):T$=LEFT$(T$,LN-1-
   (LN=Ø)):A$=""              :REM*35
24 SOUND1,A6,1:T$=T$+A$:BC=LEN(
   T$):IFBC=72THENSOUND2,6ØØØ,2
   Ø                          :REM*133
25 IFA$=" "THENWR=BC          :REM*114
26 COLOR5,BT:WINDOWØ,22,79,22,1
   :PRINT"{CTRL Ø}";T$C$;:EC=Ø:
   IFLEN(T$)>78THENEC=1:GOSUB39
                              :REM*224
27 GOTO17                     :REM*17Ø
28 GETA$:GOSUB16Ø:IFA$=""THEN28
                              :REM*2Ø6
29 ONINSTR("Ø1234",A$)GOTO11,12
   8,3Ø,31,32:GOTO17          :REM*9Ø
3Ø A6=-(A6=Ø)*64ØØØ:GOTO17
                              :REM*166
31 BG=BG+1+(BG=16)*16:ZX=1:GOSU
   B14:GOTO26                 :REM*215
32 BT=BT+1+(BT=16)*16:GOTO26
                              :REM*149
33 GETY$:IFY$=""THENGOSUB16Ø:GO
   TO33                       :REM*243
34 GOSUB222:GOTO17            :REM*2Ø9
35 COLOR5,BG:WINDOWØ,2,79,22,1:
   FORT=ATOA-19STEP-1:IFT<1THEN
   37                         :REM*1Ø
36 WINDOWØ,21+T-A,79,21+T-A,1:C
   OLOR5,BG:PRINT"{CTRL Ø}";A$(
   T);                        :REM*255
37 NEXT                       :REM*167
38 COLOR5,BT:WINDOWØ,22,79,22,1
   :PRINTC$;:RETURN           :REM*184
39 A=A+1:AA=A:IFBC=ØTHENBC=1:T$
   =""                        :REM*12
4Ø IF(A-1)/19=INT((A-1)/19)THEN
   PP=PP+1                    :REM*252
41 A$(A)=T$:IFEC=1ANDINSTR(" ,.
   ?!-='",A$)=ØTHENT$=RIGHT$(A$
   (A),79-WR):A$(A)=LEFT$(A$(A)
   ,WR):ELSET$=""             :REM*26
42 GOSUB35:DC=Ø:GOSUB164:GOSUB1
   63:BC=Ø:GOSUB159           :REM*143
43 COLOR5,BT:WINDOWØ,22,79,22,1
   :PRINTT$C$;:RETURN         :REM*211
44 GOSUB22Ø:GOSUB1ØØ:PRINTIL$"{
   CTRL Ø}{COMD 5}{2 SPACEs}{SH
   FT S} A V E "OL$"{4 SPACEs}{
   SHFT E}NTER{2 SPACEs}* TO {S
   HFT C}ANCEL";              :REM*2Ø9
45 GOSUB12Ø:PRINT"{COMD 5}";:GO
   SUB218:IFNG=5THENGOSUB222:GO
   TO17                       :REM*5
46 GOSUB61:IFSM=ØTHEN48       :REM*2Ø
47 GOSUB1Ø3:PRINT"{COMD 5}{2 CR
   SR DNs} {SHFT T}HAT NAME HAS
    BEEN USED...{SHFT I}F {SHFT
    I} SAVE IT UNDER THAT NAME
   THE OLD FILE WILL BE ERASED.
    {SHFT E}XECUTE (Y OR N)";:G
   ETKEYAN$:IFAN$<>"Y"THEN44
                              :REM*43
48 OPEN8,8,8,"@Ø:"+N$+",S,W":FO
   RT=1TOA:PRINT#8,CHR$(34);A$(
   T):NEXT:IFSM=ØTHEN52:REM*232
49 OPEN6,8,6,"@Ø:.WORD PROC.,S,
   W":PRINT"{3 SPACEs}{SHFT S}{
   SHFT SPACE}{SHFT A}{SHFT SPA
   CE}{SHFT V}{SHFT SPACE}{SHFT
    I}{SHFT SPACE}{SHFT N}{SHFT
    SPACE}{SHFT G}...":NN=LEN(N
   $):FORT=1TOL:IFN$=LEFT$(LT$(
   T).NN)ANDMID$(LT$(T),NN+1,2)
   =".."THENGOSUB53           :REM*72
5Ø PRINT#6,CHR$(34);LT$(T):NEXT
                              :REM*13
51 DCLOSE:GOSUB222:GOSUB157:GOT
   O17                        :REM*219
52 APPEND#6,(NAME$):L=L+1:T=L:G
   OSUB53:PRINT#6,CHR$(34);LT$(
   T):GOTO51                  :REM*79
53 N1$=N$+LEFT$(DD$,19-LEN(N$))
   :N2$=M5$+".....":N3$=M7$+"..
   .":N7$=STR$(CH):N8$=STR$(A):
   N9$=STR$(PP)               :REM*252
54 N4$=LEFT$(DJ$,7-LEN(N7$))+N7
   $:N5$=LEFT$(DJ$,1Ø-LEN(N8$))
   +N8$:N6$=LEFT$(DJ$,12-LEN(N9
   $))+N9$:LT$(T)=N1$+N2$+N3$+N
   4$+N5$+N6$:LL=1:RETURN
                              :REM*95
55 GOSUB1ØØ:T=Ø:PRINTCHR$(15)"{
   CTRL Ø}{CTRL 6}{2 SPACEs}{SH
   FT E} {SHFT D} {SHFT I} {SHF
   T T}{2 SPACEs}"CHR$(143)"{CT
   RL 9}{CTRL 1}{5 SPACEs}{SHFT
    E}NTER * TO EXIT{2 SPACEs}"
   ;:GOSUB1Ø5:GOSUB157:PRINT"{C
   OMD 6}";:PP=1              :REM*27
56 COLOR5,BT:WINDOWØ,1,79,1,1:P
   RINT"{CTRL 6}";:WINDOWØ,2,79
   ,2Ø,1:T9=Ø:ET=Ø            :REM*145
57 TT=T+1:DT=T:T8=1:T6=Ø:REM*34
58 T=T+1:T8=T8+1:T6=T6+1:WINDOW
   Ø,T8,79,T8,1:PRINT"{CTRL Ø}{
   CTRL 6}";A$(T);:IFT6=19ANDT<
   ATHENT6=Ø:GOTO166          :REM*92
59 IFT=>ATHENET=1:T6=Ø:COLOR5,B
   T:WINDOW3Ø,1,57,1,1:PRINTMS$
   (4);:GOTO166               :REM*47
6Ø GOTO58                     :REM*214
61 SM=Ø:N$=PF$+N$:NH=LEN(N$):FO
   RT=1TOL                    :REM*174
62 IF(LEFT$(LT$(T),NH)=N$ANDMID
   $(LT$(T),NH+1,2)="..")OR(LEF
   T$(LT$(T),NH-1)=LEFT$(N$,NH-
   1)ANDRIGHT$(N$,1)="*")THENSM
   =1:ZZ$=LT$(T)              :REM*93
63 NEXT:RETURN                :REM*221
64 GOSUB22Ø:GOSUB1ØØ:PRINTIL$"{
   CTRL Ø}{CTRL 7}{2 SPACEs}{SH
   FT L} {SHFT O} {SHFT A} {SHF
   T D} "OL$"{CTRL 9}{4 SPACEs}
   {SHFT E}NTER{2 SPACEs}* TO{2
    SPACEs}{SHFT C}ANCEL";:GOSU
   B12Ø                       :REM*1Ø4
65 PRINT"{CTRL 7}";:GOSUB218:IF
   NG=5THENGOSUB222:GOTO17
                              :REM*5
66 IFLEFT$(N$,1)="{LB.}"THENN$=
   RIGHT$(N$,LEN(N$)-1):GOTO69
                              :REM*114
67 GOSUB61:IFSM=1THEN69       :REM*84
68 GOSUB1Ø3:PRINT"{CTRL 7}{2 CR
   SR DNs} {SHFT T}HAT NAME IS
   NOT LISTED....{SHFT E}XECUTE
    (Y OR N)";:GETKEYAN$:IFAN$=
   "N"THENGOTO64              :REM*29
69 G=Ø:OPEN8,8,8,N$:IFDS=62THEN
   G=A:N$=FIL$:DCLOSE:GOSUB221:
   GOTO92                     :REM*131
7Ø GOSUB221:PRINT"{COMD 7}";:WI
   NDOW2Ø,7,6Ø,12,1:PRINT"{CRSR
    DN}{3 CRSR RTs}LOADING"N$:I
   FA$=CHR$(14Ø)THENG=A:ELSEDC=
   Ø:CH=Ø:BC=Ø                :REM*194
71 G=G+1:INPUT#8,A$(G):CH=CH+LE
   N(A$(G)):IFST=ØTHEN71
                              :REM*182
72 DCLOSE:A=G:PP=INT((G-1)/19)+
   1:FIL$=N$:FORT=A+1TOA+4Ø:PRI
   NT"{CTRL G}";:A$(T)="":NEXT:
   GOSUB158:GOSUB159:GOSUB163:T
   $="":GOSUB35:GOTO17        :REM*98
73 GOSUB22Ø:GOSUB1ØØ:PRINTIL$"{
   CTRL Ø}{COMD 4}{2 SPACEs}{SH
   FT R} {SHFT E} {SHFT A} {SHF
   T D} "OL$"{CTRL 9}{4 SPACEs}
   {SHFT E}NTER * TO CANCEL {CT
   RL Ø}";:GOSUB12Ø:GOSUB218:M$
   =N$                        :REM*145
74 IFLEFT$(M$,1)="{LB.}"THENM$=
   RIGHT$(M$,LEN(M$)-1):GOTO75:
   ELSEIFNG=5THENN$=FIL$:GOSUB2
   22:GOTO17:ELSEM$=PF$+M$
                              :REM*188
75 OPEN8,8,8,M$:WINDOWØ,1,79,1,
   1:IFDS=62THENDCLOSE:GOSUB222
   :GOTO17                    :REM*94
76 MS=3:GOSUB1Ø8:UU=1:GOSUB85:U
   U=Ø:T=Ø:PRINT:PR=1         :REM*3
77 PRINT"{CTRL 1}";:WINDOWØ,24,
   1Ø,24,1:PRINT"{CTRL Ø} {SHFT
    P}AGE "PR" {CTRL 9}";
                              :REM*186
78 T=T+1:INPUT#8,A$:GOSUB85:PRI
   NT"{CTRL Ø}"A$             :REM*84
79 IFT/2Ø<>INT(T/2Ø)THEN82:ELSE
   PR=PR+1                    :REM*195
8Ø GETO$:IFO$=""THENGOSUB16Ø:GO
   TO8Ø                       :REM*243
81 IFO$=CHR$(13)THENDCLOSE:N$=F
   IL$:GOSUB222:GOTO17        :REM*2Ø
82 IFST=ØTHEN77               :REM*87
83 CLOSE8:WINDOWØ,23,79,23,1:GO
   SUB127                     :REM*24
84 GETY$:IFY$=""THENGOSUB16Ø:GO
   TO84:ELSEIFY$=CHR$(13)THENO$
   =Y$:GOTO81:ELSEGOTO75
                              :REM*117
85 PRINT"{COMD 4}";:WINDOWØ,2,7
   9,23,UU:SYSII,Ø,21,Ø:RETURN
                              :REM*2Ø
86 GOSUB1ØØ:PRINTIL$"{CTRL Ø}{C
   OMD 7}{2 SPACEs}{SHFT P} {SH
   FT R} {SHFT I} {SHFT N} {SHF
   T T} "OL$"{CTRL 9} {CTRL 1}{
   3 SPACEs}{SHFT E}NTER * TO {
   SHFT C}ANCEL ";:BS=Ø:REM*194
87 HP=1:HC=Ø :GOSUB137        :REM*24
88 AB=Ø:LM=Ø:FORT=1TOA:AB=AB+1:
   GOSUB94:PRINTA$(T):PRINT#4,A
   $(T)                       :REM*63
```

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```
89 LM=LM+1:IFLM<LSTHENAB=AB+1:G
   OSUB94:PRINT:PRINT#4:GOTO89:
   ELSELM=Ø                  :REM*38
9Ø NEXT:E=1:HC=HC+1:IFHC<HPTHEN
   PRINT#4,CHR$(12);:CLOSE4:GOS
   UB151:GOTO88              :REM*114
91 PRINT#4,CHR$(12);:CLOSE4
                             :REM*33
92 ZX=1:GOSUB14:ZX=Ø:GOTO17
                             :REM*158
93 GETZ$:IFZ$=""THENPRINT"{CTRL
    9} {CTRL Ø}{CRSR LF}";:FORT
   =1TO2ØØ:NEXT:PRINT" {CRSR LF
   }";:GOTO93                :REM*123
94 IFAB<51THENRETURN:ELSEAB=Ø:I
   FBS=1THENPRINT#4,CHR$(12);:G
   OTO95:ELSERETURN          :REM*154
95 IFR2=1THENPRINT#4,TP$(1Ø);HN
   $;TP$(Ø);:PRINTCR$;HN$;
                             :REM*196
96 PG=PG+1:IFR3=1THENPRINT#4,TP
   $(1Ø);" /PAGE";PG;TP$(Ø):PRI
   NTTAB(65)"PAGE"PG         :REM*75
97 GOTO155                   :REM*189
98 WINDOWØ,2,79,2,1:RETURN
                             :REM*159
99 WINDOWØ,2,79,2Ø,Ø:PRINT"{CTR
   L G}";:RETURN             :REM*234
1ØØ WINDOWØ,Ø,79,24,1:PRINT"{CT
   RL G}";:RETURN            :REM*53
1Ø1 PRINT"{CTRL 2}";:WINDOWØ,2+
   T9,79,2+T9,1:PRINT"{CTRL 9}
   {CTRL 1}"A$(TT)"{CTRL Ø}{CT
   RL G}";:RETURN            :REM*248
1Ø2 WINDOW2Ø,8,6Ø,16,1:PRINT"{C
   TRL G}";:RETURN           :REM*253
1Ø3 WINDOW15,6,65,12,1:RETURN
                             :REM*29
1Ø4 PRINT"{CTRL 1}";:WINDOW55,5
   ,75,19,1:RETURN           :REM*59
1Ø5 PRINT"{CTRL 2}";:WINDOWØ,21
   ,79,21,1:PRINT"{CRSR DN}{CT
   RL 3}{CTRL Ø} {SHFT S}{CTRL
    9}PAGE {CTRL Ø}{SHFT A}{CT
   RL 9}DVANCE {CTRL Ø}{SHFT D
   }{CTRL 9}ELETE {CTRL Ø}{SHF
   T C}{CTRL 9}HANGE {CTRL Ø}{
   SHFT I}{CTRL 9}NSERT {CTRL
   7}{CTRL Ø}{SHFT R}{CTRL 9}E
   LOCATE {CTRL Ø}{SHFT H}{CTR
   L 9}ERE {CTRL 3}{CTRL Ø}{SH
   FT N}{CTRL 9}EXT {CTRL 1}{C
   TRL Ø}{SHFT G}{CTRL 9}ET {C
   TRL Ø}{SHFT U}{CTRL 9}NGET
   {CTRL 3}{CTRL Ø}{SHFT F}{CT
   RL 9}IND {CTRL Ø}{SHFT E}{C
   TRL 9}XCHANGE{CTRL Ø}";:RET
   URN                       :REM*176
1Ø6 WINDOWØ,2,79,23,1:RETURN
                             :REM*254
1Ø7 WINDOWØ,2,79,2Ø,1:RETURN
                             :REM*222
1Ø8 PRINT"{CTRL 5}";:WINDOWØ,MS
   (MS),79,MS(MS),1:PRINT"{CTR
   L Ø}"MS$(MS)"{CTRL 9}{CTRL
   3}";:RETURN               :REM*53
1Ø9 GOSUB22Ø:GOSUB1ØØ:PRINTIL$"
   {CTRL Ø}{COMD 1} {SHFT S} {
   SHFT C} {SHFT R} {SHFT A} {
   SHFT T} {SHFT C} {SHFT H} "
   OL$" {CTRL 9}* TO {SHFT C}A
   NCEL ";:GOSUB12Ø          :REM*237
11Ø GOSUB218:IFNG=5THENGOSUB222
   :GOTO17:ELSEM$=PF$+N$
                             :REM*171
111 M=LEN(M$):FORT=1TOL:IFLEFT$
   (LT$(T),M)=M$ANDMID$(LT$(T)
   ,M+1,2)=".." THENLT$(T)="@"
   :GOTO113                  :REM*216
112 IFRIGHT$(M$,1)="*"ANDLEFT$(
   LT$(T),M-1)=LEFT$(M$,M-1)TH
   ENLT$(T)="@"              :REM*213
113 NEXT                     :REM*243
114 OPEN8,8,8,"@Ø:"+NAME$+",S,W
   ":FORT=1TOL:IFLT$(T)="@"THE
   N115:ELSEPRINT#8,CHR$(34);L
   T$(T)                     :REM*2Ø1
115 NEXT:LL=Ø:CLOSE8:SCRATCH(M$
   ):N$=FIL$:GOSUB222:GOTO17
                             :REM*41
116 GOSUB22Ø:GOSUB1ØØ:PRINTIL$;
   "{CTRL Ø}{CTRL 1}{2 SPACES}
   {SHFT M} E R G E "OL$"{4 SP
   ACEs}{SHFT E}NTER{2 SPACES}
   * TO {SHFT C}ANCEL ";
                             :REM*248
117 GOSUB12Ø:GOSUB218:IFNG=5THE
   NGOSUB222:GOTO17          :REM*4
118 IFLEFT$(N$,1)="{LB.}"THENN$
   =RIGHT$(N$,LEN(N$)-1):ELSEN
   $=PF$+N$                  :REM*197
119 GOTO69                   :REM*21
12Ø SM=Ø:WINDOWØ,1,79,1,1:PRINT
   "{CTRL Ø}"LB$"{CTRL 1}";:WI
   NDOWØ,2,79,24,1:IFJJ=1THENR
   ETURN                     :REM*59
121 IFLL=1THENFORT=1TOL:GOSUB12
   5:NEXT:GOTO127            :REM*255
122 OPEN8,8,8,NAME$:L=Ø       :REM*16
123 L=L+1:T=L:LM=L:INPUT#8,LT$(
   T):IFLEFT$(LT$(T),1)<>"."TH
   ENL=L-1:GOTO124:ELSEGOSUB12
   5                         :REM*131
124 IFST=ØTHEN123:ELSEDCLOSE:GO
   TO127                     :REM*186
125 PRINT"{CTRL Ø} "RIGHT$(LT$(
   T),LEN(LT$(T))-2):IFT/21=IN
   T(T/21)THENPRINTMS$(1)"{CRS
   R UP}":GETKEYY$           :REM*58
126 RETURN                   :REM*13
127 COLOR5,BT:PRINTMS$(4);:LL=1
   :RETURN                   :REM*12
128 GOSUB22Ø:GOSUB1ØØ:PRINTIL$"
   {CTRL Ø}{CTRL 3}{2 SPACES}{
   SHFT S} {SHFT O} {SHFT R} {
   SHFT T} "OL$"{CTRL 9}";::IF
   LL=1THENJJ=1              :REM*13Ø
129 GOSUB12Ø:GOSUB136        :REM*7
13Ø WL=2:IFL<2THEN135        :REM*2ØØ
131 LW=Ø:FORW=LTOWLSTEP-1
                             :REM*174
132 IFLT$(W)>=LT$(W-1)THEN134
                             :REM*34
133 LT$=LT$(W):LT$(W)=LT$(W-1):
   LT$(W-1)=LT$:LW=1         :REM*188
134 NEXT:IFLW=1THENWL=WL+1:GOTO
   131                       :REM*1
135 JJ=Ø:GOSUB12Ø:GETKEYY$:GOTO
   51                        :REM*188
136 PRINT"{4 CRSR DNs}{4 SPACEs
   }{SHFT S} {SHFT O} {SHFT R}
    {SHFT T} {SHFT I} {SHFT N}
    {SHFT G} ":RETURN :REM*225
137 LS$="1":S$="":WINDOW2Ø,5,6Ø
   ,8,1:INPUT"{CTRL Ø}{CTRL 7}
   {2 SPACEs}{SHFT H}OW MANY S
   PACES BETWEEN LINES ";LS$
                             :REM*66
138 IFLS$="*"THEN92:ELSELS=VAL(
   LS$)                      :REM*7Ø
139 BU=1:PRINT"{4 SPACEs}{SHFT
   H}OW MANY COPIES{2 SPACEs}"
   ;:HP=1:INPUTHP:WINDOW1Ø,1Ø,
   33,16,1                   :REM*137
14Ø PRINT"{CTRL 1} {SHFT W}HAT
   TYPE OF PRINTING? {COMD 6}"
   :WINDOWØ,11,79,16,1:PRINT"{
   CTRL 5} Ø- {SHFT N}ORMAL{5
   SPACEs}1- {SHFT I}TALIC{5 S
   PACEs}2- {SHFT C}ONDENSED{4
    SPACEs}3- {SHFT N}O SPACIN
   G{5 SPACEs}4- {SHFT L}ETTER
    QUALITY"                 :REM*36
141 PRINT"{5 SPACEs}5- {SHFT S}
   MALL{3 SPACEs}6- {SHFT M}ED
   IUM{4 SPACEs}7- {SHFT L}ARG
   E{3 SPACEs}8- {SHFT C}ENTER
   ED{3 SPACEs}9- {SHFT B}USIN
   ESS FORMAT":TP$="Ø":INPUT"{
   COMD 4}{SHFT E}NTER TYPE(S)
   ";TP$                     :REM*88
142 T1$="":FORT=1TOLEN(TP$):T2=
   VAL(MID$(TP$,T,1))        :REM*42
143 T1$=T1$+TP$(T2):NEXT
                             :REM*148
144 WINDOWØ,14,79,14,1:Z=Z+1:ZH
   $(Z)=CHR$(13)             :REM*79
145 INPUT" {SHFT C}{SHFT H}{SHF
   T R}$( #){2 SPACEs}OF CHARA
   CTER YOU DESIRE. ({SHFT N}U
   LL ENTRY STOPS ENTERING)";Z
   H$(Z):IFZH$(Z)=CHR$(13)THEN
   147                       :REM*197
146 TH$=TH$+"{SHFT C}{SHFT H}{S
   HFT R}$("+ZH$(Z)+");":WINDO
   W3,15,79,16,1:PRINTTH$;:GOT
   O144                      :REM*129
147 TH$="":FORT=1TOZ:TH$=TH$+CH
   R$(VAL(ZH$(T))):NEXT
                             :REM*229
148 R1=Ø:WINDOW6,7,69,16,1:RP$=
   "N":HN$="":INPUT"{3 SPACEs}
   {SHFT D}O YOU WANT TO MAKE
   A HEADLINE";RP$:IFRP$<>"Y"T
   HEN149:ELSEPRINT"ENTER HEAD
   LINE":INPUTHL$:R1=1:REM*219
149 R2=Ø:INPUT"{3 SPACEs}{SHFT
   D}O YOU WANT A HEADNOTE";RP
   $:IFRP$<>"Y"THEN15Ø:ELSEPRI
   NT"ENTER HEADNOTE":INPUTHN$
   :R2=1:BS=1                :REM*151
15Ø R3=Ø:INPUT"{3 SPACEs}{SHFT
   D}O YOU WANT TO NUMBER PAGE
   S";RP$:IFRP$<>"Y"THEN151:EL
   SEINPUT"{3 SPACEs}STARTING
   PAGE NUMBER";PG:R3=1:BS=1:G
   OTO151                    :REM*177
```


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```
151 OPEN4,4,7:PRINT#4,E$;CHR$(6
    4);:GOSUB1ØØ          :REM*95
152 IFR2=1THENPRINT#4,TP$(1Ø);H
    N$;TP$(Ø);:PRINTHN$;:AB=AB+
    1                     :REM*141
153 IFR3=1THENPRINT#4,TP$(1Ø);"
    /PAGE";PG;TP$(Ø):PRINTTAB(6
    8)"PAGE"PG"{2 CRSR DNs}":AB
    =AB+1:IFR2=1THENAB=AB-1
                          :REM*3Ø
154 IFR1=1THENPRINT#4,CHR$(13);
    TP$(8);TP$(7);TP$(2);HL$;CH
    R$(13);TP$(Ø);TP$(11):PRINT
    TAB(4Ø-(LEN(HL$)/2))HL$"{2
    CRSR DNs}":AB=AB+9    :REM*89
155 IFBS=1THENPRINT#4,CR$;TH$;T
    1$;:PRINTCR$          :REM*42
156 PRINT#4,TH$;T1$;:RETURN
                          :REM*156
157 IFLEN(N$)<3THENFIL$="...***
    ****":                :REM*52
158 PRINT"{CTRL 1}";:WINDOW33,2
    4,6Ø,24,1:PRINT"{CTRL Ø}{3
    SPACEs}{SHFT F}ILE.."FIL$"
    {CTRL 9}";:RETURN     :REM*214
159 PRINT"{CTRL 1}";:WINDOW6Ø,2
    4,79,24,1:PRINT"{CTRL Ø}"FR
    E(1)-2ØØØ" {SHFT B}YTES FRE
    E {CTRL 9}";:RETURN   :REM*98
16Ø FORK=ØTO3:K$(K)=RIGHT$(HEX$
    (PEEK(PK-K)),2):NEXT
                          :REM*2Ø4
161 IFPEEK(PK)>127THENM6$=" {SH
    FT P}{SHFT M} ":K$(Ø)=RIGHT
    $(HEX$(PEEK(PK)AND31),2):EL
    SEM6$=" {SHFT A}{SHFT M} "
                          :REM*159
162 PRINT"{CTRL 1}";:WINDOW11,2
    4,34,24:M7$=K$(Ø)+":"+K$(1)
    +":"+K$(2)+M6$:PRINT"{CTRL
    Ø} "M7$"{2 SPACEs}{SHFT P}O
    S#";:PRINTUSING"###";BC;:RE
    TURN                  :REM*235
163 PRINT"{CTRL 1}";:WINDOWØ,24
    ,1Ø,24,1:PRINT"{CTRL Ø} {SH
    FT P}AGE "PP" {CTRL 9}";:RE
    TURN                  :REM*253
164 CH=CH+BC-DC:IFFRE(1)<2ØØØTH
    ENGOSUB231            :REM*139
165 RETURN                :REM*5Ø
166 GOSUB1Ø1:GOSUB159:GOSUB163:
    GOSUB2Ø1:GOSUB2Ø2     :REM*32
167 GETY$:GOSUB16Ø:IFY$=""THEN1
    67:ELSEIFY$="{UP ARROW}"THE
    N233                  :REM*16
168 ONINSTR(YQ$,Y$)GOTO169,17Ø,
    171,172,173,174,175,176,177
    ,178,179,18Ø,181:GOTO167
                          :REM*18
169 PRINT"{CTRL 6}{CTRL Ø}";:WI
    NDOWØ,2+T9,79,2+T9,1:PRINTA
    $(TT);:T9=T9+1+((TT=T)OR(T9
    =19))*(TT-DT):TT=TT+1+((TT=
    T)OR(T9=19))*(TT-DT):GOSUB1
    Ø1:GOTO167            :REM*49
17Ø IFT<ATHENPP=PP+1:GOSUB163:G
    OTO56:ELSET=Ø:PP=1:GOSUB163
    :GOTO56               :REM*37
171 WINDOW3Ø,6,5Ø,12,1:PRINT"{2
    SPACEs}OLD PHRASE ":INPUTF
    $:F$=" "+F$:BC=LEN(F$):PRIN
    T" NEW PHRASE ":INPUTNF$:NF
    $=" "+NF$:DC=LEN(NF$):GOTO2
    28                    :REM*44
172 ZX=1:GOSUB14:ZX=Ø:T$="":BC=
    Ø:GOTO17              :REM*96
173 WINDOW3Ø,6,6Ø,12,1:PRINT" W
    HAT PHRASE: ":INPUTF$:NF=LE
    N(F$):GOTO223         :REM*71
174 WINDOW3Ø,6,5Ø,11,1:PRINT"{C
    RSR DN}{3 SPACEs}WHAT SCREE
    N PAGE":INPUTPP:T=(PP-1)*19
    :AA=T:ET=Ø:T9=Ø:WINDOWØ,2,7
    9,2Ø,1:GOTO57         :REM*197
175 GOSUB188:GOSUB1Ø1:GOSUB159:
    GOTO167               :REM*159
176 IFA=>TTTHENDC=LEN(A$(TT)):B
    C=Ø:GOSUB182:GOSUB164:GOSUB
    185:GOSUB159:GOTO166:ELSE16
    7                     :REM*132
177 GOSUB183:A$(TT)="":GOSUB184
    :PRINT"{CTRL 6}{CTRL Ø}";:T
    $="":GOSUB188:GOSUB159: GOT
    O166                  :REM*7Ø
178 IFRR<41THENRR=RR+1:RR$(RR)=
    A$(TT):GOSUB2Ø2:GOTO167:ELS
    E167                  :REM*11Ø
179 IFR<41THENR=R+1:RL$(R)=A$(T
    T):GOSUB182:GOSUB2Ø1:GOSUB1
    85:GOTO167:ELSE167 :REM*123
18Ø IFRR>ØTHENGOSUB183:A$(TT)=R
    R$(RR):RR=RR-1:GOSUB2Ø2:GOS
    UB184:GOTO167:ELSE167
                          :REM*6Ø
181 IFR>ØTHENGOSUB183:A$(TT)=RL
    $(R):R=R-1:GOSUB2Ø1:GOSUB18
    4:GOTO167:ELSE167     :REM*97
182 FORDE=TTTOA-1:A$(DE)=A$(DE+
    1):NEXT:A$(A)="":A=A-1:RETU
    RN                    :REM*71
183 FORDE=ATOTTSTEP-1:A$(DE+1)=
    A$(DE):NEXT:A=A+1:RETURN
                          :REM*1Ø6
184 IFET=1THENT=T+1       :REM*226
185 T8=1:FORDD=DT+1+T9TOT:T8=T8
    +1                    :REM*171
186 IF(T8+T9)<21THENPRINT"{CTRL
     6}";:WINDOWØ,T8+T9,79,T8+T
    9,1:PRINT"{CTRL Ø}{CTRL 6}"
    A$(DD);               :REM*126
187 NEXT:GOSUB1Ø1:RETURN:REM*52
188 T$=A$(TT):DC=LEN(T$):LM=1:G
    OSUB2Ø6               :REM*16Ø
189 AU=Ø:GETA$:GOSUB16Ø:IFA$=""
    ORA$="{CRSR UP}"ORA$="{CRSR
     DN}"THEN189          :REM*127
19Ø IFA$="{CRSR RT}"THENLM=LM+1
    +(LM>LEN(T$)):AU=1:GOTO2ØØ:
    ELSEIFA$="{CRSR LF}"THENLM=
    LM-1-(LM=1):AU=1:GOTO2ØØ
                          :REM*5
191 IFA$=CHR$(13)ORA$=CHR$(141)
    THENA$(TT)=T$:BC=LEN(T$):GO
    SUB164:RETURN         :REM*18Ø
192 IFA$=CHR$(2Ø)THENGOSUB2Ø3:L
    M=LM-1:GOTO196:ELSEIFA$=CHR
    $(34)THENA$="'"       :REM*165
193 IFA$=CHR$(148)THENGOSUB2Ø7:
    GOTO196:ELSEIFA$<" "THEN189
                          :REM*248
194 IFLM=<LEN(T$)THENMID$(T$,LM
    ,1)=A$:LM=LM+1:GOTO196
                          :REM*175
195 T$=T$+A$:LM=LM+1      :REM*47
196 PRINT"{CTRL Ø}{CTRL 2}";:WI
    NDOWØ,2+T9,79,2+T9,1:PRINT"
    {CTRL 9}{CTRL 6}"T$;:TJ=LEN
    (T$):BC=TJ            :REM*1Ø5
197 IFLM>LEN(T$)THENPRINT"{CTRL
     Ø} {CTRL 9}";        :REM*13
198 GOSUB2Ø6:IFAU=1THENRETURN:E
    LSEIFLEN(T$)=79THENA$(TT)=T
    $:T$="":GOSUB164:RETURN
                          :REM*44
199 GOTO189               :REM*61
2ØØ GOSUB196:GOTO189      :REM*166
2Ø1 PRINT"{CTRL 7}";:WINDOWØ,23
    ,79,23,1:PRINT"{CTRL Ø}{CTR
    L G}"RL$(R);:RETURN:REM*193
2Ø2 PRINT"{CTRL 1}";:WINDOWØ,22
    ,79,22,1:PRINT"{CTRL Ø}{CTR
    L G}"RR$(RR);:RETURN :REM*6
2Ø3 TE$="":TA$="":IFLM=1THENLM=
    2:RETURN              :REM*176
2Ø4 IFLM=2THENT$=RIGHT$(T$,LEN(
    T$)-1):RETURN         :REM*9
2Ø5 TE$=LEFT$(T$,LM-2):TA$=RIGH
    T$(T$,LEN(T$)-LM+1):T$=TE$+
    TA$:RETURN            :REM*254
2Ø6 LL$=MID$(T$,LM,1):PRINT"{CT
    RL 2}";:WINDOWØ,2+T9,79,2+T
    9:PRINTTAB(LM-1)"{CTRL Ø}{C
    TRL 1}"LL$;:RETURN    :REM*79
2Ø7 TE$="":TA$="":IFLM=1THENT$=
    " "+T$:RETURN         :REM*35
2Ø8 TE$=LEFT$(T$,LM-1):TA$=RIGH
    T$(T$,LEN(T$)-(LM-1)):T$=TE
    $+" "+TA$:RETURN      :REM*16Ø
2Ø9 KY$="":FORT=1TO8:KEYT,CHR$(
    132+T):KY$=KY$+CHR$(132+T):
    NEXT                  :REM*138
21Ø E$=CHR$(27):TK$=E$+"M":TP$(
    Ø)=E$+CHR$(1Ø4)+CHR$(Ø)+E$+
    "!"+CHR$(Ø)+E$+"T"+E$+"2"+E
    $+CHR$(97)+CHR$(Ø)+E$+"P":T
    P$(1)=E$+"4":TP$(2)=E$+CHR$
    (15)+TK$              :REM*12
211 TP$(3)=E$+"3"+CHR$(22):TP$(
    4)=E$+CHR$(12Ø)+CHR$(1):TP$
    (5)=E$+"S"+CHR$(1):TP$(6)=E
    $+CHR$(1Ø4)+CHR$(1)+TK$:TP$
    (7)=E$+CHR$(1Ø4)+CHR$(2)+TK
    $                     :REM*232
212 TP$(8)=E$+CHR$(97)+CHR$(1):
    TP$(9)=E$+CHR$(1Ø8)+CHR$(9)
    +E$+CHR$(33)+CHR$(25):TP$(1
    Ø)=TP$(2)+TP$(5):TP$(11)=E$
    +CHR$(1Ø4)+CHR$(Ø):IL$=CHR$
    (15):OL$=CHR$(143) :REM*162
213 MS$(1)=" {SHFT P}RESS{2 SPA
    CEs}"+IL$+"ANY{2 SPACEs}KEY
    {2 SPACEs}"+OL$+"TO{2 SPACE
    s}CONTINUE":MS$(2)=" {SHFT
    P}RESS "+IL$+" ANY{2 SPACEs
    }KEY "+OL$+" TO{2 SPACEs}RE
    TURN{2 SPACEs}TO{2 SPACEs}W
    ORK{2 SPACEs}FILE":C$=IL$+" ►
```

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```
    {COMD +}"+OL$:CU$=IL$+" "+O
    L$                    :REM*153
214 MS$(3)="{2 SPACEs}{SHFT P}R
    ESS"+IL$+"{2 SPACEs}{SHFT R
    }{SHFT E}{SHFT T}{SHFT U}{S
    HFT R}{SHFT N} "+OL$+"{2 SP
    ACEs}FOR{2 SPACEs}WORK FILE
    {4 SPACEs}OR{5 SPACEs}ANY"+
    IL$+"{2 SPACEs}OTHER KEY"+O
    L$+" TO CONTINUE LISTING":M
    S(1)=21:MS(2)=1:MS(3)=1:C=1
    :                     :REM*88
215 LB$="{2 SPACEs}{SHFT F}ILEN
    AME{11 SPACEs}{SHFT D}ATE{1
    Ø SPACEs}{SHFT T}IME{7 SPAC
    Es}{SHFT C}HARACTERS{3 SPAC
    Es}{SHFT L}INES{4 SPACEs}{S
    HFT S}CRN.PAGES":FORT=1TO4Ø
    :DD$=DD$+".":DJ$=DJ$+" ":NE
    XT:YQ$="ANE*FSCDIGRUH"
                          :REM*45
216 YS$=E$+KY$+CHR$(13)+CHR$(14
    1)+CHR$(34)+CHR$(2Ø)+CHR$(1
    48)                   :REM*78
217 MS$(4)=IL$+" {SHFT E} {SHFT
     N} {SHFT D}{3 SPACEs}{SHFT
     O} {SHFT F}{3 SPACEs}{SHFT
     F} {SHFT I} {SHFT L} {SHFT
     E}{2 SPACEs}"+OL$:RETURN
                          :REM*68
218 WINDOW36,Ø,79,Ø,1:NG=Ø:N$="
    *":INPUT"{CTRL Ø}{3 SPACEs}
    FILENAME... ";N$:IFN$=""ORN
    $="*"THENNG=5:N$=FIL$:ELSEW
    INDOW36,Ø,79,Ø,1:PRINT"{3 S
    PACEs}"N$;            :REM*73
219 RETURN                :REM*1Ø4
22Ø SYS52684,16,12:SYS52684,24,
    2Ø:POKE26Ø6,16:POKE26Ø7,24:
    RETURN                :REM*62
221 SYS52684,Ø,12:SYS52684,8,2Ø
    :POKE26Ø6,Ø:POKE26Ø7,8:RETU
    RN                    :REM*98
222 GOSUB221:PRINT"{COMD 5}";:W
    INDOWØ,22,79,22:PRINT"{CTRL
     Ø}";T$;C$;:RETURN :REM*1Ø5
223 WINDOWØ,2,79,2Ø,1:SYSII,Ø,1
    8,Ø:FORTT=1TOA:SS=1:BE$=A$(
    TT):ZC=Ø              :REM*2ØØ
224 SA=INSTR(BE$,F$,SS):IFSA>ØT
    HENSS=SA+2:ZC=1:BE$=LEFT$(B
    E$,SA-1)+"{CTRL 9}"+F$+"{CT
    RL Ø}"+RIGHT$(BE$,LEN(BE$)-
    SA-NF+1):PRINT"{CTRL G}";:G
    OTO224                :REM*88
225 WINDOWØ,2,79,2Ø:SYSII,Ø,18,
    Ø:PRINT"{CTRL Ø}"BE$:IFZC=Ø
    THEN227               :REM*182
226 GETY$:IFY$=""THEN226:REM*75
227 NEXT:WINDOWØ,2,79,2Ø:SYSII,
    Ø,18,3Ø:PRINTMS$(4):GETKEYY
    $:GOTO55              :REM*12
228 FORTT=1TOA            :REM*1Ø5
229 SA=INSTR(A$(TT),F$,1):IFSA>
    ØTHENBE$=LEFT$(A$(TT),SA-1)
    +NF$+RIGHT$(A$(TT),LEN(A$(T
    T))-SA-BC+1):IFLEN(BE$)<8ØT
    HENA$(TT)=BE$:GOSUB164:GOTO
    229                   :REM*62
23Ø NEXT:GOSUB158:DC=Ø:BC=Ø:GOT
    O55                   :REM*44
231 XX=1:PRINT"{CTRL 7}";:WINDO
    W2Ø,6,6Ø,9,1:PRINT"{CRSR DN
    }{4 SPACEs}THIS FILE HAS BE
    COME TOO LARGE":PRINT"{2 SP
    ACEs}IF YOU WANT TO KEEP IT
    ,SAVE NOW!":RETURN :REM*25Ø
232 OPEN2,4,15:PRINT#2,"8MK":CL
    OSE2:OPEN1,4:CMD1:PRINTCHR$
    (27)"M";CHR$(27);CHR$(15):L
    IST-231:PRINT:CLOSE1
                          :REM*116
234 PRINTTR$;             :REM*22Ø
                                ■
```

TYPE-IN TROUBLES?

YOU HAVE TYPED IN A *RUN* PROGRAM and are having some problems getting it to run. After a while, you feel like calling for help, but since we're not next door, it's expensive to call us. But we can share our experiences with you. Having heard from many users over the years about their difficulties with typing in listings, we've identified a few recurring problems that plague many people but are easy to fix. So read on and see if your problem is one of these. If so, perhaps the answers will help you find and correct the difficulty.

● You get an Out of Data in Line xxx message. This means that a program line was reading from Data statements and reached the end of the data before it was done reading. There are two possible problems.

One might be with the line that reads the data, usually a For . . . Next loop. Make sure you have the proper values for the loop, because if the listing has a loop of 0 to 150 and you've typed 0 to 160, you'll get the "Out of Data" message. If the loop is correct, then the problem lies in the Data statements themselves. One possibility is that you omitted a whole line of data. That's easy enough to find and correct. More likely, you may have skipped one or more individual data items or typed in a period instead of a comma, which causes two data values to be read as one number. Check your typing carefully against the listing.

● You get an Illegal Quantity Error in Line xxx. That means that you've read a number from a Data statement and tried to Poke it into a memory address. The error occurs because the number is larger than 255 (the largest value a memory address can contain), which means that somewhere in your Data statements you've made an error by typing in a number larger than 255. Again, this is easy to check for and correct. Just look in your Data statements for a number larger than 255. You might have added an extra digit, or perhaps you ran two numbers together (23456 instead of 234,56).

● You get a Syntax Error in Line xxx. This could be almost anything. What it tells you is that there is something wrong in the indicated line. Usually you've misspelled a Basic keyword or omitted some required character. List the line and examine it carefully.

● You get an Error in Data message. This occurs in programs that add up all the data as read, and, when finished, compares that sum with what it should be if all the data were typed in correctly. If it isn't the same, it means an error somewhere in typing the Data statements. Go back and check the data carefully, correct the mistake(s), save the new version and try again.

Finally, we urge everyone who intends to type in one of our listings to use *RUN*'s Checksum program, which is printed in each issue. This nifty little program will help you avoid every mistake we mentioned above, except that it won't detect the omission of a line. ■

—LOU WALLACE

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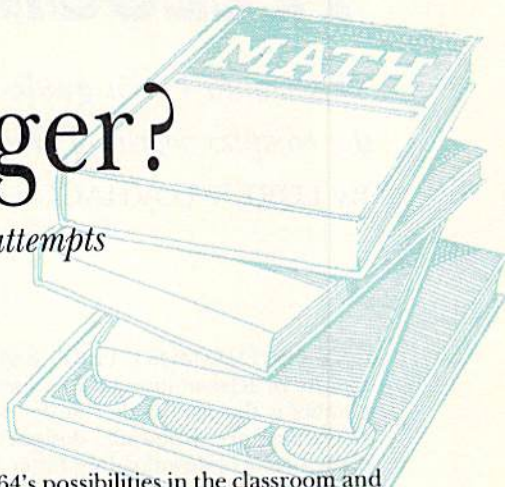
Truant No Longer?

After years of playing hookey, Commodore attempts to return support to education.



By SHARON WEINER

Good news for educators! After a lengthy recess, Commodore Business Machines is once again providing basic support for its eight-bit computers in education. In fact, according to recently appointed Commodore Education Manager John DiLullo, the company is aggressively developing ways to again facilitate the use of the C-64 and C-128 in schools and colleges.

More than 95 percent of U.S. schools are said to use microcomputers, with one computer for every 30 children nationwide, and many of those computers are C-64s or C-128s. Worldwide, according to DiLullo, the C-64 is number one in sales and a significant force in education. To help maintain and improve this position, Commodore is renewing a "substantial support program" for these machines in the schools.

The new education manager reflects this commitment: he has 25 years experience in school systems, including 19 in the classroom as a science, mathematics and computer science teacher. He also represented his school district in an IBM-sponsored program to introduce teachers to computers.

In an interview, DiLullo explained that Commodore wants to address three categories of schools: those that need to add to their C-64s or replace machines that are inoperative; those that hope to begin a computer program by installing inexpensive machines in a few classes; and those, such as vocational schools, that are interested in teaching computer repair. He went on to describe the support program.

Support's New Image

A new organizational team has been established to coordinate activities relating to educational groups, such as issuing press releases and making presentations about Commodore computers. "We haven't had this kind of focus in recent history," said DiLullo. Members of the team are also working with software firms to update lists of educational programs and help develop new ones, and they hope to assist colleges and universities through grant programs and sharing expertise.

An Education Advisory Board, consisting primarily of educators interested in the use of technology in the schools, has been set up, too. This group met in January to discuss Commodore's position in the educational market and how to facilitate use of Commodore computers in the classroom. They are scheduled to meet again to provide ideas to the organizational team.

Of course, in order to use computers, schools must have an adequate supply of working hardware and appropriate software. DiLullo reported that, to help meet this need, Commodore "would like to support school districts that have C-64s or 128s by providing additional machines. We can offer refurbished machines, excellent applications software and updated software guides. We're also soliciting from educators both new and proven curriculum applications."

New and refurbished systems will be available, at "extremely reasonable" prices, to districts that don't yet have Commodores. The hardware offers (see below) will enable schools to both increase their stock of working machines and keep broken machines for parts.

As part of its program, Commodore hopes to educate dealers about the C-64's possibilities in the classroom and to train teachers to demonstrate it to other teachers. To this end, the company is developing more curriculum and teacher-training materials, from activity suggestions to computer workstation displays.

It has also recently published an Educational Software Directory. Prepared by EPIE (Educational Products Information Exchange) Institute, this directory lists more than 2000 of the educational programs currently available for C-64/64C and C-128/128D computers. The programs are arranged alphabetically by subject area, from alphabetizing and aviation to space flight and spelling. Each listing includes a description, age range, publisher and price. The directory also provides publishers' addresses and phone numbers.

John DiLullo believes that a new age in classroom computing has arrived. "The age of computer literacy as 'understanding the machine' is over," he explained. "Now teachers must know how to use the machines as tools for teaching skills and concepts."

"The C-64 represents classic computing," DiLullo concluded. "After years of experience with educational computing, I am still fascinated with what it can do." ■

Sharon Weiner has had wide experience as a high school English teacher and as a free-lance writer and editor of textbook materials and educational software.

Table 1. Commodore's hardware offers to schools.

C-64, 1541 disk drive and 1802 color monitor, refurbished—$299.95.

C-64, 1541-II disk drive and 1802C color monitor, new—$533.90.

Extended warranties are available on all components.

Send inquiries to: John DiLullo, Education Department, Commodore Business Machines, 1200 Wilson Drive, West Chester, PA 19380.

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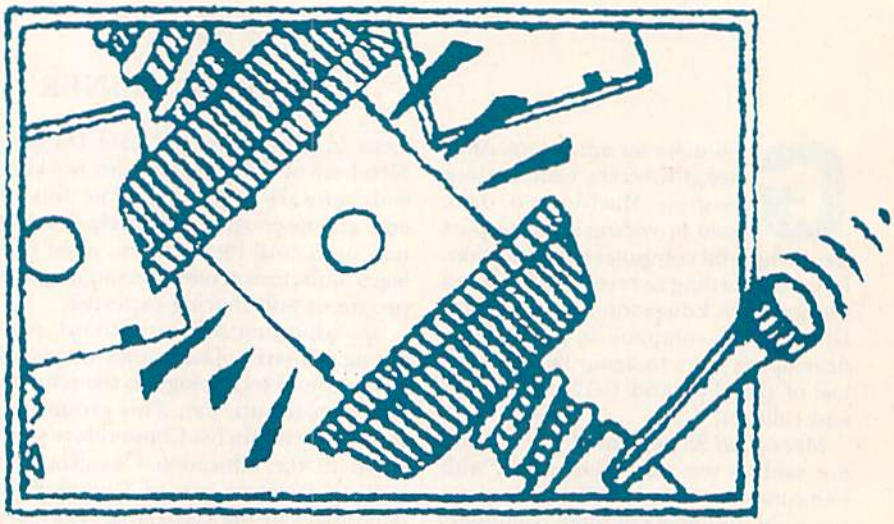
TELECOMPUTING WORKSHOP

This month Loren guides beginning telecomputerists through the complex world of file-transfer utilities.

By LOREN LOVHAUG



ONE OF THE MOST PERPLEXING aspects of telecommunications for beginners is the use of file-transfer utilities, which are, ironically, designed to make protocol downloading faster and easier.

There are two major reasons why these utilities are popular. First, since it's quite common for a single program to rely on several disk files, the utility primarily ensures that the downloader receives all of the files he or she needs. Multiple files may result from memory constraints during the creation of a large program or the separation of graphic or sprite screens from the program code. You also frequently find programs stored as separate files when they are written in a combination of Basic and assembly language.

Before the advent of file-transfer utilities, users would spend a lot of time downloading, only to find that they were missing one or more files. In addition to the frustration associated with missing files, it was tedious to monitor the progress of each sub-file download so that you knew when to start downloading the next. Most file-transfer utilities now overcome these problems by combining multiple file downloads into one large contiguous file for transfer purposes.

The other reason these utilities are popular is that many offer file-compression capabilities in addition to their file-combination functions. There are a variety of file compression techniques, but all have the same result: storing data in a smaller amount of disk space. This is often accomplished by encoding data in such a way that repeated elements are expressed by smaller code words.

For example, in this column, you'll notice that the word "download" occurs a lot. A typical file-compression algorithm might substitute the characters "!d!" for each occurrence of "download," thereby saving five characters' worth of storage space each time. Of course, if I used such a compression technique, I'd have to provide the *RUN* editors with a suitable decoder. In the same vein, in order to use a file that has been compressed or combined, you must first employ the appropriate utility to return the data to its original unencoded form.

By using file compression, you cut the size of program and data files considerably and thereby significantly decrease the time it takes to transfer them. These savings are important on pay systems such as national telecommunications networks.

A variety of file combiners and compressors have evolved over the years, and most of the confusion beginning telecomputerists experience stems from being unable to recognize which one they need. Fortunately, once you're initiated, it's not very difficult to recognize which utility to choose and how to use it. Most user groups have file-transfer utilities in their public domain libraries. Programs can also be found under "telecommunication utilities" on most electronic bulletin boards, both national and local.

Here's a brief description of the major utilities and how you can recognize which one to use with any particular file.

LIBRARY

The Library program is, to my knowledge, the oldest Commodore file-transfer utility. The original C-64 versions were very simple file combiners, with crude user interfaces. They supported only one disk drive and didn't have any options to delete the source file as it was being incorporated into the Library file. This meant that, due to a lack of disk space, users were limited in the size and number of files they could combine.

Today's versions of Library, for both the C-64 and C-128, are more sophisticated and often incorporate menu- or mouse-driven operation. Most now include options for deleting source files and support multiple disk drives. Recent versions also give you the option of extracting some or all of the files in a particular Library and performing a limited amount of file compression. Files combined using Library always have ".lbr" as their last four characters.

ARC

Like Library, Arc has been around for several years. In fact, Arc can be called an "industry standard" for file-transfer utilities because there are versions of it available for almost every personal computer on the market. This is advantageous in that learning to use Arc on one computer means you can work with its equivalent on just about any other.

In general, Arc is more difficult to use than most such utilities, since it is a command wedge and not menu

ILLUSTRATED BY MARCEL DUROCHER

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driven, which means you must familiarize yourself with Arc's commands and syntax.

What Arc lacks in ease of use, however, is made up for in power. As both a file combiner and compressor, it can, depending on the makeup of the data, reduce the size of a file anywhere from 10 to 50 percent. It also includes many MS-DOS-like commands that get disk directories, change disk drives, and copy and move files.

Because of its complex nature, Arc has been updated less frequently than other file-transfer utilities. The current public domain version for the C-64 is 2.50. The C-128 version of Arc is not in the public domain, but is part of a commercial package, CS-DOS 128, that I'll discuss in a future Telecomputing Workshop. Arc'd files, by convention, should end with the suffix ".arc".

Lynx

Lynx first appeared on the telecommunications scene about three years ago, and its chief claim to fame is speed. Like Library, it doesn't do a lot in the way of file compression. When Lynx combines your files for transfer, it doesn't actually copy each file; instead, it changes the file pointers (the first two bytes in a given disk sector) on the last sector of each file to point to the next file to be included as part of your combined Lynx file.

It then rewrites the disk directory to reflect this change, basically fooling Commodore DOS into thinking your separate files are now one large file. This means you don't have to worry about having space for the new file, since Lynx uses the same spaces on the disk that the uncombined files had been occupying.

For the sake of speed, Lynx uses custom disk routines. While this is a great boon to C-64 owners with 1541 drives, it severely cripples Lynx's compatibility with large-capacity drives like the 1581 and the SFD-1001.

Another problem related to its highly specialized disk-access routines is the fact that different versions of Lynx are not necessarily compatible with one another. Lynx'd files have ".lyx" or ".lnx" as extensions.

Self-dissolving Arcs

Self-dissolving Arcs, the most recent file-transfer utilities to appear on the scene, are an outgrowth of Arc. This file-combination technique merges the power and compression capabilities of Arc with a decompression utility that is simply unbeatable in its ease of use. Self-dissolving Arcs simply uncompact and dissolve themselves! When you download a self-dissolving Arc, all you need do is load the program on your 64 or 128, run it, and the files it contains are created on your disk. Self-dissolving Arcs are created by using the Arc utility and then linking the dissolve code to the Arc'd file. They are denoted by the extension ".sda".

Conclusion

Those are the four major file-transfer utilities that you'll find are being used on Commodore-oriented telecommunications systems. I hope this introduction to the programs eases beginner's frustrations and leads to more productive downloading sessions. ■

Loren Lovhaug is the SYSOP of Q-Link's C-128 Special Interest Group. You can write to him care of RUN Magazine, 80 Elm St., Peterborough, NH 03458.

You can also send him electronic mail on QuantumLink (LOVHAUG) or GEnie (Sparrow.J).

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GEOWATCH

As you boot up GEOS, enter the time and date with AutoSet, an example of auto-execute files.

By WILLIAM COLEMAN

ONE RELATIVELY undocumented area of GEOS concerns auto-execute files, which, since they can be executed directly from the system disk, are ideal for anything that needs doing each time GEOS is booted. This month's geoWatch explores this filetype and provides a program, AutoSet, that demonstrates how to use these files.

After the GEOS Kernal has been loaded and initialized, the system disk is checked for the presence of auto-execute files. Any found there are executed in the order in which they reside on the disk; so if you want a certain file to execute before any other, simply make sure it has priority in the system-disk directory. Auto-execute files on a work disk can also be called up from the GEOS deskTop in the usual way.

One of the prime candidates for an auto-execute file on the system disk is Berkeley Softworks' Configure program, which configures the disk drives and REU for your system. In most cases you should allow Configure to set things up before any other file executes; therefore, place any other auto-execute files after Configure in the system-disk directory.

Note About GEOS Versions

Auto-execute files were not supported until Version 1.3 of GEOS (all 128 versions support them). However, the filetype was already allocated, so if you are using an older version of GEOS, you can still run these programs as you would a regular application, by clicking on them; but they will not automatically execute from the system disk during boot-up.

Creating AutoSet

You first create the AutoSet file on a GEOS work disk, and then you use GEOS to copy it onto your system disk. Type in the AutoSet creator program (Listing 1), using *RUN*'s Checksum program, and save it to disk before running it. Make sure you have a (preferably blank) GEOS work disk in drive 8, which must be either a 1541 or 1571 drive. The program will not work on a 1581 drive.

Once the file is created, which takes about two minutes, boot GEOS and open the disk containing AutoSet. Test the program by double-clicking on it (the program's operation is self-explanatory) and trying all the options. If everything is working all right, copy the file onto your system disk. From now on, whenever you boot GEOS, AutoSet enables you quickly to set the time and date.

There is one small quirk you should be aware of. When the deskTop is loaded, it searches the system disk for a specified input driver and, if it finds one, loads it into the computer. Unfortunately, this happens *after* any auto-execute file on the system disk has executed during boot-up—and the default driver is for a joystick in port 1. So if you're using a mouse, you'll find it won't work when you go to set the time and date during boot-up. AutoSet gets around this problem by allowing you to use the cursor-up and -down keys at this point (left and right movements are not needed here). One consolation is that the firebutton works normally if the mouse is in port 1.

For Programmers Only

For those of you who like to program under GEOS, here are some tips for creating auto-execute files:

Write the program just as you would any other application, except use filetype #14 instead of #6. All of the GEOS Kernal entries can be used. Exit by calling EnterdeskTop as usual.

Do not modify memory from $5000 to $6000, for this area contains the GEOS initialization code. EnterdeskTop is modified to point within this area, and if you corrupt it, GEOS will crash when your program exits.

FirstBoot ($88C5) is zero during boot-up, but the deskTop changes it to $FF, and it will stay that way. This location can be checked if your program needs to tell whether it was called during boot-up. (This is why you never see the Configure screen during boot-up, even though Configure is run.)

Make certain always to verify that you are running version 1.3 or above before checking this location. If your version is 1.2 or below, your application should assume it was clicked from the deskTop.

If C128Flag ($C013) and graphMode ($003F) should be used, decide what computer, and if it's a C-128, under what mode the program is being run. C128Flag will have bit 7 set if running under a 128 GEOS Kernal. If it is running under 128 GEOS, bit 7 of graphMode will be set if it's in 80-Column mode. Again, check first to see whether the Kernal version is above V1.2. If the version is 1.2 or below, your application should assume a C-64 GEOS Kernal.

Remember that an input driver hasn't been loaded. You can either program the keyboard to move the mouse or use FindFTypes and ReadFile to load the driver yourself. R

William Coleman is the author of geoTerm, geoOrganizer and a number of other GEOS utilities.

Listing 1. AutoSet program. (Available on ReRUN disk. See page 52.)

```
Ø REM * CREATES GEOS PROGRAM 'A
  UTOSET' *                 :REM*9
1 DR=8:FI$="AUTOSET":TY$=CHR$(1
  4):GOTO9                  :REM*188
2 HI=INT(A/256):PRINT#15,"M-R"C
  HR$(A-HI*256)CHR$(HI):REM*25Ø
3 GET#15,A$:A=ASC(A$+CHR$(Ø)):R
  ETURN                     :REM*82
4 PRINT#15,"U1:"2;Ø;TR;SC:RETUR
  N                         :REM*134
5 PRINT#15,"U2:"2;Ø;TR;SC:RETUR
  N                         :REM*254
6 PRINT#15,"B-P:"2;PS:RETURN
                            :REM*77
```


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```
7 GET#2,A$:A$=LEFT$(A$+CHR$(Ø),
  1):RETURN              :REM*13Ø
8 PRINT#2,CHR$(A);:RETURN
                         :REM*11Ø
9 DIM D$(29):PRINT "WORKING..."
  :OPEN3,DR,3,FI$+",U,W"
                         :REM*179
1Ø READ A$:PRINT ".";:IF A$="-1
  " THEN CLOSE 3:GOTO 15
                         :REM*97
11 FOR I=1 TO LEN(A$):IF MID$(A
  $,I,1)=" " THEN A$=LEFT$(A$,
  I-1)+MID$(A$,I+1)      :REM*217
12 NEXT:FOR I=1 TO LEN(A$) STEP
   2:H$=MID$(A$,I,1):L$=MID$(A
  $,I+1,1)               :REM*227
13 H=16*(VAL(H$)-(H$>"@"ANDH$<"
  G")*(ASC(H$)-55))      :REM*192
14 PRINT#3,CHR$(H+(VAL(L$)-(L$>
  "@"ANDL$<"G")*(ASC(L$)-55)))
  ;:NEXT:GOTO 1Ø          :REM*132
15 OPEN 15,DR,15:OPEN 2,DR,2,"#
  ":OPEN 3,DR,3,FI$:CLOSE 3
                         :REM*237
16 A=656:GOSUB 2:DB=A:A=66Ø:GOS
  UB 2:DE=A:TR=18:SC=DB:GOSUB
  4                      :REM*236
17 PS=DE:GOSUB 6:FORI=Ø TO 29:G
  OSUB 7:D$(I)=A$:NEXT:TR=ASC(
  D$(1))                 :REM*189
18 SC=ASC(D$(2)):GOSUB 4:GOSUB
  7:XT$=A$:GOSUB 7:XS$=A$:GOSU
  B 4                    :REM*6Ø
19 A=Ø:GOSUB 8:A=255:GOSUB 8:A=
  3:GOSUB 8:A=24:GOSUB 8:GOSUB
   5                     :REM*61
2Ø D$(19)=D$(1):D$(2Ø)=D$(2):D$
  (1)=XT$:D$(2)=XS$:D$(21)=CHR
  $(Ø):D$(22)=TY$        :REM*56
21 FORI=23 TO 27:D$(I)=CHR$(1):
  NEXT:TR=18:SC=DB:GOSUB 4:PS=
  DE:GOSUB 6             :REM*214
22 FORI=Ø TO 29:PRINT#2,LEFT$(D
  $(I),1);:NEXT:GOSUB 5:CLOSE
  2:CLOSE 15             :REM*43
23 PRINT:PRINT"DONE!":END
                         :REM*255
24 :                     :REM*82
25 REM AUTOSET HEX DATA:REM*124
26 DATA Ø315BFFFFFFC8ØØØØ68Ø ØØ
  Ø78183Ø782548783D7 878ØFEØ78
  183Ø783ØD87            :REM*185
27 DATA 8618C7863ØC78618C783 ØD
  878183Ø78ØFEØ78ØEE Ø78ØØØØ78
  ØØØØ7FFFFFF            :REM*114
28 DATA 7FFFFF3FFFFF83ØEØØØØ Ø4
  FFØ3E4Ø44175746F53 65742Ø2Ø2
  Ø2Ø2Ø56312E             :REM*127
29 DATA 3ØØØØØØ4Ø57696C6C69 61
  6D2Ø432E2Ø436F6C65 6D616E2ØØ
  ØØØØØØØØØØ             :REM*66
3Ø DATA ØØØØØØØØØØØØØØØØØØØØ ØØ
  ØØØØØØØØØØØØØØØØ ØØØØØØØØ
  ØØØØØØØØØØ             :REM*98
31 DATA ØØØØØØØØØØØØØØØ5468 69
  732Ø7Ø726F6772616D 2Ø616C6C6
  F77732Ø796F             :REM*159
32 DATA 752Ø746F2Ø7365742Ø74 68
  652Ø646174652F7469 6D652Ø617
  42Ø626F6F74             :REM*17
33 DATA 757ØØØØØØØØØØØØØØØØ ØØ
  ØØØØØØØØØØØØØØØØ ØØØØØØØØ
  ØØØØØØØØØØ             :REM*94
34 DATA ØØØØØØØØØØØØØØØØØØØØ ØØ
  ØØØØØØ1B5365747320 746865Ø4
  3757272656E             :REM*241
35 DATA 742Ø54696D652EØØ5365 74
  732Ø7468652Ø437572 72656E742
  Ø446174652E             :REM*9
36 DATA ØØ53656C656374205768 65
  6E2Ø46696E69736865 642EØØ184
  96C6C656761             :REM*119
37 DATA 6C2Ø44617465Ø6F722Ø 54
  696D652Ø466F726D61 74212121Ø
  Ø646174653A             :REM*121
38 DATA 2Ø6D6F6E74682F646179 2F
  79656172ØØ74696D65 3A2Ø686F7
  5723A6D696E             :REM*91
39 DATA 757465612Ø286F722Ø7Ø 29
  ØØ456E746572Ø6461 746520Ø6
  5783A2Ø3Ø32             :REM*21Ø
4Ø DATA 2F3Ø382F3837ØØ2Ø2Ø45 6E
  7465722Ø74696D652Ø 2Ø65783A2
  Ø3Ø393A3539             :REM*95
41 DATA 61ØØ182D2D2D2Ø64642F 6D
  6D2F79792Ø2Ø2Ø6868 3A6D6D2Ø4
  14D2Ø2D2D2D             :REM*2Ø7
42 DATA 1BØØ2ØE1C12Ø8AC1A98Ø 85
  2FA9ØØ8DB1848DB284 2Ø4ØØ59Ø1
  BA9ØØ853BA9            :REM*97
43 DATA D2853AA9868D21Ø88D29 Ø8
  A92D8DE3Ø78DF9Ø7B8 5ØØ8A9ØØ8
  53BA969853A             :REM*46
44 DATA A95D853CA9Ø785Ø3A9F4 85
  Ø22Ø56C2A5Ø2C9Ø7DØ Ø34C41Ø6C
  9Ø8DØØ34C86             :REM*87
45 DATA Ø54C2CC2ADØFCØC9ØCFØ ØB
  2C13CØ1ØØ6243F1ØØ2 386Ø186ØA
  DØ485C91ØDØ             :REM*127
46 DATA ØAA53CC9489Ø12E918DØ ØC
  C911DØØAA53CC967BØ Ø46918853
  C2ØA7C2C9ØØ             :REM*112
47 DATA DØDD6ØA9Ø58DA484A954 8D
  A3846ØA9Ø48513A994 8512A9Ø88
  DEFØ72ØFFØ6             :REM*124
48 DATA A5Ø2C9Ø2FØ2EAØFF2ØDØ Ø5
  9Ø2AC9ØDBØ268DE4Ø8 2ØDØØ59Ø1
  EC92ØB01A8D             :REM*247
49 DATA E6Ø82ØDØØ59Ø128D1685 AD
  E4Ø88D1785ADE6Ø88D 18854CF6Ø
  44C22Ø6C8B9             :REM*38
5Ø DATA ECØ82Ø33Ø69Ø2485Ø5C8 B9
  ECØ82Ø33Ø69ØØDC885 Ø4A5Ø52ØØ
  5Ø6186Ø438              :REM*13Ø
51 DATA 6ØA5Ø585Ø4A9ØØ85Ø5A5 Ø4
  386ØA9ØØ85Ø485Ø518 6Ø85Ø2ØA0
  A1865Ø2ØA6Ø             :REM*77
52 DATA AØØØC9ØA9ØØ638E9ØAC8 DØ
  F6Ø93Ø85Ø298Ø93Ø6Ø A9Ø785Ø3A
  9C785Ø22Ø15             :REM*15
53 DATA Ø72Ø56C24CF6Ø4C93Ø9Ø Ø8
  C93ABØØ429ØF386Ø18 6ØA9Ø4851
  3A9AD8512A9             :REM*154
54 DATA Ø68DEFØ72ØFFØ6A5Ø2C9 Ø2
  DØØ64CF6Ø44C22Ø6AØ FF2ØDØØ59
  ØF6C919BØF2             :REM*23Ø
55 DATA 8DE8Ø8A5Ø58DE7Ø8A5Ø4 8D
  E6Ø82ØDØØ59ØEØC93C BØDC8DE9Ø
  8A5Ø58DE5Ø8             :REM*173
56 DATA A5Ø48DE4Ø8A2ØØB9ECØ8 C9
  5ØFØØ4C97ØDØØ2A28Ø 8AAEE8Ø8E
  ØØCDØØ2498Ø             :REM*2Ø1
57 DATA 8DEAØ82Ø3CØ7ADØFDC29 7F
  8DØFDCADE7Ø8ØAØAØA ØAØDEAØ8Ø
  DE6Ø88DØBDC             :REM*14Ø
58 DATA ADE5Ø8ØAØAØAØAØDE4Ø8 8D
  ØADCA9ØØ8DØ9DC8DØ8 DC2Ø53Ø7A
  DE8Ø8C9ØCDØ             :REM*1Ø3
59 DATA ØAADEAØ8498Ø8DEAØ8A9 ØØ
  AEEAØ8FØØ31869ØC8D 1985ADE9Ø
  88D1A854CF6             :REM*235
6Ø DATA Ø42Ø15Ø7A9Ø785Ø3A9DE 85
  Ø2A9Ø885ØDA9EC85ØC 4C56C2AØØ
  EA9ØØ99ECØ8             :REM*42
61 DATA 881ØFA2Ø4ØØ59ØØBA9Ø1 85
  3BA99C853AB85ØØ8A9 ØØ853BA9C
  E853AA97485              :REM*133
62 DATA 3C6ØADØFCØC912FØØF2C 13
  CØ3ØØA78A5Ø18DEBØ8 A93585Ø16
  ØADØFCØC912              :REM*254
63 DATA FØØB2C13CØ3ØØ6ADEBØ8 85
  Ø1586ØAD17852ØØE Ø6 8DCBØ4A5Ø
  28DCCØ4AD18              :REM*169
64 DATA 852ØØEØ68DCEØ4A5Ø28D CF
  Ø4AD16852ØØEØ68DD1 Ø4A5Ø28DD
  2Ø4AD1985DØ              :REM*9Ø
65 DATA Ø4A9ØCDØØFC9ØC9ØØBDØ Ø2
  A918AØ5Ø38E9ØCDØØ2 AØ418CDCØ
  42ØØEØ68DD6              :REM*19
66 DATA Ø4A5Ø28DD7Ø4AD1A852Ø ØE
  Ø68DD9Ø4A5Ø28DDAØ4 6Ø81ØB1Ø1
  Ø45Ø4ØB1Ø3Ø              :REM*255
67 DATA 65Ø4ØB1Ø4Ø7AØ4Ø11148 13
  7BØ5ØØ81136Ø7ØB1Ø ØEC6Ø4ØC2
  42Ø12ØD243Ø              :REM*122
68 DATA ØCØØØ2114ØØ81136Ø7 ØB
  1ØØEC6Ø412Ø2181DØ8 ØB4722ØØØ
  412Ø23Ø25Ø8               :REM*6
69 DATA ØB473A18Ø4Ø1Ø248ØB47 52
  2FØ4137BØ5ØØ38Ø8ØØ Ø4Ø61Ø2DØ
  88EØ8ØØØ4Ø6              :REM*64
7Ø DATA 1Ø3ØØ8A9Ø72CA9Ø88D1D 85
  4CBFC2Ø5FF82FE8ØØ4 ØØ82Ø38ØØ
  4ØØB8Ø38ØFF              :REM*48
71 DATA 3ØØØØØØ38Ø18ØØØØØØ3 8Ø
  1877DC78Ø38Ø183776 CCØ38Ø183
  666CCØ38Ø18              :REM*58
72 DATA 3666FCØ38Ø183666CØØ3 8Ø
  183666CCØ38Ø183666 78Ø38ØØ4Ø
  ØØ82Ø38ØØ4ØØ            :REM*179
73 DATA 81Ø3Ø6FF817FØ5FFØCB7 Ø5
  FF82FE8ØØ4ØØ82Ø38Ø Ø4ØØB8Ø38
  Ø3EØØ3ØØØØ3             :REM*168
74 DATA 8Ø33ØØ3ØØØØ38Ø319E78 FØ
  Ø38Ø31B33198Ø38Ø31 9F3198Ø38
  Ø31B331F8Ø3              :REM*238
75 DATA 8Ø31B3318ØØ38Ø333331 98
  Ø38Ø3E1F1CFØØ38ØØ4 ØØ82Ø38ØØ
  4ØØ81Ø3Ø6FF              :REM*72
76 DATA 817FØ5FFØCØØ     :REM*162
77 DATA -1                :REM*188 ■
```

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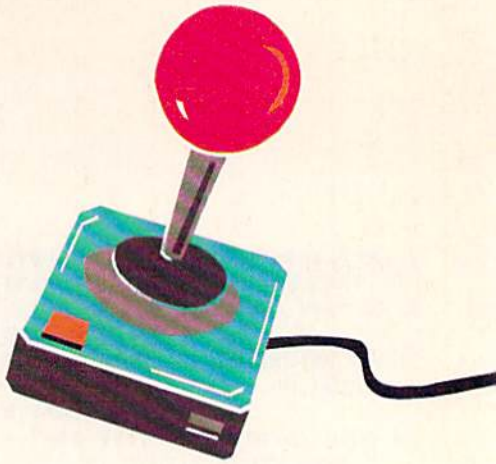
GAMES GALLERY

Lost in a dungeon? Lacking gold pieces or inventory? Don't despair—hint books can come to your rescue!

By BOB GUERRA



I'M ABOARD THE SPACESHIP Heart of Gold. To the west, a screen door blocks my entry into Marvin's pantry. Marvin—a depressing, yet highly intelligent, robot—can come and go through the door as he pleases. Unfortunately, the door demands some small sign of my intelligence before it will let me pass.

I consult the Hitchhiker's Guide and check my inventory: advanced tea substitute, pocket fluff, a towel, a babel fish (in my ear), a screwdriver and some unidentifiable thing my aunt gave me. It's difficult to prove your intelligence when you carry around an assortment of junk like that. However, I know that if I can only get past that screen door, Marvin will help me open the ship's access hatch and maybe, just once, I'll be able to complete a text adventure.

I also know that without some assistance, I'll put Infocom's Hitchhiker's Guide to the Galaxy back on the shelf. It'll sit there alongside other adventure and fantasy role-playing games that haven't seen the inside of my disk drive since the last time I became hopelessly lost in a dungeon or watched my fearless band of on-screen warriors massacred at the hands of wandering orcs.

Buy a clue book? Aren't they only for cheaters and weak-willed adventurers who don't have the fortitude to plug away on their own? I swallow my pride and plunk down $7.95 for my first InvisiClues hint booklet from Infocom.

With that purchase, I realized that none of my adventure or role-playing games need sit idly on the shelf. I can obtain clue books specific to a variety of commercial games. Hints and complete walk-throughs are available online with CompuServe and Q-Link, in monthly newsletters devoted exclusively to the adventure/role-playing game genre, and in large volumes that contain solutions and maps. The next time you find yourself roaming aimlessly through a monster-infested dungeon, here's where to turn for help.

CLUE ME IN!

Although most of Infocom's newest adventures have hints built right into the programs and documentation, InvisiClues are available for all their classic text adventures like Suspended, Deadline and Zork Trilogy, as well as for some of their more recent text-only games like Plundered Hearts, Beyond Zork, Stationfall and Lurking Horror. What separates InvisiClues from most other hint books is a magic marker that lets you reveal only the tip(s) you need to solve whatever has you stumped, without giving away the rest of the story.

Some helpful hint and clue books.

Several other companies have published clue books, partly in response to a deluge of letters and phone calls from gamers wondering where they can find things like "the jewel-encrusted sword." Electronic Arts, for example, currently has hint books available for all three Bard's Tales, Wasteland, Deathlord and Mars Saga.

Instead of simply providing you with a set of maps and step-by-step instructions for completing these games, tip books are generally written in a narrative style, adding details or subplots to enhance the player's enjoyment. The Wasteland Survival Guide, for instance, tells the story of four nuclear-war survivors who set out to explore the radioactive desert of the American southwest. Illuminating the places you must visit and the objects you need to pick up, it helps you succeed in your quest.

The Masters Collection Advanced Hint Book features hints, maps and strategy tips for some of Epyx' titles: The Legend of Blacksilver, Space Station Oblivion, L.A. Crackdown and Sub Battle Simulator. The sections on Blacksilver and Oblivion are the most detailed; the latter includes a map of the planet Mitral that can be photocopied and folded into a polyhedron. The Sub Battle Simulator part is the weakest, as it contains only a few pages of general strategy tips and classic submarine warfare tactics.

Frustrated Might & Magic fans can finally discover the "Secret of the Inner Sanctum" with New World Computing's Adventurer's Guide. It contains 60 pages of maps, as well as a list of specific locations for hard-to-find items. All the tips are printed in a number/letter code that prevents you from inadvertently learning more than you want to know. In addition, over 200 items found in the software are cataloged in a table that lists information such as the alignment needed to use an item, the class (knight, sorcerer, and so on) allowed to use it, any special powers associated with it, and the item's gold value.

Origin Systems, publishers of the Ultima series of fantasy role-playing games, distributes clue books for Ultimas III, IV and V. These guides, Secrets of Sosaria, Way of the Avatar and Paths of Destiny, are required reading for all Ultima addicts. They feature extensively detailed maps, along with vital information on the use of potions, scrolls and a variety of mystical artifacts. Origin also publishes Quest for Clues, a compendium of solutions and walk-throughs for over 50 adventure and role-playing games.

Shay Addams, the editor of Quest for Clues, produces a monthly newsletter called Questbusters: The Adventurer's Journal. Each 16-page issue contains at least one complete walk-through. In addition, the columns Waiting for Duffy and Keys to the Kingdom provide a forum for readers to ask specific questions of other adventurers and share tips with readers.

ON-LINE ACTION

Sometimes you simply can't wait to find out how to get through Dungeon

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Hythloth to the Underworld. When you've got an adventuring question that needs an immediate answer, one of the best places to turn to is the electronic gamer SIG on CompuServe [GO TEG]. There you'll find game hints, reviews and complete walk-throughs to 30 Infocom games and 80 other adventure and role-playing programs. The walk-throughs are usually divided into sections, allowing you to download only the part you need. In most cases, you can log on, find the information you desire and log off in under five minutes.

QuantumLink can also be a valuable resource for adventurers in search of advice. Although Q-Link doesn't offer the same type of help as CompuServe, its Commodore Information Network includes a gamer's support group. You can direct questions to representatives from Electronic Arts, Accolade, Mediagenic, Epyx, Mindscape and others in Q-Link's Commodore Software Showcase.

Further, don't be afraid to ask for help from your local BBS. Even if the conversation usually centers on the latest GEOS application or public domain terminal software, there might be some adventurer out there who has just the information you're looking for. Be sure, too, to check out that board's list of other BBSs in the area. If you call boards with names like Dragonslayers' Den, you're sure to find fellow adventurers willing to share their secrets. ■

Bob Guerra, editor for a Boston hospital, reports that, with a little help, he has successfully completed many adventure games.

Table 1. Clue books referenced.

Infocom's InvisiClues
$7.95 and $9.95
Available from: Triton Products
1159 Triton Drive
Foster City, CA 94404

Electronic Arts' clue books
$12.95 each
Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404

Origin Systems' Ultima clue books
$12.95 each
Quest for Clues
$24.99
Origin Systems
136-B Harvey Rd.
Londonderry, NH 03053

Epyx' Masters Collection: Advanced Hint Book
$7.99
Available from: Softmail
2995 Woodside Rd., Suite 400-383
Woodside, CA 94062

New World Computing's Adventurer's Guide to Might and Magic
$12.95
Available from: Mediagenic
3885 Bohannon Drive
Menlo Park, CA 94025

Questbusters: The Adventurers' Journal
$18 per year
Shay Addams
PO Box 32698
Tucson, AZ 85751

Table 2. Clue books not mentioned in text.

Lucasfilm Games' clue books
$7.95 each
Lucasfilm
PO Box 2009
San Rafael, CA 94912

Strategic Simulation's Pool of Radiance Clue Book
$12.95
Strategic Simulations, Inc.
1046 N. Rengstorff Ave.
Mountain View, CA 94043

The Electronic Battlefield
by Bob Guerra
$12.95
Compute! Publications
PO Box 5406
Greensboro, NC 27403

Keys to Solving Computer Adventure Games, Book II
by M. K. Simon
$19.95
Prentice-Hall
Englewood Cliffs, NJ 07632

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CALORIE COUNTER

From p. 31.

```
    R PRINTER (S/P)?";  :REM*210
700 X$="":GETX$:IFX$<>"P"ANDX$<
    >"S"THEN700         :REM*135
710 OD=-3*(X$="S")-PD*(X$="P")
                        :REM*251
720 X$="":GOSUB1330:X1=24:X2=24
    :GOSUB2270          :REM*52
730 TC=0:ND=0:X2=0:F=1:DX$=D1$:
    NE=0:Z=0:F2=1       :REM*153
740 INPUT#3,D$:INPUT#3,J:INPUT#
    3,K:X=ST:IF D$<D1$THEN840
                        :REM*245
750 IF D$>D2$THEN850    :REM*234
760 IF F THEN F=0:Z1=K:IF D$<>D
    1$ THEN D1$=D$      :REM*180
770 TC=TC+J             :REM*157
780 IF D$=DX$ THEN 840  :REM*237
790 ND=ND+1:IF F2THENF2=0:DX$=D
    $                   :REM*244
800 DY$=DX$:DZ$=D$:GOSUB1340:Z=
    Z-ED+1              :REM*212
810 IFZ>0THEN840        :REM*181
820 NE=NE+1:IFNE<31THENWA(NE)=K
                        :REM*48
830 Z=Z+IN:GOTO810      :REM*212
840 IF(XAND64)=0THENDX$=D$:GOTO
    740                 :REM*48
850 REM                 :REM*226
860 CLOSE3:CLOSE15:WA(NE)=WT:IF
    ND<>0THEN880        :REM*240
870 M$(0)="NO DATA BETWEEN "+D1
    $+" AND "+D2$:X$="":GOSUB16
    20:GOTO5900         :REM*1
880 DY$=D1$:DZ$=D2$:GOSUB1340
                        :REM*113
890 OPEN3,OD:IFOD=3THENPRINT"{S
    HFT CLR}"           :REM*217
900 PRINT#3,"REPORT FOR: "NM$:P
    RINT#3              :REM*157
910 X1=INT(ED/7):X2=ED-X1*7:PRI
    NT#3,D1$" TO "D2$";"X1"WEEK
    S,"X2"DAYS"         :REM*173
920 PRINT#3,MID$(STR$(ND),2)" O
    UT OF"ED"DAYS REPORTED"
                        :REM*217
930 PRINT#3,"IDEAL WEIGHT:"STR$
    (W1)"/"MID$(STR$(W2),2)SPC(
    8)"GOAL:"DW         :REM*91
940 PRINT#3,"START WEIGHT:"Z1SP
    C(5)"END WEIGHT:"WT :REM*19
950 PRINT#3,"HOURS OF EXERCISE
    PER WEEK:"AL        :REM*142
960 AC=INT(TC/ND):PRINT#3,"AVG.
     DAILY CALORIES:"AC:NC=WT-Z
    1:X$="GAINED"       :REM*213
970 IFNC<=0THENX$="LOST":PRINT#
    3,"TOTAL POUNDS "X$":"ABS(N
    C)                  :REM*224
980 J=INT(ED/7+.5)      :REM*131
990 X=INT((AC-W1*15-AL*2*W1/7)*
    ED/350)/10:Y$="GAIN":IFX<=0
    THENY$="LOSS"       :REM*152
1000 PRINT#3,"{4 SPACEs}EXPECTE
     D "Y$":"ABS(X)"LBS"
                        :REM*227
1010 IFJTHENPRINT#3,"AVG. POUND
     S "X$" PER WEEK:"INT(ABS(N
     C)/J*10)/10        :REM*167
1020 DL=0:IFNC<>0ANDED<>0THENDL
     =(WT-DW)/(NC/ED)   :REM*232
1030 IF(WT<=DW)AND(Z1>=DW)AND((
     WT-Z1)<0)THEN1100  :REM*241
1040 IF(WT>=DW)AND(Z1<=DW)AND((
     WT-Z1)>0)THEN1100  :REM*221
1050 IF((WT>DW)AND((WT-Z1)>=0))
     OR((WT<DW)AND((WT-Z1)<=0))
     THENX$="NEVER":GOTO1080
                        :REM*158
1060 WK=ABS(INT(DL/7+.5)):X$="I
     N"+STR$(WK)+" WEEKS"
                        :REM*105
1070 IFWK<2THENX$=" THIS WEEK"
                        :REM*10
1080 PRINT#3,"AT THIS RATE, YOU
      CAN EXPECT TO REACH"
                        :REM*54
1090 PRINT#3,"YOUR DESIRED WEIG
     HT: ";X$:GOTO1120  :REM*223
1100 PRINT#3,"CONGRATULATIONS!{
     2 SPACEs}YOU HAVE REACHED"
                        :REM*138
1110 PRINT#3,"YOUR DESIRED WEIG
     HT!"               :REM*84
1120 PRINT#3:PRINT#3:PRINT#3:IF
      OD<>3 THEN 1140   :REM*88
1130 X1=25:X2=25:X$="":CF=1:PK=
     1:GOSUB2270        :REM*16
1140 HW=0:LW=999:FORK=1TONE:IFW
     A(K)>HWTHENHW=WA(K):REM*38
1150 IF WA(K)<LWTHENLW=WA(K)
                        :REM*140
1160 NEXT               :REM*15
1170 IFOD=3THENPRINT"{SHFT CLR}
     "                  :REM*239
1180 PRINT#3:X$="{6 SPACEs}WEIG
     HT{6 SPACEs}"      :REM*77
1190 HW=HW+4:LW=LW-4:I=INT((HW-
     LW)/18+.5):IF I=0THENI=1
                        :REM*142
1200 FORJ=1TO18:Z$=STR$(INT(HW+
     .5)):Z$=LEFT$("{3 SPACEs}"
     ,4-LEN(Z$))+Z$     :REM*20
1210 PRINT#3," "MID$(X$,J,1)Z$;
     "{SHFT -}";        :REM*180
1220 FORK=1TO30:Z$=" ":IF ABS(W
     A(K)-HW-.01)<=I/2THENZ$="{
     SHFT Q}"           :REM*231
1230 PRINT#3,Z$;:NEXTK:HW=HW-I:
     PRINT#3:NEXTJ:PRINT#3,SPC(
     6)"{COMD Z}";      :REM*251
1240 FORJ=1TO5:PRINT#3,"{4 SHFT
      *s}{SHFT +}";:NEXT:PRINT#
     3,"{4 SHFT *s}{COMD W}":PR
     INT#3,SPC(11)"5 ";:REM*225
1250 FOR J=10TO30STEP5:PRINT#3,
     " "J;:NEXT:PRINT#3:PRINT#3
                        :REM*116
1260 T=19:L$="WEEK":IFIN=1THENL
     $=" DAY"           :REM*26
1270 IF(IN<>1)AND(IN<>7)THENL$=
     STR$(IN)+" DAY INTERVAL":T
     =14                :REM*80
1280 PRINT#3,SPC(T)L$:IFOD<>3TH
     EN1310             :REM*42
1290 PRINT"{CRSR DN}"TAB(9)"{CT
     RL 9}PRESS ANY KEY TO CONT
     INUE";             :REM*251
1300 GET X$:IF X$=""THEN1300
                        :REM*53
1310 PRINT#3:PRINT#3:CLOSE3:GOT
     O170               :REM*32
1320 Z$="{CTRL 8}{CTRL 9} CALOR
     IE COUNT:"+STR$(CC)+" {CTR
     L 0}{CTRL 2}{3 SPACEs}":PR
     INT"{HOME}{CRSR DN}"TAB(9)
     Z$:RETURN          :REM*55
1330 X1=2:X2=2:CF=1:GOSUB2260:G
     OSUB1460:RETURN    :REM*239
1340 ED=0:IFDZ$<DY$THENED=-1:RE
     TURN               :REM*83
1350 Y1=VAL(LEFT$(DY$,2)):M1=VA
     L(MID$(DY$,4,2)):D1=VAL(MI
     D$(DY$,7,2))       :REM*132
1360 Y2=VAL(LEFT$(DZ$,2)):M2=VA
     L(MID$(DZ$,4,2)):D2=VAL(MI
     D$(DZ$,7,2))       :REM*12
1370 ML%(2)=28-((INT(Y1/4)*4)=Y
     1)                 :REM*61
1380 IF(Y1=Y2)AND(M1=M2)AND(D1=
     D2)THENED=ED+1:RETURN
                        :REM*238
1390 ED=ED+1:D1=D1+1:IFD1<=ML%(
     M1)THEN1380        :REM*102
1400 M1=M1+1:D1=1:IFM1<13THEN13
     80                 :REM*101
1410 M1=1:Y1=Y1+1:GOTO1370
                        :REM*108
1420 PRINT"{SHFT CLR}{CRSR DN}{
     CTRL 9}CALORIE DATA MUST B
     E LOGGED IN"       :REM*242
1430 PRINT"{CTRL 9}CHRONOLOGICA
     L ORDER."          :REM*112
1440 PRINT"{CTRL 9}CAN'T SAVE D
     ATA PRIOR TO "DZ$".":GOSUB
     1450:RETURN        :REM*116
1450 X1=1:X2=2:X$="":CF=1:PK=1:
     GOSUB2270:RETURN   :REM*227
1460 IF SFTHENRETURN    :REM*20
1470 V$=NM$:V$=V$+LEFT$(BL$,10-
     LEN(V$))+DT$+"{2 SPACEs}CA
     LORIES:"           :REM*40
1480 V$=V$+MID$(STR$(CC),2)+"/"
     +MID$(STR$(DW*10),2)
                        :REM*147
1490 V$=V$+LEFT$(BL$,38-LEN(V$)
     )                  :REM*178
1500 W$="WEIGHT:"+MID$(STR$(WT)
     ,2)+"{4 SPACEs}GOAL:"+MID$
     (STR$(DW),2)+"{3 SPACEs}ID
     EAL:"              :REM*104
1510 W$=W$+MID$(STR$(W1),2)+"/"
     +MID$(STR$(W2),2):W$=W$+LE
     FT$(BL$,38-LEN(W$)):REM*67
1520 IF SFTHENRETURN    :REM*88
1530 IF CT=64THEN1550   :REM*52
1540 SYSP,0,0,0,1:K1=PEEK(7):K2
     =PEEK(8):SYSP,0,23,0,0:GOT
     O1570              :REM*86
1550 POKE783,1:SYSP:K1=PEEK(781
     ):K2=PEEK(782):POKE783,0:P
     OKE781,23:POKE782,0:REM*23
1560 SYSP               :REM*81
1570 PRINT" {CTRL 2}{CTRL 9}"V$
     :PRINT" {CTRL 9}"W$"{CTRL
     0}";               :REM*224
1580 IFCT=64THENPOKE783,0:POKE7
     81,K1:POKE782,K2:SYSP:RETU
```


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    RN                          :REM*147
159Ø SYSP,Ø,K1,K2,Ø:RETURN
                                :REM*95
16ØØ IF CC>ØTHEN163Ø            :REM*124
161Ø M$(Ø)="CAN'T SAVE Ø CALORI
    E COUNT"{31 SPACEs}
                                :REM*153
162Ø X1=Ø:X2=1:PK=1:CF=1:GOSUB2
    26Ø:RETURN                  :REM*239
163Ø IF DT$>DZ$THEN165Ø:REM*135
164Ø GOSUB142Ø:GOTO17Ø          :REM*9
165Ø X$="":GOSUB133Ø:X1=12:X2=1
    2:GOSUB227Ø:Z$="A":REM*119
166Ø CLOSE3:CLOSE15:OPEN15,D,15
    :OPEN3,D,3,NM$+".LOG,S,"+Z
    $                           :REM*224
167Ø INPUT#15,E,E$:IF E=Ø THEN
    17ØØ                        :REM*11Ø
168Ø IF E=62 THEN Z$="W":GOTO16
    6Ø                          :REM*17Ø
169Ø M$(Ø)="DISK ERROR: "+E$:CL
    OSE3:CLOSE15:GOTO162Ø
                                :REM*24Ø
17ØØ PRINT#3,D$:PRINT#3,CC:PRIN
    T#3,WT:CLOSE3:CLOSE15:MD=Ø
    :DZ$=DT$:RETURN             :REM*157
171Ø GOSUB226Ø:PRINT"{CRSR DN}"
    TAB(15)"YEAR":K1=VAL(LEFT$
    (D$,2)):S$=MID$(STR$(K1),2
    )                           :REM*211
172Ø R=11:C=22:W=2:GOSUB186Ø:K1
    =VAL(S$)                    :REM*157
173Ø PRINT"{CRSR DN}"TAB(15)"MO
    NTH":K2=VAL(MID$(D$,4,2)):
    S$=MID$(STR$(K2),2)
                                :REM*2Ø4
174Ø R=13:C=22:W=2:GOSUB186Ø:K2
    =VAL(S$):IF(K2<1)OR(K2>12)
    THEN174Ø                    :REM*2Ø7
175Ø PRINT"{CRSR DN}"TAB(15)"DA
    Y":K3=VAL(MID$(D$,7,2)):S$
    =MID$(STR$(K3),2)           :REM*72
176Ø ML%(2)=28-((INT(K1/4)*4)=K
    1)                          :REM*222
177Ø R=15:C=22:W=2:GOSUB186Ø:K3
    =VAL(S$):IFK3>ML%(K2)THEN1
    77Ø                         :REM*1Ø9
178Ø X$=MID$(STR$(K1),2):IF LEN
    (X$)=1 THEN X$="Ø"+X$
                                :REM*88
179Ø D$=X$+"/":X$=MID$(STR$(K2)
    ,2):IF LEN(X$)=1THENX$="Ø"
    +X$                         :REM*125
18ØØ D$=D$+X$+"/":X$=MID$(STR$(
    K3),2):IF LEN(X$)=1 THEN X
    $="Ø"+X$                    :REM*26
181Ø D$=D$+X$:RETURN            :REM*136
182Ø IF MD<>ØTHENPRINT"{SHFT CL
    R}{2 CRSR DNs}":GOSUB278Ø
                                :REM*147
183Ø X1=2:X2=2:CF=1:X$="INPUT N
    EW DATE":D$=DT$:GOSUB171Ø
                                :REM*81
184Ø IF D$<DZ$THENGOSUB142Ø
                                :REM*33
185Ø DT$=D$:CC=Ø:MD=Ø:GOTO17Ø
                                :REM*248
186Ø IF S$="Ø"THENS$="":REM*198
187Ø GOSUB243Ø:PRINT"{CRSR LF}>
    {CTRL 9}"S$LEFT$(BL$,W-LEN
    (S$))"{CTRL Ø}<{CTRL 9}";:
    N=LEN(S$):C=C+N             :REM*41
188Ø GOSUB243Ø:C=C-N            :REM*218
189Ø POKECB,Ø:GETY$:IFY$=""THEN
    189Ø                        :REM*171
19ØØ POKECB,1:POKE212,Ø:X=ASC(Y
    $):IFX<>13THEN193Ø          :REM*86
191Ø PRINT"{CTRL 9} ";:IFLEN(S$
    )=WTHENPRINT"{CRSR LF}{CTR
    L Ø}<";                     :REM*16Ø
192Ø PRINT:RETURN               :REM*61
193Ø IFX<>2ØORN=ØTHEN197Ø
                                :REM*127
194Ø N=N-1:S$=LEFT$(S$,N):GOSUB
    243Ø:PRINT"{CTRL 9}"S$;:PO
    KEQM,Ø:PRINT"{2 SHFT SPACE
    s}{CRSR LF}";               :REM*145
195Ø IFLEN(S$)=W-1THENPRINT"{CT
    RL Ø}<";                    :REM*Ø
196Ø C=C+N:GOSUB243Ø:C=C-N:GOTO
    189Ø                        :REM*4Ø
197Ø IFN=WTHEN189Ø              :REM*161
198Ø IF(X>31ANDX<129)OR(X>161)T
    HENPRINTY$;:S$=S$+Y$:N=N+1
                                :REM*66
199Ø GOTO189Ø                   :REM*38
2ØØØ X$="PLEASE TYPE YOUR NAME:
    ":GOSUB133Ø:S$=NM$:W=1Ø:R=
    12:C=15                     :REM*7Ø
```


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CALORIE COUNTER

```
201Ø GOSUB 186Ø:IFS$=""THEN2Ø1Ø
                        :REM*181
202Ø NM$=S$:CLOSE15:OPEN15,D,15
     :F$=NM$+".DAT":OPEN3,D,3,F
     $+",S,R":INPUT#15,E,E$
                        :REM*6Ø
203Ø IF E<>62 THEN 2Ø6Ø :REM*11
204Ø M$(Ø)="CAN'T FIND DATA FIL
     E "+F$:X1=Ø:X2=1:CF=1:PK=1
     :GOSUB227Ø         :REM*8
205Ø KF=1:GOTO21ØØ      :REM*151
206Ø IF E=Ø THEN 2Ø8Ø    :REM*51
207Ø M$(Ø)="DISK ERROR: "+E$:X1
     =Ø:X2=Ø:GOSUB227Ø:CLOSE15:
     END                :REM*48
208Ø INPUT#3,DT$:INPUT#3,WT:INP
     UT#3,W1:INPUT#3,W2:INPUT#3
     ,DW:INPUT#3,AL     :REM*35
209Ø INPUT#3,DZ$:CLOSE3:REM*182
21ØØ X1=2:X2=2:CF=1:X$="INPUT T
     HE DATE":D$=DT$:GOSUB171Ø:
     DY$=DT$:DT$=D$     :REM*6Ø
211Ø PRINT"{2 CRSR DNs}"TAB(7)"
     {CTRL 9}INPUT YOUR CURRENT
      WEIGHT":R=2Ø:C=18:W=3
                        :REM*112
212Ø S$=MID$(STR$(WT),2):GOSUB1
     86Ø:WT=VAL(S$)     :REM*63
213Ø D1$=DY$:D2$=DT$:GOSUB134Ø:
     IFED<3THENDT$=D$:GOTO224Ø
                        :REM*92
214Ø PRINT"{SHFT CLR}{CRSR DN}{
     CTRL 9}PROGRAM WAS LAST US
     ED ON "DY$         :REM*9
215Ø PRINT"{CTRL 9}WHICH IS"+ST
     R$(ED-1)+" DAYS AGO."
                        :REM*23
216Ø PRINT"{CTRL 9}CALORIE DATA
      MUST BE ENTERED IN"
                        :REM*235
217Ø PRINT"{CTRL 9}CHRONOLOGICA
     L ORDER--IF YOU LOG"
                        :REM*119
218Ø PRINT"{CTRL 9}CALORIE DATA
      FOR TODAY YOU CAN'T"
                        :REM*3
219Ø PRINT"{CTRL 9}GO BACK TO A
     N EARLIER DATE LATER."
                        :REM*169
22ØØ PRINT"{CRSR DN}{CTRL 9}DO
     YOU WANT TO CHANGE THE DAT
     E (Y/N)?"          :REM*199
221Ø GETX$:IFX$<>"Y"ANDX$<>"N"T
     HEN221Ø            :REM*129
222Ø 1F X$="N"THENRETURN
                        :REM*167
223Ø X$="INPUT NEW DATE":D$=DY$
     :GOSUB171Ø:DT$=D$  :REM*32
224Ø IFKFTHENKF=Ø:GOSUB246Ø
                        :REM*96
225Ø RETURN             :REM*81
226Ø PRINT"{SHFT CLR}" :REM*249
227Ø IF(X$<>"")AND(X1<>2)THENPR
     INTTAB((4Ø-LEN(X$))/2)"{3
     CRSR DNs}{CTRL 9}"X$"{CRSR
      DN}":X$=""        :REM*1Ø4
228Ø L1=Ø:FORK=X1TOX2:IFLEN(M$(
     K))>L1THENL1=LEN(M$(K))
                        :REM*167
229Ø NEXTK              :REM*Ø
23ØØ W=L1+4-CF*2:Z=(4Ø-W)/2:PRI
     NTTAB(Z)"{CRSR DN}{CTRL 8}
     {CTRL 9}"LEFT$(BL$,W)
                        :REM*176
231Ø FORK=X1TOX2:IF CF THEN Y$=
     LEFT$(BL$,(W-LEN(M$(K)))/2
     ):GOTO233Ø         :REM*112
232Ø Y$=" {CTRL Ø}"+MID$(STR$(K
     -X1+1),2)+"{CTRL 9} "
                        :REM*163
233Ø Z$=Y$+M$(K):PRINTTAB(Z)"{C
     TRL 9}"Z$LEFT$(BL$,W-LEN(Z
     $)-2*(CF=Ø))       :REM*134
234Ø IF(SP=Ø)OR(K=X2)THENPRINTT
     AB(Z)"{CTRL 9}"LEFT$(BL$,W
     )                  :REM*131
235Ø NEXTK:PRINT"{CTRL 2}";
                        :REM*246
236Ø IF(X$<>"")THENPRINTTAB((4Ø
     -LEN(X$))/2)"{3 CRSR DNs}{
     CTRL 9}"X$"{CRSR DN}":X$="
     "                  :REM*189
237Ø IF (CF AND (PK=Ø))ORSP THE
     NRETURN            :REM*252
238Ø IF PK=Ø THEN 241Ø :REM*136
239Ø GETY$:IFY$=""THEN239Ø
                        :REM*2Ø5
24ØØ PK=Ø:RETURN        :REM*131
241Ø Y$="":GET Y$:K=ASC(Y$+"Ø")
     -48:IF K<1 OR K>X2-X1+1THE
     N241Ø              :REM*191
242Ø RETURN             :REM*8
243Ø IFCT=64THENPOKE783,Ø:POKE7
     81,R:POKE782,C:SYSP:RETURN
                        :REM*18
244Ø SYSP,Ø,R,C,Ø:RETURN
                        :REM*174
245Ø GOSUB 246Ø:GOTO17Ø :REM*78
246Ø X1=2:X2=2:CF=1:X$="INPUT Y
     OUR HEIGHT":GOSUB226Ø
                        :REM*1Ø1
247Ø PRINT"{CRSR DN}"TAB(15)"FE
     ET":S$="":R=11:C=22:W=1
                        :REM*1Ø
248Ø GOSUB186Ø:K1=VAL(S$):IFK1=
     ØTHEN248Ø          :REM*217
249Ø PRINT"{CRSR DN}"TAB(14)"IN
     CHES":S$="":R=13:C=22:W=2:
     GOSUB186Ø:HT=12*K1+VAL(S$)
                        :REM*184
25ØØ GOSUB133Ø:X$="ARE YOU:":X1
     =5:X2=6:CF=Ø:GOSUB227Ø:KX=
     K                  :REM*212
251Ø GOSUB133Ø:X$="YOUR BODY ST
     RUCTURE:":X1=7:X2=9:CF=Ø
                        :REM*88
252Ø GOSUB227Ø:ON (KX-1)*3+KGOT
     O253Ø,254Ø,255Ø,256Ø,257Ø,
     258Ø               :REM*254
253Ø IW=2.71*HT-37.Ø1:IV=((HT-6
     2)*.57+7)/2:GOTO259Ø
                        :REM*116
254Ø IW=3*HT-51:IV=((HT-62)*.57
     +11)/2:GOTO259Ø    :REM*238
255Ø IW=3.57*HT-77.34:IV=(HT-62
     +13)/2:GOTO259Ø    :REM*193
256Ø IW=2.71*HT-5Ø.68:IV=((HT-5
     8)*.29+1Ø)/2:GOTO259Ø
                        :REM*25Ø
257Ø IW=2.86*HT-5Ø.88:IV=((HT-5
     8)*.14+13)/2:GOTO259Ø
                        :REM*253
258Ø IW=3.14*HT-57.12:IV=((HT-5
     8)*.5+14)/2        :REM*159
259Ø W1=INT(IW-IV+.5):W2=INT(IW
     +IV+.5)            :REM*171
26ØØ M$(11)=STR$(W1)+" AND"+STR
     $(W2)+" POUNDS"    :REM*2Ø9
261Ø X1=2:X2=2:CF=1:X$="HOW MAN
     Y HOURS DO YOU EXERCISE WE
     EKLY?":GOSUB226Ø   :REM*94
262Ø R=1Ø:C=18:W=3:S$=MID$(STR$
     (AL),2):GOSUB186Ø:AL=VAL(S
     $)                 :REM*141
263Ø PRINT"{2 CRSR DNs}"TAB(7)"
     {CTRL 9}INPUT YOUR DESIRED
      WEIGHT":R=15:C=18:W=3
                        :REM*167
264Ø S$=MID$(STR$(DW),2):GOSUB1
     86Ø:DW=VAL(S$)     :REM*125
265Ø GOSUB133Ø:X1=1Ø:X2=11:CF=1
     :GOSUB227Ø         :REM*23
266Ø IFDW>=WTTHEN273Ø  :REM*133
267Ø X=(WT-DW)*35ØØ/(W1*35+AL*2
     *W1):X=INT(X+.5)   :REM*1Ø5
268Ø M$(26)="BY LIMITING CALORI
     ES TO"+STR$(DW*1Ø)+" PER D
     AY"                :REM*23Ø
269Ø M$(27)="AND EXERCISING"+ST
     R$(AL)+" HOURS PER WEEK"
                        :REM*171
27ØØ M$(28)="YOU CAN EXPECT TO
     REACH YOUR WEIGHT":REM*177
271Ø M$(29)="GOAL IN"+STR$(X)+"
      WEEKS.{2 SPACEs}(PRESS AN
     Y KEY)"            :REM*241
272Ø X1=26:X2=29:CF=1:X$="":PK=
     1:GOSUB227Ø:RETURN:REM*117
273Ø X$="":GOSUB133Ø:X1=4:X2=4:
     GOSUB227Ø          :REM*249
274Ø CLOSE3:CLOSE15:OPEN15,D,15
     ,"SØ:"+NM$+".DAT":OPEN3,D,
     3,NM$+".DAT"+",S,W"
                        :REM*187
275Ø PRINT#3,DT$:PRINT#3,WT:PRI
     NT#3,W1:PRINT#3,W2:PRINT#3
     ,DW:PRINT#3,AL     :REM*174
276Ø PRINT#3,DZ$:CLOSE3:CLOSE15
     :IFMD<>ØTHENGOSUB278Ø
                        :REM*229
277Ø END                :REM*89
278Ø IF DT$<DZ$ THEN RETURN
                        :REM*178
279Ø PRINT"{2 CRSR DNs}"TAB(8)"
     {2 CRSR DNs}{CTRL 8}{CTRL
     9} UNSAVED CALORIE DATA! "
                        :REM*11
28ØØ PRINT"{CRSR DN}"TAB(13)"{2
      CRSR DNs}{CTRL 9} SAVE (Y
     /N)? {CTRL 2}"     :REM*35
281Ø GETX$:IFX$<>"Y"ANDX$<>"N"T
     HEN281Ø            :REM*16Ø
282Ø IF X$="Y"THENGOSUB16ØØ
                        :REM*28
283Ø RETURN             :REM*151
284Ø DATA 31,28,31,3Ø,31,3Ø,31,
     31,3Ø,31,3Ø,31     :REM*222
285Ø DATA PRESS ANY KEY TO CONT
     INUE               :REM*1ØØ
286Ø DATA CALORIE MINDER,PLEASE
```

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```
     WAIT - INITIALIZING
                          :REM*140
2870 DATA SAVING PROFILE DATA..
     .                    :REM*105
2880 DATA MALE,FEMALE,SMALL FRA
     ME,MEDIUM FRAME,LARGE FRAM
     E                    :REM*60
2890 DATA YOUR IDEAL WEIGHT IS
     BETWEEN,DUMMY        :REM*239
2900 DATA SAVING CALORIE DATA..
     .                    :REM*147
2910 DATA COUNT CALORIES,ANALYZ
     E CALORIE LOG,IDEAL WEIGHT
      ANALYSIS            :REM*59
2920 DATA CHANGE DATE,EXIT PROG
     RAM                  :REM*243
2930 DATA ADD CALORIES,NEXT SCR
     EEN, PREV SCREEN     :REM*10
2940 DATA SUBTRACT CALORIES,SAV
     E CALORIE DATA,MAIN MENU
                          :REM*72
2950 DATA READING CALORIE LOG..
     .                    :REM*254
2960 DATA PRESS ANY KEY TO SEE
     WEIGHT CHART         :REM*203
2970 DATA FINI            :REM*57
```

Listing 2. Calorie Data program. (Available on ReRUN disk. See page 52.)

```
100 D=8:SF=1              :REM*72
110 PRINT"{SHFT CLR}{CRSR DN}{C
    TRL 9}CALORIE DATA FILE MAK
    ER":PRINT"{CRSR DN}{CTRL 9}
    READING DATA STATEMENTS..."
                          :REM*184
120 DIM X(2000),X$(2000):K=1
                          :REM*122
130 READ X$(K):IF X$(K)="!!!"TH
    ENX(0)=K:GOTO 130     :REM*154
140 IFX$(K)<>"***"THENREADX(K):
    K=K+1:GOTO130         :REM*134
150 IF SF=0THEN230        :REM*239
160 K=K-1:PRINT"{CRSR DN}{CTRL
    9}SORTING...PLEASE WAIT"
                          :REM*29
170 F=0:J=1:IFX(0)THENJ=X(0)
                          :REM*183
180 FOR J=JTO K-1         :REM*34
190 IF X$(J)<=X$(J+1)THEN210
                          :REM*49
200 F=1:Z$=X$(J):Z=X(J):X$(J)=X-
    $(J+1):X(J)=X(J+1):X$(J+1)=
    Z$:X(J+1)=Z           :REM*129
210 NEXT J                :REM*233
220 IF F THEN 170         :REM*217
230 PRINT"{CRSR DN}{CTRL 9}CREA
    TING CAL.DATA FILE..."
                          :REM*198
240 OPEN15,D,15:OPEN3,D,3,"@0:C
    AL.DATA,S,W"          :REM*204
250 INPUT#15,E,E$:IF E=0 THEN 2
    70                    :REM*74
260 PRINT"DISK ERROR:{SHFT SPAC
    E}"E$:CLOSE3:CLOSE15:END
                          :REM*2
270 X$(0)="MARK":FOR J=0 TO K:P
    RINT#3,X$(J):PRINT#3,X(J):N
    EXT                   :REM*37
280 PRINT#3,"***":CLOSE3:CLOSE1
    5:PRINT"{CRSR DN}{CTRL 9}FI
    NISHED":END           :REM*199
1000 REM FIRST DATA STATEMENTS
     WILL NOT BE SORTED :REM*36
1010 DATA MISCELLANEOUS-010,10
                          :REM*132
1020 DATA MISCELLANEOUS-050,50
                          :REM*103
1030 DATA MISCELLANEOUS-100,100
                          :REM*207
1040 DATA !!!             :REM*185
1050 REM DATA STATEMENTS PAST H
     ERE WILL BE SORTED:REM*134
1060 DATA APPLE CIDER/6 OZ,80
                          :REM*161
1070 DATA APPLE JUICE/6 OZ,90
                          :REM*235
1080 DATA APPLE SAUCE/HALF CUP,
     90                   :REM*120
1090 DATA APPLE/3 IN.,96
                          :REM*238
1100 DATA APPLE/DRIED 1 CUP,208
                          :REM*81
1110 DATA APRICOT,17      :REM*59
1120 DATA BACON BITS/1 TSP,10
                          :REM*61
1130 DATA BACON/2 SLICES,110
                          :REM*223
1140 DATA BAGEL/3 OZ,240:REM*58
1150 DATA BANANA/9 IN.,110
                          :REM*220
1160 DATA BASS/4 OZ,125 :REM*91
1170 DATA BEANS/GREEN 1 CUP,44
                          :REM*31
1180 DATA BEANS/KIDNEY 1 CUP,23
     0                    :REM*230
1190 DATA BEANS/LIMA 1 CUP,208
                          :REM*145
1200 DATA BEANS/NAVY 1 CUP,220
                          :REM*86
1210 DATA BEANS/REFRIED HALF CU
     P,130                :REM*21
1220 DATA BEEF/GROUND LEAN 4 OZ
     ,300                 :REM*17
1230 DATA BEEF/ROAST 4 OZ,400
                          :REM*227
1240 DATA BEEF/ROUND STEAK 4 OZ
     ,300                 :REM*93
1250 DATA BEEF/SIRLOIN 4 OZ,330
                          :REM*172
1260 DATA BEER/12 OZ,160:REM*87
1270 DATA BEER/LIGHT 12 OZ,110
                          :REM*127
1280 DATA BEETS/1 CUP,52
                          :REM*245
1290 DATA BISCUIT,110  :REM*226
1300 DATA BLACK EYE PEAS/1 CUP,
     230                  :REM*164
1310 DATA BLACKBERRIES/1 CUP,74
                          :REM*58
1320 DATA BLUEBERRIES/1 CUP,82
                          :REM*39
1330 DATA BOLOGNA/1 SLICE,95
                          :REM*36
1340 DATA BRATWURST/1 OZ,87
                          :REM*209
1350 DATA BREAD/WHEAT SLICE,110
                          :REM*43
1360 DATA BRGR KNG/CHEESBURGER,
     360                  :REM*19
1370 DATA BRGR KNG/CHEESE WHALE
     R,590                :REM*174
1380 DATA BRGR KNG/CHEESE WHOPP
     ER,760               :REM*173
1390 DATA BRGR KNG/CHICKEN,690
                          :REM*31
1400 DATA BRGR KNG/DBL BEEF WHO
     PPER,890             :REM*160
1410 DATA BRGR KNG/DBL HAMBURGE
     R,430                :REM*206
1420 DATA BRGR KNG/FRIES,210
                          :REM*32
1430 DATA BRGR KNG/HAM'N CHEESE
     ,550                 :REM*8
1440 DATA BRGR KNG/HAMBURGER,31
     0                    :REM*15
1450 DATA BROCOLLI/1 CUP,46
                          :REM*109
1460 DATA BRUSSEL SPROUT,8
                          :REM*54
1470 DATA BUTTER/1 TSP,33
                          :REM*69
1480 DATA CABBAGE/1 CUP,32
                          :REM*174
1490 DATA CANDY/3 MUSKETEERS,26
     0                    :REM*244
1500 DATA CANDY/ALMOND JOY,240
                          :REM*47
1510 DATA CANDY/BABY RUTH/1 OZ,
     130                  :REM*161
1520 DATA CANDY/BRIDGE MIX/1 OZ
     ,140                 :REM*244
1530 DATA CANDY/BUTTERFINGER/2
     OZ,270               :REM*159
1540 DATA CANDY/CARAMEL/1 PIECE
     ,35                  :REM*172
1550 DATA CANDY/CHOC. CHERRY/1
     PIECE,90             :REM*185
1560 DATA CANDY/CHOC. KISSES/4,
     100                  :REM*77
1570 DATA CANDY/CHOCOLATE/2 OZ,
     290                  :REM*136
1580 DATA CANDY/LICORICE/1 OZ,1
     10                   :REM*203
1590 DATA CANDY/LIFE SAVER/1 PI
     ECE,10               :REM*98
1600 DATA CANDY/MALTED BALLS/1
     OZ,140               :REM*94
1610 DATA CANDY/MILKY WAY,270
                          :REM*63
1620 DATA CANDY/MOUNDS,230
                          :REM*46
1630 DATA CANDY/PEANUT BRITTLE/
     1 OZ,140             :REM*48
1640 DATA CANDY/PLANTER'S PEANU
     T,240                :REM*17
1650 DATA CANDY/REESE'S PNUT CU
     PS/2,250             :REM*216
1660 DATA CANDY/SNICKERS,270
                          :REM*21
1670 DATA CANDY/TOOTSIE ROLL,12
     0                    :REM*96
1680 DATA CANDY/WHATCHAMACALLIT
     ,210                 :REM*213 ►
```

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```
169Ø DATA CANDY/ZAGNUT,131                    :REM*175
17ØØ DATA CANDY/ZERO,25Ø                      :REM*165
171Ø DATA CANTALOUPE/1 CUP,52                 :REM*25
172Ø DATA CARROT/1 CUP,7Ø                     :REM*244
173Ø DATA CATFISH/4 OZ,1ØØ                    :REM*9Ø
174Ø DATA CAULIFLOWER/1 CUP,4Ø                :REM*138
175Ø DATA CHEESE/1 OZ,11Ø                     :REM*1Ø
176Ø DATA CHERRIES/1 CUP,1Ø4                  :REM*159
177Ø DATA CHICKEN PIE/FROZEN,5Ø
     Ø                                        :REM*187
178Ø DATA CHICKEN/BREAST HALF,1
     93                                       :REM*37
179Ø DATA CHILI/1 CUP,36Ø                     :REM*173
18ØØ DATA COLESLAW/HALF CUP,2ØØ               :REM*24
181Ø DATA COLLARD GREENS/CUP,27               :REM*16Ø
182Ø DATA CORN/1 EAR/HALF CUP,9
     Ø                                        :REM*69
183Ø DATA CRAB MEAT/4 OZ,11Ø                  :REM*212
184Ø DATA CRACKER/SALTINE,12                  :REM*23
185Ø DATA CRANBERRIES/CUP,46                  :REM*2Ø7
186Ø DATA CREAM/1 TBSP,4Ø                     :REM*22Ø
187Ø DATA CREAMER/1 TSP,14                    :REM*166
188Ø DATA CROISSANT,14Ø                       :REM*152
189Ø DATA CUCUMBER/1 CUP,14                   :REM*142
19ØØ DATA DIP/1 OZ,6Ø                         :REM*67
191Ø DATA DOMINOS/PIZZA CHEESE
     1SL,185                                  :REM*16
192Ø DATA DOMINOS/PIZZA PEPRNI
     1SL,2Ø5                                  :REM*157
193Ø DATA DUCK/ROAST 4 OZ,228                 :REM*1Ø8
194Ø DATA ECLAIR/CHOCOLATE,34Ø                :REM*238
195Ø DATA EGG/1 LARGE,79                      :REM*64
196Ø DATA ENCHILADA,14Ø                       :REM*1Ø3
197Ø DATA FISH STICKS/4,23Ø                   :REM*18
198Ø DATA FRANKFURTER,19Ø                     :REM*243
199Ø DATA FRITOS/HALF OZ,27Ø                  :REM*65
2ØØØ DATA GRAPE JUICE/6 OZ,12Ø                :REM*74
2Ø1Ø DATA GRAPEFRUIT JUICE/6 OZ
     ,12Ø                                     :REM*24Ø
2Ø2Ø DATA GRAPEFRUIT/HALF,45                  :REM*243
2Ø3Ø DATA GRAPES/1 CUP,58                     :REM*42
2Ø4Ø DATA HAM/ROASTED 3 OZ,25Ø                :REM*216
2Ø5Ø DATA HAM/SLICE 1 OZ,26                   :REM*67
2Ø6Ø DATA ICE CREAM/HALF CUP,15
     Ø                                        :REM*158
2Ø7Ø DATA ICE CREAM/PREMIUM,15Ø               :REM*12Ø
2Ø8Ø DATA ICE MILK/HALF CUP,11Ø               :REM*71
2Ø9Ø DATA JAM/2 TSP,35                        :REM*115
21ØØ DATA JELLY/2 TSP,35                      :REM*198
211Ø DATA KENTUCKY CHICKEN BREA
     ST,276                                   :REM*222
212Ø DATA KENTUCKY CHICKEN DRUM
     STICK,17Ø                                :REM*18Ø
213Ø DATA KENTUCKY CHICKEN THIG
     H,278                                    :REM*7
214Ø DATA KENTUCKY NUGGET SAUCE
     ,52                                      :REM*19
215Ø DATA KENTUCKY NUGGET/1,46                :REM*25
216Ø DATA LAMB/ROASTED 4 OZ,316               :REM*216
217Ø DATA LASAGNA/8 OZ,38Ø                    :REM*86
218Ø DATA LIQUOR/1 OZ,85                      :REM*81
219Ø DATA LIVER/4 OZ FRIED,4ØØ                :REM*253
22ØØ DATA LOBSTER MEAT/4 OZ,111               :REM*24
221Ø DATA LUNCHEON MEAT/1 OZ,1Ø►
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3 TECHNICAL PROGRAMS

Linear Programmer

Maximize: $Z = 2X_1 + X_2$

Subject to:

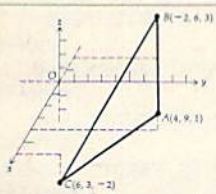
$3X_1 + X_2 \leq 44$

$X_2 \leq 10$

$X_1 + X_2 \leq 18$

$2X_1 + 5X_2 \leq 60$

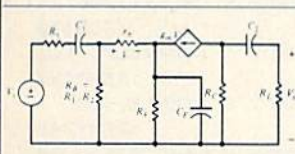
Solves linear programming problems of up to 50 variables and 35 constraints. Systems may be restricted by constraints of *equality, less than* or *greater than*, (different types may appear in the same problem). Objective (Z function) may be maximized or minimized. Computer displays solution (in example at left, $Z = 31$, $X_1 = 13$, $X_2 = 5$). Initial and final tableaus. Special command for easy entry of sparse contraints.



Analytical Geometry in 3 Dimensions

Solves numerical geometry problems like those found in college level analytical geometry text books. After entering point lines, planes and vectors, users may then calculate. Vector cross, dot, triple and scaler products. $\vec{A} \times \vec{B}$, $\vec{A} \cdot \vec{B}$, $\vec{A} \times \vec{B} \cdot \vec{C}$, $s\vec{A}$; find the angle between 2 lines, vectors or planes; find intersection of 3 planes, 2 planes, line and a plane; find a plane through 3 points, a point and a line, point and normal point and parallel plane,or perform 18 other geometric calculations. Entries made and answers displayed in users choice of several methods, including symetric equation, parametric equation, multiple points, direction and magnitude.

(NOT A GRAPHICS PROGRAM)



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Program computes general numeric solution to electronic circuit of up to 40 nodes and 63 branches. Branches may contain resistors, capacitors, inductors, current sources, voltage sources or 4 types of controlled sources. Computer displays node voltages, branch voltages, currents, powers and power factors. Step function of branch parameters or frequency with graphic display of results. Menu controlled and user friendly.

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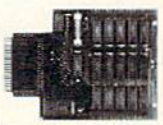

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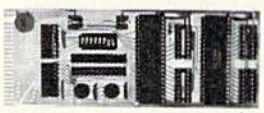

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CALORIE COUNTER

```
      Ø                         :REM*89
222Ø DATA MACADAMIA NUTS/1 OZ,2
      Ø4                        :REM*147
223Ø DATA MACARONI/CHEESE 1 CUP
      ,39Ø                      :REM*255
224Ø DATA MACARONI/COOKED 1 CUP
      ,19Ø                      :REM*133
225Ø DATA MARGARINE/1 TBSP,1ØØ
                                :REM*177
226Ø DATA MAYONNAISE/1 TBSP,1ØØ
                                :REM*59
227Ø DATA MCDONALD'S APPLE PIE,
      253                       :REM*28
228Ø DATA MCDONALD'S BIG MAC,57
      Ø                         :REM*15Ø
229Ø DATA MCDONALD'S BISCT/SAUS
      AGE/EGG,585               :REM*27
23ØØ DATA MCDONALD'S CHEESEBURG
      ER,318                    :REM*167
231Ø DATA MCDONALD'S CHERRY PIE
      ,26ø                      :REM*64
232Ø DATA MCDONALD'S CHICK MCNU
      GGETS/6,323               :REM*1Ø1
233Ø DATA MCDONALD'S EGGS SCRAM
      BLED,18Ø                  :REM*169
234Ø DATA MCDONALD'S ENG. MUFFI
      N,186                     :REM*31
235Ø DATA MCDONALD'S FISH FILET
      ,435                      :REM*147
236Ø DATA MCDONALD'S FRENCH FRI
      ES,22Ø                    :REM*187
237Ø DATA MCDONALD'S HAMBURGER,
      263                       :REM*157
238Ø DATA MCDONALD'S HASH BROWN
      S,125                     :REM*1Ø1
239Ø DATA MCDONALD'S HOTCAKES,5
      ØØ                        :REM*51
24ØØ DATA MCDONALD'S MILK SHAKE
      ,38Ø                      :REM*1Ø8
241Ø DATA MCDONALD'S SAUSAGE,21
      Ø                         :REM*78
242Ø DATA MCDONALD'S SUNDAE,32Ø
                                :REM*125
243Ø DATA MILK/LOW FAT 1 CUP,86
                                :REM*114
244Ø DATA MILK/SKIM 1 CUP,86
                                :REM*58
245Ø DATA MILK/WHOLE 1 CUP,15Ø
                                :REM*2Ø6
246Ø DATA NECTARINE/1 MEDIUM,67
                                :REM*21
247Ø DATA OIL/VEGETABLE 1 TBSP,
      12Ø                       :REM*33
248Ø DATA ORANGE DRINK/6 OZ,1ØØ
                                :REM*227
249Ø DATA ORANGE JUICE/8 OZ,111
                                :REM*136
25ØØ DATA ORANGE/1 MEDIUM,65
                                :REM*15
251Ø DATA OYSTER/4 OZ MEAT,1ØØ
                                :REM*183
252Ø DATA PANCAKE SYRUP/1 OZ,1Ø
      3                         :REM*184
253Ø DATA PANCAKE SYRUP/LITE 1
      OZ,67                     :REM*91
254Ø DATA PANCAKES/3 EA. 4 IN,2
      36                        :REM*85
255Ø DATA PARSNIPS/1 CUP,126
                                :REM*189
256Ø DATA PASTA/1 CUP COOKED,19
      2                         :REM*1
257Ø DATA PASTRAMI/1 OZ,99
                                :REM*63
258Ø DATA PEACH/1 MED,4Ø
                                :REM*163
259Ø DATA PEANUT BUTTER/2 TBSP,
      195                       :REM*19
26ØØ DATA PEANUT/1 OZ,18Ø
                                :REM*167
261Ø DATA PEAR/1 MED,98 :REM*56
262Ø DATA PEAS/1 CUP,134:REM*53
263Ø DATA PECANS/1 OZ,19Ø
                                :REM*1Ø1
264Ø DATA PEPPERONI/1 OZ,14Ø
                                :REM*13Ø
265Ø DATA PIE/1 SLICE,3ØØ
                                :REM*121
266Ø DATA PIZZA/1 SLICE,32Ø
                                :REM*1Ø8
267Ø DATA POPCORN/2 OZ,23Ø
                                :REM*233
268Ø DATA PORK/3 OZ,29Ø :REM*66
269Ø DATA POTATO CHIPS/1 OZ,16Ø
                                :REM*183
27ØØ DATA POTATO/1 CUP,118
                                :REM*25Ø
271Ø DATA POTATO/BAKED 1 MED,22
      Ø                         :REM*6
272Ø DATA PRETZELS/1 OZ,11Ø
                                :REM*73
273Ø DATA PRUNES/DRIED HALF CUP
      ,19Ø                      :REM*1Ø2
274Ø DATA PUDDING/5 OZ,19Ø
                                :REM*2Ø2
275Ø DATA QUICHE/1 SLICE,23Ø
                                :REM*152
276Ø DATA RAISINS/1 CUP,488
                                :REM*62
277Ø DATA RASPBERRIES/1 CUP,61
                                :REM*25Ø
278Ø DATA RAVIOLI/CANNED 8 OZ,2
      6Ø                        :REM*18Ø
279Ø DATA RICE/COOKED 2/3 CUP,1
      3Ø                        :REM*194
28ØØ DATA ROLL/BREAD,9Ø:REM*132
281Ø DATA SALAD DRESSING/1 TB,7
      Ø                         :REM*45
282Ø DATA SALAMI/1 OZ,9Ø
                                :REM*2ØØ
283Ø DATA SALMON/4 OZ,21Ø
                                :REM*216
284Ø DATA SARDINES/4 OZ, 2Ø2
                                :REM*187
285Ø DATA SAUERKRAUT/HALF CUP,2
      Ø                         :REM*141
286Ø DATA SCALLOPS/4 OZ,127
                                :REM*8
287Ø DATA SHIITAKE/1 CUP,8Ø
                                :REM*1Ø3
288Ø DATA SHORTENING/1 TB,116
                                :REM*145
289Ø DATA SHRIMP/4 LARGE,3Ø
                                :REM*11
29ØØ DATA SOFT DRINK COLA/12 OZ
      ,155                      :REM*68
291Ø DATA SOFT DRINK DR. PEPPER
      /12 OZ,144                :REM*197
292Ø DATA SOFT DRINK GINGER ALE
      /12 OZ,14Ø                :REM*161
293Ø DATA SOFT DRINK GRAPE/12 O
      Z,18Ø                     :REM*2Ø1
294Ø DATA SOFT DRINK ORANGE/12
      OZ,18Ø                    :REM*14
295Ø DATA SOFT DRINK SEVEN UP/1
      2 OZ,14Ø                  :REM*176
296Ø DATA SOFT DRINK SPRITE/12
      OZ,14Ø                    :REM*43
297Ø DATA SOFT DRINK TONIC/12 O
      Z,13Ø                     :REM*19Ø
298Ø DATA SPAGHETTI SAUCE/4 OZ,
      14Ø                       :REM*244
299Ø DATA SQUASH/CUBED 1 CUP,56
                                :REM*51
3ØØØ DATA STRAWBERRIES/1 CUP,45
                                :REM*238
3Ø1Ø DATA SUGAR/1 TSP,15:REM*59
3Ø2Ø DATA SWEET POTATO/8 OZ,234
                                :REM*147
3Ø3Ø DATA SWORDFISH/4 OZ,137
                                :REM*158
3Ø4Ø DATA TAMALE,14Ø     :REM*56
3Ø5Ø DATA TANGERINE,37   :REM*57
3Ø6Ø DATA TARTAR SAUCE/1 TB,7Ø
                                :REM*98
3Ø7Ø DATA TOMATO JUICE/6 OZ,35
                                :REM*193
3Ø8Ø DATA TOMATO/1 CUP,55:REM*7
3Ø9Ø DATA TORTILLA/1,5Ø:REM*255
31ØØ DATA TUNA IN OIL/2 OZ,15Ø
                                :REM*71
311Ø DATA TUNA IN WATER/2 OZ,6Ø
                                :REM*88
312Ø DATA TURKEY/4 OZ,195:REM*6
313Ø DATA TURNIP/1 CUP,3Ø
                                :REM*14
314Ø DATA V-8 JUICE/6 OZ,4Ø
                                :REM*157
315Ø DATA VEAL/4 OZ,267  :REM*7
316Ø DATA WAFFLE/FROZEN,12Ø
                                :REM*112
317Ø DATA WALNUTS/1 OZ,19Ø
                                :REM*115
318Ø DATA WATERMELON/1 CUP,5Ø
                                :REM*22Ø
319Ø DATA WENDY'S BACON CHEESEB
      URGER,46Ø                 :REM*71
32ØØ DATA WENDY'S CHILI,25Ø
                                :REM*6
321Ø DATA WENDY'S DANISH,36Ø
                                :REM*93
322Ø DATA WENDY'S DOUBLE,56Ø
                                :REM*163
323Ø DATA WENDY'S FRENCH TOAST,
      4ØØ                       :REM*184
324Ø DATA WENDY'S FRIES,28Ø
                                :REM*1Ø
325Ø DATA WENDY'S OMELET,28Ø
                                :REM*1Ø
326Ø DATA WENDY'S SCRAMBLED EGG
      S,19Ø                     :REM*192
327Ø DATA WENDY'S SINGLE,35Ø
                                :REM*248
328Ø DATA WENDY'S TACO SALAD,39
      Ø                         :REM*7
329Ø DATA WINE/4 OZ,92   :REM*2
33ØØ DATA YAM/1 CUP,177:REM*13Ø
331Ø DATA YOGURT/FRUIT 8 OZ,24Ø
                                :REM*16Ø
332Ø DATA YOGURT/PLAIN 8 OZ,15Ø
                                :REM*16Ø
333Ø DATA ***                   :REM*241
```

■

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RUN's Checksum

TYPE IN *RUN*'s CHECKSUM, which serves for both the C-64 and for the C-128 in either 40- or 80-Column mode, and save it to disk before running. When typing in a program from *RUN*, first load and run *RUN*'s Checksum. The screen will display a SYS number that deactivates and reactivates the Checksum. Always disable *RUN*'s Checksum before attempting to run another program. Note: You can abbreviate Basic keywords; spaces affect the checksum only when within quotes; and the order of characters affects the checksum.

With this new version, when you press return after typing in a program line, a one-, two-, or three-digit number from 0 to 255 appears in the home position. If this number matches the checksum value in the program listing, the line is correct. If the number that appears *doesn't* match the checksum value, compare the line with the magazine listing to find your error. Then move the cursor back up to the line and make your corrections. Now, after you press return, the correct checksum value should appear. Continue entering the listing until all the lines have been correctly typed. Then deactivate *RUN*'s Checksum, using the SYS number. Save the finished program.

All the graphics and control characters in the listings in *RUN* have been translated into understandable key combinations. They are the instructions you see inside the curly braces. For example, {SHIFT L} means you hold down the shift key while you press the L key. You do *not* type in the curly braces. What appears on the screen will look quite different from what is designated inside the braces. Here are some more examples:

{22 SPACEs}—press the space bar 22 times

{SHIFT CLR}—hold down the shift key and press the clr-home key

{2 CRSR DNs}—press the cursor-down key twice

{CTRL 1}—hold down the control key and press the 1 key

{COMD T}—hold down the Commodore logo key and press the T key

{FUNCT 1}—press the F1 key

{5 LB.s}—press the British pound key (*not* #) five times R

Listing 1. *RUN*'s Checksum program. This program is available on *RUN*'s BBS for users to download.

```
10 REM RUN'S CHECKSUM 64/128 - BOB KODADEK
20 MO=128:SA=3328:IF PEEK(40960)THEN MO=64:SA=4
   9152
30 FOR I=0TO169:READB:CK=CK+B:POKE SA+I,B:NEXT
40 IFCK<>20651 THENPRINT"DATA ERROR!":END
50 POKESA+110,240:POKESA+111,38:POKESA+140,234
60 PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":PRINT
70 PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO=128
   THEN 100
80 POKESA+13,124:POKESA+15,165:POKESA+25,124:PO
   KESA+26,165
90 POKESA+39,20:POKESA+41,21:POKESA+123,205:POK
   ESA+124,189
100 POKESA+4,INT(SA/256):SYS SA:NEW
110 DATA 120,162,24,160,13,173,4,3,201,24,208,4
    ,162,13,160,67,142,4,3,140
120 DATA 5,3,88,96,32,13,67,152,72,169,0,141,0,
    255,133,176,133,180,166,22
130 DATA 164,23,134,167,132,168,170,189,0,2,240
    ,58,201,48,144,7,201,58,176
140 DATA 3,232,208,240,189,0,2,240,42,201,32,20
    8,4,164,180,240,31,201,34
150 DATA 208,6,165,180,73,1,133,180,230,176,164
    ,176,165,167,24,125,0,2,133
160 DATA 167,165,168,105,0,133,168,136,208,239,
    232,208,209,169,42,32,210
170 DATA 255,165,167,69,168,170,169,0,32,50,142
    ,169,32,32,210,255,32,210
180 DATA 255,169,13,32,210,255,104,168,96,104,1
    70,24,32,240,255,104,168
190 DATA 96,56,32,240,255,138,72,152,72,24,162,
    0,160,0,32,240,255,169
200 DATA 42,208,198
```


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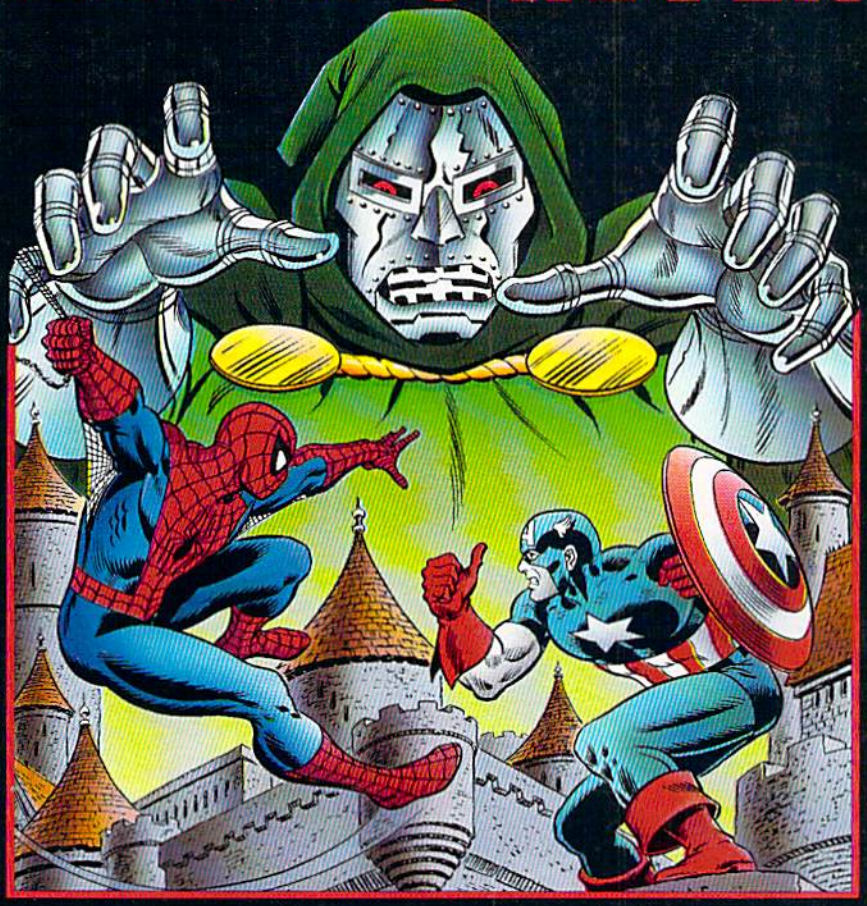

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