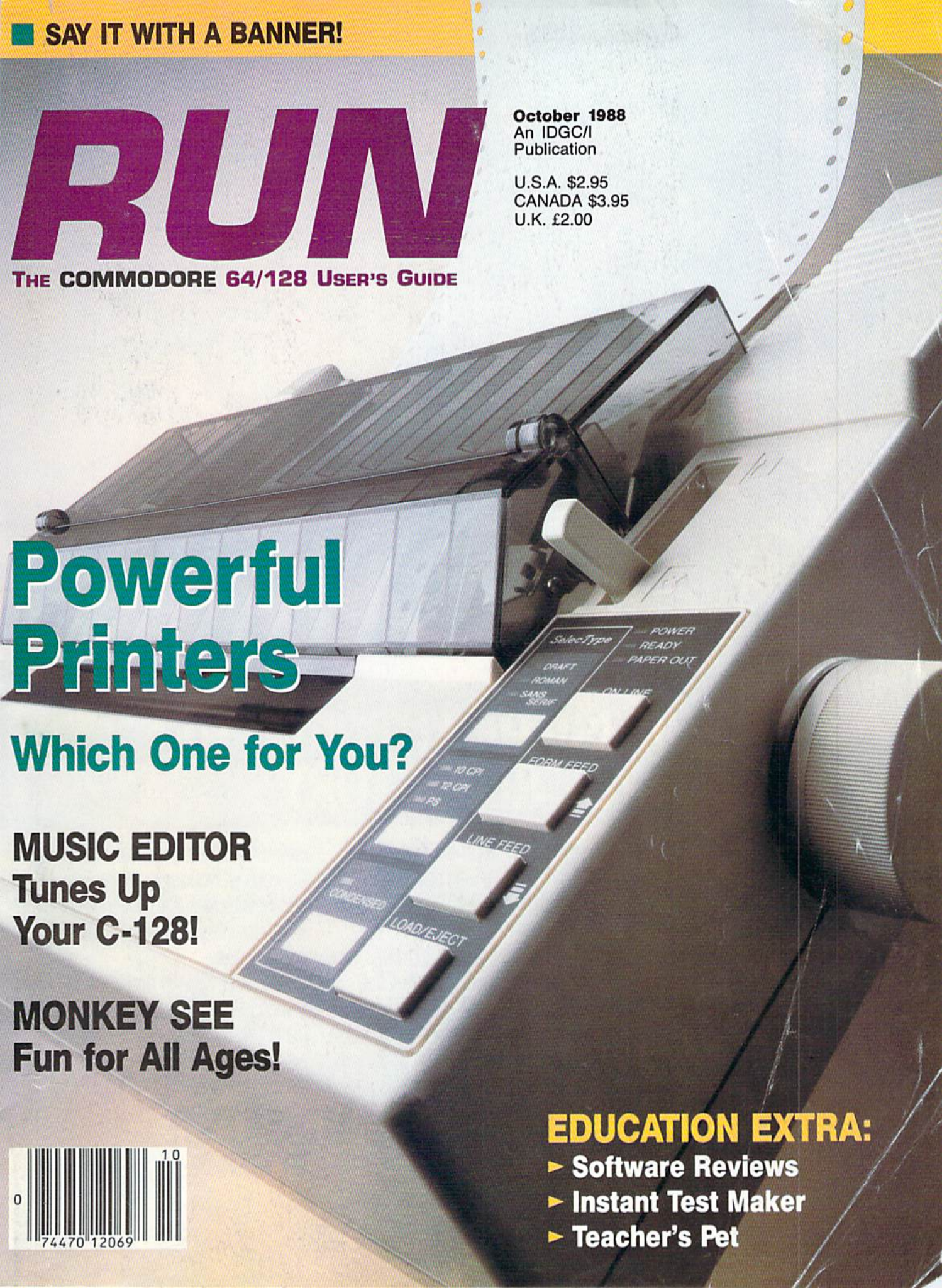
SAY IT WITH A BANNER!

RUN

THE COMMODORE 64/128 USER'S GUIDE

October 1988
An IDGC/I Publication

U.S.A. $2.95
CANADA $3.95
U.K. £2.00



Powerful Printers

Which One for You?

MUSIC EDITOR
Tunes Up Your C-128!

MONKEY SEE
Fun for All Ages!

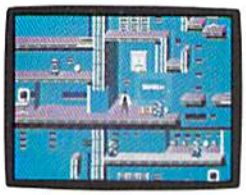
EDUCATION EXTRA:
- Software Reviews
- Instant Test Maker
- Teacher's Pet

0 74470 12069 10

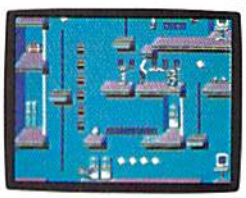


IF THIS IS THE FUTURE, THEN YOU'RE HISTORY.

Hold it. What's this? Human-seeking suicide robots? An evil mastermind bent on world annihilation?



There are 8 office towers to search, each with its own theme and level of difficulty.



Of course, Elvin's floor plans are almost as complicated as his global plans.

No wonder they call this mission impossible. Why, it's got even more strategy and action than the original top-selling Impossible Mission.™

The trick here is to collect the secret code numbers that will ultimately allow you to access Elvin's stronghold. And waste him before he wastes the world.

There are over 50 rooms to search for codes. Careful. The floors and catwalks in this place end a little abruptly. And of course, they're guarded by those pesky bots. But you've got an MIA9366B pocket computer to help you crack the security code. A working tape player to play music clues. And a map to show which towers you have or have not searched.

Go then. Elvin is preparing to launch his missile attack in less than ten hours. You must stop him. Or the world will be terminally late for dinner tonight.

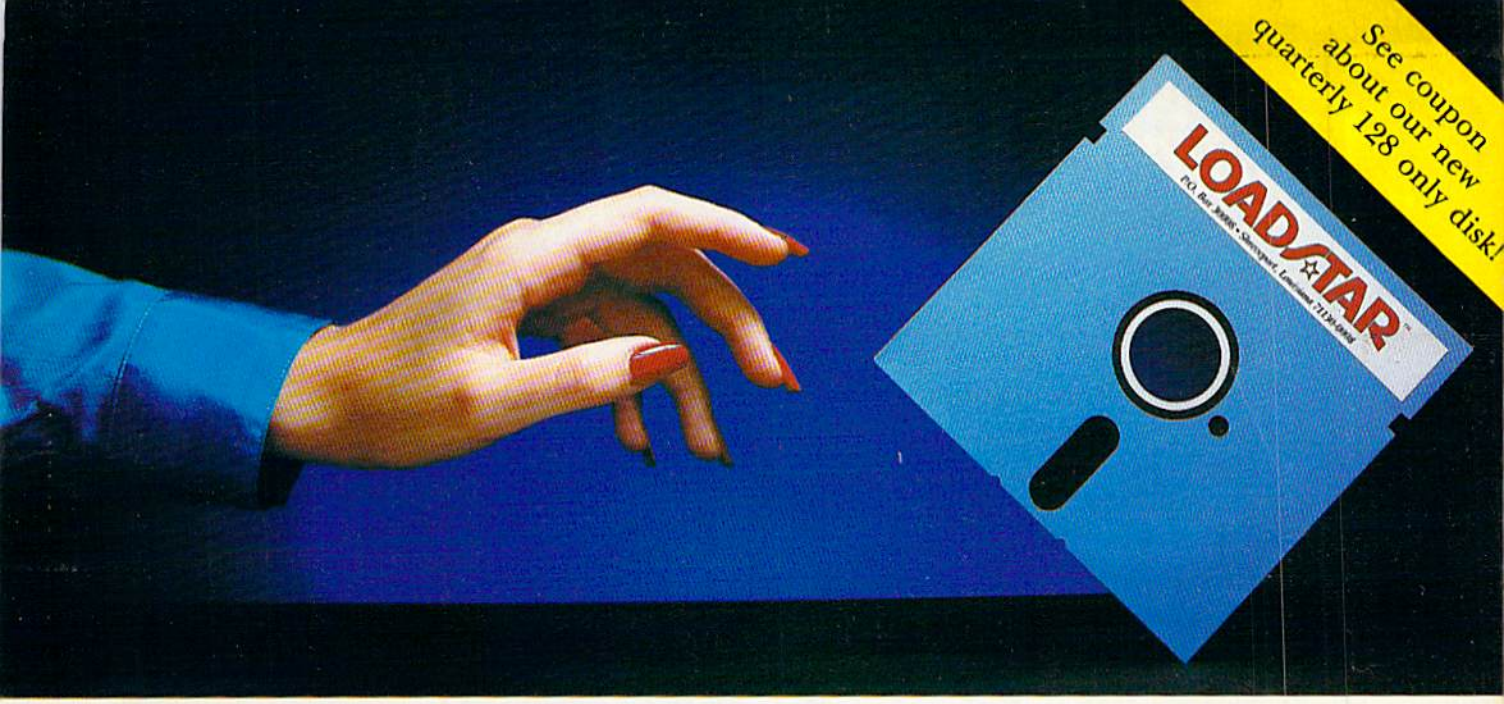
IMPOSSIBLE MISSION II

BY EPYX®

Commodore 64, IBM & compatibles, Atari ST, Apple II & compatibles, Amiga



Circle 12 on Reader Service card.



Reaching For the Right Balance

Software to Balance Your Commodore™ 64/128 Skills

LOADSTAR is two 5¼" disks full of quality software for your Commodore 64/128, delivered to your door every month for only $6.65 an issue. LOADSTAR gives you just the right balance of useful applications for home or work as well as entertaining games and features. Each month you'll receive from five to ten quality, original programs (not public domain) depending on the size of each program.

Get the Most from Your Commodore

Every month, you can rely on the vast experience of our editors and programmers to provide you with carefully selected software **you can use**. Each monthly issue contains valuable features such as: home financial programs, recipe organizers, accounting packages, word processing applications, graphics, music programs, educational programs and games. With our easy-to-follow documentation on disk and our unique menu system, you'll master each new application with confidence and ease.

Your Best Software Value

Without investing a fortune, LOADSTAR will convince you that your Commodore is the most versatile and powerful tool you own. You'll learn more about your Commodore, its capabilities, and available software, than you now believe possible. At $6.65 an issue — you just can't find a better software value for your Commodore than LOADSTAR.

Call Toll Free 1-800-831-2694

Commodore is a trademark of Commodore Inc.

FREE SOFTWARE— With a 3-Month Trial Subscription

LOADSTAR is sent to you each month on two 5¼" disks. Try LOADSTAR for three months for only $19.95 (that's only $6.65 an issue) and receive "The Best of LOADSTAR" absolutely free. This bonus disk contains the very best programs from past issues of LOADSTAR.

Guaranteed Satisfaction or Your Money Back

As software publishers since 1981, we at SOFTDISK INC. guarantee the quality of all our software products. If you are not fully satisfied with LOADSTAR, return your first issue for a full refund. "The Best of LOADSTAR" is yours to keep. You can't lose. Order today with the attached coupon or call toll free **1–800–831–2694**.

YES! ❑ Please rush me my free *The Best of LOADSTAR* and start my three month trial subscription to LOADSTAR for my Commodore for only $19.95 postage paid. (*Canada/Mexico $24.94, Overseas $27.95*) Make checks payable to Softdisk, Inc. in U.S. Funds. (Louisiana residents add 4% sales tax).

❑ Please send me information on your new quarterly disk for the Commodore 128.

Name _____

Address _____

City _____ State _____ Zip + 4 _____–_____

Daytime Phone (_____) _____–_____ Ext. _____

❑ VISA/MC ❑ AmEx ❑ Payment Enclosed(*U.S. funds only!*)

Card # _____ Exp. _____

Signature _____

SOFTDISK, INC. RU108

P.O. Box 30008 • Shreveport, La. 71130-0008

Circle 66 on Reader Service card.

Magical Mysterious Tour



Might and Magic™

NEW WORLD COMPUTING, INC.
ENTERTAINMENT SOFTWARE
14922 Calvert Street • Van Nuys, CA 91411
Technical Support (818) 785-0519



Come travel the path to a new realm of reality.

Might and Magic™ is waiting to take you away on a journey packed with challenging monsters and exciting quests.

A fantasy role-playing game featuring:

- ☐ 200 Monsters
- ☐ 94 Spells
- ☐ 250 Magic Items
- ☐ Flicker Free, 3-D indoor/outdoor graphic terrains to explore
- ☐ Detailed combat system with quick fight option.

Let **Might and Magic™** be your guide to a world of mazes, monsters, magic and mystery.

Now available for Apple II series, Macintosh, Commodore 64/128, and IBM/Tandy/Compatible. Hint/Map book also available.

Ask for **Might and Magic™** at your local dealer.

Circle 229 on Reader Service card

Exclusively Distributed by

ACTIVISION
ENTERTAINMENT SOFTWARE

Might and Magic is a trademark of New World Computing, Inc.
Activision logo is a trademark of Activision, Inc.
Macintosh and Apple are trademarks of Apple Computer, Inc.
Commodore is a trademark of Commodore Business Machines, Inc.
IBM is a trademark of International Business Machines, Inc.
Tandy is a trademark of Tandy, Inc.

C O N T E N T S

VOLUME 5, NUMBER 10 OCTOBER 1988



PAGE 49



PAGE 68

COVER PHOTOGRAPH BY LARRY DUNN

RUN (ISSN 0741-4285) is an independent journal not connected with Commodore Business Machines, Inc. *RUN* is published monthly by IDG Communications/Peterborough, Inc., 80 Elm St., Peterborough, NH 03458. Phone 603-924-9471. Second class postage is paid at Peterborough, NH, and at additional mailing offices. Canadian second-class mail registration number is 9565. Subscription rates in U.S. are $22.97 for one year, $34.97 for two years and $48.97 for three years. In Canada and Mexico, the one-year subscription rate is $27.97, with U.S. funds drawn on a U.S. bank. Foreign surface mail subscriptions are $42.97 for one year, and foreign air mail one-year subscriptions are $77.97, with U.S. funds drawn on a U.S. bank. *RUN* is nationally distributed by International Circulation Distributors. **Postmaster**: Send address changes to *RUN*, Subscription Services, PO Box 58711, Boulder, CO 80322-8711. (Canadian address changes to *RUN*, PO Box 1051, Fort Erie, Ontario, Canada L2A 5N8.)

FEATURES

40 PRINTERS ON PARADE *by Tim Walsh*
Take a tour of some 9- and 24-pin printers.

49 SONGS IN THE KEY OF C-128* *by Barbara Schulak*
Enter music into your C-128 with Music Editor.

54 INSTANT TEST-MAKER* *by Hugh McMenamin*
Attention, teachers: Take the drudgery out of making up tests for your students with The Question Box for the C-64/128.

64 EASY BANNERS* *by John Ryan*
Print banners long enough to wrap around your neighborhood. A C-64/128 program.

68 MONKEY SEE. . .* *by Jerome Reuter*
. . .monkey do; see if the sequence will stick with you. A C-128 game.

72 SCARED SILLY!* *by Joey Latimer*
Delight trick or treaters this Halloween with an animated C-64/128 video pumpkin.

DEPARTMENTS

4 RUNNING RUMINATIONS
A reader tells *RUN*'s editor-in-chief what she thinks of computers.

8 MAGIC *by Tim Walsh*
The original column of hints and tips for performing Commodore computing wizardry.

12 NEWS AND NEW PRODUCTS
Recent developments and releases in the world of Commodore computing.

20 MAIL RUN
Input from our readers.

24 SOFTWARE GALLERY *Reviews of:*

- Bank Street School Filer
- Pre-Reading
- Number Farm
- The Electronic Writing Lab
- Dragon Game Series
- Math Power
- Adventures with Fractions
- Spelling Bee
- Building Perspective
- Tiger's Tales
- Alphabet Circus
- Regions of the United States
- Path Tactics
- Simon Says

71 COMMONSENSE APPROACH TO COMPUTING

78 EASY APPLICATIONS* *by Rick Kephart*
A C-64 test-score analysis program to help spot students' weaknesses.

81 TELECOMPUTING WORKSHOP *by Loren Lovhaug*
Information and advice on all aspects of telecommunications.

83 GEOWATCH *by William Coleman*
Getting the most out of geoProgrammer.

85 COMMODORE CLINIC *by Lou Wallace*
Answers to your questions about Commodore computing.

90 MEGA-MAGIC* *by Kenny Lawson*
Turn your joystick into a mouse.

91 *RUN*'S CHECKSUM PROGRAM

96 COMING ATTRACTIONS; LIST OF ADVERTISERS

* The listings for these articles are also available on the September–October 1988 ReRUN disk. To order, see page 80.

PUBLISHER
STEPHEN ROBBINS

EDITOR-IN-CHIEF
DENNIS BRISSON

MANAGING EDITOR
SWAIN PRATT

SENIOR EDITOR
BETH S. JALA

ASSOCIATE EDITOR
HAROLD R. BJORNSEN

TECHNICAL MANAGER
LOU WALLACE

TECHNICAL EDITOR
TIMOTHY WALSH

COPY EDITOR
PEG LEPAGE

CONTRIBUTING EDITORS
ROBERT KODADEK; ROBERT ROCKEFELLER; JOHN RYAN

ART DIRECTOR
HOWARD G. HAPP

DESIGNER
ANNE DILLON

PRODUCTION ASSISTANT
LAURA JOHNSON

ADVERTISING SALES MANAGER
KENNETH BLAKEMAN

SALES REPRESENTATIVES
NANCY POTTER-THOMPSON
BARBARA HOY

CLASS AD SALES-EAST COAST
HEATHER PAQUETTE
603-924-9471

ADVERTISING COORDINATOR
SUE DONOHOE

SECRETARY
MARGOT SWANSON

WEST COAST OFFICE:

SALES MANAGER
GIORGIO SALUTI

CLASS AD SALES
DANNA CARNEY

3350 W. BAYSHORE ROAD, SUITE 201
PALO ALTO, CA 94303
415-328-3470

MARKETING MANAGER
WENDIE HAINES-MARRO

MARKETING COORDINATOR
LAURA LIVINGSTON

EXECUTIVE ASSISTANT TO PUBLISHER
LISA LAFLEUR

Entire contents copyright 1988 by IDG Communications/Peterborough, Inc. No part of this publication may be printed or otherwise reproduced without written permission from the publisher. Programs published in this magazine are for the personal use of the reader; they may not be copied or distributed. All rights reserved. *RUN* assumes no responsibility for errors or omissions in editorial or advertising content. *RUN* does not assume any liability for advertisers' claims.

RUNNING RUMINATIONS

I KNEW I SHOULDN'T have opened it, but there it was on my desk, summoning me to take a peek inside. My name, written in large red letters, was emblazoned on the envelope. What follows is an unedited letter from Silvia Dos, a certified technophobe.

Dear Editor,

I want to sue for breach of promise. Like a glib politician at a Democratic or Republican convention, the personal computer world is long on promises but short on delivery. Let me explain.

The computer industry paints a picture of smooth-running, efficient machines that perform wondrous tasks at the touch of a key. This is the so-called "promise" of computing. Ha! In reality, computerists run the risk of making simple tasks much more complicated than they need to be.

Sometimes it takes a while to realize the promise of computing.

For me, computerdom is a nightmare world of disk crashes, computer theft, human error, software copying, contaminated/lost/destroyed files, computer illiteracy, clones and error handling.

Even the simple act of turning on my equipment can be traumatic. Is it monitor first, disk drive second, computer third, or the other way around?

I can never remember whether I'm uploading or downloading files on the BBS. And does the temperature in the room determine whether I should perform a warm boot or a cold boot?

I spend so much time worrying if my software is "compatible" with my hardware—it's enough to make me pack up my floppies and head for the sanity of a world before computers.

The computer world can be an intimidating environment populated by pirates, mavericks, computer freaks, computer addicts and mischievous programmers who can strike with an epidemic of viruses at any moment.

The industry aspires to make their products as easy to use as the average household appliance. No thanks. They obviously never had to grapple with my VCR or microwave oven.

In sum, Mr. Brisson, the personal computer world is a bewildering, overwhelming place—not a leading-edge technological paradise. I've been hoodwinked by the promise of computing, which states that my computer can help solve all my problems (quit smoking, lose weight, improve my memory, become a better golfer).

There's something missing in my life. I have yet to experience the utility, power and convenience of computing without the hassle. What went wrong?

Dear Ms. Dos,

Since I received your letter, I'm glad to hear that you have undergone extensive psychiatric sessions at computer camp and are back in the mainstream of computerdom with a more positive outlook. You may be surprised to learn that your opinions are probably shared by more than one new computer user.

If you hopped onto the computer bandwagon looking for a cure-all, then you're in for a bumpy ride. At its best, a computer is an effective tool that can do some things extremely well, as millions of people of varying interests and abilities have discovered.

Despite the unpredictability and uncertainty, the promise of computing still beckons. Like the American dream, it can be elusive, but attaining the goal is worth the struggle.

Regards,

Dennis Brisson

Dennis Brisson
Editor-in-Chief



Get a FREE Commodore modem and FREE Q-Link software when you join Q-Link.

Call toll-free **1-800-782-2278** ext. 1566

or mail this coupon to **Q-Link, 8619 Westwood Center Drive • Vienna, VA 22180**

Choose one:

☐ **I need a modem.** Send me the FREE Commodore 300 baud auto-dial modem and the FREE Q-Link software. Charge me now for my first 4 months of Q-Link membership at $39.80 ($9.95 per month).

☐ **I already have a modem.** Send me the FREE Q-Link software and charge me now for my first month of Q-Link membership at $9.95.

Full Name _____

Street Address _____

City _____ State _____

Zip _____ Phone (_____) _____

Signature _____

Choose your method of payment:

☐ Please charge my credit card. ☐ MasterCard ☐ Visa

Acct. # _____ Exp. _____

☐ Check enclosed.

30 DAY MONEY-BACK GUARANTEE-YOU RISK NOTHING. Try Q-Link for 30 days. If you're not completely satisfied, send us (within 30 days of registering online) your letter of cancellation along with the Q-Link software and modem you received, and you'll get a full refund of your Q-Link monthly membership fee.

8619 Westwood Center Drive
Vienna, VA 22180
1-800-782-2278 ext. 1566

This offer is only valid for new members who respond to this advertisment.
Offer expires March 31, 1989.

Q-link SM

The Commodore Connection.

Circle 183 on Reader Service card.

Red Storm Rising™



THE WORLD IS FALLING TO THE SOVIETS. YOUR SUBMARINE IS AMERICA'S LAST HOPE.

Based on Tom Clancy's Number 1 best-selling book, **Red Storm Rising** puts you in the role of captain of an American nuclear attack submarine. . . a sub that becomes the Free World's last hope, following the Soviet invasion of Europe. **Red Storm Rising** is a chillingly realistic blend of contemporary high technology and classic military strategy. Offering the



pulse-pounding excitement you've come to expect from famed programmer/designer Sid Meier, creator of **F-15 Strike Eagle** and **Silent Service**. For the Commodore 64/128 systems and soon for IBM/PC compatibles and Apple II. Suggested retail price, $44.95.

Red Storm Rising. Find out if you have what it takes to tackle the Russian bear.

MICRO PROSE™
SIMULATION • SOFTWARE

180 Lakefront Drive Hunt Valley, Maryland 21030
(301) 771-1151

Based on the book *Red Storm Rising*, by Tom Clancy, Larry Bond and co-author. Copyright 1986 by Jack Ryan Enterprises Ltd. and Larry Bond. Software © 1988 by MicroProse Software, Inc. All Rights Reserved.

Circle 68 on Reader Service card.

MAGIC

Use a "fizzle" effect rivaling those found on commercial programs; make DIP switches easily accessible; or test your skill in a C-64 game.

Compiled by TIM WALSH

$4D2 Scientific Notation Elimination

Get rid of scientific notation when performing multiplication on large numbers by using my program, Scientific Notation Elimination. Without resorting to scientific notation, it produces an answer after multiplying integers up to nine digits long.

```
Ø REM MULTIPLIES WITHOUT NOTATION - WILLIA
  M B BAILEY                          :REM*211
1Ø PRINT CHR$(147)"CANCELS SCIENTIFIC NOTA
  TION"                               :REM*65
2Ø DIM C(19),C$(19):M=Ø:N=Ø           :REM*99
3Ø INPUT"ENTER 1ST NUMBER";A$         :REM*15Ø
4Ø INPUT"ENTER 2ND NUMBER";B$:LA=LEN(A$):L
  B=LEN(B$)                           :REM*2Ø5
5Ø IF LEN(A$)>9 OR LEN(B$)>9THEN24Ø
                                      :REM*152
6Ø VA=VAL(A$):VB=VAL(B$):P=19-(LA+LB)
                                      :REM*116
7Ø IF VA<>INT(VA)OR VB<>INT(VB)THEN24Ø
                                      :REM*16Ø
8Ø FOR I=1 TO LA:A(I)=VAL(MID$(A$,I,1)):NE
  XT                                  :REM*26
9Ø FOR I=1 TO LB:B(I)=VAL(MID$(B$,I,1)):NE
  XT                                  :REM*2Ø6
1ØØ FOR I=18 TO P STEP-1:Q=I          :REM*211
11Ø FOR J=LA TO 1 STEP-1              :REM*1Ø6
12Ø C(Q)=C(Q)+A(LA-N)*B(LB-M):Q=(Q-1)
                                      :REM*6
13Ø N=N+1:NEXT                        :REM*174
14Ø M=M+1:N=Ø:IF M<=LB THEN NEXT      :REM*182
15Ø FOR I=18 TO P STEP-1:C(I)=C(I)+R
                                      :REM*177
16Ø R=INT(C(I)/1Ø):C(I)=C(I)-1Ø*INT(C(I)/1 ►
```

TRICK OF THE MONTH

$4D3 Character Fade/Restore 64

Many commercial games use a technique, called "fizzle," that makes screen images fade out and fade in. Until now, using this technique in your own programs was well beyond the reach of everyone but highly skilled programmers.

Now, using the C-64's character set and the Character Fader 64 program, anyone can do it. Type in the program, using *RUN*'s Checksum, and save it. Run the program and treat yourself to a performance that rivals those found in most commercial programs.

When you first enter the SYS 49152 command, the screen fades, and entering it the second time returns the screen. To change the speed of fade out/fade in, enter POKE 49240, followed by a comma and a number from 0 (fastest) to 255 (slowest). Adding this technique to your own programs will create some stunning displays.

```
Ø REM 64 LETTER FADER - JEFF MARTIN:REM*35
1Ø FORI=49152 TO 4942Ø:READD:POKEI,D:C=C+D
  :NEXTI                              :REM*59
2Ø IF C<> 31597 THENPRINT"ERROR IN DATA...
  ":END                               :REM*168
3Ø FORT=1TO2Ø:PRINT" LETTER FADER IS ACTIV
  ATED":SYS49152:NEXT                 :REM*219
4Ø DATA 173,24,2Ø8,41,8,2Ø8,62,32,27,192,2
  Ø8,4Ø,16Ø,Ø,132,25Ø,132,252         :REM*212
5Ø DATA 169,2Ø8,133,253,169,48,133,251,96,
  32,12,192,133,52,133,56,173         :REM*6Ø
6Ø DATA 24,2Ø8,41,24Ø,9,12,141,24,2Ø8,14Ø,
  14,22Ø,169,51,133,1,96,177          :REM*155
7Ø DATA 252,145,25Ø,2ØØ,2Ø8,249,23Ø,251,23
  Ø,253,165,253,2Ø1,224,2Ø8,239       :REM*234
8Ø DATA 32,44,192,32,12,192,16Ø,Ø,169,192,
  133,255,238,11,193,173,11,193       :REM*237
9Ø DATA 2Ø1,1,2Ø8,246,169,255,141,11,193,1
  66,255,169,248,133,254,173,12       :REM*226
1ØØ DATA 193,24Ø,5,32,171,192,8Ø,3,32,187,
  192,232,2ØØ,24Ø,6,23Ø,254,2Ø8       :REM*23
11Ø DATA 235,24Ø,212,23Ø,251,23Ø,253,165,2
  53,2Ø1,21Ø,2Ø8,24Ø,32,12,192        :REM*228
12Ø DATA 24,165,255,1Ø5,8,133,255,2Ø8,19Ø,
  173,12,193,24Ø,5,142,12,193         :REM*196
13Ø DATA 2Ø8,4,232,142,12,193,169,55,133,1
  ,169,1,141,14,22Ø,96,177,252        :REM*1Ø7
14Ø DATA 61,11,192,141,13,193,177,25Ø,13,1
  3,193,145,25Ø,96,189,11,192,73      :REM*37
15Ø DATA 255,141,13,193,177,25Ø,45,13,193,
  145,25Ø,96,16,4,4,1,1,64,128        :REM*13
16Ø DATA 32,64,64,64,2,4,8,64,1,128,32,128
  ,16,128,16,8,128,4,128,32,64        :REM*185
17Ø DATA 32,128,1,2,8,8,8,128,64,32,2,8,32
  ,1,1,32,16,1,4,16,1,16,2,8,2,2:REM*181
18Ø DATA 32,4,2,2,16,4,8,4,16,64,255,Ø
                                      :REM*18Ø
```

—JEFF A. MARTIN, ROSEVILLE, CA

Out of Sight!



F-19 STEALTH FIGHTER will turn your computer into the hottest flying machine on today's electronic battlefront. The graphics are that vivid ... the game play that challenging ... and the realism that convincing.

Learn the secrets of stealth flying — maintaining a low electromagnetic profile to evade enemy radar and mastering the tactics that only a stealth pilot dares to try. MicroProse has painstakingly researched stealth technology — and we make it real!

You'll discover hundreds of action-packed scenarios in real-world regions — from a deep-strike mission in North Africa to a reconnaissance flight over Central Europe. We'll train you in the basics, but only your skill and cunning can save the day.

F-19 STEALTH FIGHTER

Out of Sight

Featuring

- Carrier and land-based take-offs/landings
- Advanced electronics, counter-measures
- Intelligent enemies — land, sea, air opposition
- Realistic flight experience

For Commodore C-64/128

Can't find F-19? Outside MD call 800 645-8632, weekdays 8am to 5pm EST and order by MC/VISA; or mail check/money order for $44.95 for C-64/128. U.S. funds only. MD residents add 5% sales tax. Free shipping in U.S.; $5.00 international. Allow 1-3 weeks for U.S. delivery.



Circle 103 on Reader Service card.

MICROPROSE™
SIMULATION • SOFTWARE

180 Lakefront Drive, Hunt Valley, MD 21030 (301) 771-1151

```
    Ø)                                  :REM*33
17Ø NEXT                                :REM*45
18Ø FOR I=PTO18:C$(I)=STR$(C(I)):NEXT
                                        :REM*63
19Ø IF C$(P)=" Ø"THEN P=P+1             :REM*193
2ØØ FOR I=P TO 18:T$=T$+RIGHT$(C$(I),1):NE
    XT                                  :REM*77
21Ø PRINT:PRINT"{3 SPACEs}"T$:PRINT
                                        :REM*157
22Ø PRINT" PRESS {LEFT ARROW} TO REPEAT
                                        :REM*56
23Ø GET A$:IF A$<>"{LEFT ARROW}"THEN23Ø
                                        :REM*176
24Ø CLR:GOTO1Ø                          :REM*74
```

—William B. Bailey, Sacramento, CA

$4D4 The Final Grade

In keeping with the educational theme of this issue, here's a useful 64/128 program for students from elementary to undergraduate school to help them determine their final grades. Type in Last Grade 64/128 and save it to disk, and run it in either 64 or 128 mode. It determines your final grade based on the results of all your test scores. It also tells you the score you need on your final exam in order to achieve a desired final grade.

If your teacher or instructor tells you that all tests have the same weight in determining the final grade, enter 100 at the first prompt. Then enter the scores from all previous tests in that class. Make sure that the missing grade percentage is configured last. After entering all the percentages, the program displays a list of potential last-grade percentages corresponding to the final average. Also, note that variables that can affect your final grade, such as attendance and class participation, are not reflected in this program.

```
Ø REM C-128/C-64 LAST GRADE - ANDREW SENFT
                                        :REM*159
1Ø POKE 5328Ø,Ø:POKE 53281,Ø:PRINTCHR$(147
    )"LAST GRADE                        :REM*222
2Ø PRINT"{CRSR DN}PRESS RETURN WHEN FINSIH
    ED"                                 :REM*134
3Ø P%=Ø:PRINT"{CRSR DN}GRADE SECTION PERCE
    NTAGE FROM";1ØØ-TP%;"{CRSR LF}%";:INPUT
     P%                                 :REM*151
4Ø IFP%+TP%>1ØØTHENPRINT"{CRSR DN}TOTAL EX
    CEEDS 1ØØ% BY";(TP%+P%)-1ØØ:GOTO3Ø
                                        :REM*238
5Ø TP%=TP%+P%:IFP%=ØTHENLP=1ØØ-TP%:GOTO 12
    Ø                                   :REM*15
6Ø GC%=Ø:GA%=Ø                          :REM*194
7Ø G$="":INPUT"GRADE IN %";G$:IFG$<>""THEN
    GA%=GA%+VAL(G$):GC%=GC%+1:GOTO7Ø
                                        :REM*1ØØ
8Ø IF GC%=ØTHEN GC%=1                   :REM*243
9Ø PRINT"AVERAGE= ";GA%/GC%             :REM*13Ø
1ØØ IFTP%<1ØØTHENA=A+(GA%/GC%)*P%/1ØØ:GOTO
     3Ø                                 :REM*23Ø
11Ø A=A+(GA%/(GC%+1))*P%/1ØØ:LP=P%/(GC%+1)
                                        :REM*23
12Ø PRINT"{2 CRSR DNs}{CRSR LF}";LP;"{CRSR
     LF}% LEFT TO COMPUTE LAST GRADE":GOSU
    B18Ø                                :REM*43
13Ø FORD= 1ØØ TO 1STEP-2Ø:PRINT"{SHFT CLR}
    NEED ","TO RECEIVE"                 :REM*1Ø6
14Ø PRINT"----","----------"             :REM*28
15Ø FORC= D TO D-2Ø STEP-1:A%=(A+(LP*C/1ØØ
    )+.5):PRINTC,A%;                    :REM*135
16Ø IF AF%=ØTHEN IFA%=>CTHENAF%=1:PRINT"CU
    RRENT AVERAGE";                     :REM*171
17Ø PRINT:NEXT:GOSUB18Ø:NEXT:AF%=Ø:GOTO13Ø
                                        :REM*138
18Ø PRINT"{CRSR DN}PRESS A KEY TO CONTINUE
    {CRSR UP}"                          :REM*234
19Ø GETA$:IFA$=""THEN 19Ø               :REM*157
2ØØ RETURN                              :REM*87
```

—Andrew Senft, Auburn, NY

$4D5 Slowing the Frequency

We've received letters from *RUN* readers such as Juan Braghini of Concordia, Argentina, and Giorgio Grassi of Parma, Italy, asking for a way to change the C-64 and C-128 internal clocks to operate on the South American and European 50 Hz electrical current. In response, I've written utilities for both the C-64 and the C-128 that slow the CIA #1 and CIA #2 clocks to 50 Hz. This permits Commodore owners in these countries to use programs that utilize internal clocks, such as Notepad 64/128, Time Keeper 64/128 and, of course, Tick Tock 128.

Before using any Commodore program on overseas electrical currents, run the appropriate version of this utility. Anyone taking his or her Commodore abroad would also be wise to take along these two clock-conversion programs.

```
Ø REM C-64 5Ø HZ WEDGE - BOB KODADEK
                                        :REM*133
1Ø SA=3Ø4:VEC=768:REM 'SA' IS RELOCATABLE
                                        :REM*98
2Ø FORI=Ø TO 1Ø:READBY:POKE SA+I,BY:NEXT
                                        :REM*229
3Ø POKE VEC,SA-INT(SA/256)*256          :REM*132
4Ø POKE VEC+1,INT(SA/256)               :REM*12Ø
5Ø DATA 173,14,221,9,128,141,14,221,76,139
    ,227                                :REM*58


Ø REM C-128 5Ø HZ WEDGE - BOB KODADEK
                                        :REM*52
1Ø SA=2Ø48:VC=768                       :REM*247
2Ø FORI=Ø TO 18:READB$:POKE SA+I,DEC(B$):N
    EXT                                 :REM*187
3Ø POKE VEC,SA-INT(SA/256)*256          :REM*132
4Ø POKE VEC+1,INT(SA/256)               :REM*12Ø
5Ø DATA AD,Ø,FF,29,FE,8D,Ø,FF,AD,E,DD,9,8Ø
    ,8D,E,DD,4C,3F,4D                   :REM*14Ø
```

—Bob Kodadek, Aston, PA

$4D6 Lengthy DIP Switches

I've placed this DIP tip on a local BBS and have gotten many thank-yous in return. I hope *RUN* readers will find it equally helpful. To make the DIP switches on the rear of

Continued on p. 88.



NOW PLAYING AT A SOFTWARE DEALER NEAR YOU

Available for Amiga, Commodore 64, IBM PC, Apple IIgs, and Atari ST, which are trademarks respectively of Commodore-Amiga, Commodore Electronics, Ltd., International Business Machines, Apple Computer Inc., and Atari Inc.

Cinemaware Corporation, 4165 Thousand Oaks Blvd., Westlake Village, CA 91362

NEWS AND NEW PRODUCTS

Games are hot, and the Summer CES was sizzling with new releases for the C-64.

Compiled by HAROLD R. BJORNSEN

ANOTHER FINE MESS

MENLO PARK, CA—Rainbird (3885 Bohannon Drive, Menlo Park, CA 94025) introduces four new games.

The Universal Military Simulator lets you re-enact some of the world's greatest military conflicts, such as the battles of Gettysburg and Waterloo. You can design your own battlefields and create your own armies, or place two armies from different eras into combat. $39.95.

In **Carrier Command**, a game of strategic warfare, you try to capture enemy islands and destroy its forces. You control the ship with a squadron of remote fighters, an amphibious assault division and 360-degree, turret-mounted laser cannons. $34.95.

The evil Acamantor returns to Belorn in the arcade game **Enlightenment**, 103 years after Hasrinaxx the Druid banished him. Hasrinaxx must scout Belorn to find the spells that will take him across to Acamantor's dungeon. He must then use his powers to defy Acamantor's demon princes who guard him, and finally destroy Acamantor with the mystical White Orb. $19.95.

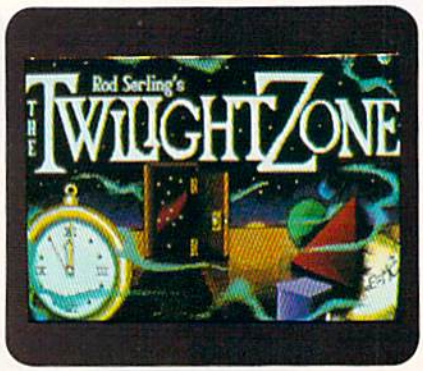
In **Black Lamp**, a medieval melodrama, Jolly Jack the Jester fights animated animals and characters to find the enchanted lamps and the Black Lamp. Reward for success is the hand of princess Grizelda; the price of failure is death. $19.95.

Starglider II, the flight simulator and sequel to Starglider, puts you in a futuristic spaceship with a 3-D instrument panel and sophisticated weapon systems, flying around alien deserts, destroying Egron patrol craft and rescuing alien colonies under Egron attack. $19.95.

Check Reader Service number 401.

GOOD TV OR BAD TV

KING OF PRUSSIA, PA—In **The Twilight Zone**, you are that "normal person thrust into fantastic situations" as you participate in several stories that at first seem unrelated but eventually weave themselves into a single complex plot, complete with a patented Twilight Zone ending. $39.95.



First Row Software's fantasy adventure, The Twilight Zone.

Tired of watching bad TV? Do something about it—make it worse! In **Prime Time**, you get a chance to run a television network, buy shows, cancel shows and do lunch. $29.95.

In **Moses: The Old Testament #1**, you experience the many pitfalls and puzzles to make your mission challenging, like leading the children of Israel to the Promised Land. $29.95. First Row Software Publishing, 900 East 8th Ave., Suite 300, King of Prussia, PA 19406.

Check Reader Service number 406.

SPEAKING OF SPORTS

SAN JOSE, CA—**Fast Break**, a three-on-three action basketball game, features full-court basketball from a television perspective. Playing under professional rules, you select defensive or offensive plays, design your own plays and substitute players. $29.95.

Serve & Volley, an action-strategy tennis simulation, emphasizes correct ball placement, timing and stroke selection. It features three levels of difficulty, practice modes and three different court surfaces. $29.95.

Rack 'Em, with an overhead and 3-D view of the pool table, contains five billiard games: snooker, bumper pool, straight pool, and 8-ball and 9-ball rules. The one- or two-player game lets you pick the object ball, pocket, aim, English and power. $29.95.

T.K.O., an arcade-style, split-screen boxing game, lasts a lot longer than 91 seconds. The first-person perspective gives you a feel for what it's like to be in the ring. Featuring both offensive and defensive maneuvers, boxers dodge and duck, and when hit, each boxer's face shows the damage he's sustained, such as black eyes, fat lips and swollen cheeks. $29.95.

In **Jet Boys**, you're a jet pack-equipped commando who must enter and deactivate an enemy-controlled reactor room and survive numerous waves of deadly galactic terrorist attacks. For one or two players. $14.95. Accolade, 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128.

Check Reader Service number 412.

BATTLES R US

NORTH VANCOUVER, B.C.—Taito Software (267 West Esplanade, Suite 206, North Vancouver, B.C., Canada, V7M 1A5) offers eight new games.

Alcon: Battle aliens with lasers, homing missiles, bombs and shields as you maneuver your SW475 over the planet Orac. $29.95.

Arkanoid: You need fast action to break down the 33 barriers that stand between you and DOH, the destroyer of the universe. $29.95.

Bubble Bobble: You and your two brontosaurus buddies battle battalions of evil beasties by blowing and bursting billions of bullies. $34.95.

Gladiator: Take a journey back to ancient Rome to become the strongest and bravest gladiator. $29.95.

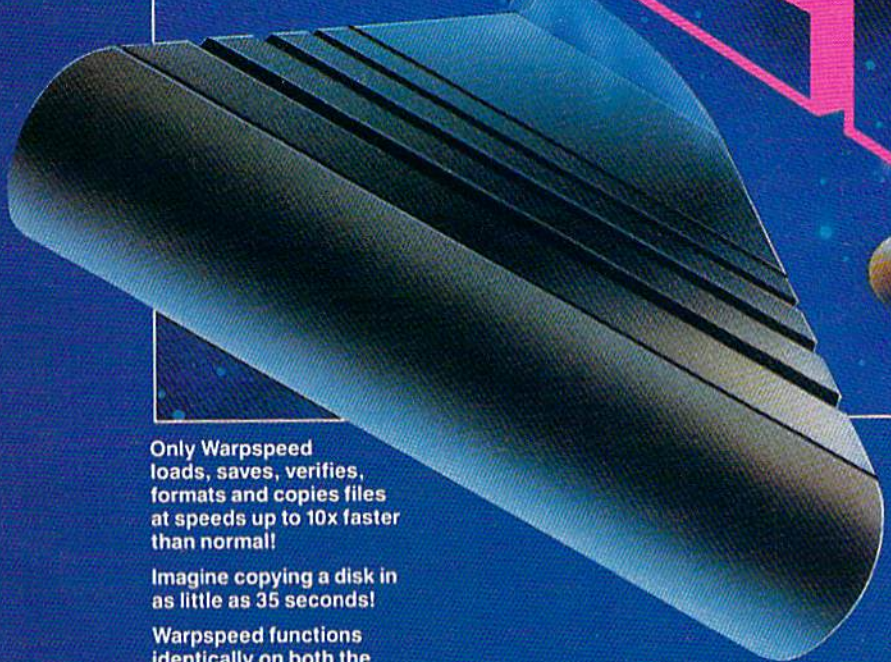
Operation Wolf: The last of the hostages has been taken, and the only way to save them is to get in, strike hard and get out fast. $39.95.

Rastan: Be the invincible ancient warlord, Rastan, and kill off a host of evil lords and their servants as you try to defeat the mighty castle king. $34.95.

Renegade: Are you ready to be the baddest dude on the streets? Only you and your flying fists and killer kicks will ►

INTRODUCING THE INDISPENSABLE ACCELERATOR CARTRIDGE FOR YOUR C64 OR C128.

WARP SPEED™



Only Warpspeed loads, saves, verifies, formats and copies files at speeds up to 10x faster than normal!

Imagine copying a disk in as little as 35 seconds!

Warpspeed functions identically on both the C64 and C128 in the 40 or 80 column mode and works with all compatible drives, including the 1581. Built in mode select and reset switches too!

Attention advanced users: An integrated sector editor and drive monitor and a full featured mini-assembler are all included!

Only Warpspeed delivers 55 features that no other cartridge can match.

Why limp along on impulse power when you can jump to Warpspeed?

CINEMAWARE
CORPORATION

Exclusively distributed by Cinemaware Corporation 4165 Thousand Oaks Blvd., Westlake Village, Ca. 91362

C64, C128 and 1581 drive are trademarks of Commodore Electronics, Ltd. Warpspeed is a trademark of Alien Technology Group.

put these gangs in their place. $34.95.

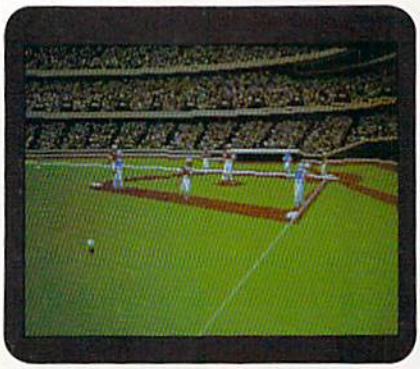
Sky Shark: Pilot the legendary P-40 Tiger Shark as you go deep into enemy lines. $29.95.

Check Reader Service number 408.

From the Edge of the Universe to Your Town

MENLO PARK, CA—Mediagenic (3885 Bohannon Drive, Menlo Park, CA 94025) adds two new games to their catalog.

Pete Rose Pennant Fever, a baseball simulation, challenges you to guide your



Pete Rose Pennant Fever, a baseball simulation from Mediagenic.

own expansion team through a ten-season, 24-team league race for the Pennant. Catch the action from eight different perspectives: behind home plate, at every base and from four outfield views. $34.95.

Main Event, a wrestling simulation, breaks all the rules, with outrageous characters and wrestling that's hard to believe—just like the real thing. Choose from eight rowdy wrestlers and battle for Tag Team Supremacy.$29.95.

Check Reader Service number 410.

Focusing Attention on Some Further Education

NEW YORK—Hi Tech Expressions (584 Broadway, New York, NY 10012) releases several new educational titles for the C-64.

With the help of Muppet characters Grover, Barkley and Cookie Monster in **Letter-Go-Round**, preschoolers ages 3 to 6 get practice in letter-matching and simple spelling. Graphics include a two-speed ferris wheel to help keep children's attention and encourage repeat play. Each of the three game levels progress to more challenging activities. $9.99.

The company's new line of three Electric Company software titles, below, helps children ages 6 to 9 to continue to develop their reading comprehension, vocabulary, word recognition and linguistic competence skills. They cost $12.99 each or $29.99 for all three:

Bagasaurus, a reading comprehension activity starring a dinosaur, encourages children to practice and develop vocabulary skills. Students collect on-screen words and pictures to make up stories about "Baggy's" adventures around the world.

Picture Place!, a beginning reading activity, helps children build their basic vocabulary and develop word-recognition skills. Children choose from six background scenes and create pictures, using words as building blocks.

Roll-A-Word, a linguistic activity, gives practice in rhyming patterns, learning word families and developing spelling skills. A word-generating machine assists as children spell words to match pictures and then create sentences with them.

The **Sesame Street Print Kit** lets children design and print out signs, posters, banners, greeting cards, invitations, stationery, story and coloring books, party decorations, placemats and games on their C-64s. Features include 60 Sesame Street Muppet characters in high-resolution outline, 20 decorative graphics borders and seven typefaces in three sizes and three fonts (italics, boldface and outline). A dot matrix printer is required. $14.99.

Swimware, a C-64 graphics program, produces personalized calendars (daily, weekly and monthly) with digitized pictures of swimsuit models. It also keeps track of important appointments, events and milestones and lets you plan ahead through the year 1999. A printer is recommended. $9.99.

Play the popular TV game show, **Win, Lose or Draw** on your C-64. Famous quotes, titles and sayings revealed with on-screen graphics inspire hilarious interaction among players. $12.99.

Check Reader Service number 416.

Adventure, a Quest, and a Trip to the Future

GREENSBERG, PA—**Wizard Wars** is a role-playing, graphics adventure where you, as the wizard, venture forth to defeat a host of dragons, elves, warriors and magic creatures and stop the plans of the mad wizard Aldorin. $44.95.

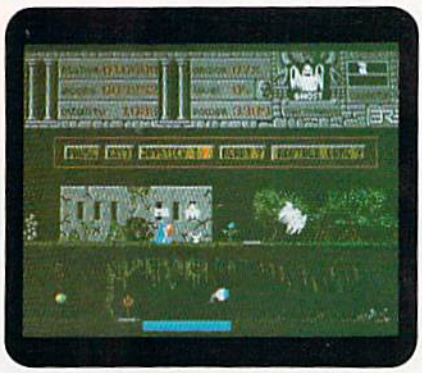
In **Master Ninja: Shadow Warrior of Death**, a graphic animation game, you are a great ninja warrior sent to recover a precious magical sword stolen by an evil Japanese warlord. $29.95.

The science fiction game, **Alien Fires—2199 AD**, places you in the role of a time lord sent to a distant planet to destroy an insane genius and his deadly invention. $29.95. Paragon Software, 600 Rugh St., Suite A, Greensburg, PA 15601.

Check Reader Service number 405.

Warlock

CAMPBELL, CA—In **Warlock**, an arcade-action adventure, you begin a quest to find the stolen Karna. It features 20 increasingly difficult levels of play.



Three-Sixty's arcade-action adventure, Warlock.

$29.95. Three-Sixty Pacific, Inc., 2105 South Bascom Ave., Suite 290, Campbell, CA 95008.

Check Reader Service number 403.

For Fans of AD&D

MOUNTAIN VIEW, CA—Strategic Simulations (1046 N. Rengstorff Ave., Mountain View, CA 94043) introduces two Advanced Dungeons & Dragons fantasy role-playing games and a utility to generate encounters in both games.

Located on the northern shore of the Moonsea in the Forgotten Realms, the city of Phlan has been overrun by monsters led by a mysterious leader. Your quest: Discover the identity of this evil force and rid Phlan of its scourge in **Pool of Radiance**. $39.95.

Heroes of the Lance re-creates the epic battle between good and evil on the world of Krynn. You control eight companions, each with different attributes and skills and guide them deep into the treacherous ruins of the temple Xak Tsaroth to retrieve the precious Disks of Mishakal, guarded by the black dragon Khisanth. $29.95.

Dungeon Master's Assistant, Volume I: Encounters, helps the Dungeon Master generate encounters for AD&D cam-

paigns. It includes over 1000 separate encounters and over 1300 monsters and characters to help reduce game prep time by several hours per session. You can modify the existing data or add your own original monsters and encounters. $29.95.

Battles of Napoleon, a war game and construction set, lets you simulate practically any Napoleonic engagement on a tactical level. Generate random maps, then modify them, or build your own. Your terrain options include five levels of elevation, woods, roads, fields, swamps, water, towns and redoubts. Create your own armies with the number of men, types of units, weapons and nationality, and then rate the units for melee strength, leadership and morale. $49.95.

Check Reader Service number 414.

STARGAZING

CAMBRIDGE, MA—Follow Gable or Bogie down Sunset Blvd. See where the Rat Pack hung out. Attend a premiere at Grauman's. You can travel through eight eras, visiting old nickelodeons, Paramont Studios or Hollywood Theatre. Witness the changes to Hollywood Blvd. since 1910 and explore the many phases of film, from the silent screen to the latest blockbusters. Answer thousands of trivia questions about the stars. Included are 25 different mysteries for you to solve. **Ticket to Hollywood** is from Blue Lion Software (90 Sherman St., Cambridge, MA 02140) for $29.95.

Check Reader Service number 413.

THIS ISN'T A *GAME*!

GRAND RAPIDS—You're right! It's **Award Maker Plus**, a desktop publishing package for the C-64 from Baudville (5380 52nd St. SE, Grand Rapids, MI 49508). With it, you create awards, certificates, coupons and more, from hundreds of predesigned award styles, then print them in color or black and white. Themes include home, education and business. $39.95.

Check Reader Service number 415.

OVERJOYED

MIDDLESEX, NJ—With the many games released for the C-64 so far this year, you may have worn out your old joystick playing some of them. Beeshu (101 Wilton Ave., Middlesex, NJ 08846) has two sticks that are compatible with the 64 and carry a one-year warranty. Hot Stuff comes in a choice of four colors (green, pink, yellow and blue), includes auto-fire, two trigger buttons in the handle, two base buttons for left- or right-handed play, and four suction feet to firmly anchor the stick to a surface. They're available for $12.95 each. The Zipper joystick has eight-directional control and an extra-long cord. It's available for $8.98.

Check Reader Service number 409.

STUPIDITY EPIDEMIC WIDESPREAD

SAN RAFAEL, CA—In **Zak McKracken and the Alien Mindbenders**, a comedy/thriller game, journalist Zak McKracken discovers that a worldwide stupidity epidemic is an extraterrestrial plot to reduce everyone's IQ. You help Zak search the earth and beyond for clues, allies and ancient artifacts to unmask the alien saboteurs and unplug the stupidity machine. $34.95. Lucasfilm Games, PO Box 2009, San Rafael, CA 94912.



Lucasfilm's comedy/thriller game, Zak McKracken and the Alien Mindbenders.

Check Reader Service number 404.

THERE'S NO PLACE LIKE HOME

SAN MATEO, CA—Electronic Arts (1820 Gateway Drive, San Mateo, CA 94404) releases eight new games.

Rockford, the hero of BoulderDash, returns in search of the Pharaoh's gold. You'll accompany the archaeologist on his arduous mission through five locations, from the Cavern of Craymar on a quest for the gold to the Kitchens of Kyssandra as you search for the Apples of Eternal Youth—each with four difficulty levels. $29.99.

In **Roadwars**, you find yourself in the 25th century, where a series of space roadways link the moons. Problems arise when a computer goes haywire and alters some of the magnetic side panels that keep vehicles on the roadways. As controller of an invincible interplanetary tank, you must destroy the altered panels and clear the roadways of killer sparks, spikes, barriers and vicious aliens. $29.99.

Alternate Reality: The City begins when an alien spaceship deposits you in a room with a single exit. Once you step through the door—into The City of Xebec's Demise—you find the weather, life forms and the rules against you. You'll need as much skill as possible to survive. $29.95.

In **Tomahawk**, a 3-D flight-combat simulation game, you're in command of a helicopter that reaches speeds of 200 knots, with advanced air-to-air combat techniques and weaponry, plus 13 on-board computers to help you carry out your missions. $29.95.

Someone sights an approaching piece of space rock the size of Louisiana, and, with the assistance of an adventurer, you search for Professor K. K. Renegade to help him build an anti-asteroid deflector. If you fail to find him or build the deflector in **Cosmic Relief: Professor Renegade to the Rescue**, Earth perishes. $24.95.

In **Reach for the Stars (Third Edition)**, a four-player game of space colonization and conquest, you are responsible for the survival of your race. Starting with one colony, you build your interstellar empire by searching for planets to colonize, managing your people's economic and social forces and developing its military power. $39.95.

Rommel Battles for North Africa, a strategy war game, takes place in 1941, when Rommel contested the Allied forces for control of North Africa. The game re-creates eight of the crucial battles from the North African Theatre, and the package's construction kit lets you create your own conflicts. $39.95.

In **Risk**, based on Parker Brothers' strategy board game, you build your military might to dominate the world. You can create your own game structure, and play against friends or computer opponents. The price of domination is $39.95.

Check Reader Service number 400.

SPACE RACE

SAN RAFAEL, CA—Broderbund Software (17 Paul Drive, San Rafael, CA 94903) introduces two new games.

In **Star Wars**, an arcade adventure based on the movie and coin-operated video game, you're Luke Skywalker, piloting an X-Wing Fighter in an attack on the Empire's Death Star. $39.95.

Downhill Challenge is an interactive ►

Give A Gift That Will Be Opened Every Month.

No need to plug in, hook-up or add on. A *RUN* gift subscription is one of the most valuable accessories you can give your favorite Commodore user this season. That's because *RUN* will be opened every month of the year—each issue revealing fresh and exciting operating hints and programming tips for the C-128 and C-64 user. And no accessory can match *RUN* for features like the incomparable "Magic" column. . .first-class type-and-run program listings for every application. . .thorough new product information. . .and candid reviews. This year, surprise your brother, your mother or a friend with a great Commodore reference library for which they'll remember you all year. *RUN* is easy to give, and easy on your shopping budget—you'll **save 35%** off the newsstand price. Best of all, you won't be billed until *after* the holidays! To order, simply fill in the coupon, or call **1-800-258-5473.**





YES. This year, I want to give the ideal Commodore accessory! Please send a *RUN* gift subscription to the person listed below. I'll pay the special holiday rate of just $22.97 for 12 issues—a **35% saving** off the newsstand price.

( ) Payment Enclosed ( ) Bill me after the holidays

Charge my: _____ Visa _____ MasterCard 2AOD6

Card # _____ Exp. Date _____

Signature _____

Name of Gift Recipient _____

Address _____

City _____ State _____ Zip _____

My Name _____

Address _____

City _____ State _____ Zip _____

Please make checks payable to *RUN*

Canada and Mexico $27.97, Foreign Surface $42.97, Foreign Airmail $77.97 (U.S. Funds drawn on U.S. Bank). All rates are 1 year only. All gift subscriptions will begin with the first available issue in 1989.

MAIL TO: *RUN* • PO BOX 58711 BOULDER, CO • 80322-8711

ski-racing simulation with 3-D animation. Choose downhill, slalom, giant slalom or jumping events, each containing separate runs for beginning, intermediate and advanced skiers. Start practicing now for $24.95.

Check Reader Service number 418.

One Man and a Thousand Babies

NORTHBROOK, IL—Torka, **Captain Blood**'s solar system sweetheart, has promised to bear him 1000 (!) little Bloods. But there's one problem—half a dozen Captain Blood clones are scattered around the galaxy, and they're sapping his energy. Your mission is to find the pesky clones and destroy them. $34.95.

Check Reader Service number 411.

Battles in or on the Field

WESTLAKE VILLAGE, CA—Civil war erupts in 12th century Japan, and your rivals kill your father and subvert the emperor. To redeem the family honor, you must command armies of samurai warriors, fight ninja assassins, negotiate alliances with other clans and confront your enemies in personal combat in the war game, **Lords of the Rising Sun**. $34.95.

TV Sports: Football, a sports simulation, puts you on the bench as the coach or on the field as a quarterback, running back or wide receiver. Choose the pro set, "I" formation or the shotgun; sharpen your skills in exhibition play or put it on the line in a regular season game. $34.95. Cinemaware Corp., 4165 Thousand Oaks Blvd., Westlake Village, CA 91362.

Check Reader Service number 402.

Overwhelming Odds

COSTA MESA, CA—As Hegor the Barbarian, you enter the fearful realms of the underground world of Durgan, a world terrorized by the evil Necron. Battling powerful warriors and horrific monsters, you must use all the wits you possess to defeat the cunning traps and ingenious machines protecting the path to Necron's lair. **Barbarian** is available for $29.99.

In **War in Middle Earth**, you follow Frodo, Aaragorn and Gandalf to get the ring to the Cracks of Doom. Ranged against you are the evil forces of the Dark Lord Sauron and the corrupt Wizard Saruman. The odds are overwhelming, but you cannot afford to fail. $59.99. Mastertronic International, 711 West 17th St., Unit G9, Costa Mesa, CA 92627.

Check Reader Service number 407.

Last but Not Least

REDWOOD CITY, CA—In **The Legend of Blacksilver**, the Princess needs you to rescue her father, the King, from the evil Baron Taragas. The powers of the mystical mineral Blacksilver has pushed the Baron to sink the continent and raise a new one from the depths of the sea, which he then populated with creatures



Final Assault, a mountain-climbing simulation from Epyx.

of his own twisted mind. As the hero, you'll roam a medieval world rife with politics, natural disturbances, fearsome dragons and powerful sorcerers, looking for clues and objects to help you save the King. $39.95.

Puddles, oil slicks, sidewalk cracks, a construction site and old man Baker's El Dorado are some of the dangers to watch out for as you play tackle in **Street Sports Football**. You choose your team from nine heckling hoodlums and pick your plays from a computerized playbook or design your own asphalt action. $39.95.

Players use their noodle in the sports parody, **Sports-a-Roni**. It takes place in Italy, where you race down the streets of Napoli in the Sack Race, balance a pile of Pasta Plates near the Leaning Tower of Pisa, pole-vault the Arno River in the River Jump or climb a pole slick with olive oil in Verona's Pole Climb. Other events included. $24.95.

Defy a watery grave in **Tower Toppler**, an action-adventure game. Eight towers rise from the sea on the planet Nebulus. You destroy them by activating destruction mechanisms at the top of each tower. To get there, you climb your way along slippery, crumbling ledges, through dark labyrinths, and deal with deadly, rolling boulders, flying phantoms and flashing blockades. $39.95.

Armed with a computer wristwatch, criminal radar locator, snare net gun, an .88 magnum and the V-Max, the most technologically advanced car ever built, your mission, as a member of the elite police force, the Enforcers, is to thwart the international crime family known as Death on Arrival, in **Technocop**. $39.95.

Battleship is now a computer game. The strategic adventure is enhanced with colorful graphics and digitized sound effects. A Salvo Fire option increases the challenge by allowing players only four shots per ship remaining. $29.95.

In **Mind-Roll**, a strategy game, players manipulate a ball that bounces and rolls through walls, floors and ramps drawn in elaborate, 3-D, real-world perspective in any of ten different games, with various levels of difficulty. $39.95.

Gear up and take on the icy unknown in **Final Assault**, a mountain-climbing thriller. Test yourself on some of the world's most treacherous peaks, but practice your knowledge and skills over the training course before tackling the big one. You should also prepare thoroughly for this rugged endurance test by carefully selecting the more than 50 items you'll carry in your rucksack. $39.95.

Trials of Honor, an adventure game, begins with a battle for a French kingdom. The monarch has been murdered and the assassin has assumed his throne. As the former heir to the throne, you journey across the realm—testing yourself in such games as an archery trial and staying alive by slaying menacing monsters—to prove your valor and your right to assume rule. $39.95.

Ice Thrashers, a cross between hockey, soccer and utter chaos, is set in the Superconductor Age, where you cut along the ice on magnetic skates to rack up points—and stay alive. Evade explosive devices, rev over ramps and leap bottomless pits, hurdles and jagged ice cracks. Multiple levels take you through rookie challenges and rinkriots. $39.95.

The Games—Summer Edition takes place in Seoul, South Korea. Knife through the water in the Springboard Diving event; strain for one more turn on the Uneven Parallel Bars; propel yourself to a record-breaking win in pole vaulting. Other competitive events include Velodrome Sprint Cycling, the Hammer Throw, Hurdles, Archery, and the Rings. $39.95. Epyx, Inc., PO Box 8020, Redwood City, CA 94063.

Check Reader Service number 419. ■

DON'T SETTLE FOR LESS...

COMMODORE 64C



$149.95

1541II DISK DRIVE $169.95
1802C MONITOR $189.00

64C w/1541II Drive $309
1802C Monitor with Package $184

COMMODORE 128D



$439

- 128K Memory
- Built in 1571 Disk Drive
- Detatchable Keyboard

128D with
1084 Monitor $719

COMMODORE AMIGA

FOR ALL YOUR AMIGA NEEDS ... CALL tcp

512K RAM Upgrade..... $159
1010 EXT DRIVE $219
1680 MODEM $139

TUSSEY'S SPECIAL PACKAGES

GAME GALLERY

Educational Software too!
All Games stocked for quick ship!!!

ACCESS
Echelon	$27.95
Leader Board	$22.95
Leader Board Tourn. Disk	$13.95

ACCOLADE
Apollo 18	$17.95
Comics	$19.95
4th & Inches	$19.95
Hard Ball	$19.95
Killed Until Dead	$12.95
Miniputt	$19.95
Test Drive	$19.95

ACTIONSOFT
Thunder Chopper	$19.95
Up Periscope	$17.95

ACTIVISION
Air Rally	$19.95
Aliens	$11.95
Gamemaker Package with all Libraries	$39.95
Last Ninja	$22.95
Maniac Mansion	$24.95
Music Studio	$19.95
Shanghai	$19.95

AVALON HILL
NBA	$27.95

BRODERBUND
Lode Runner	$22.95
Moebius	$27.95
Superbike Challenge	$14.95
Ultima V	$39.95

CINEMAWARE
Defender of the Crown	$22.95
King of Chicago	$32.95
SDI	$27.95
The Three Stooges	$27.95

COSMI
Def Con 5	$17.95

DATA EAST
Commando	$14.95
Karate Champ	$14.95
Kid Niki	$19.95
Platoon	$19.95
Speed Buggy	$17.95

DATASOFT
Alt Reality/Dungeon	$27.95
Hunt For Red October	$27.95
Video Title Shop	$19.95

DIGITAL SOLUTIONS
Pocket Writer 2	$39.95
Pocket Filer 2	$37.95
Pocket Planner 2	$37.95
Digital Superpak	$64.95
Dictionary	$12.95

ELECTRONIC ARTS
Bard's Tale	$24.95
Bard's Tale II	$27.95
Bard's Tale III	$24.95
Chessmaster 2000	$26.95
Demon Stalkers	$19.95
Dragon's Lair	$19.95
EOS(Erth Orbit Stat'n)	$19.95
Instant Music	$22.95
Legacy of the Ancients	$19.95
Marble Madness	$19.95
Master Ninja	$24.95
Monopoly	$24.95
Outrageous Pages	$34.95
PHM Pegasus	$19.95
Roadwars	$24.95
Rockford	$22.95
Skate or Die	$19.95
Sky Fox II	$19.95
Strike Fleet	$19.95
Wasteland	$CALL
World Tour Golf	$19.95
Yeager AFT	$24.95



EPYX ONLY $24.95

500 XJ Joystick	$14.95
California Games	$24.95
Champ'ship Wrestling	$14.95
Create a Calendar	$17.95
Destroyer	$22.95
4x4 Off-Road Racing	$24.95
Impossible Mission	$24.95
L. A. Crackdown	$24.95
Movie Monster	$12.95
Street Sports Baseball	$24.95
St Sports Basketball	$24.95
Street Sports Soccer	$24.95
Sub Battle	$22.95
Summer Games	$14.95
Summer Games II	$14.95
Winter Games	$14.95
World Games	$24.95

FIREBIRD
Elite	$17.95
Guild of Thieves	$22.95
Knight ORC	$24.95
Star Glider	$24.95
The Sentry	$24.95

GAMESTAR
Championship Football	$24.95
GBA Basketball 2 on 2	$22.95
Top Fuel Eliminator	$17.95

INFOCOM
Beyond Zork	$26.95
Hitchhiker's Guide	$14.95

LANCE HAFNER for the best in sports strategy simulation

3 in 1 Football	$29.95
Bktball, the Pro Game	$29.95
Final Four Basketball	$29.95
Full Count Baseball	$29.95

MICROLEAGUE
Baseball	$24.95
Wrestling	$19.95

MICRO PROSE
Airborne Rangers	$24.95
F-15 Strike Eagle	$21.95
Gunship	$21.95
Kennedy Approach	$14.95
NATO Commander	$22.95
Pirates	$23.95
Silent Service	$21.95
Solo Flight	$14.95
Stealth Fighter	$24.95

MINDSCAPE
Gauntlet	$24.95
Indoor Sports	$19.95
Infiltrator II	$19.95
Paperboy	$22.95
Perfect Score:SAT prep	$44.95
Superstar Hockey	$22.95

SIMON & SHUSTER
Star Trek: Promethian Adv	$24.95
Typing Tutor IV	$24.95

SPECTRUM HOLOBYTE
Falcon	$22.95
Intrigue	$19.95
PT 109	$24.95
Soko Ban	$17.95

SOFTWARE SIMULAT'NS
Football	$19.95
Pure Stat Baseball	$24.95
Pure Stat College BB	$24.95

SSI
Advanced Dungeon & Dragons	$24.95
B-24	$22.95
Eternal Dagger	$24.95
Phantasie I, III (each)	$24.95
Rings of Zilfin	$24.95
Roadwar Europa	$24.95
Shard of Spring	$24.95
Wargame Const Set	$19.95

SUBLOGIC
Flight Simulator II	$32.95
Jet	$27.95
Stealth Mission	$34.95

64C BUSINESS AND PRODUCTIVITY

Vizastar 64 4K
Integrated Productivity Package For The 64
NOW ONLY $9.95

64C DATABASES
Bank Street Filer	$24.95
Data Manager II	$19.95

64C SPREADSHEETS
Swiftcalc 64 w/sideways	$17.95
Sideways	$14.95

64C WORD PROCESSORS
Bank Street Writer	$29.95
Font Master II	$29.95
Paperclip w/spellpack	$32.95
Paperclip III	$39.95
Pocket Writer Dictionary	$12.95
Word Writer III	$34.95

FINANCIAL & ACCT.
Timewks Electr. Checkbk	$17.95
Timeworks Money Mgr	$17.95
CMS Acct Pkg/64	$119.95

MISC. HARDWARE
Estes pwr supply for C-64	$54.95
Naverone 3 Slot expder	$24.95

UTILITIES
Thinking Cap	$24.95
Toy Shop	$24.95
Copy II 64/128	$24.00
Fast Load	$24.95
Bobs Term Pro	$32.95

COMMODORE 128 SOFTWARE

WORD PROCESSORS
Fleet System 4	$49.95
Font Master 128	$39.95
Paperclip II	$54.95
Paperclip III	$39.95
Superscript 128	$44.95
Term Paper Writer	$29.95
Wrdwriter 128 w/spell	$34.95

SPREADSHEETS
Swiftcalc 128 w/sdwys	$39.95

DATA BASES
Data Manager 128	$34.95
Perfect Filer	$44.95
Superbase 128	$49.95

MISC. 128 SOFTWARE
Accountant Inc	$79.95
CMS Acct Pkg/128	$124.95
Mach 128	$34.95
Partner 128	$39.95
Sylvia Porter's Personal Finance Planner	$44.95

GRAPHICS CORNER

Batteries Included
Paperclip Publisher	$39.95

Berkeley Softworks
GEO Publish	$44.95

Broderbund
Graphics Library I,II or III	$16.95
Print Shop	$25.95

Electronics Arts
Outrageous Pages	$34.95

Springboard
Certificate Maker	$29.95
Clip Art I or III	$19.95
Newsroom	$19.95

Unison World
Printmaster Plus	$24.95

WICO JOYSTICKS

The Boss	$12.95
Bat Handle	$17.95
3-Way	$22.95

tcp TUSSEY COMPUTER PRODUCTS

P.O.BOX 1006, STATE COLLEGE, PA 16804

...tcp SHIPS IT

PRINTERS



Panasonic Office Automation

2 yr warranty

1080iII $164
1091iII $199
1092i $319

star micronics, inc



NX-1000
(144 draft/36 NLQ) $169
NX 1000 Rainbow
(color printer) $229
NX-1000C
(Commodore Int'face) $174
NX-1000C Rainbow
(Commodore Interface/
Color Printer) $229
NX-2400
(24 Pin Printer) $349

SEIKOSHA



2 yr warranty

SP-180 VC $139
SP-1200 VC ...$CALL
SP-1200 AI $169

CITIZEN



120D ..... $CALL
180D ..... $CALL
MSP-40 ..... $319
Tribute 224 ..... $679

OKIDATA 180

$229

- Built in COMMODORE® and EPSON® Interface
- 180 CPS Print Speed

Call For Other Okidata Printers

COMMODORE AMIGA

FOR ALL YOUR AMIGA NEEDS ... CALL tcp

AMIGA SOFTWARE

PRODUCTIVITY

Deluxe Music Const Set	$79.95	Logistix	$89.00
Deluxe Paint II	$99.95	Superbase	$89.00
Deluxe Print II	$59.95	Vizawrite	$89.00
Deluxe Video 1.2	$99.95	Word Perfect	$CALL
Draw Plus	$189.00		

ENTERTAINMENT

Balance of Power	$29.95	Hot-Cold Jazz	$24.95
Bards Tale	$39.95	Leisure Suit Larry	$44.95
Beyond Zork	$37.95	Marble Madness	$32.95
Chessmaster 2000	$29.95	Racter	$27.95
Defender of the Crown	$29.95	S.D.I.	$29.95
Deja Vu	$29.95	Silent Service	$29.95
Earl Weaver Baseball	$39.95	Sinbad	$29.95
Ferrari Formula One	$32.95	Starfleet I	$39.95
Flight Simulator II	$39.95	Univited	$29.95
Halley Project	$29.95		

512K RAM Upgrade.. $159
1010 EXT DRIVE $219
1680 MODEM $139

NEW LOWER PRICES !!

SUPER GRAPHIX JR
Printer Interface $32.95
w/Printer from Tussey $29.95

SUPER GRAPHIX
Interface w/8K buffer
down loadable fonts $54.95
w/Printer from Tussey $49.95

SUPER GRAPHIX GOLD ..$94.95
w/Printer from Tussey $84.95

Xetec



RGB/COMPOSITE COLOR MONITORS FOR THE 128



COMMODORE 1084
640 x 400 Resolution.
4 Operating Modes
..... $299

MAGNAVOX 8762
640 x 240 Resolution.
3 Modes. 1 yr warranty
..... $249

THOMSON 4120
560 x 240 Resolution.
4 Modes.1 yr warranty
..... $219

All 3 monitors include cables to Commodore 128

Berkeley Softworks

GEO PUBLISH (64/128) $44.95

GEOS 128	$44.95	GEOS	$36.95
Geo Calc 128	$44.95	Geo Calc	$31.95
Geo File 128	$44.95	Geo File	$31.95
Geo Programmer	$47.95	Geodex	$24.95
Geo Publish	$44.95	Deskpack	$21.95
Geo Write 128	$44.95	Fontpack	$19.95
Geo Spell	$22.95	Geo Write	$31.95

FEDERAL EXPRESS

Software orders over $100 and Accessories under 6 pounds will be shipped Federal Express

(Even at these prices) You only pay TCP's standard shipping charge of $4.00 per order. Orders arriving before 3:00 PM our time will be shipped out same day. If part of your order is backordered the remainder will be shipped UPS Ground FREE!

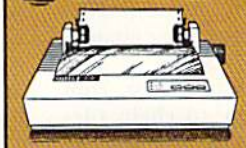
SECURITY
- Your Credit Card is not charged until your order is shipped.
- We insure your order at no extra cost to you.
- Tussey is a financially strong and well established company.

CUSTOMER SUPPORT
- After sales support.
- Knowledgeable staff, all graduates of Tussey's "Computer Boot Camp".
- Our advanced warehouse/materials handling system assures your order is shipped out accurately & on time.
- Our IBM 5360 allows instant order and inventory status.

To order by mail: We accept money order, certified check, personal check. Allow 2 weeks for personal & company checks to clear. **Shipping:** $4.00 for software FOR ALL HARDWARE AND ANY ACCESSORY OVER 6lbs Call our Toll Free Number 1-800-468-9044 for shipping charges. Add $3.00 per box shipped COD. Additional shipping required on APO, FPO, AK, HI, and foreign orders. **Terms: PRICES REFLECT CASH DISCOUNT, ADD 1.9% FOR MASTERCARD OR VISA.**
ALL SALES ARE FINAL
Defective items replaced or repaired at our discretion. Pennsylvania residents add 6% sales tax. Prices and terms subject to change without notice.

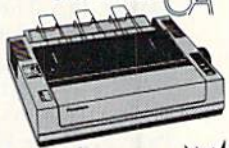
VISA MasterCard

CITIZEN™



120D ..... $CALL
- 120 cps (draft)
- 80 Column Print Width
- Hi-Resolution Graphics

Panasonic Office Automation



1080iII Printer
- 144 cps (draft)
- NLQ Mode
- 2 yr Warranty

$164

C= COMMODORE
1670 MODEM
$79

C= COMMODORE
1764
256K RAM EXPANSION
$119

C= COMMODORE
1581
3½" DISK DRIVE
$197

CMS

ACCOUNTING SYSTEMS
Pkg. Price for all Modules:
C128 version $124.95
C64 version $119.95

DISK-KOUNTS

per box of 10		3.5"	5.25"
BONUS	DS DD	$16.95	$6.95
MAXELL	DS DD	$17.95	$9.95
VERBATIM	DS DD	$19.95	$9.95
SONY	DS DD	$16.95	$8.95

Circle 209 on Reader Service card.

Regular Hrs: 8:00AM-9:00PM Mon-Fri, 10:00AM-6:00PM Sat, 12:00PM-8:00PM EST

CALL TOLL FREE 1-800-468-9044

tcp

FOR INFORMATION CALL 814-234-2236 FAX: 814-237-4450

MAIL RUN

RUN's readers defend their favorite word processors, look for BBS pen pals and tell why they patronize mail-order houses.

THE ASSEMBLY LINE

I enjoyed Michael Broussard's excellent review and comparison of machine language assemblers ("The Assembly Line," May 1988). As a result, I purchased Merlin-64 and am quite pleased with it. Keep up the good work.

—CHARLIE YOUNG
BENTON, AR

A MISSED SPELLING

We appreciate your article on word processors ("The Lastest Word," June 1988) and the fact that ours was included. However, the prices in the table on page 45 give the impression that FontMaster 128 is sold without the SpellMaster for $69.95 and that SpellMaster must be purchased for an additional $10. The current version of FontMaster 128 sells for $69.95 and includes SpellMaster 128. The older version retailed for $59.95, which owners can update to include SpellMaster for $10.

Also, the article stated that FontMaster 128 was unable to chain files. Page 51 of the FontMaster manual tells you how to chain files. It does work and is a feature of the program.

—JOHN SHOULTYS
MARKETING DIRECTOR, XETEC, INC.
SALINA, KS

The section of the manual entitled "Miscellaneous Formatters" states that: "When printing text, if FontMaster encounters this [CH: text file] format control, the file listed after the colon is loaded into memory from the disk and printing continues at the start of the file. This is useful when printing large documents that must be split into smaller files." We regret the error and any inconvenience it may have caused.

—EDITORS

MY WP IS BETTER THAN YOUR WP

Mike Cavanaugh's excellent review of five new word processors ("The Latest Word," June 1988) showed the persistence of the Commodore computers due to the constant upgrading of the software. Commodore also attracts third-party developers such as R. Eric Lee of Busy Bee Software.

After three years as the Pittsburgh Commodore Group Librarian, the only word processor I recommend is Busy Bee's The Write Stuff. The writeup caught most of its features, although the chart on page 44 should have a Y (for Yes) for 80-Column Video Preview.

—BOB AGOSTINO
PITTSBURGH, PA

You're right in pointing out that The Write Stuff does have an 80-Column Preview mode. Also, the 1581 drive is supported. The chart was in error.

—EDITORS

"The Latest Word" neglected to cover one of the best word processors, Timeworks' Word Writer 128. I recently received an updated version and, to my surprise, it's not copy-protected. You can answer Yes to all the features except for the 1581 drive and RAM expanders. There is also a great outliner and a mail-merge program, and the pull-down menus almost eliminate the need for a manual.

—NICK RICCIUTI
BALTIMORE, MD

What gives? Here you do articles on word processors, and you leave out one of the best buys on the market. Look in your own Productivity Pak. Your RUN Script is easy to use; others require you to memorize a chart of special characters or look up things. Not yours. Yours uses simple dot commands and logical command sequences.

I teach C-64 Basic in our adult enrichment programs in the Huntsville city school system, and I recommend and demonstrate RUN Script to the students.

—LYSLE E. SHIELDS, JR.
HUNTSVILLE, AL

I enjoyed your review on word processors but was disappointed when you failed to review WordStar. Although it's not for C-128 mode, it does work very well in CP/M mode and has some very nice features.

—BROOKE WHEELER
JACKSON, CA

What criteria do you use for evaluating word processors? You put down one of my favorite programs, Spinnaker's Word Pro, by saying its time had come and gone. To be sure, it's not a desktop publishing program, but for short documents and ordinary correspondence, it can't be beat.

—ROBERT E. WILNER
MEDIA, PA

TOO NEGATIVE?

Your August Telecomputing Workshop was so negative, I just had to write. Generally speaking, a columnist should be promoting telecomputing. If I were new to telecomputing, I'd be so scared of it due to pirates, hostage-holding, computer terrorism, viruses, and—you forgot to mention this one—tapeworms, I'd throw away my modem before calling any BBS. These problems are unknown to 99.99 percent of telecommunicators.

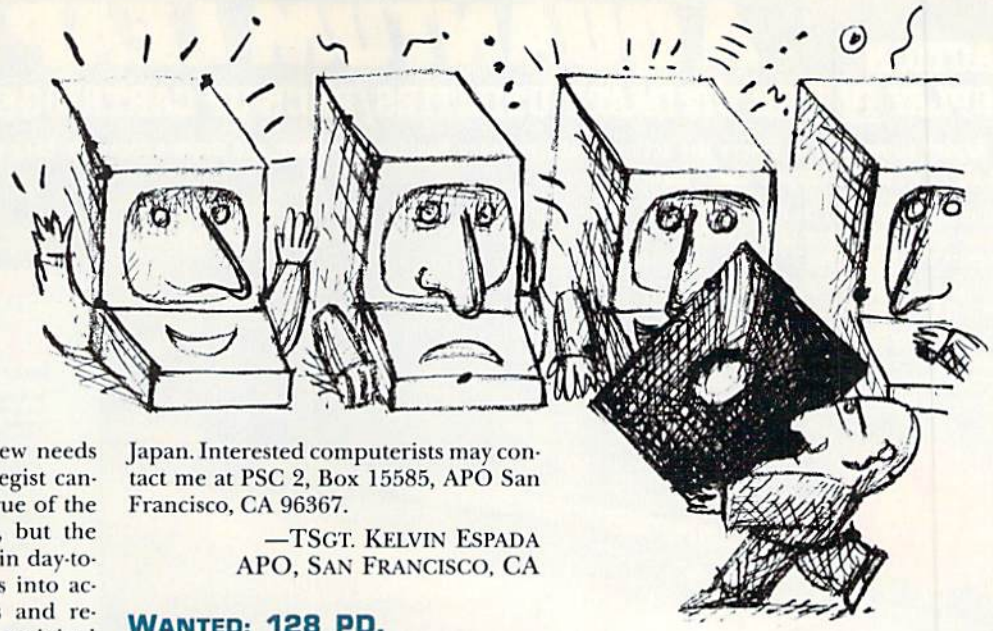
—THOMAS WEAVER
PENSACOLA, FL

STOCK DATA

Reviewer Peter King did a good job of reviewing our market timing system, Strategist (Software Gallery, May 1988). However, I think he overestimated, or at least overreacted to, the work required to obtain the historical data the program uses.

CompuServe has historical quote data for stocks, mutual funds and commodities, and a terminal program is included in Strategist's package for downloading them.

We offer Strategist-format quote file on disk. Single-data disks, with seven to ten years' worth of weekly quotes, are $8.95 for three issues. Double disks (six issues) are available for $13.95.



Also, one point in the review needs updating. Mr. King said Strategist cannot use daily quotes. That's true of the first release of the program, but the current release is fully fluent in day-to-day trading. It also now takes into account stock dividends, splits and reverse splits. Purchasers of the original version, which has a user number of 871279 or lower, can get a free upgrade by writing to us at Box 14-2403, Anchorage, AK 99714.

—STAN JONES
STRATEGY SOFTWARE
ANCHORAGE, AK

I LIKE MY 1526 PRINTER!

I strongly object to you referring to the Commodore 1526 printer as a "maintenance disaster" and a "pretty poor printer" (Commodore Clinic, July 1988). I've been using my printer for heavy daily use for four years, the only problem being that I got address labels stuck under the bail roller.

I also put my 1541 disk drive through heavy use for five years with no problem until it was destroyed by a rampant three-year-old with a ball-peen hammer.

—WAYNE V. H. LORENTZ
HIGHLAND LAKES, NJ

We've always advocated keeping magnets and hammers away from disk drives.

—EDITORS

CAN WE TALK?

I'm a Technical Sergeant in the air force, stationed in Okinawa, Japan. We have a very active Commodore community here and are looking for your assistance in solving a problem.

We are trying to set up an electronic pen-pal system with some BBSs in the States. We would mail them our disks with our messages and they in turn would return those disks with any messages and replies. This way we hope to be able to maintain some contact with other computerists in the States while we spend our four-year tour of duty in Japan. Interested computerists may contact me at PSC 2, Box 15585, APO San Francisco, CA 96367.

—TSGT. KELVIN ESPADA
APO, SAN FRANCISCO, CA

WANTED: 128 PD, SHAREWARE AND FREEWARE

I'm in the middle stages of publishing a 128 users guide to public domain, shareware and freeware programs. I need to hear from more C-128 programmers and to get their software out to all interested users. So far, I've reviewed over 200 programs for the book, but it's lacking in a few areas. If any of your readers have software of this type, they may reach me at Blynd Dog Publishing, 9410 E. 18th Terrace, Independence, MO 64052.

—BRAD S. BUREAN
INDEPENDENCE, MO

WHY WE BUY THROUGH MAIL-ORDER

It's no surprise to me that "Commodore users are more apt to purchase... through mail-order..." and that "Commodore users rely on magazine articles..." (RUNning Ruminations, July 1988).

Just why do Commodore users rely so much on mail-order houses? There are several reasons. Foremost is the fact that Commodore historically has not supported small business. Instead, they seem to prefer selling to mass merchandisers such as Sears and K-Mart, none of which are qualified to provide after-sales support.

Furthermore, most computer store managers consider Commodore computers as nothing more than toys. Their attitude is supported by the plethora of arcade-action and role-playing games and the paucity of professional-quality software. Consequently, we can't just go to a local computer store, try out and buy the software and hardware that we want or need.

Also, without mail-order ads in the various Commodore-specific publications, we wouldn't even know that Commodore is still making computers. Is it any wonder then that most Commodore users resort to mail-order houses for making their hardware and software purchases?

The Commodore-specific magazines must provide us with comprehensive reviews, not overstated publicity, that reflect actual use of products currently available. We also expect magazines such as *RUN* to provide us with news and announcements of products for the Commodore computers.

—DAN W. CROCKETT
PINETOP, AZ

RUN COPY

The letter by Fred Nichols in the May 1988 issue of *RUN* ("Running RUN Copy," Mail RUN) says that RUN Copy 64 (February 1988) automatically formats a disk. My copy of RUN Copy doesn't do this. Is it supposed to?

—H. MARK NEWMAN
HASTINGS, MI

Yes. RUN Copy formats a copy disk as it writes to that disk. Therefore, you can use a formatted or unformatted disk as a copy disk.

—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.

Send your letters to Mail RUN, 80 Elm St., Peterborough, NH 03458. Each letter must include the writer's name and complete address. RUN *reserves the right to edit letters for style, clarity and space.* ■

ILLUSTRATED BY MACIEK ALBRECHT

TOTAL BACK UP POWER TAKES A QUANTUM LEAP!

ACTION REPLAY IV THE ULTIMATE UTILITIES/BACK-UP CARTRIDGE FOR THE 64/128

• Action Replay allows you to Freeze the action of any memory Resident Program and make a complete back-up to disk or tape – but thats not all . . . . Just compare these features

- Simple Operation: Just press the button at any point and make a complete back-up of any* memory resident program to tape or disk.
- Turbo Reload: All back-ups reload completely independantly of the cartridge at Turbo speed.
- Sprite Monitor: View the Sprite set from the frozen program – save the Sprite – transfer Sprites from one game to another. Wipe out Sprites, view the animation on screen. Create custom programs.
- Sprite Killer: Effective on most programs – make yourself invincible. Disable Sprite/Sprite/Backround collisions.
- Unique Picture Save: Freeze and save any Hires Screen to tape or disk. Saved in Koala, Blazing Paddles Format.

ONLY $59.99

UNIQUE FEATURES:

WARP 25

Loads 50K in under 5 seconds!!

The it true action replay features 'Warp 25' the world's fastest disk serial Turbo. A typical backup will reload in under 5 seconds.

● No additional hardware required ● No special formats ● Super reliable ● Remember this is not a system where files have to be converted – with action replay you simply save directly into Warp 25 status – reload in seconds. ● Back-up all your existing programs to load at unbelievable speed!! ● Because AR4 has on board ram it can also load commercial disks directly at 25 times speed.

This is unique to Action Replay!!

● Warp Save/Load Available straight from Basic.

Plus unique Code Cracker Monitor

● Freeze any program and enter a full machine code monitor ● Full Monitor Features – Dissassemble, Hex, Find, Jump, Compare, Replace, Two Way Scroll, Full Disk Load/Save, Printer Support etc. In fact all usual monitor commands plus a few others. ● Because of Action Replay's on Board Ram the Frozen program can be looked at in it's ENTIRETY – In it's Frozen state. That means Video Ram, Zero Page etc. and remember you see the code in it's Frozen state not in a Reset state as with competitors products. ● Restart the program at any point. ● No corruption ● An absolute must for the program Hacker – make changes and see your result's instantly!

POWERFUL DESIGN WITH ON BOARD LSI LOGIC PROCESSOR CHIP PLUS 40K OF ON BOARD ROM/RAM!

- Compactor: Efficient compacting techniques – 2 programs per disk side – 6 programs if you use both sides.
- Single File: All programs saved as a single file for maximum compatibility.
- Utility Commands: A host of additional commands: Monitor, Append, Old, Delete, Linesave, Printer Assist.
- Screen Dump: Print out any Screen to Host or Printers. 16 Gray Scales, Double size print options.
- Unstoppable Reset: Reset button to Rectrieve System and Reset even so called Unstoppable Programs
- Fully Compatible: Works with 1541/C, 1581, 1571 and Datacassette with C64,128, 128D (in 64 Mode)
- Compatible: With Fast DOS and Turbo Rom Systems
- Disk Utilities: Fast Format, Directory, List, Run and many other key commands are operated by Function Keys
- Unique Restart: Remember all of these utilities are available at one time from an integrated operating system. A running programme can be Frozen to enter any Utility and the program is restarted at the touch of a key – without corruption.

LSI Logic Processor: This is where Action Replay IV gets it's power. A special custom LSI chip designed to process the logic necessary for this unmatched Freeze/Restart power. No other cartridge has this power!

Action Replay Graphics Support Disk

To help take advantage of action replay's unique power to freeze any screen and save it into your favourite graphics package we have prepared a suite of graphic support facilities.

● **Screen Viewer** View screens in a 'slide show' sequence – Joystick control simple to use. ● **Message Maker** Add scrolling messages to your saved screens with music, very easy to use. ● **Proesprite** A full sprite editor, modify/save/load feature, full edit facilities. ● **Zoon Lens** Explode sections of any saved screen to full size including Border – Superb fun and very useful.

ONLY $19.99

CENTRONICS PRINTER LEAD

- Take full advantage of Action Replay or Final Cartridge screen dump features with this centronics lead.
- Connects user port to any full size Epson compatible printer.

ONLY $18.99

SUPERCRUNCHER

- A utility to turn your Action Replay into a super powerful program compactor. Reduce programs by up to 50%! Save disk space and loading times. Can even further compact programs already crunched by Action Replay's own compactor.

ONLY $9.99

NOW WITH RAMLOADER™

- Not only can Action Replay load your backups at 25 times normal speed. . . Now with the new RAMLOADER feature you can also load most of your commercial originals also at 25 times faster!
- Making use of our special LSI logic processor and 32K of onboard Ram Action Replay now offers the world's fastest Disk Serial Turbo.

ORDERS ONLY 1-800-782-9110

NOTE: – Technical or any other type of Enquiry cannot be answered by the staff on this number.

TECHNICAL SUPPORT CUSTOMER SERVICE (702) 454-7700

MONDAY THRU SATURDAY 9am to 5pm PACIFIC TIME
EXTRA SHIPPING REQD. OUTSIDE CONTINENTAL U.S.

DATEL COMPUTERS



☐ FINAL CARTRIDGE III

☐ Give your C64/128 an "Amiga Look Alike" environment. Pull down windows/icons.
☐ PLUS a huge range of utilities all built into this one cartridge . . . including:
☐ Freezer option to freeze and copy most any memory resident program.
☐ Full machine code monitor with all the usual commands and more.
☐ Unique picture print dump – compressed/enlarged
Plus other effects.
☐ Fast loader – loads commercial software at up to 15 times normal speed.
☐ Range of desk top type tools – clock, calculator, desktools etc. etc.
☐ Final Cartridge 3 is a superb utilities cartridge with an added bonus of a freezer function.

ONLY $54.99

TOOLKIT IV

The ultimate disk toolkit for the 1540/1541

☐ A disk toolkit is an absolute must for the serious disk hacker. Toolkit IV has more features than most for less.
☐ DISK DOCTOR V2 – Read and write any track and sector including extra and renumbered tracks. Repair damaged sectors. Look underneath read errors.
☐ HEADER/GAP EDITOR – Decodes and displays ALL header information including off bytes and header gap. Rewrite the entire header and header gap. Renumber sectors. Also edit any sector tail gap.
☐ DISK LOOK – Sort directory. Recover lost files. Display file start/end addresses. Disassemble any file program directly from the disk to SCREEN or PRINTER including undocumented opcodes. Edit Ram. Much, much more.
☐ FILE COMPACTOR – Can compact machine programs by up to 50%. Saves disk space. Compacted programs run as normal.
☐ FAST DISK COPY – Copy an entire disk in 2 minutes or less using single 1541.
☐ FAST FILE COPY – Selective file copy. Works at up to 6 times normal speed.
☐ FORMATTER – 10 second format an entire disk or format any individual track or half track 0 to 41. Redefine any of 30 parameters to create or recreate unique disk formats.
☐ ERROR EDIT – Quickly find and recreate all read errors including extra and renumbered tracks or sectors and half tracks from 0 to 41. Even recreates data under errors and allows you to redefine any necessary parameters.

ONLY $14.99



DIGITAL SOUND SAMPLER

☐ The new sampler allows you to record any sound digitally into memory and then replay it with astounding effects.
☐ Playback forwards/backwards with echo/reverb/ring modulation.
☐ Full 8 bit D to A & ADC conversion.
☐ Midi compatible with suitable Midi interface. (see Ad')
☐ Full sound editing and realtime effects menu with waveforms
☐ Powerful sequencer plus load/save functions
☐ Line In/Mic In/Line Out/Feedback controls.
☐ Complete hardware/software package

ONLY $89.99



MIDI 64

☐ Full specification MIDI interface at a realistic Price.
☐ MIDI IN ☐ MIDI OUT ☐ MIDI THRU
Compatible with most leading MIDI software.

ONLY $49.99

TURBO ROM II



Turbo Rom II is a replacement for the actual kernal inside your 64. It provides superfast load/save routines.

☐ Loads/Saves most programs at 5-6 times normal speed.
☐ Improved DOS support including 10 sec format.
☐ Programmed function keys:- load, directory, old, etc.
☐ Return to normal kernal at flick of a switch.
☐ PCOPY – 250 block file copier.
☐ FLOAD – special I/O loader.
☐ Plus lots more.
☐ Fitted in minutes – no soldering usually required. (On some 64's the old ROM may have be desoldered).

ONLY $24.99



256K SUPEROM EXPANDER

☐ Now you can select from any of 8 32K EPROMs
☐ 8 sockets to accept upto a 32K EPROM in each.
☐ On board operating system – no programs to load.
☐ Program your own EPROMs using our EPROM programmer.
☐ No need to have loads of cartridges – just make a selection from the Superom menu.
☐ Directory of utilities on power up.
☐ Fully menu driven on power up.
☐ Select any slot under software controls.
☐ Unique EPROM generator feature will take your own programs – basic or m/c and turn them into autostart EPROMs. (EPROM burner required).
☐ Accepts 2764/27128/27256 EPROMs.

ONLY $49.99



EPROMMER 64™

☐ A top quality, easy to use EPROM programmer for the 64/128.
☐ Fully menu driven software/hardware package makes programming/reading/ verifying/ copying EPROM's simplicity itself.
☐ Will program 27256 chips. 12.5, 21 or 25 volts.
☐ Fits into user port for maximum compatibility with cartridges/Superom Board etc.
☐ Full feature system – all functions covered including device check/verify.
☐ We believe Eprommer 64 is the most comprehensive, most friendly and best value for money programmer available for the 64/128.
☐ Ideal companion for Superom Board. Cartridge development System, our kernal expanders or indeed any EPROM base project.
☐ Comes complete with instructions – plus the cartridge handbook.

ONLY $69.99 COMPLETE



DEEP SCAN BURST NIBBLER™

☐ The most powerful disk nibbler available anywhere, at any price!
☐ Burst Nibbler is actually a two part system – a software package **and** a parallel cable to connect the 1541/1570/1571 to 64/128 (state type).
☐ What gives Burst Nibbler its power? Conventional nibblers have to decode the data from the disk before it can transfer it using the serial bus – when non standard data is encountered they are beat. Burst Nibbler transfers data as raw GCR code via the parallel cable without the need to decode it so you get a perfect copy of the original.

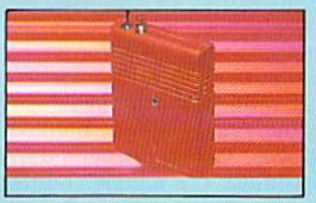
● Will nibble upto 41 tracks. ● Copy a whole disk in under 2 minutes. ● Full instructions.
● Regular updates – we always ship the latest. ● Fitted in minutes – no soldering usually required.
● Full or $\frac{1}{2}$ tracks. ● No need to buy parallel cable if you have Professional DOS etc.
● Cable has throughbus extension for other add ons.

ONLY $39.99 COMPLETE
SOFTWARE ONLY $19.99 CABLE ONLY $19.99

BURST NIBBLER PARAMETER DISK

☐ Burst Nibbler is the most powerful Nibbler around – but even the best can be better. ☐ This disk contains dozens of parameters specially written for the protection schemes impossible to Nibble. These are mainly 'V-max' and 'Rapidlock' and include titles such as 'Defender of the Crown,' Gauntlet etc. ☐ Regularly updated to include any new titles. ☐ This disk is by no means a necessity – the standard Burst Nibbler will copy 98% of software as is – if you want to go to the limits, this is the product for you!

ONLY $14.99



SMART CART

☐ NOW YOU CAN HAVE A 32K CARTRIDGE THAT YOU PROGRAM LIKE RAM THEN ACTS LIKE ROM!
☐ 32K pseudo ROM – battery backed to last up to 2 years (lithium battery).
☐ Simply load the program you require – then flick the switch. The cartridge then acts like a ROM cartridge and can even be removed.
☐ Make your own cartridges – even auto start types, without the need for an Eprom burner.
☐ Can be switched in/out via software.
☐ I/02 slot open for special programming techniques.

ONLY $59.99



DUPLIKATOR

☐ Duplikator is a mass disk copier ideal for clubs, user groups etc.
☐ Comes with 256K on board RAM and it's own built-in operating system – no software to load.
☐ Makes entire backups in 8 seconds!!
☐ Multiple copies from one original – over 250 disks per hour. Full verify option.
☐ Copies upto 40 tracks and can cope with standard disk errors 21-29.
☐ The most price effective method of mass duplication available.

ONLY $189.99



☐ EXTERNAL 3.5" DISK DRIVE

● Slimline extra low profile unit – only 6" long!
● Top quality NEC drive mechanism. ● Throughport allows daisychaining other drives. ● A superbly styled case finished in amiga colours. ● Fully compatible. ● 1 meg unformatted capacity. ● Good length cable for positioning on your desk etc. ● Complete – no more to buy.

ONLY $169.99 SINGLE
ONLY $299.99 DUAL



☐ MIDIMASTER

● Full Midi Interface for A500/2000/1000 (Please state model).
● Compatible with most leading Midi packages (inc. D/Music).
● Midi In – Midi Out x 3 – Midi Thru.
● Fully Opto Isolated/Full MIDI.

ONLY $59.99

Circle 154 on Reader Service card.

VISA® MasterCard

Add $4.00 Shipping/Handling
CHECKS/MONEY ORDER/CODS ACCEPTED

DATEL COMPUTERS
3430 E. TROPICANA AVENUE, UNIT #67, LAS VEGAS, NV 89121

SOFTWARE GALLERY

October is Computer Learning Month, so we've compiled a selection of reading, 'riting and 'rithmetic programs.

Compiled by BETH S. JALA

BANK STREET SCHOOL FILER ..... A–

An Organizing Dream Come True for Teachers

Teachers: Have you ever dreamed of a computer product geared entirely to your needs, complete with database capabilities and classroom management forms? How about content area data and suggestions for lessons that incorporate the data? Easy-to-follow screens, for both you and your students? An easy way to arrange information into tables? A tutorial, too?

Look no further. The Bank Street School Filer is available for the C-64. Essentially a database manager with educational files, it lets you variously manipulate information like grades, student addresses or financial accounts.

The program comes with a disk that contains forms for databases in which you can enter records. You can scan and sort files, find records that meet particular criteria, and print out data to screen, disk or paper in several easily altered formats, including text and tables. You can include comments on each record, and passwords will protect them from prying eyes.

You'll find that password protection comes in handy, because you may be allowing your students—in grades five and up—to investigate and alter data on companion science and social studies data disks. Students and teachers can create, edit and sort the files; they can also design and print custom reports. By doing so, students will be reinforcing their research, critical-thinking and information-management skills.

The astronomy disk, for example, includes files on constellations, pre- and post-1800 discoveries and planets. A log file contains the solar, lunar, tidal and temperature information for each of 52 consecutive Mondays.

Another content disk covers mammals and extinct and endangered species. Students can explore the endangered species of their own areas, and examine the causes of certain extinctions. Both the astronomy and the endangered-species disks include annotated bibliographies and glossaries that can be edited and updated. Each also comes with a teacher's guide that includes background information, introductory activities and reproducible activity sheets.



Entering information into your Bank Street School Filer database will get you organized.

The Bank Street Filer and its companion disks are not perfect. The tutorial to the Filer is somewhat confusing, because actual forms, with their prompts, are displayed along with the tutorial instructions. The introduction to database terminology is weak; novices would benefit from earlier, and more complete, definitions of terms like "field" and "record." Also, the content files have various minor errors, ranging from unnecessary commas to the representation of unknown data—the surface temperatures of Neptune and Saturn are shown as "999."

These files—and others on North America, animal life, space and the United States—will never replace books; they are, by nature, limited research sources. Nonetheless, this product should prove a tremendous boon to both students and teachers. Ninety-nine dollars buys young students a wonderful introduction to database management that provides incentive for research and critical-thinking projects involving skills like generalizing, classifying and synthesizing. That same $99 also gets you a valuable tool for both teaching and recordkeeping. The Bank Street Filer does what it claims—and does it well. *(Sunburst Communications, Inc., 39 Washington Ave., Pleasantville, NY 10570. C-64/$99; databases, $59 each.)*

—SHARON G. WEINER
CHICAGO, IL ►

REPORT CARD

A Superb!
An exceptional program that outshines all others.

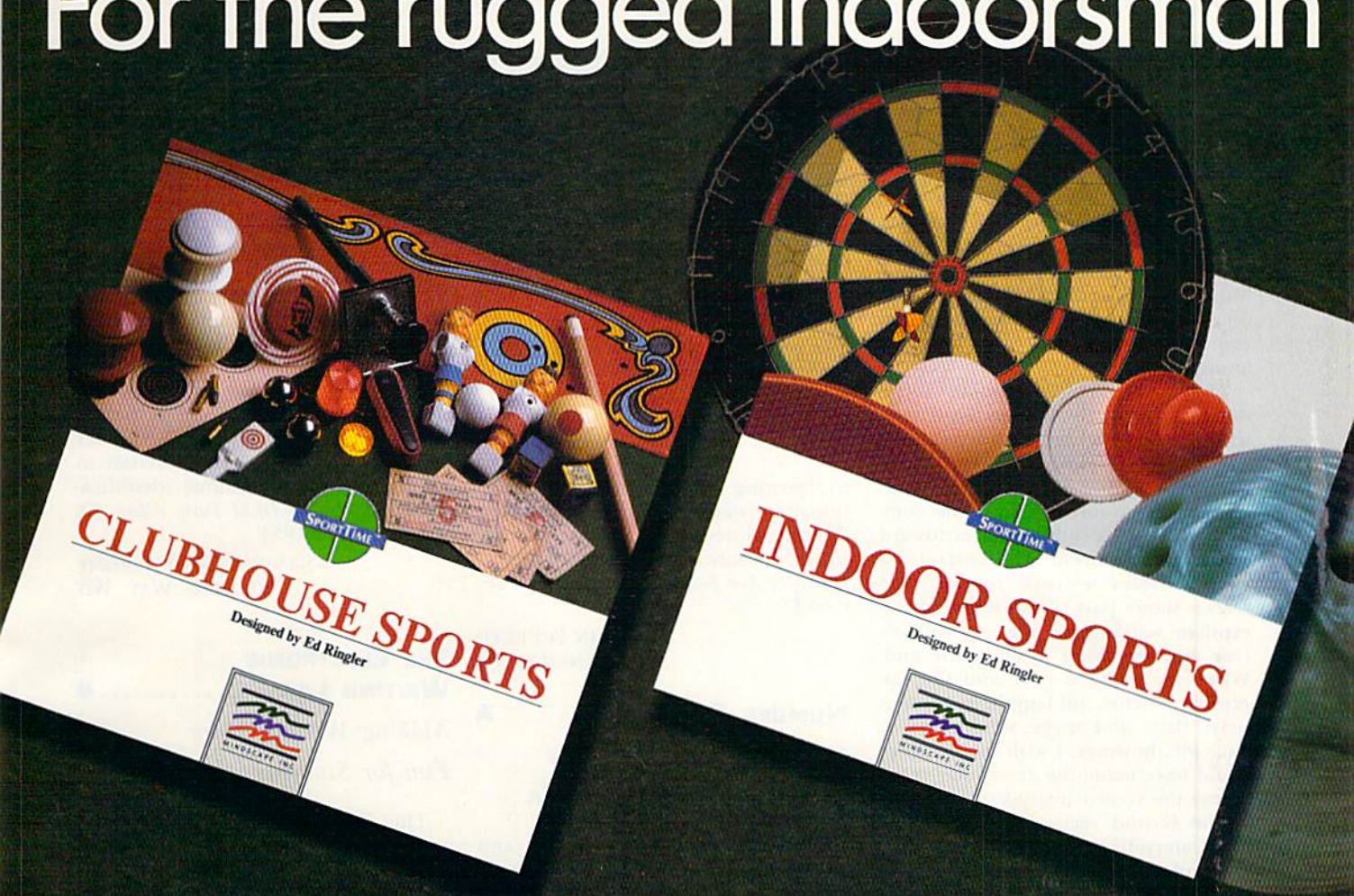
B Good.
One of the better programs available in its category. A worthy addition to your software library.

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

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

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

For the rugged indoorsman



SIX GREAT NEW GAMES. FOUR AWARD-WINNING GAMES.





Success breeds success!

We're introducing Clubhouse Sports in exactly the same winning tradition of Indoor Sports. The same complete, realistic sports simulations. The same quality of graphics and sound that won Commodore Magazine's "Best of 1987" award.

Accurate translations of the actual games, you can play in your own individual style. And you can play against the computer or play a 2-player game against a friend. Select from 5 computer skill levels.

MINDSCAPE INC





Clubhouse Sports adds foosball, billiards, skeeball, crazy pool, pinball and a shooting gallery to the already proven Indoor Sports' bowling, darts, ping pong and air hockey. Now you can really enjoy the great indoors!

M I N D S C A P E

Visit your retailer or call 1-800-221-9884 for VISA and MasterCard orders. To purchase by mail, send your card number and expiration date, check or money order for $29.95 (C64 & C128, Clubhouse Sports is available for C64 & C128 only, Apple II family, IBM & compatibles, 3.5" IBM & compatibles), and $49.95 (Amiga and Atari ST) for each title plus $3.00 handling to Mindscape, Inc., P.O. Box 1167, Northbrook, IL 60065. Allow 3-5 weeks for delivery. Lawyers like this part: © 1988 Mindscape, Inc. Mindscape is a trademark of Mindscape, Inc. Software under license from Designstar Consultants, Inc. Copyright © 1988 in conjunction with International Computer Group. Commodore, Apple, IBM, Atari ST and Amiga are registered trademarks of Commodore Electronics, Ltd., Apple Computer, Inc., International Business Machine, Atari, Inc. and Commodore Amiga, Inc. respectively. SportTime is a registered trademark of Designstar Consultants, Inc.

PRE-READING ..... B+

An Attention-Getting, Letter-Matching Lesson

Pre-Reading, for children ages three through seven, offers a chance to practice the alphabet and to play matching games with words, shapes and pictures. Most of the program's six sections rely on colorful graphics and excellent special effects that grab a youngster's attention.

The first part, Caterpillar, introduces a row of five uppercase letters, with one represented by a blank box. The youngster must complete the sequence by typing in the correct letter. A wrong response prompts the computer to gently prod the player toward the correct solution. The correct answer activates a visual reward: The screen shows part of a two-legged caterpillar walking to the caterpillar's rear and attaching itself to the end. When the game is over and the caterpillar reaches full length, its colored parts flash and make sound effects. Nice job; however, I wish the designer could have made the caterpillar crawl across the screen instead of walk!

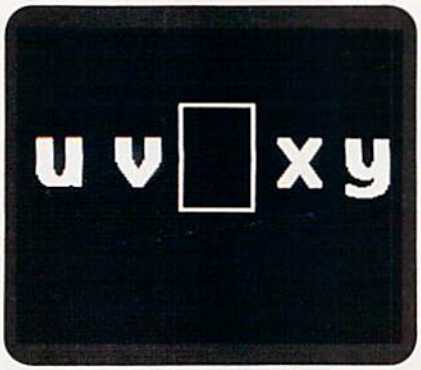
The second section, Train, resembles Caterpillar, but uses lowercase letters and a train. Correct answers cause the train to gain cars. You can even hear the "bang" as each new car couples on.

In the third part, First Letter, the screen reveals a picture and four separate letters. Youngsters must pick the letter that begins the word for the picture. For example, a ball of bright blue yarn is shown at the center of the screen, along with the letters L, C, Y and D. Picking Y reveals the correct response.

The remaining three segments, Pictures, Words and Shapes, offer a matching game similar to the television show, Concentration, without the background puzzle. During a turn, a player picks two boxes from an on-screen array. Each box opens momentarily to reveal a picture (or a shape or a word). If a match occurs, the player wins the item in the matching pair and gets another turn. At the end of the game, the winner is the player with the most prizes.

After completing a section in Pre-Reading, youngsters can play again or choose another section. Parents and teachers have the option to modify First Letter or Words.

Easy to play, Pre-Reading's approach



Can you fill in the blank in this sequence of Pre-Reading?

to learning typifies MECC's educational software, and teaches children the crucial necessities of life in a fun-filled, dynamic fashion. *(MECC, 3490 Lexington Ave. North, St. Paul, MN 55126. C-64/$19.95.)*

—JOHN DIPRETE
CRANSTON, RI

NUMBER FARM ..... A

With an Oink, Oink Here And a Quack, Quack There...

Number Farm is a colorful and musical early childhood program. It contains six games that introduce numbers and counting to preschool children. Although the purpose of the software is to teach the numbers one through nine, it could also be used for learning the placement of numbers on a keyboard.

Animal Quacker is the most charming of the six games, with farm animals quacking, mooing or oinking a predetermined number of times. The child listens to the animal, counts the sounds and enters the correct number.

During Old McDonald, the farmer plays the familiar song and after "...on this farm, he had ? ducks," the program pauses for the child to enter the number of animals displayed. If an incorrect number is chosen, the farmer counts out the animals again and waits. When the correct response is given, he nods his head and continues the song.

Number Farm show the numerals 1 though 9 and asks the child to press any key. After displaying the corresponding number of animals, a farm song is heard. Crop Count is a fast-paced game played to see how many correct crops can be counted before the sun sets. This section can be attempted by more than one child, each one trying for the highest score. Hen House is a variation of "pick a number between one and ten." The object is to guess how many eggs are hidden beneath the hens. After each guess, the farmer tells you to guess higher or lower.

The final program, Horseshoes, lets the child control the farmer's horseshoe pitches. If the requested number of horseshoes is thrown, the farmer gives the "okay" sign and plays a happy tune.

There is no recommended age for this program, but I would suggest it for preschool children. An adult needs to help the child by reading the instructions and encouraging him or her to answer the farmer's questions. Number Farm is a wonderful introduction to numbers and farm animal identification. *(DLM, One DLM Park, Allen, TX 75002. C-64/$32.95.)*

—SANDRA COOK JEROME
FEDERAL WAY, WA

THE ELECTRONIC WRITING LAB ..... B

Making Writing More Fun for Students

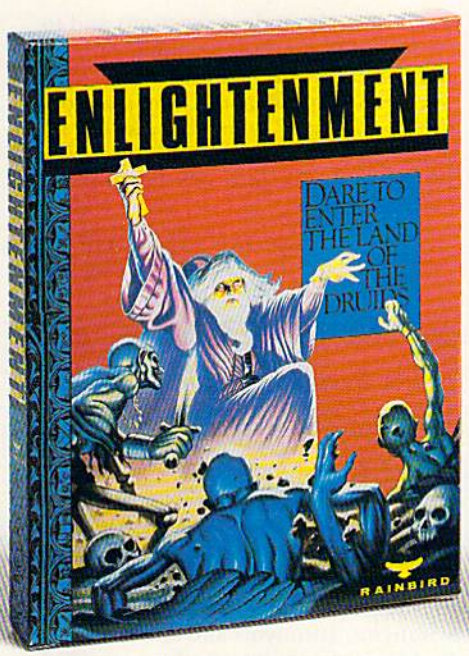
The Electronic Writing Lab is a menu-driven program that teaches writing through the "guided composition" technique. According to its thorough, 65-page manual, it is designed for middle and junior high school children, but can be used with both younger and older students.

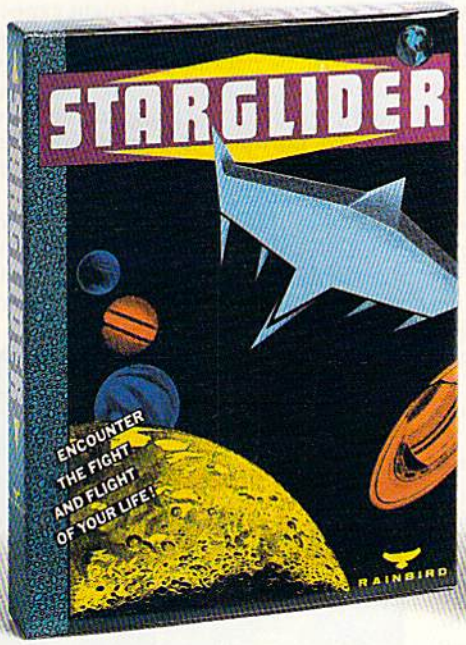
This C-64 program also runs on a PET, and there are versions available for the TRS-80 III/4, PC Jr, Apple II, IBM-PC and compatibles. Because of the affordable price, most students who have a Commodore at home could buy it for extra practice, regardless of the type of computer used at school.

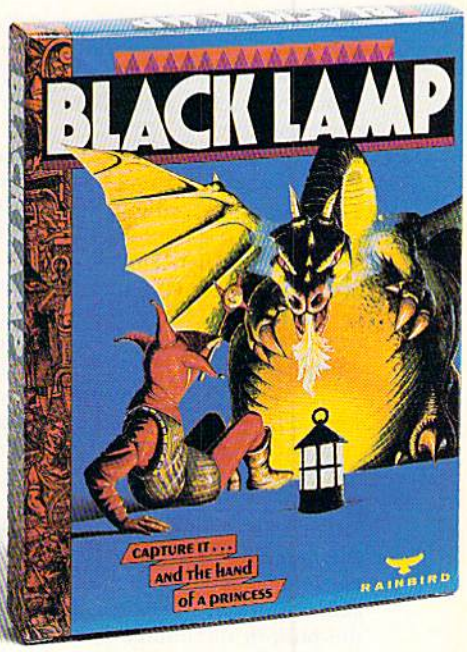
Those of us who have entertained unwholesome thoughts regarding software publishers when loading heavily copy-protected software will appreciate the fact that this program is unprotected and can easily be copied. In fact, the manual instructs you to copy both sides of the disk before using it because each student will need his or her own copy of the program. Publisher J. Weston Walch's policy seems quite fair: copies for all the students of one teacher's single class can be made for the price of $29.95. Copies for more students are authorized for double or triple the price.

Included in the manual are additional suggestions to help the teacher ►

DOWN. OUT. AND OUTRAGEOUS.







ENLIGHTENMENT

This is no ordinary descent down. . . we're talking way down. To the world of the undead.

Yes, the evil Acamantor and his legion of undead are back. And our hero, Hasrinaxx the Druid, must destroy them once and for all. Trek through swampland, Caverns of Darkness, a poisonous land of fungus. . . just to name a few. . . to finally enter the five levels of Acamantor's dungeon. Then the action really gets hot!

SUPERB EFFECTS set this game apart from all others.

15 TREACHEROUS LEVELS test your skill time and time again.

32 DIFFERENT SPELLS while you control up to five characters at a time.

TWO-PLAYER OPTION lets you play alone or with a friend.

STARGLIDER

You're in command. You control the cockpit of an Airborne Ground Attack Vehicle (AGAV) on your invaded home planet, Novenia. An entire galaxy of blood-thirsty aliens is after you. You have to out-fight, out-fly, out-maneuver the enemy. With Starglider, you can!

Starglider brings together the reality of a flight simulator with an action-packed shoot 'em up arcade game. The graphics are so incredible, you'll experience a true feeling of flight.

HIGH SPEED ANIMATION and vivid vector graphics enable you to "fly" with amazing quickness and response time.

FAST-PACED ACTION—The skies are filled with flying craft, floating mines, missiles and laser beams.

STUNNING SOUND effects and digitized speech on the Amiga and Atari ST versions.

BLACK LAMP

Jolly Jack the Jester wants more from his boss (The King) than a few good laughs. He wants his daughter's hand in marriage. The King, of course, thinks Jack is truly jesting. But what the hey. If Jack can rid the Kingdom of a plague of evil beasties, Jack can have her. If he can't, Jack dies.

Outrageous? You bet. Black Lamp is a wonderful, witty once-upon-a-time tale that has earned rave reviews for its graphics, sound and superb quality.

EXTRAORDINARY ANIMATION with detailed backdrops makes Blacklamp a winner!

EXCITING MULTI-LEVEL PLAY and fast arcade action provide hours of addictive entertainment.

APPEALING HERO–Romance, action and adventure surrounds our hero Jack the Jester.

RAINBIRD

P.O. Box 2227, Menlo Park, CA 94026, 415/322-0900

Get Down. Get Out-and-Out Outrageous. Get the Ultimate Action Series—Value Priced.

HOW TO ORDER: Visit your local software dealer today. Or call (800) 227-6900 from U.S. or Canada, 6:00am-6:00pm PST to order by Visa, MasterCard, Amex or C.O.D. To order by mail, send check or money order to Rainbird Software, P.O. Box 8123, San Francisco, CA 94128. CA residents add 6% sales tax and TX residents add 7½% sales tax. Shipping and handling is $4.50. Please allow 2-3 weeks for delivery.

ENLIGHTENMENT: Amiga $29.95. Commodore 64/128 $19.95. STARGLIDER: IBM $29.95. Amiga and Atari ST $24.95. Commodore 64/128 and Apple II $19.95. BLACK LAMP: Amiga and Atari ST $24.95. Commodore 64/128 $19.95.

Rainbird and Rainbird logo are trademarks of British Telecommunications plc. IBM, Commodore, Apple and Atari are registered trademarks of International Business Machines Corp., Commodore Electronics Ltd., Apple Computer, Inc., and Atari Corp., respectively.

Circle 224 on Reader Service card.

plan new writing topics, as well as a brief explanation of the theory and practice of teaching writing and five pages of useful printed materials to copy and use.

On one side of the disk is the Student/Write Stories program, which contains 15 topics to write about. Seven of these are creative (e.g., "Alone in the Wilderness," "The Alien Force"), while eight are expository ("This is My Life," "Boys or Girls: Who Has it Roughest?"). The topics seem as likely to inspire originality and interest in writing as those in any English composition book I've seen. The program allows for teacher creativity as well: On the other side of the disk is the Teacher/Create Stories program.

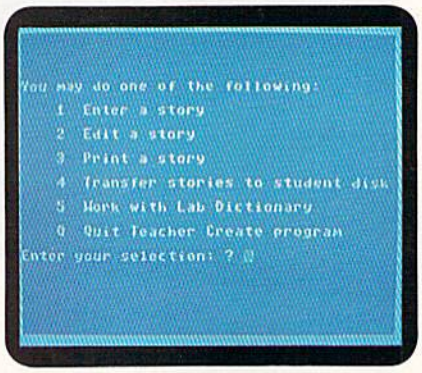
There is a help menu to assist in editing, as well as a 1200-word dictionary, which is rather limited, but adaptable. Up to 50 words can be added to the built-in dictionary, and if some or all of the original words are deleted from the work disk, up to 1250 can be substituted. Words of three or fewer letters are not checked, and verb forms ending in -ed and -ing are not included. When designing new dictionaries, the writer needs to remember that most forms of a verb are counted as separate words: use, using and used are deemed to be three different words. Thankfully, there is a provision for plural endings.

The built-in editor responds to a series of double and triple key presses, but the program is not quite a word processor. For example, there is no provision to cut out a section and paste it elsewhere. Still, there are enough features to convince a student that a computer can be superior to a typewriter or a pencil and paper.

A starter paragraph is provided for each story. Responding to prompts, the student adds five paragraphs, one at a time. The use of prompts should help keep students on the subject. Each response can be up to 18 screen lines long—about 120 words per prompt. This could prove to be a blessing to some and a curse to others—not everyone will be able to finish a story in 600 words. By making the goal quality, rather than quantity, this limitation could benefit students who tend to be wordy.

I am not aware of any other writing instruction program for the Commodore that is more versatile than The Electronic Writing Lab. Still, the program could stand some improvement. Any software designed to be used with a roomful of junior high students should be totally bombproof, and this one is not. When the screen says "press any key to continue," one might expect an eighth grader to press the run/stop key, perhaps because he or she really wants the program to run. Unfortunately, this stops the program and any unsaved portions of a story are lost. (This problem could be eliminated with a Poke or two.)

Because the program is written in Basic, it does have its drawbacks. Although the single quote (') can be used, and a blank line can easily be inserted



An example of your choices on the Teacher/Create side of The Electronic Writing Lab disk.

between paragraphs, quotation marks are not accepted, and paragraph indentation is not possible. Also, a student who can type over 20 words per minute will notice a significant delay between the keypress and the appearance of the character on the screen. The Dictionary option also causes a major delay, as the program notes on screen whether each word is "ok" or "not in the dictionary." All those words not in the dictionary are printed out as many times as they appear.

The final printout is 38 columns wide and cannot be right-justified or altered. Stories are saved as relative files, which cannot be easily loaded into a word processor for altering the printout. However, I had no difficulty printing out a story with my Star SG-10 printer and Xetec Super Graphix interface.

The Teacher/Create option might enable a teacher to use the program for many years without ever repeating an assigned topic. This option could be used to adapt the program to help either precocious third graders or even college freshmen with writing deficiencies.

All in all, The Electronic Writing Lab could easily form a worthwhile part of either an English composition course or a computer literacy course. Like any computer-assisted learning program, an instructor should expect to spend enough time working with it to understand possible student reactions and to avoid problems. I don't think anyone could use this program without learning something useful about composition, word processing, computer-assisted instruction, or all three. *(J. Weston Walch, PO Box 658, Portland, ME 04104-0658. C-64/$29.95.)*

—RICHARD H. ELDRIDGE
MIAMI, FL

DRAGON GAME SERIES .. B–

Learn Parts of Speech With an On-Screen Board Game

The Dragon Games Series (DGS) is a menu-driven collection of six similar games designed to teach students how to identify nouns, verbs, adjectives, synonyms, antonyms and contractions. Besides two copies of the one-sided program disk, the package consists of a 12-page manual in a large looseleaf binder.

Each game contains a short, clear tutorial on how to use the program. The goal in each case is to reach "home" by answering at least ten questions correctly; as few as two incorrect answers causes Gnzrabab, a multicolored fire-breathing dragon, to appear, and ends the match.

Five of the games are multiple-choice, in which only one of three correctly spelled choices displayed below the game board is accepted. In the sixth, the contraction game, the student must type in the correct contraction of the two words shown.

In all the games, a spot that marks the child's progress advances one square towards home for each correct answer. An error sends the spot three steps towards doom. And, Gnzrabab can get bored: If the student fails to reach home within 40 tries, the dragon does his fire-breathing act and terminates the competition. When the player successfully reaches home, an unseen king rewards him or her with a multicolor graphic of a treasure chest. After each win or loss, the player is offered an opportunity to repeat the same game or to load another.

DGS is easy to understand and fun to play; the examples are quite humorous. For instance, the sentence "The dragon roasted Dylan in Cleveland" is used to define a noun as the name of a person, place or thing.

The pictures of the dragon and treasure chest are well done and unlikely

to frighten even the youngest child. As a matter of fact, after displaying the treasure, the program asks for a loan of a few thousand dollars. A "yes" from the player elicits "Thanks! I need it for dragon chow," while "Phooey on you!" follows a negative answer.

Except for the graphics screens, each part of the package is written in Basic, and can be listed, changed, resaved or possibly compiled. Even a fast typist won't be irritated by input delays, because the answers are brief and the programs fairly short. My daughter, a high school sophomore, found DGS easy to use and more fun than doing exercises in a book. She wasn't bored even after 90 minutes of play.

Flexibility is the best feature of DGS. The publisher's claim that a fourth grade reading level is necessary seems accurate, as does the claim that even senior high school students could benefit by using it with instructor-written word files. The synonym and antonym games should prove particularly useful for teaching new vocabulary words at the high school level. The editor program, which allows the instructor to write and edit new lists of words, works smoothly.

As any teacher knows, Murphy's Law—anything that can go wrong, will—tends to rule in the classroom. Hence, the only major potential problem I would anticipate with DGS is that pressing the run-stop key stops the program. Any Commodore program designed for classroom use can and should be student-proofed by disabling this key and the run-stop/restore combination.

There are a few minor errors in the built-in wordlist for the noun, adjective and verb games and the rules. For example, the program doesn't acknowledge that "brass" can be a noun as well as an adjective. Also, the rule given in DGS that a contraction is formed by replacing a missing letter with an apostrophe is not always true: will not contracts to won't. Furthermore, one of the sentences shows a number under eleven written as a numeral rather than spelled out, which is the general convention.

Dragon Games Series does not come close to fully exploiting the features of the C-64. There is no animation other than the dragon's fire-breathing bit, no way to store student scores, and sound effects aren't used. Also, a method to print out word files written in the Editor mode would be helpful.

Many words, such as "cross" or "fly," have several meanings, and their use as a noun, verb or adjective depends on context. There is no context in these games, since the words don't appear in sentences. Careful thought and planning should avoid confusion when writing new wordlists, however.

Although DGS doesn't provide for printing word lists, they're saved in sequential files, and could therefore be loaded and printed out by most word processors or a sequential file reader/printer. These could then be included in the documentation binder or inserted in lesson-plan books.

The software seems to include all the commonly used contractions, but an exhaustive list can be found in many English handbooks, and a new list could be organized according to the instructor's best judgment.

All in all, Dragon Game Series deserves consideration for inclusion in elementary, middle and junior high school English curriculums (the publisher recommends grades 3 through 6 as appropriate). If new word files ►

THE GREAT COMMUNICATOR™

The direct-connect Hayes® and Commodore® 1670 compatible 1200 Baud modem for only $74.95!



Everything from Electronic Mail (E-mail) to stock quotes and huge databases of every imaginable type is now on line to the small computer owner. You can even send and receive messages anywhere in the world. All you need is a telephone and a modem which allows your computer to communicate with others.

Almost all modems (and services) are set up to communicate in one or more of three speeds; 300, 1200 and 2400 Baud. Most computer users prefer 1200 Baud. (1200 Baud is about 4 times as fast as 300 which means you spend about ¼ the time and money getting the data you want and more time enjoying it. 2400 Baud is not presently available with all services.)

What is Hayes® compatibility? It's the industry standard and about all modem manufacturers have adopted the "AT" (Hayes) command set. Beware of those who don't. Virtually all software being written now uses Hayes commands. Be sure the modem you buy is truly Hayes® and Commodore 1670® compatible therefore usable in all situations and with all services.

Let's compare Minimodem-C™ with the 1670®, Avatex-e and Volks 6480®:

Comparison of	Minimodem-C™ vs.	1670® vs.	Avatex-e vs.	Volks 6480®
Hayes® Compatibility?	100%	Subset Only	Subset Only	None
Commodore direct Connect?	Yes	Yes	No	Yes
Number of Status Indicators	7	0	8	0
Busy Detect?	Yes	No	No	No
DTR Signal Support?	Yes	No	Yes	No
High Speed Detect Line?	Yes	No	No	No
Number of DIP Switches	8	3	8	0
Number of Status Registers	16	3	16	0
Guarantee	1 yr.	90 days	2 yrs.	5 yrs.

Now you have the FACTS to make an informed decision.

What do you get with Minimodem-C™? Everything! You don't need to worry about cables, compatibility or anything else! The Aprotek Minimodem-C™ plugs directly into your Commodore C-64, C-64C or C-128 USER port. It is unique in that it has two separate (switchable) emulation modes (Hayes and Commodore 1670®) to make it compatible with ALL available software. The Minimodem-C™ is a full feature, 300/1200 Baud modem with Auto Answer, Auto Dial, Touch-Tone or rotary dialing, has status indicators and a built-in speaker. Just plug it into your computer and standard phone jack with the attached cable. Minimodem-C™ is supplied with "Multiterm" 64 and 128, and a free trial subscription to Compuserve.

Built with pride in the USA by APROTEK and fully Guaranteed for 1 year!

Modem shipping—Cont. US $6.00, UPS Blue, CAN, AK, HI, APO $10.00 ORDER #6212. Call for other models.

ORDER INFORMATION California residents add 6% tax. All prices are cash prices—VISA and MC add 3% to total. We ship the next business day on money orders, cashier's check, and charge cards. A 14-day clearing period is required for checks. Prices and availability subject to change—CALL. **Available at Selected Dealers.** Dealers inquiries invited. **2 week satisfaction or your money back trial period on all products.**

For information and in Calif. call 805/987-2454 (8-5 PST)

TO ORDER CALL TOLL FREE—**1 (800) 962-5800 - USA** (7-6 PST)

Or send order to:

APROTEK

Dept. RN
1071-A Avenida Acaso
Camarillo, CA 93010

Circle 79 on Reader Service card.

are written, it could be a worthwhile addition to a high school English computer lab program as well. Since it's available for nearly every breed of computer, and is adaptable to varying needs, DGS could also be a popular and useful program for extra practice at home or for students attending school at home. Its price is about average for educational programs of this type, not all of which have its flexibility. *(Educational Activities, Inc., PO Box 392, Freeport, NY 11520. C-64/$59.95.)*

—RICHARD H. ELDRIDGE
MIAMI, FL

MATH POWER ..... B+

It Takes Fast Thinking To Make the Problem Fit the Answer

One of the primary aims of good mathematics teaching is surely to engender in students a "sense" for number, along with skill and resourcefulness in using arithmetic operations. Math Power is an impressive package—including both a computer game and a book—that takes an unusual approach toward developing such sense and skill. I want to make clear at the outset, however, that unlike the many straightforward addition and subtraction practice games for young children, Math Power operates at a fairly high level of sophistication.

Try the following example to get the flavor of the program: Use all of these four digits—3, 4, 6 and 7—to create an arithmetical expression that equals 13. (If you really get stumped, three possible solutions are shown at the end of this review.) You may use the digits in any order (but use each one only once), combine two or more into a number (e.g., 63) and employ any of the following operation and function symbols as often as you wish, being careful, of course, to observe order-of-operation rules:

- +, −, * and / (the four fundamental operations).
- . (decimal point).
- ( ) (parentheses).
- ↑ (exponentiation).
- SQR(N) (square root of N).
- ABS(N) (absolute value—the value of N without regard to sign).
- INT(N) (greatest integer function—the greatest integer less than or equal to N. This is used to eliminate decimal fractions).

The example above is relatively simple, but even so, it's easy to get flustered and stop thinking when you're working against time, as you do in the game (three minutes is the default limit per problem). When you start to play, it quickly becomes clear that you need a lot of preliminary practice to feel comfortable with this type of exercise. That's where the book comes in.

Written by a math teacher, the 418-page book is printed on heavy stock and is ring-bound so it opens flat for photocopying. (Yes, copying within limits is encouraged, for the package is intended for teachers to use.) It contains tutorials, with many examples and tables, on all the integer operations outlined above, as well as worksheets, a chalkboard game and thousands of exercises arranged in ascending levels of difficulty. I think it is essential that you thoroughly investigate the contents of the book before you tackle the computer game.



You must work out solutions to problems on the robot's forehead in Math Power.

In the game, you can access a password-protected teacher's menu by pressing the control and P keys while the program is booting. With an eye toward the ability level of the students who are to use the program and what they have been taught, you can set 13 parameters, including, for example, fewer or more operation symbols; more or less time allowed per example (one to five minutes); number of digits used (four, five or six, with six the easiest to manipulate) and which ones (zero is excluded); and the range of answers (within the limits of −100 to +100).

One or two players can participate, and scores are based on several factors, such as order of digits used and time elapsed before the correct solution is entered. The game screen is a rather unappealing robot face, on various areas of which appear the numbers and symbols allowed, space for messages and entering solutions, the digits chosen, the answer to be achieved, the descending time and the players' cumulative scores. If all the parameters have not been preset, the players can make a number of choices; for example, the number of digits and which ones. You're also given the chance to enter an Instruction mode, in which examples are displayed.

Play proceeds by pressing return, when prompted, to produce a problem. Your digits are displayed in one robot eye and the answer in the other. You work it out on paper or in your head, aware that there are probably several possibilities. Then you carefully enter your solution, check it and press return. Correct or wrong, the robot's forehead tells you. If wrong, you get two more tries—as long as time doesn't run out. If correct, your score is increased, and it becomes the other player's turn.

The Math Power game is one that most students—and probably most adults—will find difficult, but if you persevere long enough to get the hang of it, it can certainly sharpen your mathematical wits and fine-tune your ingenuity. The time pressure could be especially frustrating, however, for young children or leisurely thinkers, which leads me to advise caution. The computer game is certainly not an appropriate *teaching* tool, although the book could be.

Outside of a few errors (possibly typos) in the book, I found Math Power carefully and thoughtfully developed and presented. There's little doubt it can be a beneficial stimulus to eager young minds who like their arithmetic served up in a challenging and nontraditional way.

Here are the answers I promised above: 1. 7/(4 − 3) + 6; 2. 63/7 + 4; 3. 3*4 − 6 + 7. *(J. Weston Walch, PO Box 658, Portland, ME 04104. C-64/$49.95.)*

—SWAIN PRATT
RUN STAFF

ADVENTURES WITH FRACTIONS ..... B

Facts About Fractions Made Fun!

Do you know how to find the common denominator of two fractions? Adventures with Fractions contains three programs that are designed to introduce the concept of fractions to children and to teach them how to compare fractions and find common denominators. ►



FOR THOSE OF YOU WITH AN OFF-TRACK MIND.

Get ready for four of the most challenging, rugged, rump-bumping cross country road racing courses this earth has to offer.

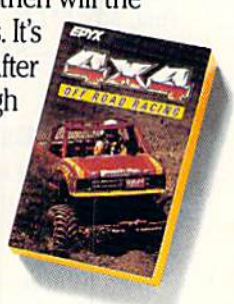


Plenty of thrills guaranteed on the following grounds: gumbo mud, packed snow, skid-sand, and the scrubbiest terrain south of the border.

Fight the torturous terrain of Baja. Rocks, boulders, skid-sand, even a few spikey cactuses. And of course, heat that's hot enough to fillet any forehead. Ever had your hands stuck to the wheel? Permanently. You will when you endure the longest winter of your life in the ice, sleet and slosh of The Michigan Course. The Georgia Red Clay Course has enough mud to keep you a human fossil for 2,000 years. And then there's Death Valley. Get it. D-E-A-T-H Valley.

Start with pre-race strategy. Select and customize your personal vehicle. Your supplies. Your repair equipment. Believe us. You'll need everything. There are boulders, rivers, potholes, and mudbogs to contend with. What are mudbogs? You'll find out. (Just after you find out there's a Demon 4 x 4 chasing you all through the race. A Demon hellbent on your destruction.)

If you win enough races, collect enough points, only then will the Victor's Cup be yours. It's the least we can do. After all, you did go through hell to get there.



4x4 OFF-ROAD RACING BY EPYX

Commodore 64/128, IBM & compatibles, Amiga

Circle 105 on Reader Service card.

One program, Comparing Fractions, first utilizes a small tutorial to graphically represent the idea behind fractions. Two candy bars are shown with one-half of one highlighted against two-thirds of the other bar. The student is taken through different steps to visually select the largest piece. At the end of the tutorial, the need to find a common denominator is explained.

The next section in Comparing Fractions demonstrates how to find a common denominator by changing each of two fractions to equivalent fractions until the denominators are the same. The final section uses the method of multiplying the denominators of the two fractions to obtain a common multiple. These three sections can be entered at any time by answering questions regarding ability.

The second program, Cross Products, is a tutorial that presents a short-cut method to compare unlike fractions without finding a common denominator. The last program, Ransom, is a game that can be used for review or initial testing of the student's skills. In the game, a prince has been kidnapped and gold coins are won to pay the ransom for his release. To collect these coins, three fractions are displayed on three doors and the largest one must be selected. If the choice is correct, the collection of coins is increased, but if it's wrong, a monster comes out from behind the door and steals away some of the coins. When the necessary coins are accumulated, the prince is released. There is a Management option that lets a teacher or parent change the difficulty level, time limit or number of coins needed to pay the ransom.

Although the recommended age level is ten through 14, it's important to know whether or not fractions have already been taught. If not, this program is a good introduction to the concept of fractions. If fractions are currently being taught, Adventures with Fractions is limited because it doesn't go beyond the concept of comparing two fractions. *(MECC, 3490 Lexington Ave. North, St. Paul, MN 55126. C-64/$19.95.)*

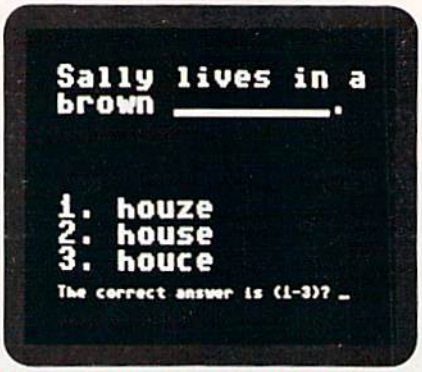
—SANDRA COOK JEROME
FEDERAL WAY, WA

SPELLING BEE ..... B

"Spell 'Spell' "!
"S-P-E-L-L"

For children of ages eight through 13 who wish to brush up on their spelling skills, Spelling Bee offers a total of 400 sentence-completion trials in a multiple-choice format. Twenty separate sections provide a series of increasingly difficult drills on verbs, nouns, pronouns, contractions, and so on. More words and sentences can be added and saved to disk.

A time-saving educational tool, Spelling Bee keeps score and lists all misspelled words at the end of a drill. Children can interrupt a section at any time to find out their score or to start on another section. When a section is replayed, a new random order appears.



Does multiple choice make it harder or easier to find the correct spelling in Spelling Bee?

Children who wish to spur their efforts can choose to race against time. In this mode, a youngster must pick the correct answer before a bee at the bottom of the screen reaches a flower. The bee's flight time can be set between 12 and 30 seconds.

Here's a typical sentence and word choice taken from the easiest section: "You can put your books ." 1. way 2. a way 3. away. Another section 1 sample is: "Did you eat of your supper?" This is followed by: 1. awl 2. all 3. owl.

Here's an example from the hardest part: "Janet was not in time." The player can choose among: 1. reddy 2. ready 3. redy. Another from that area is: "We should be finished by ." Answers to choose from are: 1. Frieday 2. Friday 3. friday.

In summary, the primary value of this program is in its ability to train children in spelling, using a technique where youngsters can see each word and its context in a particular sentence, and receive immediate feedback on the basis of their choices. In addition, Spelling Bee enables children to practice at the keyboard and teaches them familiarity with the computer. While somewhat cut and dry, Spelling Bee's time-honored approach should bolster a youngster's spelling ability. *(MECC, 3490 Lexington Ave. North, St. Paul, MN 55126. C-64/$19.95.)*

—JOHN DIPRETE
CRANSTON, RI

BUILDING PERSPECTIVE ..... B

A Challenge to Students' Spatial Perception

Sunburst specializes in non-cutesy software that appeals to many different types of thinking people. A multi-perspective, problem-solving game, Building Perspective gives students (fourth-grade age or older) a look at a collection of skyscrapers from the front, back and side, as though they were walking around the block. Then, they are asked to predict the view of the buildings from above.

The buildings, rectangular in shape, vary in height and color, and appear in narrow, upright form. Depending on the choice of play, they're grouped into one of three possible arrays: three by three, four by four, or five by five.

The screen reveals each lateral view in progression, showing the shapes from all sides. Sometimes, one side of a column shows only one or two buildings, with one of them blocking the view of one or more smaller ones. Two or more buildings of the same color, when viewed head on, appear to be only one building. A student can "remove" a building from a row to get a peek behind it. The goal is to predict the color pattern of the final, top view of the array.

Some of the best features in Building Perspective are the spatial visualization it requires, the vivid colors—up to nine—for the buildings, the sharp tones whenever a color appears and the ease of play.

However, I was frustrated by my inability to backtrack the cursor over a choice I had made; I frequently felt stuck, because my mistakes couldn't be changed. I also object a bit to the game's similarity to The Factory, Sunburst's leading educational game. Although in different form, both teach the same skills.

Building Perspective is packed in a looseleaf, notebook-style binder, and includes directions and work sheets (the latter designed for younger students who might want to put their thoughts down on paper).

I recommend Building Perspective, ►

Make Any Computer Do Exactly What You Want With McGraw-Hill's

Contemporary Programming & Software Design Series



Make no mistake. Almost all books and courses on "programming" teach you only the final 5% of the total programming process—namely, how to code in a specific language . . . information of little value if you don't know how to reach the point in the programming process when you are ready to code.

With the Series, however, you'll learn to create your own programs from scratch, even modify off-the-shelf programs. You'll learn enough BASIC and machine language to get you started on the remaining 5% of the programming process.

From Writing Your Own Programs to Modifying Existing Software, Here's the New, Easy, and Low Cost Way to Unlock the Secrets of Your Computer

Whether you use computers for business, for personal applications, or for fun, off-the-shelf programs will never do everything you want them to do for you. That's because they were written by programmers to satisfy what they perceived as the needs of the greatest number of potential users—often missing some or many of your specific needs.

That's why McGraw-Hill's new Contemporary Programming and Software Design Series teaches you how to create your own software . . . either from scratch or by making key modifications to existing programs.

There is nothing magical about it. You learn the process of building a computer program step-by-step with McGraw-Hill *Concept Modules* sent to you one at a time, once a month. Each of the ten modules in the Series takes you through an important step in the development of the structure and detailed logic of a program, including testing, debugging, and documentation.



Unique Interactive Hands-On Instruction

Each module includes an easy-to-understand guide PLUS a 5¼" floppy disk containing typical programs and interactive instruction that you can run on Commodore 64 and 128 computers, IBM PCs and PC compatibles for hands-on experience.

In the first Module, for example, when your sample program (Declining Interest Loans) appears on your screen, you'll find errors on certain program lines. You'll also see that the program is only three-quarters completed.

Now comes the fun part. You'll discover how this program is built, and in the process you'll learn how to identify and correct errors. And by the end of Module 1, you'll actually have completed this program yourself.

But there's more. Special graphics on your screen work in conjunction with the accompanying guide to amplify, illustrate, and deepen your understanding of software design principles.



Build Your Own Personal Software Library

The sample programs you work with throughout the Series are excellent learning tools. But they're more than that. By combining the sample programs onto one master disk, you'll have the start of your own personal software library. In addition to the programs you've written and modified throughout the Series, you'll also receive dozens of the most popular public domain and user-supported programs, such as data base manager, word processor, calendar generator, appointments reminder and much, much more.

15-Day No-Risk Trial

To order your first module without risk, send the card today.

Examine the first module for 15 days and see how the Series will help you make your computer do exactly what you want it to do!



If someone has beaten you to the card, write to us for ordering information about the Contemporary Programming and Software Design Series.

The Crucial 95%—Learn the Foundation of Computer Programming

While the Series includes interactive disks that run on specific computers, everything you learn you can apply to any language or machine. Why is this possible? Because McGraw-Hill knows programming is far more than coding a program into the computer using a specific language. In the real world of computers, 95% of the programming process is carried out using design techniques that are independent of specific language or machine. It is this crucial 95% that you thoroughly understand and master in the Series.

McGraw-Hill Continuing Education Center
3939 Wisconsin Avenue
Washington, DC 20016

but perhaps students would derive the most benefit from it after they had tried The Factory. *(Sunburst Communications, Inc., 39 Washington Ave., Pleasantville, NY 10570. C-64/$59.)*

—JOHN DIPRETE
CRANSTON, RI

TIGER'S TALES ..... C+

Start Reading Comprehension at an Early Age

As Saturday morning television amply illustrates, young children enjoy stories about animals. In this tradition, Sunburst Communications has published Tiger's Tales, a combination entertainment/learning program dealing with the gentle adventures of a winsome cat.

Offered for either home or school use, the software is geared to a 1.3–1.5 reading level and is intended for students in kindergarten through second grade. The program supports a joystick, the keyboard or a device called the Muppet Learning Keys, which is also available from Sunburst for $99. (Although Big Bird and his friends star in other Sunburst products, the Muppets do not appear in Tiger's Tales.)

The software is designed to develop skills in vocabulary, comprehension, picture recognition and problem-solving. Its main feature is the non-threatening presentation of core words that students should know before entering second grade.

There are two separate sections to each of five different adventures in Tiger's Tales. In the Words sections, a child tries to match one of three words to a picture. If he or she succeeds, Tiger appears in a short animated sequence. If the student picks the wrong word, the incorrect choices are crossed out leaving only the right answer. After a child has been tested on ten words, the program repeats all of the missed word/picture combinations.

The Words sections contain much of the vocabulary that is used in the Story sections, which are from five to 13 screens long. On each of these screens, the student guides Tiger through an adventure by selecting one picture out of a group of three. While a screen occasionally offers branching options for which there is no one proper response, the only correct answer is usually the representation of a word that's shown in the last line of text. In these situations, the pupil gets three attempts before the program moves on. At the end of each Story segment, characters from the tale reward the child with an animated scene.

On the one hand, the software has much to recommend it. It was developed according to sound educational principles. Also, its thorough documentation and helpful screen instructions ensure trouble-free operation for parents or teachers.



Here's part of one of the story adventures in Tiger's Tales.

However, its bland graphics and sound effects will bore most children, at least those who have previously been exposed to video games. Although Sunburst has done an admirable job to a certain degree, its product in some ways resembles a bowl of plain oatmeal. It is definitely wholesome and nourishing, but it fails to generate much enthusiasm. *(Sunburst Communications, Inc., 39 Washington Ave., Pleasantville, NY 10570. C-64/$65.)*

—MARILOU LATOCHA
OAK PARK, IL

ALPHABET CIRCUS ..... B+

Now I Know My ABCs, Tell Me What You Think of Me!

Although DLM's products have earned an excellent reputation among teachers, not as many parents currently recognize the company's name. However, with its Alphabet Circus home learning program, DLM takes another solid step toward becoming as highly regarded in households as it is in schools.

Intended for children under seven, Alphabet Circus's six activities acquaint youngsters with alphabetical order, letter recognition, keyboarding skills, text creation and problem-solving.

Meet the Circus is the easiest exercise on the disk. In it, the Ringmaster shows the letter that corresponds to any key that the child has pressed. He then displays a picture of a circus item that has a name beginning with that letter.

Another program segment, Alphabet Parade, has the player watch the ABCs appear in a parade. When it pauses, he or she must find the letter that comes next.

Secret Letter starts with the Ringmaster choosing a character. Two players take turns using on-screen clues to guess the letter.

In Juggler, the title character tosses a letter upward. The child must, within a time limit, press the key that matches it. The software automatically adjusts the game's speed to the youngster's performance, and there is a high-score display that serves as a constantly changing goal for the player.

Marquee Maker turns the C-64 into an electronic blackboard. The child types a word or phrase and then presses the space bar to make his or her message flash on the screen in large, colorful letters.

In Lost Letter, the computer shows a circus character's picture, and the boy or girl must choose the letter that it represents. If the child misses, the character's name appears as an additional hint. As in Alphabet Parade and Secret Letter, a scoreboard screen periodically uses pictures to summarize the results of play.

Each part of this program is an effective learning tool, with the possible exception of Marquee Maker. That section's splitting of words longer than six letters can confuse some children.

Reflecting the sound educational principles that generally went into the software, Alphabet Circus's instruction manual is excellent. It gives clear descriptions of each activity's features and indicates how to get the most benefit from them. The program's graphics and sound elements are also good, although not quite state-of-the-art.

Parents who wish to expose their children to enjoyable exercises that teach the ABCs and keyboarding skills should consider Alphabet Circus. On the whole, this software has the same high quality that DLM has been offering professional educators over the last 15 years. *(DLM, One DLM Park, Allen, TX 75002. C-64/$29.95.)*

—MARILOU LATOCHA
OAK PARK, IL

REGIONS OF THE UNITED STATES C

Tell the States
By Their Shapes
And Spell 'Em, Too!

Much moaning and wailing has been heard in recent years over our nation's appalling ignorance of United States, let alone World, geography. Well, Regions of the United States is a software program for the C-64 that seeks to help redress the situation, albeit rather simplistically.

Completely menu- and prompt-driven, Regions instructs and quizzes by means of outline maps of the states within seven regions: New England, Mid-Atlantic, South, Midwest, Great Plains, Western Mountain and Pacific. Users can enter their names, and quiz scores are kept.

The program is in two parts. The first, dealing with states, lets you choose to review the states in each region, take a beginner's quiz or take the super quiz. In the 20-question beginner's quiz, you see a region and a numbered list of the states therein. You are to identify by number the state containing a flashing question mark. The super quiz presents you with the same picture, but without the list. You get credit for a right answer only by typing in the name of the state—and *spelling* it correctly!

The program's second part, also containing a review and quiz, is concerned with region recognition. Here, the quiz gives you clues—up to three, if at first you don't succeed—involving geographical characteristics, natural resources, population, manufacturing, and so on. As with the states, you choose from a numbered list of the regions.

That's all there is to the program. It's not very exciting, nor even much of a challenge for anyone who has a close acquaintance with the map of the U.S. It is adequate for its purpose, yet one shortcoming is less than no help to the disoriented beginner: Except for the western states, where boundaries are relatively straight both in the north-south and east-west directions, the state outlines are graphically crude in the extreme. They are recognizable if you already know the shapes, but I would consider it an educational crime to let a child try to learn state shapes from this program. Long study of a good conformal map—even a Mercator is too distorted—should precede use of this program.



Learning geography is the name of the game in Regions of the United States.

To me, one other negative aspect was the length of loading times. You're asked to "wait a moment" at every shift to another part of the program, but the moments seem to become minutes. A quibble, I guess, but annoying.

It also occurred to me that the designer missed an opportunity to make the program far more valuable and interesting by including the state capitals and other major cities. *(Educational Activities, Inc., PO Box 392, Freeport, NY 11520. C-64/$59.95.)*

—SWAIN PRATT
RUN STAFF

PATH TACTICS ..... B

Racing Robots Teach
Problem-Solving Math

Path Tactics is a basic arithmetic drill in the form of a maze game. Children of suggested ages 5 through 12 can select from seven levels of math problems that involve combinations of counting, addition, subtraction, multiplication, division and the use of negative numbers. Youngsters of two different ages can play against one another by adjusting the skill levels, and one person can even win playing against the computer, for it always uses the same level as the player!

The goal of Path Tactics is for play- ►



Excellence...
for the Commodore
The XETEC Product Family

Look for the name that spells *Quality*, *Affordability*, and *Reliability*.

Lt. Kernal - a 20 or 40 Megabyte Hard Drive which supports CP/M.

Super Graphix GOLD - the ultimate printer interface including a 32K buffer, 4 built-in fonts, a utility disk with 27 fonts and more.

Super Graphix - an enhanced printer interface including NLQ, an 8K buffer, reset button, a utility disk with 27 fonts and more.

Super Graphix jr - an economical printer interface with NLQ and graphics.

FontMaster II - a powerful wordprocessor for the C64 with 30 fonts ready to use, 65 commands, font creator and more.

FontMaster 128 - a super wordprocessor for the 128 including 56 fonts ready to use, a 102,000 word spell checker and much more.

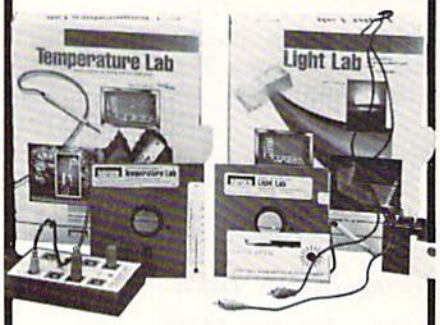
All Hardware is FCC Certified *All Interfaces include a Lifetime Warranty*

C64 and 128 are reg. TM of Commodore Business Machines, Inc.

XETEC 2804 Arnold Rd. Salina, KS. 67401 (913) 827-0685

Circle 96 on Reader Service card.

MUST LIQUIDATE
SAVE OVER 75%!



COMMODORE TEMP/LIGHT LAB SOFTWARE SETS

Fun & Educational! Learn the facts about temperature and lighting the exciting way. Conduct hands-on scientific experiments to gain knowledge...with household materials, these Educational Software Lab Sets, and your Commodore computer. Order a set of these two kits now at our **LOW money-saving liquidation price!** Ages 11 and up.

- Temperature Lab Guides You Through Heat Experiments.
- Temp. Lab Includes an 8 Prong Interface, Electronic Temperature Sensor, Alcohol Bulb Thermometer, 5¼" Floppy Diskette, and Experimenter's Guide.
- Light Lab Lets You Experiment with Light and Energy.
- Light Lab Includes a Light Sensor, Light Assembly, Light Stand, Light Stick, Red and Blue Filters, Test Tube, Glow Panel, 5¼" Floppy Disk, and Experimenter's Guide.

90-Day Ltd. Vendor Warr. on Both.

Mfr. List $79.95

Liquidation Price For Sets **$19**

Item H-3969-7343-502 S/H: $4.00/set

Credit card customers can order by phone, 24 hours a day, 7 days a week.

Toll-Free: 1-800-328-0609

SEND TO:
COMB Authorized Liquidator
1405 Xenium Lane N/Minneapolis, MN 55441-4494

Send ___ **Commodore Software Set(s)** Item H-3969-7343-502 at $19 per set, plus $4.00 per set for shipping, handling. (MN residents add 6% sales tax. VA residents add 4.5% sales tax. Sorry, no C.O.D. orders.)

☐ My check or money order is enclosed. (No delays in processing orders paid by check.)

PLEASE CHECK: ☐ VISA ☐ MasterCard ☐ DISCOVER ☐ AMERICAN EXPRESS

Acct. No. _____ Exp. ___/___

PLEASE PRINT CLEARLY

Name _____

Address _____ Apt. #____

City _____ State _____

ZIP _____ Phone (___) _____

Sign Here _____

ers to get their robots to the finish line in the least number of moves. The student solves the on-screen problem, and his or her robot moves that many spaces along the path within the maze. If a wrong answer is presented, the correct one is displayed, and the turn is lost.

There is room for development of skill and logic here: The numbers can be manipulated to land a robot on a certain space along the path. Some spaces are trap doors and when a robot lands on one, it's automatically advanced. A player can also try to land on the same space as his or her opponent, which bumps that robot back ten spaces. Appropriate light musical notes are played at all times, and, at the winner's space, there's a short, jazzed-up rendition of Mussorgsky's "Pictures at an Exhibition"! The robot smiles at the winner, and the list of high scores is written to disk.

The documentation is short and to the point, but really unnecessary, because there are on-line instructional screens available. There's even a demo that shows the game in action. Only the space bar, return and number keys are used; knowledge of the rest of the keyboard is not necessary.

The only fault I could find with this software is that, like most programs with graphics, it takes a long time to load; but a fast-load cartridge can fix that.

This product is a fine drill program for children, but it is missing the animation and energy that distinguishes a true "grade A" product. However, it's an amusing, reliable package that makes the process of learning arithmetic easier and a little more pleasant. *(MECC, 3490 Lexington Ave. North, St. Paul, MN 55126. C-64/$19.95.)*

—EDITH CHASEN
WOODHAVEN, NY

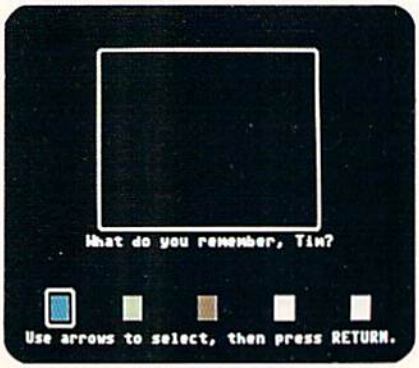
SIMON SAYS ..... C–

Simon Says Students Will Recognize and Memorize

Simon Says is intended for classroom learning from first through sixth grade, but these assignments can be modified for other learning levels. The game supports either the keyboard or, like Sunburst's Tiger's Tales, the Muppet Learning Keys. The software's goal is to provide practice in memory-chaining strategies, which the designers consider to be an important skill for problem-solving.

A teacher must load and start Simon Says at the beginning of each session. Either the instructor or from one to four players can decide whether the sound will be on, how long the wait will be between displays of objects, and whether students or the computer will set the order in which objects appear.

Students can choose to be challenged by numbers, letters or colors. No matter which category is selected, the computer begins by showing one object, erasing it, and asking a player to indicate what it was. Whenever a pupil answers correctly,



Remembering colors is just one aspect of Simon Says.

the program goes on to the next round, which repeats what has gone before and then adds another object. If a student makes a mistake in a multi-player game, he or she automatically drops out, and an error ends a single-person contest. In either case, the pupil who gave a wrong response is given an opportunity to view the correct sequence of items.

Like Tiger's Tales, Simon Says suffers from lackluster graphics and sound. But, on a positive note, the software is very easy to use, primarily because of a clearly written teacher's guide. In addition to describing the software's operation, the manual devotes 20 pages to three lessons that provide practice in chaining without using a computer. Unfortunately, the lessons are no more interesting or innovative than the program's sensory effects.

However, if a teacher believes in a heavy emphasis on chaining exercises, he or she can use to good advantage the one solid attraction of Simon Says: The game elements that the software shares with its playground and handheld electronic predecessors should generate interest in most students who are exposed to it. *(Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570. C-64/$65.)*

—MARILOU LATOCHA
OAK PARK, IL

RUN SPECIAL ISSUE

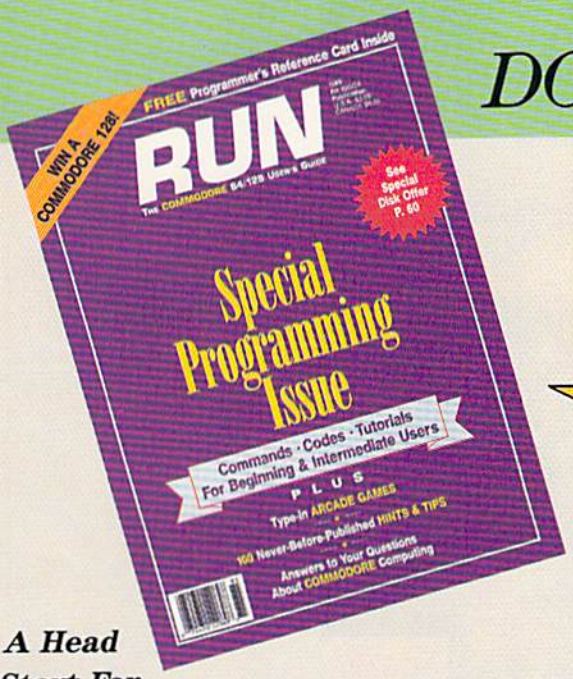
Get A Jump On The 5th Annual RUN Special Issue—

ORDER NOW!

And catch this *runaway best seller* for only $3.95!

The RUN Special Issue has become a must-have for every Commodore C-64 and C-128 user. And this year's issue promises to be our hottest RUN yet—supplies won't last long so don't delay. *Rush* your order in today.

DON'T WALK . RUN



VALUABLE REFERENCE CARD FREE WITH EVERY ISSUE!

A GIANT pull-out programmers' guide chock full of handy codes, peeks, pokes, commands and more for both the C-64 and C-128. With the latest info for the 1351 Mouse, RAM Expanders and 1581 Disk Drive.

PLUS

A Head Start For Both Beginners and Pros

Be the first to enjoy these tips, utilities, games and tactics—priceless programming information and applications that will boost your productivity and computing power. Here's just a quick glimpse of what you'll get...

FAST START SPECIAL ISSUE PROGRAM DISK

To really RUN with speed, order the Special Issue Program Disk—every program in the issue on disk ready to load and run.

PLUS YOU'LL RECEIVE THESE FREE BONUS PROGRAMS:

- C-128 Sprite Librarian
- C-64 Sprite Database
- A Show Of Hands—sign language tutorial with graphics

● *The Best of Commodore Clinic*

Ten pages of the most-asked questions on programming, hardware and software from RUN's readers—with insightful and revealing answers from Commodore computing expert Lou Wallace.

● *100 Never-before-published "Magic" Tricks*

We've thrown in a dozen of our favorite computing tricks from 1988, PLUS a *hundred* dazzlers you've never seen before.

● *Arcade Games—Including The Gravitron, an Exciting Space Adventure.*

Test the limits of your skill and coordination with a challenging variety of *new* arcade games.

● *Programming, Utilities and Tutorials*

Whether you're a beginner or advanced programmer, you'll add *speed*, *power* and *productivity* to your C-64 and C-128, including:

- Adding C-128 sprite commands on your C-64
- Sprite tutorial for the beginning C-128 Basic programmer
- Programming sound on the Commodore
- Writing relative data files in Basic

To Run Away With the 5th Annual Special Issue call **1-800-343-0728** (in New Hampshire, **1-924-9471**) Or...look for the convenient post-paid order envelope in this issue!

RUN! Special Issue

RUSH me _____ copies of the 5th Annual Special Issue with my FREE Reference Card.
Enclosed is $3.95 for each Special Issue.

FAST!

Also send _____ Special Issue Program Disk(s) with all the Special Issue (and FREE BONUS) programs, utilities and tutorials ready to load and run. Enclosed is $7.95 for each Program Disk.

☐Check Enclosed Charge my: ☐Mastercard ☐VISA ☐Am. Exp.

Card # _____ Exp. Date _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

Canada & Mexico $4.95 (Disk $9.25), Foreign Surface $5.50 (Disk $9.50), Foreign Airmail $9.50 (Disk $11.50) (U.S. Funds drawn on U.S. Bank). Orders will begin shipping in December 1988.

Call toll-free 1-800-343-0728 (in NH 1-924-9471) or mail coupon to:

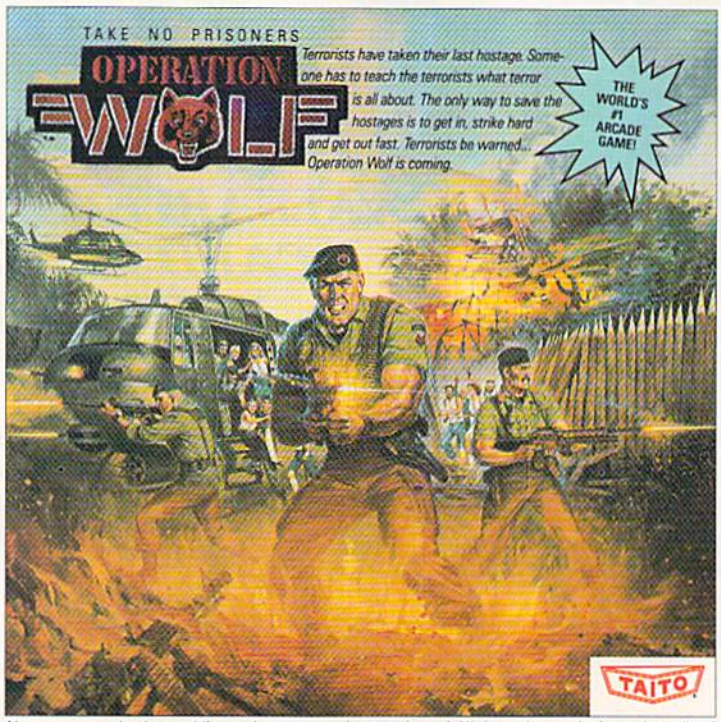
RUN Special Issue, 80 Elm Street, Peterborough, NH 03458

*Commodore 64 and 128 are registered trademarks of Commodore Business Machines, Inc.

RNA88

SEVEN WAYS TO MAKE YOUR COMMODORE SCREAM

1) EXPLOSIVE COMMANDO RAIDS.



Now you can take the world's number one arcade game home! All the action-packed arcade thrills of this awesome hostage rescue are ready for home video play.

2) SUPER-HUMAN WARRIOR LORDS.



Now you can thrill to one of the biggest-ever coin-op hits on your home computer. Rastan's mind-blowing graphics takes you to a magical land of adventure and excitement.

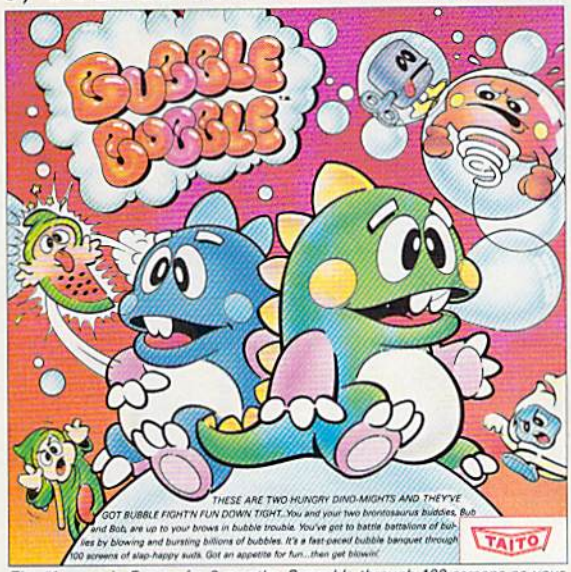
THE ONLY GAME IN TOWN.™

TAITO

Taito,® Arkanoid,™ Renegade,™ Alcon,™ Bubble Bobble,™ Sky Shark,™ Rastan™ and Operation Wolf™ are trademarks of Taito America Inc. Copyright © 1988. All rights reserved. Commodore is a trademark of Commodore Electronics, Ltd. Advertisement by: Quaily & Company, Inc. (Chicago).

COMING SOON, THE CLASSIC MIND GAME, QIX.

3) BUBBLE BLOWING DINOSAURS.



The #1 game in Europe for 3 months. Scramble through 100 screens as your brontosaurus buddies, Bub and Bob, drive you crazy with non-stop action.

4) DEATH-DEFYING ACES.



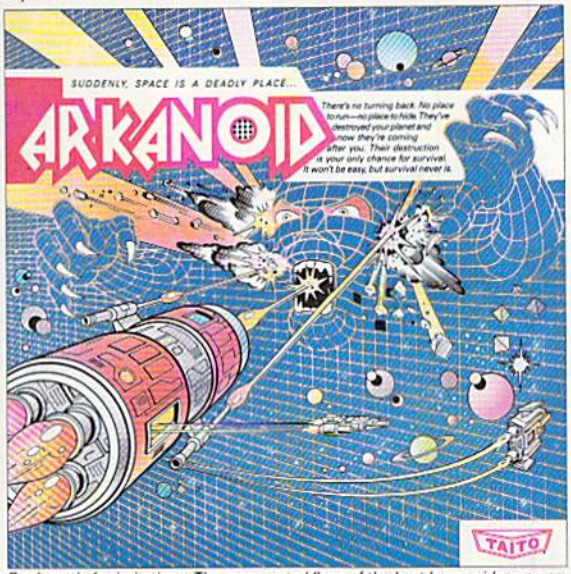
Take the arcade's meanest air battle home for keeps. Strap in for explosive high-flying action. Hold on for your life as you soar through incredible graphics.

5) INTER-PLANETARY WARFARE.



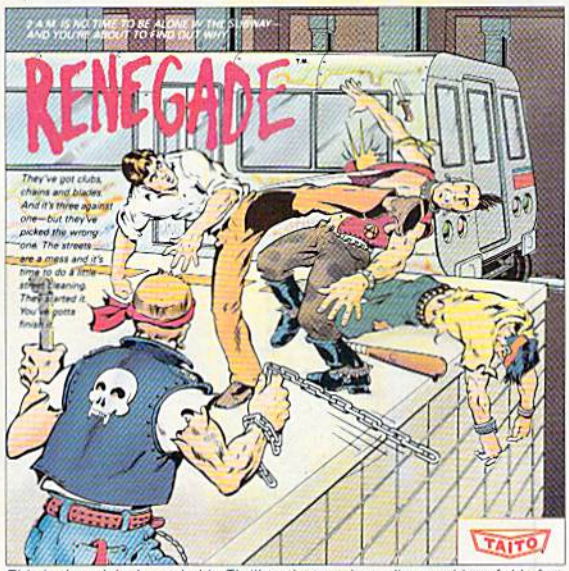
Now you can blast into one of the hottest arcade space games right in your own home. It's the ultimate inter-planetary combat. You've never seen action like this.

6) OUTER SPACE GRID MONSTERS.



Don't settle for imitations. The game voted "one of the best home video games ever" by Electronic Game Player Magazine is ready to blast into your home.

7) RAGING STREET RUMBLES.



This is the original arcade hit. Thrill to the arcade quality graphics of this fast-paced, street-style karate brawl. Find out what real action is all about!

Taito games will make your Commodore scream with the sights and sounds of arcade action, adventure, survival, destruction, heroes, villains and heart-pounding thrills.

These are the world famous arcade originals and they're ready to wail on your Commodore. Arkanoid,™ Alcon,™ Bubble Bobble,™ Operation Wolf,™ Rastan,™ Renegade™ and Sky Shark™ will make your Commodore do things you didn't think were possible.

Everyone knows that arcade games are the benchmark for all other video games and Taito has been an arcade leader since 1953. Since then we've made over 1,000 classics for arcade and home play. Count on Taito to bring the heat of the arcade to your home computer.

Buy Taito products at leading stores everywhere. Visa/MasterCard holders can order direct anywhere in the U.S. by calling 1-800-663-8067.

Circle 179 on Reader Service card.



PHOTOGRAPHED BY LARRY DUNN

Printers on Parade

RUN's resident printer expert takes you on a tour of what's currently available in 9- and 24-pin printers.



uite a few changes have occurred since *RUN* published my last roundup of printers ("In Search of the Perfect Printer," May and June 1986). Some models have faded into oblivion, while others have entered the marketplace, but perhaps the most significant development is that many computerists now consider a printer a necessity, not a luxury.

Those who use a computer primarily for work require a printer for spreadsheets, databases and most other business software; programmers find one essential for debugging program listings; and, of course, a printer is a must for word processing. Desktop publishers become experts at controlling printers as they turn out newsletters and other documents brimming with fonts, digitized images and fancy graphics, all in multicolumn format.

A wide variety of printers, both simple and fancy, is currently available. Computerists rarely achieve striking results with a feeble Commodore 1525 or MPS-1526; on the other hand, those who equip their Commodores with laser printers are usually disappointed that so little software exists. If you want both quality output and Commodore software compatibility, you need a printer that falls between those two extremes—namely, a good quality dot matrix machine.

You don't have to pay big bucks for a dot matrix printer, but, as my examination of high-end units reveals, it sure helps. If you're scouring the discounters' brochures for a printer under $100, be careful. Low-budget machines tend to have poor print quality and to be painfully slow, only marginally reliable and lacking in those features—Near Letter Quality (NLQ) mode, for example—that experienced users take for granted. Better to ►

By TIM WALSH—Technical Editor

spend some serious money for a serious printer, so you can take pride in your hard copies.

Consider a Twenty-Four-Pin

Nine-pin printers have been popular among Commodore owners for quite a while, but the Commodore community is beginning to realize that the fast, heavy-duty, 24-pin printers also work well with a wide range of C-64 and C-128 software—and their prices are declining. The 24-pin machines still average over $750, but the cost is justified by a wide range of features and superb print quality. (For novices in the printer realm, the 9 and 24 refer to the number of pins that appear vertically on the printhead. The greater the number of pins, the higher the resolution. For more explanation of printer terminology, see the glossary later on in this article.)

A commonly asked question is why any C-64 or C-128 user should invest in a 24-pin when a speedy 9-pin printer will satisfy his needs. Well, checking performance numbers (print speed, graphics, print modes, and such) doesn't always reveal the whole story.

Comparing a garden-variety 9-pin to the typical 24-pin is like comparing a VW Bug with an 18-wheeler. Twenty-four-pin printers are designed to withstand continuous, heavy-duty office use, so they are sturdier and generally more reliable than most 9-pins. For instance, the printhead on the 24-pin Okidata Microline 393 is almost the size of a doorknob and is bolted together with about a dozen heavy machine screws, while your favorite 9-pin's printhead is probably not much bigger than a thimble.

Twenty-four-pin printers are generally faster. They also offer a wider range of printing capabilities and feature highly condensed dot matrices that result in what are known as letter-quality characters. In fact, they've all but made the daisywheel obsolete.



Software compatibility is the primary variable that should determine whether a given 24-pin printer and interface you're considering for your Commodore will keep you happy. All the graphics in this article were created with the printer in Commodore-compatible Epson mode, thus using similar printer codes to set the dot density, line-spacing and other parameters. Make sure the printer of your dreams possesses an Epson mode—preferably Epson LQ. (An IBM or other mode is an extra, but not a compelling reason for buying the printer.)

I've seen a growing trend away from the manufacture of printers equipped with Commodore-ready serial ports. Anyone who's spent a good deal of time using various printers with the C-64 and C-128 is likely to tell you that a good-quality parallel printer opens up a wide range of print pitches, fonts and other options—not to mention high-resolution graphics—that owners of most Commodore-compatible serial printers can only dream about.

The rest of this article reviews a mix of well-advertised 9- and 24-pin parallel printers. These brief overviews will give you my general impressions and an idea of how well the various machines work with Commodore computers. You'll have to decide for yourself which one best meets your needs.

I'm fully aware that I'm not covering some popular printers that are probably favorites of many *RUN* readers. Regrettably, several manufacturers didn't respond in time to our requests for review units, so you'll have to stay tuned to *RUN*'s Hardware Gallery for in-depth coverage of their products.

In the chart that accompanies this article, you will find features, specifications, prices and dimensions of the printers reviewed below. The names and addresses of the manufacturers are listed in Table 1.

Table 1. Manufacturers' addresses.

PRINTERS:

SK-3000
Seikosha America, Inc.
1111 Macarthur Blvd.
Mahwah, NJ 07430

KX-P1092i
KX-P1524
Panasonic Computer Products Division
One Panasonic Way
Secaucus, NJ 07094

Microline 183
Microline 393
Okidata
532 Fellowship Rd.
Mount Laurel, NJ 08054

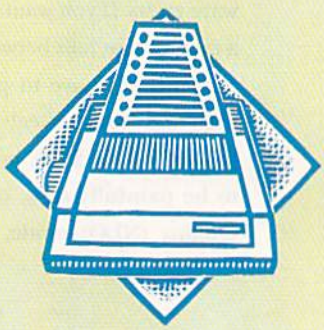
Brother M-1724L
Brother International Corp.
8 Corporate Place
Piscataway, NJ 08854

Epson FX-850
Epson America, Inc.
2780 Lomita Blvd.
Torrance, CA 90505

INTERFACES:

Hot Shot Plus; $99.95
Omnitronix Inc.
760 Harrison St.
Seattle, WA 98109

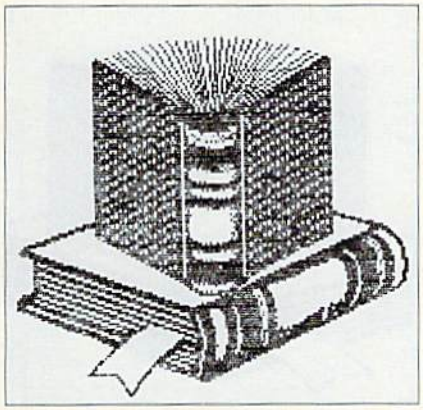
Super Graphix Gold; $119.95
Xetec
2804 Arnold Rd.
Salina, KS 67401

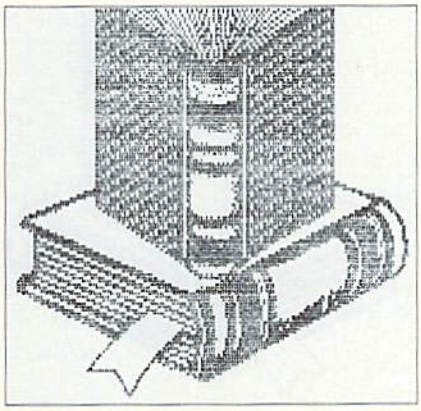


ILLUSTRATED BY BETH KROMMES









Sample clip art produced by using GEOS 128, as printed by each machine.

Bewildering the Fans

◆ The Seikosha SK-3000 ◆

Seikosha's popular SP-1000 series of low-end printers has won a strong following among Commodore users over the past few years, selling as well or better than most other printers. Now, however, Seikosha is changing its tactics and aiming at higher-end computers with its more elaborate—and expensive—9-pin SK-3000 series. Color printing capabilities and printing speed are the most noteworthy new features found in these machines.

RUN's resident graphics guru, Lou Wallace, adopted my SK-3000 review unit and reported it works well with graphics. I found that it works well with text software, is one of the speedier 9-pins (300 cps draft/75 cps NLQ) and offers a multitude of print options.

Foremost among the print options are two IBM modes and character sets, and, as in the other Epson-compatible printers in this roundup, single-, double-, double-speed double- and quadruple-density Graphics modes. The RGB Graphics mode permits programming of individual dots in seven colors (black, orange, green, yellow, purple, red and blue).

On the negative side, when printing in either color or black with the color unit installed, the SK-3000 generates an odd combination of low-volume whooshing and whining noises. Also, it uses one of the largest, bulkiest ribbon cartridges I've ever seen in a 9-pin printer, and the tractor feed unit is of the out-dated pull-instead-of-push variety. I wonder why the SK-3000 didn't inherit the simple and quiet operation of the Seikosha SP-1000. If you do not mind some noise when printing colors, though, this might be the printer for you.

Pros: Fast; Epson-compatible; color capabilities; long list of print options.

Cons: Noisy; expensive; bulky ribbons.

If 9 Is Good, Must 24 Be Better?

◆ The Panasonic KX-P1524 ◆

Panasonic's contribution to the 24-pin printer field is the KX-P1524. Like the 9-pin 1092, this machine prints at a maximum speed of only 240 cps, but its 67-cps Letter Quality mode produces characters of better quality than the 1092—no small feat.

In its default mode (Epson LQ-1500), the 1524 offers a wide range of print options and is easy to interface to a Commodore, since it can be programmed as (you guessed it) an Epson-compatible printer. Eight character sizes, two IBM character sets and letter-quality and draft fonts are available in IBM Proprinter mode. A Diablo 630 mode is included in the 1524, as well, and seven optional font cards can be purchased separately.

Print-wise, the KX-P1524 wins my admiration for both its beautifully detailed letter-quality characters and its ability to work flawlessly with all manner of graphics software for the C-64 and C-128. Its documentation, a large, bound operating instruction booklet, contains a wealth of information. As to design, the 15-inch carriage makes this printer a fairly wide, hefty piece of equipment (in fact, among the units in this roundup, it's second in size only to the massive Microline 393). The price? Let's just say I paid less for my first and second automobiles combined—but, then, they had only a fraction of the KX-P1524's life expectancy.

Actually, the 1524 is reasonably priced, and, in every respect, it's a sophisticated piece of hardware that would complement any Commodore computer system.

Pros: Excellent construction; Commodore-software friendly; possibly the best 24-pin letter-quality characters; good paper handling.

Cons: Expensive (compared to 9-pin printers); large; slower than some 24-pin printers.

Printer Interfaces

WHETHER YOU'RE BUYING your first printer or upgrading to a faster, more sophisticated unit, you may need to decide if you want a Centronics parallel or a Commodore-compatible serial printer. A serial printer uses a 6-pin DIN connector, just like a Commodore disk drive, as a direct connection to your C-64 or C-128. A parallel printer, such as all those mentioned in this roundup, requires a Commodore-compatible printer interface.

Choosing such an interface is easy nowadays, because you can count on the fingers of one hand all the manufacturers marketing them. A few years ago, dozens of companies were selling Commodore-compatible interfaces, but most have dropped from the scene. Fortunately, many of their products are stockpiled at mail-order houses and can be purchased at bargain prices. If the price is right, and the interface sounds as though it would do the job for you, go for it.

On the other hand, if performance and features are more important to you than price, read on. Two of my favorite interfaces, both introduced this year, are the Hot Shot Plus, from Omnitronix, and Super Gold, from Xetec. Both are top-of-the-line units, employing the latest technology and offering a wide range of print features. They'll enhance your printer's capabilities and provide a level of user-friendliness that older, lesser interfaces simply can't match.

The Hot Shot Plus is my favorite of the two. Selling for $99.95, it provides access to a host of features by toggling DIP switches on and off, and it lets just about any printer emulate a Commodore 1525/MPS-803, for maximum software compatibility. Moreover, you'll find built-in fonts, a font editor, an enhanced Graphics mode—and the list goes on. For an in-depth Hardware Gallery review of this interface, see the July 1988 issue of *RUN*.

Xetec's Super Graphix Gold is also a capable interface. Two features—rocker-type DIP switches and a separate power supply—distinguish this flashy unit from the Hot Shot Plus. At $119.95, the Graphix Gold also provides an excellent Commodore-emulation mode, various fonts and enhanced graphics and text printing, just to name a few features. We'll have a review of this interface in an upcoming issue of *RUN*. R

—TW



Pointers on Printer Use

GETTING A FANCY 24-pin printer to print text with a C-64 or C-128 is easy, because most interfaces include a Commodore-emulation mode. However, occasionally you'll encounter a software compatibility problem. When such troubles arise, don't panic. Instead, just set your interface to Transparent mode and use true ASCII text output (provided in most commercial software packages).

In case you're wondering how I generated the graphics accompanying this article, I placed the interface in a combination of Epson-emulation and Transparent modes, the latter to prevent unwanted codes from travelling to the printer. I also wrote a program for each printer to set it into Epson mode (if necessary), to choose either 9- or 24-pin mode, and to specify the dot density in the Graphics mode that works best with that printer and software.

I wrote programs to preselect line spacing, too. Most Epson drivers in software packages take care of this, but I find that by writing my own program, I can give the graphics better proportions; if the line spacing is too tight, the graphics are flattened and lines overlap, but if it's too great, gaps appear in the graphics and they tend to become oblong.

Most of the printers in this lineup provide line spacing in Graphics mode in increments of $^{1}/_{216}$ inch. The exception is the Okidata Microline 183, which provides only $^{1}/_{144}$ inch. For most graphics, you'll get good results in the $^{22}/_{216}$ to $^{27}/_{216}$ range. For instance, with geoPaint 128, $^{24}/_{216}$ line spacing is just about perfect.

Setting the mode(s), dot density and line spacing is a trial-and-error process the first time you set up your printer and software. You may want to take a cue from me and, using examples in your printer manual, write a short program to set your printer in the configuration that produces the best results. Then save the program to disk and run it each time you activate your graphics software.

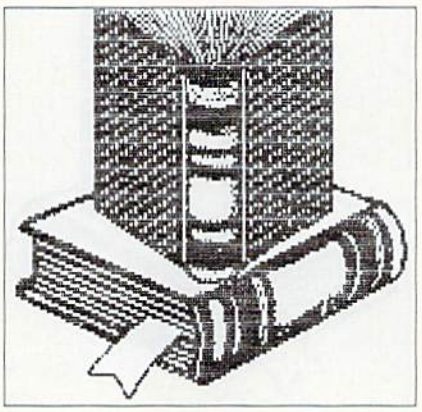
The most valuable advice I can give newcomers to the art of printing graphics is to spend an evening or two learning how to make your printer turn out high-density, proportionally correct graphics, because the output of Commodore-emulation mode is certainly mediocre by comparison. R

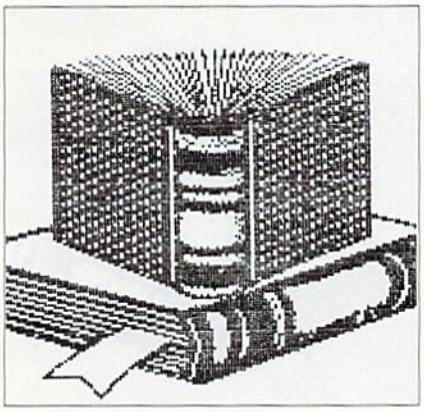
—TW











It Ain't Heavy; It's My Brother

◆ The Brother M-1724L ◆

Brother, the foremost maker of daisywheel printers and typewriters, also makes one of the Commodore software-friendliest 24-pin dot matrix printers on the market—the M-1724L. At 216 cps in Elite Draft mode, this unit is slow for a 24-pin printer, and its NLQ print is barely distinguishable from that generated by top quality 9-pin printers, but it's got strong points that make it a great 24-pin machine.

It's commendably small for a 24-pin unit with a 15-inch carriage, and its styling is clean, simple and thoroughly modern—unlike some 24-pin printers that borrow heavily from older designs. It also offers a sophisticated, built-in, tractor-feed mechanism, on which you can "park" continuous forms while you're printing individual sheets of stationery. Not only did the M-1724L work well with all the Commodore software I tried with it, but it offers Brother HR/Diablo and IBM Proprinter XL emulation in addition to its default Epson LQ-1000 configuration. Eight graphics densities, in both 8- and 24-pin modes, make for flexibility.

The M-1724L is easily programmed if you use the 116-page, bound owner's manual as a guide. It also produces graphics that rival the output of any printer in this lineup for darkness and accuracy. Best of all, the controls feel tight and precise. If Brother increases the print speed and fine-tunes the Letter Quality mode, they'll have one of the best printers on the market at any price.

Pros: One of the smallest 24-pins available; sleek modern design; quiet; superb construction; software-friendly; wide range of printing capabilities; excels at paper handling.

Cons: Expensive, compared to 9-pin printers; LQ print more closely resembles NLQ print in 24-pin mode; generally slow operation.

Aging Gracefully

◆ The Okidata Microline 183 ◆

I started using this 9-pin printer about the time I mentioned it in the RUNning Ruminations column last April, and I've been happily using this 1985-era machine ever since. When connected to a Commodore through an interface offering an Okidata mode, which most do, it prints hi-res graphics and text without any problems, even though it lacks an Epson-emulation mode.

Its documentation consists of a scant 101 spiral-bound pages—not surprising since the printer doesn't offer a lot of features. However, it does produce super- and subscripts, nice NLQ characters, single- and double-density graphics, underlining, and more.

I have only two complaints of any substance concerning this printer. Twice, when I pressed the linefeed button too rapidly, it protested by breaking its 1.5-amp fuse. The fuse is easily accessed, however, and costs only ten to 25 cents. The other problem is the primitive tractor-feed unit, with a pull, (rather than push) design that occasionally makes labels jam. All in all, though, with the Microline 183 you're getting a lot of printer for relatively little money.

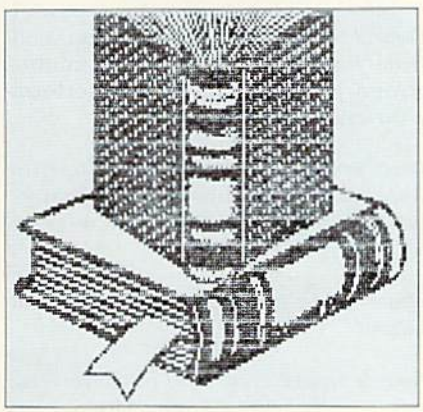
Pros: Very good NLQ characters; relatively quiet; good software compatibility; reasonable price.

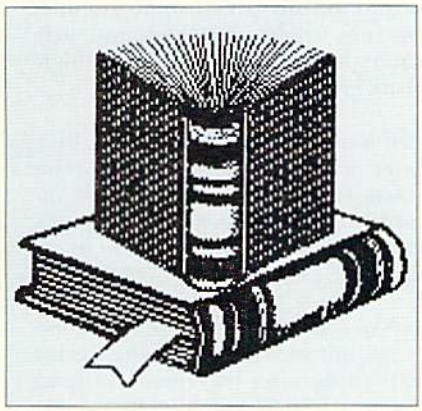
Cons: Wide carriage (15 inches) uses valuable desk space; slower and more limited in features than some printers in its price range; occasionally snacks on a fuse; only fair paper handling.

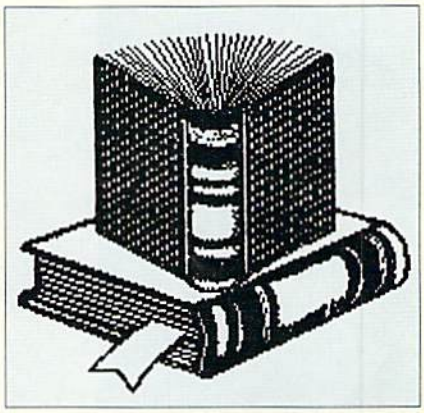












The Arnold Schwarzenegger Of Printers

◆ The Okidata Microline 393 ◆

At the other end of the Okidata spectrum sits the awesome 24-pin Microline 393. A thesaurus of superlatives is needed to describe this bell-and-whistle-laden piece of hardware that dwarfs even the most elaborate C-128D system. The 450 character-per-second (cps) Draft mode of this 15-inch (carriage width) machine is so fast you have to experience it to believe it. It is a noisy machine, but a "Quiet" mode is included to subdue the clatter.

Airline pilots will feel right at home with the 16 LED lights and eight control buttons adorning the 393's control panel, while printer programmers will revel over the seemingly endless lists of modes, menus (yes, menus!) and text- and page-formatting commands. The documentation comprises two thoroughly written user manuals, one for setting up and the other for using the machine.

The print quality in every mode is as good as money can buy in a 24-pin printer, and you'll be surprised at the 393's ability to print things other than text with its Epson LQ series-compatible personality module, which plugs into the front of the unit. For easy production of beautiful graphics, I use a 393 with an Omnitronix Printmaster/+G interface, configured with Epson settings.

Since this colossal machine costs as much as half-a-dozen or more quality 9-pin printers, it isn't a sensible investment for many Commodore owners. On the other hand, if you want your computer to have the biggest, baddest printer in town, go for it!

Pros: Unbelievably fast in every mode; Epson-compatible; software friendly; countless print options.

Cons: Expensive; noisy (when not in the "Quiet" mode); bulky.

Still Slightly Ahead Of its Time

◆ The Panasonic KX-P1092i ◆

Returning to more common ground, here's a sensible 9-pin printer for the average Commodore user. The KX-P1092i (1092 for short) offers speedy 240-cps performance in Draft mode, two IBM Proprinter modes and single-, double-, double-speed double- and quadruple-density printing. The NLQ characters are nearly as well defined as 24-pin letter-quality characters—proof that Panasonic is still slightly ahead of its time. The documentation consists of an enormous operating instruction booklet, which I found very helpful for programming the printer.

As to software, most programs fare well with the 1092. Set your interface in Panasonic or Epson mode, and the 1092 will respond correctly to most commands. As proof, using GEOS 128 and the 1092 in quadruple-density Graphics mode with an Omnitronix Hot Shot Plus interface in Epson mode, I printed scores of GEOS graphics with nary a hitch.

Like all the Panasonic printers I've used, the 1092 excels at mailing labels. Just get a sufficient number of them, align the first few in the adjustable built-in tractor unit, then sit back as endless streams of labels appear. This printer is one of the best you can get for the price.

Pros: Fast; multiple modes; excellent NLQ; good software compatibility; moderate size.

Cons: More costly than some other 9-pin printers; a bit noisy in NLQ mode.

My Checkbook's Worst Nightmare

◆ The Epson FX-850 ◆

As evidenced by the fact that most of the printers in this roundup strive to be Epson-compatible, Epson is the industry standard, and the FX-850 is proof positive that they still know how to build legendary machines. After spending a little time with the FX-850, I'm certain it has what it takes to leave a lasting mark.

What do I like best about it? Maybe it's the way I can "park" continuous forms while printing single sheets, just like an expensive 24-pin printer. Or maybe it's Epson's SelecType control panel, which lets me press a button to toggle between draft, roman and sans serif fonts, as well as to select 10 cpi, 12 cpi, condensed and proportional print pitches. The printer can even "remember" control panel selections after it's turned off. If you select, say, a sans serif font in a 12-point pitch, and then turn the printer off, those settings come up as defaults when it's turned on again five minutes or five days later.

The spiral-bound user's manual is chock-full of useful information and instructions, more so than any other documentation listed here. I also like the 264-cps print speed in 12-cpi Draft mode and find the 45-cps print speed in NLQ mode fast by 9-pin standards.

Unfortunately, the FX-850 inherited a ribbon cartridge that's long and cumbersome. Epson needs to follow Okidata's and Panasonic's lead in making small, clean, efficient cartridges.

The cartridge problem is minor, though, compared to the FX-850's strengths. This is the print machine I'd place on layaway.

Pros: Excellent construction; top-notch paper handling; rapid printing in all modes; superb software compatibility; SelecType control panel.

Cons: Cumbersome ribbon cartridge; expensive, compared to some low-end 9-pins. ►



Glossary of Printer Terms

Bit-image density: A calculated combination of Bit-Image (Graphics) mode and dot density (resolution) that represents a printer's ability to horizontally print numerous dots per inch. The significance of this is that some graphics programs won't work properly with printers incapable of producing high-density graphics.

Buffer: Computers can send data to a printer much faster than it can be printed, so most printers store the incoming data in internal memory that's known as a buffer. Buffers range in capacity from 2K to more than 30K bytes.

Characters per inch (cpi): Also called "pitch," this measure represents print size by indicating how many printed characters will fit horizontally in a 1-inch line of text. Common print pitches include 10, 12 and 17 cpi.

Characters per second (cps): A measure of print speed.

Character set: All the letters, numbers and symbols in a particular font.

Control codes: Commands that you send from your computer to set up modes, govern paper movement and perform a variety of other chores.

Draft print: A mode employed to produce quick printouts. It uses a character set consisting of a minimal number of dots.

Epson mode: See software emulation, below.

Font: A typeface, or style of characters.

Interface: A device with a cable or wires at each end that connects a printer to

Printer Comparison Chart

Manufacturer	Model	Software Emulation	Bit Image Density (Low-High dpi)	Print Pitches (Prop = Proportional)	NLQ or LQ Matrix @10 cpi
Seikosha	SK-3000	Epson LQ-1000 IBM Proprinter	60-240 60-240	10,12,15,17, Prop 10,12,15,17, Prop	24 × 18[5]
Panasonic	KX-P1092i	Epson FX-80 IBM Proprinter	60-240 60-240	10,12,15,17, Prop 10,12,15,17, Prop	18 × 18
	KX-P1524	Epson LQ-1500 IBM Proprinter Diablo 630	60-360[1] 60-240[2] 60-240[2]	10,12,15,17, Prop 12,17 10,12,15,17, Prop	24 × 30 (LQ)
Okidata	Microline 183	Okidata	60-144	10,12,17	18 × 18
	Microline 393	Epson LQ-1000	60-240[2] 60-360[3]	10,12,15,17,20, Prop	24 × 36 (LQ)
Brother	M-1724L	Epson LQ-1000 IBM Proprinter Diablo/Brother	60-360[1] 60-360[1] n/a	10,12,15,17, Prop 10,12,17, Prop 10,12,17, Prop	24 × 29 (LQ)
Epson	FX-850	Epson FX IBM Proprinter	60-240 60-240	10,12,17,20, Prop 10,12,17,20, Prop	18 × 18

(1) In both 8-pin and 24-pin modes.
(2) 8-pin mode only.
(3) 24-pin mode only.
(4) Manufacturer's claimed speed. Figures reflect high-speed mode, if available.
(5) The SK-3000 is a 9-pin printer; therefore, the 24 × 18 matrix includes half-dots.
(6) Expandable print buffers.

a computer. An interface is necessary when connecting a Commodore, with its serial output, to a printer that expects parallel input.

Letter quality (LQ) and near letter quality (NLQ): Print modes featuring high-quality characters comprising tightly packed dots.

Matrix: The horizontal and vertical array of dots that composes a character produced by a dot matrix printer.

Parallel printer: This term most often refers to a printer with a 36-pin Centronics parallel port for interfacing with a computer. Most printers manufactured today are in this category.

Proportional print: Printing in which characters are spaced according to their width. For instance, in proportional-printed text an "I" would take less space than an "M."

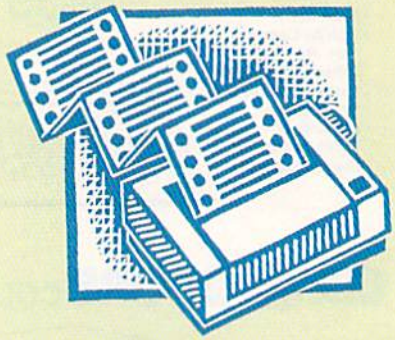
Ribbon cartridge: A nylon or fabric printer ribbon enclosed in a plastic housing. This type of ribbon is used in most printers manufactured today.

Serial printer: Any printer equipped with a 25-pin RS-232 port for interfacing. Not to be confused with Commodore-compatible serial printers, which use a 6-pin cable.

Software emulation: Printers usually have one or more operating modes that respond to a standard set of instructions, such as those used by Epson printers; thus the term "Epson mode," which refers to a widely adopted standard. The process is called software emulation because the printer is responding to a set of standard software commands.

Super- and subscripts: Superscripts are half-height characters raised slightly above the text line, such as those denoting the power of a number or referring to a footnote. Subscripts are half-height characters printed below the text line, as in mathematical or scientific formulas or equations. R

—TW



NLQ or LQ Print Speed[4]	Draft Mode Print Speed[4]	Italics Characters	Underlining	Super- and Subscripts	Buffer Capacity	Dimensions In Inches	Suggested Retail
75 cps @10 cpi 75 cps @12 cpi	300 cps @10 cpi 180 cps @12 cpi	Yes	Yes	Yes	10K	18.5 × 14.2 × 5.4	$ 649.00
48 cps @10 cpi	240 cps @10 cpi 240 cps @12 cpi	Yes	Yes	Yes	6K[6]	16.8 × 13.8 × 5.4	$ 529.95
80 cps @10 cpi	240 cps @10 cpi 172 cps @17 cpi	Yes	Yes	Yes	13.5K[c]	24 × 15.4 × 6.1	$ 949.00
n/a	120 cps @10 cpi	No	Yes	Yes	1K	20.7 × 11 × 3.2	$ 549.00
120 cps @12 cpi	450 cps @15 and 18 cpi	Yes	Yes	Yes	30K[8]	22.5 × 16.5 × 7.1	$1399.00
n/a	180 cps @10 cpi 192 cps @12 cpi	Yes	Yes	Yes	n/a	20.1 × 12 × 4.8	$ 949.00
45 cps @10 cpi 54 cps @12 cpi	220 cps @10 cpi 264 cps @12 cpi	Yes	Yes	Yes	8K	17.9 × 14.2 × 5.9	$ 549.00

Lyco Computer

Marketing & Consultants

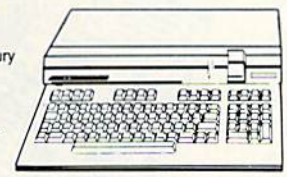
Since 1981

Air orders processed within 24 hours.

COMMODORE 128D

$439.95

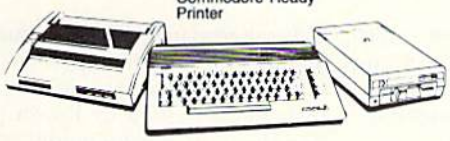
- 128K Std.
- 3 Mode Operation 1-64: Runs 64 software. 2-C128: Faster, more mercury for increased productivity 3-CPM: Uses Standard cpm titles



COMMODORE 64C Special System

$459.95

- Commodore 64C Computer
- Excel FSD-2 Disk Drive
- Star NX1000C Commodore Ready Printer



COMMODORE COLT PC

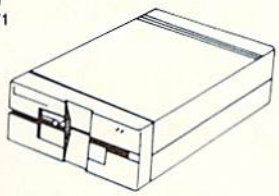


- IBM PC Compatible
- 640K Std.
- Two 5¼ Drives Std.
- Expansion for Hard Drive
- Turbo Processor
- MSDOS + GW Basic Included
- Serial + Parallel Ports
- Mono/RGB Color Card Included

$679.95

Excel 2001 Disk Drive for C128D

- Faster, quieter, more reliable than the 1571
- Fully compatible
- Separate power supply, so drive remains cool



$199.95

System Special

COMMODORE 64C Computer



- 64K RAM
- Serial Port
- Expansion Port
- Two Joystick/Paddle Ports
- Video Port
- RF TV Port
- Built-in Basic 2.0

$459.95

COMMODORE 1541c Disk Drive

- 170KB of Data (formatted)
- 5¼ inch Floppy Disk
- Data Transfer Rates 400 Bytes per Second

SEIKOSHA 180 VC



- 100 cps Draft
- 24 cps NLQ
- Tractor & Friction Feed
- Commodore Direct Connect

$10 off any program with this system.

Color System HEADSTART by Vendex

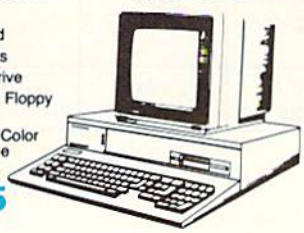


- Ready to plug in and use immediately
- Ultra fast 8 Mhz Intel 8088-2 Processor
- 512K RAM memory expandable to 768K
- 2-360K disk drives standard
- First complete system with clock calendar and built-in ports for printer, RS232, 2 joysticks, mouse and light pen
- Includes $500 worth FREE software programs
- Hi Res color monitor included!

ONLY $969.95

LASER Turbo XT Model II

- Dual Speed 4.77-8 Mhz
- 640K Std.
- Built-in ColorCard
- 8 Expansion Slots
- Built-in Floppy Drive
- Can Expand to 2 Floppy & 2 Hard Drives
- Green, Amber & Color Monitors Available



$629.95

COMMODORE HARDWARE

64C Computer	$149.95
C128D Computer/Drive	$439.95
1541 II Disk Drive	$179.95
1581 Disk Drive	$189.95
Excel FSD-2+ C64 Drive	$149.95
1802C Monitor	$179.95
1084 Monitor	$279.95
C1351 Mouse	$39.95
1764 RAM C64	$117.95
Colt PC	$679.95

PC COMPATIBLE HARDWARE

Laser Compact XTE 640K	$549.95
Laser Turbo XT Model II	$629.95
Blue Chip Popular	$549.95
Vendex Headstart Color	$969.95
Vendex Headstart Mono	$799.95
Vendex Headstart 888 LTD Color	$1599.95
Sharp PC 4501	$679.95
Sharp PC 4502	$1229.95
Zucker CGA ColorCard	$89.95
BCC CG ColorCard	$94.99
Mitsubishi 310/AT	$1229.95
ATI Graphics Solution	$129.95
ATI EGA Wonder	199.95
ATI VIP	$299.95
Kraft PC Joystick Card	$24.95

Seagate HARD DRIVES

5.25" Half Heights

ST225 20 meg 65msec MFM	$215.95
ST225N 20 meg SCSI	$289.95
ST238R 30 meg RLL	$229.95
ST251 40 meg 40 msec MFM	$345.95
ST251-1 40 meg 28 msec MFM	$429.95
ST277R 65 meg 40 msec RLL	$389.95

3.5"

ST125 20 meg 40 msec MFM	$235.95
ST125N 20 meg SCSI	$299.95
ST138R 30 meg RLL	$249.95
ST138N 30 meg SCSI	$329.95
ST157R 49 meg RLL	$399.95
ST157N 48 meg SCSI	$439.95

Seagate Internal Cards

ST125 20 meg Internal Card	$299.95
ST157R 49 meg Internal Card	$485.95

Controllers

MFM Controller (XT)	$55.95
RLL Controller (XT)	$64.95

Call for kit pricing and specials.

Ask about our

Seagate Paired Solutions!

1-800-233-8760

Important Answers to Important Questions About Lyco Computer!

Why shop at Lyco Computer?

Lyco Computer is one of, if not the largest, oldest, and most established firms to provide only quality name brand computer products to the general public at prices 30% to 50% lower than retail. We've set many industry standards, and we are setting the pace for many more in the future. Our standards include: a separate department for customer service; a price guarantee; guaranteed factory fresh merchandise; diverse payment and shipping policies, including a C.O.D. policy which allows customers to have products in their hands before paying anything. Selection places Lyco at the forefront of the industry. Due to our in-stock volume, we cannot advertise all of our products. Enjoy one-stop shopping for national products by calling our marketing staff for products and low prices.



How do I know I will get the product I need?

Our marketing staff is well educated in the computer industry. They receive continuous formal training by our manufacturers which enables them to develop and maintain a high degree of expertise on the products they represent. Though our strict guarantee on providing only new merchandise prohibits free trial periods and a guarantee on compatibility, a wealth of knowledge is available to our customers to help with the purchasing decision. As thousands of people every week capitalize on our savings and services, we hope you too, will make Lyco Computer your first choice.



What about warranty or service?

At Lyco Computer we decided several years ago that a customer service department was needed in the industry. Unfortunately, few of our competitors offer this service. Our product line enjoys "name brand recognition." We back all of our manufacturer's warranties in accordance with the manufacturer's stated warranty terms. These warranty terms are normally outlined in each owner's manual or explained at a retail store near you. Our customer service department is available to provide assistance in all warranty matters. Many manufacturers will allow defective products to be exchanged. Before you return any item that appears to be defective, we ask that you call our customer service department. They will assist you in determining if the product is defective, and then will give you a special authorization number and speed processing of your order.

Will you rush an item to me?

Since 1981, we have set the standard in the industry by processing orders within 24 hours — not 4 to 6 weeks. We offer next day air, two day air, standard UPS, and postal international shipping services. With a multi-million dollar inventory and the utilization of an IBM mainframe for processing, our records show we fill 95% of our orders daily. Temporary shortages are normally filled within 10 days. Our experience indicates most of our customers will wait the ten days in order to receive the benefit of our price savings and products. If an order cannot be filled within 60 days, money is refunded in full in the hope that the customer will reorder when the product is available. Any time prior to shipment, customers may cancel or change the out of stock product by simply contacting our customer service department.



How do I order?

Simply send your order to Lyco Computer, P.O. Box 5088, Jersey Shore, PA 17740. Or, call either **1-800-233-8760** or **717-494-1030**. We provide four payment methods. We have always accepted C.O.D. orders through UPS. Prepaid orders over $50 are shipped freight free. For orders under $50, please add $3 for freight. Orders prepaid by a certified check or money order payments, merchandise is shipped immediately. Personal and company checks require a 4 week waiting period prior to shipping. Visa and Master Card orders are accepted for your convenience, but we cannot pass along the 4% discount offered for cash. Purchase orders are accepted from Educational Institutions. We only charge sales tax on items delivered in Pennsylvania. For APO, FPO, and international orders, please add $5 plus 3% for priority mail. Advertised prices and availability are subject to change.

MasterCard VISA

COMMODORE | COMMODORE | AMIGA | IBM | IBM

Access:
Echelon $25.95
Mach 128 ..... $28.95
Wld. Cl. Leader Brd. ... $22.95
Famous Courses 1 or 2 ..... $11.95

Action Soft:
Up Periscope $18.95
Thunderchopper $18.95

Activision:
Last Ninja $19.95
Might & Magic $22.95
Crossbow $19.95
Maniac Mansion $19.95
Beyond Zork $25.95

Batteries Included:
Paperclip III $31.95

Berkeley Softworks:
Geofile 64 ..... $29.95
Geos 64 ..... $35.95
Geos 128 ..... $39.95
Geowrite 128 ..... $39.95
Berkeley TriPak $29.95

Broderbund:
Bank St. Writer $29.95
Print Shop $26.95
Print Shop Compan. $20.95
Graphic Library 1,2,3 .. $14.95
Cauldron $9.95

Electronic Arts:
Bard's Tale III $25.95
Hunt for Red October .. $25.95
Monopoly $20.95
Strike Fleet $20.95
Wasteland $25.95

Epyx:
Fastload $22.95
California Games $22.95
4x4 Off Road Racing .. $22.95
Metrocross $13.95

Firebird:
Jinxter $19.95
Starglider $11.95

Microleague:
Microleag. Baseball $22.95
Microleag. Wrestling $16.95

Microprose:
Airborne Ranger $22.95
Gunship $19.95
F-15 Strike Eagle $19.95
Pirates $22.95
Stealth Fighter $22.95

Mindscape:
Blockbuster $16.95
Harrier Combat Simulator $16.95
Paperboy $19.95
Road Runner $19.95

Origin:
Autoduel $29.95
Ultima IV $34.95

Software Simulations:
College Basketball $22.95
Football $17.95

Springboard:
Newsroom $19.95
Certificate Maker $14.95

Strategic Simulations:
Phantasie III $25.95
Eternal Dagger $25.95
Questron II $25.95

Sublogic:
Flight Simulator II $30.95
Stealth Mission $30.95

Timeworks:
Swiftcalc 128 ..... $27.95
Wordwriter 3 ..... $22.95

Unison World:
Art Gallery 1 or 2 ..... $14.95
Print Master $17.95

Activision:
Fairy Tale Adventure ... $27.95
Romantic Encounters .. $22.95

Electronic Arts:
FA/18 Interceptor $33.95
Ferrari Formula One ... $33.95
World Tour Golf $24.95

Epyx:
Destroyer $22.95
Death Sword $11.95
Sub Battle Simulator ... $27.95

Microprose:
Silent Service $22.95

Mindscape:
Balance of Power $27.95
Harrier Combat Simulator $27.95

Origin:
Moebius $34.95
Ogre $18.95

Strategic Simulations:
Gettysburg $35.95
Kampfgruppe $35.95
Phantasie III $25.95

Sublogic:
Flight Simulator $31.49
Jet Simulator $31.49
Scenery Disk ..... $CALL

Unison World:
Print Master $25.95
Art Gallery 1 or 2 ..... $14.95
Fonts & Borders $17.95



Access:
Wld. Cl. Value Pack $9.95
10th Frame $27.95

Activision:
Beyond Zork $27.95
GBA Basketball $9.95
Last Ninja $24.95
Might & Magic $27.95

Broderbund:
Ancient Art of War $26.95
Print Shop $34.95
Print Shop Comp. $29.95
Carmen San Diego Europe $27.95

Electronic Arts:
Yeager's AFT $26.95
Weaver Baseball $26.95
Hunt for Red October .. $31.95
Pegasus $26.95
Skyfox II $18.95
Starflight $31.95
Alternate Reality-City .. $25.95

Epyx:
California Games $22.95
L.A. Crackdown $28.95
Home Video Producer . $28.95
Print Magic $32.95
Death Sword $11.95
Impossible Mission 2 ... $22.95
Str. Sport Baseball $22.95
Spider Bot $13.95

Firebird:
Jinxter $22.95
Universal Military Simulator $28.95

Microleague:
Microleag. Baseball $22.95
GM Disk $16.95
Stat Disk $13.95

Microprose:
Confliction Vietnam $22.95
Silent Service $22.95
Gunship $27.95
Pirates $22.95

Mindscape:
Blockbuster $20.95
Gauntlet $22.95
Harrier Combat Simulator $20.95
Indoor Sports $16.95
Paperboy $22.95
Willow $22.95
Uninvited $22.95

Origin:
Ultima III $23.95
Ultima IV $34.95
Moebius $34.95

Strategic Simulations:
Gettysburg $35.95
Phantasie III $25.95
Questron II $25.95
Stellar Crusade $31.95
Star Command $31.95
Wargame Constr. $23.95

Sublogic:
Flight Simulator $34.95
Jet Simulator $30.95
Western Europe Scenery Disk $14.95

Timeworks:
Wordwriter PC $27.95
PC Quintet $49.95
Partner PC $22.95
Swiftcalc PC $22.95

Unison World:
Newsmaster II $39.95
Print Master $29.95
Art Gallery 1 or 2 ..... $14.95
Fonts & Borders $17.95

Printer Paper

1000 sheet laser $16.95
1000 mailing labels $8.95
200 sheet OKI 20 ..... $8.95
Transparent Labels $4.95
Banner Paper 45' Roll . $10.95

Printer Interfaces

Xetec Jr. $35.95
Xetec Supergraphics ... $55.95
Xetec Gold $74.95
PPI $29.95
Cardco GWhiz $32.95
Cardco Super G $44.95
MW 350 ..... $49.95

We carry cables for most printer applications for many popular computers.

Surge Suppressors

PP102-6 outlet $16.95
PP106-6 outlet with EMI/RFI $28.95
PP104-6 outlet with indicator $19.95
PP101-6 outlet powerstrip $9.95
Modem Protector $10.95

Printer Ribbons

Save up to 50%! We carry a stock of thousands for most applications.

Switch Boxes

Cent '25' AB $39.95
Cent '36' AB $39.95
RS232 ABC $45.95
Cent ABC $49.95
RS232 ABCD $49.95
Cent ABCD $49.95

Bargain Basement

Here are opportunities to enjoy below cost savings on items currently not in production due to newer replacement models. Call for updated product list.

Drive Maintenance

5¼ Drive Cleaner CMP142 ..... $7.95
5¼ Drive Cleaner with program $15.95
3.5 Drive Cleaner CMP 154 ..... $10.95

Video Tape

SKC T120 VHS Video Tape:

each $3.99
3 pack $10.95
10 pack $35.95

C64 Power Supply

Micro R + D MW 701A



$34.95

1-Year Warranty

Disc Storage

QVS-10 5¼ $3.95
QVS-75 5¼ $10.95
QVS-40 3½ $9.95

Diskettes

3.5

Maxell:
SSDD $11.50
DSDD $17.95

Bonus:
SSDD $10.95
DSDD $13.95

Verbatim:
SSDD $12.95
DSDD $18.95

SKC:
SSDD $9.95
DSDD $13.99

5-1/4

Disk Notcher $5.95

Maxell:
SSDD $7.95
DSDD $8.95

Bonus:
SSDD $5.95
DSDD $6.95

SKC:
DSDD $6.95
DSHD $13.95
Generic DSDD $4.95

Verbatim:
SSDD $8.99
DSDD $11.50

Joysticks



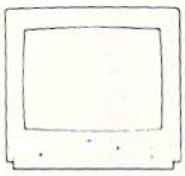
Tac 3 ..... $9.95
Tac 2 ..... $10.95
Tac 5 ..... $12.95
Tac 1 + IBM/AP $26.95
Slik Stick $6.95
Black Max $10.95
Boss $11.99
3-Way $19.99
Bathandle $16.75
Winner 909 ..... $24.95
Wico IBM/AP $29.95
Lipstick Plus $14.95
Kraft KC III Ap/PC $16.95
Kraft PC Joystick Card $27.95
Kraft Maze Master $8.95
I Controller $13.95
Epyx 500 XJ $13.95

MAGNAVOX

CM8762

$239.95

- 17% Larger Screen Than Standard 12" Monitors
- RGB TTL (CGA)
- Composite Video Inputs
- 640X 240 Resolution
- Green Text Display Switch
- Audio Input
- Built-in Tilt Stand
- One-Year Limited Warranty



BLUE CHIP

TTL Green Monitor



$54.95

- 720 x 348 in Graphics Mode
- Separate TTL Signal
- Non-glare "Flicker Free" Tube



Attention Educational Institutions:

If you are not currently using our educational service program, please call our representatives for details.

MONITORS

Thomson:

230 Amber TTL/12"	$69.95*
4120 CGA	$199.95*
4160 CGA	$244.95*
GB 100	$119.95*
GB 200 Super Card	$169.95*

**Quantities Limited*

NEC

Multisync II	$589.95

Blue Chip:

BCM 12" Green TTL	$54.95
BCM 12" Amber TTL	$69.95

Magnavox:

BM7652	$79.95
BM7622	$79.95
7BM-613	$79.95
7BM-623	$79.95
CM8502	$179.95
CM8505	$199.95
9CM-053	$339.95
CM8762	$239.95
8CM-515	$259.95
CM9043	$CALL
8CM-873	$499.95
9CM-082	$439.95

MODEMS

Avatex:

1200e	$65.95
1200i PC Card	$65.95
1200p	$89.95
1200hc Modem	$89.95
2400	$149.95
2400i PC Card	$139.95

Hayes:

Smartmodem 300	$139.95
Smartmodem 1200	$279.95
Smartmodem 2400	$419.95

US Robotics:

Courier 1200	$169.95
Courier 2400	$299.95

PRINTERS

Okidata

Okimate 20	$129.95
Okimate 20 w/cart	$189.95
120	$189.95
180	$219.95
182	$209.95
182+	$225.95
183	$239.95
292 w/interface	$449.95
293 w/interface	$585.95
294 w/interface	$799.95
393	$955.95
Laser 6	$CALL
390	$479.95
391	$649.95
320	$345.95
321	$475.95

Toshiba

321SL	$489.95
341 SL	$659.95
351 SX 400 cps	$979.95

Epson

LX800	$184.95
FX850	$339.95
FX1050	$499.95
EX800	$434.95
LQ500	$339.95
GQ3500	$LOW
LQ850	$525.95
LQ1050	$699.95

Brother

M1109	$159.95
M1509	$335.95
M1709	$439.95
Twinwriter 6 Dot & Daisy	$899.95
M1724L	$569.95
HR20	$345.95
HR40	$559.95
HR60	$649.95

Citizen

120 D	$144.95
180 D	$159.95
MSP-40	$279.95
MSP-15E	$309.95
MSP-50	$369.95
MSP-45	$349.95
MSP-55	$469.95
Premiere 35	$445.95
Tribute 224	$539.95
Tribute 124	$439.95

SEIKOSHA

Sp1000VC

$139.95

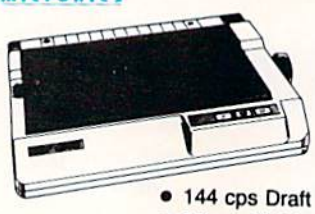
- Commodore Direct Connect
- 100 Cps Draft
- 20 Cps NLQ
- Auto Paper Loading
- Tractor & Friction Feed Std.



SP 180Ai	$125.95*
SP 180VC	$125.95*
SP 1000VC	$139.95
SP 1000AP	$159.95
SP 1200VC	$149.95
SL 80Ai	$289.95
MP5420FA	$999.95
SP Series Ribbon	$7.95
SK3000 Ai	$349.95
SK3005 Ai	$419.95
SPB 10	$CALL
SL 130Ai	$599.95

star micronics

NX1000C



- 144 cps Draft
- 36 cps NLQ
- EZ Front Panel Control
- Commodore Direct Connect

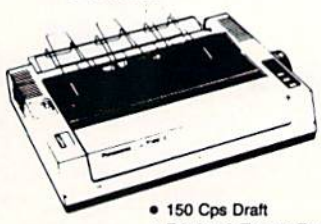
$169.95

NX-1000	$165.95*
NX-1000C	$169.95
NX-1000 Color	$225.95
NX-1000C Color	$229.95
NB-15 24 Pin	$669.95
NX-2400	$309.95
NB24-10 24 Pin	$399.95
NB24-15 24 Pin	$545.95
Laser 8	$1759.95
ND-15	$349.95
NL-10	$149.95

**w/cable purchase*

Panasonic Office Automation OA

1080i



- 150 Cps Draft
- Friction & Tractor Feed Std.
- Bidirectional & Logic Seeking
- NLQ in all Pitches

$159.95

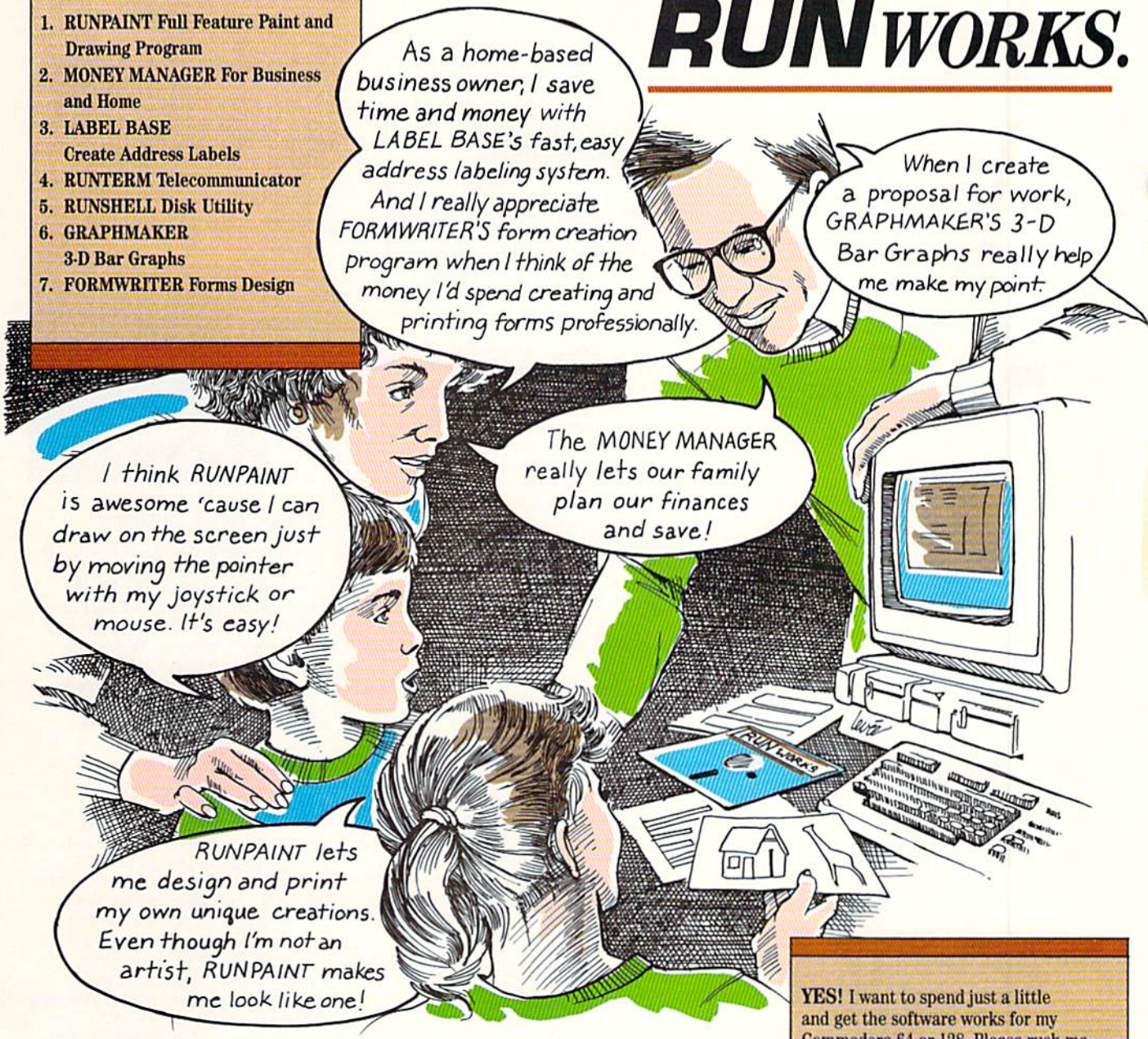
1080i Model II	$159.95
1091i Model II	$189.95
1092i	$309.95
1592	$375.95
1595	$419.95
3131	$289.95
3151	$459.95
KXP 4450 Laser	$1649.95
1524 24 Pin	$559.95
Fax Partner	$579.95
Optical Scanner	$859.95

RUNworks: A One-Disk Software System for Everything Commodore 64 and 128 Users Need

1. **RUNPAINT Full Feature Paint and Drawing Program**
2. **MONEY MANAGER For Business and Home**
3. **LABEL BASE Create Address Labels**
4. **RUNTERM Telecommunicator**
5. **RUNSHELL Disk Utility**
6. **GRAPHMAKER 3-D Bar Graphs**
7. **FORMWRITER Forms Design**

Spend a little and get the works...

RUNWORKS.



Introducing RUNworks ...a complete selection of all the software programs you'll ever need.

On just one disk!

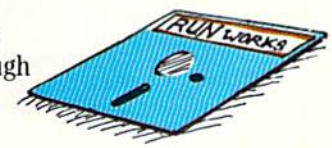
RUNworks is easy-to-use. But it works hard so you don't have to. Which means you're more productive and efficient.

And you can buy RUNworks at a fraction of the price you'd pay for comparable programs –up to $50 each elsewhere.

What's more, RUNworks and its fully illustrated documentation booklet are only available through this special offer.

So order today. There's no risk. RUNworks is 100% Money Back Guaranteed for thirty days.

Call 1-800-343-0728
Or send back the coupon or order card today.



YES! I want to spend just a little and get the software works for my Commodore 64 or 128. Please rush me all seven RUNworks programs on just one easy-to-use disk.

I'll pay only $24.97!

☐ Check is enclosed. ☐ MasterCard
☐ American Express ☐ Visa

CARD# EXP. DATE

NAME

ADDRESS

CITY STATE ZIP

Foreign Airmail, please add $3.95 per order.
Or mail this coupon or the postage-paid card to:
IDG Communications/Peterborough,
Attn: RUNworks, RWA88
PO Box 802, Peterborough, NH 03458

Songs in the Key of C-128

Entering music is an exercise in harmony with Music Editor.

By BARBARA SCHULAK

Better tune up your C-128! Music Editor 128 facilitates transcribing written music, whether your own or sheet music, into strings that can be used by the C-128 Play statement. It will also store the music as a sequential file on disk, so you can rework it later or use it in your own programs.

The Music Editor screen displays three menus and octaves 1–6 of the piano keyboard. The two bottom lines of the screen are reserved for input and program response.

To select options from the menus, use a joystick plugged into port 2. Move it up and down to highlight the choices; then press the fire-button to select the one you want.

Menu 1 lets you access the editor (which leads to menus 2 and 3), load or save a file, print the file either to the screen or your printer, view the directory and set the tempo for the music. After you press the fire-button, a prompt appears at the bottom of the screen. Enter the necessary information, and the operation will proceed. To abort the operation, press the return key. You can also play all or part of the music from menu 1 by entering the starting and ending measures you want to hear.

Keying In the Music

To facilitate entering data, Music Editor works one measure at a time. Menu 2 lets you choose a measure to edit, start and end the measure and play it. You can also select the volume for each measure and the tuning envelope for each voice. I'd suggest using the first measure to define your tuning envelopes, so they can easily be changed later. It's also possible to change the tuning envelopes and volume for sections of the music. When you are all ready to begin work, choose the Start Measure option, which takes you to menu 3.



Menu 3 is for entering notes. First use the joystick to highlight and select the Voice Number option. Then move the joystick up and down and press the fire-button to choose the voice number, 1–3. Notice that the number you've chosen appears at the bottom of the screen. This is where the string will be displayed as you enter it.

To enter a note, move the joystick up and down to choose the duration (whole, half, quarter note, and so forth), then right and left to slide the arrow up and down the keyboard. When the arrow is pointing to the note you want, press the fire-button. The note will be played and displayed at the bottom of the screen. The red R on the keyboard stands for a rest. Continue in this fashion until you've completed your measure.

Then return to menu 2 to play the measure. If it sounds fine, select End Measure to add it to your file. If not, you can begin again by selecting Start Measure, which erases the string, or return to menu 3 to edit the string. Place the arrow on the red E at the right end of the keyboard and press the fire-button to erase a letter from the end of the string. You may have to do this several times to erase the parts you want to delete. When your measure is finished, select End Measure from Menu 2.

You can choose any measure to edit by selecting the Measure # option. Be sure to save your file periodically as you work.

Program Music

When you have a piece finished and want to include it in a program, use the following code to load and play the file:

```
10 F$ = "FILENAME":DIMA$(200)
20 DOPEN#2,(F$),R
30 INPUT#2,N
40 FORI = 1TON:INPUT#2,A$(I):NEXT
50 DCLOSE#2
60 FORI = 1TON:PLAYA$(I):NEXT
70 END
```

You can add your own Tempo statement (the default is 8), change the tuning envelopes with the Envelope state- ►

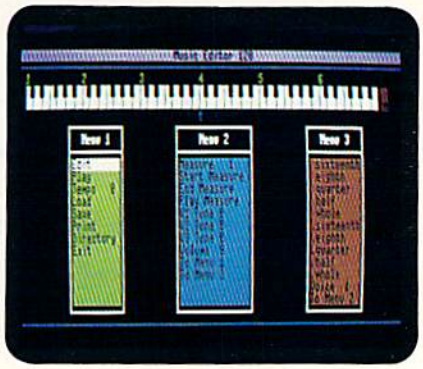
RUN it right: **C-128, in 80-Column mode; joystick; printer optional**

ILLUSTRATED BY LAURA CORNELL

ment and add filtering effects with the Filter statement. Refer to any C-128 reference guide for a discussion of the computer's music commands to help you use Music Editor.

Keep in mind that Music Editor limits strings to 160 characters (two screen lines). You may have to divide a measure into two sections if your string is getting too long. R

Barbara Schulak is a self-taught computer programmer and freelance writer with interests in educational and home applications.





Dozens of options are at your fingertips to help you get rockin' 'round the clock!

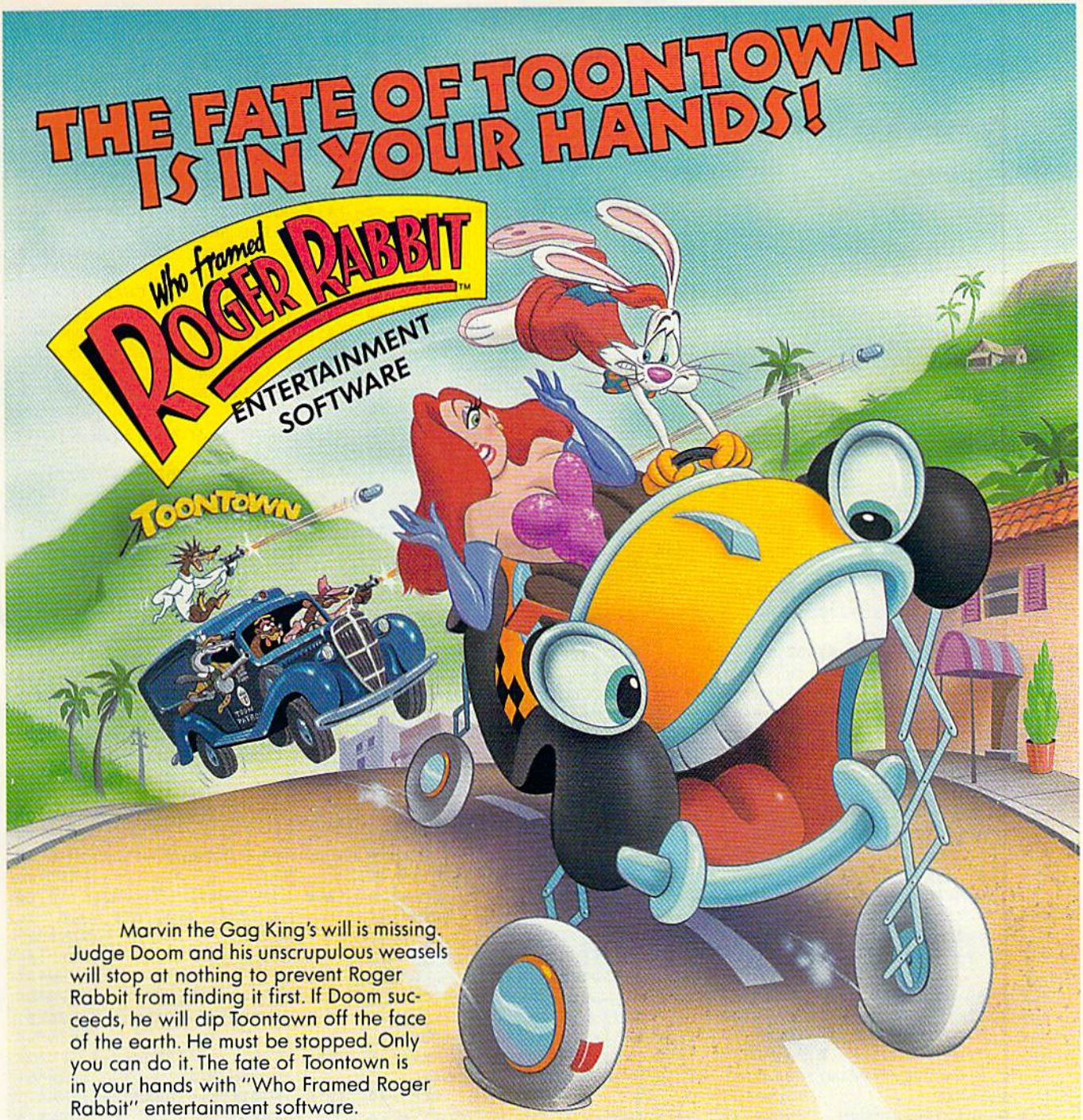
Listing 1. Music Editor program.

```
10 SCNCLR:PRINTCHR$(14);CHR$(11
   );CHR$(27)"M";CHR$(2);
                          :REM*187
20 COLOR5,5:CHAR,32,5,"{SHFT M}
   USIC {SHFT E}DITOR 128":PRIN
   TCHR$(130);            :REM*238
30 TEMPO12:PLAY"V1T0V2T0V3T0U9V
   105IEI#DIEI#DIEO4IBO5IDICO4H
   AV202HA"               :REM*90
40 COLOR5,2:CHAR,31,18,"{SHFT P
   }LEASE {SHFT S}TAND {SHFT B}
   Y..."                  :REM*42
50 A$="{CTRL 9}{COMD G}{CRSR RT
   } {CRSR RT} {COMD G}{CRSR RT
   } {CRSR RT} {CRSR RT} ":C$="
   {CTRL 9}{COMD G}{SHFT -} {SH
   FT -} {COMD G}{SHFT -} {SHFT
    -} {SHFT -} "         :REM*56
60 DIMM1$(8),M2$(9),M3$(12),N$(
   74),L$(12),O$(73),D$(10),A$(
   200):X=37:W=0:VO=1:TP=8:VL=9
   :CA=2:M=1:T(1)=0:T(2)=0:T(3)
   =0:VC=1:A$(1)=""       :REM*248
70 FORI=1TO12:READL$(I):NEXT
                          :REM*127
80 DATA C,#C,D,#D,E,F,#F,G,#G,A
   ,#A,B                  :REM*16
90 CT=0:FORI=1TO6:FORJ=1TO12:CT
   =CT+1                  :REM*197
100 N$(CT)=L$(J):NEXT:NEXT
                          :REM*241
110 CT=0:FORI=1TO6:FORJ=1TO12:C
   T=CT+1:O$(CT)="O"+RIGHT$(ST
   R$(I),1):NEXT:NEXT     :REM*157
120 N$(73)="R":O$(73)=""
                          :REM*182
130 FORI=0TO9:READD$(I):NEXT
                          :REM*182
140 DATA S,I,Q,H,W,.S,.I,.Q,.H,
   .W                     :REM*140
150 FORI=0TO7:READM1$(I):NEXT
                          :REM*103
160 DATA "{SHFT E}DIT{6 SPACES}
   "                      :REM*20
170 DATA "{SHFT P}LAY{6 SPACES}
   "                      :REM*87
180 DATA "{SHFT T}EMPO{3 SPACES
   }8 "                   :REM*132
190 DATA "{SHFT L}OAD{6 SPACES}
   "                      :REM*204
200 DATA "{SHFT S}AVE{6 SPACES}
   "                      :REM*35
210 DATA "{SHFT P}RINT{5 SPACES
   }"                     :REM*202
220 DATA "{SHFT D}IRECTORY "
                          :REM*209
230 DATA "{SHFT E}XIT{6 SPACES}
   "                      :REM*138
240 FORI=0TO9:READM2$(I):NEXT
                          :REM*151
250 DATA "{SHFT M}EASURE{3 SPAC
   Es}1{3 SPACEs}"        :REM*92
260 DATA "{SHFT S}TART {SHFT M}
   EASURE "               :REM*236
270 DATA "{SHFT E}ND {SHFT M}EA
   SURE{3 SPACEs}"        :REM*187
280 DATA "{SHFT P}LAY {SHFT M}E
   ASURE{2 SPACEs}"       :REM*146
290 DATA "{SHFT V}1 {SHFT T}UNE
   0{5 SPACEs}"           :REM*105
300 DATA "{SHFT V}2 {SHFT T}UNE
   0{5 SPACEs}"           :REM*119
310 DATA "{SHFT V}3 {SHFT T}UNE
   0{5 SPACEs}"           :REM*69
320 DATA "{SHFT V}OLUME{2 SPACE
   s}9{5 SPACEs}"         :REM*74
330 DATA "{SHFT T}O {SHFT M}ENU
   1{5 SPACEs}"           :REM*196
340 DATA "{SHFT T}O {SHFT M}ENU
   3{5 SPACEs}"           :REM*37
350 FORI=0TO11:READM3$(I):NEXT
                          :REM*52
360 DATA " SIXTEENTH"     :REM*226
370 DATA " EIGHTH{3 SPACEs}"
                          :REM*173
380 DATA " QUARTER{2 SPACEs}"
                          :REM*57
390 DATA " HALF{5 SPACEs}"
                          :REM*174
400 DATA " WHOLE{4 SPACEs}"
                          :REM*153
410 DATA ".SIXTEENTH"     :REM*77
420 DATA ".EIGHTH{3 SPACEs}"
                          :REM*14
430 DATA ".QUARTER{2 SPACEs}"
                          :REM*157
440 DATA ".HALF{5 SPACEs}"
                          :REM*11
450 DATA ".WHOLE{4 SPACEs}"
                          :REM*245
460 DATA "{SHFT V}OICE{2 SPACEs
   }1{2 SPACEs}"          :REM*196
470 DATA "{SHFT T}O {SHFT M}ENU
   {SHFT SPACE}2 "        :REM*173
480 PRINT"{SHFT CLR}":COLOR5,5:
   CHAR,0,0,"{32 SPACEs}{SHFT
   M}USIC {SHFT E}DITOR 128{31
    SPACEs}",1            :REM*44
490 COLOR5,7:CHAR,0,1,"{79 SHFT
    *s}"                  :REM*242
500 COLOR5,6:CHAR,0,2," 1{11 SP
   ACEs}2{11 SPACEs}3{11 SPACE
   s}4{11 SPACEs}5{11 SPACEs}6
   "                      :REM*51
510 COLOR5,2:CHAR,1,3,"":FORI=1
   TO6:PRINTA$;:NEXT:PRINT"{CT
   RL 3}{2 SPACEs}";      :REM*7
520 CHAR,1,4,"":PRINT"{CTRL 9}{
   CTRL 2}";:FORI=1TO6:PRINTC$
   ;:NEXT:PRINT"{CTRL 3}RE"
                          :REM*252
530 COLOR5,7:CHAR,X,5,"{UP ARRO
   W}"                    :REM*201
540 COLOR5,2:CHAR,10,6,"{COMD A
   }{10 SHFT *s}{COMD S}{10 SP
   ACEs}{COMD A}{14 SHFT *s}{C
   OMD S}{10 SPACEs}{COMD A}{1
   0 SHFT *s}{COMD S}":REM*224
550 CHAR,10,7,"{SHFT -}{2 SPACE
   s}{SHFT M}ENU 1{2 SPACEs}{S
   HFT -}{10 SPACEs}{SHFT -}{4
    SPACEs}{SHFT M}ENU 2{4 SPA
   CEs}{SHFT -}{10 SPACEs}{SHF
   T -}{2 SPACEs}{SHFT M}ENU 3
   {2 SPACEs}{SHFT -}" :REM*78
560 CHAR,10,8,"{COMD Q}{10 SHFT
    *s}{COMD W}{10 SPACEs}{COM
   D Q}{14 SHFT *s}{COMD W}{10
    SPACEs}{COMD Q}{10 SHFT *s
   }{COMD W}"             :REM*52
570 FORI=9TO20:CHAR,10,I,"{SHFT
    -}{10 SPACEs}{SHFT -}{10 S
   PACEs}{SHFT -}{14 SPACEs}{S
   HFT -}{10 SPACEs}{SHFT -}{1
   0 SPACEs}{SHFT -}":NEXT
                          :REM*242
580 CHAR,10,21,"{COMD Z}{10 SHF
   T *s}{COMD X}{10 SPACEs}{CO
   MD Z}{14 SHFT *s}{COMD X}{1
   0 SPACEs}{COMD Z}{10 SHFT *
   s}{COMD X}"            :REM*203
590 COLOR5,7:CHAR,0,22,"{80 SHF
   T *s}"                 :REM*175 ►
```

THE FATE OF TOONTOWN IS IN YOUR HANDS!

Who Framed ROGER RABBIT™

ENTERTAINMENT SOFTWARE



Marvin the Gag King's will is missing. Judge Doom and his unscrupulous weasels will stop at nothing to prevent Roger Rabbit from finding it first. If Doom succeeds, he will dip Toontown off the face of the earth. He must be stopped. Only you can do it. The fate of Toontown is in your hands with "Who Framed Roger Rabbit" entertainment software.

It's a fast-paced, action-packed adventure that's **more** than an arcade game. Stunning graphics, high quality animation and sound effects put you "in Toon" with Toontown's fate.

Can you defeat Judge Doom? Are you going to let him get away with this? It's up to you. And remember, Toons are idiotic—but they're not stupid!

Ask for "Who Framed Roger Rabbit" at a software dealer near you. The future of Toontown depends on it!

Available Now: IBM PC/XT, AT, PS/2 and 100% Compatibles, Amiga, Commodore 64/128



Actual Amiga Screen



Actual IBM Screen



Actual Commodore Screen

Coming Soon: Apple® II Series

Amiga, Commodore 64/128, IBM PC/XT, AT, PS/2, Apple® II Series are trademarks respectively of Commodore-Amiga, Inc., Commodore Electronics, Limited, International Business Machines, and Apple Computer, Inc.

BUENA VISTA SOFTWARE

© 1988 The Walt Disney Company and Amblin Entertainment, Inc.

Circle 228 on Reader Service card.

SONGS IN THE KEY OF C-128

```
600 GOSUB2370:GOSUB2420:GOSUB247
    0                    :REM*190
610 :                    :REM*158
620 FORT=1TO50:NEXT      :REM*129
630 R=9:COLOR 5,2:CHAR,11,R,M1$
    (R-9),1              :REM*234
640 IFJOY(2)=5THENBEGIN:COLOR 5
    ,14:CHAR,11,R,M1$(R-9),1:R=
    R+1:IFR=17THENR=9    :REM*131
650 COLOR 5,2:CHAR,11,R,M1$(R-9
    ),1:BEND             :REM*205
660 IFJOY(2)=1THENBEGIN:COLOR 5
    ,14:CHAR,11,R,M1$(R-9),1:R=
    R-1:IFR<9THENR=16    :REM*243
670 COLOR 5,2:CHAR,11,R,M1$(R-9
    ),1:BEND             :REM*161
680 IFJOY(2)<>128THEN640
                         :REM*126
690 IFR=16THENPRINT"{2 HOMEs}{S
    HFT CLR}";CHR$(27)"L":END
                         :REM*173
700 IFR=9THENCOLOR 5,14:CHAR,11
    ,R,M1$(R-9),1:GOTO1440
                         :REM*203
710 IFR=14THENGOTO1220   :REM*220
720 IFR=15THEN1390       :REM*142
730 Z=R-9:ONZGOSUB760,880,970,1
    100                  :REM*171
740 GOTO640              :REM*48
750 :                    :REM*43
760 GOSUB2770:COLOR5,2:CHAR,0,2
    3,"{SHFT E}NTER STARTING ME
    ASURE: "             :REM*215
770 TY=2:L=2:GOSUB2510:IFCT=0TH
    EN860                :REM*169
780 GOSUB2770:S1=VAL(V$)
                         :REM*126
790 CHAR,0,23,"{SHFT E}NTER END
    ING MEASURE: "       :REM*11
800 TY=2:L=2:GOSUB2510:IFCT=0TH
    EN860                :REM*143
810 S2=VAL(V$):IFS2<S1THEN860
                         :REM*193
820 IFS2>NTHEN860          :REM*5
830 IFS1<1THEN860        :REM*132
840 TEMPO TP:GOSUB2770   :REM*240
850 FORI=S1TOS2:CHAR,0,23,"{SHF
    T M}EASURE:":PRINTI:PLAYA$(
    I):NEXT              :REM*139
860 GOSUB2770:RETURN     :REM*247
870 :                    :REM*163
880 GOSUB2770:COLOR5,2:CHAR,0,2
    3,"{SHFT E}NTER {SHFT T}EMP
    O [1-255]: "         :REM*176
890 L=3:TY=2:GOSUB2510:Q=VAL(V$
    ):IFCT=0THEN940      :REM*21
900 IFQ<1ORQ>255THENGOSUB2770:G
    OTO880               :REM*246
910 TP=VAL(V$):IFCT=1THENM1$(2)
    ="{SHFT T}EMPO{3 SPACEs}"+V
    $+" "                :REM*82
920 IFCT=2THENM1$(2)="{SHFT T}E
    MPO{2 SPACEs}"+V$+" "
                         :REM*179
930 IFCT=3THENM1$(2)="{SHFT T}E
    MPO "+V$+" "         :REM*53
940 GOSUB2770              :REM*9
950 CHAR,11,R,M1$(R-9),1:RETURN
                         :REM*21
960 :                    :REM*249
970 GOSUB2770:COLOR5,2:CHAR,0,2
    3,"{SHFT E}NTER {SHFT F}ILE
    NAME: "              :REM*43
980 L=15:TY=4:GOSUB2510:IFCT=0T
    HEN940               :REM*13
990 F$=V$                :REM*134
1000 DOPEN#2,(F$),R      :REM*167
1010 IFDS<>0THENGOSUB2730:GOTO1
    060                  :REM*195
1020 INPUT#2,N           :REM*166
1030 GOSUB2770           :REM*111
1040 CHAR,0,23,"":PRINT"{SHFT T
    }OTAL # {SHFT M}EASURES"N
                         :REM*229
1050 FORI=1TON:INPUT#2,A$(I):NE
    XT                   :REM*70
1060 DCLOSE#2            :REM*119
1070 GOSUB2770           :REM*151
1080 COLOR5,2:CHAR,11,R,M1$(R-9
    ),1:RETURN           :REM*59
1090 :                   :REM*120
1100 GOSUB2770:COLOR5,2:CHAR,0,
    23,"{SHFT E}NTER {SHFT F}I
    LENAME: "            :REM*168
1110 L=15:TY=4:GOSUB2510:IFCT=0
    THEN940              :REM*143
1120 F$=V$               :REM*25
1130 SCRATCH (F$)        :REM*220
1140 DOPEN#2,(F$),W      :REM*107
1150 IFDS<>0THENGOSUB2730:GOTO1
    180                  :REM*130
1160 PRINT#2,N           :REM*71
1170 FORI=1TON:PRINT#2,A$(I):NE
    XT                   :REM*177
1180 DCLOSE#2            :REM*239
1190 GOSUB2770             :REM*0
1200 COLOR5,2:CHAR,11,R,M1$(R-9
    ),1:RETURN           :REM*179
1210 :                   :REM*240
1220 GOSUB2770:COLOR5,2:CHAR,0,
    23,"[{SHFT S}]CREEN OR [{S
    HFT P}]RINTER ?"     :REM*206
1230 GETKEYK$:IFK$=CHR$(13)THEN
    1370                 :REM*208
1240 IFK$="P"THEN1310    :REM*246
1250 IFK$<>"S"THEN1230   :REM*139
1260 PRINTCHR$(147);CHR$(27)"L"
    ;                    :REM*100
1270 FORI=1TON:PRINT"{SHFT M}EA
    SURE "I": ";A$(I):NEXT
                         :REM*13
1280 GOSUB2690           :REM*111
1290 PRINTCHR$(27)"M";:GOTO480
                         :REM*156
1300 :                   :REM*75
1310 GOSUB2770:CHAR,0,23,"{SHFT
     P}RINTER {SHFT R}EADY [Y/
    N]"                  :REM*248
1320 GETKEYK$:IFK$<>"Y"THEN1370
                         :REM*189
1330 OPEN4,4,7           :REM*186
1340 PRINT#4,"{SHFT F}ILE: "F$:
    PRINT#4              :REM*98
1350 FORI=1TON:PRINT#4,"{SHFT M
    }EASURE"I"- ";A$(I):NEXT
                           :REM*7
1360 PRINT#4:CLOSE4      :REM*136
1370 GOSUB2770:GOTO640   :REM*40
1380 :                   :REM*155
1390 PRINTCHR$(27)"L";CHR$(147)
    ;                      :REM*9
1400 DIRECTORY           :REM*96
1410 GOSUB2690           :REM*225
1420 PRINTCHR$(27)"M":GOTO480
                         :REM*140
1430 :                   :REM*213
1440 R=9:COLOR 5,2:CHAR,33,R,M2
    $(R-9),1             :REM*64
1450 FORT=1TO50:NEXT     :REM*196
1460 IFJOY(2)=5THENBEGIN:COLOR
    5,15:CHAR,33,R,M2$(R-9),1:
    R=R+1:IFR=19THENR=9
                         :REM*139
1470 COLOR 5,2:CHAR,33,R,M2$(R-
    9),1:BEND            :REM*117
1480 IFJOY(2)=1THENBEGIN:COLOR
    5,15:CHAR,33,R,M2$(R-9),1:
    R=R-1:IFR<9THENR=18
                         :REM*131
1490 COLOR 5,2:CHAR,33,R,M2$(R-
    9),1:BEND            :REM*65
1500 IFJOY(2)<>128THEN1460
                         :REM*92
1510 IFR=17THENCOLOR 5,15:CHAR,
    33,R,M2$(R-9),1:GOTO620
                         :REM*68
1520 IFR=10THENCOLOR 5,15:CHAR,
    33,R,M2$(R-9),1:A$(M)="":G
    OSUB2810:COLOR5,15:CHAR,33
    ,R,M2$(R-9),1:GOTO2080
                         :REM*219
1530 IFR=18THENCOLOR 5,15:CHAR,
    33,R,M2$(R-9),1:GOTO2080
                         :REM*116
1540 IFR=9THENGOSUB1580:GOTO145
    0                    :REM*196
1550 Z=R-9:ONZGOSUB1580,1710,20
    50,1770,1790,1810,1940
                         :REM*227
1560 GOTO1450            :REM*106
1570 :                    :REM*90
1580 FORT=1TO50:NEXT     :REM*69
1590 COLOR5,16:CHAR,33,R,M2$(0)
    ,1                   :REM*94
1600 IFJOY(2)=1THENM=M+1:IFM>N+
    1THENM=M-1           :REM*61
1610 IFJOY(2)=5THENM=M-1:IFM<1T
    HENM=1               :REM*14
1620 IFM<10THENM2$(0)="{SHFT M}
    EASURE{2 SPACEs}"+STR$(M)+
    "{3 SPACEs}":GOTO1650
                         :REM*119
1630 IFM<100THENM2$(0)="{SHFT M
    }EASURE "+STR$(M)+"{3 SPAC
    Es}":GOTO1650        :REM*230
1640 M2$(0)="{SHFT M}EASURE"+ST
    R$(M)+"{3 SPACEs}":REM*225
1650 COLOR5,16:CHAR,33,R,M2$(0)
    ,1                   :REM*154
1660 GOSUB2810           :REM*192
1670 IFJOY(2)<>128THEN1600
                         :REM*204
1680 COLOR5,2:CHAR,33,R,M2$(0),
    1                    :REM*236
1690 RETURN               :REM*47
1700 :                   :REM*216
1710 A$(M)=A$(M)+"M":GOSUB2810
```

SONGS IN THE KEY OF C-128

```
                              :REM*Ø
172Ø COLOR5,13:CHAR,33,R,M2$(2)
     ,1:FORI=1TO5Ø:NEXT       :REM*79
173Ø COLOR5,2:CHAR,33,R,M2$(2),
     1                        :REM*7
174Ø IFM>NTHENN=M             :REM*142
175Ø RETURN                   :REM*99
176Ø :                        :REM*29
177Ø VO=1:GOSUB183Ø:RETURN
                              :REM*15
178Ø :                        :REM*41
179Ø VO=2:GOSUB183Ø:RETURN
                              :REM*55
18ØØ :                        :REM*69
181Ø VO=3:GOSUB183Ø:RETURN
                              :REM*95
182Ø :                        :REM*81
183Ø FORT=1TO5Ø:NEXT          :REM*9Ø
184Ø COLOR5,16:CHAR,33,R,M2$(R-
     9),1                     :REM*184
185Ø IFJOY(2)=1THENT(VO)=T(VO)+
     1:IFT(VO)>9THENT(VO)=Ø
                              :REM*44
186Ø IFJOY(2)=5THENT(VO)=T(VO)-
     1:IFT(VO)<ØTHENT(VO)=9
                              :REM*232
187Ø M2$(R-9)="{SHFT V}"+RIGHT$
     (STR$(VO),1)+" {SHFT T}UNE
     "+STR$(T(VO))+"{5 SPACEs}"
                              :REM*198
188Ø COLOR5,16:CHAR,33,R,M2$(R-
     9),1                     :REM*83
189Ø IFJOY(2)<>128THEN185Ø
                              :REM*14
19ØØ COLOR5,2:CHAR,33,R,M2$(R-9
     ),1                      :REM*2
191Ø A$(M)=A$(M)+"V"+RIGHT$(STR
     $(VO),1)+"T"+RIGHT$(STR$(T
     (VO)),1):GOSUB281Ø       :REM*3
192Ø RETURN                   :REM*6
193Ø :                        :REM*195
194Ø FORT=1TO5Ø:NEXT          :REM*172
195Ø COLOR5,16:CHAR,33,R,M2$(7)
     ,1                       :REM*118
196Ø IFJOY(2)=1THENVL=VL+1:IFVL
     >9THENVL=Ø               :REM*88
197Ø IFJOY(2)=5THENVL=VL-1:IFVL
     <ØTHENVL=9               :REM*192
198Ø M2$(7)="{SHFT V}OLUME "+ST
     R$(VL)+"{5 SPACEs}":REM*83
199Ø COLOR5,16:CHAR,33,R,M2$(7)
     ,1                       :REM*78
2ØØØ IFJOY(2)<>128THEN196Ø
                              :REM*135
2Ø1Ø COLOR5,2:CHAR,33,R,M2$(7),
     1                        :REM*149
2Ø2Ø A$(M)=A$(M)+"U"+RIGHT$(STR
     $(VL),1):GOSUB281Ø       :REM*92
2Ø3Ø RETURN                   :REM*116
2Ø4Ø :                        :REM*58
2Ø5Ø TEMPO TP                 :REM*77
2Ø6Ø PLAYA$(M):RETURN         :REM*252
2Ø7Ø :                        :REM*88
2Ø8Ø R=9:COLOR 5,2:CHAR,59,R,M3
     $(R-9),1                 :REM*125
2Ø9Ø FORT=1TO5Ø:NEXT          :REM*73
21ØØ IFJOY(2)=5THENBEGIN:COLOR
     5,11:CHAR,59,R,M3$(R-9),1:
     R=R+1:IFR=21THENR=9
                              :REM*2Ø4
211Ø COLOR 5,2:CHAR,59,R,M3$(R-
     9),1:BEND                :REM*143
212Ø IFJOY(2)=1THENBEGIN:COLOR
     5,11:CHAR,59,R,M3$(R-9),1:
     R=R-1:IFR<9THENR=2Ø:REM*45
213Ø COLOR 5,2:CHAR,59,R,M3$(R-
     9),1:BEND                :REM*147
214Ø IFJOY(2)=3THENBEGIN:COLOR5
     ,7:CHAR,X,5," ":X=X+1:IFX=
     75THENX=1                :REM*146
215Ø CHAR,X,5,"{UP ARROW}":BEND
                              :REM*241
216Ø IFJOY(2)=7THENBEGIN:COLOR5
     ,7:CHAR,X,5," ":X=X-1:IFX=
     ØTHENX=74                :REM*162
217Ø CHAR,X,5,"{UP ARROW}":BEND
                              :REM*197
218Ø IFJOY(2)<>128THEN21ØØ
                              :REM*131
219Ø IFR=2ØTHENCOLOR 5,11:CHAR,
     59,R,M3$(R-9),1:GOTO144Ø
                              :REM*6Ø
22ØØ IFR=19THEN226Ø:GOTO21ØØ
                              :REM*98
221Ø IFX=74THENL2=LEN(A$(M)):IF
     L2<=ØTHEN224Ø            :REM*122
2215 IFX=74THENA$(M)=LEFT$(A$(M
     ),L2-1):GOTO224Ø         :REM*147
222Ø Q$=O$(X)+D$(R-9)+N$(X)
                              :REM*23Ø
2225 IFLEN(A$(M))+LEN(Q$)>16ØTH
     EN224Ø                   :REM*2
223Ø A$(M)=A$(M)+Q$:PLAYQ$
                              :REM*175
224Ø GOSUB281Ø:GOTO2Ø9Ø:REM*17Ø
225Ø :                        :REM*13
226Ø FORT=1TO5Ø:NEXT          :REM*227
227Ø COLOR5,16:CHAR,59,R,M3$(1Ø
     ),1                      :REM*172
228Ø IFJOY(2)=1THENVC=VC+1:IFVC
     >3THENVC=1               :REM*2Ø5
229Ø IFJOY(2)=5THENVC=VC-1:IFVC
     <1THENVC=3               :REM*43
23ØØ M3$(1Ø)="{SHFT V}OICE "+ST
     R$(VC)+"{2 SPACEs}":REM*73
231Ø COLOR5,16:CHAR,59,R,M3$(1Ø
     ),1                      :REM*132
232Ø IFJOY(2)<>128THEN228Ø
                              :REM*149
233Ø COLOR5,2:CHAR,59,R,M3$(1Ø)
     ,1                       :REM*142
234Ø A$(M)=A$(M)+"V"+RIGHT$(STR
     $(VC),1)                 :REM*162
235Ø GOSUB281Ø:GOTO2Ø9Ø :REM*57
236Ø :                        :REM*123
237Ø WINDOW11,9,2Ø,2Ø,1:REM*1ØØ
238Ø FORI=ØTO7:PRINT"{CTRL 9}{C
     OMD 6}";M1$(I):NEXT:REM*53
239Ø FORI=1TO4:PRINT"{CTRL 9}{C
     OMD 6}{1Ø SPACEs}":NEXT
                              :REM*49
24ØØ RETURN                   :REM*231
241Ø :                        :REM*173
242Ø WINDOW33,9,46,2Ø,1:REM*226
243Ø FORI=ØTO9:PRINT"{CTRL 9}{C
     OMD 7}";M2$(I):NEXT
                              :REM*157
244Ø FORI=1TO2:PRINT"{CTRL 9}{C
     OMD 7}{14 SPACEs}":NEXT
                              :REM*185
245Ø RETURN                   :REM*42
246Ø :                        :REM*223
247Ø WINDOW59,9,68,2Ø,1:REM*111
248Ø FORI=ØTO11:PRINT"{CTRL 9}{
     COMD 3}";M3$(I):NEXT
                              :REM*75
249Ø PRINT"{2 HOMEs}":RETURN
                              :REM*21
25ØØ :                        :REM*247
251Ø V$="":K$="":CT=Ø:SYS52684,
     135,1Ø                   :REM*171
252Ø GETKEYK$                 :REM*2Ø9
253Ø IFK$=CHR$(13)THEN266Ø
                              :REM*219
254Ø IFK$=CHR$(2Ø)ANDCT<>ØTHENP
     RINTCHR$(2Ø);:CT=CT-1:V$=L
     EFT$(V$,CT):GOTO252Ø
                              :REM*189
255Ø IFK$=" "THEN263Ø         :REM*52
256Ø IFK$="."THEN263Ø         :REM*15Ø
257Ø IFTY=1OR TY>2THENIF(K$>"@"
     )AND(K$<"[")THEN263Ø
                              :REM*19Ø
258Ø IFTY>1THENIF(K$>"/")AND(K$
     <":")THEN263Ø            :REM*18Ø
259Ø IFTY=1ORTY>2ANDCA=2THENIF(
     K$>"{SHFT *}")AND(K$<"{SHF
     T +}")THEN263Ø           :REM*238
26ØØ IFTY=4THENIF(K$>" ")AND(K$
     <"Ø")THEN263Ø            :REM*58
261Ø IFTY=4THENIF(K$>"9")AND(K$
     <"@")THEN263Ø            :REM*238
262Ø GOTO252Ø                 :REM*141
263Ø IFCT>=LTHEN252Ø          :REM*123
264Ø CT=CT+1:V$=V$+K$:PRINTK$;
                              :REM*141
265Ø GOTO252Ø                 :REM*147
266Ø IFCT=ØTHENV$=CHR$(Ø)
                              :REM*137
267Ø SYS52684,32,1Ø:RETURN
                              :REM*175
268Ø :                        :REM*184
269Ø CHAR,Ø,24,"{SHFT P}RESS {S
     HFT F}{SHFT I}{SHFT R}{SHF
     T E} TO CONTINUE.":REM*134
27ØØ IFJOY(2)<>128THEN27ØØ
                              :REM*42
271Ø RETURN                   :REM*47
272Ø :                        :REM*2Ø8
273Ø GOSUB277Ø                :REM*2
274Ø COLOR5,2:CHAR,Ø,24,"{SHFT
     D}ISK {SHFT S}TATUS: ":PRI
     NTDS$                    :REM*146
275Ø SLEEP2:RETURN            :REM*6
276Ø :                        :REM*9
277Ø CHAR,Ø,23,"":PRINTCHR$(27)
     "Q"                      :REM*36
278Ø CHAR,Ø,24,"":PRINTCHR$(27)
     "Q"                      :REM*2Ø
279Ø RETURN                   :REM*127
28ØØ :                        :REM*33
281Ø COLOR5,2:CHAR,Ø,23,A$(M):P
     RINTCHR$(27)"Q"          :REM*98
282Ø RETURN                   :REM*153
1ØØØØ SCRATCH"MUSIC EDITOR 128"
      :DSAVE"MUSIC EDITOR 128"
                              :REM*177 ■
```

Instant Test-Maker

If you're a teacher who's tired of making up tests, this Question Box program has the answer for you.

By HUGH McMENAMIN

Of all the chores teachers have to face, the most time-consuming seems to be preparing and grading examinations. The Question Box program eliminates some of this drudgery by letting you construct a library of examination questions and then retrieve individual questions to assemble into tests.

Question Box, which works on both the C-64 and the C-128 in 40-Column mode, handles all the common forms of questions: multiple-choice, true-false, fill-in-the-blank and essay. Individual questions can be previewed from the Master file and selected either by you or, randomly, by the computer. The new Test file can then be printed out or stored to disk. As a bonus, you can include superscripts and subscripts in your questions.

Here are instructions for using The Question Box's numerous commands.

Entering Questions

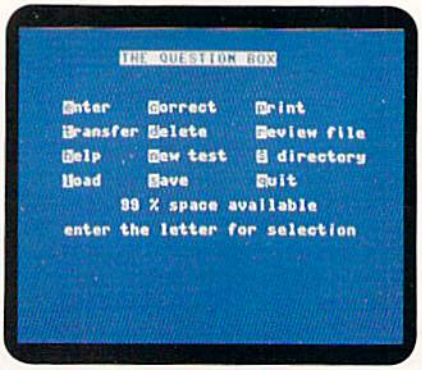
E (Enter) calls up the menu for selecting the type of question. The body of a question may consist of four lines of up to 60 characters each, with a ← marker in reverse field indicating the 60-character limit. If you exceed the limit, the program will truncate the line automatically.

To enter each line, press the return key. Also press return to enter null (empty) lines when no further text is desired. If you want additional space between the body of a multiple-choice, true-false or essay question and the answer, enter a shift/space.

Note that commas and colons *may* be used in your entries, but quotation marks may not.

T (True-false) questions are automatically followed with the two responses to be circled: True False

F (Fill-blank) requires you to construct the blank, (_____), within the question by using the Commodore and @ keys simultaneously.



All steps in test-making start here at the main menu.

E (Essay) mode provides for up to nine empty lines after the main body of the question.

M (Multiple-choice) questions allow you to add four answers after the letters A–D, again within the 60-character limit per line.

Each time you finish entering a question, you'll be asked if you want to add another. If your response is other than Y, the command screen will return.

R (Review File) lists the number of each question in the Master file and 26 characters of the question's first line. The question type is also shown, in reverse field, for easy identification in using the Correct, Delete and Transfer modes.

C (Correct) asks for the number of the question to be corrected, then displays the question, along with code numbers 0–7 for multiple-choice and 0–3 for the others. Null lines are indicated by a period after the number (5 .), while shift/space lines are indicated by a blank after the number (5). The line you select by entering a code number is displayed below a dashed line. Make your corrections, including commas and colons, then reenter the line by pressing return.

Making Up Tests

T (Transfer) mode lets you select individual questions to be transferred from the Master file to the Test file. If you don't enter N at the prompt, the selected question will be appended to the Test file.

N (New Test) moves a random selection of questions from the Master file to the Test file. Both Transfer and New Test limit Test file questions to 50. If New Test doesn't reach the 50-question limit, you can add other questions to the Test file individually.

P (Print) allows printing from either the Master or Test file to the screen, disk or printer. When printing to the screen, the display will scroll about 20 lines. When printing to the printer, only complete questions will appear on a page; they won't wrap to the next page. Print-to-disk stores the data as ASCII characters, which then can be loaded into a word processor, such as RUN Script, for further revision. If you're using RUN Script, you can enter formatting codes with the Define Macros program (see *RUN*, January 1987). The print-to-disk files are identified by a hyphen (-) preceding the filename.

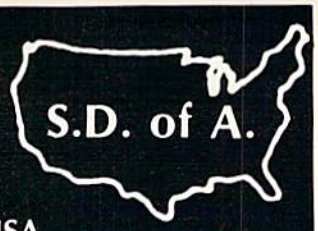
D (Delete) asks for the number of a question to be removed from the Master file. Since the remaining questions are renumbered, check first with Review for the correct numbers of any additional questions to be deleted. Once a question has been deleted, it cannot be recalled.

Disk Operations

Press 4 or $ (shifted 4) to view a directory of all the Question Box files on ►

RUN it right: **C-64; C-128 in 40-Column mode; printer**

SOFTWARE DISCOUNTERS OF AMERICA



USA/Canada Orders—1-800-225-7638
PA Orders—1-800-223-7784
Customer Service 412-361-5291

- **Free shipping on orders over $100 in continental USA**
- **No Surcharge for VISA/MasterCard**
- **Your Card is not charged until we ship**

ABACUS SOFTWARE
Assembler Monitor ... $25
Basic ... $25
Basic 128 ... $39
*Becker Basic ... $33
Cad Pak ... $25
Cad Pak 128 ... $39
Chart Pak ... $25
Chart Pak 128 ... $25
Cobol ... $25
Cobol 128 ... $25
PPM ... $25
PPM 128 ... $39
Speed Term 64 or 128 $25
Super C ... $39
Super C 128 ... $39
Super Pascal ... $39
Super Pascal 128 ... $39
TAS ... $25
TAS 128 ... $39
*Requires GEOS!

ACCESS
Echelon w/Lip Stik ... $29
Famous Course Disk #1 for World Class L.B. ... $14
Famous Course Disk #2 for World Class L.B. ... $14
Famous Course Disk #3 for World Class L.B. ... $14
Fire Storm ... $9.88
Leader Board (Original) Triple Pack ... $14
Tenth Frame ... $25
Triple Pack: BH1, BH2, Raid Over Moscow ... $14
World Class Leader Board ... $25

ACCOLADE
Ace of Aces ... $9.88
Apollo 18 ... $19
Bubble Ghost ... $19
Card Sharks ... $19
Fast Break ... Call
Fight Night ... $9.88
4th & Inches Football ... $19
4th & Inches Team Const. $9.88
Hardball ... $9.88
Mini Putt ... $19
Power at Sea ... $19
Rack 'Em ... Call
Serve & Volley ... Call
Test Drive ... $19
The Train: Escape to Normandy ... $19

ACTION SOFT
Thunder Chopper ... $19
Up Periscope! ... $19

ACTIVISION
Aliens ... $9.88
Black Jack Academy ... $25
Crossbow ... $19
Cross Country Road Race ... $9.88
Faery Tale Adventure ... Call
Ghostbusters ... $9.88
Hacker 1 or 2 ... $9.88 Ea.
Little Computer People $9.88
Mainframe ... $23
Maniac Mansion ... $23
Might & Magic ... $25
Music Studio ... $23
Rampage ... $23
Shanghai ... $19
Sky Travel ... $33
The Last Ninja ... $23
Transformers ... $9.88
Zak McKracken ... $23

ARTWORX
Bridge 5.0 ... $19
Daily Double Horse Racing ... $14
Highland Games ... $9.88
Linkword French ... $16
Linkword Spanish ... $16
Magic Madness ... $14
Strip Poker ... $21
Data Disk #1 Female ... $14
Data Disk #2 Male ... $14
Data Disk #3 Female ... $14

AVALON HILL
NBA Basketball ... $25
NBA '85-86 Season Disk $14
Super Bowl Sunday ... $21
SBS 1986 Team Disk ... $14
SBS Gen. Mgr. Disk ... $19
Under Fire ... $23

AVANTAGE
Project Space Station $9.88
Spy vs. Spy 1 & 2 ... $9.88

BATTERIES INCLUDED
Paper Clip 3 ... $33
Paper Clip Publisher ... $33

BAUDVILLE
Award Maker Plus ... $25
Blazing Paddles ... $23
Video Vegas ... $19

BERKELEY SOFTWORKS
Geos 128 ... $44
Geo-Calc 128 ... $44
Geo File 128 ... $44
Geo-Write Workshop 128 ... $44
Geos 64 (2.0) ... $39
*Desk Pack Plus ... $19
*Font Pack Plus ... $19
*Geo-Calc ... $33
*Geo File ... $33
*Geo Programmer ... $44
*Geo Publish ... $33
*Requires Geos 64!

BOX OFFICE
Alf ... $9.88
California Raisins ... $16
Psycho ... $16

BRODERBUND
Carmen Sandiego: Europe ... $25
USA ... $25
World ... $23
Cauldron ... $9.88
Choplifter/David's Midnight Magic ... $9.88
Karateka ... $9.88
Loderunner ... $9.88
Magnetron ... $9.88
Print Shop ... $26
P.S. Companion ... $23
P.S. Graphics Library #1, #2, or #3 ... $16 Ea.
P.S. Graphics Library Holiday Edition ... $16
Toy Shop ... $19

CENTRAL POINT
Copy 2 ... $23

CINEMAWARE
Defender of the Crown $23
Sinbad: Throne of the Falcon ... $23
The Three Stooges ... $23
Warp Speed (R) ... $33

DATA EAST
Breakthru ... $19
Commando ... $14
Ikari Warriors ... $19
Karnov ... $19
Kid Niki ... $19
Lock On ... Call
Platoon ... $19
Tag Team Wrestling ... $14

DATASOFT
Alternate Reality: The City ... $19
The Dungeon ... $26
Battle Droidz ... $19
Bismarck ... $19
Cosmic Relief ... $19
Dark Lord ... $14
Global Commander ... $19
Hunt for Red October $26
Rubicon Alliance ... $14
Tobruk ... $21
Tomahawk ... $21
Video Title Shop/Comp. $21

DAVIDSON
Algeblaster ... $32
Math Blaster ... $32
Spell It ... $32
Word Attack ... $32

DIGITAL SOLUTIONS
Pocket Filer 2 ... $19
Pocket Planner 2 ... $19
Pocket Writer 2 ... $33
*all 3 in 1 Super Pack ... $59

DIGITEK
Vampire's Empire ... $19

ELECTRONIC ARTS
Software Classic Series:
Adventure Const. Set $9.88
Arctic Fox ... $9.88
Earth Orbit Station ... $9.88
Heart of Africa ... $9.88
Marble Madness ... $9.88
Lords of Conquest ... $9.88
Movie Maker ... $9.88
Music Const. Set ... $9.88
One-on-One ... $9.88
Patton vs. Rommel ... $9.88
Pinball Const. Set ... $9.88
Seven Cities Gold ... $9.88
Skyfox ... $9.88
Super Boulder Dash ... $9.88
World Tour Golf ... $9.88

ELECTRONIC ARTS
Alien Fires ... $19
Bard's Tale 1 or 2 ... $26 Ea.
Bard's Tale 3 ... $26
Chessmaster 2000 ... $26
Chuck Yaeger's AFT ... $23
Demon Stalker ... $21
Dragons Lair ... $19
Instant Music ... $21
Legacy of Ancients ... $21
Marble Madness ... $23
Master Ninja ... $19
Monopoly ... $21
Pegasus ... $23
Roadwars ... $21
Rockford ... $21
Scrabble ... $23
Scruples ... $23
Skyfox 2 ... $21
Skate or Die ... $21
Star Fleet 1 ... $26
Strike Fleet ... $21
Twilights Ransom ... $23
Wasteland ... $26

EPYX
Boulder Dash Construction Kit ... $14
California Games ... $24
Champ. Wrestling ... $14
Create A Calendar ... $19
Death Sword ... $14
Destroyer ... $24
Fast Load (R) ... $24
Final Assault ... Call
4x4 Off Road Racing ... $24
Impossible Mission 2 ... $24
L.A. Crackdown ... $24
Metrocross ... $16
Pitstop 2 ... $6.88
P.S. Graphics Scrapbook: #1:Sports ... $9.88
#2:Off the Wall ... $9.88
#3:School ... $9.88
Rad Warrior ... $14
Spy vs. Spy 3: Arctic Antics ... $14
Street Sports: Baseball ... $24
Basketball ... $24
Soccer ... $24
Sub Battle Simulator ... $24
Summer Games 1 or 2 $14 Ea.
Temple Apshai Trilogy ... $14
The Games: Winter Edition ... $24
Winter Games ... $14
World Games ... $14

GAMESTAR
Champ. Baseball ... $9.88
Champ. Basketball ... $9.88
GFL Ch. Football ... $23
Main Event ... Call
Star Rank Boxing 2 ... $19

HI-TECH EXPRESSIONS
Astro Grover ... $6.88
Award Ware ... $9.88
Big Bird's Spc. Delivery $6.88
Ernie's Big Splash ... $6.88
Ernie's Magic Shapes $6.88
Grover's Animal Adv. $6.88
Matterhorn Screamer $6.88
Pals Around Town ... $6.88
Print Power ... $9.88
Sesame St. Print Kit ... $9.88
Tom Sawyers Island ... $6.88

INFOCOM
Beyond Zork 128 ... $29
Border Zone ... $23
Hitchhiker's Guide ... $9.88
Infocomics: Gamma Force ... $8.88
Lane Mastadon ... $8.88
Zork Quest ... $8.88
Leather Goddesses ... $9.88
Zork 1 ... $9.88
Zork Trilogy ... $29

INKWELL SYSTEMS
#170 Deluxe L.P. ... $69
#184C Light Pen ... $44
Flexidraw 5.5 ... $23
Graphics Galleria #1 ... $19
Graphics Galleria #2 ... $19
Graphics Intregrator 2 $19

MASTERTRONIC
Captain Zap ... $6.88
Feud ... $6.88
Ninja ... $4.88
Prowler ... $6.88
Shogun ... $6.88
Squash ... $6.88
Storm ... $6.88
Vegas Poker ... $4.88
Water Polo ... $6.88

MELBOURNE HOUSE
Barbarian ... $19
John Elway's QB ... $19

MICROLEAGUE
Baseball ... $25
Box Score Stats ... $16
General Manager ... $19
1986 Team Data Disk ... $14
1987 Team Data Disk ... $14
WWF Wrestling ... $19

MICROPROSE
Airborne Ranger ... $23
F-15 Strike Eagle ... $23
Gunship ... $23
Pirates ... $25
Project Stealth Fighter $25
Red Storm Rising ... $25
Silent Service ... $23

MINDSCAPE
Bad Street Brawler ... $19
Blockbuster ... $19
Bop & Wrestle ... $19
Captain Blood ... Call
Clubhouse Sports ... $19
*Deeper Dungeons ... $16
De Ja Vu ... $23
Gauntlet ... $23
Harrier Combat Simulator $19
Indiana Jones & The Temple of Doom ... $23
Indoor Sports ... $19
Infiltrator 1 or 2 ... $19 Ea.
Into the Eagle's Nest ... $19
MISL Soccer ... $23
Paperboy ... $23
Perfect Score SAT ... $44
Road Runner ... $23
720 ... Call
S.S. Ice Hockey ... $23
Super Star Soccer ... $23
*Requires Gauntlet!

MISC
Bob's Term Pro ... $29
Bob's Term Pro 128 ... $39
CSM 1541 Align Kit ... $29
Doodle ... $25
Final Cartridge 3 ... $47
Font Master 2 ... $29
Font Master 128 ... $35
GEOS—Inside & Out (Book) ... $13
GEOS—Tricks & Tips (Book) ... $13
Multiplan 64 ... $9.88
Superbase 64 ... $29
Superbase 128 ... $39
Superscript 64 ... $25
Superscript 128 ... $29

ORIGIN
Autoduel ... $25
Moebius ... $25
Ultima 1 or 3 ... $25 Ea.
Ultima 4 ... $39
Ultima 5 ... $39

PROFESSIONAL
Fleet System 2 Plus ... $33
Fleet System 4 128 ... $43

SIMON & SCHUSTER
JK Lasser Money Mgr. ... $14
Typing Tutor 4 ... $25

SIR TECH
Deep Space ... $25
Wizardry Series: Knight of Diamonds ... $25
Proving Ground ... $25

SHARE DATA
Concentration ... $9.88
Family Feud ... $8.88
Jeopardy ... $8.88
Wheel of Fortune ... $8.88
Wheel of Fortune 2 ... $9.88

SPRINGBOARD
Certificate Maker ... $14
C.M. Library Vol. 1 ... $9.88
Newsroom ... $14
N.R. Clip Art Vol. 1 ... $9.88
N.R. Clip Art Vol. 2 ... $9.88
N.R. Clip Art Vol. 3 ... $9.88

SSI
Advanced Dungeons & Dragons: Heroes of the Lance ... $21
Pool of Radiance ... $26
Demon's Winter ... $21
Gettysburg ... $39
Panzer Strike! ... $29
Phantasie 1, 2 or 3 $26 Ea.
Questron 2 ... $26
Rings of Zilfin ... $26
Shiloh: Grant's Trial ... $26
Typhoon of Steel ... $32
War Game Const. Set ... $19
Warship ... $39
Wizard's Crown ... $26

SUBLOGIC
Flight Simulator 2 ... $32
F.S. Scenery Disks ... Call
Jet ... $26
Stealth Mission ... $32

TAITO
Arkanoid ... $19
Alcon ... $19
Bubble Bobble ... $23
Rastan ... $23
Renegade ... $23

THREE SIXTY
Dark Castle ... $23
Warlock ... Call

THUNDER MOUNTAIN
Dig Dug ... $6.88
Galaxian ... $6.88
Implosion ... $9.88
Jr. Pac Man ... $6.88
Super Pac Man ... $9.88
Ms. Pac Man ... $6.88
Pac Man ... $6.88
Pole Position ... $6.88
Tau Ceiti ... $9.88
Top Gun ... $6.88
Winter Challenge ... $9.88

TIMEWORKS
Data Manager 2 ... $14
Data Manager 128 ... $33
Partner 64 (R) ... $25
Partner 128 (R) ... $33
Swiftcalc/Sideways ... $14
Swiftcalc/Sideways 128 ... $33
Sylvia Porter's Personal Fin. Planner 64 ... $25
Sylvia Porter's Personal Fin. Planner 128 ... $33
Word Writer 3 ... $25
Word Writer 128 ... $33

UNISON WORLD
Art Gallery 1 or 2 ... $16 Ea.
Art Gallery: Fantasy ... $16
Print Master Plus ... $23

WEEKLY READER
Stickybear Series:
ABC's ... $16
Math 1 or 2 ... $16 Ea.
Numbers ... $16
Reading ... $16
Reading Comp. ... $16
Spellgrabber ... $16

WINDHAM CLASSICS
Alice In Wonderland ... $9.88
Swiss Family Robinson $9.88
Treasure Island ... $9.88
Wizard of Oz ... $9.88

ACCESSORIES
Animation Station ... $49
Bonus SS, DD ... $4.99 Bx.
Bonus DS, DD ... $5.99 Bx.
Compuserve Starter Kit $19
Disk Case (Holds 75) ... $6.88
Disk Drive Cleaner ... $6.88
Epyx 500 XJ Joystick ... $14
Icontroller ... $14
Suncom TAC 5 J.S. ... $14
Wico Bat Handle ... $17
Wico Boss ... $12
Wico Ergostick J.S. ... $19
XETEC Super Graphix ... $59
XETEC Super Graphics Gold ... $89
XETEC Super Graphics Jr. ... $39

*All programs on disk unless otherwise noted!

P.O. BOX 111327—DEPT. RN—BLAWNOX, PA 15238

*Please Read The Following Ordering Terms & Conditions Carefully Before Placing Your Order: Orders with cashiers check or money order shipped immediately on in stock items! Personal & Company checks, allow 3 weeks clearance. No C.O.D.'s! Shipping: Continental U.S.A.-Orders under $100 add $3; free shipping on orders over $100. AK, HI, FPO, APO-add $5 on all orders. Canada & Puerto Rico-add $10 on all orders. Sorry, no other International orders accepted! PA residents add 6% sales tax on the total amount of order including shipping charges. CUSTOMER SERVICE HOURS: Mon.-Fri. 9 AM-5:30 PM Eastern Time. REASONS FOR CALLING CUSTOMER SERVICE—412-361-5291 (1)Status of order or back order (2)if any merchandise purchased within 60 days from S.D.of A. is defective, please call for a return authorization number. We will not process a return without a return auth. #! Defective merchandise will be replaced with the same merchandise only. Other returns subject to a 20% restocking charge! After 60 days from your purchase date, please refer to the warranty included with the product purchased & return directly to the manufacturer. Customer service will not accept collect calls or calls on S.D.of A.'s 800# order lines! Prices & availability are subject to change! New titles are arriving daily! Please call for more information. NEW, MORE CONVENIENT ORDER LINE HOURS: Mon.-Thurs. 9:00 AM-7:00 PM Fri. 9:00 AM-5:30 PM Sat. 10:00 AM-4:00 PM Eastern Time.

Circle 245 on Reader Service card.

a disk. These files are identified by a + before the name.

L (Load) displays a $ prompt to ask for the name of the file. Press return to view a list of the Question Box files on the disk, then select the one you want by moving the cursor to the name and pressing return. Or, you can type in the filename—without the + prefix.

You'll also be asked if the file should be added to the Master file. With this mechanism, you can append small files to each other to build larger files. Just don't try to make the Master file too big; The Question Box limits it to 100 questions.

S (Save) asks if the Master file or the Test file is to be saved. When a Test file is saved, .t is appended to the filename as an identifier. You can load Test files directly from the disk to the Master file by entering the entire name, including the .t suffix.

Quitting and Help

Q (Quit) terminates the program. If you press Q accidentally, you can preserve any test data in memory by entering GOTO 190 and return.

H (Help) lists the Question Box commands and some of the program functions.

Superscripts and Subscripts

I designed The Question Box so that you can utilize embedded super- and subscript commands with printers that support them. You have two size options for these: conventional and full-size. Those of the conventional small size are set by line 160. The control code for the superscript is CHR$(27) + "S0", and for the subscript CHR$(27) + "S1". Both are cancelled by CHR$(27) + "T".

To activate superscript printing, press the up-arrow (↑) key. After the superscript is completed, press the left-arrow (←) key to return to normal printing. The subscript is activated by the British pound key (£), and again is cancelled by the left-arrow key. Following this pattern, the formula for water would be printed with H£2←O and the notation for ten squared with 10↑2←.

Because of the difficulty in copying the miniature characters with some printers, I've provided for full-size super- and subscripts. However, they work only with printers that allow you to reverse direction with the paper feed. Examples of these are the Epson FX-80 and emulators of the FX-80 series (the C.Itoh Prowriter Jr. and the Star NX-1000, in Tractor mode only).

Full-size is selected at the beginning of the printer option. The printer control codes are defined as the up string (up$) and down string (dn$) in line 140, and these strings are activated when you choose the full-size option.

To initiate full-size superscripts, you press the ↑ key, and you cancel them with the £ key. Subscripts are activated and cancelled with the reverse procedure: £ to activate, and ↑ to cancel. With the full-size characters, then, you'd print ten squared with 10↑2£ and the formula for water with H£2↑O.

Operating Notes

The Question Box is heavily dependent on string manipulation, which slows operation on the C-64 because of that machine's memory limitations. You can speed things up by placing a REM at the beginning of line 240 to negate the Fre(1) command, which performs the nonessential functions of calculating free space left and packing strings.

If your computer seems to stop while you're running The Question Box, it's probably the result of garbage collection and not a complete lock-up. When this happens, wait for a minute or two to see if the program continues. If not, press run-stop/restore and enter GOTO 190 to preserve your questions.

If you possess Abacus's Basic 64, I'd highly recommend using it to compile The Question Box. Then it will work very well in C-64 mode, even with line 240 fully operational.

If your printer won't work with The Question Box, you may have to change the control codes in lines 140–170 to accommodate your interface. See your printer manual for these codes.

Last but not least, be sure to save your questions to disk frequently. Then you won't have any test surprises! Ⓡ

Hugh McMenamin is a physician and amateur programmer who wrote this program to help his daughter, a chemistry teacher.

Listing 1. Question Box program.

```
10 REM THE QUESTION BOX V.3
                          :REM*222
20 REM BY HUGH MCMENAMIN
                          :REM*140
30 GOSUB3840              :REM*122
40 DIM CA$(101,7),CB$(50,7),P(1
   00),PP$(4),PZ$(4):EF=FRE(1)
                          :REM*238
50 FORI=1TO4:READPP$(I):NEXT
                           :REM*7
60 FORI=1TO4:READPZ$(I):NEXT
                          :REM*181
70 GOSUB3790:GOTO180      :REM*35
80 PRINT"{SHFT CLR}"TAB(124)"SE
   LECT SIZE OF SUPER-SUBSCRIPT
                          :REM*70
90 PRINT"{2 CRSR DNs} {CTRL 9}R
   {CTRL 0}EGULAR SIZE (MOST PR
   INTERS)                :REM*14
100 PRINT"{3 CRSR DNs} {CTRL 9}
    F{CTRL 0}ULL SIZE (PRINTERS
     WITH REVERSE FEED)":REM*67
110 PRINT"{CRSR DN} EPSON FX-80
     PROWRITER JR. OR COMPATABL
    E                      :REM*195
120 GOSUB3800             :REM*192
130 IFA$<>"F"THEN160      :REM*69
140 UP$=CHR$(27)+"J"+CHR$(10):D
    N$=CHR$(27)+"{SHFT J}"+CHR$
    (10):ST$="":REM* BIG SUPSCR
                          :REM*69
150 GOTO170               :REM*228
160 UP$=CHR$(27)+"{SHFT S}0":DN
    $=CHR$(27)+"{SHFT S}1":ST$=
    CHR$(27)+"{SHFT T}":REM * R
    EG SUPER-SUBSCR       :REM*43
170 PF$=CHR$(12):RETURN:REM * P
    AGE FEED              :REM*184
180 BQ$="{16 COMD @s}{CRSR DN}{
    16 CRSR LFs}{CTRL 9}{SHFT T
    }{SHFT H}{SHFT E} {SHFT Q}{
    SHFT U}{SHFT E}{SHFT S}{SHF
    T T}{SHFT I}{SHFT O}{SHFT N
    } {SHFT B}{SHFT O}{SHFT X}{
    CTRL 0}"              :REM*146
190 PRINT"{SHFT CLR}{CTRL 2}"CH
    R$(14)TAB(51)BQ$      :REM*124
200 PRINTTAB(125)"{CTRL 9}E{CTR
    L 0}NTER{4 SPACEs}{CTRL 9}C
    {CTRL 0}ORRECT{4 SPACEs}{CT
    RL 9}P{CTRL 0}RINT    :REM*31
210 PRINTTAB(45)"{CTRL 9}T{CTRL
     0}RANSFER {CTRL 9}D{CTRL 0
    }ELETE{5 SPACEs}{CTRL 9}R{C
    TRL 0}EVIEW FILE      :REM*235
220 PRINTTAB(45)"{CTRL 9}H{CTRL
     0}ELP{5 SPACEs}{CTRL 9}N{C
    TRL 0}EW TEST{3 SPACEs}{CTR
    L 9}${CTRL 0} DIRECTORY
                          :REM*48
230 PRINTTAB(45)"{CTRL 9}L{CTRL
     0}OAD{5 SPACEs}{CTRL 9}S{C
    TRL 0}AVE{7 SPACEs}{CTRL 9}
    Q{CTRL 0}UIT{CRSR DN}"
                          :REM*243
240 FX=FRE(1):FY=EF/100:FA%=FX/
    FY                    :REM*184
250 PRINTTAB(10)FA%"% SPACE AVA
    ILABLE"               :REM*89
260 PRINTTAB(45)"ENTER THE LETT
    ER FOR SELECTION      :REM*135
270 GETB$:IFB$<>""THEN270
                          :REM*182
280 GETB$:IFB$=""THEN280
                          :REM*252 ►
```

CELEBRATING OUR 20TH YEAR 1968-1988

MONTGOMERY GRANT

RUN 10/88

Retail Outlet: Penn Station, Main Concourse
(Beneath Madison Square Garden) NYC,N.Y.10001
Store Hours: Mon-Fri 8:30-8/Sat-Sun 9:30-7

OUTSIDE USA----*CALL*
(718)692-0071
FOR CUSTOMER SERVICE
Call Mon-Fri:9:30am-4:30pm
(718) 692-1148

FOR ORDERS & INFORMATION CALL TOLL FREE
1-800-759-6565

OR WRITE TO:
Montgomery Grant Mail Order Dept.
P.O. Box 58 Brooklyn,NY 11230

FAX NO. 7186923372
TELEX 422132MGRANT

OPEN 7 DAYS A WEEK FOR ORDERS: Monday-Fridav9am-7:30pm/Saturday & Sunday 9:30am-6pm (EST)
NO SURCHARGE FOR CREDIT CARD ORDERS / WE INVITE CORPORATE & EDUCATIONAL CUSTOMERS / CORPORATE LEASING AVAILABLE

commodore

C128 COMPUTER PACKAGES



#1 COMPLETE PACKAGE
COMMODORE 128 COMPUTER
COMMODORE 1541 DISK DRIVE
12" MONITOR
COMMODORE PRINTER
BOX OF 10 DISKETTES
DISK DRIVE HEAD CLEANER
GAME DISK

$399 COLOR MONITOR ADD *$90*

TO SUBSTITUTE 1571 FOR 1541 - ADD$60

#2 DELUXE PACKAGE
COMMODORE 128 COMPUTER
COMMODORE 1571 DISK DRIVE
COMMODORE 1902 RGB COLOR MONITOR
COMMODORE 1515 80 COL. PRINTER
BOX OF 10 DISKETTES
DISK DRIVE HEAD CLEANER
GAME DISK

$659

SPECIAL!
C-128/D DELUXE PACKAGE
C-128 COMPUTER W/ BUILT-IN DISK-1902 RGB COLOR MONITOR
• COMMODORE COLOR PRINTER

$629

C64 COMPUTER PACKAGES

#3 COMPLETE PACKAGE
COMMODORE C-64/C COMPUTER
COMMODORE 1541 DISK DRIVE
COMMODORE PRINTER
12" MONITOR
GEOS SOFTWARE PROGRAM
BOX OF 10 DISKETTES
DISK DRIVE HEAD CLEANER
GAME DISK

$339

COLOR MONITOR ADD *$90*

#4 COLOR PACKAGE
COMMODORE C-64/C COMPUTER
COMMODORE 1541/C DISK DRIVE
COMMODORE PRINTER
COLOR MONITOR
GEOS SOFTWARE PROGRAM
BOX OF 10 DISKETTES
DISK DRIVE HEAD CLEANER
GAME DISK

$439



C64C With Geos Software **$139.95**

C128 NEW C-128D with Built in Disk Drive **$219.95** **$415**

#1764 EXPANSION MODULE	$119.95
XETEC S. GRAPHIX JR. INTERFACE	$29.95
XETEC S. GRAPHIX SR. INTERFACE	$49.95
XETEC SUPER GRAPHIX GOLD	$79.95
C-128 POWER SUPPLY	$39.95
C64/C64-C POWER SUPPLY	$29.95
C-1660 MODEM	$19.95
1670 MODEM	$66.95
COMMODORE MOUSE	$26.88

XETEC LT. KERNEL 20MB. HARD DRIVES FOR
C64-C $749
C-128 ..... $799

commodore DISK DRIVES



C1541/C	$149.95
C1571	$199.95
C1581	$184.95
C1541II	$164.95

MONITORS



C1702 COLOR....$169.95
C1084 COLOR....$284.95
THOMSON HI-RES RGB COLOR MONITOR.....$299.95
MAGNAVOX RGB 13" COLOR MONITOR.....$199.95

COMMODORE PRINTERS



C MPS-1000	$159
C MPS-1250	$219
DPS-1101 DAISY WHEEL PRINTER	$149

C Commodore AMIGA 500



IN STOCK-CALL FOR LOW PRICE!
AMIGA 500 W/1084 ..... $799
AMIGA 500/1084/1010 ..... $999

AMIGA 2000 IN STOCK

ALL PERIPHERALS IN STOCK

A-501 512K EXPANSION A-1010 3.5" FLOPPY DRIVE A-1020T 5.25" DISK DRIVE WITH TRANSFORMER A-2088D BRIDGE CARD A-1084 RGB COLOR MONITOR A-1680 MODEM A-2090 HARD DRIVE CONTROLLER FOR A-2000 A-2010 3.5" INTERNAL DISK DRIVE FOR A-2000 A-2052 2MB EXPANSION FOR A-2000

Supra 20MB Hard Drive for A-500.....$699

commodore COLT PACKAGE



COMMODORE COLT Computer • 640K 4.77-7.16MHz • 2 Floppy Disk Drives • 12" High Resolution Mono Monitor • All Hook Up Cables & Adapters • Box of 10 Diskettes

$719

SPECIAL! commodore PC10-1



PROFESSIONAL PACKAGE

PC10-1 Computer • 512K Expandable to 640K • 360K Disk Drive • Enhanced Keyboard • Serial & Parallel ports • 12" Monitor • All Hook Up Cables & Adapters Package of 10 Diskettes

$499

SAME PACKAGE W/20 MB HARD DRIVE **$749**

SEAGATE

20,30,40 MB HARD DRIVES IN STOCK

AMIGA 2000

IBM PC/XT COMPATIBLE
RGB COLOR PACKAGE



A-2000 Computer w/ Keyboard 1 MB Exp. to 9 MB • Built-in 3.5" Disk Drive • RGB Color Monitor 2088 IBM Compatible Bridge Card w/ 5.25" Floppy Disk Drive

$2049

INCLUDES FREE MOUSE AND SOFTWARE

Circle 98 on Reader Service card.

LEADING EDGE

LEADING EDGE MODEL D PACKAGE
IBM PC/XT COMPATIBLE



512K RAM • Computer Keybpooard • 360K Floppy Drive • 4.7-7.16 MHz • 12" Monitor • 8088-2 Processor

$729

W/20 MB HAND DRIVE.....$989
W/30 MB.....$1039
W/40 MB.....$1089

EPSON

EPSON EQUITY II+
IBM AT Compatible Hard Drive Package



$1399

Keyboard 640K RAM 80286 Microprocessor • 1.2 MB Floppy Drive • 20 MB Hard Drive • Mono Monitor
LOGITECH MOUSE M-7.....$59.95

PRINTERS

NEC

P-6	$419.95
P-2200	$339.95

TOSHIBA

PS-321 SL	$479.95

EPSON

FX-850	$349.95
FX-1050	$489.95
LQ-500	$315.95
LQ-800	$329.95
LQ-850	$509.95
LQ-1050	$709.95
LX-800	$199.95

Panasonic

1080i-II	$159.95
1092i	$299.95
1091VII	$189.95
1524	$499.95

Star

NX-1000C	$169.95
NX-1000C Rainbow	$224.95
NX-1000	$164.95
NX-1000 Rainbow	$219.95
NX-15	$299.95
NX-2400	$304.95
NB-2410	$409.95

OKIDATA

OKIDATA 120	$189.95
OKIDATA 180	$219.95
OKIDATA 183	$299.95
OKIMATE 20	$119.95

HP LASERJET SERIES II...$1629

NO SURCHARGE FOR CREDIT CARD ORDERS

WE INVITE CORPORATE & EDUCATIONAL CUSTOMERS

NO SURCHARGE FOR CREDIT CARD ORDERS

Certified Check, Bank Check, Approved P.O.'s, Money Orders, Visa, Am-Ex, Diners Club, Carte Blanche, Discover Card & C.O.D.'s accepted. No additional surcharge for credit card orders. Non-certified checks must wait 4-6 weeks for clearance. N.Y. residents add applicable sales tax. Prices and availability subject to change without notice. Not responsible for typographical errors. Return of defective merchandise must have prior return authorization number, or returns will not be accepted. IBM PC XT are registered trademarks of International Business Machine Corp. APO FPO orders please add 15% shipping & handling. All APO FPO orders are shipped first class priority air. All orders can be shipped Air Express-call for details. NYC DCA #800233

```
29Ø FORI=1TO13:IFB$=MID$("ECRDP
    LSQTH$4N",I,1)THENB=I
                        :REM*221
3ØØ NEXT                :REM*175
31Ø ONBGOSUB73Ø,354Ø,37Ø,6ØØ,11
    6Ø,221Ø,2Ø3Ø,34Ø,289Ø,272Ø,
    49Ø,49Ø,322Ø        :REM*212
32Ø B$="":B=Ø:GOTO18Ø   :REM*12Ø
33Ø REM QUIT            :REM*68
34Ø PRINT"{SHFT CLR}"TAB(247)BQ
    $;                  :REM*56
35Ø PRINT" IS CLOSED!"TAB(24Ø):
    END                 :REM*163
36Ø REM REVIEW          :REM*36
37Ø PRINT"{SHFT CLR}{CRSR DN}{2
     SPACEs}THESE ARE YOUR QUES
    TIONS:{CRSR DN}"    :REM*14Ø
38Ø IFCA$(1,Ø)=""THENGOTO32ØØ
                        :REM*171
39Ø PRINTTAB(19)"QUESTION {CTRL
     9} TYPE {CRSR DN}" :REM*2Ø
4ØØ FORX=1TOQN          :REM*219
41Ø PRINTX;LEFT$(CA$(X,Ø),26):P
    RINTTAB(28);"{CRSR UP}{CTRL
     9}";               :REM*117
42Ø FORI=1TO4:IFRIGHT$(CA$(X,Ø)
    ,1)=MID$("EFMT",I,1)THENP=I
                        :REM*1ØØ
43Ø NEXT                :REM*5Ø
44Ø PRINTPP$(P)         :REM*48
45Ø NEXT                :REM*7Ø
46Ø GOSUB379Ø           :REM*61
47Ø RETURN              :REM*1Ø2
48Ø REM DIRECTORY       :REM*54
49Ø PRINT"{SHFT CLR}"TAB(122)"D
    IRECTORY OF {CRSR UP}";BQ$;
    " FILES:{CRSR DN}"  :REM*237
5ØØ OPEN1,8,Ø,"$Ø:*=S"  :REM*2Ø5
51Ø FORJ=1TO32:GET#1,S$:NEXT
                        :REM*66
52Ø GET#1,S$,S$,L$,H$:IFSTTHENC
    LOSE1:GOTO58Ø       :REM*132
53Ø GET#1,S$:IFS$>""THENF$=F$+S
    $:GOTO53Ø           :REM*24
54Ø IFMID$(F$,4,2)=CHR$(34)+"+"
    THEN PRINTMID$(F$,4,18)
                        :REM*73
55Ø IFMID$(F$,3,2)=CHR$(34)+"+"
    THEN PRINTMID$(F$,3,18)
                        :REM*32
56Ø F$=""               :REM*Ø
57Ø GOTO52Ø             :REM*135
58Ø IFB$="L"THENRETURN  :REM*9
59Ø GOSUB379Ø:RETURN    :REM*242
6ØØ PRINT"{SHFT CLR}{CRSR DN}{5
     SPACEs}DELETE ROUTINE "
                        :REM*171
61Ø INPUT"{3 CRSR DNs}{2 SPACEs
    }DELETE WHICH QUESTION ";A$
                        :REM*19Ø
62Ø DQ=VAL(A$)          :REM*3
63Ø IFCA$(DQ,Ø)=""THENRETURN
                        :REM*173
64Ø FORX=DQTOQN         :REM*251
65Ø IFRIGHT$(CA$(X+1,Ø),1)="M"T
    HENW=7:GOTO67Ø      :REM*49
66Ø W=4                 :REM*239
67Ø FORI=ØTOW           :REM*2Ø6
68Ø CA$(X,I)=CA$(X+1,I):REM*228
69Ø NEXT:NEXT           :REM*43
7ØØ QN=QN-1             :REM*239
71Ø RETURN              :REM*87
72Ø REM ENTER QUESTION  :REM*98
73Ø QN=QN+1             :REM*247
74Ø IFQN>1ØØTHENGOSUB383Ø:QN=QN
    -1:RETURN           :REM*166
75Ø PRINT"{SHFT CLR}"TAB(88)"EN
    TER QUESTION TYPE:  :REM*62
76Ø PRINTTAB(82)"{CTRL 9}M{CTRL
     Ø}ULTIPLE CHOICE{6 SPACEs}
    {CTRL 9}T{CTRL Ø}RUE-FALSE
                        :REM*41
77Ø PRINT"{CRSR DN}{2 SPACEs}{C
    TRL 9}F{CTRL Ø}ILL IN BLANK
    S{7 SPACEs}{CTRL 9}E{CTRL Ø
    }SSAY               :REM*1ØØ
78Ø GETP$:IFP$=""THEN78Ø
                        :REM*161
79Ø IFP$<>"M"ANDP$<>"T"ANDP$<>"
    F"ANDP$<>"E"THEN78Ø:REM*186
8ØØ IFP$="F"ORP$="T"ORP$="M"THE
    NL$="Ø"             :REM*1Ø
81Ø IFP$="E"THENINPUT"{CRSR DN}
     HOW MANY LINES FOR THE ANS
    WER{3 SPACEs}4 {4 CRSR LFs}
    ";L$                :REM*5
82Ø IF(P$="E"ANDVAL(L$)>9)OR(P$
    ="E"ANDVAL(L$)<1)THENPRINT"
    {2 CRSR UPs}";:GOTO81Ø
                        :REM*9Ø
83Ø GOSUB251Ø:PRINT:REM PRINT H
    EADER               :REM*238
84Ø FORI=ØTO3           :REM*156
85Ø GOSUB264Ø:REM GET I$
                        :REM*178
86Ø CA$(QN,I)=I$+L$+P$  :REM*146
87Ø NEXT                :REM*235
88Ø IFP$="F"ORP$="T"ORP$="E"THE
    N94Ø                :REM*124
89Ø PRINT"ENTER POSSIBLE ANSWER
    S"                  :REM*147
9ØØ FORSN=4TO7          :REM*18Ø
91Ø GOSUB262Ø           :REM*223
92Ø CA$(QN,SN)=I$+L$+P$ :REM*51
93Ø NEXT                :REM*32
94Ø PRINT"{CRSR DN}{2 SPACEs}AN
    OTHER QUESTION?"    :REM*133
95Ø GOSUB381Ø           :REM*2
96Ø IFA$<>"Y"THENSN=Ø:RETURN
                        :REM*176
97Ø SN=Ø:GOTO73Ø        :REM*16Ø
98Ø REM WHICH FILE?     :REM*71
99Ø PRINT"{2 CRSR DNs}{7 SPACEs
    }WHICH FILE?{3 SPACEs}{SHFT
     SPACE}"            :REM*243
1ØØØ PRINT"{CRSR DN}{2 SPACEs}{
    CTRL 9}M{CTRL Ø}ASTER OR {
    CTRL 9}T{CTRL Ø}EST FILE?"
                        :REM*249
1Ø1Ø GETAN$:IFAN$=""THEN1Ø1Ø
                        :REM*135
1Ø2Ø IFAN$<>"M"ANDAN$<>"T"THEN1
    Ø1Ø                 :REM*225
1Ø3Ø IFAN$="M"THENFL=1  :REM*15Ø
1Ø4Ø IFAN$="T"THENFL=Ø  :REM*196
1Ø5Ø RETURN             :REM*172
1Ø6Ø REM FLAG MASTER/TEST
                        :REM*18
1Ø7Ø IFFL=1THENPR$=CA$(X,I)
                        :REM*1Ø4
1Ø8Ø IFFL=ØTHENPR$=CB$(X,I)
                        :REM*89
1Ø9Ø IFPR$=""THEN111Ø   :REM*68
11ØØ R=VAL(MID$(PR$,LEN(PR$)-1,
    1)):PT$=RIGHT$(PR$,1):PR$=
    LEFT$(PR$,LEN(PR$)-2)
                        :REM*1Ø5
111Ø RETURN             :REM*224
112Ø TI$="ØØØØØØ"       :REM*88
113Ø IFTI>15ØTHENRETURN:REM*227
114Ø GOTO113Ø           :REM*169
115Ø REM PRINT          :REM*78
116Ø PRINT"{SHFT CLR}"TAB(87)"P
    RINT ROUTINE"       :REM*27
117Ø GOSUB99Ø           :REM*25Ø
118Ø I=Ø                :REM*223
119Ø IFFL=1THENQX=QN    :REM*37
12ØØ IFFL=ØTHENQX=NQ    :REM*45
121Ø IFQX=ØTHENPRINT"{CRSR DN}{
    2 SPACEs}{CTRL 9} THE FILE
     IS EMPTY {CTRL Ø}":GOSUB1
    12Ø:RETURN          :REM*75
122Ø PRINT"{CRSR DN}{2 SPACEs}P
    RINT TO THE:{CRSR DN}"
                        :REM*71
123Ø PRINT"{2 SPACEs}{CTRL 9}S{
    CTRL Ø}CREEN, {CTRL 9}P{CT
    RL Ø}RINTER, OR {CTRL 9}D{
    CTRL Ø}ISK{CRSR DN}"
                        :REM*227
124Ø GETPO$:IF PO$=""THEN124Ø
                        :REM*95
125Ø IFPO$<>"S"ANDPO$<>"P"ANDPO
    $<>"D"THEN124Ø      :REM*78
126Ø IFPO$="S" OR PO$="{SHFT S}
    "THENOF$="":D=3:SA=Ø
                        :REM*28
127Ø IFPO$="D"ORPO$="{SHFT D}"T
    HEN129Ø             :REM*1Ø
128Ø GOTO135Ø           :REM*64
129Ø PRINT"{SHFT CLR}PRINT TO D
    ISK":INPUT"{2 SPACEs}FILEN
    AME ";OF$           :REM*163
13ØØ IF OF$="" THEN129Ø:REM*113
131Ø OF$="-"+LEFT$(OF$,15)
                        :REM*161
132Ø OF$="@Ø:"+OF$+",S,W"
                        :REM*164
133Ø INPUT"{2 SPACEs}DEVICE #{3
     SPACEs}8{3 CRSR LFs}";D:I
    FD<8 OR D>3ØTHEN133Ø
                        :REM*65
134Ø SA=3               :REM*251
135Ø IFPO$="P" OR PO$="{SHFT P}
    " THEN137Ø          :REM*2Ø4
136Ø GOTO144Ø           :REM*159
137Ø OF$="":D=4:GOSUB8Ø :REM*84
138Ø PRINT"{CRSR DN} ENTER THE
    NAME OF THE TEST.{CRSR DN}
                        :REM*191
139Ø GOSUB264Ø          :REM*2Ø1
14ØØ IF I$="."THENI$="":REM*19Ø
141Ø PH$=I$             :REM*2Ø8
142Ø PRINT"{SHFT CLR}"TAB(245)"
    PRINT TO PRINTER"   :REM*61
143Ø INPUT"{CRSR DN}{5 SPACEs}S
    ECONDARY ADDRESS{3 SPACEs}
```

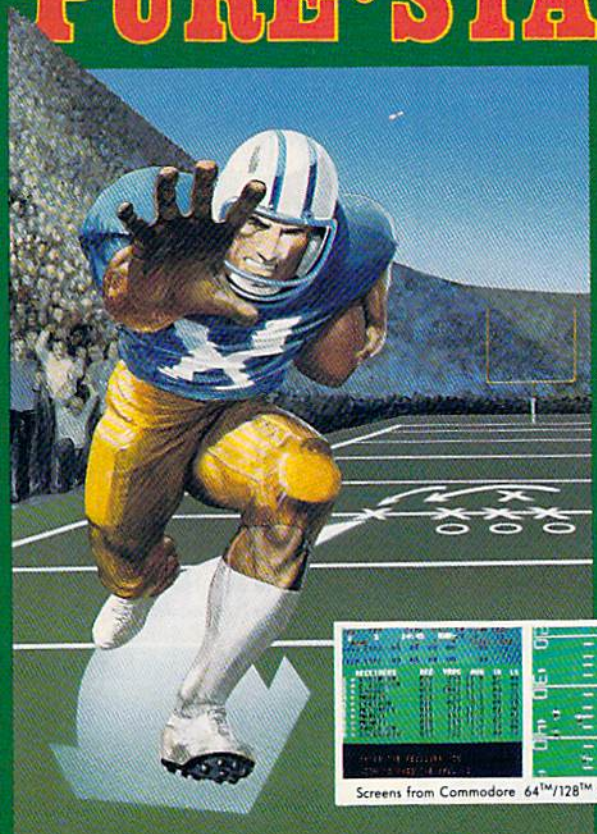
```
    7{3 CRSR LFs}";SA:IFSA<ØOR
    SA>255THEN142Ø     :REM*137
144Ø PRINT"{SHFT CLR}"TAB(2Ø6)"
    PRINTING...{2 CRSR DNs}
                       :REM*2Ø7
145Ø OPEN D,D,SA,OF$:LC=Ø:LA=1
                       :REM*74
146Ø FORX=1TOQX         :REM*8Ø
147Ø GOSUB1Ø7Ø          :REM*Ø
148Ø IFPR$=""THENPRINT" THE FIL
    E IS EMPTY!":GOSUB112Ø:CLO
    SED:RETURN         :REM*2Ø4
149Ø IFD=3ANDLC>2ØTHEN GOSUB379
    Ø:LC=Ø:PRINT"{SHFT CLR}{CR
    SR DN}";           :REM*6Ø
15ØØ IFD=4ANDLC>5ØTHENLC=Ø:PRIN
    T#4,PF$            :REM*212
151Ø IFD=4ANDLC=ØTHENGOSUB181Ø
                       :REM*113
152Ø IFD=4THENPRINT#4,TAB(1Ø);
                       :REM*1Ø
153Ø PRINT#D,STR$(X);". ";
                       :REM*1Ø7
154Ø IFD=4THEN GOSUB189Ø:LC=LC+
    1:GOTO156Ø         :REM*1Ø1
155Ø PRINT#D,PR$:LC=LC+1:REM*75
156Ø FORI=1TO3          :REM*1Ø1
157Ø GOSUB1Ø7Ø          :REM*1ØØ
158Ø IFPR$="."THEN162Ø  :REM*7Ø
159Ø IFD=4THENPRINT#D,SPC(LEN(S
    TR$(QX))+12);      :REM*54
16ØØ IFD=4THENGOSUB189Ø:LC=LC+1
    :GOTO162Ø          :REM*158
161Ø PRINT#D,SPC(4)PR$:LC=LC+1
                       :REM*1Ø
162Ø NEXT              :REM*2Ø8
163Ø IFPT$="F"THEN175Ø :REM*12Ø
164Ø IFPT$="T"THENPRINT#D:PRINT
    #D,SPC(22)"{SHFT T}RUE{4 S
    PACEs}{SHFT F}ALSE":LC=LC+
    2:GOTO175Ø         :REM*22Ø
165Ø IFD=4THENPRINT#D:LC=LC+1
                       :REM*2ØØ
166Ø IFPT$="E"THENFORZ=1TOR:PRI
    NT#D:LC=LC+1:NEXT:GOTO175Ø
                       :REM*2Ø8
167Ø FORI=4TO7          :REM*243
168Ø GOSUB1Ø7Ø          :REM*21Ø
169Ø IFPR$="."THEN174Ø :REM*247
17ØØ IFD=4THENPRINT#4,TAB(13);
                       :REM*223
171Ø PRINT#D,SPC(5)CHR$(189+I);
    ". ";              :REM*223
172Ø IFD=4THENGOSUB189Ø:LC=LC+1
    :GOTO174Ø          :REM*219
173Ø PRINT#D,PR$:LC=LC+1:REM*62
174Ø NEXT              :REM*73
175Ø PRINT#D:PRINT#D:LC=LC+2
                       :REM*85
176Ø I=Ø               :REM*2Ø
177Ø NEXTX             :REM*2Ø
178Ø IFD=4THENPRINT#D,PF$:REM*8
179Ø CLOSED:IFD=3ANDLC<>ØTHENGO
    SUB379Ø            :REM*172
18ØØ RETURN            :REM*145
181Ø PRINT#D           :REM*58
182Ø PRINT#D,SPC(7Ø)"{SHFT P}AG
    E ";LA:LA=LA+1     :REM*51
183Ø PRINT#D           :REM*78
184Ø PRINT#D,SPC(5Ø)"{SHFT N}AM
    E {19 COMD @s}":PRINT#D
                       :REM*125
185Ø PRINT#D,SPC((8Ø-LEN(PH$))/
    2)PH$              :REM*59
186Ø PRINT#D:PRINT#D:LC=LC+8
                       :REM*16
187Ø RETURN            :REM*219
188Ø REM * PRINT SUPER AND SUBS
    CRIPT *            :REM*127
189Ø FORR=1TOLEN(PR$)  :REM*2Ø8
19ØØ A$=MID$(PR$,R,1)  :REM*32
191Ø IFA$="{UP ARROW}"THENPRINT
    #D,UP$;:GOTO195Ø   :REM*218
192Ø IFA$="{LB.}"THENPRINT#D,DN
    $;:GOTO195Ø        :REM*237
193Ø IFA$="{LEFT ARROW}"THENPRI
    NT#D,ST$;:GOTO195Ø:REM*128
194Ø PRINT#D,A$;       :REM*94
195Ø NEXT              :REM*4Ø
196Ø PRINT#D           :REM*192
197Ø RETURN            :REM*72
198Ø REM GET PRINT STRING
                       :REM*135
199Ø IFFL=1THENPR$=CA$(X,I)
                       :REM*195
2ØØØ IFFL=ØTHENPR$=CB$(X,I)
                       :REM*61
2Ø1Ø RETURN            :REM*96
2Ø2Ø REM SAVE          :REM*129
2Ø3Ø IFCA$(1,Ø)=""ANDCB$(1,Ø)="
    "THENPRINT"{SHFT CLR}":GOS
    UB32ØØ:RETURN      :REM*27
2Ø4Ø INPUT"{SHFT CLR}{2 CRSR DN
    s}{2 SPACEs}NAME OF FILE";
    IN$                :REM*61
2Ø5Ø GOSUB99Ø          :REM*1Ø2
2Ø6Ø GOSUB384Ø         :REM*1Ø8
2Ø7Ø PRINT"{CRSR DN}{1Ø SPACEs}
    SAVING ";IN$       :REM*148
2Ø8Ø IFFL=1THENQX=QN:IN$=LEFT$(
    IN$,15)            :REM*72
2Ø9Ø IFFL=ØTHENQX=NQ:IN$=LEFT$(
    IN$,13)+".T"       :REM*2Ø7
21ØØ OPEN2,8,2,"@Ø:+"+IN$+",S,W
    "                  :REM*2Ø1
211Ø PRINT#2,QX         :REM*182
212Ø FORX=1TOQX         :REM*198
213Ø FORI=ØTO7          :REM*169
214Ø IFI>3ANDRIGHT$(PR$,1)<>"M"
    THEN217Ø           :REM*155
215Ø GOSUB199Ø         :REM*223
216Ø PRINT#2,CHR$(34);PR$
                       :REM*63
217Ø NEXT:NEXT         :REM*252
218Ø CLOSE2            :REM*129
219Ø RETURN            :REM*21
22ØØ REM LOAD          :REM*9
221Ø PRINT"{SHFT CLR}{2 CRSR DN
    s}{2 SPACEs}NAME OF FILE O
    R"                 :REM*85
222Ø INPUT"{CRSR DN}{2 SPACEs}$
     FOR DIRECTORY{4 SPACEs}${
    3 CRSR LFs}";IN$   :REM*231
223Ø IFIN$="$"THENPRINT"{SHFT C
    LR}{2 CRSR DNs} CURSOR TO
    FILE AND HIT <RETURN>{CRSR
     DN}":GOSUB5ØØ:INPUTIN$
                       :REM*54
224Ø IFLEFT$(IN$,1)<>"+"THENIN$
    ="+"+IN$           :REM*119
225Ø OPEN15,8,15,"IO":OPEN2,8,2
    ,IN$+",S,R"        :REM*141
226Ø INPUT#15,EN,EM$,ET,ES
                       :REM*156
227Ø IFEN<>ØTHENGOTO245Ø:
                       :REM*124
228Ø INPUT#2,QT         :REM*49
229Ø PRINT"{SHFT CLR}{4 CRSR DN
    s}DO YOU WANT TO ADD TO TH
    E PRESENT FILE?    :REM*252
23ØØ GOSUB381Ø         :REM*71
231Ø GOSUB384Ø         :REM*1Ø9
232Ø PRINTTAB(51)"LOADING ";IN$
                       :REM*11
233Ø QA=QN             :REM*195
234Ø IFA$="Y"ANDQNTHENQN=QN+QT:
    GOTO236Ø           :REM*32
235Ø QN=QT:QT=Ø:QA=Ø   :REM*162
236Ø FORX=QA+1 TOQN    :REM*127
237Ø IFX>1ØØTHENGOSUB383Ø:QN=1Ø
    Ø:GOTO242Ø         :REM*77
238Ø FORI=ØTO7         :REM*162
239Ø INPUT#2,CA$(X,I)  :REM*251
24ØØ IFI=3ANDRIGHT$(CA$(X,I),1)
    <>"M"THENI=7       :REM*115
241Ø NEXT:NEXT         :REM*237
242Ø CLOSE2:CLOSE15    :REM*214
243Ø RETURN             :REM*6
244Ø REM ERROR REPORT  :REM*58
245Ø PRINT"{SHFT CLR}"TAB(163)"
    SORRY FRIEND, BUT THE PROB
    LEM IS:            :REM*113
246Ø PRINT"{CRSR DN}{3 SPACEs}"
    ;EM$               :REM*91
247Ø CLOSE2:CLOSE15    :REM*27
248Ø GOSUB112Ø         :REM*23Ø
249Ø RETURN            :REM*66
25ØØ REM QUESTION ENTRY:REM*242
251Ø PRINT"{SHFT CLR}{CRSR DN}{
    3 SPACEs}THIS IS A {CTRL 9
    }";                :REM*132
252Ø FORI=1TO4:IFP$=MID$("EFMT"
    ,I,1)THENP=I       :REM*123
253Ø NEXT              :REM*11Ø
254Ø PRINTPZ$(P);"{CTRL Ø} QUES
    TION"              :REM*194
255Ø IFP$="F"THENPRINT"{5 SPACE
    s}USE {CTRL 9}{SHFT C}=@{C
    TRL Ø} KEYS TO MAKE BLANKS
                       :REM*83
256Ø PRINT"{CRSR DN}USE <SHIFT>
    <SPACE> TO INSERT BLANK LI
    NE                 :REM*2Ø7
257Ø PRINT"PLAIN <RETURN> ENTER
    S A NULL LINE THAT{2 SPACE
    s}WON'T BE PRINTED.:REM*46
258Ø PRINT"{CRSR DN}YOU MAY ENT
    ER 4 LINES OF 6Ø CHARACTER
    S{2 SPACEs}AFTER THE QUOTE
     MARK.             :REM*169
259Ø PRINT"THAT IS ONCE ACROSS
    AND BACK TO{9 SPACEs}THIS
    LINE{9 SPACEs}{2 SHFT *s}>
    {SHFT -}{CRSR DN}{CRSR LF}
    {SHFT -}           :REM*242
26ØØ PRINT"ENTER QUESTION #:"ST
    R$(QN)             :REM*158►
```

```
261Ø RETURN                :REM*2Ø2
262Ø PRINT"ANSWER - ";CHR$(189+
     SN)                   :REM*64
263Ø REM INPUT QUESTIONS W/OUT
     ?                     :REM*95
264Ø IFPEEK(82Ø)<>Ø THEN266Ø
                           :REM*152
265Ø POKE631,34:POKE632,141:POK
     E633,145:POKE634,29:POKE19
     8,4:GOTO267Ø:REM C=64
                           :REM*46
266Ø POKE842,34:POKE843,141:POK
     E844,145:POKE845,29:POKE2Ø
     8,4:REM{2 SPACEs}C=128
                           :REM*28
267Ø OPEN1,Ø:INPUT#1,I$:PRINT:C
     LOSE1                 :REM*247
268Ø I$=LEFT$(I$,6Ø)       :REM*184
269Ø IFI$=""THENI$="."     :REM*15Ø
27ØØ RETURN                :REM*17
271Ø REM HELP              :REM*75
272Ø PRINT"{SHFT CLR}"TAB(1Ø)BQ
     $                     :REM*168
273Ø PRINT"{CRSR DN}{2 SPACEs}{
     CTRL 9}E{CTRL Ø}NTER {CTRL
      9}MASTER{CTRL Ø} FILE QUE
     STIONS AS {CTRL 9}E{CTRL Ø
     }SSAY,                :REM*42
274Ø PRINT"{3 SPACEs}{CTRL 9}M{
     CTRL Ø}ULTIPLE CHOICE, {CT
     RL 9}T{CTRL Ø}-F OR {CTRL
     9}F{CTRL Ø}ILL BLANKS
                           :REM*94
275Ø PRINT"{5 SPACEs}(6Ø CHARAC
     TERS PER LINE MAXIMUM)
                           :REM*35
276Ø PRINT"{4 SPACEs}MAY USE CO
     MMAS OR COLONS {CTRL 9}NO{
     CTRL Ø} QUOTES        :REM*198
277Ø PRINT"{CRSR DN}{2 SPACEs}{
     CTRL 9}${CTRL Ø} OR {CTRL
     9}4{CTRL Ø} LISTS {CRSR UP
     }";BQ$;" FILES.       :REM*8
278Ø PRINT"{2 SPACEs}{CTRL 9}R{
     CTRL Ø}EVIEW LISTS {CTRL 9
     }MASTER{CTRL Ø} FILE NUMBE
     RS                    :REM*227
279Ø PRINT"{2 SPACEs}{CTRL 9}D{
     CTRL Ø}ELETE OR {CTRL 9}C{
     CTRL Ø}ORRECT {CTRL 9}MAST
     ER{CTRL Ø} FILE ONLY.
                           :REM*131
28ØØ PRINT"{2 SPACEs}{CTRL 9}P{
     CTRL Ø}RINT FROM {CTRL 9}M
     ASTER{CTRL Ø} FILE OR {CTR
     L 9}TEST{CTRL Ø} FILE.
                           :REM*87
281Ø PRINT"{CRSR DN}{2 SPACEs}{
     CTRL 9}T{CTRL Ø}RANSFER OR
      {CTRL 9}N{CTRL Ø}EW TEST
     FROM {CTRL 9}MASTER{CTRL Ø
     } TO                  :REM*137
282Ø PRINT"{5 SPACEs}{CTRL 9}TE
     ST{CTRL Ø} FILE (5Ø QUESTI
     ONS LIMIT)            :REM*16
283Ø PRINT"{CRSR DN}{2 SPACEs}{
     CTRL 9}{UP ARROW}{CTRL Ø}
     FOR SUPERSCRIPT - {CTRL 9}
     {LB.}{CTRL Ø} FOR SUBSCRIP
     T                     :REM*73
284Ø PRINT "{2 SPACEs}USE {CTRL
      9}{LEFT ARROW}{CTRL Ø} TO
      RETURN TO LINE IF REGULAR
                           :REM*16Ø
285Ø PRINT "{2 SPACEs}SUPER-SUB
     SCRIPTS ELSE OPPOSITE ({CT
     RL 9}{UP ARROW}{LB.}{CTRL
     Ø})                   :REM*41
286Ø PRINT"{CRSR DN}{2 SPACEs}{
     CTRL 9}GOTO 19Ø{CTRL Ø} TO
      RE-ENTER AND SAVE DATA.
                           :REM*1Ø5
287Ø GOSUB379Ø:RETURN      :REM*243
288Ø REM TRANSFER          :REM*197
289Ø PRINT"{SHFT CLR}{2 CRSR DN
     s} QUESTION TRANSFER ROUTI
     NE"                   :REM*37
29ØØ IFCA$(1,Ø)=""THENGOTO32ØØ
                           :REM*73
291Ø PRINT"{CRSR DN} YOU MAY TR
     ANSFER QUESTIONS FROM THE
                           :REM*251
292Ø PRINT" MASTER FILE TO YOUR
      TEST FILE BY.        :REM*134
293Ø PRINT" ENTERING THE QUESTI
     ON NUMBER.{CRSR DN}"
                           :REM*171
294Ø PRINT" THE QUESTIONS WILL
     BE ENTERED"           :REM*63
295Ø PRINT" IN THE ORDER YOU SE
     LECT AND WILL         :REM*78
296Ø PRINT" BE PRINTED OR SAVED
      IN THAT ORDER.{CRSR DN}"
                           :REM*134
297Ø GOSUB379Ø             :REM*9
298Ø PRINT"{2 CRSR UPs} TO STAR
     T A NEW FILE PRESS 'N'"
                           :REM*194
299Ø PRINT" OTHERWISE THE QUEST
     IONS WILL BE          :REM*73
3ØØØ PRINT" ADDED TO YOUR TEST.
                           :REM*237
3Ø1Ø GOSUB381Ø             :REM*3Ø
3Ø2Ø IFA$="N"THENNQ=Ø      :REM*87
3Ø3Ø NQ=NQ+1               :REM*234
3Ø4Ø IFNQ>5ØTHENGOSUB383Ø:RETUR
     N                     :REM*45
3Ø5Ø INPUT"{SHFT CLR}{CRSR DN}
     WHICH QUESTION FROM MASTER
      FILE";Q$             :REM*45
3Ø6Ø Q=VAL(Q$):PRINT        :REM*78
3Ø7Ø IFCA$(Q,Ø)=""THENPRINT" {C
     TRL 9}INVALID NUMBER":GOSU
     B112Ø:RETURN          :REM*231
3Ø8Ø FOR X=ØTO3:CB$(NQ,X)=CA$(Q
     ,X):NEXT              :REM*199
3Ø9Ø IFRIGHT$(CB$(NQ,3),1)<>"M"
     THEN311Ø              :REM*178
31ØØ FOR X=4TO7:CB$(NQ,X)=CA$(Q
     ,X):NEXT              :REM*155
311Ø PRINTNQ;" ";CB$(NQ,Ø):PRIN
     T                     :REM*222
312Ø FORI=1TO3:PRINTTAB(5)I;CB$
     (NQ,I):NEXT           :REM*69
313Ø IFRIGHT$(CB$(NQ,3),1)<>"M"
     THEN317Ø              :REM*235
314Ø FORI=4TO7             :REM*175
315Ø PRINTTAB(6)CHR$(189+I);" "
     ;CB$(NQ,I)            :REM*175
316Ø NEXT                  :REM*214
317Ø PRINT"{CRSR DN}{2 SPACEs}A
     NOTHER QUESTION?":GOSUB381
     Ø                     :REM*234
318Ø IFA$="Y"THEN3Ø3Ø      :REM*142
319Ø RETURN                :REM*9
32ØØ PRINT"{2 CRSR DNs} {CTRL 9
     } THERE ARE NO FILES IN TH
     E MEMORY. ":GOSUB112Ø:RETU
     RN                    :REM*49
321Ø REM PICK OUT RANDOM QUESTI
     ONS                   :REM*64
322Ø PRINT"{SHFT CLR}{2 CRSR DN
     s}{4 SPACEs}RANDOM QUESTIO
     N SELECTION{CRSR DN}"
                           :REM*9
323Ø IFCA$(1,Ø)=""THENGOTO32ØØ
                           :REM*134
324Ø PRINT"{2 SPACEs}YOU HAVE";
     QN;"QUESTIONS IN THE MEMOR
     Y                     :REM*44
325Ø PRINT"{2 SPACEs}YOU MAY MA
     KE A RANDOM TEST USING
                           :REM*17Ø
326Ø IFQN<5ØTHENQM=QN-1:GOTO328
     Ø                     :REM*158
327Ø QM=5Ø                 :REM*154
328Ø PRINT"{2 SPACEs}UP TO";QM;
     "QUESTIONS.           :REM*27
329Ø INPUT"{2 CRSR DNs}{2 SPACE
     s}HOW MANY QUESTIONS DO YO
     U WANT";AT$           :REM*135
33ØØ AT=VAL(AT$):IFAT<1THENRETU
     RN                    :REM*124
331Ø IFAT>5Ø ORAT>QN-1 THENPRIN
     T"{2 SPACEs}THAT'S TOO MAN
     Y QUESTIONS!!":GOTO329Ø
                           :REM*155
332Ø PRINT"{SHFT CLR}"TAB(12Ø)"
     HAVE A LITTLE PATIENCE
                           :REM*213
333Ø PRINT"{CRSR DN}{3 SPACEs}I
     'M WORKING ON IT!!:REM*24Ø
334Ø FORX=1TOAT:FORI=ØTO7
                           :REM*186
335Ø CB$(X,I)=".ØE"         :REM*59
336Ø NEXT:NEXT             :REM*147
337Ø REM RANDOM GENERATOR
                           :REM*242
338Ø A=QN:L=AT             :REM*213
339Ø N=1                   :REM*14Ø
34ØØ X=INT(RND(Ø)*A+1):IFN>1THE
     N343Ø                 :REM*155
341Ø P(N)=X:N=N+1          :REM*211
342Ø IFN=L+1THEN345Ø       :REM*66
343Ø FORM=1TON:IFX=P(M)THEN34ØØ
                           :REM*12Ø
344Ø NEXTM:GOTO341Ø        :REM*122
345Ø FORNQ=1TOAT           :REM*157
346Ø FORI=ØTO7             :REM*254
347Ø CB$(NQ,I)=CA$(P(NQ),I)
                           :REM*231
348Ø IFRIGHT$(CB$(NQ,Ø),1)="M"T
     HEN35ØØ               :REM*246
349Ø IFI>2THENI=7           :REM*52
35ØØ NEXT:NEXT              :REM*56
351Ø NQ=AT                 :REM*119
352Ø RETURN                 :REM*64
```

```
353Ø REM CORRECT          :REM*217
354Ø PRINT"{SHFT CLR}{2 CRSR DN
     s}{6 SPACEs}CORRECT QUESTI
     ONS                  :REM*159
355Ø IFCA$(1,Ø)=""THENGOTO32ØØ
                          :REM*193
356Ø INPUT"{2 CRSR DNs}{2 SPACE
     s}WHICH QUESTION NUMBER";C
     $                    :REM*243
357Ø B=VAL(C$)            :REM*216
358Ø IFB<1ORB>QNTHEN354Ø:REM*73
359Ø H$=RIGHT$(CA$(B,Ø),2)
                          :REM*7
36ØØ P$=RIGHT$(CA$(B,Ø),1)
                          :REM*4
361Ø FORI=1TO4:IFP$=MID$("EFMT"
     ,I,1)THENP=I:NEXT :REM*174
362Ø PRINT"{SHFT CLR}{CRSR DN}
     CORRECT {CTRL 9}";PZ$(P);"
     {CTRL Ø}QUESTION:";B:I=O
                          :REM*2
363Ø PRINT:FORX=ØTO7      :REM*24Ø
364Ø IFX>3ANDP$<>"M"THEN367Ø
                          :REM*139
365Ø IFX=4THENPRINT"{2 SPACEs}A
     NSWERS               :REM*121
366Ø PRINT"{CTRL 9}"X"{CTRL Ø}"
     ;LEFT$(CA$(B,X),LEN(CA$(B,
     X))-2)               :REM*218
367Ø NEXT                 :REM*214
368Ø INPUT"{CRSR DN}CORRECT WHI
     CH LINE";I           :REM*127
369Ø IFI<ØORI>7THENPRINT"{2 CRS
     R UPs}":GOTO368Ø     :REM*32
37ØØ IFI>3ANDP$<>"M"THENPRINT"{
     2 CRSR UPs}":GOTO368Ø
                          :REM*12Ø
371Ø PRINT"{SHFT CLR}{CRSR DN}{
     4 SPACEs}CORRECT LINE THEN
      HIT <RETURN>        :REM*94
372Ø REM                  :REM*24
373Ø PRINT"{CRSR DN} ----------
     ----------
                          :REM*26
374Ø PRINT"{CRSR DN} ";LEFT$(CA
     $(B,I),LEN(CA$(B,I))-2):PR
     INT"{HOME}"TAB(2ØØ):REM*48
375Ø GOSUB264Ø            :REM*232
376Ø IFI$=""THENI$="."    :REM*2ØØ
377Ø CA$(B,I)=I$+H$       :REM*74
378Ø RETURN               :REM*93
379Ø PRINTTAB(46)"PRESS ANY KEY
      TO CONTINUE"        :REM*61
38ØØ GETA$:IFA$<>""THEN38ØØ
                          :REM*86
381Ø GETA$:IFA$=""THEN381Ø
                          :REM*191
382Ø RETURN               :REM*117
383Ø PRINT"{SHFT CLR}{3 CRSR DN
     s}{3 SPACEs}{CTRL 9}THE FI
     LE IS FULL":GOSUB112Ø:RETU
     RN                   :REM*134
384Ø PRINTCHR$(14):POKE53281,6:
     POKE5328Ø,6          :REM*127
385Ø PRINT"{SHFT CLR}{CTRL 2}"T
     AB(24Ø)TAB(24Ø)      :REM*81
386Ø PRINTTAB(14Ø)"THE QUESTION
      BOX                 :REM*1Ø6
387Ø PRINTTAB(21)"BY      :REM*158
388Ø PRINTTAB(22)"HUGH MCMENAMI
     N                    :REM*231
389Ø PRINTTAB(23)"RUN OCT 1988{
     CRSR DN}             :REM*239
39ØØ RETURN               :REM*197
391Ø DATA"ESSAY{6 SPACEs}","FIL
     L BLANK ","MULT-CHOICE","T
     RUE-FALSE "          :REM*1Ø8
392Ø DATA" ESSAY "," FILL BLANK
     S "," MULTIPLE CHOICE ","
     TRUE-FALSE "         :REM*29
```

■

PURE·STAT FOOTBALL



The authors of **Pure-Stat Baseball** and **Pure-Stat College Basketball** introduce their most precise simulation to date, **PURE-STAT FOOTBALL! This third generation** football game has a wide array of innovative features that include: Computer Coaching using artificial intelligence to select offensive/defensive plays, Vertical and Horizontal Scrolling of on-field action, a built-in Stat Compiler, and much more. PURE-STAT FOOTBALL will challenge even the most avid fan!

- For zero, one, or two players
- Statistically based program where Pro-Football players and teams perform as they did in real life
- Built-in Stat Compiler that includes League Standings
- Full screen graphics with 22 animated players (No X's and O's)
- Eight types of runs, 12 types of passes
  - *Draw Plays, Reverses, Screen Passes*
  - *Blitz Linebackers, Double Team Receivers*
  - *Zone Defense, Prevent Defense*
  - *Use Four Receivers, Insert a Fifth Defensive Back*
- Optional Team and Create Team Disks Available

Suggested retail price $39.95

Screens from Commodore 64™/128™ version of game.

See your local dealer, or contact:

Software Simulations

959 Main Street, Suite 204, Stratford, CT 06497
(203) 377-4339

Circle 111 on Reader Service card.

PROTECTO'S "COMPUTER DIRECT"
Will Not Be UNDERSOLD!
AND WE MEAN IT!*

Prices Expire 10-31-88

Free Catalog • Over 1,000 Software & Accessory Items In Stock

Complete C64c Commodore System



- Commodore 64c Computer
- 1541 II Disk Drive
- 12" Monochrome Monitor
- Genuine IBM® Printer With Interface And One Roll Of Paper
- GEOS Program For Word Processing & Drawing

Our Low Sale Price
$395.95
List $825

C128D Computer

- Full 128 Detached Keyboard
- 1571 Drive With 128K Of User Memory Expandable To 640K
- 3 Operation Modes (C64, C128, & CP/M, Ver. 3.0)
- 40/80 Column Output, 16 colors
- **Free Programmer's Reference Guide**

Our Low Sale Price
$419.95
List $549

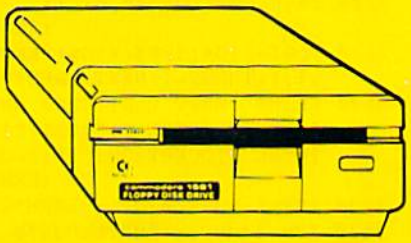
C1541 II Disk Drive

- Increase in Speed
- Increase in Storage Capacity
- Increase in Reliability

Our Low Sale Price
$159.95
List $299

800K 3½" Disk Drive

Commodore 1581 Works With C64/C64c, and C128/C128D. Over 800K Bytes of Formatted Storage On Double-Sided 3.5" Microdiskettes.



Our Low Sale Price
$179.95
List $249

Genuine IBM® Printer

8½" Letter Size • 80 Column
Limited Quantities



- Upper & Lower Case (with true lower descenders)
- Advanced Dot Matrix - Heat Transfer
- Graphics With Commodore, & Apple Interfaces
- Ready to Hook Up To Serial Port Of IBM® PCjr.
- Low Cost Adapters For IBM®, Apple, Commodore, & Laser Computers
- Underline & Enlarged

Our Low Sale Price
$44.95
List $199

300/1200 BPS External Modem

Capetronic

- **Fully Hayes Compatible**
- 1200 Baud Bell 212A at 1200 or 300 Bits/Sec
- Automatic Dialing & Answering
- Auto Redial At Receipt Of Busy Signal
- Built-In Speaker With Volume Control
- Built-In Help Commands
- Both Touch Tone and Pulse Dialing
- Uses RS-232C Interface (Cable Required)

Our Low Sale Price $79.95
List $139

300/1200/2400 BPS External Modem

Supra Corporation

- **Fully Hayes Compatible**
- 2400 Baud Bell 212A At 300, 1200 & 2400 BPS
- Both Tone & Pulse Dialing
- Built-In Speaker With Volume Control
- Command Buffer That Holds Up To 40 Characters
- Uses RS-232C Interface (Cable Required)

Our Low Sale Price $149.95
List $249

Excelerator Disk Drive



- Commodore 1541 Compatible
- Faster than 1541
- 1 Year Limited Warranty

Our Low Sale Price
$139.95
List $249

Call **(312) 382-5050** **Mail**

We Love Our Customers!

COMPUTER DIRECT
22292 N. Pepper Road
Barrington, IL. 60010

PROTECTO'S "COMPUTER DIRECT"

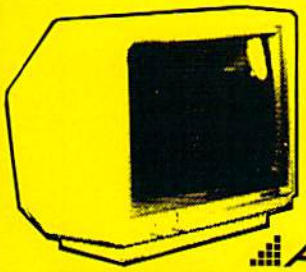
Is 1st In PRICE, SUPPORT, & GUARANTEE!

WE LOVE OUR CUSTOMERS!

Prices Expire 10-31-88

15 Day Home Trial • 90 Day Immediate Replacement Policy

12" Amber Monitor



2 Year Limited Manufacturer's Warranty

AMDEK

- High Resolution
- 80 Column
- 1000 Lines At Center
- Great For Business
- Fantastic Value

Our Low Sale Price

$79.95

List $329

13" Color Composite Monitor



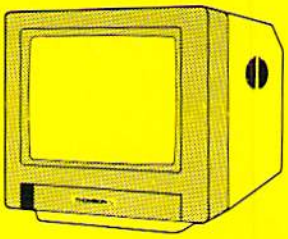
- Anti-Glare Screen
- Audio Speaker
- Volume Control
- Black Matrix Tube
- Horizontal Resolution 260 Lines
- Includes Composite Cable

Our Low Sale Price

$149.95

List $329

13" RGB/Composite Color Monitor



THOMSON

The Vision of Personal Computers.

- Black Dot Screen
- 3 Monitors In One - Composite/RGB/80 Column
- Green Screen Only Switch
- Cables Included (please specify computer)

Our Low Sale Price

$199.95

List $399

Smith Corona XD6600

The Versatile Professional Electronic Typewriter For The Home Or Office



- 60,000 Word Dictionary
- Self Demonstration
- Word-Right AutoSpell
- 16 Character Display
- 12K Memory
- Battery Back-Up
- 5 Line Correction
- WordEraser
- Relocate
- Auto Return
- Auto Center
- Auto Underscore
- Auto Half Space
- Auto Zone
- End of Page Warning
- Decimal Tab
- 10, 12, 15 Pitch
- Auto Paper Insert

Apple, IBM or Commodore Parallel Port Interface & Cable List $149.95 **Sale $99.95**

Our Low Sale Price

$249.95

List $499

5¼" Floppy Disks

Double Sided Double Density
Minimum Quantity 50
Maximum Quantity 250

19¢ each

Box of 50 ..... **$9.50 (19¢ each)** (without sleeves)

Box of 50..... **$10.50 (21¢ each)** (with sleeves)

Box of 100 (no limit) ... **$24.00 (24¢ each)** (with sleeves & labels)

Economy Sleeves .... $1.00 per quantity of 50
Disk Labels ..... $3.95 per quantity of 100
Disk Notchers ..... $3.95 each

5¼" Sony Disks



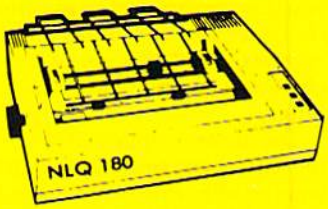
49¢ each

Limited Quantities

Single-Sided, Double Density
Sold In Packages Of 5 With Sleeves, Labels & Write Protects Included
$2.45 Per Box

Hi-Speed NLQ Printer

Lowest Price of 180 CPS Printer Available Anywhere



- High Speed Dot Matrix
- Near Letter Quality Selectable From Front Panel
- Italics - Elite - Condensed - Pica
- Tractor/Friction Feed
- Centronics Parallel Port
- * Lifetime Warranty On Print Head
- 6 Month Replacement Policy For Printer
- Dot Addressable Graphics
- 8K Print Buffer
- Low Cost Adapters Available

Our Low Sale Price

$149.95

List $499

COMPUTER DIRECT

22292 N. Pepper Rd, Barrington, IL. 60010

Call (312) 382-5050 To Order!

* Illinois residents add 6½% sales tax. All orders must be in U.S. Dollars. We ship to all points in the U.S., CANADA, PUERTO RICO, & APO-FPO. Please call for charges outside continental U.S. or C.O.D. **MAIL ORDERS** enclose cashier check, money order, or personal check. Allow 14 days delivery, 2 to 7 days for phone orders and 1 day express mail. Prices, specifications & availability subject to change without notice. Shipping - $3.00 minimum, call for exact charges.Shipping and handling charges are not refundable. (Monitors only shipped in continental U.S.) **COMPUTER DIRECT** will match any valid nationally advertised delivered price on the exact same product with a comparable payment method (excluding any applicable sales taxes).

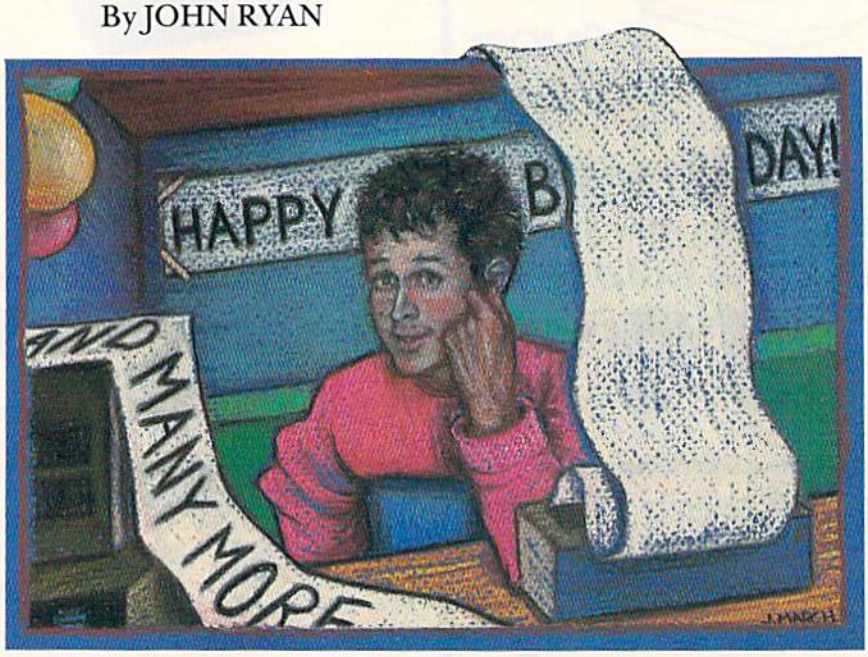
VISA — MASTERCARD — C.O.D.

Circle 15 on Reader Service card.

Easy Banners

Use this C-64/C-128 utility to print lengthy banners for any occasion.

By JOHN RYAN



Whether it be a birthday party for your five-year-old or a welcome-home celebration for a loved one, almost everyone needs to create a quick sign or banner at one point or another. While most printer utilities limit you to printing messages on a single sheet of paper, Easy Banner will print any message sideways, enabling you to create banners as long as your imagination or pocketbook allows.

Although the program is deceptively short, Easy Banner is flexible enough to meet the needs of most occasions. It may be loaded in either C-128 40-Column mode or in C-64 mode, and there are four options in the program. The first lets you choose the height of the characters you wish to print (1–8, smallest to largest). Then, under this option, you may wish to elect an expanded print character at the prompt, since the largest sizes (7 and 8) tend to be vertically elongated and thus hard to read at close range.

The second option lets you specify the character you wish to print your banner with; this may be any Commodore keyboard character. Finally, select option three to enter the message you want printed, first making sure that the printer is connected and turned on, and that any special features have been disabled (most notably, skip-perforation DIP switches). The fourth option lets you exit the program.

Easy Banner will handle inputs of up to 80 characters at a time, which, believe me, will use a tremendous amount of paper. Of course, you may create longer messages by simply appending separate banners.

The program should be compatible with most dot matrix and letter-quality printers. So next time, don't paint it. . .print it!—with Easy Banner. R

John Ryan, one of RUN*'s contributing editors, is an air traffic controller working in the computer-based instruction section. In his spare time, he pursues a computer science degree and shares with his wife the demands of a home and three children. Somehow, he manages to find time to write programs for this magazine.*

Listing 1. Easy Banner program.

```
10 REM EASY BANNER - JOHN RYAN          :REM*178
20 REM (C) RUN MAGAZINE 1988            :REM*184
30 MD=PEEK(4096):POKE 254,MD            :REM*191
40 I=12288:EX=0:CH=1:CH$="{SHFT
   Q}":P$=CH$:SP$=" "  :REM*86
50 READ A:IF A=256 THEN 70              :REM*140
60 POKE I,A:I=I+1:GOTO 50               :REM*41
70 POKE 53281,0:POKE 53280,0:PR
   INTCHR$(147)CHR$(142)CHR$(30
   ):SC=1147:                           :REM*99
80 BASE=12544:C$=""     :REM*208
90 PRINT TAB(14)"EASY BANNER":P
   RINT                                 :REM*180
100 PRINT:PRINTTAB(7)"{CTRL 9}[
    1]{CTRL 0} SELECT CHARACTER
    SIZE"                               :REM*15
110 PRINT:PRINTTAB(7)"{CTRL 9}[
    2]{CTRL 0} SELECT PRINT CHA
    RACTER"                             :REM*210
120 PRINT:PRINTTAB(7)"{CTRL 9}[
    3]{CTRL 0} PRINT BANNER":PR
    INT                                 :REM*77 ►
```

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

ILLUSTRATED BY JANET MARCH

THERE ARE SOME THINGS YOU JUST CAN'T DO WITH GEOS . . .

only $24.97

. . . UNTIL NOW, THAT IS.

Introducing **GEOS Power Pak***, a collection of the most useful GEOS desktop accessories, utilities and applications ever assembled on one disk.

The editors of *RUN* magazine have packed this two-sided disk with over a half-dozen useful programs, a wide variety of fonts and over a hundred illustrations to use with GEOS. It features the work of some of the **BEST** talent in the GEOS market, including telecommunications expert Bill Coleman; font designers and artists Susan Lamb, Tom Trevorrow and Shaun Jones; and GEOS programmers Joe Buckley and Wayne Dempsey. This assures you, the GEOS user, of increased productivity and ease of use each and every time you boot up GEOS.

Discover how it feels to be a GEOS power user with the **GEOS Power Pak**. This disk will give you features unavailable anywhere else.

For example:

"The editors of RUN have assembled the best talent in the GEOS community for this disk!"

APPLICATIONS

—geoTerm is the first terminal program for GEOS. Before the **GEOS Power Pak**, this application had the experts stumped. But now you can telecommunicate to BBSs and online networks, sending and receiving messages, attending conferences and uploading and downloading programs.

—CardFile is a file manager that comes in handy to maintain lists. Use it as an address book or to keep lists of tapes, records or household items . . . the possibilities are endless.

FONTS

—Choose from a wide selection of character fonts and point sizes. All the fonts are original and unpublished. Suitable for letter writing, headlines or to spruce up any newsletter, memo or sign.

CLIP ART

—Pick from over one hundred illustrations to use in your own documents.

ACCESSORIES

—Thumbnail is a unique program that reduces full-page geoPaint images for display on the screen and to save to disk. Catalog your geoPaint collection or paste images into a geoWrite document.

—geoOrganizer is a disk utility that lets you rearrange your GEOS files quickly and easily.

—Pattern Editor lets you create your own fill patterns for use within geoPaint.

—geoBreak. Enjoy this classic arcade game.

—Convert 2.2. Convert GEOS data and programs for uploading and downloading with geoTerm.

—Write Hand Man. Word and document analyzer.

—AutoView. geoPaint slide show maker.

—PaintView II. View geoPaint pages.

Like the original GEOS program, the **GEOS Power Pak** greatly enhances the capabilities of your C-64.

Let's face it. You've invested lots of time and energy learning to use GEOS. The **GEOS Power Pak** returns this investment tenfold with easy applications, expanded capabilities and increased productivity.

GEOS Power Pak revolutionizes the program that revolutionized your C-64.

***GEOS Power Pak** is a product of *RUN* magazine and is not connected with Berkeley Softworks, creator of GEOS, or Commodore, manufacturer of the C-64.

YES! I want to add more computing power to my Commodore 64. Send me the GEOS POWER PAK from *RUN* magazine for $24.97.

☐ Check enclosed ☐ American Express
☐ MasterCard ☐ Visa

Card # _____

Exp. Date _____

Name _____

Address _____

City _____

State _____ Zip _____

Foreign Airmail, please add $3.95 per order.

Mail to: **ReRUN 80 Elm St. Peterborough, NH 03458**
or call toll free **1-800-343-0728**

GPA88

EASY BANNERS

```
13Ø PRINTTAB(7)"{CTRL 9}[4]{CTR
    L Ø} END"              :REM*62
14Ø POKE 198,Ø             :REM*9
15Ø GETA$:IF A$="" THEN15Ø
                           :REM*57
16Ø A=VAL(A$):IF A<1 OR A>4 THE
    N 15Ø                  :REM*18Ø
17Ø ON A GOSUB 19Ø,25Ø,26Ø,18Ø:
    GOTO7Ø                 :REM*219
18Ø PRINTCHR$(147):END :REM*217
19Ø PRINT                  :REM*86
2ØØ INPUT "CHARACTER SIZE (1-8)
    ";CH:IF CH<1 OR CH>8 THEN P
    RINT"{CRSR UP}";:GOTO 2ØØ
                           :REM*89
21Ø INPUT"EXPANDED CHARACTER (Y
    /N)";EX$:IF EX$="Y" THEN EX
    =1:GOTO 23Ø            :REM*215
22Ø EX=Ø                   :REM*163
23Ø P$="":SP$=P$:FOR I=1 TO CH:
    P$=P$+CH$:SP$=SP$+" ":NEXTI
    :                      :REM*11
24Ø RETURN                 :REM*127
25Ø PRINT:INPUT"ENTER PRINT CHA
    RACTER";CH$:GOTO 23Ø
                           :REM*157
26Ø PRINTCHR$(147)"{2 CRSR RTs}
    ENTER MESSAGE (8Ø CHARACTER
    S OR LESS)             :REM*236
27Ø INPUT"{HOME}{3 CRSR DNs}>";
    W$:IFW$=""THEN26Ø      :REM*9Ø
28Ø N=(8Ø-(CH*8))/2 :FORJ=1 TO
    N:C$=C$+" ":NEXTJ      :REM*244
29Ø OPEN 1,4:W=LEN(W$):I=Ø:A=Ø
                           :REM*216
3ØØ D=PEEK(SC)             :REM*Ø
31Ø POKE 253,D:SYS 12288:SA=128
    ØØ                     :REM*39
32Ø PRINT#1,C$;            :REM*229
33Ø FOR J=Ø TO 63:IF PEEK(BASE+
    J)<>Ø THENPRINT#1,P$;:GOTO3
    5Ø                     :REM*219
34Ø PRINT#1,SP$;           :REM*43
35Ø A=A+1:IFA=8THENA=Ø:PRINT#1,
    CHR$(13);C$;:GOTO 37Ø
                           :REM*11
36Ø GOTO 41Ø               :REM*175
37Ø IF EX<>1THEN 41Ø       :REM*212
38Ø FOR N=Ø TO 7:IF PEEK(SA+N)<
    >Ø THENPRINT#1,P$;:GOTO4ØØ
                           :REM*1Ø5
39Ø PRINT#1,SP$;           :REM*93
4ØØ NEXTN:SA=SA+8:PRINT#1,CHR$(
    13);C$;                :REM*2Ø9
41Ø NEXTJ:I=I+1:SC=SC+1:IFI<>W
    THEN3ØØ                :REM*46
42Ø CLOSE1:RETURN          :REM*137
43Ø DATA 169,Ø,133,251,133,252,
    17Ø,157,Ø,49,157,Ø,5Ø,232,2
    24,64,2Ø8,245          :REM*195
44Ø DATA 166,253,24Ø,16,24,165,
    251,1Ø5,8,133,251,165,252,1
    Ø5,Ø,133,252,2Ø2       :REM*246
45Ø DATA 2Ø8,24Ø,24,165,251,1Ø5
    ,Ø,133,251,165,252,1Ø5,2Ø8,
    133,252,12Ø,165        :REM*2Ø9
46Ø DATA 254,24Ø,9,165,1,41,251
    ,133,1,76,7Ø,48,169,1,141,Ø
    ,255,169,Ø,141         :REM*164
47Ø DATA 171,48,169,8,141,167,4
    8,169,128,141,17Ø,48,16Ø,7,
    162,Ø,177,251,45       :REM*255
48Ø DATA 17Ø,48,2Ø8,35,232,136,
    16,245,238,171,48,78,17Ø,48
    ,2Ø6,167,48,2Ø8        :REM*132
49Ø DATA 23Ø,165,254,2Ø8,8,169,
    Ø,141,Ø,255,76,129,48,165,1
    ,9,4,133,1,88,96       :REM*43
5ØØ DATA 142,169,48,24,174,171,
    48,189,159,48,1Ø9,169,48,17
    Ø,169,42,157,Ø         :REM*67
51Ø DATA 49,157,Ø,5Ø,174,169,48
    ,76,96,48,Ø,8,16,24,32,4Ø,4
    8,56,Ø,Ø,Ø,Ø,Ø         :REM*45
52Ø DATA 256               :REM*98
```

■



Circle 40 on Reader Service card.

Best Buys From TENEX

No Gimmicks, No Hidden Charges, No Nonsense, Just Low Prices and Great Service!

FREE

Dust Cover & Everything Book

Discover the savings and easy shopping available from TENEX Computer Express PLUS receive a **FREE** dust cover for your C64, C128 or 64C! Cover is anti-static, 8-gauge vinyl sewn to our exacting standards with reinforced seams. Get to know our great products, extensive selection and fast service with a **FREE** copy of our *Everything Book for Commodore Computing*. ($2.95 Shipping Charge)

31627 C64 Dust Cover and Catalog **(R2U)**
38464 C128 Dust Cover and Catalog **(R2U)**
65180 64C Dust Cover and Catalog **(R2U)**

From microPal

The 39¢ Diskette

Are you paying too much for diskettes? Try our first quality, prime, 5-1/4" diskettes (no rejects, no seconds) at these fantastic sale prices and save, save, SAVE! Disks are packaged in boxes of 50; including diskettes in sleeves, labels, and write-protect tabs.

Each diskette is certified to be 100% error free and comes with a lifetime warranty (if you have a problem, we'll replace the diskette). All diskettes include hub reinforcement rings and write-protect notch.

All diskettes are double-density and work in either single or double-density drives.

SS, DD Diskettes, Box of 50
32391 **$19.50 - 39¢ ea.!**

DS, DD Diskettes, Box of 50
32403 **$24.50 - 49¢ ea.!**



Diskette Storage

Only $9.95

- 100 disk (5-1/4") capacity.
- Lock and keys for extra security and easy carrying.
- Includes 8 index dividers with labels for organization of filing and retrieval.
- Made of durable anti-static, high impact plastic.
- Attractive smoked color lid.

Sug. Retail $19.95

66826 **NOW ONLY $9.95**

Hardware

Printers		Interfaces	
Okidata 180 Printer	$224.95	Xetec Super Graphix Jr	$44.95
Okidata 120 Printer	$189.95	Xetec Super Graphix	$59.95
Okidata Microline 183	$279.95	Xetec Super Graphix Gold	$CALL
Okimate 20 Color Printer	$124.95	PPI Interface	$29.95
Star NX-1000	$CALL		
Star NX-1000C	$CALL	**Joysticks/Controllers**	
Star NX-1000 Rainbow	$CALL	NEW! Wico Ergostick	$19.95
Star NX-15	$CALL	Commodore 1352 Mouse	$69.95
Seikosha SP-180	$169.95	Epyx 500XJ	$15.95
Seikosha SP 1200-AI	$199.95	Cartridge Expander, C64	$19.95
Seikosha SP 1600-AI	$CALL	IconTroller	Sale $14.95
		SuncomTac 5	$14.95
Computers		**Power Supplies**	
Commodore C128D	$CALL	CPS-30 Power Supply, C64	$29.95
Amiga 500	$CALL	Pow'r Pak 64	$49.95
Amiga 2000	$CALL	Pow'r Pak 128	$59.95
TENEX Turbo (Loaded)	$595.00		
Disk Drives		**Accessories**	
FSD-2+ Disk Drive	Sale $149.00	Disk Doubler	$6.95
Excel 2001 Disk Drive	Sale $199.00	Universal Printer Stand+	$14.95
Commodore 1581Drive	$CALL	Data Transfer Switch	$24.95
Commodore 1541 Drive	$CALL		
		Ribbons	
Monitors		NX-1000 Black	$5.95
13" Color Composite	$CALL	Okidata 120/180/183	$7.95
Com. 1084 RGB Color	$CALL	Okimate Color	$3.95
Magnavox CM8762, Color	$269.95	Gemini 10X,SG-10/15	$2.99

Software

Access		Cinemaware	
Echelon	$26.95	The Three Stooges	$23.95
Berkeley		Warpspeed	$34.95
GEOS-64	$39.95	**Thunder Mountain**	
GEOS-128	$44.95	Pac-Man	$7.95
geoPublish	$44.95	Ms. Pac-Man	$7.95
geoCalc, C128	$44.95	**Utilities**	
geoFile, C128	$44.95	Big Blue Reader CP/M	$34.95
Writer's Workshop-C128	$49.95	Drive Alignment	$24.95
Writer's Workshop-C64	$32.95	Fast Load (Epyx)	Sale $23.95
Deskpack	$24.95	Copy II 64/128	$34.95
		The Final Cartridge III	$53.95
		Flexidraw 5.5	$23.95
		Print Shop	$26.95

Free! 56 Page "Everything" Book With Any Order!

$89.95



True Letter-Quality Printing

The Blue Chip features bi-directional daisywheel printing with a print speed of over 150 words per minute. Its friction feed mechanism operates just like a typewriter's release lever and paper advance knob, for your use with letterhead, envelopes, etc. This printer will plug into the serial port of your Commodore. Use the included cable and you're ready to go! Includes a high-quality print ribbon that lasts for 70,000 characters. Six month warranty

77428 Blue Chip Daisywheel Printer $89.95
77436 Black Film Ribbon for Blue Chip $5.95
77512 Black Ribbon, Multi-strike for Blue Chip $8.95

$74.95



1200 Baud Bargain

The VOLKS 6480 MODEM transmits at 1200 baud with the ability to slow down to 300 baud for maximum capability. This Volks Modem will connect directly to the user port of your Commodore. Its features include over 30K memory, Auto Dial/Auto Answer, Bell 212A capability, tone and pulse dialing plus more. Includes FREE Comterm IV software.

40521 Volks 6480 Modem $74.95

THE BEST PRICES
THE BEST SERVICE

WHY SHOP ANYWHERE ELSE?

Formed For The Human Hand

Only $19.95

Ergostick Joystick. This is the cutting edge of joystick technology. It's the Ergostick Joystick and you'll be amazed at its innovation. Unlike all other joysticks, the Ergostick literally forms around the human hand which optimizes the operator's hand/eye coordination.

76253 Ergostick Joystick $19.95

From Your Friends At

TENEX Computer Express

We gladly accept mail orders!
P.O. Box 6578
South Bend, IN 46660

Ad R2U

Questions?
Call 219/259-7051

Shipping Charges

Order Amount	Charge
less than $19.99	$3.75
$20.00-$39.99	4.75
$40.00-$74.99	5.75
$75.00-$149.99	6.75
$150.00-$299.99	7.75
$300.00 & up	8.75

MasterCard · American Express Card · VISA

No Extra Fee For Charges!

ORDER TOLL FREE
1-800-348-2778

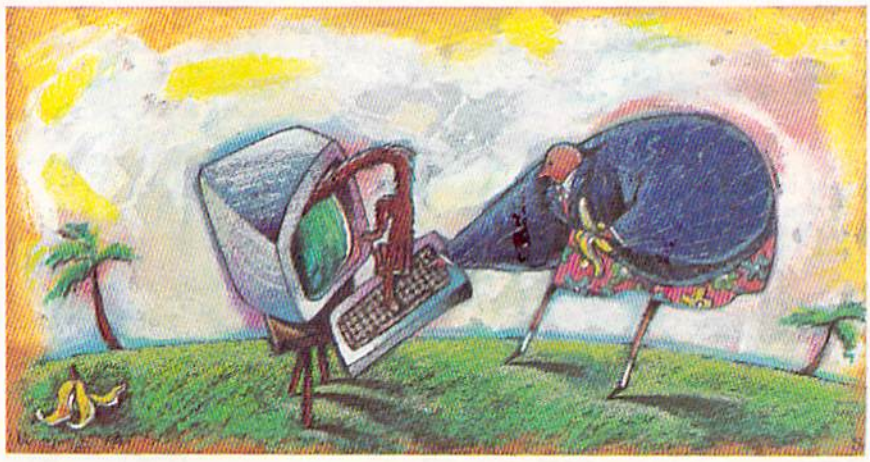
WE VERIFY CHARGE CARD ADDRESSES

COMMODORE 64 is a registered trademark; and COMMODORE 128 is a trademark of Commodore Electronics, Ltd. APO, FPO, AK, HI, CN, VI, GU, and foreign orders are subject to additional shipping charges. NOTE: Due to publishing lead-times, product prices and specifications are subject to change without notice.

Circle 155 on Reader Service card.

Monkey See . . .

. . . monkey do; see if the sequence will stick with you.



By JEROME REUTER

You're probably familiar with the game called Simon Says, or Follow Me. You may even have one of those little plastic boxes with four buttons on it—and a dead battery inside—lurking in a closet. Well, here's a program for the C-128 that brings the game to life. Called Monkey See, it replaces the plastic box with the 40-column screen and the C-128's keypad. Instead of a blinking colored light, you see animated sprites on a colorful background, and the sound is much superior to the buzz of the original game.

After typing in Listing 1, save a copy to disk; then run the program. It boots up with the difficulty level set at E, for easy, but you can change that to medium, hard or impossible by pressing any key to cycle through the options, and then the return key to select your challenge.

The screen shows four boxes, or "pads," arranged like the 2, 4, 6 and 8 keys on the keypad, with a musical note sprite in the area in the middle. The computer plays a note by "pressing" on one of the pads with the movable note sprite. Then it waits for you to play the same note with keypad number 2, 4, 6 or 8. After you play the note, Monkey See ups the ante by playing the first note again, and then another. This pattern of adding notes continues until you make a mistake or exhaust the level you've preset.

If you make a mistake, the screen offers the options of hearing the last sequence played correctly, starting the game again or quitting.

Monkey See is written in Basic, with Data statements at the end for the sprite data and the actual key sequence. Don't think for a moment that the game won't be random enough with the key sequences in an array. While the array holds a sequence of only 100 keys, there are over 50 random starting positions.

The listing lines are numbered by two's, so you can use your auto numbering system and still have room to add custom comments where needed. The difficulty levels are set in lines 98–104 and should provide the amount of challenge you need. The sprite movement is set in lines 88–96. A variable empty timing loop in those lines keeps shortening the time between notes until either you or the computer gives up.

One caution: Monkey See is good fun for all ages, so don't turn up the volume too loud. Otherwise, you'll have a number of people standing behind you, all yelling, "I'm next!" R

Jerome Reuter is a retired naval officer who runs a small contracting business. He's written all the software for his firm and has had a number of programs published.

Listing 1. Monkey See program.

```
Ø REM MONKEY SEE - JEROME REUTE
  R                          :REM*251
2 PRINT"{SHFT CLR}{CTRL 1}":POK
  E 5328Ø,14:POKE 53281,14
                             :REM*2ØØ
4 DIM ZZ(1ØØ):W$="{CTRL 2}{HOME
  }{5 CRSR DNs}{4 CRSR RTs}":Y$
  ="{HOME}{9 CRSR DNs}":X$="{HO
  ME}{23 CRSR DNs}"          :REM*51
6 FOR I=Ø TO 128:READ S:POKE 35
  84+I,S:NEXT:FOR X=1 TO 1ØØ:RE
  AD ZZ(X):NEXT              :REM*122
8 PRINT"{CTRL 9}{CTRL 7} MONKEY
   SEE, MONKEY DO - BY J.E. REU
  TER ":Q=Ø:N=Ø:A$=""        :REM*41
1Ø PRINT "{2 CRSR DNs}{3 CRSR R
  Ts}{CTRL 9}{CTRL 1}{3 SPACEs
  }{CTRL Ø}":PRINT "{3 CRSR RT
  s}{CTRL 9}{3 SPACEs}{CTRL Ø}
  ":PRINT "{3 CRSR RTs}{CTRL 9
  }{3 SPACEs}{CTRL Ø}{3 CRSR U
  Ps}":PRINT TAB(13) "{3 CRSR
  DNs}{CTRL 9}{11 SPACEs}{CTRL
   Ø}":FOR X=1 TO 3:PRINT TAB(
  13) "{CTRL 9}{CTRL 1}{2 SPAC
  Es}{CTRL 3}{7 SPACEs}{CTRL 1
  }{2 SPACEs}{CTRL Ø}":NEXT
                             :REM*214
12 PRINT TAB(7) "{CTRL 9}{23 SP
  ACEs}{CTRL Ø}":FOR X=1 TO 5:
  PRINT TAB(7) "{CTRL 9} {CTRL
   8}{4 SPACEs}{CTRL 1}{3 SPAC ►
```

RUN it right: **C-128, in 40-Column mode**

ILLUSTRATED BY RICHARD STEADHAM

VSI BANK CARDS SAME AS CASH

MISCELLANEOUS

C64/VIC20 Computer Dust Cover, brown	$5.95
1541 Disk Drive Dust Cover, brown	$5.95
C128 Computer Dust Cover, brown	$6.95
1571 Disk Drive Dust Cover, brown	$6.95
Disk Sleeves, white TYVEK, 100 pack	$7.95
Write Protect Tabs, silver, 100 pack	$1.49
Disk Pages, 2 pocket, 3 hole, 10 pack	$6.95

CABLES, All cables have a 5 YEAR WARRANTY

Mac to ImageWriter II	A306II	$9.95
Mac to ImageWriter LQ	A306LQ	$9.95
Mac to Apple Personal Modem	A306PM	$9.95
Mac to Hayes Modem, 300/1200/2400	A203MM	$9.95
Mac+, 8 Pin Mini F/DB9 F Adaptor	A101M+	$9.95
Mac+ to Hayes Compatible Modem	A202M+	$9.95
Mac+ to ImageWriter I	A303M+	$9.95
Mac+ to Laser Writer	A304M+	$9.95
Mac+ to ImageWriter II	A305M+	$9.95
Mac SE 8 Pin Mini F/DB9 F Adaptor	A101SE	$9.95
Mac SE to Hayes Compatible Modem	A202SE	$9.95
Mac SE to ImageWriter I	A303SE	$9.95
Mac SE to Laser Writer	A304SE	$9.95
Mac SE to ImageWriter II	A305SE	$9.95
Mac II 8 Pin Mini F/DB9 F Adaptor	A101M2	$9.95
Mac II to Hayes Compatible Modem	A202M2	$9.95
Mac II to ImageWriter I	A203M2	$9.95
Mac II to Laser Writer	A304M2	$9.95
Mac II to ImageWriter II	A305M2	$9.95
Apple II to ImageWriter II	A307II	$9.95
Apple II to Hayes Compatible Modem	A204II	$9.95
Apple II+ to ImageWriter II	A307I+	$9.95
Apple II+ to Hayes Compatible Modem	A204I+	$9.95
Apple IIe to ImageWriter II	A307IE	$9.95
Apple IIe to Hayes Compatible Modem	A204IE	$9.95
Apple IIc to ImageWriter II	A308II	$9.95
Apple IIc to ImageWriter LQ	A308LQ	$9.95
Apple IIc to Apple Personal Modem	A308AM	$9.95
Apple IIgs to 8 Pin Mini F/DB9 F Adap	A101GS	$9.95
Apple IIgs to Hayes Compat. Modem	A202GS	$9.95
Apple IIgs to ImageWriter I	A303GS	$9.95
Apple IIgs to Laser Writer	A304GS	$9.95
Apple IIgs to ImageWriterII	A305GS	$9.95
Laser 128 to ImageWriter II	A3088I	$9.95
Laser 128 to ImageWriter LQ	A3088Q	$9.95
Laser 128 to Apple Personal Modem	A308AM	$9.95
8 Pin Mini Din, male/male, 6 ft	A8MM6	$9.95
8 Pin Mini Din Extension, 6 ft	A8E6	$10.95
8 Pin Mini Din Extension, 10 ft	A8E10	$14.95
6 Pin Din, 6 ft., male/male	B66	$5.95
6 Pin Din, 9 ft., male/male	B69	$7.95
6 Pin Din, 18 ft., male/male	B618	$12.95
6 Pin Din, 36 ft., male/male	B636	$19.95
6 Pin Din Extension, 6 ft	A66	$5.95
5 Pin Din to 3 RCA plugs, 5 ft	M653	$5.95
5 Pin Din to 2 RCA plugs, 5 ft	M652	$4.95
5 Pin Din Extension, 10 ft	ME65	$5.95
8 Pin Din to 2 RCA plugs, 3 ft	M382	$4.95
8 Pin Din to 5 RCA plugs, 3 ft	M385	$5.95
DB9, 12ft., Joystick Extension	JS12	$4.95
DB9, 'Y' cable, 1 female/ 2 male	JSY	$6.95
DB9, 'Y' cable, 1 male/2 female	RJSY	$3.95
DB9, 6 ft., male/male	DB9MM	$8.95
DB9, 6 ft., Extension	DB9MF	$8.95
Parallel, 36 Pin, 6 ft., male/male	C6MM	$9.95
Parallel, 36 Pin, 10 ft., male/male	C10MM	$11.95
Parallel, 36 Pin, 6 ft., male/fem	C6MF	$9.95
Parallel, 36 Pin, 10 ft., male/fem	C10MF	$11.95
Serial, DB25, 6 ft., male/male	R6MM	$8.95
Serial, DB25, 6 ft., male/fem	R6MF	$8.95
IBM Printer, 6 ft., male/male	IBP6	$8.95
IBM Printer, 10 ft., male/male	IBP10	$10.95
IBM Printer, 15 ft., male/male	IBP15	$16.95
IBM Printer, 25 ft., male/male	IBP25	$24.95
IMB Keyboard Extension, 5 Pin, 5 ft	IBKE	$5.95
Power Cable, male/right angle female	PR6	$6.95
Gender Changer, 6 Pin, female/fem	GC6FF	$4.95
Gender Changer, parallel, male/male	GCMM	$9.95
Gender Changer, parallel, female/fem	GCFF	$9.95
Gender Changer, serial, male/male	GSMM	$5.95
Gender Changer, serial, female/fem	GSFF	$5.95
Gender Changer, DB9, male/male	G9MM	$4.95
Gender Changer, DB9, female/female	G9FF	$4.95
Adaptor, DB9 female to DB25 male	G9F25M	$8.95
Adaptor, DB25 male to 36 pin male	A2536M	$8.95
Null Modem, DB25, male/male	NMMM	$5.95
Null Modem, DB25, male/female	NMMF	$5.95
Null Modem, DB25, female/female	NMFF	$5.95
RS232 Mini Tester, male/female	TESMF	$12.95
RS232 Line Surge Protector	SSP	$14.95
Parallel Line Booster	PLB	$24.95

TO ORDER: VISA, MASTER CARD, money orders, or check (allow 21 days for check to clear) accepted.

SHIPPING: $3.00, power supplies $4.00, power center $5.00. $3.00 service charge on C.O.D. (cash only) plus U.P.S., APO, FPO, etc., no extra charge.

TERMS: All sales are final. Defective items replaced or repaired at our discretion. RA# REQUIRED. Price and availability subject to change.

VALUE SOFT INC
3641 S.W. Evelyn
Portland, OR 97219

VISA MasterCard

NEW...MODEM LINK by VSI $15.95

This is the LINK from a Hayes compatible modem to your Commodore. Emulates Hayes or a 1670. The LINK connects to the user port, and has been tested in 1200 or 2400 baud. Compact, full plastic case, why pay more.

NEW...THE BUTTON by VSI $8.95

The BUTTON is a deluxe reset for the C64. Plugs into the user port, don't worry the port is duplicated on the outside edge of the case. Comes in a compact case, 3x1½ inches. do not confuse the C64 with the newer 64C.

VOICE MASTER JR. $37.95

Turn your computer into a talking and listening servant. Get speech and voice recognition in ONE product. Easy to use, write music by whistling a tune. Unlimited uses for fun, education, or business.

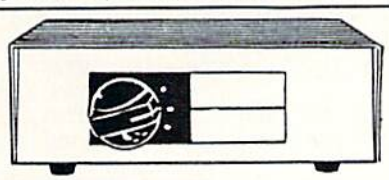
DISK DOUBLER $6.95



The original! All metal Cuts an exact square notch in the disk. Same spot every time!

BLASTER C64, C128 $5.95

Add automatic firepower to your games, plug-in module that makes the fire button of your joystick have machine gun action. Adjustable speed control.



DATA SWITCHES

VSI switches let users share equipment, end costly duplication. Plan your own system; two computers to one disk drive and printer, or two printers to one computer, share a printer between a PC and a C128, etc... Cable changing is a thing of the past, turn a knob to switch from one device to another. Remember, if you need extra cables, we carry a broad selection.

- **ONE YEAR WARRANTY**
- Compact Design, Deluxe Metal Case
- Female Sockets, Long Life Rotary Switch
- Anti-Skid Feet to Prevent Movement
- Full Shielding Exceeds FCC Requirements

$ SAVER AB $29.95

VIC-20, C16, Plus 4, C-64, OR C128 compatible.

SUPER SAVER ABCD $39.95

VIC-20, C16, Plus 4, C-64, OR C128 compatible.

PARALLEL, SERIAL, DB9, AB $29.95

Parallel = 36 pins, serial = 25 pins.

PARALLEL, SERIAL, DB9, ABCD $39.95

Parallel = 36 pins, serial = 25 pins.

PARALLEL Aa x Bb $44.95

Two computers share two printers.

8 PIN MINI DIN AB $29.95

Designed for the new Apple Computer applications.

BLACK BOOK of C128 $15.95



The best friend a C128 user ever had ...Includes C-64, C128, CPM, 1541, 1571. 261 pages of easy to find information. 75 easy to read charts and tables. The Black Book of C128 is very much like a dictionary, always ready to answer your questions.

SAM's BOOKS

C64 Trouble Shooting & Repair Guide	$19.95
1541 Trouble Shooting & Repair Guide	$19.95
C128 Trouble Shooting & Repair Guide	$19.95

"TOUCH ME BUTTON" $9.95

Static can KILL your COMPUTER and your PROGRAMS. Touch Me rids your system of harmful static like MAGIC before you touch your computer peripherals or other devices.

OMNITRONIX INTERFACES

HOT SHOT PLUS $64.95
Printer interface, 8K buffer, expandable to 64 K. 6 fonts plus editor in ROM, prints double or quad density, CPM selection.

DELUX RS232 INTERFACE $39.95
Connects standard modems or RS 232 accessories to the C64, C128, 64C, SX64, VIC20, or Plus4.

SERIAL PRINTER INTERFACE $64.95
Use a standard RS232 type printer on the Commodore. Conncets to Serial Bus (6 pin).

IBM to CBM Adaptor $37.95
Now use your C64 compatible printer on a PC compatible. Includes a specially designed cable and software.

Super SUNTRON C64/VIC20 POWER SUPPLY $26.95 SALE

PHOENIX

CPS-30, C64, fused, repairable, all metal case. Full 1 year warranty on parts/labor. 5V DC, 2A, 10V AC, 1A. $39.95

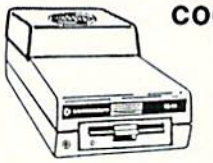
POWER CENTER WAS $59.95 NEW LOW PRICE $49.95

The POWER CENTER provides individual control of up to 5 components plus master on or off switch.



System protection: EMI/RFI filtering, surge and spike protection, 15 AMP breaker, heavy duty cable, 3 prong plug. Lighted rocker switches, all steel case, size: 1 3/4 H x 12 1/4 D x 15 W.

COOLING FAN



$29.95

Heat is a #1 enemy to your disk drive. Reduce bad loads and costly repair bills with a fan, keep your 1541 or 1571 cool. Quiet, surge and spike protection, EMI filtering

APROSPAND-64

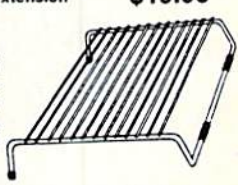
Give your C64 or 128 full expandability. This skillfully designed expansion unit plugs into the cartridge port, this gives you 4 switchable (single or in combination) cartridge slots, includes fuse protection and a reset button!

$26.95

12 PLUS 12 in. cartridge port extension $19.95

SPECIAL PURCHASE

Now $12.95



Chrome plated, heavy duty universal printer stand. Rubber feet, allows front, back, or bottom feed. For 80 or 132 column printers. Original price $24.95, sale limited to quantities in stock.

JOYSTICK REDUCER $3.95

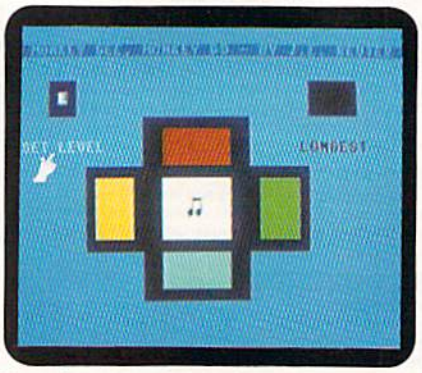
Every once in a while, our buyers find one of those odd gadgets they just can't resist. The Joy Stick Reducer is odd and low-priced. It allows one joystick to be plugged into both ports at the same time. I know you are saying, what's it good for. Stop and think, how many times have you had to try both ports before finding the right one?

1-800-544-7638
Inquiries & Oregon buyers
1-503-246-0924

SCHOOLS
OUR
SPECIALTY

VSI

```
Es}{CTRL 2}{7 SPACEs}{CTRL 1
}{3 SPACEs}{CTRL 6}{4 SPACEs
}{CTRL 1} ":NEXT          :REM*13
14 PRINT TAB(7) "{CTRL 9}{23 SP
ACEs}{CTRL Ø}"            :REM*11
16 FOR X=1 TO 3:PRINT TAB(13) "
{CTRL 9}{CTRL 1}{2 SPACEs}{C
TRL 4}{7 SPACEs}{CTRL 1}{2 S
PACEs}{CTRL Ø}":NEXT:PRINT T
AB(13) "{CTRL 9}{CTRL 1}{11
SPACEs}{CTRL Ø}"          :REM*118
18 CHAR1,3Ø,4,"{5 SPACEs}",1:CH
AR1,3Ø,5,"{5 SPACEs}",1:CHAR
1,3Ø,6,"{5 SPACEs}",1:CHAR1,
29,9,"LONGEST"            :REM*211
2Ø MOVSPR 1,158,153:SPRITE 1,1,
1,Ø,Ø,Ø,Ø:GOSUB 9Ø:PRINT Y$
"{CTRL G}{CTRL 4}SET LEVEL"
                          :REM*74
22 PRINT W$ "E":GETKEY A$:IF A$
=CHR$(13) THEN LV$="E":GOTO
32:REM E-ASY              :REM*44
24 PRINT W$ "M":GETKEY A$:IF A$
=CHR$(13) THEN LV$="M":GOTO
32:REM M-EDIUM            :REM*124
26 PRINT W$ "H":GETKEY A$:IF A$
=CHR$(13) THEN LV$="H":GOTO
32:REM H-ARD              :REM*147
28 PRINT W$ "I":GETKEY A$:IF A$
=CHR$(13) THEN LV$="I":GOTO
32:REM I-MPOSSIBLE        :REM*2
3Ø GOTO 22                :REM*16Ø
32 PRINT W$ " {CTRL 9}{CTRL 1}
{CTRL Ø}{9 SPACEs}":PRINT Y$
 "{CTRL 8}GET READY":SLEEP 2
:MOVSPR 2,33,97:Q=INT(RND(1)
*75)+1:N=Q                :REM*44
34 SLEEP 1:FOR L=Q TO N:PRINT Y
$ "{CTRL 1}MY TURN{2 SPACEs}
"                         :REM*38
36 IF ZZ(L)=1 THEN GOSUB 88:GOT
O 44                      :REM*35
38 IF ZZ(L)=2 THEN GOSUB 92:GOT
O 44                      :REM*247
4Ø IF ZZ(L)=3 THEN GOSUB 94:GOT
O 44                      :REM*2Ø9
42 IF ZZ(L)=4 THEN GOSUB 96:GOT
O 44                      :REM*5Ø
44 NEXT L                 :REM*71
46 FOR K=Q TO N:PRINT Y$ "{CTRL
 2}YOUR TURN":GETKEY A$
                          :REM*54
48 IF (A$="8"ANDZZ(K)=1) THEN G
OSUB 88:GOTO 58           :REM*184
5Ø IF (A$="6"ANDZZ(K)=2) THEN G
OSUB 92:GOTO 58           :REM*2
52 IF (A$="2"ANDZZ(K)=3) THEN G
OSUB 94:GOTO 58           :REM*226
54 IF (A$="4"ANDZZ(K)=4) THEN G
OSUB 96:GOTO 58           :REM*188
56 IF (A$<>"8"ORA$<>"6"ORA$<>"2
"ORA$<>"4") THEN 62 :REM*156
58 A$="":IF K=N THEN GOTO 98
                          :REM*64
6Ø NEXT K                 :REM*85
62 FOR T=1 TO 5:SOUND 3,5ØØØ,9:
NEXT                      :REM*1ØØ
64 A$="":PRINT X$ "{CTRL 2}{3 S
PACEs}{CTRL 9}L{CTRL Ø}{CTRL
```



Two, four, six, eight—play those notes; don't hesitate!

```
 1}AST SEQUENCE, {CTRL 2}{CT
RL 9}E{CTRL 1}{CTRL Ø}ND OR
{CTRL 2}{CTRL 9}P{CTRL Ø}{CT
RL 1}LAY AGAIN{CTRL 2}":GETK
EY A$                     :REM*149
66 IF A$="P" THEN GOSUB 9Ø:PRIN
T Y$ "PLAY AGAIN":SLEEP 1:RU
N                         :REM*128
68 IF A$="L" THEN GOSUB 9Ø:PRIN
T Y$ "LAST SEQ.":PRINT X$ "{
36 SPACEs}":SLEEP 1:GOTO 74
                          :REM*123
7Ø SPRITE 1,Ø:SPRITE 2,Ø:PRINT
"{SHFT CLR}{3 CRSR DNs}CURCU
IT OVERLOAD":PRINT"{2 CRSR D
Ns}";N-Q+1;" RIGHT KEY PRESS
ES.":PRINT"{2 CRSR DNs}PLAY
AGAIN (Y/N)"              :REM*31
72 GETKEY A$:IF A$="Y" THEN RUN
:ELSE END                 :REM*246
74 FOR L=Q TO N           :REM*2Ø4
76 IF ZZ(L)=1 THEN GOSUB 88:GOT
O 84                      :REM*95
78 IF ZZ(L)=2 THEN GOSUB 92:GOT
O 84                      :REM*18
8Ø IF ZZ(L)=3 THEN GOSUB 94:GOT
O 84                      :REM*76
82 IF ZZ(L)=4 THEN GOSUB 96:GOT
O 84                      :REM*174
84 NEXT L                 :REM*111
86 GOTO 64                :REM*23Ø
88 MOVSPR 1,158,114:SOUND 1,75Ø
,15:PRINT W$ "8":FOR G=1 TO
126-5*(N-Q):NEXT:MOVSPR 1,15
8,153:RETURN              :REM*14
9Ø MOVSPR 2,33,127:SPRITE 2,1,2
,Ø,Ø,Ø,Ø:RETURN           :REM*73
92 MOVSPR 1,227,153:SOUND 1,1Ø5
Ø,15:PRINT W$ "6":FOR G=1 TO
 126-5*(N-Q):NEXT G:MOVSPR 1
,158,153:RETURN           :REM*157
94 MOVSPR 1,158,194:SOUND 1,135
Ø,15:PRINT W$ "2":FOR G=1 TO
 126-5*(N-Q):NEXT G:MOVSPR 1
,158,153:RETURN           :REM*137
96 MOVSPR 1,91,153:SOUND 1,165Ø
,15:PRINT W$ "4":FOR G=1 TO
126-5*(N-Q):NEXT G:MOVSPR 1,
158,153:RETURN            :REM*11Ø
98 IF (LV$="E" AND (Q+6)=N) THE
N GOTO 1Ø8:REM 7 NOTES WINS
 'EASY'                   :REM*21Ø
1ØØ IF (LV$="M" AND (Q+12)=N) T
HEN GOTO 1Ø8:REM 13 NOTES W
INS 'MEDIUM'              :REM*55
1Ø2 IF (LV$="H" AND (Q+17)=N) T
HEN GOTO 1Ø8:REM 18 NOTES W
INS 'HARD'                :REM*242
1Ø4 IF (LV$="I" AND (Q+24)=N) T
HEN GOTO 1Ø8:REM 25 NOTES W
INS 'IMPOSSIBLE'          :REM*185
1Ø6 PRINTW$TAB(3Ø)"{CTRL 9}{CTR
L 1} {CTRL Ø}{CTRL 2}";N-Q+
1:N=N+1:GOTO 34           :REM*47
1Ø8 PRINT "{SHFT CLR}{3 CRSR DN
s}{3 CRSR RTs} YOU BEAT THE
 COMPUTER IN ";LV$;" LEVEL"
:FOR K=1 TO 25:R=RND(Ø)*6ØØ
ØØ:L=RND(Ø)*1Ø:SOUND 1,R,L,
Ø,Ø,Ø,2                   :REM*216
11Ø X=RND(Ø)*6ØØØØ:M=RND(Ø)*2Ø:
SOUND 2,X,M,Ø,Ø,Ø,1:X=RND(Ø
)*1ØØØØ:M=RND(Ø)*1Ø:SOUND 3
,X,M,Ø,Ø,Ø,Ø:NEXT K:GOTO 7Ø
                          :REM*48
112 REM SPRITE #1 (MUSICAL NOTE
)                         :REM*98
114 DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø:REM*8Ø
116 DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø:REM*82
118 DATA Ø,Ø,Ø,63,192,Ø,63,192
                          :REM*183
12Ø DATA Ø,32,64,Ø,32,64,Ø,32
                          :REM*81
122 DATA 64,Ø,32,64,Ø,32,64,1
                          :REM*184
124 DATA 227,192,3,231,192,3,23
1,192                     :REM*71
126 DATA 3,231,192,1,195,128,Ø,
Ø                         :REM*215
128 DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø:REM*78
13Ø REM SPRITE #2 (POINTING HAN
D)                        :REM*245
132 DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø:REM*66
134 DATA Ø,Ø,Ø,96,Ø,Ø,192,Ø
                          :REM*128
136 DATA 193,128,Ø,227,Ø,Ø,1Ø2,
Ø                         :REM*216
138 DATA Ø,1Ø9,128,Ø,235,96,Ø,2
22                         :REM*5
14Ø DATA 216,1,255,176,1,255,22
4,1                       :REM*113
142 DATA 255,192,3,255,128,3,25
4,Ø                        :REM*7
144 DATA 7,248,Ø,15,24Ø,Ø,31,24
Ø                         :REM*18Ø
146 DATA Ø,63,224,Ø,127,224,Ø,Ø
                          :REM*25Ø
148 REM KEY SEQUENCE WITH RANDO
M START - ANY ORDER OF ONES
,TWOS,THREES & FOURS
                          :REM*177
15Ø DATA 1,4,3,3,2,3,1,3,2,1,4,
4,1,2,4,3,2,3,2,4,1,1,4,2,3
,4,1,2,2,3,4,1,2,3 :REM*253
152 DATA 2,3,1,2,4,3,2,1,2,3,2,
4,2,3,4,2,1,3,2,1,1,3,3,4,4
,3,4,1,2,3,4,3,2,4 :REM*216
154 DATA 2,4,2,4,1,3,2,3,2,4,2,
1,2,4,2,3,2,4,2,1,2,1,1,2,1
,2,3,3,4,1,4,1,4,3 :REM*1Ø8 ■
```

COMMONSENSE APPROACH TO COMPUTING

1. The best arrangement for your computer system is to plug your components into a power strip, which you should shut off when not using your computer. If you don't have a power strip, be sure to always unplug your power supply when you're not using your computer. Even though your computer is off, your power supply can overheat.

2. Water can destroy data on your disk. Avoid storing your disks in excessively humid conditions. Also avoid extremes of hot and cold, which may distort or compromise the reliability of the data on your disk. Try to keep 'em at room temperature.

3. To keep your disk drive from overheating, raise it to allow air to circulate under and over it. To cool off their drives, computerists have devised many different methods—for example, spent bullet shells or sawed-off pencils in the drive's screw holes, fans directed at the unit or paper chimneys over the drive's vents!

4. If you spend a lot of time in front of your computer monitor, you run the risk of eyestrain. Get an anti-glare shield, which will also protect you from radiation and eliminate static shock. Staring at a computer screen a lot can also cause headaches, fatigue, irritability and facial twitches. Here are some things you can do:
—take a visual break every 20 minutes. Focus on different distances.
—if you don't have an anti-glare shield, make sure there are no bright lights reflecting off the screen and into your eyes. Also, don't locate your computer by, or directly in front of, a window. The contrast between the outside brightness and the low-level lighted screen can cause eyestrain.
—according to optometrists, green letters on a green screen is the worst combination for your eyes; amber screens are better; but black-and-white screens are best.

5. Sitting for long hours in front of your monitor can also cause back, neck and shoulder strain; slow blood circulation in the legs; and slacken muscle tone. An ergonomically designed chair can minimize these health hazards and muscular aches. Also, constantly changing your sitting position and good body posture with feet firmly on the floor can help.

WIN BIG MONEY!

The COMPLETE Lottery TRACKER and WHEELER™

The MOST COMPREHENSIVE Lottery Software Program on the Market Today for PICK-6 games is now available for Commodore 64/128! Look at ALL of these Features:

- Record Hundreds of Past Winning Lottery Numbers and Dates!
- Track as many State or International Lottery Games as you want! No Limit!
- Produce EXPERT Trend Charts to Indentify Those HOT and DUE Numbers!
- Analyze Hits 4 ways: Bell Curves, Recency, Percentages, Frequencies, MORE!
- Produce STATISTICS for ALL Numbers You Play – No Randomizing Here!
- Select Numbers to Play 5 Different Ways! You Choose what YOU Like Best!
- Check Your Bets For WINNING Combinations! Records ALL Systems Played including BONUS NUMBER, where applicable.
- Print Charts, Statistics, Recorded Numbers and WHEELING SYSTEMS!
- We Include FREE Addresses and Phone Numbers (where available) of ALL State and International Lottery Commission Offices for Winning Number Lists.

Includes 20 of the Worlds MOST Popular WHEELING SYSTEMS!

Use your computer to improve your odds HUNDREDS of TIMES!

Look At What Our Customers Have To Say:

"I Hit 54 CASH PRIZES the first 8 weeks with the help of your program! The Tracker and Wheeler IS the BEST lottery software program I have used overall...Over $2100 ahead after ALL expenses!" B.C., El Paso, TX

"I won 4 cash prizes the first 2 times I used the Tracker and Wheeler!" B.L.M., Wilmington, DL

"The COMPLETE Lottery TRACKER and WHEELER is SPECTACULAR!" E.D., New York, NY

Many, Many More Letters from CASH WINNERS on File!

No other lottery software package provides all of these features! When we say complete, WE MEAN COMPLETE. Easy to use MENU DRIVEN SCREENS. Printer and Color Monitor recommended but not required for use. All wheeling systems and program features now take only SECONDS to complete! You will LOVE this program in COLOR! Why pay UP TO $150.00 for less?

Don't Hesitate! Place your Order Now!

ONLY: $34.95 Plus $2.00 S&H

Now Sold in All 50 States and 17 Foreign Countries!

NEW

The Daily Number Buster!™

You won't believe it until you see it. A COMPLETE Software Package for 3 & 4 digit DAILY NUMBER GAMES!

- Stores 100's of past winning 3 & 4 digit numbers and dates!
- Print Charts, Stats, Position Hits & more!
- Position Hit Chart displays HOT & DUE numbers by Drawn Winners!
- Choose from 4 bet methods!
- Every straight & combination bet and all BOXING BETS!
- Save your bets & review against winning numbers!
- Complete Odds explanation chart on the BUSTER DISK!
- . . . and MUCH, MUCH MORE!

If you play the Daily Number Games you will quickly see the advantages (and REWARDS!) of working with your computer to analyze and find those WINNING 3 & 4 digit numbers!

Call or write for Your Copy Now! Only: $34.95 Plus $2.00 S&H

NEW

The 50 System Lottery Wheeler Plus!™

- 50 NEW wheels PLUS the ability to add your own favorites to the system!
- Use WITHOUT the Lottery Tracker OR Link to the Tracker Data Base to extract the Hot & Due Numbers!

All GUARANTEED Winning Systems!

Introductory Price Only: $24.95 Plus $2.00 S&H

VISA MasterCard **Now!** MC/Visa Call Toll Free **1-800-824-7888, Ext. 283**
For Canadian Callers: **1-800-544-2600**

Entertainment On-Line®, Inc. P.O. Box 553, Westboro, MA 01581
The *PREMIERE* Lottery Software and Audio Products Company

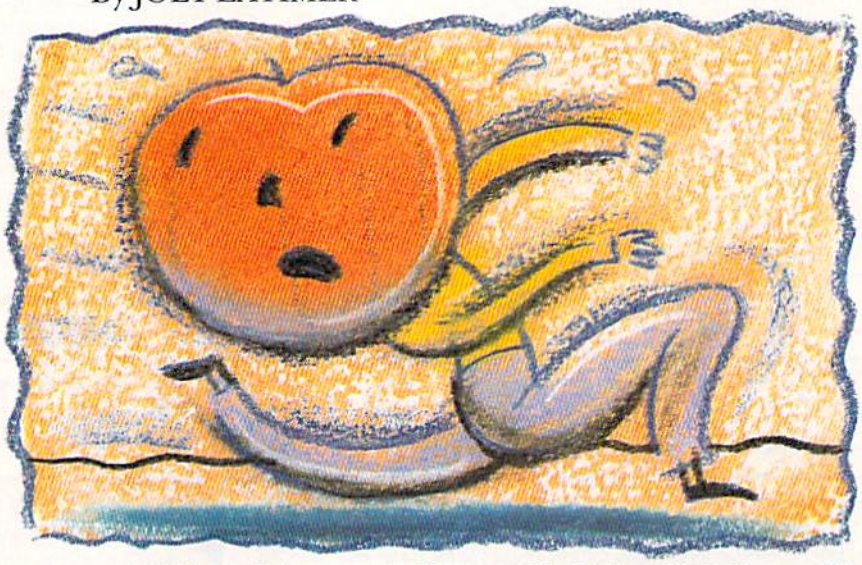
MC, Visa and MO orders shipped within 1 week. Please allow 3 to 4 weeks for Personal Checks.
MA Residents add 5% sales tax. Dealers Inquiries a MUST!! ©Copyright Entertainment-On-Line®, Inc., 1988

Circle 158 on Reader Service card.

Scared Silly!

Boo! This Halloween, be the hit of the neighborhood with this animated video pumpkin.

By JOEY LATIMER



One character you would not want to be on Halloween is a pumpkin. You'd first suffer the horrible ordeal of getting your insides scooped out and your eyes, nose and mouth carved. Then you'd be placed outdoors, helpless in the black night and chill wind and at the mercy of ghosts and goblins and other terrifying monsters who want to squash you.

So, instead of making a scary pumpkin, I made a *scared* pumpkin!

His eyes dart from side to side in frantic desperation, hoping against hope that *this* house will be overlooked by the trick or treaters.

Without warning, a sickly white flash lights up the night, followed by the sharp slap of thunder. And music! Where's that haunting music coming from! Another bright flash silhouettes a trick or treater gliding up the walk. The porch light pops on. No! It can't be! It's wearing an Ozzy Osborne outfit! Arrrgggghhh!!!

Type in Listing 1, using *RUN*'s Checksum to catch any gremlins in typing, then save it. You can run it on a C-64 or a C-128 in 40-Column mode. If you use C-128 mode (the pumpkin looks quite different), you will see that certain lines refer you to Listing 2 for additional program lines.

Put your scared pumpkin in a window—safe from the wicked night outside—and hope the tricksters and goblins will be kind on this Halloween. R

Joey Latimer has extensive experience as a programmer on Commodore and other microcomputers. A former recording engineer, musician and teacher, he worked for several years on the staff of Family Computing Magazine, most recently as Technical Editor.

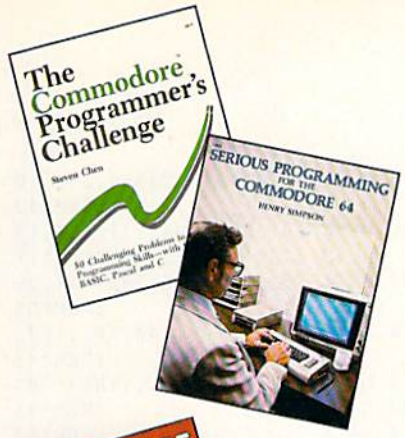
Listing 1. Pumpkin program.

```
10 REM HALLOWEEN PUMPKIN - J. L
   ATIMER                  :REM*132
40 DIM V1(44,3),V2(44,3)
                           :REM*152
50 S=54272:V=53248:R$=CHR$(18)
                           :REM*139
60 B$=R$+CHR$(149):P$=R$+CHR$(1
   29)                     :REM*201
70 S$=CHR$(32):Y$=R$+CHR$(158):
   NR$=CHR$(146)           :REM*249
80 IF PEEK(40960) THEN MO=64
                           :REM*205
90 FOR X=S TO S+23:POKE X,0:NEX
   T X                     :REM*26
100 POKE S+5,68:POKE S+6,238
                           :REM*228
110 POKE S+12,68:POKE S+13,238
                           :REM*95
120 FOR X=1 TO 38:P$=P$+S$:Y$=Y
   $+S$                    :REM*174
130 B$=B$+S$:SP$=SP$+S$:REM*201
140 NEXT X:B$=LEFT$(B$,3)
                           :REM*58
150 PRINT CHR$(147):POKE 53281,
   0:POKE 53280,0          :REM*235
160 FOR R=1 TO 24:READ C,NO:GOS
   UB 690                  :REM*44
170 IF MO=64 THEN PRINT LEFT$(P
   $,NO+2);                :REM*14
180 NEXT R                 :REM*219
190 FOR X=1 TO 18:READ C,R,NO:G
   OSUB 690                :REM*68
200 IF MO=64 THEN PRINT LEFT$(Y
   $,NO+2);                :REM*141
210 NEXT X                 :REM*6
220 FOR R=1 TO 2:READ C,NO:GOSU
   B 690                   :REM*146
230 IF MO=64 THEN PRINT "{CTRL
   1}";LEFT$(SP$,NO);      :REM*205
240 NEXT R                 :REM*20
250 FOR R=0 TO 2:C=18:GOSUB 690
                           :REM*233
260 IF MO=64 THEN PRINT "{CTRL
   1}";B$;B$;B$            :REM*135
270 NEXT R                 :REM*54
280 IF MO=64 THEN PN=0:GOTO 330
                           :REM*82
290 FOR X=3584 TO 3775:READ D:P ►
```

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

ILLUSTRATED BY REGAN DUNNICK

Discover How Much More You Can Do
With Computer Guides From TAB



THE COMMODORE PROGRAMMER'S CHALLENGE: 50 Challenging Programs to Test Your Programming Skills—With Solutions in BASIC, Pascal, and C

by Steven Chen

Have fun while expanding your programming expertise. These stimulating problems include: mathematical questions, character problems involving sophisticated logic procedures, and applications programs that demand use of your intuition, deductive reasoning skills, and business acumen. For the 64/128. **No. 2817P, $14.95**

SERIOUS PROGRAMMING FOR THE COMMODORE 64™

by Henry Simpson

". . . outlines good programming techniques as well as helping you get the most out of the C64"—**Rainbo Electronic Reviews**

Develop clearly organized, professional-quality programs with the help of this guide. Shows you how to program from the top down using a series of modules and subroutines. **No. 1821P, $10.95**



COMMODORE 128™ BASIC PROGRAMMING TECHNIQUES

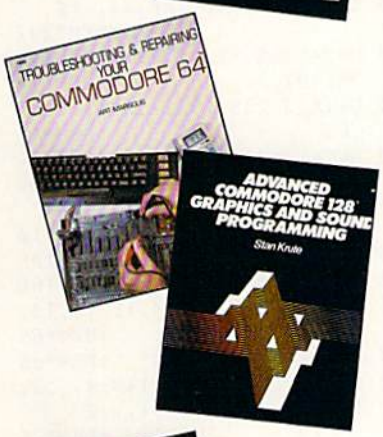
by Martin Hardee

Programming in BASIC becomes fast and easy with the help of this expert guide. You'll master telephone communications techniques, storing and retrieving data, and sound and graphics commands. Over 50 programs yield a wide range of applications. **No. 2732H, $18.95**

COMMODORE 128™ DATA FILE PROGRAMMING

by David Miller

Take advantage of the 128's 80-column monitor and other special capabilities with this collection of file-handling techniques and shortcuts. You'll develop a working mailing list database, a mathematics tutorial system, a personal medical records system, a home inventory system, and a stock market portfolio manager. **No. 2805H, $21.95**



TROUBLESHOOTING AND REPAIRING YOUR COMMODORE 64™

by Art Margolis

"With the complete set of schematics and many well placed illustrations, this is an excellent book to help anyone learn to make repairs to the Commodore 64"—**Online Today**

Symptom analysis charts, step-by-step repair instructions, safety precautions, and your own chip location guide enable you to confidently repair your own C-64. **No. 1889H, $22.95**

ADVANCED COMMODORE 128™ GRAPHICS AND SOUND PROGRAMMING

by Stan Krute

Create high-performance graphics and sound with your C-128. Commodore expert Stan Krute shows you how with the complete source code for two programs. The first is an 80-column graphics package for drawing lines and polygons, pattern painting, and more. The second, a sound and music package, allows you to record, edit, print out, and play back sound compositions. **No. 2630H, $21.95**



ARTIFICIAL INTELLIGENCE PROJECTS FOR THE COMMODORE 64™

by Timothy J. O'Malley

"Well worth the cost and lots of fun!"—**Rainbo Electronic Reviews**

Explore artificial intelligence with the 16 BASIC programs in this book. They demonstrate tree searches (testing all possible solutions to a problem), heuristics (a modified trial-and-error technique), algorithms, and pattern searching/recognition routines, as well as game and puzzle programs. **No. 1883P, $12.95**

COMMODORE 64™ ADVANCED GAME DESIGN

by George A. and Nancy E. Schwenk

Featuring three full-length games that alone are worth the price, this unique guide shows how you can create exciting games for fun or profit. Using the games as models, it explains: how to develop a game program . . . what makes a good game . . . the pros and cons of game programming in BASIC, assembly language, and FORTH . . . and more. **No. 1923P, $21.95**

TOLL-FREE ORDERING

1-800-343-0728

Ask for the TAB BOOKS operator.

SATISFACTION GUARANTEED

If you are not completely satisfied with the books you receive, you may return it (them) within 15 days for a complete refund—no questions asked!

YES, I want to get more from my Commodore with these great books from TAB. Send me the following:

No. _____ $ _____

No. _____ $ _____

No. _____ $ _____

Mail coupon to: TAB BOOKS Inc., Blue Ridge Summit, PA 17294-0840

☐ Check/money order enclosed made payable to TAB BOOKS Inc.
Charge my ☐ VISA ☐ MasterCard ☐ American Express

Acct. No. _____ Exp. _____

Signature _____

Name _____

Address _____

City _____

State/Zip _____

PA residents add 6% sales tax. Orders subject to credit approval. Prices subject to change.

RM108

```
    OKE X,D:NEXT X          :REM*44
300 IF MO<>64 THEN GOSUB 1290
                            :REM*151
310 REM:IF YOU'RE USING A C-128
    , SEE LISTING 2 FOR THIS LI
    NE'S CONTENTS           :REM*43
320 REM:IF YOU'RE USING A C-128
    , SEE LISTING 2 FOR THIS LI
    NE'S CONTENTS           :REM*37
330 FOR X=832 TO 1023:READ D:PO
    KE X,D:NEXT X           :REM*6
340 POKE V+37,1:POKE V+38,14:PO
    KE V+16,0               :REM*197
350 POKE V+39,0:POKE V+40,0:POK
    E V+41,0                :REM*106
360 POKE V+28,3:POKE V+29,0:POK
    E V+23,0                :REM*225
370 POKE V,94:POKE V+1,100:POKE
     V+2,238:POKE V+3,100
                            :REM*15
380 FOR X=1 TO 4:READ PT(X,1),P
    T(X,2):NEXT X           :REM*26
390 IF MO=64 THEN 410       :REM*98
400 REM:IF YOU'RE USING A C-128
    , SEE LISTING 2 FOR THIS LI
    NE'S CONTENTS           :REM*117
410 POKE 2040,PN+13:POKE 2041,P
    N+13                    :REM*191
420 POKE V+21,3 :POKE V+27,0
                            :REM*22
430 FOR X=1 TO 44:READ V1(X,1),
    V1(X,2),V1(X,3):NEXT X
                            :REM*3
440 FOR X=1 TO 44:READ V2(X,1),
    V2(X,2),V2(X,3):NEXT X
                            :REM*126
450 GOSUB 510:FOR X=1 TO RND(1)
    *5+5:GOSUB 470          :REM*166
460 FOR DE=1 TO RND(1)*1500+250
    :NEXT DE,X:GOTO 450 :REM*26
470 N=INT(RND(1)*4)+1   :REM*232
480 IF MO=64 THEN 500   :REM*219
490 REM:IF YOU'RE USING A C-128
    , SEE LISTING 2 FOR THIS LI
    NE'S CONTENTS           :REM*158
500 POKE 2040,PN+PT(N,1):POKE 2
    041,PN+PT(N,2):RETURN
                            :REM*252
510 POKE S+24,10        :REM*238
520 FOR X=1 TO 44:POKE S+4,33:P
    OKE S+11,33             :REM*127
530 POKE S+1,V1(X,1):POKE S,V1(
    X,2)                    :REM*130
540 POKE S+8,V2(X,1):POKE S+7,V
    2(X,2)                  :REM*148
550 FOR DE=1 TO (35-(PN/2))*V1(
    X,3):NEXT DE            :REM*37
560 IF RND(1)>.7 THEN GOSUB 470
                            :REM*228
570 POKE S+4,32:POKE S+11,32
                            :REM*130
580 NEXT X:POKE S+11,0:POKE 204
    0,PN+14:POKE 2041,PN+15
                            :REM*7
590 REM:IF YOU'RE USING A C-128
    , SEE LISTING 2 FOR THIS LI
    NE'S CONTENTS           :REM*50
600 POKE S+4,129:POKE S+24,15:P
```



Even a scared pumpkin can frighten trick or treaters!

```
    OKE S,104               :REM*2
610 FOR L=1 TO RND(1)*75+25:POK
    E S+1,RND(1)*9+2        :REM*14
620 POKE V+33,RND(1)*15:POKE V+
    32,RND(1)*15            :REM*35
630 POKE V+37,RND(1)*15+1:POKE
    V+38,RND(1)*15+1        :REM*207
640 NEXT L:POKE V+33,0:POKE V+3
    2,0:POKE V+37,1:POKE V+38,1
    4                       :REM*37
650 IF MO=64 THEN 670       :REM*169
660 REM:IF YOU'RE USING A C-128
    , SEE LISTING 2 FOR THIS LI
    NE'S CONTENTS           :REM*72
670 POKE 2040,PN+13:POKE 2041,P
    N+13                    :REM*162
680 POKE S+4,128:FOR DE=1 TO 20
    0:NEXT DE               :REM*89
690 IF MO=64 THEN 710       :REM*167
700 SYS 52332,,R,C:RETURN
                            :REM*85
710 POKE 781,R:POKE 782,C:POKE
    783,0                   :REM*231
720 SYS 65520:RETURN        :REM*96
730 REM --PUMKIN DATA       :REM*216
740 DATA 8,24,5,30,4,32,3,34,2,
    36,1,37                 :REM*196
750 DATA 1,38,1,38,1,38,1,38,1,
    38,1,38                 :REM*217
760 DATA 1,37,2,36,2,36,3,34
                            :REM*70
770 DATA 3,34,4,32,5,31,6,29
                            :REM*132
780 DATA 7,27,8,24,9,21,11,17
                            :REM*164
790 DATA 10,4,1,28,4,1,9,5,3,27
    ,5,3                    :REM*124
800 DATA 8,6,5,26,6,5,7,7,7,19,
    7,1,25,7,7              :REM*26
810 DATA 6,8,9,18,8,3,24,8,9
                            :REM*120
820 DATA 17,9,5,16,10,7,15,11,9
                            :REM*3
830 DATA 12,16,15,13,17,13,14,1
    8,11                    :REM*35
840 REM --SPRITE DATA       :REM*33
850 DATA 15,8,17,5          :REM*93
860 DATA ,,,,,,,            :REM*234
870 DATA ,,,,2,170,128,10
                            :REM*134
880 DATA ,160,40,,40,160,255,10
                            :REM*43
890 DATA 131,255,194,131,235,19
    4,131,235               :REM*111
900 DATA 194,131,235,194,131,25
    5,194,160               :REM*54
910 DATA 255,10,40,,40,10,,160
                            :REM*43
920 DATA 2,170,128,,,,,:REM*205
930 DATA ,,,,,,,            :REM*35
940 DATA ,,,,,,,            :REM*57
950 DATA ,,,,2,170,128,10
                            :REM*214
960 DATA ,160,40,,40,160,,252
                            :REM*153
970 DATA 128,3,255,128,3,235,12
    8,3                     :REM*156
980 DATA 235,128,3,235,128,3,25
    5,160                   :REM*222
990 DATA ,252,40,,40,10,,160
                            :REM*64
1000 DATA 2,170,128,,,,,:REM*62
1010 DATA ,,,,,,,           :REM*115
1020 DATA ,,,,,,,           :REM*137
1030 DATA ,,,,2,170,128,10
                            :REM*103
1040 DATA ,160,40,,40,63,,10
                            :REM*242
1050 DATA 255,192,2,235,192,2,2
    35,192                  :REM*114
1060 DATA 2,235,192,2,255,192,2
    ,63                     :REM*15
1070 DATA ,10,40,,40,10,,160
                            :REM*197
1080 DATA 2,170,128,,,,,
                            :REM*110
1090 DATA ,,,,,,,           :REM*195
1100 REM --EYE DATA         :REM*158
1110 DATA 13,13,14,14,15,15,13,
    13                      :REM*65
1120 REM --MUSIC DATA       :REM*86
1130 DATA 9,104,4,12,143,4,,,2,
    14,239,4,12,143,4,,,2
                            :REM*76
1140 DATA 9,104,4,12,143,4,,,2,
    14,239,4,12,143,4,,,2
                            :REM*181
1150 DATA 9,104,4,12,143,4,,,2,
    14,24,3,14,239,3        :REM*178
1160 DATA 14,24,3,12,143,3,11,2
    18,4,,,2,12,143,4,14,24,4,
    ,,2                     :REM*133
1170 DATA 9,104,4,12,143,4,,,2,
    14,239,4,12,143,4,,,2
                            :REM*151
1180 DATA 9,104,4,12,143,4,,,2,
    14,239,4,12,143,4,,,2
                            :REM*157
1190 DATA 9,104,4,12,143,3,18,2
    09,3,16,195,3           :REM*94
1200 DATA 14,239,3,14,24,3,11,2
    18,3,12,143,6           :REM*171
1210 DATA 12,143,4,14,239,4,,,2
    ,18,209,4,14,239,4,,,2
                            :REM*252
1220 DATA 12,143,4,14,239,4,,,2
    ,18,209,4,14,239,4,,,2
                            :REM*134
```

```
123Ø DATA 12,143,4,14,239,4,,,2
     ,16,195,3,18,2Ø9,3:REM*191
124Ø DATA 16,195,3,14,239,3,14,
     24,4,,,2,14,239,4,16,195,4
     ,,,2                  :REM*1
125Ø DATA 12,143,4,14,239,4,,,2
     ,18,2Ø9,4,14,239,4,,,2
                           :REM*164
126Ø DATA 12,143,4,14,239,4,,,2
     ,18,2Ø9,4,14,239,4,,,2
                           :REM*174
127Ø DATA 12,143,4,14,239,3,25,
     3Ø,3,22,96,3          :REM*99
128Ø DATA 18,2Ø9,3,16,195,3,14,
     24,3,14,239,6         :REM*246
129Ø REM:IF YOU'RE USING A C-12
     8, SEE LISTING 2 FOR LINES
      129Ø-15ØØ            :REM*23Ø
```

Listing 2. Additional C-128 40-Column mode program lines.

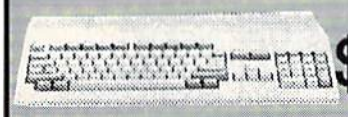
```
31Ø PN=43:SPRITE 1,1,1,Ø,Ø,Ø,1:
    SPRITE 2,1,1,Ø,Ø,Ø,1:POKE V
    +38,14                 :REM*33
32Ø MOVSPR 1,134,1Ø7:MOVSPR 2,2
    14,1Ø7:GOTO 38Ø        :REM*1
4ØØ SPRSAV SP$(1),1:SPRSAV SP$(
    1),2:GOTO 42Ø          :REM*3Ø
49Ø SPRSAV SP$(PT(N,1)-12),1:SP
    RSAV SP$(PT(N,1)-12),2:RETU
    RN                     :REM*132
59Ø IF MO<>64 THEN SPRSAV SP$(2
    ),1:SPRSAV SP$(3),2:REM*122
66Ø SPRSAV SP$(1),1:SPRSAV SP$(
    1),2:GOTO 68Ø          :REM*74
129Ø COLOR Ø,1:COLOR 4,1:COLOR
    2,9                    :REM*171
13ØØ COLOR 1,1Ø:COLOR 3,8:GRAPH
    IC3,1:SCNCLR:FAST      :REM*99
131Ø FOR X=5 TO 65 STEP 1Ø
                           :REM*29
132Ø CIRCLE 1,8Ø,1ØØ,X,9Ø,Ø,18Ø
    ,Ø,1                   :REM*185
133Ø CIRCLE1,8Ø,1ØØ,X,9Ø,18Ø,36
    Ø,Ø,1:NEXT             :REM*86
134Ø FOR X=2Ø TO 14Ø STEP 1Ø:PA
    INT 2,X,1ØØ,1:NEXT:REM*116
135Ø DRAW 3,6Ø,57 TO 7Ø,73 TO 5
    Ø,73 TO 6Ø,57          :REM*96
136Ø DRAW 3,1ØØ,57 TO 11Ø,73 TO
     9Ø,73 TO 1ØØ,57       :REM*89
137Ø DRAW 3,8Ø,82 TO 9Ø,98 TO 7
    Ø,98 TO 8Ø,82          :REM*59
138Ø PAINT 3,6Ø,7Ø,Ø:PAINT 3,1Ø
    Ø,7Ø,Ø:PAINT 3,8Ø,85,Ø
                           :REM*249
139Ø CIRCLE 3,8Ø,15Ø,5Ø,1Ø,27Ø,
    45Ø:CIRCLE 3,8Ø,135,5Ø,1Ø,
    29Ø,43Ø                :REM*8Ø
14ØØ DRAW 3,33,131 TO 3Ø,15Ø:DR
    AW 3,127,132 TO 13Ø,15Ø:PA
    INT3,8Ø,135,Ø          :REM*97
141Ø FOR I=1 TO 4:SPRSAV I,SP$(
    I):NEXT                :REM*18
142Ø MOVSPR 1,134,1Ø7:MOVSPR 2,
    214,1Ø7                :REM*2Ø3
143Ø SPRSAV SP$(1),1:SPRSAV SP$
    (1),2                  :REM*99
144Ø COLOR 3,6:CIRCLE 3,8Ø,1Ø,5
    ,1Ø,225,36Ø:CIRCLE 3,9Ø,1Ø
    ,5,1Ø,225,36Ø          :REM*28
145Ø DRAW 3,8Ø,Ø TO 89,Ø:DRAW 3
    ,76,17 TO 85,17:PAINT 3,8Ø
    ,12,Ø                  :REM*1Ø8
146Ø FOR X=4Ø TO 112 STEP 8
                           :REM*42
147Ø DRAW Ø,X,128 TO X+4,139 TO
     X+8,128:NEXT          :REM*13Ø
148Ø DRAW Ø,4Ø,128 TO 6Ø,122:DR
    AW Ø,12Ø,128 TO 1ØØ,122:DR
    AW Ø,6Ø,122 TO 1ØØ,122
                           :REM*14
149Ø PAINT Ø,5Ø,13Ø,Ø      :REM*218
15ØØ SLOW:RETURN           :REM*6 ■
```


BUY·SELL·TRADE BUY·SELL·TRADE BUY·SELL·TRADE

Computer Repeats, Inc.

UNBELIEVABLE DEALS EVERYDAY! ALL ORDERS PROCESSED IN 24 HRS!

FREE SOFTWARE! **Amiga 500**



$259 NEW

with trade-in of 128, 1571, 1902A OR $395 with 64, 1541, 1702 $CALL for your system

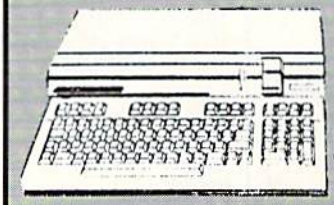
Products - Used

C64 CPU	$119	C128 CPU	$199
VIC-20 CPU	$35	1541 Drive	$125
1571 Drive	$189	Vicmodem 64/128	$25
Hayes Smartmodem	$39	MPS 801 Printer	$72
VIC 1525 Printer	$79	Diablo 630 Printer	$249
Okimate color w/PIP	$99	C1702 Monitor	$135
C1802C Monitor	$149	Monitors from	$39
Commodore C2N	$20	DSI PPI Interface	$32
Xetec Interface	$25	Software/Books from	$1

Products - New

Amiga 2000 CPU	$1549	Amiga 2010 Int.	$179
C1084 RGB Monitor	$299	Master 3A (A1010)	$185
A1010 Drive	$199	Bridge Card w/Drive	$509
A20MB Hard Drive	$509	Avatex 1200HC	$99
Avatex 2400HC	$189	SmartLink 2400HC	$179
Star NX-1000 144cps	$189	Star NX-1000 Color	$249
128D CPU	$449	64C CPU	$159
PC-10 III	$679	Colt PC Turbo	$719
1541-II Drive	$179	1581 Drive	$179

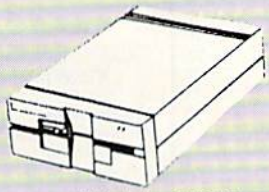
Commodore 128D



$249 NEW

with trade-in of 128, 1571 OR $309 with 64C, 1541C $CALL for your system

Excelerator+ FSD-2



$99 NEW

with trade-in of 1541 Drive $CALL for your system

Commodore 64C



$89 NEW

with trade-in of C64 $CALL for your system

$Cash for your equipment
Thousands of software & book titles
Plus, MUCH, MUCH MORE!

2017 13th Street Suite A
Boulder, CO 80302

All references to trade-ins assume equipment to be in good working condition. Shipping/handling will be added to all prices. No additional charge for credit cards or COD. Mail order prices shown.
WE CHECK FOR CREDIT CARD THEFT!

1-303-939-8144
24 HR Modem Software Quotes: 1-303-939-8174

Authorized Dealers for COMMODORE/AMIGA and ATARI ST/XL/XE Computers and Accessories.

VISA MASTERCARD DISCOVER AMERICAN EXPRESS COD

BRiWALL

Our Third Year In Business!
We Know How To Service Our Customers!

SOLID PRODUCTS & SOLID SUPPORT

P.O. Box 129 / 58 Noble Street
Kutztown, PA 19530

24 HOURS — TOLL FREE
1-800-638-5757

SATISFACTION GUARANTEED
Earn Bonus $$
No Surcharge On Charge Orders
Friendly Service

ACCESSORIES/HARDWARE

Aprospan Cartridge Expander	$ 25
Banner Band Paper-Party	12
Banner Band Paper-Christmas	12
Banner Band Roll Paper COLOR	12
Cover 1541	7
Cover 1571	9
Cover C128	9
Cover C64	7
Cover C64-C	8
Diskette Box (70-5 ¼ disks)	10
Drive Box	27
Explode Fast Load Cart	19
Final Cartridge	49
Hot Shot Plus Printerinterfce	69
Joystick-Winner 104	8
Joystick-Winner 220	15
Joystick-Winner 770	13
Lightpen-Model 170C	69
Lightpen-Model 184C	49
M3 Mouse (full proportional)	39
Mach 128 Cartridge	35
Mousepad	8
Parchment 100 sheets COLOR	12
Quick Brown Box-32K	79
Quick Brown Box-64K	99
RS232 Interace Cable	39
Ribbons for your printer	Call
Serial Box 2-for-1	29
Serial Box 4-for-1	39
Serial Cable-6ft	9
Super Chips-C128	45
Super Chips-C128D	45
Super Chips-C64	25
Super Chips-C64 mode on C128	25
Super Graphix Gold Ptr Interface	89
Super Graphix Senior	65
Warpspeed 128 Cartridge	35
40/80 Column Switch Cable	18

BOOKS

1541 Trblshoot & Repair	17
Anatomy of 1541	17
Anatomy of C64	17
Basic 7.0 for C128	12
Beginner's Guide-Basic 8	9
C128 Assembly Programming	14
C128 Internals Book	17
C128 Programmer's Ref Guide	20
C128 Trblshoot & Repair	17
C64 Basic Prgrmmng (also disk)	25
C64 Programmer's Ref Guide	17
C64/C128 Assembly Programming	14
GEOS Inside & Out	20
GEOS Tips & Tricks	17
GEOS Programmer's Ref. Guide	17
I Speak Basic To My C64	9
K Jax Book Revealed 1	23
K Jax Book Revealed 2	23
Machine Language 64	13
Subroutines for C128	15
Superbase The Book	15
Troubleshoot & Repair C64	18
Twin Cities C128 Book NEW	15

DATABASES

Data Manager 128	37
Data Manager 2 (C64)	17
Fleet Filer 64/128	29
Pocket Filer 2	29
Superbase 128	49
Superbase 64	44

CREATIVITY

Advanced Art Studio	$ 25
Animation Station	65
Awardware	12
Billboard Maker	29
Blackjack Academy	29
Blazzing Paddles	25
Bumpersticker Maker	35
Businesscard Maker	29
CAD 3D	39
Cadpak 128	42
Cadpak 64	29
Cardware	9
Certificate Maker	17
Colorez 128	12
Create a Calendar	22
Crossword Magic	39
Cybervideo	29
Doodle	29
Flexidraw 5.5	29
Flexifont	24
Galleria 1-clipart ddle/flxdrw	24
Galleria 2-clipart sddle/flxdrw	24
Graphics Integrator 2	24
Home Designer CAD 128	45
Home Designer-Engnring Library	10
ICON Factory	25
Krack Jax Art Disks 1-10 EA	13
Newsroom	17
PC Circuit Board Maker	79
Page Illustrator 128	29
Party Ware	12
Perspectives 2 (3D)	39
Photo Finish	19
Postcards	19
Printmaster Art I	15
Printmaster Art II	15
Printmaster Art III-Fantasy	17
Printmaster Plus	25
Printshop	35
Printshop Holiday Library	19
Screen F/X	25
Slideshow Creator	13
Toy Shop	22
VTS-Graphic Companion 2	17
Video Title Shop w/Gr Comp 1	25

GARAGE SALE

Brainpower Decision Maker	15
Brainpower Forecaster	15
Brainpower Numbers at Work	15
Brainpower Project Planner	15
C Power 128	15
C Power 64	15
Flexi-Aided Design	15
How to Get Most Geos Bk/Disk	12
Jewels of Darkness	10
Maps of Europe Game	12
Maps of USA Game	12
Maps of World Game	12
Silicon Dreams	10

UTILITIES/LANGUAGES

Assembler/Monitor 64	$ 29
Basic 8	25
Basic Compiler 128	42
Basic Compiler 64	29
Big Blue Reader	32
Bobsterm Pro 64	35
Bobterm Pro 128	42
CP/M Kit 128	22
Cobol 128	29
Cobol 64	29
Gnome Kit 64/128	29
Gnome Speed Compiler 128	29
K Jax-Elite 4.2	14
K Jax C128 Cannon	29
K Jax Elite V3	9
K Jax Hacker's Utility Kit	17
K Jax Volume 1-4 EACH	9
K Jax Volume 5-7 EACH	17
Merlin 128	45
Merlin 64	35
Physical Exam 1541	29
Physical Exam 1571	29
Power Assembler 64/128	30
Power C 64/128	30
Protolinc 128	29
Prototerm 128	12
RamDOS 128	29
Renegade	29
SYSRES Enhanced	30
Super 81 Utilities C128	29
Super 81 Utilities C64	29
Super C 128	45
Super C 64	45
Super Cat	22
Super Disk Librarian C128	19
Super Disk Librarian C64	29
Super Disk Utilities C128	29
Super Pascal 128	45
Super Pascal 64	45
Super Snapshot V3	49
Super Snapshot w/C128 Disable	54
Syntech BBS	39
Syntech BBS Games Disk	15

GEOS—RELATED

Becker Basic 64	35
Deskpak Plus 64/128	22
Fontpak Plus 64/128	22
GEOS 128	45
GEOS 64	39
Geocalc 128	45
Geocalc 64	39
Geofile 128	45
Geofile 64	39
Geos Programmer 64	45
Geopublish 64	45
Geospell	19
Geowrite Workshop 128	45
Geowrite Workshop 64	39
Wordpublisher	28

PRODUCTIVITY

Business Form Shop	$ 30
CMS Accounting 128	129
CMS Accounting 64	129
Chartpak 128	29
Chartpak 64	29
KFS Accountant 128	109
KFS add-on Industry Modules EA	49
Leroys Label Maker	24
Page Builder 128	39
Paperclip Publisher	39
Partner 128 Cartridge	39
Partner 64 Cartridge	39
Persnl Portfolio Manger 128	42
Persnl Portfolio Manger 64	29
Pocket Superpak 2	67
Security Analyst 128	35
Sylvia's Persnl Manger 128	39
TAS 128	42
TAS 64	29
TW Account Payable 64	39
TW Account Receivable 64	39
TW General Ledger 64	39
TW Inventory 64	39
TW Payroll 64	39
Microlawyer	39

PERSONAL ENRICHMENT

Bodylog Cardio Exercise	75
Bodylog Enhanced Stress Reduct	229
Bodylog Hartlab	49
Bodylog Muscle Developement	54
Bodylog Stress Reduction	89
Boston Bartender's Guide	12
Bridge 5.0	22
Chessmaster 2000	30
Dr. Ruth's Bk Good Sex	22
Dream Machine Analyzer	19
Family Tree 128	39
Family Tree 64	39
Jeopardy 2	12
Monopoly	25
Paul Whitehead Chess	25
Scrabble	29
Scrubbles	29
Sexual Edge	19
Strider's Classical Music EA	9
Tarot 128	15
Wheel of Fortune 2	12

SPREADSHEETS

Pocket Planner 2	29
Swiftcalc 128 w/Sideways	37
Swiftcalc 64 w/Siddways	17
Vizistar 128	60

EDUCATIONAL

Alphabet Zoo	$ 18
Alphabuild	6
Calculus by Numeric Methods	27
Counting Parade	6
Early Learning Friends	6
Easy Sign (sign Language)	17
Evelyn Wood Dynamic Reader	17
Facemaker	16
First Men Moon Math	19
Hayden SAT Preparation	32
How to Program in Basic	24
Kids on Keys	18
Kidsword (large characters)	35
Kidwriter	22
Kindercomp	18
Linkword: French	19
Linkword: French 2	19
Linkword: German	19
Linkword: Italian	19
Linkword: Russian	19
Linkword: Spanish	19
Little Computer People	12
Mathbusters	22
Mavis Beacon Typing	30
Memory Academy	15
R.S.V.P.	21
Reading 1 (Peter Rabbit)	19
Reading 2 (Jungle Book)	19
SWM Add/Subtract	22
SWM Add/Subtract w/Decimals	22
SWM Add/Subtract w/Fractions	22
SWM Mltply/Divide w/Decimals	22
SWM Mltply/Divide w/Fractions	22
SWM Multply/Divide	22
Sky Travel	35
Stickybear ABC's	22
Stickybear Math 1	22
Stickybear Math 2	22
Stickybear Numbers	22
Stickybear Opposites	22
Stickybear Reading	22
Stickybear Reading Comp	22
Stickybear Spellgrabber	22
Stickybear Townbuilder	22
Ticket to London	21
Ticket to Paris	21
Ticket to Spain	21
Ticket to Washington DC	21
Where Carmen-Europe	29
Where Carmen-USA	29
Where Carmen-World	29
Widham-Below the Root	12
Widham-Swiss Family Robsin	12
Widham-Wizard of OZ	12
Widham-Alice in Wonderland	12

WORDPROCESSORS

Bank Street Writer	35
Fleet System 2 + (C64)	39
Fleet System 4 (C128)	52
Fontmaster 128 w/Speller	39
Fontmaster II (C64)	35
Paperclip 3	39
Pocket Dictionary 64/128	10
Pocket Writer 2	39
Superscript 128	45
Vizistar 128	60
Wordpro 128 w/Spell w/Filer	30
Wordpro 64 w/Spell	30
Wordwriter 128	37
Wordwriter 3 (C64)	30
Write Stuff 128 NEW	24
Write Stuff 64	19
Write Stuff 64 w/Talker	24

OUR POLICY

Our policy is to stock what we advertise and carry the best products available for your C64 and C128 computers. Over 400 of the best productivity, educational & technical software and a host of accessories in stock now! And CHECK OUT OUR C128 LINE! You will be amazed at the number of products that we carry for this fantastic machine!

1541/1571 DRIVE ALIGNMENT

1541/1571 Drive Alignment

This excellent alignment program is a must have for every Commodore owner. Easy to use, it helps you to align your drive so that it runs just as if it were new! The simple instructional manual and on-screen help prompt you thru the alignment procedure and help you adjust the speed and head stop of your drives. It even includes instructions on how to load the alignment program when nothing else will load. Don't be caught short! We get more RED LABEL orders for this program, then any other program we sell. Save yourself the expense! Order now, keep it in your library and use the 1541/1571 Drive Alignment program regularly!! Works on the C64, C128, and SX64 for both the 1541 and 1571 drives.

STILL ONLY $25.00

SUPER 81 UTILITIES

Super 81 Utilities

This full-featured disk utilities system, for your 1581 drive, is available in both C64 and C128 versions. Among the many features included in this fine package are:

- Copy whole unprotected 1541/1571 disks to 1581 partitions
- Copy unprotected 1541/1571 files to 1581 disks
- Copy unprotected 1581 files to 1571 disks
- Backup 1581 files or disks with 1 or 2 1581's
- 1581 Disk Editor, Drive Monitor and RAM Writer
- Includes numerous DOS commands such as Rename a file/disk,
- Scratch/Unscratch files, Lock/Unlock files, Create Auto-Boot and more

Tired of not being able to use your 1581? Super 81 will get that great little drive out of the closet and into use.

only $29.00

(please specify C64 version or C128 version)

RAMDOS Lightning Fast RAM-DISK

RamDOS 128

Yes...we know that Ram Expanders are scarce these days. But for you lucky ones that already have one, RamDOS 128 is just for you! This complete RAM based "Disk" Operating System for the 1750 RAM Expander, will turn ALL or part of your expansion memory into a lightning-fast RAM-DISK! Under RamDOS, a 50K file(190 blocks) will load in just ½ second. Load entire disks or individual files into your expansion memory and get to work. When done save the entire memory or individual files back to your disk for permanent storage. RamDOS makes your work fast and easy!

only $29.00

(C128 and 1750 Ram Expander required)

Home Designer

When the details are important!

Home Designer CAD 128

Given glowing ratings by every major Commodore magazine, this CAD system outclasses every other CAD program, because of its object-based design. With over 50 powerful commands, 5 drawing layers, superb support of library figures and lazer-quality printouts at ANY scale on your dot matrix printer or plotter, you can create drawings so accurate that a blueprint can be made from them!

Tired of working with poor quality/inaccurate print-outs, manipulating little dots on a bit-map, giving up on detailed work because you can't zoom in close enough? Join the professionals!

only $45.00

mouse or joystick required

NEW!Engineering Library disk available now. **$10.00**

CATALOGS

People tell us our catalog is the BEST! Find out for yourself. Our 40 page catalog is crammed full of detailed descriptions of hundreds of C64/C128 products. Call or write for your copy today!

BONUS DOLLARS

EARN BONUS $$$ WHEN YOU ORDER!! For every $50 of software and accessories that you order, you earn one bonus dollar. That's an additional 2% discount!! Use your bonus dollars on future purchases.

BRiWALL

SOLID PRODUCTS & SOLID SUPPORT

P.O. Box 129 / 58 Noble Street
Kutztown, PA 19530
24 HOURS — TOLL FREE
1-800-638-5757

Circle 73 on Reader Service card.

The Write Stuff

The most productive C128 word processor on the market! Features? The list is so long, but...

60 User-definable macros, Up to 64K divided into 10 work areas. Built-In Outline Generator, File Translator for other w/p documents, Quick preview for up to 250 columns, WYSIWYG preview, Industrial strength printer macros, Load/save to 16K buffer, Support 1700/1750 RAM Expanders, Split screen option, Alarm clock. Micro justification/line pitch control; Create custom characters, and much more! The Write Stuff, with it's well-written manual, on-line help and full keyboard overlay, is easy to use. And if you need power, you won't find another w/p system on the market that can match it!

ONLY $24.00

PROTOLINC BBS

PROTOLINC BBS 128

This fast & flexible multi-message base Bulletin Board System for your C128 is easy to setup and packed full of features. It supports 1500 Users, all memory resident for lightning fast log ons. No relative files are used in the board, so you won't be plagued by file crashes. Full Remote Sysop control, Multi-level menu for ease-of-use, supports up to 8 drives and a host of protocols including Punter, Xmodem, Checksum $ Xmodem CRC. Works with 1650, 1670 and most 100% Hayes compatible modems.

If you have been searching for a BBS that uses the speed and power of your C128, Protolinc BBS is your answer!

NEW PRICE - $29.00

(40 & 80 columns supported)

TAROT~128

Now you can consult your computer about love and romance, marriage, business and personal challenges, spiritual matters and search for wisdom. Learn about the divinatory and reversed meaning of all 78 cards. Print out your readings for future reference. Really interesting!!

Memory Academy 128

Memory Academy will help you improve your ability to recall colors, words, numbers and story details! It is packed full of practice routines (you set the number of items and display time) and a final exam.

either only $15.00

(80 column monitor required)

GREAT ACCESSORIES FOR YOUR C64/C128

The Drive Box - With some simple souldering you can make any Commodore drive switchable between devices 8, 9, 10 or 11 and also write the unnotched side of your disk - **$27.00**

2-For-1 or 4-For 1 Serial Boxes - Connect 2 or 4 peripherals to the box and share with another device. Multiple computers sharing one drive. Multiple printers hooked to one computer, etc. 2-For 1 Box is **$29.00.** 4-For-1 Box is **$39.00.**

Quick Brown Box - A great cartridge into which you can write programs, utilities or data files. What you store will remain intact, even with the cartridge unplugged or the computer turned off! 32K Box is **$79.00;** 64K Box is **$99.00.**

M3 Mouse - If you are looking for a reliable, well-built fully proportional mouse, stop looking! Built by Contriver, the M3 Mouse is the best we've seen. **$39.00.**

ORDERING INSTRUCTIONS

For your convenience, you can place a phone order 24 HOURS/7 DAYS A WEEK on our TOLL-FREE LINE 1-800-638-5757. Price, Availability and Compatability Checks are also Welcome on our order line, Monday thru Friday, 9AM-4PM EST. AFTER HOURS, Orders Only Please!! When placing an order, please specify your COMPUTER MODEL, HOME & DAYTIME PHONE NUMBER, SHIPPING ADDRESS, METHOD OF PAYMENT and ITEMS ORDERED. To help us serve you better, please have all your information, including your CHARGE CARD number, ready before you call us.

ACCEPTED PAYMENT METHODS: We gladly accept payment by, PREPAID BY PERSONAL CHECK (will not hold for clearing) or MONEY ORDER: COD (continental USA only AND $4.00 ADDITIONAL); MASTERCARD; VISA; SCHOOL PURCHASE ORDERS. All payment must be in USA DOLLARS. THERE IS NO SURCHARGE FOR CHARGE CARDS and your card is NOT charged until we ship.

TECHNICAL SUPPORT

We do our very best to help you with your product selections, before you order and after you receive your product. General questions, price, and compatibility with your computer, etc. will be handled by our order staff at the time you place your order. BUT if you have specific, detailed questions about a product, printer compatibility questions etc., you will get the most help from our TECHNICAL SUPPORT LINE at 215-683-5699. Call Monday thru Friday, 9AM-4PM EST, and our trained tech staff will be happy to help you.

SHIPPING POLICY

ALL ORDERS received before 3PM EST will normally be shipped same or next business day. Out-of Stock items will be shipped by the same shipping method as original order, normally within 3 or 4 business days. All UPS shipments are sent SIGNATURE REQUIRED/NO DRIVER RELEASE. ADD the following shipping charges to your TOTAL software order.

UPS: GROUND-$4.00 (cont USA ONLY); AIR/RUSH-$7.00 (Includes Puerto Rico/Hawaii); OVERNIGHT-$12.00 PLUS $2.50 per item (must be received by 12 NOON)

PRIORITY MAIL: USA-$4.00 (includes APO/FPO); CANADA/MEXICO-$6.00; OTHER FOREIGN-$4.00 handling PLUS Actual Shipping (minimum $12.00)

RETURN POLICY

We have a liberal return policy to better service your needs. Software piracy is a problem, but as long as our policy is not abused, we will continue to honor it. If within 15 days from the time you receive an item, you are not satisfied with it for any reason, you may return it to us for either a refund, exchange or open credit. REFUNDS ARE SUBJECT TO A 10% RESTOCKING FEE PER ITEM RETURNED ($5.00 MINIMUM PER ITEM). A DEFECTIVE ITEM will be replaced with the same item (NO CHARGE... of course). EXCHANGES/OPEN CREDITS will gladly be issued for the FULL PURCHASE PRICE OF THE ITEM.

Tool for Teachers

Use this test-score analysis to help spot students' weaknesses.

By RICK KEPHART

Teachers who are Commodore owners will appreciate this Z-Scores program (Listing 1). It statistically analyzes test scores to produce a z-score for each student and then a more easily used "curved" grade derived from the z-score. It also generates a rank-ordered listing of the raw scores (the scores entered).

Z-scores are based on the standard deviation from the mean of the raw scores. Therefore, they normally remain quite constant from test to test, regardless of the difficulty of the test. When a student's z-scores are consistently lower than those of most other students taking the same tests, he or she probably needs special help. Similarly, if a particular student's z-scores suddenly drop, he or she may be encountering a momentary difficulty that requires attention.

Z-scores can indicate problems with a test, as well. If many of the z-scores for the test are inconsistent with the students' past records, the test design may have been faulty, or the students may have been guessing too much, or even cheating.

A z-score of 0 is average. Positive z-scores are above average, and negative scores are below average. To make the z-scores more meaningful, the program plots them on a standard bell curve, then translates them into letter grades. The letter grades have the following meanings: A, far above average; B, above average; C, average; D, below average; F, far below average. The program also displays the average of the raw scores.

You have a choice of an on-screen display or a printout. I recommend a printout, especially when you have more than ten students taking a test. Both outputs consist of four columns—name, rank ordering of the raw scores, curved letter grades and z-scores—with the average of the raw scores below.



Lines are skipped in the display or printout, except when identical raw scores have been earned. This makes the statistical mode—the most frequent score—in the rank ordering more apparent. If there's more than one mode—that is, it more than one score appears at this greatest frequency—there may be a need for separate grouping.

In addition to your choice of screen display or printout, you have the option of using a sequential disk file for inputting students' names. This file is created by the program in Listing 2. Having the names on disk saves retyping them each time you run Z-Scores. However, you can't use file input if you don't have a score for every name in the file.

When entering names and scores into the program, you can correct mistakes by typing – 1 at the next prompt. Pressing the return key without entering a name indicates that you're done with the names; pressing return while entering scores repeats a score.

Note that only the first 15 letters of a name will appear in the screen display or printout. Also, scores must represent the number or percentage correct, not those wrong; no score can be less than zero or more than 127; and only whole numbers are allowed. Finally, when typing in the listings, be sure to use *RUN*'s Checksum program to detect input errors. R

Rick Kephart is a teacher and a Commodore SIG leader for DEL-CHUG, a multiuser's group in his area.

Listing 1. Z-Scores program.

```
Ø REM Z-SCORES              :REM*157
1Ø PRINT CHR$(147):PRINT TAB(1Ø
   ) "Z-SCORE CALCULATOR":PRINT
                            :REM*226
2Ø FOR I=828 TO 874:READ X:Y=Y+
   X:POKE I,X:NEXT          :REM*143
3Ø IF Y<>7342 THEN PRINT "ERROR
    IN DATA":END            :REM*22
4Ø DIM NA$(255),SC(255),DV(255)
   ,ZS(255)                 :REM*23
5Ø S$="{2Ø SPACEs}"         :REM*215
6Ø INPUT "OUTPUT TO PRINTER";D$
   :D=3:IF LEFT$(D$,1)="Y" THEN
    D=4                     :REM*17Ø
7Ø PRINT:INPUT "FILENAME";F$:IF
    F$="" THEN11Ø           :REM*23Ø
8Ø OPEN 8,8,8,F$:OPEN15,8,15
                            :REM*63
9Ø INPUT#15,A,B$:IF A THEN PRIN
   T B$:CLOSE 8:CLOSE 15:F$="": ►
```

RUN it right: **C-64; printer recommended**

ILLUSTRATED BY TIM TEEBKEN

```
   GOTO7Ø                    :REM*122
1ØØ INPUT#8,X:FOR I=1 TO X:INPU
    T#8,NA$(I):NEXT:CLOSE 8:CLO
    SE 15                    :REM*233
11Ø N=N+1:IF F$="" THEN PRINT "
    NAME"N;:INPUT NA$(N):REM*46
12Ø IF NA$(N)="" THEN19Ø
                             :REM*22Ø
13Ø IF NA$(N)="-1" THEN NA$(N)=
    "":N=N-2:GOTO11Ø         :REM*23
14Ø NA$(N)=RIGHT$(S$+NA$(N),15)
                             :REM*26
15Ø PRINT NA$(N)+"'S SCORE";:IN
    PUT SC$:SC(N)=VAL(SC$)
                             :REM*95
16Ø IF SC(N)<Ø THEN N=N-1:GOTO1
    5Ø                       :REM*112
17Ø IF SC(N)>127 THEN15Ø
                             :REM*2Ø7
18Ø POKE 49151+N,SC(N):GOTO11Ø
                             :REM*1Ø9
19Ø S$=RIGHT$(S$,4)          :REM*24
2ØØ N=N-1:POKE 254,N:POKE 253,N
    :SYS 828:FOR I=1 TO N:SU=SU
    +SC(I):NEXT              :REM*57
21Ø ME=INT(SU/N+.5)          :REM*213
22Ø FOR I=1 TO N:DV(I)=SC(I)-ME
    :SM=SM+(DV(I)*DV(I)):NEXT
                             :REM*54
23Ø SD=SQR(SM/N)             :REM*65
24Ø OPEN 4,D                 :REM*136
25Ø FOR J=1 TO N:SP=SC(I):I=PEE
    K(494Ø8+J)               :REM*1Ø2
26Ø IF SC(I)<>SP THEN PRINT#4
                             :REM*77
27Ø ZS(I)=INT(((DV(I)/SD)+.ØØ5)
    *1ØØ)/1ØØ                :REM*57
28Ø GR=1-(ZS(I)>-1.5)-(ZS(I)>-.
    5)-(ZS(I)>.5)-(ZS(I)>1.5)
                             :REM*21Ø
29Ø SC$=RIGHT$(S$+STR$(SC(I)),5
    )                        :REM*43
3ØØ PRINT#4,NA$(I);SC$;S$;MID$(
    "FDCBA",GR,1);S$;ZS(I)
                             :REM*82
31Ø NEXT                     :REM*185
32Ø PRINT#4:PRINT#4,"AVERAGE ="
    ME                       :REM*7Ø
33Ø CLOSE 4                  :REM*8Ø
34Ø DATA 16Ø,255,2ØØ,152,17Ø,18
    5,Ø,192,48,248,232,228,254,
    176,11,221,Ø,192         :REM*193
35Ø DATA 144,246,2Ø2,138,168,76
    ,62,3,166,253,2ØØ,152,157,Ø
                             :REM*127
36Ø DATA 134,253,136,169,255,15
    3,Ø,192,2Ø8,21Ø,96       :REM*24
```

Listing 2. File program.

```
Ø REM Z-SCORES LISTING 2     :REM*9
1Ø DIM N$(255):FOR I=1 TO 255
                             :REM*22Ø
2Ø PRINT "NAME #";I;:INPUT N$(I
   )                         :REM*17
3Ø IF N$(I)="" THEN 6Ø       :REM*25Ø
4Ø IF N$(I)="-1" THEN I=I-2:NEX
   T                         :REM*173
5Ø NEXT                      :REM*18Ø
6Ø INPUT "FILENAME";F$:OPEN 8,8
   ,8,F$+",S,W":OPEN 15,8,15
                             :REM*133
7Ø INPUT#15,A,B$:IF A THEN PRIN
   T B$:CLOSE 8:CLOSE 15:GOTO 6
   Ø                         :REM*96
8Ø PRINT#8,I-1               :REM*122
9Ø FOR J=1 TO I-1            :REM*1Ø3
1ØØ PRINT#8,N$(J)            :REM*18
11Ø NEXT:CLOSE 8             :REM*32
```

■

PIK'EM 88

A Complete Pro Football Prediction Program
For The 1988 NFL SEASON

60% + Accurate Since 1982—More In '88 To
BEAT THE SPREAD

★ ★ FEATURES ★ ★

- Predicted Scores All Games
- Season Schedule By Week
- Season Schedule By Team
- Scores By Week
- Scores By Team
- Scoring Summary
- Win/Loss Record Home/Away
- Division Standings
- Stats — Accumulated & Average
- Line By Week
- Line By Team
- Record vs Line
- Record vs Common Opponents
- Individual Team Match-Ups
- Printed Copy All Screens
- 1983-1987 Data Base (Includes All of the Above)
- Easy Updates Playoffs/1988
- AND MORE

Dealer Inquiries Invited

64.95 INCLUDES DISK AND DOCUMENTATION

- IBM, Tandy & Compatibles
- Apple II Series
- Commodore 64 — 128

Stats Needed To Run Program Available In Local Newspapers Or We Will Furnish All Stats By 1st Class Mail. Season Price 40.00.
Our Bulletin Board Will Furnish All Stats, Lines, Predictions and Trends Updated Daily. Season Price 55.00. Program Comes Updated Thru Current Week of Season . . . No Extra Charge.

VISA C.O.D.

ORDERS SHIPPED IN 2 DAYS
PHONE LINES OPEN 24 HRS.
ADD 3.00 SHIPPING & HANDLING

ORDER TOLL FREE
800-722-2277

INFORMATION 214-586-8212

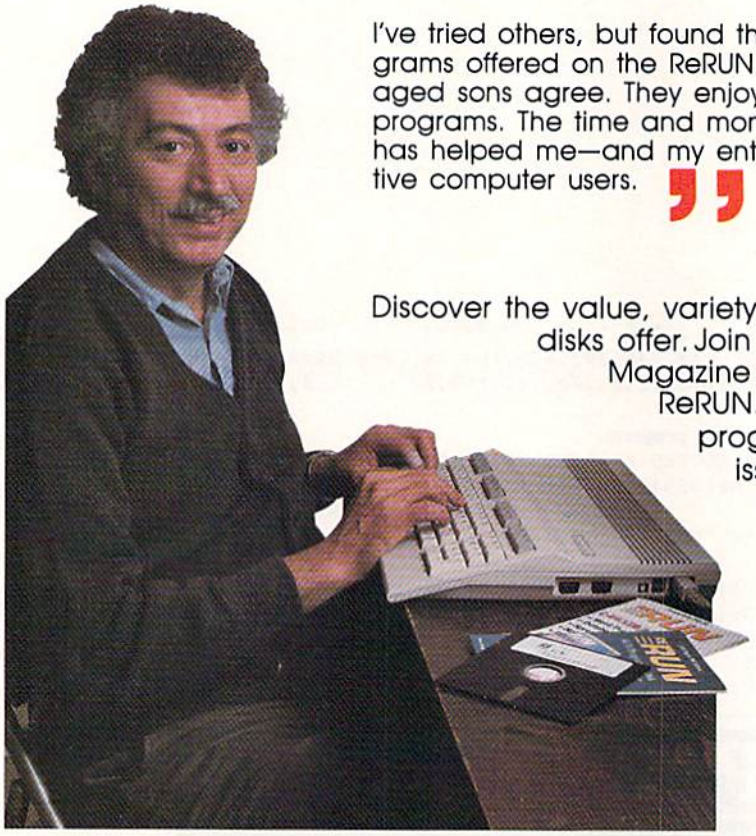
MARATHON SOFTWARE DEPT. 6
P. O. BOX 1349 — 641 FORT WORTH ST.
JACKSONVILLE, TEXAS 75766

TOLL FREE: ORDERS ONLY

Circle 119 on Reader Service card.

NOW ONLY $69.97 A YEAR!

"For my money, RERUN DISKS are the greatest."



I've tried others, but found that the quality and number of programs offered on the ReRUN disk can't be beat. My two teenaged sons agree. They enjoy the games and educational programs. The time and money that I've saved with ReRUN has helped me—and my entire family—become more productive computer users."

—Jim Palmieri, ReRUN Subscriber
Farmingville, NY

Discover the value, variety and ease-of-use that ReRUN disks offer. Join the thousands of RUN Magazine readers who subscribe to ReRUN. Each disk is packed with programs from the two most recent issues of RUN, plus never-before-published BONUS programs. ReRUN is great software at an affordable price, including:

- Word Processing
- Spreadsheets
- Data Bases
- Educational Applications
- Home Entertainment

ORDER A SUBSCRIPTION TODAY! CALL TOLL-FREE **1-800-343-0728**

(single issues available at $16.47 each)



SAVE 30% ON A YEAR'S SUBSCRIPTION

YES! I want to save time and money! Send me the following:

☐ One year (6 issue) subscription to **ReRUN** for only $69.97

☐ Back issues at $16.47 each

_____ month _____ year

_____ month _____ year

☐ Payment Enclosed ☐ VISA

☐ MasterCard ☐ American Express

Card # _____ Exp. Date _____

Signature _____

Name _____

Address _____

City _____

State _____ Zip _____

Add $23.70 for foreign airmail
Please allow up to 2 weeks for delivery

RNA88

mail to:
RERUN 80 ELM ST. PETERBOROUGH, NH 03458

RERUN

TELECOMPUTING WORKSHOP

Confused by the multitude of terminal software? Here are some specifics to look for.

By LOREN LOVHAUG

RECENTLY, I CONDUCTED a seminar at a Commodore show. One of the participants had two queries: "What telecommunications question are you most often asked, and what telecommunications question do you find hardest to answer?"

After some thought, I realized that the reply to both is the same. The most frequent and most difficult telecommunications inquiry I encounter does not deal with the intricate details of baud rates, file-transfer protocols, handshaking or stop bits. Instead, I'm asked, "What telecommunications (terminal) software do you *recommend*?"

This probably seems like an innocent, non-technical question. However, there are literally hundreds of quality public domain and commercial terminal packages available for the C-64 and C-128, with more being added or upgraded every day. The terminal software that's best for you is a matter of personal preference and specific need. So, in the most hallowed tradition of American politics, I generally side-step the issue when queried as I was above. Instead of making specific recommendations, I like to discuss some of the features that I think are "must haves" in a good terminal program, and why.

Modem Support and User Friendliness

The first thing to look for in terminal software is modem support. Your terminal package should let you accurately telecommunicate at your modem's top speed. Most C-64/C-128 terminal programs will have no problem at speeds of 1200 baud, and the better ones render error-free communications at 2400 baud as well.

Almost all terminal packages and modems support the industry-standard Hayes command set. However, if you own an older modem or one that is not Hayes-compatible, you'll have to look for a program that works with your setup.

Another basic characteristic of a good terminal package is a user-friendly interface. You might not think that the way the software's menus or command structures are designed is crucial, but it's probably one of the most important factors to consider.

The goal of terminal software is to provide fast and competent computer-to-computer communications, while giving you as much power and control over the process as possible. If you're currently using a terminal program that's difficult or cumbersome, it's neither efficient nor powerful. When the majority of your online sessions are spent with your eyes glued to the program's documentation rather than the screen, you're probably not telecommunicating very effectively.

Look for terminal software that can be operated intuitively. If a program is menu driven, ask yourself some questions. Are the menus organized in such a way that you can quickly select the options you need? Are submenus organized as part of a logical hierarchy, so that suboptions can be located without having to guess which menus they fall under?

If the software is command- or keyboard-driven, look for key sequences that are mnemonic in nature, and therefore easier to learn and remember. For instance, control/U is a good mnemonic keyboard sequence for uploading because the U key is easily associated with that purpose.

Status indicators are another important user-interface consideration. A good terminal package relates important operating information to the user, without being a nuisance. Feedback like communications settings, up- and download status, buffer space remaining, and so on, should be easy to obtain without disrupting exchanges or cluttering valuable screen space.

File-Transfer Protocols

A crucial terminal program design element involves file-transfer protocols. These are "conversation" rules or standards that ensure accurate transmission between two computers sending and receiving data.

To better understand how protocols work, consider the following from an imaginary computer conversation:

Computer A: I like you. 3 words.
Computer B: Sorry I only heard 2 words. Please repeat your message.
Computer A: I like you. 3 words.
Computer B: 3 words received. Please continue.

In this example, computer A attempts to send computer B a message. After transmitting, computer A informs computer B that the correct message consisted of three words. Unfortunately, computer B only received two words, so it asks for the message to be repeated. In a similar fashion, file-transfer protocols constantly monitor the accuracy of the data being transmitted, and ask the transmitting computer to repeat portions when circumstances indicate that an error has occurred.

Over the years, dozens of file-transfer protocols have been developed, but the two most popular in the Commodore world are the Punter and the Xmodem. Punter protocol is used only by bulletin board systems that are run on Commodore 8-bit computers, while Xmodem is a universal protocol, compatible with almost every type of computer. Both protocols accomplish the same task, but use different rules for data transfer and error detection. Because these two protocols have gained such widespread acceptance within the Commodore community, you should look for a terminal program that, at the very least, supports *both* Punter and Xmodem.

Capture Buffers

Although file-transfer protocols facilitate the accurate transmission and reception of large amounts of data, they're not always the most convenient method for doing so. You should also look for a "capture" or "text" buffering capability when researching terminal software. Capture buffers let you record and store text data "on the fly"—directly as it comes in from your modem. This feature is particularly suited for storing text like electronic mail or public messages and announcements that you want to review at a later time. ►

Capture buffers vary in size from program to program. On the 64, the size of a typical capture buffer is 20K, whereas on the 128, most are in excess of 45K. Twenty kilobytes is usually large enough, but there are times, especially if you frequent national telecommunications networks, when even a 60K buffer won't fit the bill. This is when it's important to have a terminal package that can "dump" the contents of the capture buffer to printer or disk.

Conversely, another very useful capture buffer feature is the ability to load text from disk to the buffer and transmit it via modem. You can save a lot of time and, in the case of national networks, money, by composing long messages off-line, loading them into the capture buffer and then having the buffer send them out through the modem. Some terminal software packages even have built-in text editors expressly for this purpose.

The Age of Automation

Most quality terminal programs have automatic dialers that not only let you store the phone numbers of your favorite BBSs and networks, but will also continuously dial them until you're connected. The best of these autodialers let you create sequences of phone numbers that are automatically and continuously dialed in turn until you get a connection. These features are particularly important in urban areas where you're more likely to encounter busy signals when trying to connect with a popular local BBS.

The most sophisticated terminal packages available for the C-64 and C-128 allow even further automation of your telecommunications sessions. Some display keyboard macros, in which text or entire command sequences can be stored and later recalled at the touch of a key. Basic macro facilities simply let you assign text to your function keys, which can be useful for the storage of passwords or other frequently typed words.

Some terminal programs even have script languages for complete automation of log-on procedures, text buffering, uploads and downloads and remote hosting. In fact, some of these languages are so sophisticated that they can program your terminal package to automatically call a certain bulletin board or network at a prescribed time, buffer new public messages and electronic mail for later off-line viewing, post prewritten messages and log-off—all while you're away from the computer.

That's a brief overview of what I feel are important aspects of quality terminal software. In a future column, I'll size up many of the most popular public domain and commercial terminal packages against the criteria I outlined above. I hope you found this column helpful in your search for the "ultimate" terminal program. ■

Loren Lovhaug is a programmer and writer with a lot of telecommunications experience. You can write to him care of:

Telecomputing Workshop
RUN Magazine
80 Elm St.
Peterborough, NH 03458

COMPUTEREYES™



Capture Video Images: only $129.95

Now you can easily and inexpensively acquire images from any standard video source – videotape, camera, disk – for display on your Commodore 64 or 128. Capture time is less than six seconds.

ComputerEyes has everything you need: Interface hardware, complete easy-to-use software support on disk, owner's manual, and optional enhancement software. And it's compatible with virtually all popular graphics programs. Think of the possibilities!

ComputerEyes is backed by a one year warranty and the success of over 10,000 systems sold. Satisfaction guaranteed or return it within ten days for full refund. Also available: Demo Disk, $3; ComputerEyes with quality b/w video camera, $399.95 complete. See your dealer or order direct. For more information call 617-329-5400.

To order call 800-346-0090
or mail your order to: Digital Vision, Inc.
66 Eastern Avenue, Dedham, MA 02026
VISA, M/C, or COD accepted.
S&H: $4 for ComputerEyes, $9 for Camera System. Mass. residents add 5% sales tax.

DIGITAL VISION

Circle 128 on Reader Service card.

Attention
Foreign Computer Stores/
Magazine Dealers

You have a large technical audience that speaks English and is in need of the kind of microcomputer information that IDG Communications/ Peterborough provides.

Provide your audience with the magazines they need and make money at the same time. For details on selling AmigaWorld, *RUN*, *CD-ROM Review*, *PC Resource* and *inCider* contact:

Marjorie Rubin
Boarts International
747 3rd Avenue
New York, NY 10017
Phone: (212) 688-2778

GEOWATCH

Find out how you can streamline your geoProgramming sessions.

By WILLIAM COLEMAN

THERE IS NO QUESTION that GEOS has revolutionized the use of the C-64 and C-128. Until recently, however, GEOS suffered from one major disadvantage: programming under it was difficult, since its unique disk structures necessitated the use of special programs to modify the machine code so it would run properly.

GeoProgrammer has changed that. It's now much easier to write source code that compiles into true GEOS files. Since most Commodore programmers aren't accustomed to intermediate (linker) files or to using geoWrite files to create source code, I'll discuss some of the finer points of geoAssembler and geoLinker. This won't be a crash course in ML programming, but you do need some familiarity with programming technology. My main emphasis will be on style and efficiency in creating geoProgrammer files.

geoWrite Source Code Files

I admit it: I had misgivings about the fact that all source code files must be in geoWrite format. But I quickly learned that it's really not a problem. GeoAssembler and geoLinker will accept *all* versions of geoWrite files through V2.1. (If possible, try to keep all your source files in the same version; mixing versions is allowed, but it can cause confusion when you try to read error files.)

There are several techniques you can employ to make working with geoWrite files easier. The first, and probably the most important, is to place page breaks at frequent intervals throughout your code. If you don't, geoWrite will have to reformat every time you try to move from one page to another. And, even with a RAM expansion unit (REU), things will slow down considerably if, for example, geoWrite has to reformat ten pages of source code because you inserted three lines of text.

Leave plenty of "white space" within the text area when you are initially designing an application; don't put data on more than about half the page. If you're creating a set of routines that you know will later be expanded upon, don't be afraid to leave a page or two blank (and remember to put a comment to that effect on the top of each page). This will let you insert additions at another time, without increasing the number of pages.

Put the application's name, author, date and so forth on page 1, and include a table of contents that lists the subroutines contained on each page of the file. In this way, you'll be able to quickly locate a subroutine. It may seem like a lot of trouble, but six months later, when you need to correct a bug, you'll be glad you took the time!

Type style and indentation are also important. Choose tab stops for labels, opcodes and comments, and then adhere to them throughout your applications. My personal preference is to place labels, on a line by themselves, in BSW 9-point boldface and the remainder of the source code in BSW 9-point plain. Whatever format you use, remember to be consistent throughout all your files. Font changes don't make things any easier, and they slow down the assembler.

Try not to let subroutines take up more than a single page. While this is not always possible, it helps to follow the flow of logic and makes the code easier to read. If you must split up a subroutine, place a comment line at the top of the second and subsequent pages indicating that the routine begins on a previous page. If you notice that a subroutine is getting too long, try to split it up into several smaller ones. You'll often find generic routines embedded in the subroutine that you can use again in another section of the application.

While geoWrite files of any size will work, larger files—over 15 pages—become cumbersome to maintain and debug. Try to separate your code into several files of related functions—menus and icon data, display handlers, tables, dialog boxes, and so on. The only possible exception to this is when the entire application is less than approximately 20 geoWrite pages; in that case, you can use a single file.

I've found that a handy time-saver is to keep readily available files of generic routines that can be used in virtually any program. For example, I have files that contain routines to clear the screen, drive fileboxes, make beeps, build icon tables, and so forth. These routines are all self-contained, so when I need one, all I do is link it into the application. This saves me from having to reinvent the wheel every time I design a new application.

Include Files

One of the biggest mistakes people make when using Include files is that they try to "include" source code. This is a bad practice for several reasons. Any bugs in the included file will not be flagged—all you'll get is a "hidden error" message. Also, you'll have to completely recompile the included file every time you compile the main file, and this wastes time. A much better solution is to compile each file separately and then let the Linker combine them.

You should use Include files only for constants, equates and macros. In fact, I carry this rule one step further: any source files in any application I write have only one .include statement at the beginning of the file. The .include statements for geosSym, geosMac, and so on, are contained at the beginning of my application's Include file. This type of nesting is perfectly acceptable and works like a charm. Just make sure that the .IF Pass1... etc. sequence that normally surrounds an .include statement is only in a source file; any nested .includes should be by themselves.

VLIR files are a minor exception. Each group of files that makes up a single module can have a second Include file that contains the equates or constants that pertain only to that particular module.

Unfortunately, there's one major exception. The current version of geoLinker has a ten-file limit per module, so you may need to use .include source files to get around this if you're writing a long application. The only other solutions are to make the source files larger to keep the total under ten, or ►

to use a VLIR structure and have the root module load all the others when the application is first loaded. All of these solutions are kludges to a nasty problem. Supposedly, version 2.0 will correct this deficiency, but only time will tell.

Disk Drive Management

If you're lucky enough to own two disk drives, the best way to arrange your files is to have all the system files—geoAssembler, geoLinker, geoWrite and so forth—on one disk, and all of the source files, including the .rel and .lnk files, on the other. If you have a single drive and an REU, then load all of the system files into the REU and assemble/link to the disk.

Single drive users have more of a problem, because you won't be able to get all the files on a single disk unless the application you're writing is extremely small. The best method I've found is to have a "linker" disk that contains geoLinker, geoDebugger, geoWrite, the .rel files, and the .lnk file, and one "assembler" disk that contains geoAssembler, geoWrite, and all of the source and Include files. Whenever you assemble a file or files, you can then copy them to the linker disk for linking. Admittedly, this is a bit awkward, but it works better than any of the alternatives I've tried to date. For really large applications, you might need to use more than one assembler disk.

Another problem single drive users will encounter is the inability to generate a viewable symbol table while linking files. The dialog box that contains this option is only available to dual-drive systems. This oversight should be corrected in the next version of geoLinker.

The .End Command

The .End command is used to stop the assembly of a current file. While you won't normally need this function, certain situations warrant its use. For example, when placed in an Include file, it causes the remainder of the file to be ignored without aborting the assembly of the parent file. I use .end in BSW's Macro file to prevent the assembly of the bit-manipulation macros located at the end of the file. This process leaves room for more of my own macros. If I need to retrieve the old macros, all I have to do is remove the .End statement.

This feature also comes in handy for testing or debugging routines. Simply place them at the end of a source file and insert or remove an .End statement as needed to activate the routines.

In Conclusion

No matter what methods or techniques you decide to use, do be consistent in all of your applications. Continuity in style and procedure makes it easier to debug and maintain your work months after it is "finished." ■

GEOS programming expert Bill Coleman is the GEOS SYSOP for GEnie online service.

Send your questions regarding GEOS to geoWatch, RUN Magazine, 80 Elm St., Peterborough, NH 03458.

Faster than a Speeding Cartridge
More Powerful than a Turbo ROM
It's Fast, It's Compatible, It's Complete, It's...

JiffyDOS

A ROM upgrade for your computer and disk drives that gives you the performance, features, compatibility and convenience missing in other disk-drive speed-enhancement systems.

- Load, Save, Format, access SEQ, REL & USR files up to 15x faster
- Built-in DOS Wedge with 14 add'l commands
- JiffyDOS/128 speeds up disk operations in both 64 and 128 modes
- Easy Installation & Money-Back Compatibility Guarantee
- For C-64, 64C, SX-64, C-128, C-128D, 1541, 1541C, 1541-II, 1571, 1581, FSD1, FSD2, MSD1&2, Enhancer 2000, Excel 2001

Unlike *Fastload, Mach-5, Mach-128, Final Cartridge, and Warp Speed,* JiffyDOS speeds up all disk operations, leaves the cartridge port open, speeds up SEQ, REL & USR files, and works within all types of programs. And, unlike *RapiDOS, 1541 Flash!, DigiDOS, Dolphin DOS,* and other so-called "parallel" systems, JiffyDOS requires no extra cabling between computer and drive, leaves the Cartridge & User Ports open, works with modems, and can be installed on more than two disk drives.

C-64/SX-64 versions $49.95; C-128 version $59.95; Additional drive ROM's $24.95
Please add $4.25 shipping/handling per order. VISA/MC, COD, Money Order accepted
Call or write for more information. Dealer, Distributor, & Users' Group pricing available
Please specify computer and drive when ordering

Creative Micro Designs, Inc.
P.O. Box 789, Wilbraham, MA 01095 — Phone: (413) 525-0023
50 Industrial Dr., E. Longmeadow, MA 01028 — FAX: (413) 525-0147

Circle 166 on Reader Service card.



GET MORE PLEASURE FROM THE BIBLE WITH **LANDMARK**

The Computer Reference Bible

Here's what LANDMARK will enable you to do:

- SEARCH THROUGH THE BIBLE—Find Phrases, words or sentences.
- DEVELOP TOPICAL FILES—Copy from The Bible text and search results then add your own comments and notes.
- COMPILE YOUR PERSONAL BIBLE—Outline texts in color. Add Notes and comments. Create your own supplementary Study files.
- CREATE FILES—Then convert them for use with wordprocessors like Paperclip and GEOS.
- MAKE SUPPLEMENTARY STUDY FILES—and develop translation variations.

SUGGESTED RETAIL **$164.95**

ASK ABOUT OUR FALL '88 SPECIAL!

v1.2 for C64 or v2.0 for C128/1571

CALL OR WRITE TODAY FOR A FREE BROCHURE, WHICH SHOWS HOW VALUABLE LANDMARK CAN BE IN YOUR BIBLE STUDY

P.A.V.Y. Software P.O. Box 1584
Ballwin, MO 63022 (314) 527-4505

ASK FOR IT AT YOUR LOCAL SOFTWARE DEALER!

Circle 221 on Reader Service card.

COMMODORE CLINIC

Want to add nine voices to your C-64? Looking for programs that operate on the 1581 drive? Need to hide your directories from prying eyes? Commodore Clinic has the answers!

By LOU WALLACE

HARDWARE

Q *I need a way to add additional voices to my C-64, beyond the three already built in. I thought I saw an ad for a product that does this, but I can't recall the name. Can you help?*

—DON FERGUSON
ST. MARYS, OH

A The C-64 and C-128 normally have only three sound voices, created by the SID chip. It will take a hardware addition and software designed to use the added hardware to increase the number of voices.

One way to add voices is via an external device. One such product advertised in *RUN* is the SFX Sound Expander. This device adds nine voices to the C-64 through digital synthesis and can be equipped with a keyboard. You can get information on it by writing to Fearn & Music, 519 W. Taylor #114, Santa Maria, CA 93454; 800-447-3434.

Another way is to add a SID chip to your 64. This gives you a total of six voices, in stereo (three per channel). However, it involves modifications to the computer, and would of course void your warranty. And if it's not installed properly by a skilled technician, it could even destroy your computer. Information for adding the second SID can be downloaded from QuantumLink's CIN MUSIC area. The file to download can be found in the SID Utilities area of the Music Room and can be directly downloaded by referring to its file number, 799745. You'll find quite a bit of software support there for this modification, including music files and music editing utilities.

Q *I understand that some RAM expander cartridges, such as the 1750 and 1764, come with (and require) a more powerful power supply than the original that came with the Commodore. Is this true, and if so where do you get these power supplies?*

—SHIBU KINATUKARA
YONKERS, NY

A Only the 1764 (when used with the C-64) requires a new power supply. One already comes with the 1764 cartridge when you buy it. As for the C-128, its power supply is good enough to handle RAM expansion. No other is needed to use the 1700 or 1750 on the C-128.

Q *I'm one of the few people who still has some programs on cassette tapes. And they take so-o-o long to load! I'd like to transfer them to my disk drive, but many of the files are binary and cannot just be loaded and saved to a disk. Is there a copy program that copies from a tape to a disk?*

—RAY TOWER
BYRON, MI

A Since at one time there were many C-64 users with tape systems, you'd think that such a program would have been written, but I have to admit I've never seen one. Perhaps a reader knows of one and can either send it in or tell us where to get it. If he does, I'll publish the information in the Update section of Commodore Clinic.

Q *I have both the SFD-1001 and 1541 disk drives. The SFD drive is interfaced to the computer with the Skyles IEEE Flash 64 interface. My problem is finding a copy program that will let me copy programs from the 1541 to the 1001. Are there any commercial or public domain programs that do this?*

—DOUGLAS BREDA
PETERBOROUGH, NH

A Commodore guru Jim Butterfield wrote a popular program called Copy/All 64 that will work just fine. It's available from just about every user group library, local BBS or national telecommunications network around. It's also on the 1541 Test Demo disk that came with your 1541.

But if you need to copy entire disks, using a track and sector-type copier won't work. In order to get the larger capacity of the 1001 drive, it has to use a different disk format, one that's unfortunately incompatible with the 1541. So, whole disk backups are not possible. But, as mentioned, you can copy a disk one file at a time.

Other problems will arise when you try to run some software from the SFD-1001. Anything that uses the 1541 disk ROMs for faster loading or copy protection will not work correctly on the 1001. And some software may be incompatible with your IEEE interface and not run properly.

SOFTWARE

Q *Is there* any *C-64 or C-128 software available in 1581 format? I have the 1581 drive and nothing to put in it!*

—GEORGE BLOOM
NEW YORK, NY

A Yes, there is. One is Super 81 Utilities ($39.95) by Free Spirit Software (905 West Hillgrove, Suite 6, LaGrange, IL 60525; 312-352-7323). It's available in both C-64 and C-128 modes. Another group of 1581 format programs is available from Abacus Software (5370 52nd St. SE, Grand Rapids, MI 49508; 616-698-0330). They have six titles available in 1581 format. These are: Super C-64 Compiler, Super C-128, Basic 128 Compiler, Chartpak 128, Cobol 128 and Cadpak 128. You can only get these unprotected disks by ordering them as backup copies to the original disks.

PROGRAMMING

Q *I've written a C-64 game for a friend of mine, and the disk directory contains a lot of files I'd like to keep secret from him. Is there any way to hide the directory from prying eyes?*

—RENLY DUTTON
THOUSAND OAKS, CA

A I had to look around quite a bit before coming up with a solution. ►

RUN is a publication of IDG Communications/Peterborough, a division of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 90 computer publications in 33 countries. Fourteen million people read one or more of IDG Communications' publications each month. IDG Communications publications contribute to the *IDG News Service*, offering the latest domestic and international computer news. IDG Communications publications include: ARGENTINA's *Computerworld Argentina*; ASIA's *Communications World, Computerworld Hong Kong, Computerworld Malaysia, Computerworld Singapore, Computerworld Southeast Asia, PC Review*; AUSTRALIA's *Computerworld Australia, Communications World, Australian PC World, Australian Macworld*; AUSTRIA's *Computerwelt Oesterreich*; BRAZIL's *Data-News, PC Mundo, Micro Mundo*; CANADA's *Computer Data*; CHILE's *Informatica, Computacion Personal*; DENMARK'S *Computerworld Danmark, PC World Danmark*; FINLAND's *Tietoviikko, Mikro*; FRANCE's *Le Monde Informatique, Distributique, InfoPC, Telecoms International*; GREECE's *Micro and Computer Age*; HUNGARY's *Computerworld SZT, PC Mikrovilag*; INDIA's *Dataquest*; ISRAEL's *People & Computers Weekly, People & Computers BiWeekly*; ITALY's *Computerworld Italia*; JAPAN's *Computerworld Japan*; MEXICO's *Computerworld Mexico*; THE NETHERLANDS' *Computerworld Netherlands, PC World Benelux*; NEW ZEALAND's *Computerworld New Zealand*; NORWAY's *Computerworld Norge, PC World Norge*; PEOPLE'S REPUBLIC OF CHINA's *China Computerworld, China Computerworld Monthly*; SAUDI ARABIA's *Arabian Computer News*; SOUTH KOREA's *Computerworld Korea, PC World Korea*; SPAIN's *CIMWORLD, Computerworld Espana, Commodore World, PC World Espana, Communicaciones World, Informatica Industrial*; SWEDEN's *Computer Sweden, MikroDatorn, Svenska PC World*; SWITZERLAND's *Computerworld Schweiz*; UNITED KINGDOM's *Computer News, DEC Today, ICL Today, PC Business World, LOTUS*; UNITED STATES' *AmigaWorld, CD-ROM Review, CIO, Computer Currents, Computerworld, Computers in Science, Digital News, Federal Computer Week, 80 Micro, FOCUS Publications, inCider, InfoWorld, Macintosh Today, MacWorld, Computer & Software News (Micro Marketworld/Lebhar-Friedman), Network World, PC World, Portable Computer Review, Publish!, PC Resource, RUN, Windows*; VENEZUELA's *Computerworld Venezuela*; WEST GERMANY's *Computerwoche, PC Welt, Run, Information Management, PC Woche*.

DEALERS SELL

Selling *RUN* will make money for you. Consider the facts:

Fact #1: Selling *RUN* increases store traffic—our dealers tell us that *RUN* is the hottest-selling computer magazine on the newsstands.

Fact #2: There is a direct correlation between store traffic and sales—increase the number of people coming through your door and you'll increase sales.

Fact #3: Fact #1 + Fact #2 = INCREASED ALE, which means money for you. And that's a fact.

For information on selling *RUN*, call 1-800-343-0728 and speak with our Direct Sales Manager. Or write to *RUN*, Direct Sales Dept., 80 Elm St., Peterborough, NH 03458.

RUN

COMMODORE CLINIC

I was just about to give up when I came across this snip of a program (see below) in a Data Becker book called *Tricks & Tips for the C-128*, which is published by Abacus Software. When you type in and run the program, it erases the program file, "$", so when you try to load and list it, you won't get any directory.

A couple of words of warning are in order, however. First, this only works for loading "$", and not with the Directory command. Second, don't do this to any disk that you haven't made a backup of, since what you have done is corrupt the disk directory file, and you could end up losing valuable data or programs. And third, if you are going to do it, prepare the disk first with everything on it you need, then erase the "$" file.

```
10 REM ERASE A DISK $ DIRECTORY
   FILE
20 REM FROM THE BOOK TRICKS & TIPS
   FOR THE C128
30 OPEN 1,8,3,"#"
40 OPEN 2,8,15,"B-P3,144"
50 PRINT#1,CHR$(20)CHR$(20)CHR$(20)
   CHR$(0)CHR$(0)CHR$(0)
60 PRINT#2,"U2:3,0,18"
70 PRINT#2,"I"
80 CLOSE2:CLOSE1
90 END
```

Q *I've been trying to join together two C-128 programs by using the command Concat "Part2" to "Part1". I've also renumbered the programs so they don't have overlapping line numbers. The problem is the C-128 keeps giving me a File Type Mismatch Error message. What am I doing wrong?*

—JAY GREEN
PAHOKEE, FL

A The C-128 is already telling you what is wrong with its error message. The error message means you've told your computer to merge two *program* files, yet Concat is used only for *data* files. To join programs together, you'll need some sort of append utility program, of which there are many. Check your local user's group library or BBS—you may find one there.

Q *Help! I've been waiting in vain for any RUN Amok corrections to RUN Term 128 (January 1988). Since none has appeared, I must assume the listing was correctly published. I've checked and rechecked my listings, but whenever I run the RUN Term 128 Boot program, I get an Undefined Statement Error in 20 message. What am I doing wrong?*

—RICHARD WEST
SPRING VALLEY, CA

A There were no errors in the listing, so I have to think that you've made an error in typing it in. Hopefully, you used the Checksum program to catch most of your errors. However, it won't detect missing lines, which would definitely cause problems, so make sure you haven't skipped any.

Another potential problem is that you didn't create the proper binary files first. Listings 2–5 are not the actual programs; they are used to *create* the binary files. Make sure you've named each of those listings with names like Listing 2, Listing 3, and so on. Then run each one in order, and they'll write to your disk the real RUN Term files needed by the Boot program. Then run the Boot program.

If that fails, you could order the January-February 1988 ReRUN disk, which contains the actual program all ready to run. And for those of you interested, the new RUN Works disk contains an enhanced version of RUN Term, both C-64 and C-128 versions, that has a lot of new features like support for RAM expanders, multiple drives, and so forth.

Q *I'm trying to program sprites from Basic on my C-64, and I'm having problems getting more than one sprite to come on at a time. Assuming the variable V (for VIC II) is equal to 53248, and S is the sprite I want to turn on (0–7), I can then turn on any sprites I want by issuing POKE V+21,2^S. But when I try calling up a second sprite, the first one turns off.*

The line I use to turn them on is: POKE V+21,2^0:POKE V+21,2^1. This should turn on sprites 0 and 1, but instead, sprite 0 comes on for a second, turns off and then sprite 1 is on. What's going on?

—SHAWN ZOOWSKI
CLEVELAND, OH

A The problem is created by your use of two Pokes instead of one. V + 21 is the Sprite Display Enable register, and each of the eight bits in that register determines if a sprite is on or off. If the bit equals 1, the sprite is on; if it equals 0, the sprite is off. So poking 210 turns on sprite 0, 211 turns on sprite 1, 213 sprite 2, and so on. But by poking in each value one at a time, you turn off all the preceding values. Using POKE V + 21,210 + 211 will allow you to turn on two sprites at once.

The flip side of the problem is how to turn off one sprite without turning off the others, which can be difficult if you don't know what others are on. Again, we can use the Poke statement,

but this time we combine it with a Peek command. To turn off a sprite S with a value of 0–7, you'd enter POKE V+21,(PEEK(V+21) AND (255–2↑S)) in your program.

Take a look at what this rather cryptic line does. First, it uses the Peek command to get the contents of memory address (V+21). Then it performs the Boolean function AND on that value, using the expression (255–2↑S) as its argument. If S = 0, then 255–2↑S = 254. ANDing the value found at V+21 with 254 turns off bit 0 if it's on, and leaves it unaltered if it's off. Finally, this new number is poked back into memory location V+21. In general, we can use the above procedure to selectively turn off any bit in a byte.

The earlier example above for turning on two sprites at once is fine as far as it goes. But suppose we want to turn on a specific sprite without changing any of the others. We can use a variation of the Peek and Poke statement above, only this time using the Boolean OR function to selectively set a bit: POKE V+21,(PEEK(V+21) OR 2↑S). Again, S is a value between 0 and 7 that represents the eight sprites. This Poke will turn on any of the eight sprites, and have no effect on the others. You could use these two Pokes as subroutines, which you would call to turn on and off any sprite.

BOOKS

Q *I'm new at this computer business, and while there are some terms that I use and understand, I must admit my ignorance on many others. My question: Can you recommend a good, comprehensive dictionary of computer terms?*

—MARV RUTISHAUSER
BROOKFIELD, WI

A One that I've found both invaluable and easy to use is the *Barnes & Noble Thesaurus of Computer Science* (its ISBN number is 0-06-463594-5). Not only is it full of just about every computer term you can imagine, it also contains hundreds of color illustrations. Best of all, it costs only $6.95.

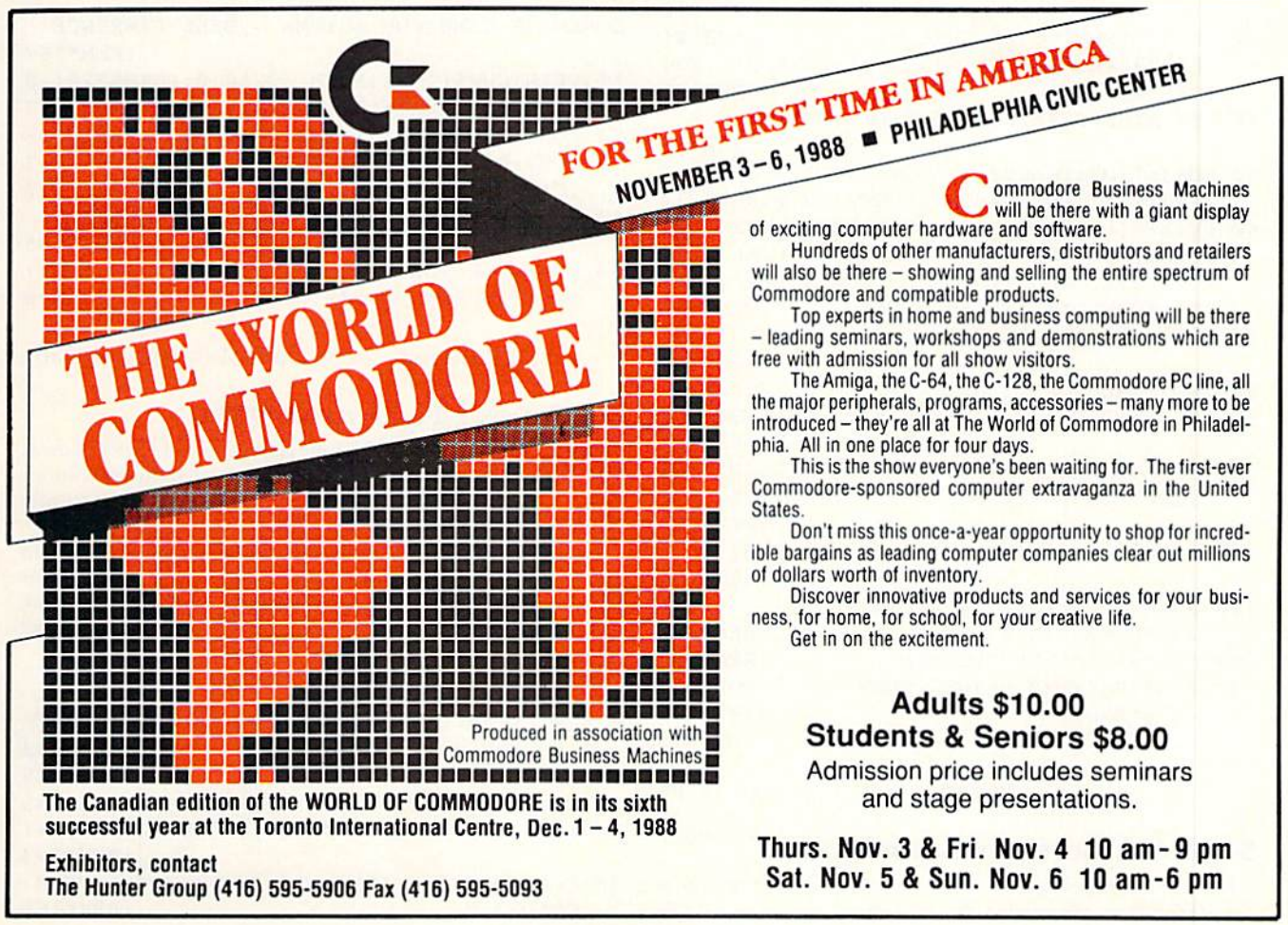
Q *Are there any good books on programming sound and music from machine language on the C-128?*

—JEFF RAYSON
NEW ORLEANS, LA

A I just received a new volume from Tab Books that covers the topic quite well. It's called *Advanced Commodore 128 Graphics and Sound Programming* ($15.95, ISBN 0-8306-8630-4). Besides sound, it also discusses programming 80-Column graphics and contains listings for several powerful sound and graphics programs.

Do you have a problem or question about your Commodore computer system, software or programming? Send your questions to:

Commodore Clinic
RUN Magazine
80 Elm St.
Peterborough, NH 03458.



Circle 54 on Reader Service card.

From p. 10.

1571 and 1581 drives easily accessible, take a spray extension tube (found on cans of lubricants and cleaners) and cut a piece off about ½ to ¾ of an inch long.

Slip the tubing securely over the left DIP switch. Now you simply lift the piece of tubing up for setting the drive to device 8, or press it down to configure the drive as device 9. And you'll never have to disconnect cables, turn the drive around and find a pen just to change device numbers. Plus, since the tubing is firm but flexible, you'll never damage the DIP switches from excessive pressure.

—MARTIN ZINAICH, PLANT CITY, FL

$4D7 RESCUE RUN 64

Accurately dropping supply packages onto a target from a fast-moving airplane requires quick reactions and a steady hand. This program, Rescue RUN 64, has an airplane flying across the screen at randomly chosen altitudes. On each pass, you get one chance to release a package on a ground-based target by pressing any key. Hitting the target wins you 25 points; a bull's-eye is worth 50. Bombs away!

```
Ø REM 64 RESCUE RUN - JOE CHARNETSKI
                                        :REM*1Ø2
1Ø R=54272:FORI=R TO R+23:POKEI,Ø:NEXT:POK
   EI,15:POKE R+5,5:POKE5328Ø,2    :REM*198
2Ø POKE53281,Ø:N=INT(RND(.)*12+1):TC=56267
   +N:TL=1995+N:BT=TL-38:Y=N+3:POKE646,N
                                        :REM*219
3Ø PRINT"{SHFT CLR}{CTRL 9}"SPC(17)RIGHT$(
   "ØØØØØ"+MID$(STR$(S),2),5):POKE R+1,23:
   POKE R+4,2Ø                          :REM*185
4Ø IFS<ATHENPOKE R+4,23:S=S+5:GOTO3Ø
                                        :REM*14
5Ø FORJ=1TO3:POKETC+J,N+2+(JAND1):POKETL+J
   ,16Ø:NEXT:POKE646,N+1:POKE198,Ø:REM*214
6Ø PRINT"{HOME}";:FORI=1TOY:PRINT:NEXT:PRI
   NTTAB(X)" {CRSR DN}{CRSR LF} {CRSR UP}{
   CTRL 9}{COMD *}{CRSR DN}{CRSR LF} {SHFT
    *} {COMD *}":IFK$=""THENGETK$ :REM*139
7Ø IFK$<>""THENIFD<6THENC=X+3:D=D+1
                                        :REM*214
8Ø IFD>1THENPOKE B,32:V=V+1          :REM*13
9Ø IFCTHENB=C+1Ø24+(V+Y+2)*4Ø:POKEB,98
                                        :REM*81
1ØØ IFB>BT-2ANDB<BT+2THENA=S+5Ø+(B<>BT)*25
    :K$="":B=Ø:C=Ø:D=Ø:V=Ø:X=Ø:GOTO2Ø
                                        :REM*235
11Ø X=X+1:IFX< 36 AND B <1984 GOTO 6Ø
                                        :REM*131
12Ø PRINT"{HOME}{2 CRSR DNs}{CTRL 2}"TAB(1
   3)"TRY AGAIN (Y/N)?"             :REM*183
13Ø GETA$:IFA$="Y"THENRUN           :REM*152
14Ø IFA$="N"THEN PRINT"{SHFT CLR}":POKE R+
   24,Ø:END                          :REM*37
15Ø GOTO13Ø                         :REM*216
```

—JOSEPH CHARNETSKI, DALLAS, PA

$4D8 CHARACTERS FROM THE CENTER

Having messages "grow" out from the center of the monitor screen is an eye-catching trick. Letter Extracter works in both 64 and 128 modes. Just assign a message to A$, and you can use it repeatedly in one program with a GOSUB 50000 command.

```
Ø REM 64/128 LETTER EXTRACTOR - BRIAN JAND
  ULA                                   :REM*242
1Ø PRINTCHR$(147):PRINT"{CTRL 2}"  :REM*63
2Ø A$="PRESS A KEY FOR ANOTHER MESSAGE!":G
   OSUB 5ØØØØ                           :REM*77
25 GET A$:IF A$=""THEN 25              :REM*9
3Ø A$="{6 SPACEs}HERE'S THE SECOND MESSAGE
   !{6 SPACEs}":GOSUB 5ØØØØ             :REM*22
35 REM REDEFINE A$ AS NECESSARY    :REM*166
4Ø PRINT:END                           :REM*183
5ØØØØ A=LEN(A$):IFA/2<>INT(A/2)THEN A$=A$+
      "{CTRL 9}"                        :REM*39
5ØØ1Ø FORI=1 TO A/2:PRINT"{HOME}"TAB(22-I)
      ;LEFT$(A$,I)RIGHT$(A$,I):PRINT"{2 CR
      SR DNs}"                          :REM*16Ø
5ØØ15 FORH=1TO4Ø:NEXT:NEXT:RETURN :REM*213
```

—BRIAN K. JANDULA, ANTIOCH, IL

$4D9 C-64 AUTUMN LETTERS ARE A-FALLIN'

Alpha Autumn 64 makes autumn leaves in all their colors fall down your screen in the shape of letters. The value of A gives the letters an unusual twirling effect.

```
Ø REM IN TIME FOR AUTUMN - BILL LAWRENCE
                                        :REM*167
1Ø PRINTCHR$(147):POKE 5328Ø,Ø:POKE53281,Ø
   :A=66:B=32:R1=1Ø31:R2=1471       :REM*197
2Ø FORL=1TO26:C=INT(RND(Ø)*4+7)     :REM*66
3Ø FORI=R1 TO R2STEP4Ø:POKEI,L:POKE54272+I
   ,C:FORJ=1TO5Ø:NEXT                :REM*16Ø
4Ø POKEI,A:FORJ=1TO5Ø:NEXT:POKEI,B:NEXT
                                        :REM*98
5Ø POKER2,L:POKE54272+R2,C:R1=R1+1:R2=R2+1
   :NEXT:FORJ=1TO15ØØ:NEXT           :REM*8
```

—BILL LAWRENCE, WINNEPEG, MANITOBA, CANADA

$4DA DON'T FORGET THE 1902A!

Color Cornucopia (*RUN*, July 1988) showed C-128 owners how to squeeze hundreds of colors out of their 80-column video monitors. Unfortunately, the program has practically no effect on the Commodore 1902A's 80-column screen.

But don't despair. My program uses the C-128's 40-Column mode to squeeze some colors out of the 1902A in Multicolor mode. By drawing series of closely knit, multicolored lines, you can get some unusual colors. For reference, the standard 16 colors are drawn at the top of the screen.

Now, if I could just find a use for these. . . .

```
Ø REM EXTRA C-128 4Ø-COLUMN COLORS - ROBER
  T MORTON                              :REM*23Ø
1Ø GRAPHIC 3,1                          :REM*148
2Ø COLOR Ø,1:COLOR4,1                   :REM*185
3Ø T=T+1:IFT=16GOTO1ØØ:COLOR1,T:COLOR2,T+1
                                        :REM*174
4Ø C=Ø:FORX=ØTO16ØSTEP1Ø:C=C+1:IFC<16THEN
   COLOR3,C                             :REM*168
```

```
5Ø BOX 3,X,Ø,X+1Ø,2Ø,Ø,1                    :REM*75
6Ø NEXT                                     :REM*19Ø
7Ø FORX=Ø TO 16ØSTEP2:DRAW1,X,2Ø TO X,199
                                            :REM*2Ø5
8Ø DRAW 2,X+1,2Ø TOX+1,199:NEXT:SCNCLR
                                            :REM*17Ø
9Ø GOTO 3Ø                                  :REM*216
1ØØ END                                    :REM*228
```

—ROBERT MORTON, DENTON, MD

$4DB C-128/1571 GO64 SAFEGUARD

After using the C-128's GO64 command with a 1571 drive, the drive is still in 1571 mode, even though the computer is in 64 mode. Therefore, it's a good idea to issue the following command after the GO64 command to set things straight:

```
OPEN 15,8,15,"UJ":CLOSE 15
```

Now you can safely load most copy-protected software and programs such as your QuantumLink terminal package.

—ROBERT V. TAYLOR, LITTLE ROCK, AR

$4DC UNRESTRICTED FRACTION CONVERSION

Here's a 64- and 128-mode program that converts any decimal number into a common fraction in lowest terms. The resulting fraction is the precise equivalent in the case of a terminating decimal, and is very accurate, although, of course, not exact, when the decimal number is periodic or irrational. It is more powerful than Magic Trick $3FD (*RUN*, July 1987), which converts only terminating numbers.

Just type it in, using *RUN*'s Checksum, and then run it in either 64 or 128 mode. The accuracy in non-terminating cases can be enhanced by substituting other values for E in line 10. Programmers will undoubtedly find uses for this routine in any programs that display decimal results.

```
Ø REM C-128/C-64 FRACTION CONVERSION - DAN
  ILO R. VELIS                              :REM*21
1Ø E=1E-8:J=2:DIME(16),R(16):INPUT"{CRSR D
  N}NUMBER";N$:T=LEN(N$)                    :REM*16Ø
2Ø I=I+1:C$=MID$(N$,I,1):IFC$<>"."ANDI<TTH
  ENB$=B$+C$:GOTO2Ø                         :REM*46
3Ø T=T-I:T=VAL("."+RIGHT$(N$,T)):U=T
                                            :REM*1Ø1
4Ø IFT=ØTHENB$=B$+C$:GOTO1ØØ                :REM*1Ø7
5Ø T=1/T:E(J)=INT(T):T=T-E(J):R(J)=E(J):R(
  J+1)=1                                    :REM*161
6Ø FORI=1TOJ-2                              :REM*89
7Ø R(J-I)=E(J-I)*R(J-I+1)+R(J-I+2):NEXT
                                            :REM*174
8Ø IFABS(R(3)/R(2)-U)>EANDJ<15THENJ=J+1:GO
  TO5Ø                                      :REM*49
9Ø A$=STR$(R(2)):B$=B$+STR$(R(3))+"/"+RIGH
  T$(A$,LEN(A$)-1)                          :REM*242
1ØØ PRINT"THE FRACTION IS "B$:RUN           :REM*21
```

—DANILO R. VELIS, BUENOS AIRES, ARGENTINA

$4DD LINE-BY-LINE CLEARING ON THE C-64

Anyone who writes programs on the C-64 has probably at some time needed to erase part of the screen, while leaving the remainder intact. There are several ways to do this, such as holding down the space bar or the delete key.

C-64 Line Eraser gives you a much faster and easier way. Just type in this program, save it, then run it. After it's activated, you won't even know it's present until you want to delete a line. To do so, position the cursor on the line, press the F1 key and—zap!—no more line. The program from which you deleted the line is unaffected, and the line is still in the program and in memory, in case you decide you want it back.

```
Ø REM 64 LINE ERASER - MARC TEMANSON
                                            :REM*254
1Ø FORX=49152 TO 49193:READS:POKEX,S:NEXT:
  SYS49152:NEW                              :REM*6
2Ø DATA 12Ø,169,192,141,21,3,169,13,141,2Ø
  ,3,88,96,165,2Ø7,2Ø1,Ø,24Ø                :REM*248
3Ø DATA 3,76,49,234,165,2Ø3,2Ø1,4,24Ø,3,76
  ,49,234,166,214,142,13,3                  :REM*189
4Ø DATA 32,255,233,76,49,234                :REM*224
```

—MARC TEMANSON, PEABODY, KS

$4DE GETTING OUT OF C-128 WINDOWS

Although long-time C-128 users eventually learn how to escape a window on the C-128's 40- and 80-Column modes without pressing run-stop/restore, most new C-128 users don't yet know how. Pressing run-stop/restore will exit the window, but it will also clear the screen and possibly disable any interrupt-driven utilities you may have active.

For those wondering how to properly exit a window, just press the home key twice in Direct mode, or, in a program, enter PRINT"{2 HOMES}", which will accomplish the same thing.

—RICK SPRAGUE, GLADWIN, MI

$4DF MORE SAFE WINDOW EXITS

Pressing the home key twice to exit a window causes the C-128 to reset all line links. Once they're reset, lines that wrap around to form two or more lines are interpreted as individual lines. Therefore, never edit program lines already displayed on the screen after exiting a window in this manner. Rather, clear the screen and display a fresh listing.

—DOUGLAS JOHNSON, LARGO, FL

$4E0 ANOTHER USE FOR REM STATEMENTS

When debugging or testing a new program, you'll find that deleting a line or group of lines comes in handy in many situations. However, instead of deleting the line(s), try inserting a REM statement at the beginning thereof. Use the shifted insert-delete key to insert four spaces at the beginning of the line between the line number and the first statement. Here's an example:

```
10 POKE 53280,0:POKE 53281,0:PRINT CHR$(147)
```

and after inserting the REM:

```
10 REM POKE 53280,0:POKE 53281,0:PRINT CHR$(147)
```

Later, after testing the program, you'll probably want to restore the lines to their original syntax, so list them and remove the REM statement. You'll soon find that this process is one of the handiest uses for the REM statement.

—TONY PATTON, LOUISVILLE, KY ►

$4E1 Fancy Character Printing

If you're writing a program and need to print text to the screen at some point, don't use a standard Print statement. Instead, spice up your program with my fancy print routine, Comet-Like Cursor. It earned its name because it makes the cursor move across the screen while leaving a trail of user-defined letters contained in the variable A$.

```
Ø REM COMET-LIKE CHARACTERS - HELEN ROTH
                                        :REM*252
1Ø A$="THIS CAN BE ANY MESSAGE DESIRED"
                                        :REM*185
2Ø FOR I=1 TO LEN(A$)                   :REM*212
3Ø PRINTMID$(A$,I,1)"{CTRL 9} {CTRL Ø}{CRS
   R LF}";                              :REM*122
4Ø FOR J=1 TO 5Ø:NEXT:NEXT:PRINT" ":REM*7Ø
```

—Helen Roth, Los Angeles, CA ■

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

RUN *pays $10 to $40 for each trick published in the column. A payment of $50 and a Magic Contributor T-shirt is awarded for the Trick of the Month.*

MEGA-MAGIC

Use your joystick as you would a mouse for pointing and selecting.

Joystick Mouse Emulator

With a joystick in port 2, Joystick Mouse Emulator moves a pointer about the screen much as does a mouse input device. Type in Listing 1 (Joystick Pointer) and Listing 2 (Mouse Emulation Demonstration), using *RUN*'s Checksum program to trap your mistakes, and save them to disk.

Plug a joystick into port 2 after you turn off your computer, power up again, and load and run Listing 1, then load and run Listing 2. Listing 2 lists some typical commands on the screen, along with the pointer, calls the machine language routine and waits for the joystick to move the pointer. A formula computes the pointer's screen location (1024–2023 in default) when you press the fire-button.

The pointer moves in the direction you press the joystick. When you move the tip of the pointer over a desired instruction, press the fire-button to get a message identifying your selection. For instance, if you move the pointer to the Print option and press the fire-button, the screen displays the message "You called for Print".

The data for the sprite shape begins at the eighth data element in Listing 1 on line 220. Change this data to create other shapes. Data items 13 and 15 in line 200 change the speed at which the pointer moves; I used values that make it move at a reasonable speed.

You can use Joystick Pointer as a machine language subroutine in your own applications programs. Just use a Gosub command early in your own program to install the ML. Your programs will have to contain a series of If-Then statements, such as the demo program uses, to determine the action taken when you make a selection.

Of course, in using the joystick routine in your own applications, you must map out the format of your own on-screen instructions, commands, options, and so on. The formula in line 70 of the demo program returns the number of the screen cell that the pointer occupied when you pressed the fire-button, by reading the sprite horizontal and vertical registers for the pixel number of the line and column of the sprite. For instance, for a pointer in the upper-left corner of the screen, P = 1024, the first screen location in default memory.

To switch screen locations, adjust the formula by changing 1024 to the number of the first byte of screen memory that your program uses; the joystick routine still works.

—Kenny Lawson, Indianapolis, IN Ⓡ

Listing 1. Joystick Pointer program.

```
1Ø REM JOYSTICK POINTER - KENNY LAWSON
                                        :REM*2Ø4
2Ø FORX=68ØTO695:READA:POKEX,A:CT=CT+A:NEX
   T                                    :REM*123
3Ø FORX=4Ø96ØTO41311:READA:POKEX,A:CT=CT+A
   :NEXT                                :REM*4Ø
4Ø IFCT<>37849THENPRINT"{SHFT CLR}ERROR IN
    DATA STATEMENTS!":END               :REM*62
5Ø PRINTCHR$(147)"RUN LISTING 2 TO SEE MOU
   SE EMULATOR."                        :REM*184
6Ø DATA 165,1,41,254,133,1,32,Ø,16Ø,165,1,
   9,1,133,1,96,162,Ø,189,32,161        :REM*51
7Ø DATA 157,192,2,232,224,64,2Ø8,245,165,1
   7Ø,141,Ø,17Ø,169,11,141,248,7        :REM*181
8Ø DATA 169,1,141,21,2Ø8,169,Ø,141,16,2Ø8,
   141,27,2Ø8,141,31,2Ø8,141,39         :REM*97
9Ø DATA 2Ø8,169,24,141,Ø,2Ø8,169,5Ø,141,1,
   2Ø8,173,Ø,22Ø,133,17Ø,41,16          :REM*1Ø2
1ØØ DATA 2Ø8,6,173,Ø,17Ø,76,19,161,165,17Ø
    ,41,15,133,17Ø,169,15,56,229        :REM*9Ø
```

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

```
11Ø DATA 17Ø,24Ø,228,2Ø1,1,2Ø8,6,32,235,16
    Ø,76,1,161,2Ø1,2,2Ø8,6,32,246 :REM*173
12Ø DATA 16Ø,76,1,161,2Ø1,4,2Ø8,6,32,175,1
    6Ø,76,1,161,2Ø1,8,2Ø8,6,32,2Ø5 :REM*94
13Ø DATA 16Ø,76,1,161,2Ø1,5,2Ø8,9,32,235,1
    6Ø,32,175,16Ø,76,1,161,2Ø1,9   :REM*62
14Ø DATA 2Ø8,9,32,235,16Ø,32,2Ø5,16Ø,76,1,
    161,2Ø1,6,2Ø8,9,32,246,16Ø,32 :REM*159
15Ø DATA 175,16Ø,76,1,161,2Ø1,1Ø,2Ø8,9,32,
    246,16Ø,32,2Ø5,16Ø,76,1,161,76:REM*225
16Ø DATA 52,16Ø,173,16,2Ø8,24Ø,14,173,Ø,2Ø
    8,2Ø8,16,2Ø6,16,2Ø8,169,255   :REM*189
17Ø DATA 141,Ø,2Ø8,96,173,Ø,2Ø8,2Ø1,24,24Ø
    ,3,2Ø6,Ø,2Ø8,96,173,16,2Ø8,24Ø:REM*171
18Ø DATA 11,173,Ø,2Ø8,2Ø1,82,24Ø,3,238,Ø,2
    Ø8,96,173,Ø,2Ø8,2Ø1,255,2Ø8    :REM*2Ø
19Ø DATA 245,238,Ø,2Ø8,238,16,2Ø8,96,173,1
    ,2Ø8,2Ø1,5Ø,24Ø,3,2Ø6,1,2Ø8,96 :REM*12
2ØØ DATA 173,1,2Ø8,2Ø1,245,24Ø,3,238,1,2Ø8
    ,96,162,16,16Ø,1ØØ,136,2Ø8,253 :REM*89
21Ø DATA 2Ø2,2Ø8,248,169,Ø,141,31,2Ø8,76,5
    2,16Ø,174,31,2Ø8,24Ø,243,133   :REM*11
22Ø DATA 17Ø,169,Ø,141,21,2Ø8,96,24Ø,Ø,Ø,1
    92,Ø,Ø,16Ø,Ø,Ø,144,Ø,Ø,8,Ø,Ø,Ø:REM*1Ø9
23Ø 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 :REM*74
24Ø DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
                                   :REM*39
```

Listing 2. Mouse Emulation Demonstration program.

```
1Ø REM MOUSE EMULATION DEMONSTRATION - KEN
   NY LAWSON                       :REM*1
2Ø A$="{5 SPACEs}":B$=A$+"{2 SPACEs}":FORX
   =1TO15:AN$=AN$+CHR$(17):NEXT:AN$=CHR$(1
   9)+AN$                          :REM*74
3Ø PRINTCHR$(147);:PRINT"FILE"B$"COPY"B$"C
   UT"B$"PASTE":PRINT              :REM*1Ø8
4Ø PRINT"DISK"B$"VIEW"B$"HELP"B$"PRINT":FO
   RX=1TO21:PRINT:NEXT             :REM*121
5Ø PRINT"TRANSFER"A$"DATA"A$"TIME"A$"QUIT"
   CHR$(19)                        :REM*25
6Ø C$="":SYS68Ø                    :REM*74
7Ø P=1Ø24+(INT((PEEK(53249)-5Ø)/8)*4Ø)+(IN
   T((PEEK(53248)+256*PEEK(53264))/8)-3)
                                   :REM*82
8Ø IFP<1Ø27THENC$="FILE"           :REM*236
9Ø IFP>1Ø34ANDP<1Ø39THENC$="COPY"   :REM*51
1ØØ IFP>1Ø45ANDP<1Ø49THENC$="CUT"   :REM*17
11Ø IFP>1Ø56ANDP<1Ø61THENC$="PASTE"
                                   :REM*253
12Ø IFP>11Ø3ANDP<11Ø8THENC$="DISK":REM*184
13Ø IFP>1114ANDP<1119THENC$="VIEW"   :REM*Ø
14Ø IFP>1125ANDP<113ØTHENC$="HELP":REM*194
15Ø IFP>1136ANDP<1142THENC$="PRINT":REM*71
16Ø IFP>1983ANDP<1992THENC$="TRANSFER"
                                   :REM*2Ø
17Ø IFP>1996ANDP<2ØØ1THENC$="DATA":REM*245
18Ø IFP>2ØØ5ANDP<2Ø1ØTHENC$="TIME":REM*167
19Ø IFP>2Ø15ANDP<2Ø19THENC$="QUIT" :REM*21
2ØØ PRINTAN$"YOU CALLED FOR{9 SPACEs}{8 CR
    SR LFs}"C$:IFC$<>"QUIT"THEN6Ø:REM*18Ø■
```

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.

```
1Ø REM RUN'S CHECKSUM 64/128 - BOB KODADEK
2Ø MO=128:SA=3328:IF PEEK(4Ø96Ø)THEN MO=64:SA=4
   9152
3Ø FOR I=ØTO169:READB:CK=CK+B:POKE SA+I,B:NEXT
4Ø IFCK<>2Ø651 THENPRINT"DATA ERROR!":END
5Ø POKESA+11Ø,24Ø:POKESA+111,38:POKESA+14Ø,234
6Ø PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":PRINT
7Ø PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO=128
   THEN 1ØØ
8Ø POKESA+13,124:POKESA+15,165:POKESA+25,124:PO
   KESA+26,165
9Ø POKESA+39,2Ø:POKESA+41,21:POKESA+123,2Ø5:POK
   ESA+124,189
1ØØ POKESA+4,INT(SA/256):SYS SA:NEW
11Ø DATA 12Ø,162,24,16Ø,13,173,4,3,2Ø1,24,2Ø8,4
    ,162,13,16Ø,67,142,4,3,14Ø
12Ø DATA 5,3,88,96,32,13,67,152,72,169,Ø,141,Ø,
    255,133,176,133,18Ø,166,22
13Ø DATA 164,23,134,167,132,168,17Ø,189,Ø,2,24Ø
    ,58,2Ø1,48,144,7,2Ø1,58,176
14Ø DATA 3,232,2Ø8,24Ø,189,Ø,2,24Ø,42,2Ø1,32,2Ø
    8,4,164,18Ø,24Ø,31,2Ø1,34
15Ø DATA 2Ø8,6,165,18Ø,73,1,133,18Ø,23Ø,176,164
    ,176,165,167,24,125,Ø,2,133
16Ø DATA 167,165,168,1Ø5,Ø,133,168,136,2Ø8,239,
    232,2Ø8,2Ø9,169,42,32,21Ø
17Ø DATA 255,165,167,69,168,17Ø,169,Ø,32,5Ø,142
    ,169,32,32,21Ø,255,32,21Ø
18Ø DATA 255,169,13,32,21Ø,255,1Ø4,168,96,1Ø4,1
    7Ø,24,32,24Ø,255,1Ø4,168
19Ø DATA 96,56,32,24Ø,255,138,72,152,72,24,162,
    Ø,16Ø,Ø,32,24Ø,255,169
2ØØ DATA 42,2Ø8,198                ■
```

UTILITIES UNLIMITED, Inc.

12305 N.E. 152nd Street
Brush Prairie, Washington 98606

Orders taken 24 hrs. a day; seven days a week.

If you wish to place your order by phone, please call **206-254-6530**. Add $3.00 shipping & handling; $2.00 for COD on all orders. Visa, M/C accepted. Dealer Inquiries Invited.

WORLD'S BIGGEST PROVIDER OF C64/128 UTILITIES

Software Submissions Invited
We are looking for HACKER STUFF: print utilities, parameters, telecommunications, and the unusual.
We now have over 1,000 parameters in stock!

Ad copy by RWS Ind., Inc.

SUPER PARAMETERS 500 PAK

At a time when many programmers are cutting back on writing parameters, we are going full steam! After getting several requests for parameters on many of the "oldies but goodies" **WE DID JUST THAT! ANOTHER 1st: 500 MORE SUPER PARAMETERS** in one pack. This **FANTASTIC 5-DISK SET** is a value of over $100 for less than 1/2.

$39.95

SUPER PARAMETERS 100 PAKS: 1 thru 5

. . . **YOU GET 100 OF THE BEST PARAMETERS, ANYWHERE.** Professionally done, easy to use, reliable, fast and full of performance. This package can remove all protection. Includes titles from all major software publishers for the C64/128.

$14.95@

ALL PARAMETERS ARE TOP QUALITY—NO FILLER OR JUNK

The 'Original' Parameter Cross-Reference

Ever ask, "Is there a parameter for this program? And where do I get it?" **ASK NO MORE!** The answers are all in this book. Over 5,000 listings.

$19.95@

If anything can copy everything, this may be it!

Introducing SUPERCARD

Well folks, here it finally is. THE BEST! There is just not anything better than **Supercard.** Even our competitor has stated that to back up the newest protection schemes, a high powered software/hardware package is needed. **Supercard** is the product of 2 years and $300,000 in total investment. **Supercard** is installed easily into your 1541 or 1541c, in just minutes with no soldering required. This package makes backups of programs that no other utility can touch. With the **Supercard** installed in your 1541 these programs are no threat. This small card (approximately 2" square) plugs in fast and easy with only a screwdriver—and it is software upgradable to cover new schemes. (Call for 1571 version information and price.)

SUPERCARD has done 100% of everything we tested.

$44.95 **C. Games or S. Figher or A. Ranger?** For dual drives add $35.00

Guarantee: If you're not satisfied with **Supercard** for any reason, you may return it in working and saleable condition within 10 days for a full refund, minus shipping and handling charges.

THE FINAL CARTRIDGE III versus super snap shot

The Cartridge war heat up. Well folks, here's the real story!!! In their latest ad, our competition claims they are getting better reviews. Well, that's partly true . . . but mostly false. First of all, they are comparing reviews written about the old Final Cartridge and not the current version III. We at Utilities Unlimited Inc. are so sure that you would choose The Final Cartridge over that other one we make the following offers:

1. 100% no-questions-asked 10-day refund Guarantee.

2. For those of you who bought the super snap shot believing that you were buying the best, then saw the Final Cartridge III, **we offer you $30.00 for your super snap shot, as a trade in for the BEST . . . The Final Cartridge III.**

Every Final Cartridge III now includes many features not found in super snap shot, as well as our newest 64/128 nibbler and 100 Super Parameters.

(NOW W/CLOCK) Still only **$54.95**

SIMILAR PRODUCTS MAY APPEAR ELSEWHERE LATER; JUST REMEMBER YOU SAW THEM HERE FIRST!!

Circle 187 on Reader Service card.

PARAMETERS CONSTRUCTION SET

The company that has **THE MOST PARAMETERS** is about to do something **UNBELIEVABLE.** We are giving you more of our secrets. Using this **UNIQUE** program, it will take your data and automatically **WRITE PARAMETERS FOR YOU;** it will also **CUSTOMIZE** the disk with your name. It will impress you as well as your friends. The **"PARAMETER CONSTRUCTION SET"** is like nothing you've ever seen. In fact you can even **READ PARAMETERS** that you may have already written; then by using your construction set rewrite it with your new **CUSTOMIZED MENU.**

$34.95

(Another first!) THE 128 SUPERCHIP—A, B or C

A There is an empty socket inside your 128 just waiting for our **SUPER CHIP** to give you 32k worth of great **BUILT-IN UTILITIES**, all at just the **TOUCH OF A FINGER.** You get built-in features: **FILE COPIER, NIBBLER, TRACK & SECTOR EDITOR, SCREEN DUMP**, and even a 300/1200 baud **TERMINAL PROGRAM** that's 1650, 1670 and Hayes compatible. Best of all, it doesn't use up any memory. To use, simply touch a function key, and it responds to your command.

B Has super 81 utilities—a complete utility package for the 1581. Copy whole disks from 1541 or 1571 format to 1581. Many options include 1581 disk editor, drive monitor, Ram writer and will also perform many CP/M & MS-DOS utility functions.

C "C" is for combo and that's what you get. A super combination of both chips A and B in one chip, switchable at a great savings to you. **ALL CHIPS INCLUDE 100 PARAMETERS FREE!**

Chips A or B: **$29.95@** Chip C: **$44.95@**

HES MON cartridges (limited supply)	$ 4.95
1541 Mash (for drive alignment)	$14.95
64 BBS; for 1 or 2 drives	$19.95
64 MODEM prg.: w/wargames auto dialer	$14.95
N-CODER & D-CODER: together for only	$14.95
GRAPHIC LABEL MAKER: the original	$12.95
D-COMPILER: for the famous BLITZ!	$14.95
HEAVY DUTY REPAIRABLE 64 POWER SUPPLIES	$39.95
Too many 64 repairs are due to faulty old supplies—don't wait!	
DISK NOTCHERS: double disk capacity	$ 4.95
SECURITY KEYS: lost your dongle? (Golf & bowling)	$ 3.95
Used super snap shot (limited supply)	$29.95
The Original Geos Standardizer	$ 9.95
SUPER NIBBLER: 64/128	$14.95
SUPER CARTRIDGE	$44.95

V-MAX, RAPID LOCK DIGITAL SOLUTIONS™



LOCK PICK—THE BOOKS—for the C64 and C128

Lock Pik 64/128 was put together by our crack team, as a tool for those who have a desire to see the **INTERNAL WORKINGS** of a parameter. The books give you **STEP-BY-STEP INSTRUCTIONS** on breaking protection for backup of 100 popular program titles. Uses **HESMON** and **SUPEREDIT.** Instructions are so clear and precise that anyone can use it. ★**OUR BOOK TWO IS NOW AVAILABLE**★

BOOK 1: Includes Hesmon and a disk with many utilities such as: **KERNAL SAVE, I/O SAVE, DISK LOG FILE** and lots more, all with instructions on disk. A long-time favorite.

BOOK 2: 100 NEW EXAMPLES, Hesmon on disk and cartridge plus more utilities to include: **A GENERAL OVERVIEW ON HOW TO MAKE PARAMETERS** and a **DISK SCANNER.**

$29.95 each OR BUY BOTH FOR **ONLY $49.95**

Now with FREE Hesmon Cartridge.



ADULT GAME & GRAPHICS DATA DISKS

GAME: A very unusual game to be played by a very **OPEN MINDED** adult. It includes a **CASINO** and **HOUSE OF ILL REPUTE.** Please, you **MUST BE 18** to order **EITHER ONE.**

DATA ★: This **POPULAR** disk works with **PRINT SHOP** and **PRINT MASTER.**

Now version 1+2 **$24.95** ea.

For product support, call between 10 a.m. to 4 p.m. Pacific Time.

RUN CLASS ADS

CROWN CUSTOM DUST COVERS

*SATISFACTION GUARANTEED *CUSTOM MADE *HEAVY 32oz VINYL
*COLORS: TAN or BROWN *QUANTITY DISCOUNTS AVAILABLE

COMPUTERS:		DISK DRIVES:		MONITORS	
C-64	$8.00	C-1541/C	$8.00	C-1702	$16.00
C-64C	10.00	C-1571	8.00	C-1802/CM141	19.00
C-128	13.00	C-1581	8.00	C-1902/AMIGA	19.00
C-128D CPU	13.00	AMIGA 3.5	8.00	C-1902A/MAG40	19.00
C-128D KEYB'D	8.00	ENHANCER2000	8.00	C-1084	19.00
AMIGA 500	13.00	FSD-1, -2	8.00	C-2001,2	19.00

PRINTERS: DOT MATRIX 10" $13.00; 15" $16.00 VCR'S: $13.00
Order by Stating Make, Model & Color Choice TAN or BROWN with Check or M.O. Plus $2.00 per Item ($5.00 max) Shp. & Hdl.
CA. Res. Add 6% Tax. COD'S $3.00. SEND DIMENSIONS FOR QUOTES ON COVERS NOT LISTED.
CROWN CUSTOM COVERS, 24621 Paige Circle, DEPT R-1
Laguna Hills, CA 92653 (714) 472-6362

Top-Tech International, Inc.
Advanced Computer Systems

We **repair computers:** Amiga 500/1000/2000, C-64 & C-128, SX-64, VIC-20, Plus/4.
We **repair disk drives:** 1541, 1571, 1581 — **$CALL** — Up to 3 years warranty!!!
We **CARRY** full line of **Commodore** computers and peripherals. We also **HAVE** all CBM's and more Commodore/Amiga **Parts**—Catalog of hardware, parts and more—$5.00.
Service Manuals—Commodore's and/or SAMS'—From $21.95 + S&H ($4.00 minimum).
Special: Best Power Supply for C-64/VIC-20 with 3-yr Warranty—$39.75 (prepaid).
Visa, Discover, Amex & MasterCard
Riverside Plaza, 1100 S. Delaware Ave.
(215) 389-9901 • Philadelphia, PA 19147 • (215) 389-9901

Convert your C64/C128 to a DX7 with the
SFX SOUND EXPANDER

SFX SOUND EXPANDER 9 voice digital synthesizer module	$ 110.00
SFX FULL SIZED KEYBOARD	$ 88.00
SFX COMPOSER & SOUND EDITOR	$ 45.00

MIDI compatible sequencer and editor for Sound Expander
Fearn & Music, 519 W. Taylor #114, Santa Maria, CA 93454
Phone 800-447-3434 In CA 805-925-6682

PRINTER UTILITY PACKAGE

Use any parallel printer with your C-64 without an interface.
Your C-64 has the capability of interfacing directly with any Centronics-compatible printer. This package includes several printed programs that you can add to your own programs, including a utility to allow use of the computer while printing is in progress. Also included are plans for assembling a parallel printer cable and a description of the parallel interface standard. These programs are not on a disk. They are provided in printed form so you can study them and adapt them to your own programs.
$12.50 Check or Money Order to:
SOLUTIONS, PO Box 19774, Seattle, WA 98109

SAVE YOUR FAMILY!

Genealogy software with features to fit every budget and requirement: $29 for LINEAGES/Starter, $49 for LINEAGES/Standard, $99 for LINEAGES/Advanced, and our most comprehensive FAMILY ROOTS for $185. Data is compatible between systems and you may upgrade from one to another. Write or call for details and FREE samples. Satisfaction guaranteed.
QUINSEPT, INC.
PO Box 216, Lexington, MA 02173
1-800-637-ROOT 617-641-2930

LINEAR PROGRAMMER

$$\begin{aligned} \textit{Maximize:}\quad & Z = 2X_1 + X_2 \\ & 3X_1 + X_2 < 44 \\ \textit{Subject to:}\quad & X_2 < 10 \\ & X_1 + X_2 < 18 \\ & 2X_1 + 5X_2 < 60 \end{aligned}$$

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.
Linear Programming System (64/128) **$24.95**
Computer Heroes
PO Box 79, Dept. 126, Farmington, CT 06034
Orders Only 1-800-622-4070

COLOR PRINTER RIBBONS Red, Blue, Green, Brown, Purple, Yellow

Ribbons — Price Each	Black	Color	Ribbons — Price Each	Black	Color
Commodore MPS 801	4.15	4.75	Epson LX 80/90	3.60	4.25
Commodore MPS 802,	5.75	6.75	Epson MX/FX/RX 80/85	3.75	4.25
Commodore MPS 803	4.95	5.95	Okidata 82/92/93	1.75	2.25
Commodore MPS 1000	3.60	4.25	Seikosha SP 800/1000	5.25	6.50
Commodore MPS1200	5.00	6.00	Star SG10	1.75	2.25
Commodore MPS 1525	5.50	—	Star NX10/NL10	5.00	6.00

T-Shirt Ribbons (Heat Transfer)— Call For Price & Availability. For ribbons not listed above, call for price and availability. Price and specifications are subject to change without notice. Min. order $25.00. S & H $3.50. UPS Ground. Add $2.00 C.O.D. addt'l. IL res. add 6.25% tax. MC/Visa accepted.
RENCO COMPUTER PRINTER SUPPLIES
P.O. Box 475, Manteno, IL 60950 U.S.A. • 1-800-522-6922 • 815-468-8081

FREE CATALOG

Discount software for your home computer.
Apple, Atari, Commodore, IBM. . .
WMJ Data Systems-R
4 Butterfly Drive
Hauppauge, NY 11788
(516) 543-5252

NOTHING LOADS YOUR PROGRAMS FASTER THAN THE QUICK BROWN BOX
A NEW CONCEPT IN COMMODORE© CARTRIDGES

Store up to 30 of your favorite programs in a single battery-backed cartridge for easy, instant access. Change contents as often as you wish. The Quick Brown Box accepts most unprotected and "frozen" programs including the only word processor that saves your text as you type, "The Write Stuff." Coexists with GEOS© and Commodore RAM Expansion Units. Loader utilities included for both C-64 and C-128 modes.
16K $69; 32K $99; 64K $129 (plus $3 s/h; MA res. add 5%). Call for "Write Stuff" pkg.
Brown Boxes, Inc., 26 Concord Rd., Bedford, MA 01730: (617) 275-0090; 862-3675.
"Good Reliable Stuff" *Info (Jan/Feb '88)*
"A Little Gem" *Twin Cities 128 (Mar/Apr '88)*
"You'll Never Lose Your Cool, or Your Programs" *RUN (Nov '87)*
"A Worthy Product—Long Overdue" *Ahoy (Feb '88)*

Repair Disk Drives with Physical Exam

Surgically Precise!
- Illustrated manual
- True digital alignment disk
- No special scopes or tools needed
- Used by many repair shops and owners

Specify Commodore Disk Drive, 1541, 1571, etc
Cardinal Software, 14840 Build America Dr., Woodbridge, VA 22191,
Info: (703) 491-6494
$39.95 ea. + $3.50 S&H
800 762-5645

RUN Class Ads

RUN Class Ads were specifically designed to provide the effectiveness of display advertising at the cost of classified advertising. This opportunity gives the Class Ad buyer the lowest cost available to reach *RUN*'s highly qualified circulation of exclusive Commodore 64 & 128 owners.

Need help in designing your Class Ad, questions about rates, frequency or size? Call **HEATHER PAQUETTE at 1-800-441-4403 or 603-924-9471.** On the west coast call **DANNA CARNEY 1-415-328-3470.** We accept checks, money orders, Master Card or VISA.

C-64 REPAIR
$54.95*
INCL. PARTS/LABOR
KASARA MICROSYSTEMS, INC.
33 Murray Hill Drive
Spring Valley, N.Y. 10977
800-248-2983 (Nationwide) • 914-356-3131
SEND FOR CHIPS/PARTS CATALOG
Prices subject to change

Exclusives
Read/Write Heads
Print Heads
Amiga Chips
Our 10th Year
*Plus UPS postage

COMMODORE CHIPS AT LOW PRICES*

6510	$10.95
6526	11.50
6567	16.50
6581	12.85
PLA/82S100	13.25
325572	11.50
325302	11.50
8721	12.50
8520	12.50
901 Series (ROM) (for 2 or more)	10.95
C128 New ROMs	37.95
Amiga Chips	CALL

(And many others in stock)
Quantity Pricing for Dealers

RUN CLASS ADS

WIN LOTTO MILLION$!!!

NEW RELEASE! LOTTO PICKER™ PLUS v2.1

Lotto Picker™ Plus stores winning Lotto 6/7, Keno 10/11, & Pick 3/4 numbers & uses multiple statistical analysis (hot, cold, & unbiased numbers) to wheel what might be your million dollar ticket! Guaranteed to work for all Lotto-style games worldwide. Easy-to-use, fully documented, and not copy protected. Includes a database editor, programmable games, and much, much more! Never obsolete—Pays for itself! **$34.95** (Plus $5.55 S&H). **ORDERS: 1-800-634-5463 ext. 293. GE RIDGE SERVICES**, 170 Broadway, Suite 201-R, New York, NY 10038. NY residents add sales tax. For IBM-PC & compatibles, PS/2, C64/128 & Apple II. Inquiries: 718-317-1961. IBM-Apple 3.5 inch—add $10.00.



BIG BLUE READER 128/64

Commodore <=> IBM PC File Transfer Utility



Big Blue Reader 128/64 transfers Commodore word processing, text, ASCII and binary files to IBM PC compatible MS-DOS disk and vice versa. REQUIRES either the 1571 or 1581 disk drive. BBR 128 supports C-128 CP/M files, 17xx RAM exp. and more. Both 128 and 64 applications are on one disk **ONLY $39.95.** BBR 64 available separately **ONLY $29.95.**

SOGWAP Software
115 Bellmont Rd., Decatur, IN 46733
Ph. (219) 724-3900

news | reviews | tips | examples | articles | geoworld

GEOWORLD

The definitive magazine of GEOS

Send check or m/o to:
GEOWORLD
38 Santa Ynez St.
Santa Barbara, CA 93103

$20.00 - 12 issues
OK

GAME DESIGN FLASHY TRICKS OF THE TRADE

FIND OUT HOW IT'S DONE. Includes 5 handy utilities, 15 great new [c] GAMES, and more. 3-D Color Graphics, Animation, Sound and Music all fully explained with working examples. Arcade Action, Logic, Chance, and Strategy are covered, plus timing, scoring, AI/Expert Systems and $COMMERCIAL$. Besides all of the theory and practice, the games alone are worth $29.95 PPD. Disk.

RKDO, RT 1 Box 199A, Stanley, Wis 54768

90 Day Warranty on refurbished

C-64 Power Supply

Return your old *supply for $6.00 Your cost **$16.95** plus shipping

Power Supply w/o returning old supply $22.95 + $3.50 S & H

*Returned supplies must be genuine Commodore Brand. Commodore is registered ™ of Commodore Electronics, Ltd.

Cardinal Software, 14840 Build America Dr., Woodbridge, VA 22191 Info: (703) 491-6494

800 762-5645

Commodore Amiga Service Center

C-64 Repair $39.95 includes parts/labor

C-128 . . . $64.95
1541 . . . . . 25.00 (alignment)
1571 . . . . . 25.00 (alignment)

CALL for Commodore Chips & Power Supplies at *low* prices.

A&M Computer Repair
20 Guernsey Drive, New Windsor, New York 12550
(914) 562-7271

FINALLY! A Music Program that is Easy to Use and Powerful

The MAESTRO! for the C-64 and C-128 (64 mode)

Easiest and fastest music entry and playback. Powerful—can accommodate almost all popular and classical music. Add feeling by conducting music using keyboard and up to eleven designated changes each, in tempo and volume. Orchestrate up to four different sounds for each voice. Cut and Paste. Transpose. Play part of a song. Play program of up to 20 songs in any order. Excellent for learning individual vocal parts. Includes 24 sample songs, and Sound Designer program. Joystick needed for music entry only. 5¼ in. diskette and manual—$24.95 + $3 shipping. CA residents add tax.

Zwetzig Associates, Dept. S-R, 5932 Bruns Ct., Oakland, CA 94611

M. D. KRAM Won $74,000

Finishing 1st of 484 using his ULTRA-PICK Computer Program at CAESARS PALACE Las Vegas, Nevada World Cup Thoroughbred Handicapping

ULTRA-PICK $395.00
EXACTA $995.00
TRIFECTA $5,000.00
HANDICAPPING... $99.95

215-435-4178

COMMODORE 64-128

FINEST PUBLIC DOMAIN PROGRAMS
PRETESTED QUALITY PROGRAMS • $1.50 • ON DISK
YOU PICK THE PROGRAMS THAT **YOU** WANT!!!
FREE DISK FULL OF PROGRAMS WITH FIRST ORDER

FOR YOUR OWN LIST AND DESCRIPTION OF THESE PROGRAMS SEND JUST A SASE TO:

JLH CO.
DEPT A
BOX 67021
TOPEKA, KS 66667

FREE 10-DAY TRIAL • SEND NO MONEY

■ **I need to get organized** ■ **I wish it were easier to plan things**
■ Word Processors are OK, but I have trouble deciding what to say and how to organize it

*If you checked even one, you need **LIST MASTER** (C64 Disk: $29.95).*

This Idea Processor. List Keeper and Outliner helps you think, plan, compose, organize. Well documented with Context-Sensitive Help. Interfaces with Word Processors.

PLUS: FREE BONUS with this ad: **MENU MASTER** (value $25) presents **LIST MASTER** files in menu-driven form. Put address lists, catalogs, even manuals on disk in a way that's quick & easy to retrieve & peruse. Yours to keep even if you don't buy!

FULL PRODUCT SUPPORT & SATISFACTION GUARANTEED:
IF NOT FULLY SATISFIED SIMPLY RETURN PRODUCT. CALL 415/563-0660 or write:

XYTEC **1924 Divisadero, San Francisco, CA 94115** or just ask for our FREE CATALOG

NEW NEW

ATTENTION ROLE PLAYERS

The industry leader in Apple role-playing aids announces our first Commodore conversions. Call or write for more current product list. **CHARACTER EDITORS ($19.95)** -Might and Magic, Bards Tale 1, Bards Tale 2, Bards Tale 3, Wasteland, Wizardry 1, Ultima 3, Ultima 4. **MISC. MIGHT AND MAGIC** - Hint Book ($9.95), Monster Editor ($12.95), Users Group ($10.00).

Add $3.00 for shipping/handling. See A + ad for Apple software.

GOSSELIN COMPUTER CONSULTANTS
P.O. Box 1083 • Brighton, MI 48116 • (313) 229-2453

THE AMAZING NEW VOICE MASTER Jr. Junior

Get speech output and voice recognition in ONE product. Voice Master Jr. is easy to use with new commands added to BASIC. A music bonus lets you write and compose by whistling the tune! Unlimited uses for fun, education, practical applications. Demo programs included. Price only $39.95 including software and manual. A Patented price/performance breakthrough!



TO ORDER BY MAIL include $4 shipping & handling ($6 Canada, $12 overseas) per order. Visa, MasterCard phone orders accepted. Available for C64/128 and Atari 800/800XL/130XE. Specify when ordering. 30 day money back guarantee, one year warranty. Other enhanced voice I/O systems are available for Commodore, Apple, and IBM computers.

$39.95

Call or write today for FREE Product Catalog

COVOX INC. (503) 342-1271
675 Conger St., Eugene, Oregon 97402

RUN CLASS ADS

TRY BEFORE YOU BUY! Yes We Accept:

Best selling games, utilities, educational, and classics plus new releases!

- 100's of titles
- Low prices
- Same day shipping
- Free brochure



RENT-A-DISC
Frederick Bldg. #223
Huntington, WV 25701
(304) 529-3232

AUTHORIZED COMMODORE AMIGA SERVICE CENTER

C-64 REPAIR
37.95*
120 DAY WARRANTY
* Some limitation supply

C-64	$37.95
*1541 (Repair)	$45.95
SX-64	$60.95
C-128	$65.95
*1571 (Repair)	$45.95
AMIGA Products	CALL

*Not including head stepper motors or spindle motor.
We also service Epson, Star, NEC, IBM, Zenith, Apple, Okidata & COMPAQ
Discounts for Dealers and Schools.

Computer Service Center
1310 S. Dixie Hwy. Ste. 18W, Pompano Beach, FL 33060
For more info call 305-785-2490

FEDERATION SPACE

FINALLY! The ultimate star fleet battle simulation available exclusively for the power of your Commodore 128. Depart for your mission on one of six highly sophisticated federation vessels utilizing a complex array of power systems, weapons, electronic scanning and sensing devices, and many other ship systems. Engage countless foes that are as equally sophisticated as they are unique. Only the best ingenuity will make you admiral of Star Fleet.



MICROTEK SOFTWARE

Send check or money order for $19.95 to:
MICROTEK SOFTWARE
4230 Eighth NE, #302
Seattle, WA 98105
Add $2 for shipping and handling

CAD

NOW! ELECTRONIC TECHNICIANS, HOBBYISTS, AND ENGINEERS can design:
- OSCILLATORS
- POWER SUPPLIES
- AMPLIFIERS
- FILTERS

and
- LAYOUT CIRCUIT BOARDS

on your C-64 or C-128.

COMMODORE & IBM
RADIO SHACK COCO 2 + 3
YES! We accept

Demo Disk $7.50 postpaid
Orders only 1-800-356-8113

ENTER your required input/output specifications and the computer designs the circuit.
ELEVEN user-friendly, Computer Aided Design programs will help you build any custom device.
FREE detailed info.

Write:
WEASELGRAPHICS
Dept. A8
606 Thomasville, Pocahontas, AR 72455

RUN'S BEST SOFTWARE!
PRODUCTIVITY PAK III

- RUN Script Plus Word Processor
- RUN Calc Spreadsheets
- RUN File Database
- RUN Notepad
- For Commodore 64 and 128 computers

ONLY $19.97
(including postage & handling)

***RUN* Magazine, 80 Elm St., Peterborough, NH 03458**
CALL TOLL-FREE 1-800-343-0728

C-128	$57.00	Amiga 500	$70.00
1541/1571 Repair	$40.00	Amiga 1000	$77.00
SX64	$57.00	Amiga 2000	$89.00
		All Commodore monitors	$57.00

C-64 repair—$34.95
128D—$70.00

Prices include parts/labor
90 Day Warranty
Call for unlisted products
Discount for dealers & schools

Computer Technologies
1313-B Washington Ave.
Titusville, FL 32780
(407) 269-1081

AUTHORIZED COMMODORE SERVICE CENTER

"For my money, ReRUN DISKS are the greatest.

I've tried others, but found that the quality and number of programs offered on the ReRUN disk can't be beat. My two teen-aged sons agree. They enjoy the games and educational programs. The time and money that I've saved with ReRUN has helped me—and my entire family—become more productive computer users."

—Jim Palmieri, ReRUN Subscriber
Farmingville, NY

Discover the value, variety and ease-of-use that ReRUN disks offer. Join the thousands of *RUN* magazine readers who subscribe to ReRUN. Each disk is packed with programs from the two most recent issues of *RUN*, plus never-before-published BONUS programs. ReRUN is great software at an affordable price, including:

• Word Processing • Spreadsheets
• Databases • Educational Applications
• Home Entertainment

ORDER A SUBSCRIPTION TODAY—ONLY $69.97!
(Single issues $16.47 each)
CALL TOLL-FREE 1-800-343-0728

RUN
Class Ads

RUN Class Ads were specifically designed to provide the effectiveness of display advertising at the cost of classified advertising. This opportunity gives the Class Ad buyer the lowest cost available to reach *RUN*'s highly qualified circulation of exclusive Commodore 64 & 128 owners.

Need help in designing your Class Ad, questions about rates, frequency or size? Call **HEATHER PAQUETTE at 1-800-441-4403 or 603-924-9471**. On the west coast call **DANNA CARNEY 1-415-328-3470**. We accept checks, money orders, Master Card or VISA.

NOVEMBER

Coming Attractions

Entertainment Software—
The Commodore software market is healthier than ever, and nowhere is this more evident than in the games arena. Arcade games, sports, simulations, fantasy—find out what software developers will be offering for the holiday shopping season.

Presidential Trivia—
How well do you know presidential history? Find out next month with a challenging and entertaining trivia game.

Circuit Tour—
For those who are curious about the mysteries inside a Commodore, we'll provide a guided tour of the chips, buses and other wonders.

In Addition—
Utilities, home applications, programming, program listings, reviews and more. We're also planning a sneak look at the latest version of GEOS. You won't be disappointed.

ReRUN Preview—
Here are some of the programs on the September-October ReRUN disk: **Try To Remember (64)**—Challenge your spelling skills; **Programmer's Pager (64)**—Highlight program lines having errors; **Knock! (64/128)**—Play Cards-31 with your computer; **Kracking the Kernal (64)**—Learn how to manipulate the C-64's powerful Kernal routines; **Songs in the Key of C-128 (128)**—Compose, record and play music with your C-128; **Instant Test-Maker (64/128)**—Quickly create and print tests and quizzes; **Easy Banners (64/128)**—Printing huge banners was never easier; **Monkey See (128)**—Test your powers of concentration with your C-128; **Tool for Teachers (64)**—Statistically analyze test scores; **Joystick Mouse Emulator (64)**—Bring the function of a mouse to your joystick.

List of Advertisers

(603) 924-7138 or (800) 441-4403
National Advertising Sales Manager: **Ken Blakeman**
Northeast Sales: **Barbara Hoy**
Midwest/Southeast Sales: **Nancy Potter-Thompson**
Western States Sales Manager: **Giorgio Saluti, (415) 328-3470**

Reader Service		Page
18	Activision	CIII
79	Aprotek	29
73	Briwall	76, 77
228	Buena Vista	51
*	C.O.M.B.	36
*	Cinemaware Corp.	11
*	Cinemaware Corp.	13
15	Computer Direct	62, 63
226	Computer Repeats, Inc.	75
166	Creative Micro Designs	84
154	Datel Computers	22, 23
128	Digital Vision	82
12	EPYX	CII
105	EPYX	31
158	Entertainment On Line	71
66	Loadstar	1
*	Lyco Computers	48
119	Marathon Software	79
53	MicroIllusions	CIV
68	Micro Prose Software	6, 7
103	Micro Prose Software	9
*	Mindscape, Inc.	25
98	Montgomery Grant	57
*	NRI Schools	33
229	New World Computing	2
221	P.A.V.Y. Software	84
183	Quantum Link	5
224	Rainbird	27
*	*RUN*	
	Christmas Subscription Ad	16
	Special Issue	37
	RUN Works	48D
	GEOS Power Pak	65
	ReRUN Subscription	80
	Class Ads	93–95
245	Software Discounters of America	55
111	Software Simulations	61
40	SubLogic Corp.	66
*	Tab Books	73
179	Taito Software	38, 39
155	Tenex Computers	67
54	The Hunter Group	87
209	Tussey Computer Products	18, 19
187	Utilities Unlimited	92
*	Value-Soft	69
96	Xetec, Inc.	35

For further information from our advertisers, circle the corresponding Reader Service number on the adjoining card.
*This advertiser prefers to be contacted directly.

RUN Alert: As a service to its readers, *RUN* will periodically publish the names of companies who are having difficulties meeting their customer obligations or who have gone out of business. Readers are advised to contact **Lisa LaFleur, Customer Service Representative, *RUN* Magazine, 80 Elm St., Peterborough, NH 03458**, before dealing with these companies: **S&S Wholesalers, Compumed, Pro-Tech-Tronics, White House Computer, Prism Software** (Waco, Texas) and **Underware.**

President
Michael Perlis

Vice-President/General Manager
Roger Murphy

Vice President
Stephen Twombly

Circulation Director: **Frank S. Smith;** Circulation Manager: **Bonnie Welsh;**
Newsstand Sales: **Linda Ruth;** Direct Marketing Manager: **Paul Ruess;**
Direct Sales Manager: **Michael Carroll;**
Director of Credit Sales & Collections: **William M. Boyer;**

Corporate Production Director: **Dennis Christensen;**
Corporate Production Manager: **Susan Gross;** Manufacturing Manager: **Lynn Lagasse;**

Typesetting Manager: **Linda Palmisano;** System Supervisor: **Doreen Means;**
Typesetter: **Debra A. Davies**

Manuscripts: All manuscript contributions, queries, requests for writer's guidelines and any other editorial correspondence should be directed to *RUN*, Editorial Offices, 80 Elm St., Peterborough, NH 03458; telephone: 603-924-9471.

Subscription problems or address changes: Call 1-800-525-0643 (in Colorado, call 447-9330), or write to *RUN*, Subscription Services, PO Box 58711, Boulder, CO 80322-8711.

Problems with advertisers: Send a description of the problem and your current address to: *RUN*, 80 Elm Street, Peterborough, NH 03458, ATTN.: Lisa LaFleur, Customer Service.

Back Issues: *RUN* back issues are available for $3.50, plus $1 postage and handling, from: *RUN*, Back Issue Orders, 80 Elm St., Peterborough, NH 03458.

Problems with ReRUN: Write to ReRUN, 80 Elm St., Peterborough, NH 03458, or call 1-800-343-0728.

***RUN*'s BBS**: The RUNning Board is *RUN*'s reader feedback bulletin board, which you can call anytime, day or night, seven days a week, for up-to-date information about the magazine, the Commodore industry and news and information of interest to all Commodore users. Call: 603-924-9704.

The Monster Arcade Hit Comes Home!







Go ahead Go on a RAMPAGE!

Now available for Tandy 1000, IBM PC and 100% Compatibles,* Apple II Series, and Commodore 64/128. See your retailer or call 800-227-6900, to order direct.

**includes both 5¼ and 3½ inch disks*

ACTIVISION.

TM and © Bally Midway Mfg. Co. All rights reserved. Used under authorization. Tandy ® screens shown. Screens may vary depending on computer system. Tandy is a trademark of Tandy Corporation. Covered by limited warranty.

The FAERY TALE Adventure™



NOW AVAILABLE ON COMMODORE 64/128 AND AMIGA

Fear and death have come to the once peaceful land of Holm. Ogres plague the roads and wraiths walk the night! For the Necromancer has stolen the Talisman that once kept the world safe, but hope is not lost! With your help, three brothers may venture forth through thick woods and lonely mountains, across vast oceans and swampy bogs in search of the evil Necromancer and a way to defeat him. So be strong of heart and true of purpose and you may complete the Faery Tale Adventure!

The Faery Tale Adventure is a superior game of epic proportions. Over 19,000 colorful smoothly-scrolling screens make up a world full of castles, inns, cities and dungeons that take months to explore. An exceptional soundtrack sets the mood for wandering, combat and nighttime sequences through this magical land. A must for everyone's library!

QUEST AND EXPLORATION GUIDEBOOK AVAILABLE to help you complete the Faery Tale Adventure!

All Microillusions Entertainment and Educational products are developed especially for and are available on Amiga, C64/128, MAC, Apple II/GS, and PC/MS-DOS/Tandy formats.

microillusions™

17408 Chatsworth St., Granada Hills, CA 91344 Inside CA 818/360-3715, Outside CA 800/522-2041

D-MI01-AD1CM

Circle 53 on Reader Service card.