

**2<sup>nd</sup> ANNUAL**  
**Shopping Guide**  
**FOR COMPUTER LOVERS**

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# FAMILY COMPUTING

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Personal Finance  
Program**



# FAMILY COMPUTING

## FEATURES

**27 ANNUAL SHOPPING GUIDE**  
**2ND ANNUAL BEST-  
EVER SHOPPING GUIDE  
FOR COMPUTER LOVERS**

**28 ANNUAL SHOPPING GUIDE**  
**SOMETHING FOR  
EVERYONE**

by Roxane Farmanfarmaian  
A compendium of the best, most ingenious, and most useful computer gifts from \$6 to \$600.

**32 ANNUAL SHOPPING GUIDE**  
**BEST HARDWARE PICKS  
OF '85**

by Nick Sullivan  
Catch up on trend-setting hardware with picks of the year's best computers, disk drives, monitors, and printers.

**36 ANNUAL SHOPPING GUIDE**  
**SEASONAL SPECIALS**

by Karen Kane  
Special offers, prizes, and free software from over a dozen manufacturers.

**37 GROUP GAMES  
FOR THE HOLIDAYS**

by James Delson  
Gather 'round the warm light of the monitor with games everyone in the family will enjoy.

**40 TECHNOLOGY WITH  
A HEART**

by Linda Williams  
In this story of one couple, 15 children, and five computers, miracles do happen.

**42 HANDS ON: CLEAN  
YOUR COMPUTER AND  
LOOK AROUND INSIDE**

by Henry Beechhold  
How to clean out the dust, grime, and grit inside your computer. Second in a six-part series.

PLUS: A SHORT COURSE IN METERING

## PROGRAMMING

**47 THE PROGRAMMER**

**48 TIPS TO THE TYPIST**

**50 BEGINNER PROGRAM**  
Get into the holiday spirit with *Jingle Bells*. For ADAM, Apple, Atari, Commodore, IBM PC & compatibles, Macintosh, Tandy CoCo & Models III & 4, TI-99/4A, and VIC-20.  
PLUS: HOW TO WRITE MUSIC PROGRAMS

**60 PROGRAMMING P.S.**

**61 PRODUCTIVITY PROGRAM**  
Find out whether you've written too much or too little with *Wordcount*, a utility for ADAM, Apple, Atari, Commodore, IBM PC & compatibles, Macintosh, and Tandy CoCo & Models III & 4.

**66 HOLIDAY PROGRAM**  
Trim your Yuletide tree on-screen with *Christmas Tree Construction Set*. For Atari, Commodore, and IBM PC/PCjr computers.

## K-POWER

**75 The Queen of King's  
Quest II**

Roberta Williams of Sierra tells what it takes to design ground-breaking arcade/adventure games.

**76 Special Ks' Buyer's  
Guide to Controllers**

Find out which is the joystick for you in this year-end review of the best on the market.

**78 Dr. Cursor's Clinic**

Exploring cartridges, and the difference between dot-matrix and letter-quality printers.

**80 Game Strategies**  
Tips, tricks, and hints for playing your favorite games.

**84 Microtones**  
A new beat for "Rudolph the Red-Nosed . . ."

**88 Compucopia**  
It's *Jugger-Naut*, a fast-action game for the new year.

**88 Contest**  
Have a great idea for a contest? Enter the Contest Idea Contest for a chance to see it in K-POWER in '86.

## WHAT'S IN STORE

**90 SOFTWARE GUIDE  
AND REVIEWS**

Twenty-four new and noteworthy programs.



## DEPARTMENTS

**4 EDITOR'S NOTE**

**8 LETTERS**

**12 HOME-SCHOOL  
CONNECTION**

by Larry Kregel  
Your computer can help pair you up with the perfect college.  
PLUS: A SAMPLER OF SAT SOFTWARE

**14 HOME/MONEY  
MANAGEMENT**

by Matthew Stern  
How to choose the best finance program for your family's needs.

**19 TELECOMPUTING**

by Nick Sullivan  
Electronic mail lets you send documents over the phone lines to clients and family across the country.  
PLUS: A ROUNDUP OF ELECTRONIC MAIL SERVICES

**25 COMPUTING CLINIC**

**106 CLASSIFIED**

**108 ADVERTISERS' INDEX**

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**COMING IN JANUARY:**  
1986 Computing Family of the Year Contest Announcement. Watch for rules and prizes.

COVER PHOTOGRAPH BY RICK BARRICK



[ SEE PREVIOUS PAGE ]

## HERE'S HOW YOUR FAMILY CAN PARTICIPATE IN

### *The Family Software Spectacular*™

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CIRCLE READER SERVICE 49

# LETTERS

## BRINGING THE FAMILY TOGETHER WITH COMPUTERS

Your magazine has proved to be the door to the world of computing for me personally and my family. Neither my parents nor my sister (10 years old) were ever interested in computers until I optimistically introduced FAMILY COMPUTING to them. It was the September 1985 issue, which contained the article, "A Parent's Guide To Learning At Home With Computers."

The magazine magically and instantaneously fascinated the family, especially my father. It actually drove him to buy the highly praised IBM PC. The "Tips," "Glossary," and "Primer" (all included in the article) helped tremendously in our ever-growing knowledge of computers. Coincidentally, an additional article in the same issue (wow!), the "Buyer's Guide to Low-Cost Printers," helped the family decide to buy a printer that fit our budget.

After reading the article myself and also letting my family read it individually, we discussed it, and that brought my family together. For that, and all else, I thank you. Your magazine is easy for beginners and also challenging for experts. It was easy for me and my family because you are truly a family magazine. My family, thanks to you and your magazine, is now a computing family.

ANDY SZUL JR., 15, and family  
Philadelphia, Pennsylvania

## APPLICATIONS FOR BUSINESS

My family and I are recent subscribers, and I would like to compliment you on a fine, family-oriented computer magazine. I have just recently acquired a home computer, a Commodore 64.

I thoroughly enjoy FAMILY COMPUTING and will continue to read it, although I am currently investigating specific business applications which are beyond the FAMILY concept. But my family will continue to explore FAMILY COMPUTING.

ANDREW L. STRUTHERS  
Lincoln, Nebraska

EDITOR'S NOTE: Responding to increased requests from our readers, we've expanded our business—and, in particular, our home business—coverage. Take a look at the October cover story, "Buyer's Guide to Business Computer Systems," and, in September, "Computerizing Your

Small Business." We regularly publish tips and reviews of business software in our Working at Home department. And don't miss the upcoming February issue for a unique approach to using your computer at home to help out in the office. To obtain previous business articles, you can order back copies of FAMILY COMPUTING for \$3.95. Make checks or money orders payable to FAMILY COMPUTING and allow six to eight weeks for delivery. Send orders to: FAMILY COMPUTING, Back Issues, P.O. Box 717, New York, N.Y. 10276-0717.

## THANKS FOR THE MENTION

I can't tell you how pleased I am to find the ADAM computer mentioned in your August issue ("Support for ADAM" in Behind The Screens, page 8). I purchased an evidently defective unit, but I was so pleased with the word-processing part that I didn't want to return it. I called the Coleco number at least 30 times and it was always busy. After seeing your article, I decided to try again, and—lo and behold—they answered.

I detailed the problem I was having, and they referred me to a local Honeywell Service Center. They replaced a defective data drive overnight at no charge. I was pleased to find that they stock most of the hardware and some software for the the ADAM. The unit is now working perfectly. I have enclosed my subscription order; many thanks.

JACK AMORY  
Virginia Beach, Virginia

## THUMBS UP TO 'HANDS ON' AND K-POWER

In the October '85 issue is part one of a six-part series called "Hands On." What a neat idea. My compliments to the people who decided to go with this series. I am just learning to use the computer. I try to read most of the major publications on computing. Most are way too deep for me. Your magazine helps to open the doors for me.

Although I am a grandparent, I go right to the K-POWER section. The articles are easy for me to understand. I find all the articles in your magazine interesting. Of all the magazines I read on computing, I find yours by far the best.

DUANE C. TIMO  
Duluth, Minnesota

# COMPUTING CLINIC

MULTI-STATEMENT LINES IN BASIC • PCjr SOFTWARE AND HARDWARE • GRAPHICS PRINTERS • STATIC CLING • MEMORY AND COLOR FOR THE TIMEX SINCLAIR 1000 • PROGRAMS FOR ADAM

BY JEFFREY BAIRSTOW

## Why does my computer frequently stop me from typing statements at the end of a multistatement line?

WAYNE D. MARKLE  
Walden, New York

Almost all BASICs limit line length to a fixed number of characters. Some computers, like the Apple and Atari, beep when you've reached or exceeded the limit. The Apple lets you type six more characters, but doesn't accept them. If you type seven characters, the line is wiped out! Other computers, such as the ADAM, C 64, TI-99/4A, Tandy Models III/4/Color Computer, and VIC-20, won't let you type in more than the legal number of characters. The IBM PC will let you type forever, but only accepts 255 characters. The Macintosh stops you and displays a dialog box that says LINE TOO LONG.

## Where can I find a PCjr, and will IBM and third-party manufacturers continue to produce PCjr hardware and software?

LARRY KLESSER  
Branford, Connecticut

PCjr computers are still available from IBM Product Centers and from several mail-order companies at heavily reduced prices. For example, 47th Street Photo in New York City ((212) 260-4410; [800] 221-7774 outside New York) is selling the PCjr both in the company's retail stores and by mail order. IBM has said that for at least five years, it will meet "all foreseeable hardware and software demand" for the PCjr. IBM's Personally Developed Software line (\$15 and up; for a catalog, call [800] IBM-PCSW; or write to P.O. Box 3280, Wallingford, CT 06494) includes programs for the PCjr; other, more advanced IBM programs, such as the Assistant series, also run on the jr. IBM Product Centers sell all IBM hardware, such as the PCjr internal modem, speech synthesizer, and memory expansion and

JEFFREY BAIRSTOW is a contributing editor for FAMILY COMPUTING.

parallel port attachments.

In addition, much new third-party software on the market is designed for the IBM PC/PCjr. This is especially true of games, education packages, and, to a certain extent, productivity packages. Because new IBM PC software is certain to keep coming, you can expect that much of it will also run on the PCjr. Racore Corp., which makes a disk drive and memory expansion unit for the PCjr, still has units available. They can be ordered through Micro Marketing ([800] 241-6490) in Norcross, Georgia, among other places.

## Can you tell me if there is a good graphics printer under \$220 for an Apple II? I would prefer one that prints at 100 characters per second.

CARLOS DEJUANA  
McAllen, Texas

You'll have to buy via mail order or from a discounter to get a printer in your price range capable of printing graphics and text at 100 cps. The Epson LX-80, which prints at 100 cps, the Star Micronics SG-10 (120 cps), and the Okidata 182 (120 cps) all list for \$299. However, you'll find them selling for less from mail-order or discount houses. If you order one, be sure to ask for the version—parallel or serial—that matches your printer card. Your software must be configured to work with a specific printer to take full advantage of its graphics capabilities. For more information on printers, read the "Buyer's Guide to Low-Cost Printers" in the September FAMILY COMPUTING.

## I have a Commodore 1702 color monitor. When I turn the monitor on and hold the back of my hand to the screen, the hairs on my hand stand out straight. Is this radiation that would be harmful to a person?

WILLIAM E. NOICE  
Richfield, Ohio

You're not feeling fallout, just static, which builds up during winter months particularly. The static is

not harmful to you or to your monitor. However, static can play havoc with your computer and your disks. Touch something metal before you approach a computer to discharge the electricity from your body. Be sure to do this before handling plug-in circuit boards on the Apple or the IBM because you can cause severe damage.

## Where can I find a memory pack and a color pack for the Timex Sinclair 1000?

TONI MARTINAZZI  
Chicago, Illinois

Rather than adding memory and color (which could end up costing you about \$200) to a Timex Sinclair 1000, why don't you consider buying a Timex Sinclair 2068? Several mail-order firms offer them for around \$160, and Zebra Systems Inc. (78-06 Jamaica Ave., Woodhaven, NY 11421; [718] 296-2385) sells them for \$139. The 2068 comes with 48K, 16 colors, and two joystick ports.

If you want the 1000's 16K memory pack only, you can order that from Zebra for \$20.

## Are there any bulletin board systems with programs for the ADAM?

JOHN LUNDY  
Stuart, Florida

There are several local bulletin board systems with ADAM programs, but probably the biggest selection of ADAM programs (and biggest group of ADAM users) can be found in the Family Computing Forum on CompuServe (GO FAMFORUM) in Data Library 6 (DL 6). A wide range of programs are available, including text adventure games, utilities, graphics, and CP/M. You'll also find a file called BBS that lists ADAM bulletin board phone numbers around the country.

Send your questions to FAMILY COMPUTING, Computing Clinic, 730 Broadway, New York, NY 10003. Due to the volume of mail, we regret that we can neither answer nor publish all questions received.

# the PROGRAMMER



ILLUSTRATION BY BARTON STABLER

★ D E C E M B E R ★

**TIPS TO THE TYPIST**

Page 48

**PROGRAMMING P.S.**

Page 60

**MORE PROGRAMS  
IN K-POWER**

Pages 84,88

**BEGINNER PROGRAM**

Page 50

Get into the holiday swing with *Jingle Bells*, and learn how to make your computer sing a melody!

**PRODUCTIVITY PROGRAM**

Page 61

*Wordcount* may be just the holiday gift your word processor is hoping for!

**HOLIDAY PROGRAM**

Page 66

Indulge your creativity with *Christmas Tree Construction Set*. This Yuletide utility is great for designing dynamic decorations!

ILLUSTRATION BY JIM CHERRY III

Cherry

# TIPS TO THE TYPIST

Typing in FAMILY COMPUTING'S programs is a great way to become familiar with your computer and get some free software "to boot." But it's frustrating to type in a long program only to find it doesn't work as it should. When this happens, simple typing errors are most often the cause. So to help you gain greatest value from the time you spend computing with us, we've put together some tips on how to avoid typing errors—and what to do if a program doesn't run right. Read them carefully and you'll be up and running in no time!

## SOME GENERAL RULES

**1. Do** read instructions and program headings carefully. Make sure your computer has enough memory, the right version of BASIC, and the appropriate peripherals (joysticks, printers, disk drives, etc.) for a program.

**2. Don't** let fatigue and boredom contribute to inaccuracy. If you're new to programming, try typing in shorter programs first. Type in a longer program in easy stages, **SAVE**ing each installment as you go.

**3.** Until you are fairly familiar with BASIC, **do** assume that every word, number, letter, space, and punctuation mark in a program listing must be copied accurately if the program is to function as intended.

**4. Do** watch out for potential trouble spots. About 90 percent of all typing errors occur in **DATA** statements: long lines filled with numbers or incomprehensible secret codes. If possible, have someone else read **DATA** to you as you type, and help you proofread it if you have trouble later on. Proofreading from a printout is best.

**5. Do** be aware that program listings printed in FAMILY COMPUTING sometimes differ from what you will see on your computer's screen or in printouts you produce at home. Our program listings are printed 54 characters wide. Thus, a single BASIC program "line" (sometimes called a "logical line") may appear as several lines in our listing. If you are typing along and reach the right margin of the printed listing, don't press **RETURN** or **ENTER** until you've checked to see if the program "line" you're typing really ends there. The way to tell is to check if the line following begins with a multiple of 10 that follows in sequence from the previous logical line. **REM** statements are the exception and typing them in is optional.

Several computers (ADAM, Apple, Atari, and TI) format BASIC programs according to unique rules of their own. Don't let this throw you—just type in the listing exactly as printed in the magazine and your computer is guaranteed to accept it, even though it may end up looking a little different on your screen.

**6.** One foolproof way to correct an error in a BASIC program line is to type the line in again from the beginning, and press **RETURN** or **ENTER** to set it in place of the old one in your computer's memory.

## WHICH PROGRAMS WILL RUN ON MY COMPUTER?

Unless a program heading indicates otherwise, programs

will run on any version of the computer specified, with the following exceptions:

- Apple programs run under Applesoft (*not* Integer) BASIC on the Apple II (with language card), II plus, IIe, and IIc.
- IBM compatibility of BASIC programs is determined by both the hardware and the version of BASIC used. Our programs for IBM PC & compatibles are composed on IBM PC & PCjr's, and tested under most versions of BASIC available for these machines. They are then tested on a variety of IBM-compatible machines under the versions of BASIC supplied with them. Each "IBM PC & compatibles" program listing is supplemented by a rundown of the machines and versions of BASIC under which the program is guaranteed to work. Most programs will probably run on many other PC Compatibles and under other versions of BASIC.
- TI programs not marked "w/TI Extended BASIC" should be run under standard (console) TI BASIC.

## DEBUGGING HINTS

Sometimes even the most careful typist makes a mistake. Don't expect your program to run right off the bat. If you have problems, remain patient and follow these general instructions for a probable quick fix.

- 1.** Write down any error messages you receive.
- 2.** If necessary, look these up in your manual, and check the indicated lines for simple mistakes. Also check related lines (see No. 4, below), such as the **DATA** statements corresponding to a **READ** routine. Correct all the problems you can find, and **SAVE** a corrected copy of the program before typing **RUN** again. If you're lucky, all systems will be **GO**; if not . . . .
- 3.** **LIST** the program in screen-size chunks (check your manual for instructions on how to **LIST** parts of a program). Even better, if you have a printer, get a printout. Compare what you've typed in—letter by letter—to the published program. Make sure that you haven't typed the numeral 0 (which is slashed in our listings) for the letter O (which isn't), swapped a small letter "l" for the numeral one, dropped or mixed up some punctuation, switched uppercase text for lowercase, or vice versa (particularly in **DATA** statements or within quotes), or miscounted the characters (and/or spaces) between a pair of quotes. Get someone to help you if possible.
- 4.** Check your **DATA** statements—then check them again. Mistakes in **DATA** statements are the single most common cause of program failures. Bad data can cause a program to malfunction at any point, which can be misleading. If you can't find your error in the lines the computer specifies, check your **DATA** statements line by line, letter by letter, comma by comma. Then have someone else check it for you.
- 5.** If all else fails, turn off your computer and relax. Then try again the next day—exhausted proofreaders are careless proofreaders.

# JINGLE BELLS

(With Tutorial, "How to Write Music Programs")

**BY JOHN JAINSHIGG AND PAUL DIXON**

Jingling bells is one way to make beautiful music. It's as easy as grabbing the right bell at the right time and then ringing it for the correct length of time. Unfortunately, most people don't have a set of musical bells around the house. However, if you're reading this, chances are you do have a computer. More than likely, it can play music—if you can tell it what notes to play, when to play them, and for how long.

Our Beginner Program this month is a short music program that will surely put you and your computer into the holiday swing of things. Type the program in, SAVE it to disk or cassette, then RUN it. Be especially careful when typing in the DATA statements. If all goes well, in a few moments you'll hear *Jingle Bells* jingling through the house. And if you want to understand how it works—or make the program play a different song—read on!



### HOW TO WRITE MUSIC PROGRAMS

Playing a note in BASIC differs from one brand of

computer to another. Some computers have a SOUND command that lets you produce tones and, in some cases, control a sound's duration, volume, and sometimes even its quality (whether the tone sounds pure or distorted; like a flute, or like a piano). The table below shows SOUND commands for various systems as we have used them in *Jingle Bells*.

Not all computers have SOUND commands. Commodore 64 sound is controlled by placing numbers in certain memory locations, using POKE statements. A special machine-language routine, also controlled by POKES, makes sound on the Apple, and the ADAM's sound chip must be controlled by a combination of machine code and POKES as well. However, all simple SOUND commands and "POKE-and-play" sound-making schemes have one thing in common. They all use numbers to represent the pitch and other characteristics of a note, though the range of numbers used varies widely from computer to computer.

To turn a melody into a program, you start by converting each of its pitches into a number, according to a table of equivalents found in the BASIC manuals that come with most computers. ADAM and Ap-

ple owners will have more difficulty than others in doing this. Procedures for controlling ADAM sound are quite complex, and are not explained in Coleco's documentation. Interested readers should consult *ADAM's Companion*, by Ramsey Benson (Avon Books, 1984, \$9.95). Numbers used to specify pitches on the Apple change, depending on what machine-language routine is used to generate the sound. A partial table of numeric values for the machine-language routine we used in *Jingle Bells* is shown below.

	G = 162
	A = 144
	B = 128
Middle	C = 121
	D = 108
	E = 96
	F = 91
	G = 81

To play a note using the machine-language routine shown in the Apple version, you start by READING the machine code from DATA statements and POKE-ing it into addresses 768–796 in memory (see lines 30–60 and DATA in lines 1000–1020). POKE a duration number (from 2 to 255) into location 6 and a pitch number into location 8; then play the note by CALLING the routine using the statement CALL 768 (see lines 120, 130, and 140).

Computer	SOUND command format	Description
Atari	SOUND CH,P,T,V	Sound continuous tone through channel CH at pitch P, using tone quality T, at volume V.
IBM PC & compatibles	SOUND P,D	Sound pitch P for duration D. Additional, optional parameters allow control of channel and volume.
Macintosh (Microsoft BASIC 2.0)	SOUND P,D	As above.
TI-99/4A	CALL SOUND (D,P,V)	Sound pitch P for duration D at volume V. Additional, optional parameters allow added voices to be played with the same command.
Tandy CoCo	SOUND P,D	Sound pitch P for duration D.

### DURATION AND TEMPO

Playing a musical note on your computer takes three steps: 1. start playing the note; 2. wait for a specific length of time; and 3. stop playing the note. If your computer's sound-producing scheme lets you specify a note's duration at the same time you specify its pitch (Apple, IBM, Macintosh, TI, and CoCo work this way), you won't have to do any programming to handle steps two and three. Just supply the computer with a number for the note's duration—larger values cause a note

ILLUSTRATIONS BY JOSH GOSFIELD

to play for a longer time—and the computer will sound the note and turn it off automatically.

If your computer's SOUND command or sound-making scheme doesn't incorporate a duration feature (ADAM, Atari, Commodore 64, and VIC-20 don't), your music program will have to include a routine that counts while each note is playing for a length of time you specify. In *Jingle Bells*, this counting is done by a FOR/NEXT loop that counts up to a different number for each note. (To learn more about "delay" loops, see Jitterman in the August FAMILY COMPUTING.)

Each note in your melody has a particular duration relative to the other notes and rests. That is, an eighth note is always half as long as a quarter note, which is half as long as a half note, and so on. Keeping this in mind, you can calculate the relative durations of the notes in your melody by finding the notes with the shortest durations, giving these notes an arbitrary value of 1, then expressing the durations of all other notes as multiples of this value. For example, one phrase of *Jingle Bells* is coded like this:

Oh, what fun it is to ride in a...  
 2 2 3 1 2 2 2 1 1

As you can see, here eighth notes get the value 1; quarter notes, which sound for twice as long as eighth notes, get the value 2; dotted quarter notes, the value 3.

Once you've got a table of relative durations pulled together, you can then look at your computer manual (or do some trial-and-error testing) to determine what should be the duration value for your shortest note. The computer can multiply each of the relative duration values by this "tempo constant" to derive the actual duration value for

each note.

For example, if the tempo constant (called TEMPO in our program) is 24, the actual duration values for the first four notes in the phrase "Oh, what fun . . ." are  $24 \times 2$ ,  $24 \times 2$ ,  $24 \times 3$ , and  $24 \times 1$  (that is, 48, 48, 72, and 24). Increasing the value of TEMPO slows down the tune; decreasing the value speeds it up. Try it and see!

**DOING IT YOURSELF**

Adventuresome programmers may want to try modifying *Jingle Bells* to play a melody of their own. Start by deciding on a tune and converting each of its notes to a set of pitch and relative duration values as described above. Substitute this data, alternating pitches and durations, for ours in the DATA statements. There are 144 notes in *Jingle Bells*; the number of notes in your tune will probably differ. Count them and change the size of the storage arrays (DIMENSIONED in lines 10 or 20) to match. Change the upper limit of the FOR/NEXT loops that READ data into the arrays to match this number also, and that of the FOR/NEXT loop that plays the tune as well. Remove the statements that duplicate parts of the *Jingle Bells* melody—your program won't need them (the REM statements will show you which these are).

If all goes well, your tune will play when you type RUN. If the speed isn't right, you can alter the value of the constant TEMPO until you hear something you like better. That's all there is to it!

If you come up with an enhancement of one of our Beginner Programs that you're especially proud of, we'd like to see it, and maybe mention it in a future issue. Send a printout (no tapes or disks, please) to

Beginner Programs  
 FAMILY COMPUTING  
 730 Broadway  
 New York, NY 10003

—J.J.

**ADAM/Jingle Bells**

```

9 REM --PROTECT MEMORY FOR STORING MACHINE CODE--
10 LOMEM: 29000
20 DIM f(144),s(144),d(144)
30 tempo = 100
39 REM --READ IN MACHINE CODE FOR SOUND--
40 FOR i = 28000 TO 28005
50 READ a
60 POKE i,a
70 NEXT i
79 REM --READ IN SONG DATA (FIRST, SECOND, DURATION)--
80 FOR i = 1 TO 95
90 READ f(i),s(i),d(i)
99 REM --NEXT LINE DUPLICATES ONE PART OF SONG--
100 IF i < 50 THEN f(i+95) = f(i):s(i+95) = s(i):d(i+95) = d(i)
110 NEXT i
119 REM --PLAY SONG--
120 FOR i = 1 TO 144
129 REM --TURN ON VOLUME FOR VOICE 1--
130 POKE 28006,144
140 CALL 28000
149 REM --SET FIRST PART OF PITCH FOR VOICE 1--
150 POKE 28006,f(i)
160 CALL 28000
169 REM --SET SECOND PART OF PITCH FOR VOICE 1--
170 POKE 28006,s(i)
180 CALL 28000
189 REM --DELAY FOR NOTE'S DURATION--
190 FOR j = 1 TO d(i)*tempo
200 NEXT j
209 REM --TURN OFF VOLUME FOR VOICE 1--
210 POKE 28006,159
220 CALL 28000
230 NEXT i
240 END
999 REM --MACHINE CODE TO SEND SOUND DATA TO CHIP--
1000 DATA 58,102,109,211,255,201
1999 REM --SONG DATA--
2000 DATA 138,10,2,138,10,2,138,10,4,138,10,2,138,10,2
2010 DATA 138,10,4,138,10,2,143,8,2,134,13,3,143,11,1
2020 DATA 138,10,8,128,10,2,128,10,2,128,10,3,128,10,1
2030 DATA 128,10,2,138,10,2,138,10,3,138,10,1
2040 DATA 138,10,2,143,11,2,143,11,2,138,10,2,143,11,4
2050 DATA 143,8,4,138,10,2,138,10,2,138,10,4,138,10,2
2060 DATA 138,10,2,138,10,4,138,10,2,143,8,2,134,13,3
2070 DATA 143,11,1,138,10,8,128,10,2,128,10,2,128,10,3
2080 DATA 128,10,1,128,10,2,138,10,2,138,10,3
2090 DATA 138,10,1,143,8,2,143,8,2,128,10,2,143,11,2
2100 DATA 134,13,8,142,17,2,138,10,2,143,11,2,134,13,2
2110 DATA 142,17,7,142,17,1,142,17,2,138,10,2
2120 DATA 143,11,2,134,13,2,143,15,8,143,15,2,128,10,2
2130 DATA 138,10,2,143,11,2,131,14,8,143,8,2,143,8,2
2140 DATA 128,10,2,143,11,2,138,10,8,142,17,2,138,10,2
2150 DATA 143,11,2,134,13,2,142,17,7,143,17,1,143,17,2
2160 DATA 138,10,2,143,11,2,134,13,2,143,15,8
2170 DATA 143,15,2,128,10,2,138,10,2,143,11,2,143,8,2
2180 DATA 143,8,2,143,8,3,143,8,1,143,7,2,143,8,2
2190 DATA 128,10,2,143,11,2,134,13,4,143,8,4
    
```

**Apple II series/Jingle Bells**

```

10 DIM P(144),D(144)
20 TEMPO = 24
29 REM --READ IN MACHINE CODE FOR MAKING SOUNDS--
30 FOR I = 0 TO 28
40 READ A
50 POKE 768+I,A
60 NEXT I
69 REM --READ IN SONG DATA (PITCH, DURATION)--
70 FOR I = 1 TO 95
80 READ P(I),D(I)
89 REM --NEXT LINE DUPLICATES ONE PART OF SONG--
90 IF I < 50 THEN P(I+95) = P(I):D(I+95) = D(I)
    
```

```
1170 DATA 159,2,197,2,193,2,185,2,204,2
1180 DATA 204,2,204,3,204,1,210,2,204,2
1190 DATA 197,2,185,2,176,4,204,4
```

**VIC-20/Jingle Bells**

```
10 DIM P(144),D(144)
20 TEMPO=80
29 REM --TURN ON VOLUME FOR ALL VOICES--
30 POKE 36878,12
39 REM --READ IN SONG DATA (PITCH, DURATION)--
40 FOR I=1 TO 95
50 READ P(I),D(I)
59 REM --NEXT LINE DUPLICATES ONE PART OF SONG--
60 IF I<50 THEN P(I+95)=P(I):D(I+95)=D(I)
70 NEXT I
79 REM --PLAY SONG--
80 FOR I=1 TO 144
89 REM --SET PITCH FOR MIDDLE VOICE--
90 POKE 36876,P(I)
99 REM --DELAY FOR NOTE'S DURATION--
100 FOR J=1 TO D(I)*TEMPO
110 NEXT J
119 REM --TURN OFF MIDDLE VOICE TO PREVENT LEGATO--
120 POKE 36876,0
130 NEXT I
140 END
999 REM --SONG DATA--
1000 DATA 231,2,231,2,231,4,231,2,231,2
1010 DATA 231,4,231,2,235,2,225,3,228,1
1020 DATA 231,8,232,2,232,2,232,3,232,1
1030 DATA 232,2,231,2,231,3,231,1
1040 DATA 231,2,228,2,228,2,231,2,228,4
1050 DATA 235,4,231,2,231,2,231,4,231,2
1060 DATA 231,2,231,4,231,2,235,2,225,3
1070 DATA 228,1,231,8,232,2,232,2,232,3
1080 DATA 232,1,232,2,231,2,231,3
1090 DATA 231,1,235,2,235,2,232,2,228,2
1100 DATA 225,8,215,2,231,2,228,2,225,2
1110 DATA 215,7,215,1,215,2,231,2
1120 DATA 228,2,225,2,219,8,219,2,232,2
1130 DATA 231,2,228,2,223,8,235,2,235,2
1140 DATA 232,2,228,2,231,8,215,2,231,2
1150 DATA 228,2,225,2,215,7,215,1,215,2
1160 DATA 231,2,228,2,225,2,219,8
1170 DATA 219,2,232,2,231,2,228,2,235,2
1180 DATA 235,2,235,3,235,1,237,2,235,2
1190 DATA 232,2,228,2,225,4,235,4
```

**PROGRAMMING P.S.**

Corrections to previous months' programs

**Alphabet Soup: Eat** (October 1985, page 60)

**ADAM:** This version works as published, but it contains a superfluous statement. To remove it, change line 10 to read as follows:

```
10 dl = 120:max = 80:sw = 31
```

**Atari 400/800, 600/800XL, & 130XE:** Please change lines 370 and 400 to read as follows:

```
370 FOR X=PT(S) TO PT(S)+DP-1
400 DX=INT(38/LW):T=INT(RND(1)*DY)+1+WP(C-1,2)
```

**IBM PC & compatibles:** Please change line 10 to read as follows:

```
10 SCREEN 0,0:KEY OFF
```

**Tandy Color Computer & Models III/4 (w/Model III BASIC):** Please change SP to SPS in line 400:

```
400 PRINT@ (RP(P,2)-1)*SW+RP(P,1)-1,SPS;
```

**VIC-20 w/8K or 16K RAM Cartridge:** To improve the placement of text on the screen, change lines 260 and 670 to read as follows:

```
260 DY=INT((DH-2)/DP
```

```
670 PRINT CLS;:NS=CHR$(13)+"SORRY, YOU'RE WRONG!":GOSU B 3500
```

**Draw & Print** (September 1985, page 64)

**IBM PC & compatibles w/printer:** There are two IBM versions with identical heads. The one beginning on page 68 is actually the 40-column version.

**Tandy Color Computer w/printer:** To make the program pause until you've read your printer, add the following line:

```
215 IF INKEYS="" THEN 215
```

**Halloween Classic** (October 1985, page 52)

**ADAM:** Please change line 20 to read as follows:

```
20 DIM xy(4,2),h(4,2),m(28,3):fe = 1
```

**Personal Balance Sheet** (July 1985, page 14)

**Tandy Color Computer w/printer:** In addition to the modifications given, omit line 370 from the base version. Also, as you may have discovered, the lines containing "PRINT:" are 400, 500, 530, 620, 640, and 660.

**Renegade Robot II** (August 1985, page 57)

**IBM PC w/Color Graphics Adapter & IBM PCjr:** In line 700, please change STRIG(0) to STRIG(1):

```
700 IF K$="P" OR STRIG(1)=-1 THEN 110
```

**Terminal Tale** (September 1985, page 55)

**VIC-20:** Please add a space before the word PIE in line 510:

```
510 PRINT FS;" PIE, AND FED"
```

**Windowmaker** (September 1985, page 88)

**Atari 400, 800, 600/800XL, & 130XE:** Line 10 as published contains an error. This is how it should read:

```
10 FOR I=1536 TO 1640:READ A:POKE I,A:NEXT I
```

**Get 'Em** (November 1985, page 65)

**Commodore 64 & 128 (C 64 mode):** Please change line 1000 to read as follows:

```
1000 DATA 156,+,156,+,31,*,31,*,30,$,158,/,158,/,158,/,
```

**Tandy Color Computer:** Please change lines 90 and 210 to read as follows:

```
90 PRINT "POINTS: +=100 *=250 $=500 /=-100";
```

```
210 PRINT@D,SPS;:D=D+1:P=PEEK(1024+D):IF P<>96 THEN 230
```



# WORDCOUNT

BY JOHN JAINSHIGG AND PAUL DIXON.



Many people who work with words—students, writers, professionals, and others—are often faced with the problem of “writing to size.” As a journalist, for example, I’m often asked to compose, say, 1,500 words on a topic. In the past, I’ve had to apply “rules of thumb” to estimate how my output at various stages in a project compared to the word length required.

My rules of thumb went out the window when I started writing on a word processor. While I was working on a document in memory, it was hard to see how it would size up in final form. Print preview mode helped a little, and, of course, I could always print out the document and make my estimate in normal fashion. But now that the computer had entered my life, I wanted something more accurate than rules of thumb. Unfortunately, my word-processing program didn’t include a word-count feature. Yet the idea of being able to say to an editor: “I know you asked for 1,500 words here, but this piece contains more like 1,507. Do you want me to cut it?” still appealed. It appealed to me so much that I wrote a word-counting program.

## VOILA!

Presenting *Wordcount*—a handy little utility that, well . . . counts words. Just give *Wordcount* the name of a text file you’ve saved on disk in ASCII format (see below), and sit back. The program will churn away for a while (sometimes a long while, depending on the length of



your document), then beep and present you with a highly accurate count of how many words you’ve written.

*Wordcount* uses a simple algorithm for figuring out what constitutes a word and what doesn’t. It recognizes only letters, numbers, and apostrophes as valid components of a word. When it encounters other characters, such as spaces, commas, or hyphens, it assumes it’s reached the end of a word, updates the count by one, and looks for the beginning of the next word.

*Wordcount* won’t be fooled by special “control” characters embedded in a file. It does tend to treat each component of a mathematical formula as a separate word, so perhaps it

isn’t the right tool for scientists and engineers—but we’ve found *Wordcount* to be far more accurate than any “rule of thumb” for standard English text. Note: to keep things simple, we avoided having *Wordcount* make any judgment about the length of words. “I” (as in me, myself, and . . .) is just as much a word as “egomaniac” in *Wordcount*’s view.

## USING THE PROGRAM

To use *Wordcount*, you’ll have to save your word-processed document as an “uncompressed ASCII” file on disk. An ASCII file is a file that looks pretty much like a printed document—it contains normal characters, spaces, and punctuation, plus carriage returns, but normally no other special “control” characters. Some word processors always save documents as ASCII files, and *Wordcount* can work with these files directly. Others save documents in a special “compressed” format to conserve disk space, and *Wordcount* probably won’t work accurately with files of this type. Luckily, however, word processors that use file compression generally include a feature for saving documents in uncompressed ASCII format, too. Different word processors refer to this common file type in different ways—some call it an ASCII file, some a “text” file, others a “list” file. Some, such as *AppleWorks*, let you create an ASCII file by “printing” a file to disk. Check your documentation carefully to learn your program’s method of saving documents in ASCII format.

If you can, you should type in and save *Wordcount* under the same version of DOS your word processor uses. For example, an Apple owner using a ProDOS-compatible word processor should save *Wordcount* under ProDOS, so that *Wordcount* can read directly from the word processor’s text disks. If

your word processor uses a proprietary or unusual DOS that doesn’t work with BASIC, you’ll have to obtain a conversion utility to transfer files from the word processor’s text disks to normal DOS disks that *Wordcount* can access. Sometimes such a utility is included with the word-processing software. If not, one may be available separately from the software manufacturer. If you’re not sure which DOS your word processor uses, try booting the DOS you use with BASIC and getting a directory of one of your word-processing document disks. If the directory looks normal, then the word processor is probably compatible with *Wordcount*.

*Wordcount* is fairly short, so it should be easy to type in. One warning is in order, however. ADAM, Apple, IBM, Macintosh, and Model III/4 versions of the program contain error-trapping statements of the form ON ERROR (OR ON ERR) GOTO . . . that prevent the program from crashing if you make an input or other error in using it. Unfortunately, these “user-friendly” statements will also prevent normal error messages from appearing while you’re debugging the program after first typing it in. Unless you’re very sure of your typing, leave out the error-trapping statements until the program is fully debugged—then put them in (carefully) to make it fully functional.

The TRAP statements in the Atari version of the program work in a similar manner, and can be troublesome when you’re debugging. However, since certain of these TRAP statements are important to the normal functioning of the program, they should not be omitted. Atari owners should enter the program as carefully as possible, and watch for strange, TRAP-caused effects when running it the first few times. —J.J. →

## PRODUCTIVITY PROGRAM

### ADAM/Wordcount

```
10 f = 0:d$ = CHR$(4)
20 GOSUB 1000:ONERR GOTO 210
30 PRINT "What is the name of your"
40 INPUT "text file? ";n$
50 IF n$ = "" THEN 20
60 PRINT d$;"open ";n$
70 PRINT d$;"read ";n$
80 GET c$:ch = ASC(c$):GOSUB 1000
90 PRINT " Counting ... please wait."
100 PRINT:PRINT " I'll sound a tone when done."
110 PRINT:PRINT TAB(10);"Words: 0"
120 w = 0:ONERR GOTO 280
130 al = (ch > 64 AND ch < 91) OR (ch > 96 AND ch < 12
3) OR (ch > 47 AND ch < 58) OR ch = 39
140 IF NOT f AND al THEN f = 1
150 IF f AND NOT al THEN w = w+1:f = 0:HTAB 17:VTAB 9:
PRINT w
160 GET c$:ch = ASC(c$):GOTO 130
170 PRINT CHR$(7):IF f THEN w = w+1
180 PRINT "There were about ";w;" words"
190 PRINT "in your text file."
200 PRINT:END
210 PRINT d$;"close ";n$:GOSUB 1000
220 PRINT "Error ";ERRNUM(0);" has occurred."
230 PRINT:PRINT "A new file called ";n$
240 PRINT "has been created."
250 PRINT:INPUT "Do you want it deleted? ";a$
260 IF LEFT$(a$,1) = "y" OR LEFT$(a$,1) = "Y" THEN PRI
NT d$;"delete ";n$
270 GOSUB 1000:GOTO 30
280 PRINT d$;"close ";n$:CLRERR:GOSUB 1000
290 IF ERRNUM(0) = 5 THEN 170
300 PRINT "Error ";ERRNUM(0);" has occurred."
310 PRINT:PRINT "The count cannot continue."
320 STOP
1000 HOME:HTAB 10:PRINT "*WORDCOUNT*"
1010 VTAB 5:RETURN
```

### Apple II series w/disk drive/Wordcount

```
10 F = 0:D$ = CHR$(4)
20 GOSUB 1000:ONERR GOTO 240
30 PRINT "What is the name of your"
40 INPUT "text file? ";N$
50 PRINT D$;"LOCK ";N$
60 PRINT D$;"UNLOCK ";N$
70 PRINT D$;"OPEN ";N$
80 PRINT D$;"READ ";N$
90 GOSUB 1000
100 PRINT TAB(8);"Counting ... please wait."
110 PRINT " A tone will sound when I am done."
120 PRINT:PRINT TAB(15);"Words: 0"
130 W = 0:ONERR GOTO 270
140 GET C$:CH = ASC(C$)
150 AL = (CH > 64 AND CH < 91) OR (CH > 96 AND CH < 12
3) OR (CH > 47 AND CH < 58) OR CH = 39
160 IF NOT F AND AL THEN F = 1:GOTO 140
170 IF F AND NOT AL THEN W = W+1:F = 0:HTAB 22:VTAB 8:
PRINT CHR$(0);W
180 GOTO 140
190 FOR I = 1 TO 100:A = PEEK(-16336):NEXT I
200 IF F THEN W = W+1
210 PRINT "There were about ";W;" words"
220 PRINT "in your text file."
230 POKE 216,0:PRINT:END
240 GOSUB 1000:PRINT D$;"CLOSE ";N$
250 PRINT "Error ";PEEK(222);" has occurred."
260 PRINT:GOTO 30
270 GOSUB 1000:PRINT D$;"CLOSE ";N$
280 IF PEEK(222) = 5 THEN 190
290 PRINT "Error ";PEEK(222);" has occurred."
300 PRINT:PRINT "The count cannot continue."
310 POKE 216,0:STOP
1000 HOME:HTAB 15:PRINT "*WORDCOUNT*"
1010 VTAB 5:RETURN
```

### Atari 400/800, 600/800XL, & 130XE w/disk drive/Wordcount

```
10 DIM D$(20),NS(20)
20 TRAP 20:D$="D":NS="":GOSUB 1000
30 PRINT "What is the name of your"
40 PRINT "text file";:INPUT NS
50 IF NS(1,1)<>"D" OR (NS(2,2)<>": " AND NS(3,3)<>":")
THEN D$(3)=NS:GOTO 70
60 D$=NS
70 TRAP 230:OPEN #1,4,0,D$
80 GOSUB 1000:PRINT "Counting ... please wait."
90 PRINT "A tone will sound when I am done."
100 POKE 752,1:PRINT :PRINT "Words: 0"
110 W=0:TRAP 260
120 GET #1,CH
130 AL=(CH>64 AND CH<91) OR (CH>96 AND CH<123) OR (CH>
47 AND CH<58) OR CH=39
140 IF NOT F AND AL THEN F=1:GOTO 130
150 IF F AND NOT AL THEN W=W+1:F=0:POSITION 9,8:PRINT
W
160 GOTO 120
170 IF F THEN W=W+1
180 FOR I=1 TO 3:FOR J=15 TO 0 STEP -1
190 SOUND 0,121,10,J:NEXT J:NEXT I
200 PRINT "There were about ";W;" words"
210 PRINT "in your text file."
220 POKE 752,0:PRINT :END
230 CLOSE #1:TRAP 20:GOSUB 1000
240 PRINT "Error ";PEEK(195);" has occurred."
250 PRINT :GOTO 30
260 CLOSE #1:TRAP 40000:GOSUB 1000
270 IF PEEK(195)=136 THEN 170
280 POSITION 2,12:PRINT CHR$(253);
290 PRINT "Error ";PEEK(195);" has occurred."
300 PRINT :PRINT "The count cannot continue."
310 POKE 752,0:STOP
1000 PRINT CHR$(125):POSITION 14,0:PRINT "*WORDCOUNT*"
1010 POSITION 2,5:RETURN
```

### Commodore 64 & 128 (C 64 mode) w/disk drive/Wordcount

```
10 S=54272:FOR I=0 TO 24
20 POKE S+I,0:NEXT I:POKE S+24,15
30 POKE S+5,68:POKE S+6,68:POKE S,97:POKE S+1,8
40 F=0:GOSUB 1000
50 PRINT "WHAT IS THE NAME OF YOUR"
60 INPUT "TEXT FILE";N$
70 OPEN 15,8,15:OPEN 5,8,5,N$+"S,R"
80 INPUT#15,E,ER$:IF E<>0 THEN 260
90 GOSUB 1000:PRINT TAB(7);"COUNTING ... PLEASE WAIT."
100 PRINT:PRINT " A TONE WILL SOUND WHEN I AM DONE."
110 PRINT:PRINT TAB(14);"WORDS: 0"
120 W=0
130 GET#5,C$:IF ST=64 THEN 200
140 INPUT#15,E,ER$:IF E<>0 THEN 280
150 CH=ASC(C$)
160 AL=(CH>64 AND CH<91) OR (CH>96 AND CH<123) OR (CH>
47 AND CH<58) OR CH=39
170 IF NOT F AND AL THEN F=-1:GOTO 130
180 IF F AND NOT AL THEN W=W+1:F=0:POKE 214,8:PRINT:PR
INT TAB(20);W
190 GOTO 130
200 CLOSE 5:CLOSE 15:IF F=-1 THEN W=W+1
210 POKE S+4,33:FOR J=1 TO 400
220 NEXT J:POKE S+4,0:GOSUB 1000
230 PRINT TAB(7);"THERE WERE ABOUT";W
240 PRINT TAB(7);"WORDS IN YOUR TEXT FILE."
250 PRINT:END
260 CLOSE 5:CLOSE 15:GOSUB 1000
270 PRINT ER$;".":PRINT:GOTO 50
280 CLOSE 5:CLOSE 15:GOSUB 1000
290 PRINT ER$;".":PRINT
300 PRINT "THE COUNT CANNOT CONTINUE."
310 STOP
1000 PRINT CHR$(147):PRINT TAB(13);"*WORDCOUNT*"
1010 POKE 214,4:PRINT:RETURN
```

**IBM PC & compatibles\* w/disk drive/Wordcount**

```

10 KEY OFF
20 WIDTH 40:GOSUB 1000
30 PRINT "What is the name of your"
40 INPUT "text file";N$
50 ON ERROR GOTO 210:OPEN N$ FOR INPUT AS 1
60 GOSUB 1000:PRINT TAB(8);"Counting ... please wait."
70 PRINT TAB(4);"A tone will sound when I am done."
80 LOCATE 8,15,0:PRINT "Words: 0"
90 W=0:ON ERROR GOTO 240
100 IF EOF(1) THEN 160
110 CH=ASC(INPUT$(1,1))
120 AL=(CH>64 AND CH<91) OR (CH>96 AND CH<123) OR (CH>
47 AND CH<48) OR CH=39
130 IF NOT F AND AL THEN F=-1:GOTO 100
140 IF F AND NOT AL THEN W=W+1:F=0:LOCATE 8,21:PRINT W
150 GOTO 100
160 CLOSE 1:IF F THEN W=W+1
170 SOUND 500,20:GOSUB 1000
180 PRINT "There were about";W;"words"
190 PRINT "in your text file."
200 ON ERROR GOTO 0:PRINT:END
210 CLOSE 1:GOSUB 1000
220 PRINT "Error";ERR;"has occurred."
230 PRINT:RESUME 30
240 CLOSE 1:GOSUB 1000
250 PRINT "Error";ERR;"has occurred."
260 PRINT:PRINT "The count cannot continue."
270 ON ERROR GOTO 0:STOP
1000 CLS:PRINT TAB(15);"*WORDCOUNT*"
1010 PRINT:PRINT:RETURN
    
```

*\*This program has been tested and found to work on the following computers and hardware configurations, using the BASICs shown: IBM PC w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 00.05.00.*

**Macintosh w/Microsoft BASIC 2.0/Wordcount**

```

F=0
GOSUB HEAD
GETNAME:
INPUT "What is the name of your text file";N$
ON ERROR GOTO OPENERR
OPEN N$ FOR INPUT AS 1
GOSUB HEAD
PRINT TAB(20);"Counting ... please wait."
PRINT TAB(16);"A tone will sound when I am done."
PRINT:PRINT TAB(26);"Words: 0"
W=0:ON ERROR GOTO READERR
WHILE NOT EOF(1)
    CH=ASC(INPUT$(1,1))
    AL=(CH>64 AND CH<91) OR (CH>96 AND CH<123) OR (C
H>47 AND CH<58) OR CH=39
    IF NOT F AND AL THEN F=-1
    IF F AND NOT AL THEN W=W+1:F=0:LOCATE 8,31:PRINT
W
WEND
IF F THEN W=W+1
CLOSE 1:SOUND 500,5:GOSUB HEAD
PRINT "There were about";W;"words in your text fil
e."
ON ERROR GOTO 0:PRINT:END
OPENERR:
CLOSE 1:GOSUB HEAD
PRINT "Error";ERR;"has occurred."
PRINT:RESUME GETNAME
READERR:
CLOSE 1:GOSUB HEAD
PRINT "Error";ERR;"has occurred."
PRINT:PRINT "The count cannot continue."
ON ERROR GOTO 0:STOP
HEAD:
CLS:PRINT:PRINT TAB(25);"*WORDCOUNT*"
PRINT:PRINT:RETURN
    
```

**Tandy Color Computer w/disk drive & Disk Extended Color BASIC/Wordcount**

```

10 GOSUB 1000
20 PRINT "WHAT IS THE NAME OF YOUR"
30 INPUT "TEXT FILE";N$
40 OPEN "D",#1,N$,1
50 FIELD#1,1 AS C$
60 GOSUB 1000:PRINT TAB(4);"COUNTING ... PLEASE WAIT."
70 PRINT:PRINT "I'LL SOUND A TONE WHEN I'M DONE."
80 PRINT TAB(11);"WORDS: 0"
90 W=0:FOR I=1 TO LOF(1)
100 GET#1,I:CH=ASC(C$)
110 AL=(CH>64 AND CH<91) OR (CH>96 AND CH<123) OR (CH>
47 AND CH<58) OR CH=39
120 IF NOT F AND AL THEN F=-1
130 IF F AND NOT AL THEN W=W+1:F=0:PRINT@241,W
140 NEXT I
150 IF F THEN W=W+1
160 CLOSE#1:GOSUB 1000
170 SOUND 200,10
180 PRINT "THERE WERE ABOUT";W;"WORDS"
190 PRINT "IN YOUR TEXT FILE."
200 PRINT:END
1000 CLS:PRINT TAB(10);"*WORDCOUNT*"
1010 PRINT:PRINT:RETURN
    
```

**Tandy Models III & 4 (Model III mode) w/disk drive/Wordcount**

```

10 CLEAR 1000:F=0
20 GOSUB 1000
30 INPUT "What is the name of your text file";N$
40 ON ERROR GOTO 210
50 OPEN "I",1,N$
60 GOSUB 1000
70 PRINT TAB(15);"Counting ... please wait."
80 PRINT:PRINT TAB(23);"Words: 0"
90 ON ERROR GOTO 240
100 LINE INPUT#1,C$
110 IF C$="" THEN 160 ELSE CH=ASC(C$)
120 AL=(CH>64 AND CH<91) OR (CH>96 AND CH<123) OR (CH>
47 AND CH<58) OR CH=39
130 IF NOT F AND AL THEN F=-1
140 IF F AND NOT AL THEN W=W+1:F=0:PRINT@349,W
150 IF LEN(C$)>1 THEN C$=RIGHT$(C$,LEN(C$)-1):GOTO 110
160 IF NOT EOF(1) THEN 100
170 IF F THEN W=W+1
180 CLOSE 1:GOSUB 1000
190 PRINT "There were about";W;"words in your text fil
e."
200 CLOSE 1:ON ERROR GOTO 0:PRINT:END
210 CLOSE 1:GOSUB 1000
220 PRINT "Error";ERR/2+1;"has occurred."
230 PRINT:RESUME 30
240 CLOSE 1:GOSUB 1000
250 PRINT "Error";ERR/2+1;"has occurred."
260 PRINT:PRINT "The count cannot continue."
270 ON ERROR GOTO 0:STOP
1000 CLS:PRINT TAB(22);"*WORDCOUNT*"
1010 PRINT:PRINT:RETURN
    
```

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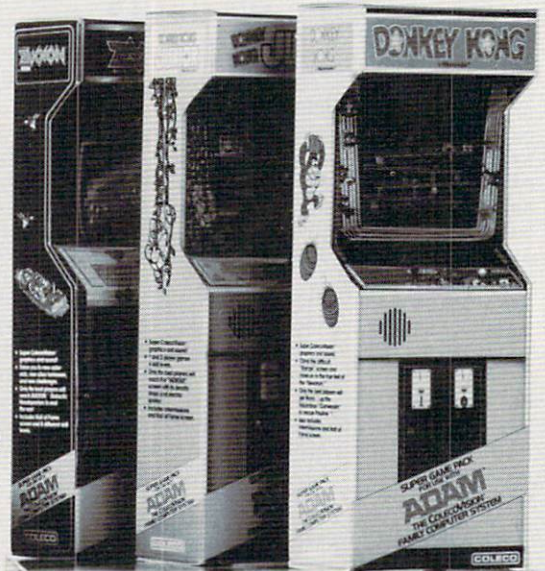
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