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PUBLISHED BY SCHOLASTIC INC.

JANUARY 1985

VOLUME 3
NUMBER 1

Buyer's Guide to JOYSTICKS

FAMILY COMPUTING™

Home Finance

Software to Help with Checkbooks, Budgets, Taxes, and Your Financial Future

The Best Games of '84

Electronic Mail

7 Tips to Word Processing

Including:
K-POWER Mini-Magazine for Kids

Inside: Original Programs for ADAM, Apple, Atari, Commodore 64 & VIC-20, IBM, TI, Timex, TRS-80

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VOLUME 3
NUMBER 1

FAMILY COMPUTING™

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Dear Chris, Greg, and Scott:
Thank you for giving me finger paints. I like this present because I can make pictures. I opened it on Christmas Eve at Grandma and Grandpa Hanley's house. I was happy. I said, "Look, Finger Paints! I love them!" I'm going to paint a big picture and send it to you. Thank you again for the finger paints.

Love always, Betsy

LETTERS

A 1985 CELEBRATION

In the January 1984 issue of your fine magazine, I typed out the *New Year's Eve* program on my VIC-20. The program gives the year 1984 and is set to start at midnight. I was wondering if anyone could show me how to change the 4 in that program to a 5 so I could use it again this coming New Year's Eve.

A.F. SKATTEBOL
Prince Rupert, British Columbia

EDITOR'S NOTE: *We've done it for you. Check out the 1985 version of* New Year's Eve *in our December 1984 issue.*

QUEST FOR CAREER

I love your magazine; you have lots of great articles and programs. The first thing I do when I buy your magazine is type in the programs. I have a Commodore SX-64. But one thing I want to know is what kind of careers there are in the computer field. I learned to program on a Franklin but adapted to the Commodore.

MICHAEL CALLAHAN, *age 14*
Holmdel, New Jersey

EDITOR'S NOTE: *Check out "Computers and Careers" in the April 1984 issue of* FAMILY COMPUTING. *The article will tell you what jobs are available, how much they pay, and what education or training is required. It sounds like you have a head start. Good luck.*

A NEAR-PERFECT BLEND

I feel that I must preface the following remarks by saying how much my 12-year-old son and I enjoy reading your magazine each month. It seems to me that you have achieved a near-perfect blend of technical data with easy-to-read product reviews, etc., so that both of us are stimulated by each new issue.

The beginner programs that you publish each month look as though they would be a lot of fun to try, but unfortunately, we own a Kaypro computer and for some reason you have chosen not to include programs for us. Since Kaypro systems are selling at a rather phenomenal rate, I am very curious as to why you seem to be ignoring us.

JOHN MACFALL
Cardiff, California

EDITOR'S NOTE: *Unfortunately, less than 1 percent of our readers own CP/M machines. But, that doesn't mean we have abandoned the computer. Although the Kaypro is not a regular part of The Programmer, we will occasionally publish programs for it. In addition, check out the chart in the "Buyer's Guide to Computer Systems" (pages 64–65) December 1984 issue, for more information on the Kaypro 2X.*

FINDING COMFORT IN COMPUTING

I was very uncomfortable with the idea of using a home computer at first. I bought a Timex Sinclair 1000 to start, and it is beginning to get easier to operate. The magazine is very enjoyable to read, and the articles are very informative for a beginner like me. Is it possible to get more programs in Timex BASIC?

DANA LEONARD
Cedar Rapids, Iowa

EDITOR'S NOTE: *We will continue to translate as many programs as possible for the TS 1000.*

A DISCONTENTED READER

I have purchased your magazine many times from the bookstore and have found that you have made no attempt to improve your articles and programs. I am aware that I get your magazine for 32 percent off the newsstand price, but why should I buy it if your reviews are contradictory? In your June review of the ADAM computer (which I own), you said that "the printer is of flimsy construction," and then you said that "the ADAM is best considered as a very reasonably priced word-processing system." Which statement is correct?

I also have noted that your programs contain numerous mistakes and are very boring . . . I mean, who wants to know about a *Father's Day Card* program? I suggest that you get your facts straight and publish more interesting programs so your readers can get their money's worth.

IQWAL MANGAT
Hamilton, Ontario

EDITOR'S NOTE: *We don't believe the two ADAM statements are contradictory. You would be hard-pressed to put together a total word-processing system at a more reasonable price. But, if you were willing to spend more money, you certainly could find a sturdier printer. As for the programs we offer, we are sorry you do not enjoy them. Responses from other readers indicate that you are in the minority, but you might watch for some of our upcoming financial and data-base programs.*

PROGRAMMING MADE EASIER

I have enjoyed your magazine. However, being a novice at programming, I am often confused when typing in the beginner programs in the magazine. I find it very difficult in some cases to distinguish between zero (0) and the alphabet letter (O) in some programs. Is this a problem because I am a novice? Can you give me some advice?

GERALD L. THOMAS
Youngstown, Ohio

EDITOR'S NOTE: *We'll do better than give you advice. Take a look at our programming section; we've given you slashed zeros. This should make typing in programs a lot easier. We apologize for the delay in bringing you this helpful feature, but a special part had to be ordered to allow our printers to produce the slashed zero character.*

WHICH ATARI?

Could you please answer a question for me about the magazine? Every time I find a good program that I like to do, it doesn't work. What Atari programs does the word Atari stand for in The Programmer? I have an Atari 400.

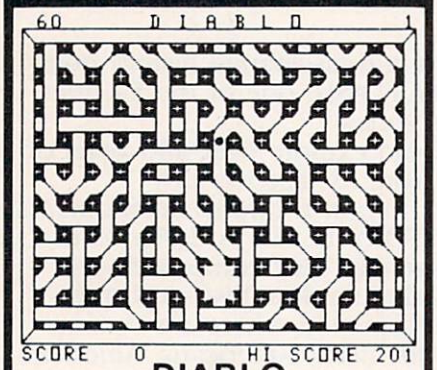
PAMELA HAGIHARA
North Hollywood, California

EDITOR'S NOTE: *The programs that fall under the Atari heading in The Programmer should work for all Atari computers, except when otherwise specified. Most of the programs should run on your Atari 400.*

STAY TUNED

Watch for the FAMILY COMPUTING *TV show on the Lifetime Television Network. The show presents 30 minutes of product demonstrations, on-location computer applications, and helpful tips to make computing a bit easier for everyone in the family. There are two new shows presented each week. Check your local listings for the time and channel.*

SOFTWARE FOR THE
COLECO
ADAM™



DIABLO

With 116 movable panels, this game demands strategy, planning & decisive joystick control of the ever advancing ball to keep it from rolling off the board. Every board is different. **DIABLO** uses the full color and sprite capabilities of the **ADAM.**

SELF-LOADING D-PACK $24.95

EBU PACKAGE

The **E**xtended **B**asic **U**tilities Package contains machine level routines that load into SmartBASIC™ and extend its capabilities. While programming in BASIC, you can use the 16 **COLORS** in your text (like the SmartWriter™ color options); automatically **RENUMBER** your program lines; a **SIDE CALCULATOR** to do HEX and Decimal Conversions in BASIC; and more.

SmartBASIC D-PACK $22.00

TAX1040-84

Up-to-date 1984 changes. Useful not only for accuracy but you can speculate on entries and see the effect on your taxes. Change an entry and it refigures your taxes. Provides a printout of 1040 entries.

SmartBASIC D-Pack $24.00

BONANZA PACKAGE

Not only useful and fun, but these programs can show you some of the capabilities and routines of SmartBASIC. This package, by Martin Consulting, is packed with programs:

- Mini Assembler
- Disassembler
- Sound Generator
- Song in 3 Voices
- Hi-Res Drawing
- Othello Game
- Graphic Adventure
- Math Game
- Spelling Game
- Home Finances
- Filing System
- Label Maker
- Typing Tutor
- Magic Program
- Tennis
- Breakout
- Designs

SmartBASIC D-PACK $35.00

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BEHIND THE SCREENS

PEOPLE, NEWS, AND TRENDS

A Novel Event

Recently, the people of Seattle wrote a detective novel. How they did it was no mystery: They used two Eagle PCs hooked to terminals in an exhibit at a major arts festival.

The party responsible was Invisible Seattle, a group of actors, dancers, artists, and writers. Members of the group dressed as "literary workers" in hardhats and overalls, and, carrying tape recorders, roamed the town, "questioning" citizens about a mysterious (fictional) disappearance. A photo had been found, even a diary. Who was it? Whodunnit? Why?

People were invited to give their answers by writing in notebooks that had been placed in fast food shops all around town or by speaking into the tape recorders the "literary workers" carried. Invisible Seattle staffers typed the notes into the computer which printed out a new chapter every two hours. These were tacked to a wall at the festival, and the public was encouraged to make changes and suggestions.

Afterwards, responses were chosen randomly by the computer, and Invisible Seattle edited them into a coherent, 15-chapter book called *The Visible Invisible*. You can get an abridged version, also called *The Visible Invisible*, for $3 from Function Industries, 2140 9th Ave. W, Apt. #1, Seattle, WA 98119.

Next year, the group plans a nationwide on-line encore, "Invisible America." Meanwhile, its literary bulletin board, In.S.Omnia [(206) 329-3099] runs several literary works-in-progress to which anyone with a computer and modem can contribute.—ROXANE FARMANFARMAIAN

Real Estate in Real Time

Real estate agents are old hats at networking—the art of making contacts. They've been swapping problems and prospects for years. Now they can do it in "real time," electronically through Charles Huggins' Exchange Network, a new electronic information and telecommunications service specializing in real estate marketing.

With a computer and modem, the network lets members buy, sell, exchange, finance, and transfer real estate across the country. Members can arrange mortgages, set up escrows, and transfer titles via the network. It also features electronic mail, brainstorming, and consulting sessions, as well as access to legal, accounting, and tax advice.

Huggins, a long-time champion of networking as a way of marketing real estate, wants the new network eventually to include real estate traders, investors, builders, developers, and mortgage brokers. Membership in the Exchange currently costs $4,000 for those who already have computers. It operates through GE Information Services.

"As business people, our time is valuable," says Huggins. "The network lets us concentrate more on "problem solving" and less on selling because we can access and provide information to our customers."

Martin Reder, of Reder Investments in Santa Barbara, California, described a network transaction that involved sending drafts of an agreement to a broker from Boise, Idaho, who was temporarily located in Billings, Montana, about a parcel of land in Los Angeles. Now, that's covering ground. —ROBIN RASKIN

ILLUSTRATIONS BY HOLLY KOWITT

HOME/MONEY MANAGEMENT

COMPUTING YOUR FINANCIAL GOALS
Here's a Program to Ease Your Planning and Increase Your Efficiency

BY KIMBALL J. BEASLEY

It's a Saturday, like any other, or so you thought. At 10 a.m., your '72 Chevy develops a slight ticking sound—similar to a time bomb. At noon, the rain shower that was sprinkling your rose garden moves indoors through the new leak in your ceiling and christens your Oriental rug. To top it off, you read in the evening paper that Harvard has raised its tuition another $500. At that rate, your kids will be in their 50s by the time you've saved up enough money to send them to college.

You can't be too upset, though. You've been expecting these expenses. The car was due for a major overhaul three years ago, and your 15-year roof warranty ran out last spring. The increasing cost of a college education certainly isn't a surprise. Luckily, you've been stashing away money to cover these expenses. You only hope you've saved enough.

PRACTICAL PLANNING

Planning for future expenses and setting financial goals are necessary tasks for all of us. Setting aside money in a special interest-bearing account established for predictable expenses is a sensible way to plan. However, knowing exactly how often and how much to set aside while adjusting for inflation and the account's changing principal plus interest is no easy matter.

People who have a large amount of surplus cash in the bank don't have to worry about tuition, car payments, or major home repairs. They can simply draw from a reservoir of money as needs arise. Those of us with limited financial means, however, must plan our goals carefully. Our planning becomes complicated when the anticipated $10,000 tuition fee, for instance, increases to $20,000 in 10 years because of inflation. At the same time, setting aside too much money during the planning years is as financially unsound as coming up short. You may end up suffering an unnecessary financial shortage or missed investment opportunities. The savvy financial planner will try to strike a good balance between expenses and the savings to cover them.

The computer program that accompanies this article provides a way to establish financial goals by creating a special account deposit schedule to help you meet all anticipated expenses. The program allows for an inflation factor and your account's growing interest earnings. All financial forecasting—particularly when dealing with inflation rates—involves estimations.

To demonstrate the use of the program, we have created a profile of one family and its financial needs. Mary and Joe Taylor have a 7-year-old and 9-year-old child. The Taylors expect that both children will attend expensive colleges. The Taylor's house has a 20-year-old roof that was built to last 25 years. In two years, the Taylors plan to buy a new car. Joe also owes his business partner $5,000, due in seven years.

Of course, the Taylors are concerned about meeting these financial obligations when each comes due. They could put aside, say, $10,000 every year in a bank account earmarked just for these expenses. However, since Joe has a business to finance and basic family needs to cover, his modest income does not allow this large an annual outlay of cash. The Taylors would like to set up a special account which they could tap into for each anticipated expense.

Furthermore, at the beginning of each year, the Taylors want to deposit the minimum amount necessary so that the special account's fluctuating principal and interest balance won't be exhausted at any time during the planning period. It should be completely empty after the last planned expense is paid, however. Finally, the Taylors don't want to worry about adjusting their account for the effect of inflation on future prices.

THE FIRST STEP

In order to organize their goals, the Taylors fill in a worksheet of anticipated expenses before they sit

EXPENSE WORKSHEET

END OF YEAR	EXPENSE AMOUNT	SUBJECT TO INFLATION	COMMENTS
2	$5,000	YES	NEW CAR DOWN PAYMENT
3	$3,000	YES	CAR PAYMENTS ($250/MONTH)
4	$3,000	YES	CAR PAYMENTS
6	$4,000	YES	REPLACE ROOF
7	$5,000	NO	PAY OFF DEBT TO PARTNER
9	$5,000	YES	JAMES' TUITION
10	$5,000	YES	JAMES' TUITION
11	$5,000	YES	JAMES' TUITION
	$5,000	YES	JOHN'S TUITION
12	$5,000	YES	JAMES' TUITION
	$5,000	YES	JOHN'S TUITION
13	$5,000	YES	JOHN'S TUITION
14	$5,000	YES	JOHN'S TUITION

KIMBALL J. BEASLEY *is a senior engineer with a consulting firm in Princeton, New Jersey. He has written numerous magazine articles dedicated to practical applications for the personal computer.*

OUTPUT WITH 5% INFLATION RATE

YEAR	MINIMUM DEPOSIT: DEPOSIT AT START OF EACH YEAR	MINIMUM DEPOSIT: LUMP-SUM DEPOSIT AT START OF YEAR 1	END OF YEAR: EXPENSE PLUS INFLATION	END OF YEAR: ACCOUNT BALANCE
1	$4779.69	OR $38731.53	$0.00	$5257.66
2	$4779.69		$5512.50	$5528.58
3	$4779.69		$3472.87	$7866.22
4	$4779.69		$3646.51	$10263.99
5	$4779.69		$0.00	$16548.05
6	$4779.69		$5360.38	$18100.13
7	$4779.69		$5000.00	$20167.81
8	$4779.69		$0.00	$27442.25
9	$4779.69		$7756.64	$27687.49
10	$4779.69		$8144.47	$27569.43
11	$4779.69		$17103.39	$18480.64
12	$4779.69		$17958.56	$7627.80
13	$4779.69		$9428.24	$4219.99
14	$4779.69		$9899.65	$0.00

SPECIAL ACCOUNT INTEREST RATE = 10 %
ESTIMATED AVERAGE INFLATION RATE = 5 %

Chart A

OUTPUT WITH 10% INFLATION RATE

YEAR	MINIMUM DEPOSIT: DEPOSIT AT START OF EACH YEAR	MINIMUM DEPOSIT: LUMP-SUM DEPOSIT AT START OF YEAR 1	END OF YEAR: EXPENSE PLUS INFLATION	END OF YEAR: ACCOUNT BALANCE
1	$7103.94	OR $57565.79	$0.00	$7814.33
2	$7103.94		$6050.00	$10360.11
3	$7103.94		$3993.00	$15217.46
4	$7103.94		$4392.30	$20161.24
5	$7103.94		$0.00	$29991.70
6	$7103.94		$7086.24	$33718.97
7	$7103.94		$5000.00	$39905.21
8	$7103.94		$0.00	$51710.06
9	$7103.94		$11789.73	$52905.67
10	$7103.94		$12968.71	$53041.87
11	$7103.94		$28531.16	$37629.22
12	$7103.94		$31384.28	$17822.20
13	$7103.94		$17261.35	$10157.41
14	$7103.94		$18987.49	$0.00

SPECIAL ACCOUNT INTEREST RATE =10%
ESTIMATED AVERAGE INFLATION RATE =10%

Chart B

down at their computer. (*See expense worksheet.*) Home maintenance, education, and automobile expenses are just a few of the areas most people will need to include on their list. There are probably other expenses that will be unique to your particular situation whether it's a second computer or a new set of golf clubs.

The Taylors' next step is to key the BASIC program provided with this article into their computer. Joe runs the program using the worksheet to answer each computer query. In a few moments, the computer responds with the appropriate output on the printer (*see Chart A*).

The Taylors can now see that $4,779.69 deposited in the special 10 percent account at the beginning of each year will cover all of their anticipated major financial goals and expenses with an assumed average 5 percent inflation rate over the 14-year planning period. The Taylors also see that if they decide to make a one-time deposit today instead of each year, $38,731 deposited at the beginning of the first year will be enough, with accumulated interest, to cover these planned expenses.

Of course, the Taylors cannot be sure that the inflation rate over the next 14 years will average 5 percent. In fact, they think it may be closer to 10 percent. To examine this possibility, Joe answers YES to the query: DO YOU WISH TO CHANGE THE INTEREST OR INFLATION RATE? He enters 10 percent as the special account interest rate. Then, he enters 10 percent in response to the computer's ESTIMATED AVERAGE INFLATION RATE query. The resulting computer output tells Joe that a deposit of $7,103.94 at the beginning of each year will be required to meet all planned expenses. The alternative one-time deposit option for this 10 percent inflation estimate is $57,565. The output resulting from the 10 percent inflation estimate is shown in Chart B.

In both cases, Joe can view the account's balance at the end of each year over the planning period, and see the inflation-adjusted financial goal/expense figure.

Obviously, it is quite simple to try various combinations of estimated inflation rates and account interest rates to compare the impact of each combination on the results. In short, this program and your personal computer can be very useful tools for establishing a special account deposit schedule tailored to meet anticipated expenses and your long-range financial goals.

Base Version (Commodore 64)/*Financial Goal Planning*

```
10 DIM T(100,2),A(100)
20 TRU=-1
30 FOR X=1 TO 33:SP$=SP$+CHR$(32):U$=U$+CHR$(45)
40 NEXT X:LS$(0)=LEFT$(SP$,19)
50 FOR Y=1 TO 100
60 T(Y,0)=0:T(Y,1)=0:T(Y,2)=0
70 NEXT Y:C=1
80 PRINT CHR$(147);
90 PRINT SPC(8);"FINANCIAL GOAL PLANNING"
100 PRINT:PRINT "PLANNED EXPENSE (END=0)";
110 INPUT T(C,0):IF T(C,0)=0 THEN C=C-1:GOTO 160
120 PRINT "  YEAR OF EXPENSE";:INPUT T(C,1)
130 PRINT "  SUBJECT TO INFLATION (Y/N)";:INPUT T$
140 GOSUB 2000:T(C,2)=TRU*T
150 C=C+1:GOTO 100
160 PRINT:PRINT "SPECIAL ACCOUNT INTEREST RATE";:INPUT
 T$:E=VAL(T$)/100
170 IF E=0 THEN 160
180 PRINT "ESTIMATED AVERAGE INFLATION RATE";:INPUT T$
:G=VAL(T$)/100
190 FOR X=1 TO 100:A(X)=0:NEXT X:L=1
200 FOR X=1 TO C
210 A(T(X,1))=A(T(X,1))+T(X,0)*(1+G*T(X,2))^T(X,1)
220 IF T(X,1)>L THEN L=T(X,1)
230 NEXT X
240 OPEN 4,4:CMD 4
250 PRINT SPC(17);"MINIMUM DEPOSIT";SPC(21);"END OF YE
AR"
260 PRINT SPC(7);"+";U$;"+   +";LEFT$(U$,24);"+"
270 PRINT SPC(7);"DEPOSIT AT START  LUMP-SUM DEPOSIT";
280 PRINT SPC(4);"EXPENSE PLUS";SPC(5);"ACCOUNT"
290 PRINT "YEAR";SPC(4);"OF EACH YEAR";SPC(4);"AT STAR
T OF YEAR 1";
300 PRINT SPC(4);"INFLATION";SPC(7);"BALANCE"
310 PRINT LEFT$(U$,4);SPC(3);LEFT$(U$,16);" ";
320 PRINT LEFT$(U$,18);SPC(3);LEFT$(U$,12);"  ";LEFT$(
U$,12)
330 F=1:GOSUB 1000:T=P
340 GOSUB 3000:LS$(1)=LEFT$(SP$,15-LEN(T$))+"OR $"+T$
350 B=0:FOR Y=1 TO L
360 B=(B+A)*(1+E)-A(Y)
370 IF B>=0 THEN W=A:GOTO 390
380 W=A-B/(1+E):B=0:F=Y+1:GOSUB 1000
390 T$=MID$(STR$(Y),2)
400 PRINT T$;:T=W:GOSUB 3000:PRINT SPC(10-TRU*(Y>9));P
F$;LS$(TRU*(Y=1));SPC(3);
410 T=A(Y):GOSUB 3000:PRINT PF$;:T=B:GOSUB 3000:PRINT
"  ";PF$
420 NEXT Y
430 PRINT:PRINT "SPECIAL ACCOUNT INTEREST RATE";SPC(4)
```

→

```
;"=";E*100;"%"
440 PRINT "ESTIMATED AVERAGE INFLATION RATE =";G*100;"
%"
450 PRINT#4:CLOSE 4:T$="":PRINT CHR$(147);
460 PRINT "DO YOU WISH TO CHANGE THE"
470 PRINT "INTEREST OR INFLATION RATE (Y/N)";
480 INPUT T$:GOSUB 2000:IF T THEN 160
490 PRINT "DO YOU WISH TO START AGAIN (Y/N)";
500 INPUT T$:GOSUB 2000:IF T THEN 50
510 END
1000 P=0:FOR S=F TO L
1010 P=P+A(S)/(1+E)^(S-F+1)
1020 NEXT S
1030 IF (L-F)<0 THEN F=L
1040 A=P*E*(1+E)^(L-F)/((1+E)^(L-F+1)-1)
1050 RETURN
2000 T$=LEFT$(T$,1):T=(T$=CHR$(89) OR T$=CHR$(121)):RE
TURN
3000 T$=STR$(INT((T+1)*100))
3010 PF$=RIGHT$(T$,2)
3020 T=VAL(LEFT$(T$,LEN(T$)-2))-1
3030 T$=MID$(STR$(T),2)
3040 PF$=T$+"."+PF$:T$=PF$
3050 PF$=LEFT$(SP$,11-LEN(PF$))+"$"+PF$:RETURN
```

MODIFICATIONS FOR OTHER COMPUTERS

ADAM & Apple

Use the base version, except change lines 20, 80, 240, 390, 450, and 3030 to read as follows:

```
20 TRU=1
80 HOME
240 PR#1
390 T$=STR$(Y)
450 PR#0:HOME
3030 T$=STR$(T)
```

IBM PC & PC*jr*

Use the base version, with the following alterations: Omit line 240. Change **PRINT** in lines 250–320, 400, 410, 430, and 440 to **LPRINT**. Finally, change lines 80 and 450 to read as follows:

```
80 CLS
450 CLS
```

TRS-80 Models III & 4

Use the base version, with the following alterations: Omit line 240. Also, change lines 10, 80, 90, 250–320, 400, 410, and 430–450 to read as follows:

```
10 CLEAR 1000:DIM T(100,2),A(100)
80 CLS
90 PRINT TAB(20);"FINANCIAL GOAL PLANNING"
250 LPRINT TAB(17);"MINIMUM DEPOSIT";TAB(53);"END OF Y
EAR"
260 LPRINT TAB(7);"+";U$;"+   +";LEFT$(U$,24);"+"
270 LPRINT TAB(7);"DEPOSIT AT START  LUMP-SUM DEPOSIT"
;
280 LPRINT TAB(45);EXPENSE PLUS";TAB(62);"ACCOUNT"
290 LPRINT "YEAR";TAB(8);"OF EACH YEAR";TAB(24);"AT ST
ART OF YEAR 1";
300 LPRINT TAB(46);"INFLATION";TAB(62);"BALANCE"
310 LPRINT LEFT(U$,4);TAB(7);LEFT$(U$,16);" ";
320 LPRINT LEFT$(U$,18);TAB(45);LEFT$(U$,12);"  ";LEFT
$(U$,12)
400 LPRINT T$;:T=W:GOSUB 3000:LPRINT TAB(11);PF$;LS$(T
RU*(Y=1));"   ";
410 T=A(Y):GOSUB 3000:LPRINT PF$;:T=B:GOSUB 3000:LPRIN
T "  ";PF$
430 LPRINT:LPRINT "SPECIAL ACCOUNT INTEREST RATE";TAB(
33);"=";E*100;"%"
440 LPRINT "ESTIMATED AVERAGE INFLATION RATE =";G*100;
"%"
450 T$="":CLS
```

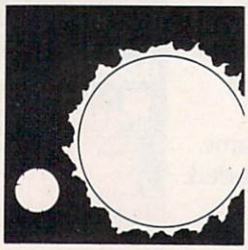
Note: Use the up-arrow ↑ key (upper left-hand corner of the keyboard) to enter the ^ character in lines 210, 1010, and 1040. This character will look like a left bracket ([) on the screen, but will show up as a ^ on most printers. FC

BOUNTY HUNTER

An adventure in the Old West. Journey back with us into the days of Jessie James and Billy the Kid where the only form of justice was a loaded revolver and a hangman's noose. In this full-length text adventure, you play the role of Bounty Hunter, battling against the ruthless outlaws, hostile Indians, wild animals and the elements of the wilderness with only your wits and your six gun. Average solving time: 20-30 hours.

SAVINGS & LOAN

This extremely easy to use home finance program will help you pick the best type of loan for your budget. See what a small difference a couple of percent makes on a 4 year car loan, and what a devastating effect a couple of percent makes on a 20 year mortgage. You can print out an amortization table of any loan. You can figure out the value of an investment based on one initial deposit, or deposits made yearly, semiannually, monthly, or weekly.



TREK

The classic game that has fascinated computerists for over a decade. Commanding the bridge of your starship, you explore the galaxy, fending off the Klingon invaders with your phasers and photon torpedoes, at the same time conserving your limited time and energy.

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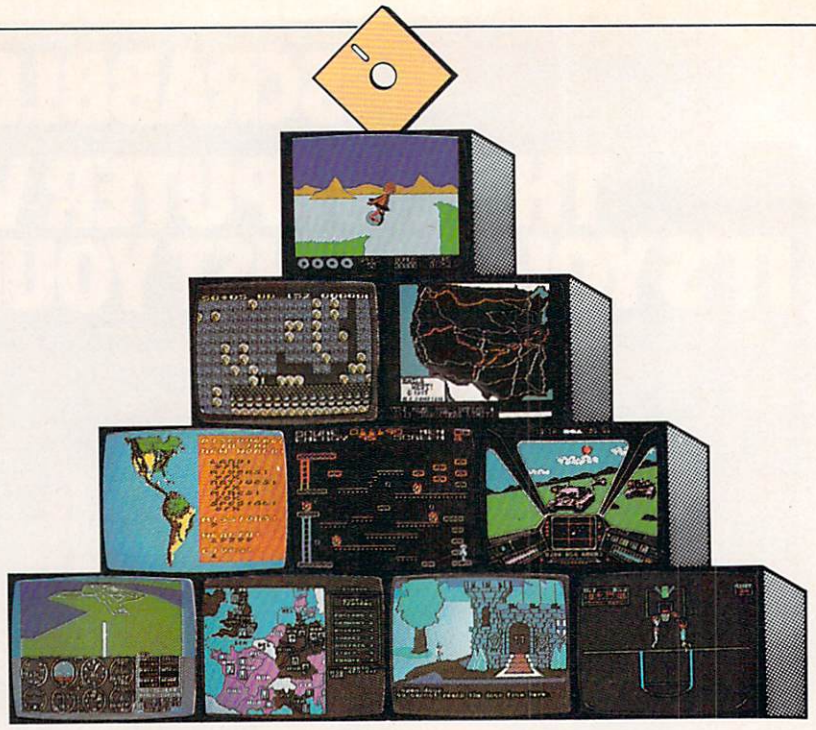
GAMES

84'S FINEST
A Run-Through of the Best Programs Reviewed This Year

BY JAMES DELSON



1984 was a superb year for games. Although arcade games continue in popularity, strict shoot-'em-ups have given way to legions of more sophisticated challenges—games that require more than the ability to aim well.

With hundreds of games from which to choose, I had trouble narrowing down the greats to fit into anything as orderly as a 10-Best list. As a result, my "Top 10" has mushroomed into a roster of the best programs in 18 different categories. These are programs that, though in some cases were published before 1984, didn't cross my desk until this year.

GAME OF THE YEAR/
BEST FINANCIAL GAME
Rails West!
Strategic Simulations;
(415) 964-1353

This role-playing adventure about the building of the American railroads is by far the most exciting, fascinating, creatively designed game of 1984. It's a financial program, which means that it can be tough-going in places. But any serious game player would be nuts not to buy it. It's suitable for gamers 12 years old and up, and has various levels of difficulty, length, and complexity. It features the best computerized opponents I've encountered thus far. Play it solo, or against a number of human and/or computer competitors. The game's design has so many variables that it doesn't repeat itself, guaranteeing it to be as exciting a year from now as it is today. (For Apple II series, Atari Home Computers; $39.95.)

CONTINUING SERIES
Knight of Diamonds and
Legacy of Llylgamyn
Sir-tech; (315) 393-6633

The second and third games in the long-running *Wizardry* series live up to the excitement of their predecessor. This best of all role-playing series is a great value because it's a long-runner: I spent 10 hours every weekend for two seasons last year fighting monsters, casting spells, mapping labyrinths, and earning imaginary fame and fortune. (For Apple II series; *Knight of Diamonds*, $34.95; *Legacy of Llylgamyn*, $39.95.)

ROLE-PLAYING
ADVENTURE
The Seven Cities of Gold
Electronic Arts; (415) 571-7171

With a shorter game length than *Wizardry*, a less complex play system than *Rails West!*, and (unfortunately) the design of a solitaire game (though several players may work together to control the central character), this is one of the finest games on the market. It's a simulation of the Great Age of Discovery, when Spanish explorers set out to tame the uncharted lands of the New World. The scenario comes complete with sailing ships; plunder; free trade; a host of choices including whether or not to spare the indigenous peoples, and how much food to take on your voyage; and the dream of all adventurers—personal glory. (For Atari Home Computers, Commodore 64; $39.95.)

ARCADE/
SHOOT-'EM-UP
Skyfox
Electronic Arts; (415) 571-7171

A fast, furious relief from the mental labors of role-playing or finance simulation, this razzle-dazzle flying fantasy puts you in the cockpit of a high-tech fighter plane. You obliterate tanks, planes, and spaceships that are out to destroy Earth. Thanks to superb, through-the-windscreen graphics, all other flight simulators' visuals pale by comparison. (For Apple II series; $40.)

STRATEGY/ARCADE
Archon II: ADEPT
Electronic Arts;
(415) 571-7171

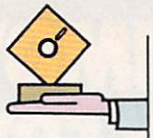
Intricate strategies combined with hand-eye skills are required for success in this "sequel" to *Archon*, a must for gamers of every age and taste. Two players maneuver their casts of fantasy characters around a board. When opponents meet on the same square, they face off on a separate battle screen. One match, either solo or two-player, takes anywhere from 15 minutes to two hours. (For Atari Home Computers, Commodore 64; $40.)

STRATEGY
AND TACTICS
Gulf Strike
Avalon Hill; (301) 254-5300

Gulf Strike is an enormous war game in which air, sea, and land units from the U.S., Iran, and their allies fight U.S.S.R./Iraqi forces to gain control of the Persian Gulf. It takes hundreds of hours to play, yet is never slow and is always completely involving. (For Atari Home Computers; $39.95. Planned for Apple II series, Commodore 64.)

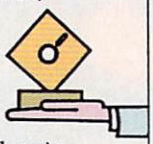
Next month, JAMES DELSON, FAMILY COMPUTING*'s games critic, interviews the designers behind* Archon II: ADEPT.

GAMES



POLITICAL
Geopolitique 1990
Strategic Simulations; (415) 964-1353

If you'd rather settle international disputes peacefully through intimidation, diplomatic missions, or other political means, this game's for you. Of course, if as the U.S. player (the computer plays Russia) you can't win by fast-talking friend and foe, there's always the disk's war scenario, "Geowar". (For Apple II series, Commodore 64; $39.95.)

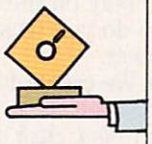


MULTIPLAYER
Diplomacy
Avalon Hill; (301) 254-5300

This adaptation of the classic board game is just the ticket for those who wish to combine tactics and strategy with political maneuvering. Up to seven players or teams control a major European power at the turn of the 20th century. By making deals or invading other countries, each tries to gain control over more than half of the continent. The computer supplies dummy players to fill out the seven if you're short, but these electronic substitutes are born losers. Played with seven people, however, this game is dynamic. (For IBM PC/PC*jr*; $50. TRS-80 III/4 at Radio Shack stores.)

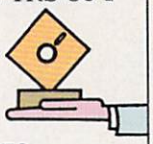
HYBRID
Sundog: Frozen Legacy
FTL Games; (619) 279-5711

This combination arcade/role-playing adventure, financial simulation, outer space shootout, and intragalactic exploration is fresh and absorbing, and takes weeks to play. You begin with an abandoned spaceship. Check for damage, then shuttle into town to obtain spare parts and information. Fly to other planets in repeated quests until you succeed in taking a crew of frozen voyagers to a planet they set out to colonize. This game's a sign of things to come, pointing towards scenarios that offer a wide variety of experience in one package. (For Apple II series; $39.95.)



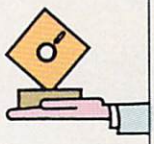
TEXT-ONLY ADVENTURE
Suspended
Infocom; (617) 492-1031

You are a human brain that controls a group of robots that maintain a planetary facility. Each robot has serious limitations, so you must coordinate their efforts. That's like trying to juggle six live grenades in a darkened room. It takes practice. (For Apple II series, Macintosh, Atari Home Computers, Commodore 64, IBM PC/PC*jr*, TI-99/4A, TRS-80 I/III/4; $49.95.)



TEXT/GRAPHIC ADVENTURE
The Mask of the Sun
Broderbund; (415) 479-1170

Mystery, adventure, and thrills abound on your expedition into the South American interior. The game features plenty of puzzles to solve, strange customs and creatures, and an occasional cliff-hanger. (For Apple II series, Atari Home Computers, Commodore 64; $39.95.)



ARCADE/ ROLE-PLAYING ADVENTURE
King's Quest
Sierra Inc.; (209) 683-6858

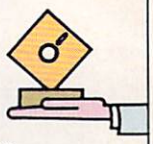
Here is a state-of-the-art text/graphic adventure with such innovative features as animated graphics; joystick controlled movement such as walking, jumping, climbing, and crouching; scrolling screens; and sound. This is the first of a new generation. Players seek to restore the once great powers of a weakened ruler by acquiring several magic items. Scour the countryside; trade, fight, and bargain with people and creatures you encounter. (For Apple II series, IBM PC; $49.95.)

SIMULATOR
Flight Simulator II
subLogic; (217) 359-8482

Fly a light aircraft across the U.S., using keyboard or joystick to control every function of a real plane in what is far and away the best computer simulation of a real-life experience. Then go on to play a W.W.I flying game. (For Apple II series, Atari Home Computers, Commodore 64; $49.95.)

FOR YOUNGSTERS
B.C.'s Quest for Tires
Sierra Inc.; (209) 683-6858

With simple joystick controls, kids help B.C. roam through the prehistoric world avoiding obstacles in search of his loved one. Excellent graphics and content make this the cutest game of the year. (For Apple II series, Atari Home Computers, Coleco ADAM, Commodore 64, IBM PC/PC*jr*; $34.95 [disk], $39.95 [cartridge].)



ARCADE
Boulder Dash
First Star; (212) 532-4666/
Micro Fun; (312) 433-7550

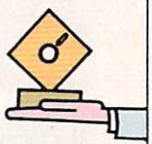
Here's a new twist. This program was so good it was turned into a coin-operated arcade game after debuting as a home version. Players move Rockford, the bug, through 16 screens (five levels), trying to survive and accumulate wealth. Only after collecting gems and avoiding falling boulders, menacing butterflies, or oozing amoeba, can you go on to the next screen. A game for all ages. (First Star: For Atari Home Computers, IBM PC/PC*jr*; Micro Fun: For Coleco ADAM, Apple II series, Commodore 64; $24.95–$39.95.)

CONSTRUCTION SET
Mr. Robot and His Robot Factory
Datamost; (818) 709-1202

This sophisticated ladder game contains a built-in modification program allowing players to alter or create boards for further use and substantially extending the play-life of the program. Fun for all ages and ideal for group play. (For Apple II series, Atari Home Computers, Commodore 64; $39.95.)

SPORTS
Julius Erving and Larry Bird Go One-on-One
Electronic Arts; (415) 571-7171

Few games are so absorbing that you forget you're playing on a computer. You'll forget with *One-on-One*. The real-life players helped develop the game, and their personalities are built into the play system. It is a remarkable basketball simulation. (For Apple II series, Atari Home Computers, Commodore 64, IBM PC; $40.)



A TOUGH CATEGORY TO CATEGORIZE
Galactic Gladiators
Strategic Simulations; (415) 964-1353

Although this game has been remaindered by S.S.I., it's one of the best role-playing adventures ever. It allows you to create, alter, and send teams of warriors into single combat, group encounter, and even self-designed quests. It's best described as a game for toy soldiers played inside a computer, but *Dungeons & Dragons* fans will go ape over it as well. Check out that price, too. (For Apple II series, IBM PC/PC*jr*; $19.)

COMPUTING CLINIC

DVORAK KEYBOARD • ADAM GRAPHICS & TEXT • USED COMPUTERS • WHEN TO TURN OFF

BY JEFFREY BAIRSTOW

Should I leave my computer (an IBM PC) switched on rather than turning it on and off frequently?
KATHRYN NORCROSS BLACK
West Lafayette, Indiana

The typical personal computer and its peripherals consume about 150–200 watts of electricity when switched on but not in actual use. That's about the same as a moderately powerful lamp, and the cost is probably only pennies per day. Switching a computer on and off can produce power surges which, over a long time, might produce component breakdowns.

My general advice, for someone who works periodically through the day with a computer, is to switch the machine on in the morning and leave it on until finishing work at the end of the day. However, do turn down the monitor's brightness and contrast when not using the computer—to avoid "burning" an image into the delicate phosphors of the screen. Some computers, such as the Atari 800 and the TI-99/4A, automatically change screen colors or blank the screen, respectively, to finesse this "burning" problem.

How can I operate my Coleco ADAM so that the top half of the screen is graphics and the bottom half is text?
JOEL VAN ALLEN
Grass Valley, California

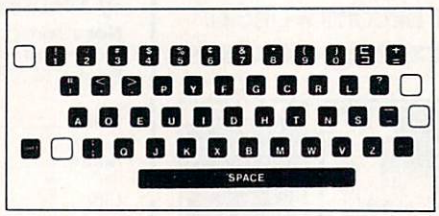
You can mix graphics and text in both low- and high-resolution. The low-res graphics mode automatically provides a four-line text "window" at the bottom of the screen. To enter the low-resolution mode from BASIC, use the GR command.

You can also use one of the two high-resolution modes. The HRG command will put you in a hi-res graphics mode and leave the same four lines at the bottom of the screen for text.

Useful low-res commands include PLOT (to plot a point), COLOR= (to set the color for the next plotting command), and HLIN and VLIN (to draw lines). Commands available in hi-res include HPLOT and HCOLOR.

What is the layout of the Dvorak keyboard?
CHRIS BOHN
Edwards, California

The Dvorak keyboard, patented in 1936 by Dr. August Dvorak and his brother-in-law, William Dealey, puts the five vowel keys, "AOEUI," together under the left hand in the center row, and the five most frequently used consonants, "DHTNS," under the fingers of the right hand (*see Home-School Connection in the March* FAMILY COMPUTING). Proponents of the Dvorak keyboard claim it's much faster to use than the standard "QWERTY" keyboard, especially for children or nontypists. One woman trained in the Dvorak system has reached a speed of 200 words per minute, faster than the recorded high of 170 on the QWERTY keyboard.



Some computer keyboards, such as the IBM PC's, can be reprogrammed to the Dvorak format. Also, a Key Tronic keyboard, in Dvorak format, is available for use with the IBM PC. The Apple IIc has a switch that alters it to the Dvorak format. All other Apple computers can be programmed to use the Dvorak format, according to the Dvorak International Federation. A program called *SmartKey II Plus*, by Software Research Technologies Inc. (3757 Wilshire Blvd., Suite 211, Los Angeles, CA 90010) will convert any CP/M, MS-DOS, or PC-DOS computer to the Dvorak format.

The Dvorak International Federation (11 Pearl St., Brandon, VT 05733; [802] 247-6020) will gladly send you more information.

Where can I buy a used computer? What is the chance of getting "taken" when buying a used computer?
JEFFREY COHEN
Fresh Meadows, New York

Your best sources of reliable used computers are probably your local users' groups. Check computer stores or area schools for their addresses. Also, regional computer "shoppers" are springing up, and they're good sources. For instance, in the New York area, *Computer Living/New York* (Meyer Publications, 155 E. 23rd St., New York, NY 10010) publishes classified ads listing used equipment. The national publication *Computer Shopper* (P.O. Box F, Titusville, FL 32781) does the same.

Used computers are also advertised on computerized bulletin board systems (BBS's), and on the bulletin boards of CompuServe and The Source.

As when buying any piece of used equipment, the password is "caveat emptor"—buyer beware. Computers themselves, once past the initial "burn-in" phase, are actually quite reliable. Still, it's a good idea to see the computer in operation before you buy, and have a friendly expert check it out for you. Pay particular attention to mechanical items, such as disk drives or printers, that can wear out. (*For further tips, see "Buyer's Guide To Used Computers," in the April 1984* FAMILY COMPUTING.)

JEFFREY BAIRSTOW, *a technical journalist who lives in West Redding, Connecticut, was a founder and managing editor of* Computer Decisions *magazine. He has also taught math and computer science. His family, including two preschoolers, uses a variety of computers.*

WANT ANSWERS?

Tune in to the FAMILY COMPUTING *TV show on the Lifetime Television Network. The show's workshop section will answer some of the most frequently asked computing questions. Check your local cable listings for the time and channel.*

"I Hereby Resolve To..."

HERE'S A SAMPLING OF COMPUTER NEW YEAR'S RESOLUTIONS FROM OUR READERS

BY ROBIN RASKIN

NAME: Lynette Stuart
RESIDENCE: Des Moines, Iowa
OCCUPATION: Work with developmentally disabled children
COMPUTER: Apple IIe
APPLICATIONS: Programming and games, developing instructional aids to use with my students

RESOLUTION: I know three different forms of BASIC, and I'm fluent in Logo. Now, I intend to learn more about Pascal and will use this knowledge to aid my youngsters.

NAME: Patricia McConnel
RESIDENCE: Moab, Utah
OCCUPATION: Author
COMPUTER: Osborne 1 and Epson PX-8
APPLICATIONS: Word processing, research and record-keeping, telecommunications

RESOLUTION: I resolve to hike to Delicate Arch, the most spectacular rock formation in Arches National Park, with my new Epson PX-8 lap computer in my rucksack. I will sit under the arch and write a poem on my computer, and feel secure that I am the first person in the world to do so. That's the fun of belonging to the Computer Age.

NAME: James Franklin
RESIDENCE: Birmingham, Alabama
OCCUPATION: Juvenile Probation Officer, Family Court, Jefferson County
COMPUTER: Coleco ADAM
APPLICATIONS: Word processing, games

RESOLUTION: I'm going to continue to pester software companies to create programs for ADAM users.

ROBIN RASKIN *is a contributing editor to* FAMILY COMPUTING. *She wrote "Diary of a Computer Shopper" for the December 1984 issue.*

A RESOLUTION FOR COMPUTER-AGE PARENTS

WHEREAS, we understand that by the time our children grow up and enter the work market, computers will be as ubiquitous as typewriters now; and

WHEREAS, we also understand that in the near future, computer-literate people will have significant career advantages over those who are computer-ignorant; and

WHEREAS, we further understand that in the future, computers will be affecting people's lives, whether or not they have jobs;

NOW, THEREFORE, we resolve to see that our children have the opportunity to become computer-competent at the earliest possible age. To accomplish this, we further resolve:

To purchase and use a personal computer in the home so that our children are guaranteed access to computer learning;

To become computer-literate ourselves in order to be better prepared to encourage and support our children;

To purchase high-quality, interactive learning software, such as Logo and educational games, and to join our children in the learning process;

To support and encourage the schools, in any way we can, as they purchase computers and train teachers to use them;

To encourage our girls to take math, science, and computer courses all the way through school, since without a background equal to boys in these areas many career options will then be closed to them;

To explore all the options inherent to computers for our handicapped children, since the enabling potentials of computers can make the difference between dependency and self-sufficiency;

To stay informed and involved with the economic, sociological, and political issues connected with computing, since the groundwork that is laid now will affect the work climate our children will inherit from us;

—PATRICIA McCONNEL

NAME: Bob Umlas
RESIDENCE: Yonkers, New York
OCCUPATION: Senior Technical Consultant, CBS
COMPUTER: Apple Macintosh
APPLICATIONS: Make "To do" lists and phone number lists; keep data bases for numerous hobbies, finances, and budget; design architectural plans, business and greeting cards; word processing

RESOLUTION: I am going to beat *Sargon III* (a chess game). I am going to find the damsel in *Transylvania*. I am going to cross-reference my jokes. I am going to write a marketable data-base program called *KWOC* (*Key Word Out of Context*).

NAME: Eleanor Notarangelo
RESIDENCE: Highspire, Pennsylvania
OCCUPATION: Typesetter
COMPUTER: Coleco ADAM
APPLICATIONS: Word processing, typing in BASIC programs

RESOLUTION: I resolve to get myself and my computer more organized, to spend more time with my computer, and to begin computerizing my recipes, telephone numbers, and addresses.

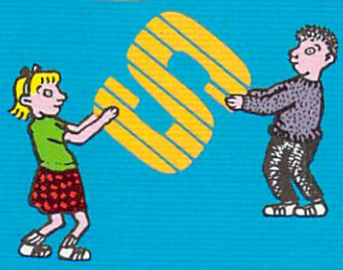
NAME: Charles Wadham
RESIDENCE: Fresno, California
OCCUPATION: Manager of Training, New York Life Insurance Co.
COMPUTER: IBM PC/XT
APPLICATIONS: Programming, use *Lotus 1-2-3* and *MultiMate* to prepare church-related documents

RESOLUTION: To discover and buy several fun/learning programs for my grandchildren. To find and use a genealogical indexing program to file the 200 handwritten pages of notes I've amassed over the last 20 years. To continue to learn and work with financial portfolio-management programs, particularly those with graphics features.

NAME: Joan LeClere
RESIDENCE: Jacksonville, Florida
OCCUPATION: Writer
COMPUTER: Kaypro II, Commodore 64
APPLICATIONS: Word processing by day, programming and operating a bulletin board by night

RESOLUTION: I gave up making resolutions when I was 12, but: I resolve to finish my third novel that's stuck at page 35 and to write more computer-related articles. I plan to learn about sequential and random files so I can modify some of my BASIC programs. I resolve to raise my head from this keyboard occasionally to pay closer attention to my family. FC

7 TRICKS FOR PROCESSING



There has been a good deal of confusion lately about the phrase "word processing."

Word processing can sound like the special job of a secretary. But that's not it at all. Using a computer to write gives you a location where writing and thinking take place, the breakthrough of always having a clean copy in front of you, and the reduction of weeks of revision and retyping to a matter of just hours. Word processing is a whole working environment.

A computer alone is not a word processor. It's just the machine that runs certain programs. The program is the word processor, and although such programs vary tremendously in their capabilities and functions, there are some general ways of using them that will make organizing, filing, and writing easier.

A few simple methods—tricks, if you will—can pave the way to highly efficient and practical word-processing habits. You don't need to spend a fortune on software to make good use of some of your computer's clever capabilities.

Starting a writing project by collecting lots of thoughts, ideas, and facts is much easier with a word processor than with paper and pencil. For example, with proper preparation, the computer works as an incubator for the perfect term paper. As I detail some of my tricks for better word processing throughout this article, I'll use a term paper as an example—but these tips work just as well for any other writing project.

P. GREGORY SPRINGER, *a freelance writer from Urbana, Illinois, is the author of a computer notebook for college students called* Electronic Notebook *(dilithium Press). He wrote the Telecomputing column in the September issue of* FAMILY COMPUTING.

1 WRITE AWAY

As soon as you've been assigned a term paper and chosen a topic, you should make an immediate effort to begin collecting thoughts, ideas, facts, and phrases. Seek and you will find! When you know you'll be writing on a particular subject, you're likely to stumble across ideas and information that can be added to that topic. Store these bits and pieces on a computer file, and frequently review what you have collected.

When the time comes to edit your information into a finished, written work, many of your thoughts on the subject will have grown, changed, and matured. Everything is properly stored in electronic memory. Perhaps you've even written some complete sentences and paragraphs that can be incorporated into the final paper.

2 TAKE IT FROM THE TOP

Eventually, the time comes when the paper is due. Don't panic. It shouldn't require much strength to pull together all the notes, quotes, and anecdotes you have already gathered in preparation for this moment. My technique, called the "top-of-file" plan, is one way to make writing the paper a more organized task.

If you have stored information on more than one computer file, or on paper, now is the time to compile all your notes together into one computer file. Make a backup of your raw "slushpile" of notes and ideas. You may want to refer back to it later.

Now you're ready to begin work on the final paper. Sort through the scattered ideas and information by reading through them a few more times. There may be repetitions and irrelevancies to delete. By sorting through what you have, you should be able to form a rudimentary outline.

As best you can, choose outline headings based on the information you have. For example, if you were doing a paper about the Romantic poets, you might choose the following ideas:

1) POETS IN ENGLAND
2) THE MOVEMENT IN AMERICA
3) PRESENT DAY CONSIDERATIONS
4) WILLIAM BLAKE'S CONTINUING INFLUENCE

The shuffle begins. If you list the four sections at the bottom of the slush file, you may then begin rearranging the information to fit into sections of your outline.

With your word processor's BLOCK or CUT-AND-PASTE functions, transfer a relevant sentence from your notes into part one. Move down a quote that fits into part three, and so on, until everything is rearranged under one of your headings, smoothing your work into order.

Once you compose a beginning for your paper, write it at the very bottom of your new file. With all your notes now organized into an outline of sentences and bits of information, you can begin writing from the bottom of this file. Gradually, you can transform the raw notes from above into coherent sentences and paragraphs below—revising sentences, correcting misspellings, adding thoughts, deleting the used-up notes as you go. This is real word "processing," and it works.

As you work, you delete all the notes above to create the finished pa-

BETTER WORD

CLEVER WAYS TO PUT YOUR WORD PROCESSING PROGRAM TO WORK

BY P. GREGORY SPRINGER

per beneath. When you've run out of notes to draw on, your cursor should be resting at the very top of a written research paper!

3 SHAPE UP

Once you've covered all the major points in your paper, it's time to "clean up" the copy. First, read through the paper as it appears on the screen. Correct any errors you find in spelling, grammar, or organization. If a paragraph might make more sense in another section, scout around and see where you might place it.

Next, print out a rough draft of your paper. Don't convince yourself that because it looked good on the screen, you don't need to review it on paper. Impressions of length, style, and clarity can be deceptive on the screen, and may change when the words are put onto paper.

4 STORE STOCK FORMATS

Once you become accustomed to using your computer, you can save a lot of time by storing formats you use regularly. How you do this depends on the word processor you use.

Some word processors work with menus while others require that you insert coded information at the start (and sometimes throughout) every written work. That code is then interpreted during the process of printing. If you have a word processor that uses codes, you may be able to save the formats you use most often.

For example, you may know that every report you write should have a page length of 56 lines, double spacing, a page-heading and numbering format, margins of 1 inch on each side, and other regular format patterns. Prepare the coded lines of information you would ordinarily type in at the beginning of every written work, and file the code permanently.

The next time you need it, you can call up the prepared format without having to hunt through the manual and retype the individual code.

5 NAME FILES

The disk directory or menu gives you a list of all your files on a particular disk. Some operating systems will alphabetize this list; most will not. So how can you name your files to keep them distinct and noticeable?

Say you are about to begin the study of "Romeo and Juliet," and you want to open a file for notes on the play. You could title the file ROMEO or JULIET or SHAKES. If you plan to keep several files of notes to be collected in alphabetical order, you could create an extension for each alphabetical limit: SHAKES/A-N, SHAKES/O-S, and SHAKES/T-Z.

Keep your titles clear and to the point. You wouldn't call the "Romeo and Juliet" files PLAY, for example, particularly if you are going to be studying other plays. Avoid confusion by being as specific and obvious as possible.

6 ADD GRAPHICS

You don't need expensive hardware or fancy software to use graphics. You can easily make computer screens and printouts easier to read and understand by using simple graphic symbols.

In the following THINGS TO DO list, common punctuation symbols available on any keyboard are used to divide up a list of deadlines, notes, and study plans. You can print out the list for a daily reminder of the work that needs to be done. Because it uses graphics, this is much faster and easier to read than a continuous list of words.

```
**********************************************
                THINGS TO DO
**********************************************
DEADLINES:                                    *
Tonight: WRITE TO COMPUTER SCHOOL             *
Wednesday: Finish paper on Shakespeare        *
- - - - - - - - - - - - - - - - - - - - - - - *
Feb. 5: Choose new paper topic                *
Feb. 20: Outline due                          *
March 11: Paper due                           *
April 7: Midterm                              *
June 28: Final, 3 p.m. Main Library           *
==============================================*
QUESTIONS:                                    *
Romeo's father first name?                    *
What kind of poison was it?                   *
Find out how to research ancient poisons      *
=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-*
PAPER PREP:                                   *
William Blake's love notions:                 *
compare to R&J                                *
Get "Great Romantic Notions", by              *
Eader, Call number 103.65/EAD                 *
++++++++++++++++++++++++++++++++++++++++++++++*
EXTRA NOTES:                                  *
Meredith's phone #: 555-6625                  *
Plan dinner with the folks soon               *
**********************************************
```

7 MAKE A DISK AND FILE INDEX

If you're like most computer users, it's hard (and probably impossible) to read the names of files that you've listed on the outside of any particular disk—you have to put the disk into the computer. Beyond keeping track of the files on each disk, you should have a method to keep track of all the files on *all* your disks. As your disk library grows, this can get complicated.

One way to get organized is to store all the titles on one special index file, which you may be able to keep on the same disk with your word processor and operating system.

Such a file, call it INDEX, is simply a listing of all your disks by name, color, number, or whatever. Under each heading or number, you list all the file names on *all* of your disks. You

ILLUSTRATIONS BY HOLLY KOWITT

may even use graphic dividers between disk listings to make it easier to read.

Whenever you start a file, check the INDEX for the disk you're working on, and add the new file name to the list. Similarly, when you delete a file, remove the name from the INDEX.

If you have forgotten which disk you have stored a file on, you may be able to use your word processor's SEARCH function, if it has one. Then you can SEARCH for the title through the INDEX.

Sometimes you will be in a hurry, or you may forget to add or delete a name from your INDEX. It's wise to set up a regularly scheduled time (weekly, monthly, etc.) to go back through your disks, note the names of all the files, and revise your INDEX to keep it as current as possible. And, to avoid loss, your backup disks should be named and numbered identically to your working set.

Remember: There are a lot of ways to put your word processor to work for you. These seven suggestions are just the beginning. Some other ways to use your word processor include: Storing all your correspondence on the same disk, so that letters are always on hand, and the disk acts as an electronic address book. (Depending on the configuration of your computer, word processor, and printer, you may even be able to slightly alter these files to print envelopes—without having to retype the addresses.) If you don't do a lot of letter writing, but do take a lot of notes, you'll find that notetaking improves when a computer is used. Certainly, portable computers make notetaking and collecting ideas much easier in the classroom or business meeting. And once you've entered notes into a computer, their value increases—they can be manipulated, printed out, revised, even typeset!

If you spend some time getting to know the variety of capabilities of your word processor, you're bound to come up with tricks of your own. FC

WORD PROCESSING ON THE ADAM

One of the great things about the ADAM is that you can start word processing as soon as you turn on the computer. The built-in program, *SmartWRITER*, is extremely user-friendly and has most of the usual word-processing features. (And now that the ADAM disk drive is finally available, you can save your files on regular 5¼-inch disks.) But every computer, and every word-processing program has its unique features. Here's a guide to some of the tricks that ADAM owners have told us about.

YOU WANT . . .	ADAM WILL . . .	ADAM WON'T . . .
. . . to format page, i.e., set margins (both horizontal and vertical), line spacing, tabs, and to tell the computer whether you are using letter- or legal-size paper.	. . . do it with the greatest of ease. Just hit Smart Key I and your options come up on the screen. Pick the options you want by pressing the keys *SmartWRITER* tells you to. When you've made your selections (or any other selections involving *SmartWRITER*) hit key VI. ADAM says DONE, and it is so.	. . . count lines and words for you, or automatically set itself to print something in the center of a page. You can use the Smart Keys to set a tab at the center of the page, then backspace half the number of spaces as there are characters in the text you want centered.
. . . to write the same thank-you letter to Aunt Sarah and Uncle John, and have them both think they're getting the original.	. . . permit you to delete AUNT SARAH and replace it with UNCLE JOHN (as well as replace "YOUR THOUGHTFUL GIFT SUBSCRIPTION TO FAMILY COMPUTING" with "THE RED PORSCHE 940 TURBO"). But you have to retrieve the whole first letter from the file tape and make the corrections you want using the SEARCH function.	
. . . to do homework problems involving mathematical or scientific notation; or flag text for footnotes.	. . . allow you to superscript or subscript, e.g., $A_2 = x^2 + 4$, by using Smart Key VI, and then going through the options it presents you with. Make sure you've chosen double spacing.	. . . automatically format a page to allow room for footnotes. You have to remember to leave enough lines at the bottom of the page.
. . . to make carbon copies or duplicate copies.	. . . allow you to make carbon copies because the striking force of the keys is great enough. A carbon form in triplicate should be no problem.	. . . automatically make duplicates without carbon. For multiple printouts of the same document you have to hit the PRINT key again, select your options anew, and command the printer to print—one copy at a time.
. . . to print only one section of a document.	. . . do it clumsily with command PRINT SCREEN. Or you can highlight the section you want to print and use the command PRINT HI-LITE. But, if you've given a separate file name to each document section, you can retrieve that section and print it in the usual way.	
. . . to create graphics with the printer.	. . . let you draw rigid-looking geometric patterns composed of the various characters found on the daisy wheel.	. . . be much more help than that because the "letter-quality" printer uses formed characters rather than a matrix of dots that can be arranged more flexibly.
. . . to work on the screen while the printer is printing.		. . . let you do it. For that you need what's called a print buffer—which is not available as of this writing.
. . . to give up and start over.	. . . give you no problems. Just press the ESCAPE/WP key and the whole range of options is presented to you again.	. . . save your text if you hit the RESET switch on the memory console.

BUYER'S GUIDE TO JOYSTICKS

IN THIS AGE OF FANCY COMPUTER DOODADS, A GOOD, SOLID JOYSTICK CAN BE A USER'S BEST FRIEND

BY KEN COACH

Joysticks look pretty much alike. They all have two crucial parts: a handle and a fire button (or two or three). When you start to use joysticks, though, you realize that each one is as different as a fingerprint.

While joysticks are used as drawing tools in some graphics programs (see "Picture Perfect" in the December 1984 FAMILY COMPUTING), and as glorified cursor-control keys in some educational software, they are designed primarily for gaming. Joysticks, in fact, are great scapegoats when learning a new game. A good score can be attributed to skill, while a poor performance is obviously the joystick's fault. "This stupid joystick . . . ." There's some truth behind this attitude—there are good and bad joysticks. But how can you tell the difference?

GETTING A GRIP ON JOYSTICKS

The problem is, beauty is often in the eye of the beholder. Different people look for different qualities in a joystick depending on the size of their hand, their hand-eye coordination, etc. Beyond that, different games respond better to joysticks than others, and some games respond better to certain joysticks. In other words, the type and quality of the software is often a factor.

Most joysticks are spring-loaded to make them spring back to the center when you take your hand away. For some games, such as *Flight Simulator*, or for some graphics programs, it's better to use a free-floating stick that doesn't automatically center. High-quality joysticks have a switch to let you choose between the self-centering and free-floating modes.

TWO TYPES

Another important factor to keep in mind is that there are two basic types of joysticks. Make sure you get one designed for your computer. Digital joysticks, often called "Atari-type," work with Atari, Coleco, and Commodore computers. Most can also be used with the Texas Instruments 99/4A, but require a plug-adapter. And some are designed with a numeric keypad, specifically for the Coleco ADAM. These digital joysticks cannot directly control the speed of an object, and can move it in only eight directions. They range in price from about $10 to $50.

Analog joysticks, which have much smaller shafts (or sticks), can control both the speed and position of an object for a full 360 degrees. These joysticks are used with the Apple, IBM, and TRS-80 Color Computer. Many analog joysticks can be calibrated to adjust the response of the stick to the user's particular style. They cost about $50.

The best way to decide if a joystick is right for you is to plug it into your computer, boot up your favorite game, and spend an hour or two testing it out. That, of course, is not always possible, so our FAMILY COMPUTING "playtesters" have checked out a range of joysticks from leading manufacturers for comparison purposes. Refer to the chart first to see which joysticks work on your computer, then check our mini-reviews.

ATARI

Atari's original joystick is a classic, but the new ProLine is even better. It works on all Atari computers, and is smaller and more streamlined than the old Atari sticks. It's self-centering, and has fire buttons on the sides of the base. Our testers were impressed with the ProLine's response, and the placement of the fire buttons.

CHAMPIONSHIP ELECTRONICS

Championship Electronics has two joysticks, both with suction-cup bottoms for secure table-mounts, and retractable cables. The JC-250 Super Champ has a 10-foot cable that disappears into the base, while the JC-351 Mini Champ has a 4½-foot cable. Both sticks have a fire button on top of the stick. The Super Champ has a second one in the trigger position. The Mini Champ, which has a button on each side of the base, is not very sturdy.

COIN CONTROLS

Coin Controls makes a series of joysticks under the Competition Pro label, ranging from the very low quality model 200X to the very high quality model 5000. All of the joysticks are of medium size, although the 200X and 1000 are slightly shorter. We tested models 3000 and 5000.

The 3000 has a wide fire bar instead of a button in front of the pistol-grip stick. There's also a trigger fire button, and another fire button on the top of the stick. Each of the three is always live.

KEN COACH *is a producer for the Canadian Broadcasting Co., and a freelance writer specializing in computer topics.*

Wico's The Boss

Discwasher PointMaster

Kraft Joystick (Atari)

Wico Command Control (Apple)

Suncom Tac-2

Suncom Tac-3

GUIDE TO JOYSTICKS

COMPANY	MODEL	PRICE	HANDLE SIZE	FIRE BUTTONS	COMPATIBILITY
Apple (408) 996-1010	Apple IIe Joystick	$59.95	Small	Two, both on base	AP
Atari, Inc. (408) 745-2000	Atari Joystick	$8.95	Medium	One, on base	AT/COM
	ProLine	$19.95	Medium	Two, one on each side of base	AT/COM
	Space Age	$14.95	Large	Trigger-type, with stick on top	AT/COM
Championship Electronics (415) 961-0664	JC-351 Mini Champ	$9.99	Small pistol grip	Three, one on each side of base and on stick	AT/COM
	JC-250 Super Champ	$12.99	Medium pistol grip	Two, one on top of stick and trigger	AT/COM
Coin Controls (800) 323-8174 or (312) 228-1810	Competition Pro Model 1000	$12.95	Short	Bar on front of base	AT/COM
	Competition Pro Model 200X	$8.95	Short	As above	AT/COM
	Competition Pro Model 3000	$15.95–$17.95	Medium pistol grip	Three, one on bar, top, and trigger	AT/COM, TI, COL
	Competition Pro Model 5000	$17.95	Medium ball-top	Two, one on each side of base	AT/COM, TI, COL
Commodore, Inc. (215) 431-9100	VIC-20 Joystick	$10	Small	Fire buttons One, on front of base	AT/COM
Discwasher (314) 449-0941	PointMaster	$16.95	Large pistol	One, mounted on shaft	AT/COM
	PointMaster Pro	$27.95	As above	As above	AT/COM
GIM Electronics (516) 741-3133	Fire Command	$39.95	Medium, large base	Two, one on each side of stick	AT/COM, COL
	Fire Command	$44.95	As above	Four, two on each side of stick	COM
	S-3000	$49.95	Small	Two, on base	AP, IBM
IBM (800) 447-4700	IBM PC*jr* Attachable Joystick	$40	Small	One, on base	IBM
Kraft (800) 854-1923	Joystick	$12.95	Small	One, left side	AT/COM
	Switch Hitter	$14.95	Small	Two, one on each side of base top	AT/COM
	Premium	$49.95	Small	One, on left side	AP, IBM, TRS
Newport Controls (408) 358-3439	Prostick II	$24.95	Medium ball-top	Two, one on each side of base front	AT/COM
	Prostick III	$29.95	Medium ball-top	Two, one on each side of base front.	COL
	Prostick 2002	$29.95	Medium ball-top	As above	TI
Personal Peripherals Inc. (214) 758-8874	Enjoystick	$19.95	Small	Two, one on each side of base	AT/COM
	Joystick	$44.95	Medium	Two, both on base top	AP, IBM
Pride Electronics (801) 298-1814	Power-Stick	$8.95	Tiny	Two, on base	AT/COM
	Power-Stick	$15.95	Tiny	As above	COL
Suncom (312) 459-8000	Slik Stik	$7.99	Short	One, on left side of base top	AT/COM
	Starfighter	$10.95	Medium	As above	AT/COM
	Tac-2	$12.95	Medium ball-top	Two, one on each side of base	AT/COM
	Tac-3	$14.95	As above	Three, two in front, one on top of handle	AT/COM
	Starfighter for Apple	$49.95	Medium	Three, one each side of top, and one in front of base	AP
Tandy/Radio Shack (817) 338-2395	Radio Shack Deluxe Joystick	$39.95	Medium	One, on base	TRS
	Radio Shack Joysticks	$24.95/pair	Small	One, on base	TRS
Wico (800) 323-4041 or (312) 647-7500	Command Control Bat Handle	$26.95	Large	Two, on base and on stick	AT/COM
	Command Control Super Three-Way	$32.95	Medium (choice of three handles)	As above	AT/COM
	Command Control Joystick	$31.95	Medium	Two, on either side of keypad	COL
	Computer Command	$49.95	Medium	Two, on base	AP, IBM
	The Boss	$17.95	Large pistol	Two, on base or top of stick	AT

Joysticks marked AT/COM are compatible with Commodore and Atari computers and, in most cases, can be used with an adapter on the TI-99/4A. Joysticks for other computers are marked as follows: AP for Apple, COL for Coleco's ADAM, IBM for the PC and PC*jr*, TRS for TRS-80 Color Computer, and TI for the TI-99/4A if an adapter is not required.

Competition Pro 5000

Championship Electronics Mini Champ

Kraft Premium Joystick

Newport Controls Prostick III

Championship Electronics Super Champ

Competition Pro 3000

The model 5000, which has a straight stick with a ball-top for a grip, and two fire buttons on the base, received raves from our testers. Everyone found it sturdy, with a "good feel." It responded well, and rested comfortably in the hand.

DISCWASHER

The PointMaster series from Discwasher has two models: the basic model and the Pro, which has suction cups to hold it on a tabletop, and a feature called "constant fire." By holding down the button, you can fire continually. Despite this nifty feature, however, the PointMaster sticks did not rate too highly with our testers, who thought they had a "flimsy" quality.

GIM ELECTRONICS

GIM's Fire Command probably comes the closest of any joystick reviewed here to capturing the feel of an arcade stick. It's almost a foot wide and weighs 5 pounds, making it far heavier than any other controller for the home market. It sits firmly on a table, or squarely on your lap, and allows you to use two hands without worrying about losing control of the joystick. Both the stick and the base are of extremely rugged construction.

Our testers liked this joystick and agreed it lent an arcade feel to a living room. But they also thought it was not quite as responsive as some of the other sticks, and that the fire button was sometimes slow on the draw.

JOYSTICK BUYING TIPS

1. Make sure the joystick is designed for your computer. If it's an Atari-type joystick and you have a TI, ask for an adapter plug.

2. Pick up the joystick and decide if it feels comfortable in your hand. Remember that you might spend an hour or two at a time in heavy combat! An uncomfortable stick will cause your hand to tire. Stiffer sticks especially tend to cause fatigue, because they force the hand holding the shaft to fight the hand holding the joystick base.

3. Check the fire button(s). Are they in convenient spots for your gaming style? Is there a trigger on the shaft, atop the stick, or on the base? Or does it have a combination? A nice (and rare) combination is a triggerlike button on the shaft for the thumb, and one on top for the forefinger. If you're left-handed, make sure the fire button allows easy access for southpaws, too.

4. Check the quality of construction. Does the joystick look and feel strong enough to fire repeated broadsides at enemy invaders? Some people like suction cups that hold a stick on a table, but most seem to prefer holding the joystick in their hands.

5. Plug in the joystick for a road test. Do movements on the screen occur as soon as you move the stick, or is there a lag? Is the fire button quick or slow? One good way to test a joystick is to play a game you're very good at on the beginner's level. If you miss a shot then it's more likely the joystick's fault than yours.

6. Does the joystick have a free-floating option or is it only spring-loaded (self-centering)? Drawing (with a graphics program) and some game-playing is easier with a stick that does not always spring back to the center.

KRAFT

Kraft joysticks are small and neat, and known for their "precision feel." The Atari-type model is adequate, though Kraft is better known for its deluxe sticks—the Kraft Premium line available for Apple, IBM, and TRS-80 CoCo. Kraft also sells an adapter for the TI-99/4A.

The Premium Joystick allows you to set each axis independently—in free-floating or spring-centering mode. Small calibration controls allow you to align the stick accurately with cursor position. With these features, the joystick is good for both drawing or gaming, and can be adjusted to suit the user.

NEWPORT CONTROLS

The Prostick line from Newport Controls features left- and right-side fire buttons, and an option that blocks the stick from making diagonal movements. This feature is helpful in right-angle maze games, such as *Pac-Man*.

The Prostick is a sturdy, dependable product that received high marks from our testers. It was the favorite stick for a fast-moving game of *Archon* or *Boulder Dash*. But, some users might find the joystick's feel too "stiff" or hard on the hands, especially those who get excited in the heat of a game. Overall, though, the Prostick is a responsive joystick that fires well.

PRIDE ELECTRONICS

The Power-Stick, formerly marketed by Amiga, is the smallest joystick on the market. It's so tiny you can use it with one hand, moving the shaft with your thumb. Two-handed use is also possible, of course, and the Power-Stick has buttons for either right- or left-handed play.

The Power-Stick allows for precise movements and responds well in delicate maze-type games. Its "dainty" feel also works well with some shoot-'em-ups, though in games requiring bold action, such as *Boulder Dash*, our testers sometimes found the small shaft a liability.

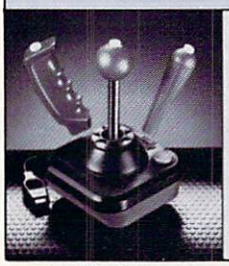
SUNCOM

Suncom makes four different Atari-type joystick models, and one for the Apple. In design, all models have small, compact bases much like the Kraft sticks, but larger handles that are easier to grip. From the Slik Stik ($7.99) on up to the Starfighter ($49.95), all models have a reputation for "good handling." The Slik Stik will break down with heavy playing, but with such a low price it's a great deal while it lasts. The Starfighter for Apple affords excellent control and has a nice feel.

WICO

Wico, which makes several joysticks that work with a wide range of computers, has built a strong reputation for quality and durability. The Boss, a basic Atari-type stick, costs somewhat more than similar sticks from other manufacturers ($17.95); but has an arcade-size pistol grip shaft, and is of rugged construction. Testers liked the choice of a fire button on top of the stick or on the base.

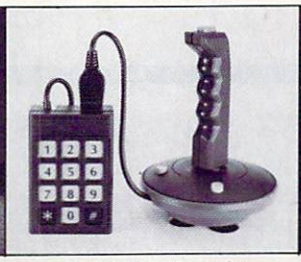
The Command Control model is available in bat-shaped-handle, a ball-top-handle, and pistol-grip models. There is also a combination model that allows you to choose from all three. All Command Control joysticks have two fire buttons, one on the base and one on the stick. FC



Wico Super Three-Way Joystick

Suncom Slik Stik

Wico Command Control Bat Handle (Atari)



Championship Electronics Champstick (Coleco)

Suncom Starfighter

the Programmer

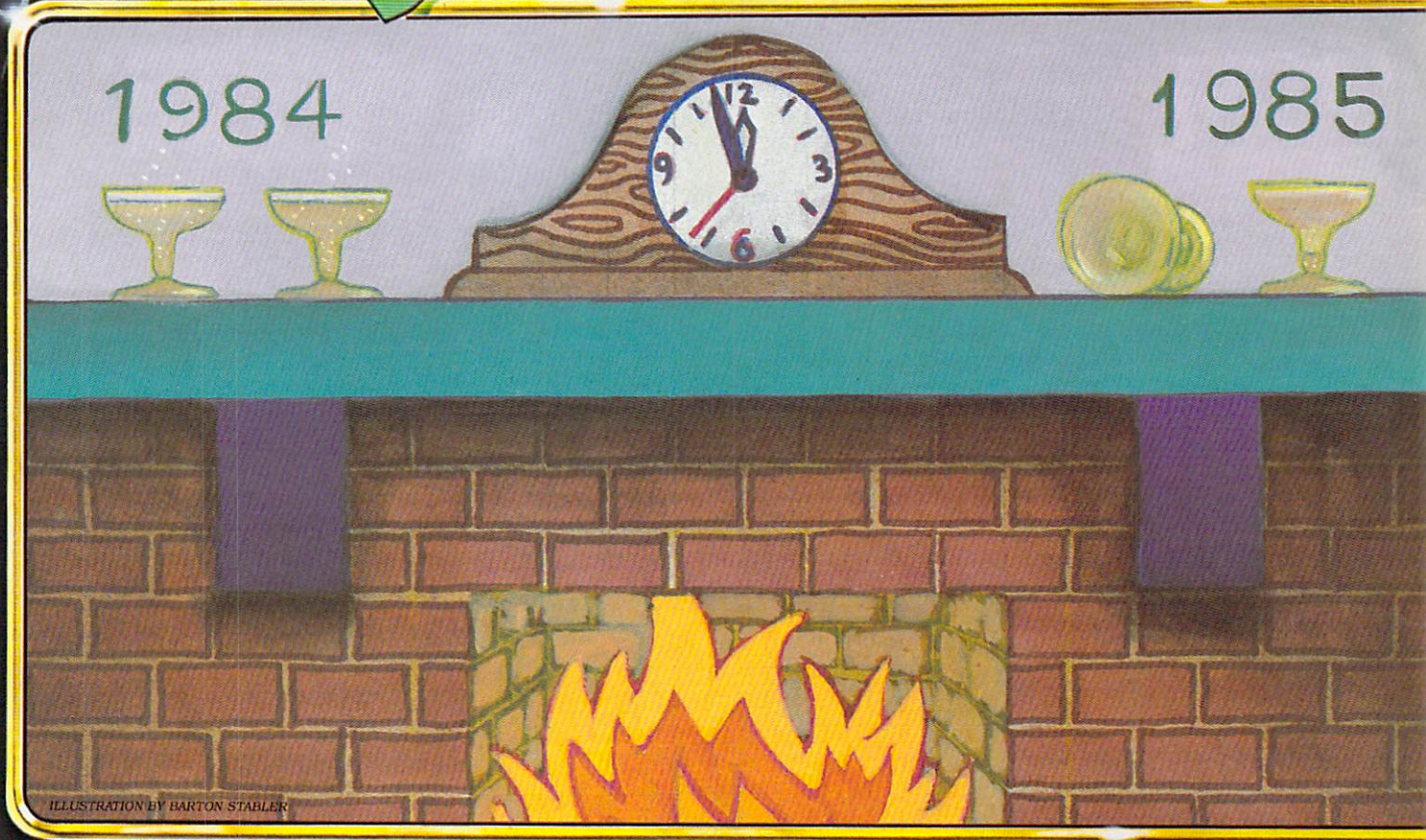


ILLUSTRATION BY BARTON STABLER

★ J A N U A R Y ★

WINTER PROGRAMS

Page 64

Warm your winter nights
with a
cheery *Fireplace* program;
and turn your
computer into a time machine
with
Perpetual Calendar.

PUZZLE

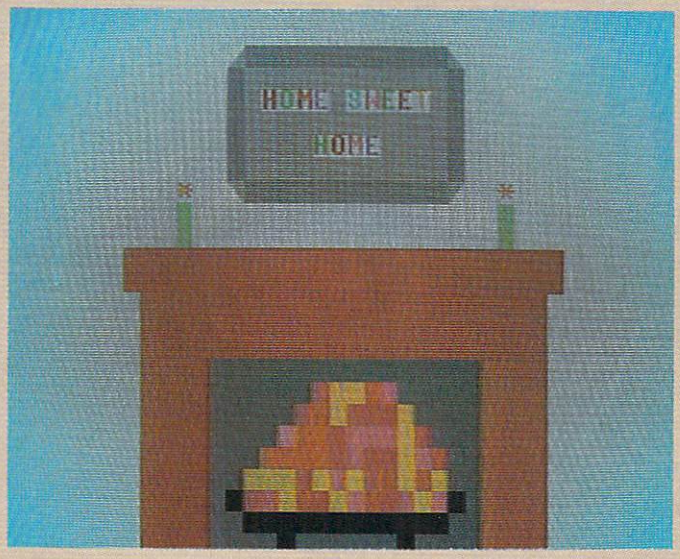
Page 77

It's romance
among the radishes
with the
Supermarket Sweethearts.
Calling all
coupon finders!

ILLUSTRATION BY JIM CHERRY III

FIREPLACE

BY JOEY LATIMER



There's nothing nicer than curling up in front of a fire on a cold winter night. Now, with the help of your computer, some of the old-time fun of a roaring fire can be yours. Just type in our *Fireplace* program and gather 'round the cheery screen!

ADAM & Apple/*Fireplace*

```
10 DIM C(5)
20 HOME
30 GR
39 REM --READ FIRE COLORS INTO ARRAY C--
40 FOR X = 1 TO 5
50 READ C(X)
60 NEXT X
69 REM --DRAW BROAD AREAS OF PICTURE--
70 FOR X = 1 TO 14
80 READ KO,A,B,C,D
90 COLOR= KO
100 FOR RO = A TO B
110 HLIN C,D AT RO
120 NEXT RO,X
129 REM --DRAW DETAILS OF PICTURE--
130 FOR X = 1 TO 13
140 READ KO,CO,RO
150 COLOR= KO
160 PLOT CO,RO
170 NEXT X
179 REM --SET LOCATION AND LENGTH OF A FLAME--
180 CO = RND(1)*10+15
190 RO = 2*RND(1)*(5-(19-CO)*(CO < 19)-(CO-21)*(CO > 2
1))
199 REM --COLOR AND DRAW THE FLAME--
200 FOR X = 37 TO 37-RO STEP -1
210 COLOR= C(RND(1)*5+1)
220 PLOT CO,X
230 NEXT X
239 REM --COLOR AND DRAW CANDLE FLAMES--
240 COLOR= C(RND(1)*3+1)
250 PLOT 10,10
260 COLOR= C(RND(1)*2+1)
270 PLOT 29,10
280 GOTO 180
999 REM --FLAME COLOR DATA--
1000 DATA 13,9,13,9,1
1999 REM --DRAWING DATA--
2000 DATA 8,16,18,6,33,8,19,39,8,31,5,27,39,13
2010 DATA 26,3,12,15,10,10,3,12,15,29,29,5,1,13
2020 DATA 13,26,6,2,7,14,25,12,8,12,14,25,14,7
2030 DATA 10,17,21,0,6,6,16,22,0,5,5,17,21,0,4
2040 DATA 4,18,20,0,3,3,19,19,0,38,38,15,24,0
2050 DATA 14,37,0,16,39,0,23,39,0,25,37,13,18,7
2060 DATA 13,20,7,8,19,10,8,19,9,13,24,2,13,25
2070 DATA 2,13,25,3,1,17,3,1,17,4
```

Atari/*Fireplace*

```
9 REM --RESERVE MEMORY FOR NEW CHARACTER SET--
10 S=(PEEK(106)-4)*256
20 POKE 106,S/256
30 GRAPHICS 1+16
39 REM --TRANSFER CHARACTERS IN "HOME SWEET HOME"--
40 FOR X=1 TO 7
50 READ CH
60 FOR Y=CH*8 TO CH*8+7
70 POKE S+Y,PEEK(57344+Y)
80 NEXT Y
90 NEXT X
99 REM --REDEFINE CHARACTERS !, ", #, AND $--
100 FOR X=8 TO 39
110 READ A
120 POKE S+X,A
130 NEXT X
139 REM --RESET CHARACTER SET POINTER--
140 POKE 756,S/256
149 REM --SET COLOR REGISTERS--
150 POKE 708,156
160 POKE 709,20
170 POKE 710,56
180 POKE 711,252
189 REM --DRAW FIREPLACE SCENE--
190 FOR X=1 TO 15
200 READ KO,A,B,C,D
210 COLOR KO
220 FOR RO=A TO B
230 FOR CO=C TO D
240 PLOT CO,RO
250 NEXT CO
260 NEXT RO
270 NEXT X
280 POSITION 7,3:PRINT #6;"HOME"
290 POSITION 8,4:PRINT #6;"SWEET"
300 POSITION 9,5:PRINT #6;"HOME"
309 REM --SET LOCATION AND LENGTH OF A FLAME--
310 CO=INT(RND(1)*6)+7
320 RO=INT(RND(1)*(CO-3-(CO>10)*(2*CO-20)))
329 REM --COLOR AND DRAW THE FLAME--
330 FOR X=21 TO 21-RO STEP -1
340 COLOR 129+32*(RND(0)>0.5)+INT(RND(0)*2)
350 PLOT CO,X
360 NEXT X
369 REM --COLOR AND DRAW CANDLE FLAMES--
370 COLOR 129+32*(RND(0)>0.5)+INT(RND(0)*2)
380 PLOT 4,6
390 COLOR 129+32*(RND(0)>0.5)+INT(RND(0)*2)
400 PLOT 15,6
409 REM --ROTATE COLOR REGISTERS FOR FLICKER EFFECT--
410 T=PEEK(710)
420 POKE 710,PEEK(711)
430 POKE 711,T
440 GOTO 310
999 REM --DATA FOR CHARACTERS IN "HOME SWEET HOME"--
1000 DATA 37,40,45,47,51,52,55
1999 REM --DATA FOR REDEFINED CHARACTERS--
2000 DATA 32,48,112,120,120,120,56,16
2010 DATA 4,12,14,30,30,30,28,8
2020 DATA 255,255,255,255,255,255,255,255
2030 DATA 255,1,125,69,85,93,65,127
2999 REM --DRAWING DATA--
3000 DATA 4,10,11,2,17,3,12,13,3,16
3010 DATA 3,14,23,3,4,3,14,23,15,16
3020 DATA 3,22,22,7,12,4,1,7,6,6
3030 DATA 4,1,7,13,13,4,1,1,7,12
3040 DATA 4,7,7,7,12,35,7,9,4,4
3050 DATA 35,7,9,15,15
3060 DATA 3,21,21,6,13,32,21,21,7,12
3070 DATA 3,23,23,8,11,32,23,23,9,10
```

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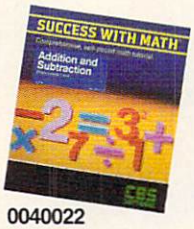

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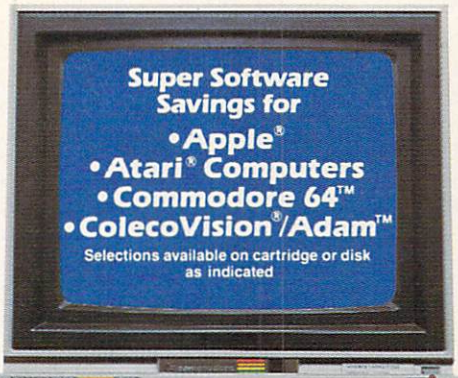

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ColecoVision/Adam, C-64, Atari H.C.: *cart;* Apple: *disk*.

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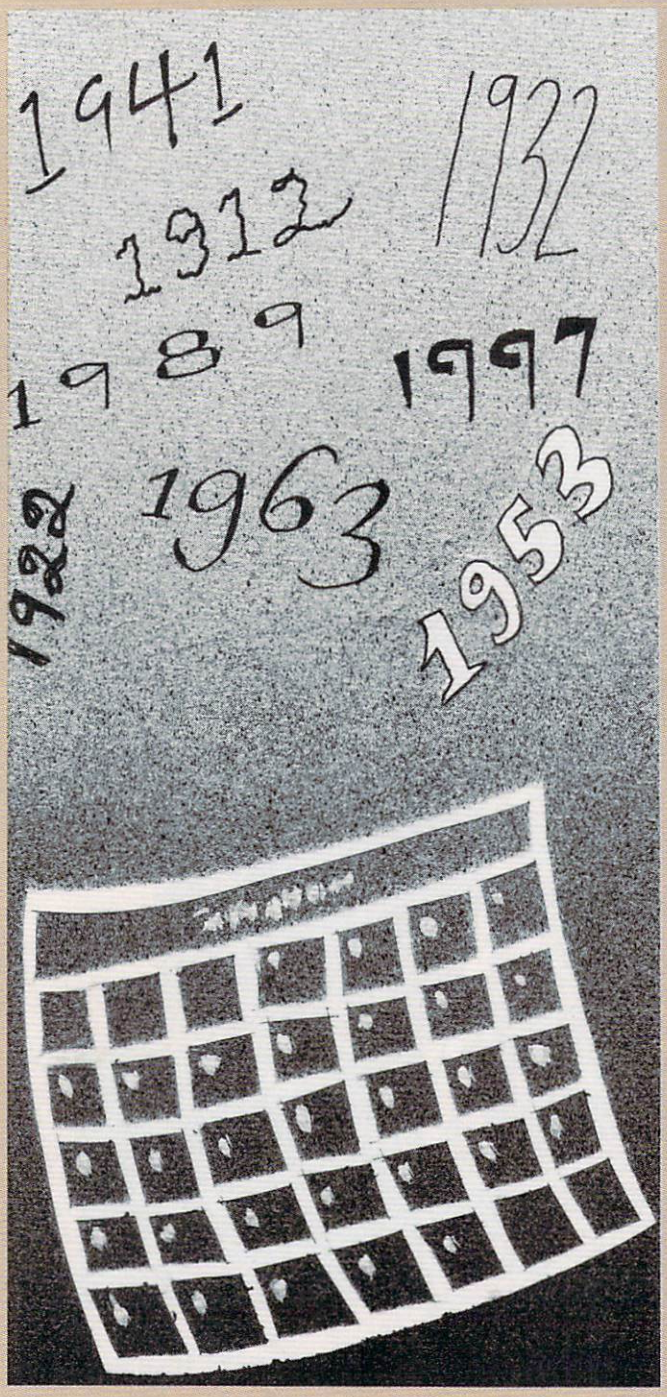
PERPETUAL CALENDAR



Was Dec. 7, 1941, a Sunday? What? You don't have a 1941 calendar handy? Don't worry—*Perpetual Calendar* can pinpoint the day of the week for dates from Jan. 1, 1801, to Dec. 31, 2399!

When you RUN the program, the computer will prompt you to enter a date in the following format: MONTH,DAY,YEAR. Use only digits, and enter all four digits of the year instead of the usual two (for example, you would enter Dec. 31, 1984, as 12,31,1984—*not* 12,31,84).

Not only will the computer tell you on what day of the week that date fell, it'll also show you the calendar for that whole month!

Oh . . . by the way, on what day of the week were you born? Type in *Perpetual Calendar* and find out!

ADAM/*Perpetual Calendar*

```
10 DIM dw$(7),mo$(12),ld(12)
19 REM --INITIALIZE VARIABLES AND ARRAYS--
20 bl$ = ""
30 FOR i = 1 TO 7
40 READ dw$(i)
50 bl$ = bl$+"  "
60 NEXT i
70 FOR i = 1 TO 12
80 READ mo$(i),ld(i)
90 NEXT i
100 dy$ = " 1 2 3 4 5 6 7 8 9101112131415161718192021222232425262728293031"
109 REM --ASK FOR, ACCEPT, AND CHECK INPUT--
110 HOME
120 PRINT TAB(6);"PERPETUAL CALENDAR"
130 PRINT
140 PRINT "Type in a date in any year"
150 PRINT "after 1800 and before 2400;"
160 PRINT "then press <RETURN>."
170 PRINT "Use this format:"
180 PRINT
190 PRINT "1,31,1985"
200 PRINT
210 INPUT "Date? ";m,d,y
220 ld(2) = 28+((y = INT(y/4)*4 AND y <> INT(y/100)*100) OR y = 2000)
230 IF m < 1 OR m > 12 THEN 170
240 IF d < 1 OR d > ld(m) OR y < 1801 OR y > 2399 THEN 170
249 REM --COMPUTE WHAT DAY THE DATE FALLS ON (dow)--
250 IF m < 3 THEN y = y-1:m = m+12
260 fom = INT(y*1.25)+(y < 1900)+(y > 2000)*INT((y-2000)/100)+INT((m-2)*2.59)
270 dow = fom+d-INT((fom+d-1)/7)*7
279 REM --fom IS DAY THAT FIRST OF MONTH m FALLS ON--
280 fom = fom-INT(fom/7)*7+1
290 IF m > 12 THEN m = m-12:y = y+1
299 REM --PRINT DAY OF WEEK AND TOP OF CALENDAR PAGE--
300 HOME
310 PRINT mo$(m);" ";d;", ";y;", is a"
320 PRINT dw$(dow);"."
330 PRINT TAB(107-LEN(mo$(m))/2);mo$(m);" ";y
340 PRINT
350 PRINT TAB(3);
360 FOR i = 1 TO 7
370 PRINT LEFT$(dw$(i),3);" ";
380 NEXT i
390 PRINT
400 PRINT
409 REM --PRINT BODY OF CALENDAR--
410 dy$ = bl$+LEFT$(dy$,2*ld(m))+bl$+bl$
420 FOR i = 1 TO 6
430 PRINT TAB(3);
440 FOR j = 1 TO 7
450 pt = i*7+j-fom-6
459 REM --PRINT SELECTED DAY IN INVERSE--
460 IF pt = d AND d < 10 THEN PRINT " ";
470 IF pt = d THEN INVERSE:PRINT d;:NORMAL:GOTO 490
480 PRINT MID$(dy$,2*pt+13,2);
490 PRINT "  ";
500 NEXT j
510 PRINT
520 PRINT
530 NEXT i
540 PRINT
549 REM --DO ANOTHER DATE OR STOP--
550 PRINT "Press <Q> to quit or any other"
560 PRINT "key to try another date.";
570 GET k$
580 IF k$ <> "Q" AND k$ <> CHR$(113) THEN 100
590 END
1000 DATA SUNDAY,MONDAY,TUESDAY,WEDNESDAY
1010 DATA THURSDAY,FRIDAY,SATURDAY
2000 DATA January,31,February,28,March,31
2010 DATA April,30,May,31,June,30
```

→

ILLUSTRATION BY JOSH GOSFIELD

```
2020 DATA July,31,August,31,September,30
2030 DATA October,31,November,30,December,31
```

Apple/*Perpetual Calendar*

```
10 DIM DW$(7),MO$(12),LD(12)
19 REM --INITIALIZE VARIABLES AND ARRAYS--
20 BL$ = ""
30 FOR I = 1 TO 7
40 READ DW$(I)
50 BL$ = BL$+"  "
60 NEXT I
70 FOR I = 1 TO 12
80 READ MO$(I),LD(I)
90 NEXT I
100 DY$ = " 1 2 3 4 5 6 7 8 9101112131415161718192021222324252627282930 31"
109 REM --ASK FOR, ACCEPT, AND CHECK INPUT--
110 HOME
120 PRINT TAB(12);"PERPETUAL CALENDAR"
130 PRINT
140 PRINT "TYPE IN A DATE IN ANY YEAR AFTER 1800"
150 PRINT "AND BEFORE 2400; THEN PRESS <RETURN>."
160 PRINT "USE THIS FORMAT:"
170 PRINT
180 PRINT "1,31,1985"
190 PRINT
200 INPUT "DATE? ";M,D,Y
210 LD(2) = 28+((Y = INT(Y/4)*4 AND Y <> INT(Y/100)*100) OR Y = 2000)
220 IF M < 1 OR M > 12 THEN 160
230 IF D < 1 OR D > LD(M) OR Y < 1801 OR Y > 2399 THEN 160
239 REM --COMPUTE WHAT DAY THE DATE FALLS ON (DOW)--
240 IF M < 3 THEN Y = Y-1:M = M+12
250 FOM = INT(Y*1.25)+(Y < 1900)+(Y > 2000)*INT((Y-2000)/100)+INT((M-2)*2.59)
260 DOW = FOM+D-INT((FOM+D-1)/7)*7
269 REM --FOM IS DAY THAT FIRST OF MONTH M FALLS ON--
270 FOM = FOM-INT(FOM/7)*7+1
280 IF M > 12 THEN M = M-12:Y = Y+1
289 REM --PRINT DAY OF WEEK AND TOP OF CALENDAR PAGE--
290 HOME
300 PRINT MO$(M);" ";D;", ";Y;", IS A ";DW$(DOW);"."
310 PRINT TAB((195-LEN(MO$(M)))/2);MO$(M);" ";Y
320 PRINT
330 FOR I = 1 TO 7
340 PRINT LEFT$(DW$(I),3);SPC(3);
350 NEXT I
355 PRINT
369 REM --PRINT BODY OF CALENDAR--
370 DY$ = BL$+LEFT$(DY$,2*LD(M))+BL$+BL$
380 FOR I = 1 TO 6
390 FOR J = 1 TO 7
400 PT = I*7+J-FOM-6
409 REM --PRINT SELECTED DAY IN INVERSE--
410 IF PT = D AND D < 10 THEN PRINT " ";
420 IF PT = D THEN INVERSE:PRINT D;:NORMAL:GOTO 440
430 PRINT MID$(DY$,2*PT+13,2);
440 PRINT SPC(4);
450 NEXT J
460 PRINT
470 NEXT I
480 PRINT
489 REM --DO ANOTHER DATE OR STOP--
490 PRINT "PRESS <Q> TO QUIT OR ANY OTHER KEY TO"
500 PRINT "TRY ANOTHER DATE.";
510 GET K$
520 IF K$ <> "Q" AND K$ <> CHR$(113) THEN 100
530 END
1000 DATA SUNDAY,MONDAY,TUESDAY,WEDNESDAY
1010 DATA THURSDAY,FRIDAY,SATURDAY
2000 DATA JANUARY,31,FEBRUARY,28,MARCH,31
2010 DATA APRIL,30,MAY,31,JUNE,30
2020 DATA JULY,31,AUGUST,31,SEPTEMBER,30
2030 DATA OCTOBER,31,NOVEMBER,30,DECEMBER,31
```

Atari/*Perpetual Calendar*

```
10 DIM DW$(50),MO$(74),T$(30),DW(7,2),MO(12,2),LD(12)
20 OPEN #1,4,0,"K:"
29 REM --INITIALIZE VARIABLES AND ARRAYS--
30 FOR I=1 TO 7
40 READ T$
50 DW(I,1)=LEN(DW$)+1
60 DW$(LEN(DW$)+1)=T$
70 DW(I,2)=LEN(DW$)
80 NEXT I
90 FOR I=1 TO 12
100 READ T$,T
110 MO(I,1)=LEN(MO$)+1
120 MO$(LEN(MO$)+1)=T$
130 MO(I,2)=LEN(MO$)
140 LD(I)=T
150 NEXT I
159 REM --ASK FOR, ACCEPT, AND CHECK INPUT--
160 GRAPHICS 0
170 POSITION 11,0:PRINT "PERPETUAL CALENDAR"
180 POSITION 2,2:PRINT "TYPE IN A DATE IN ANY YEAR AFTER 1800"
190 PRINT "AND BEFORE 2400; THEN PRESS <RETURN>."
200 PRINT "USE THIS FORMAT:"
210 PRINT
220 PRINT "1,31,1985"
230 PRINT
240 PRINT "DATE";
250 TRAP 200
260 INPUT M,D,Y
270 LD(2)=28+((Y=INT(Y/4)*4 AND Y<>INT(Y/100)*100) OR Y=2000)
280 IF M<1 OR M>12 OR D<1 OR D>LD(M) OR Y<1801 OR Y>2399 THEN 200
289 REM --COMPUTE WHAT DAY THE DATE FALLS ON (DOW)--
290 IF M<3 THEN Y=Y-1:M=M+12
300 FOM=INT(Y*1.25)+(Y<1900)+(Y>2000)*INT((Y-2000)/100)+INT((M-2)*2.59)
310 DOW=FOM+D-INT((FOM+D-1)/7)*7
319 REM --FOM IS DAY THAT FIRST OF MONTH FALLS ON--
320 FOM=FOM-INT(FOM/7)*7+1
330 IF M>12 THEN M=M-12:Y=Y+1
339 REM --PRINT DAY OF WEEK AND TOP OF CALENDAR PAGE--
340 GRAPHICS 1
350 SETCOLOR 2,0,0
360 POKE 752,1
370 T$=MO$(MO(M,1),MO(M,2))
380 POKE 657,(24-LEN(T$)-DW(DOW,2)+DW(DOW,1)-(D>9))/2
390 PRINT T$;" ";D;", ";Y;", IS A ";DW$(DW(DOW,1),DW(DOW,2));"."
400 POSITION (15-LEN(T$))/2,0:PRINT #6;T$;" ";Y
410 PRINT #6
420 FOR I=1 TO 7
430 PRINT #6;DW$(DW(I,1),DW(I,1)+1);" ";
440 NEXT I
449 REM --PRINT BODY OF CALENDAR--
450 HP=(FOM-1)*3
460 VP=4
470 FOR I=1 TO LD(M)
480 POSITION HP+(I<10),VP
490 T$=STR$(I)
500 IF I<>D THEN 540
509 REM --PRINT SELECTED DAY IN RED--
510 FOR X=1 TO LEN(T$)
520 T$(X,X)=CHR$(ASC(T$(X,X))+96)
530 NEXT X
540 PRINT #6;T$
550 HP=HP+3
560 IF HP>20 THEN HP=0:VP=VP+3
570 NEXT I
580 PRINT
589 REM --DO ANOTHER DAY OR STOP--
590 PRINT "      PRESS <Q> TO QUIT OR ANY"
600 PRINT "    OTHER KEY TO TRY ANOTHER DATE.";
610 GET #1,K
620 IF K=ASC("Q") THEN GRAPHICS 0:END
```

SUPERMARKET SWEETHEARTS
True Love at the Checkout Counter

PUZZLE BY PETER FAVARO AND SARAH KORTUM
PROGRAM BY STEVEN C.M. CHEN

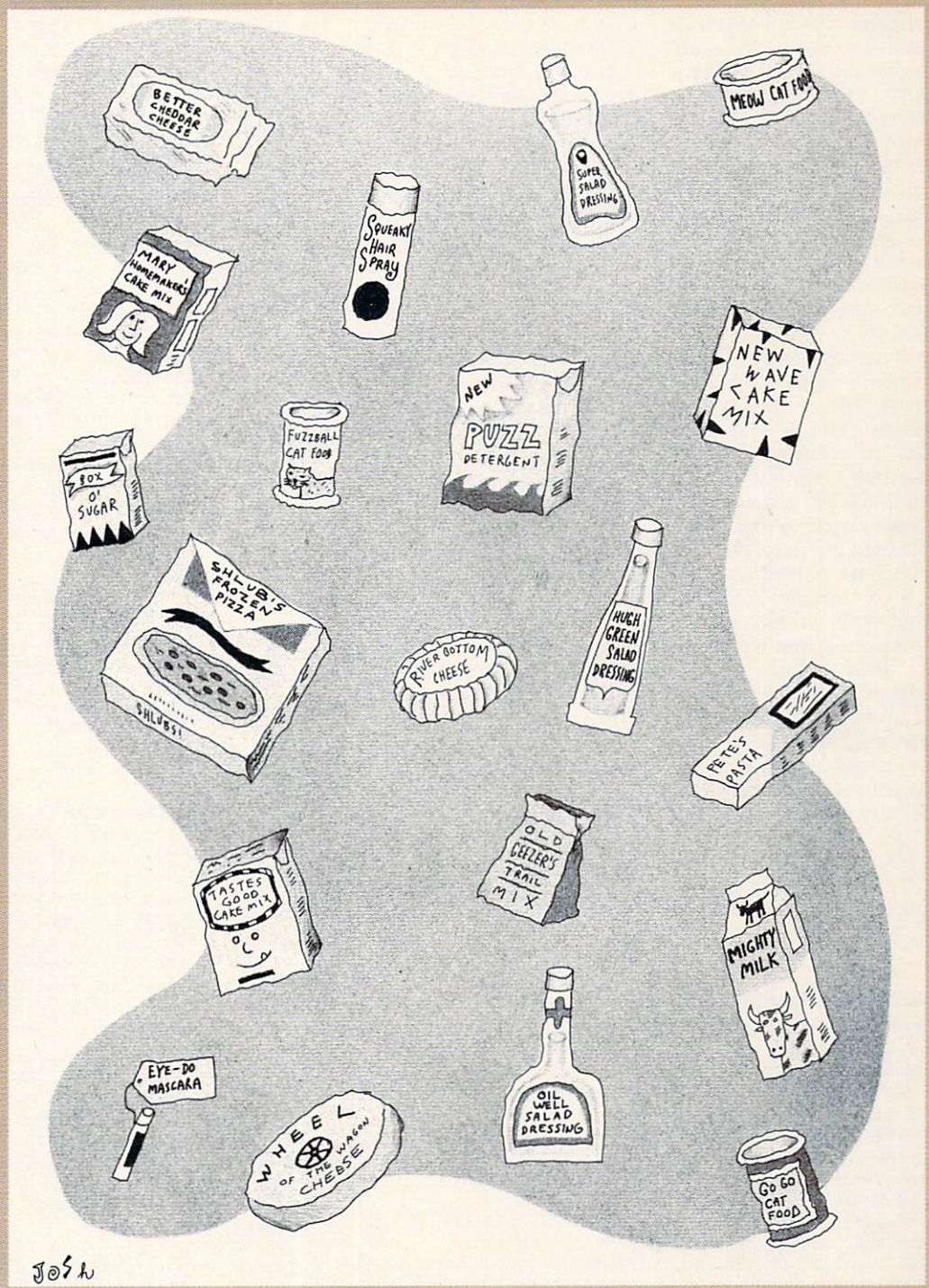


ILLUSTRATION BY JOSH GOSFIELD

It was the frozen brussels sprouts—or, to be precise, the lack of them—that first brought Linda and Bill together one snowy January afternoon nearly a year ago. The alert young assistant manager of Frozen Foods noted the look of pretty confusion on his customer's face as she peered through the icy haze in search of the delicacy. "Excuse me, Miss . . . ," he inquired gently. "Might I be of some assistance?"

"Brussels sprouts . . . ." she murmured coolly. Their eyes met. She caught her breath.

"Oh! Sorry, Miss," Bill muttered apologetically. "All out of sprouts today. More in on Friday, but . . ."—he warmed to the shyly smiling girl—" . . . have you tried our frozen cauliflower tips with creamy cheese sauce? Generic, you know. Package doesn't look like much, but it's quite good." Her smile broadened and, shyness melting, she laughed.

By spring, the earnest young grocer and the charming shopper were a hot item in the gossip aisle of the Grand Onion Superette. Linda would shop there most every day. On seeing her, Bill would contrive to shrug aside—for a few precious minutes—the icy machinations of the frozen-food business, and they would stroll through the aisles hand in hand—billing at the checkout counter and cooing in the poultry department. They were always playing romantic little jokes on one another. Linda delighted in writing notes to Bill, and taping them to the running lights of his scooter as it stood in the parking lot. Bill was fond of drawing up special coupons for free hugs and kisses, sneaking them into Linda's grocery bags when her attention was distracted. Linda loved finding these coupons. She saved them in a coupon holder with a big, cardboard heart pasted on top.

For the anniversary of their first date, Linda decided to prepare a special candlelit dinner for Bill—fettuccine Alfredo and

PETER FAVARO *and* SARAH KORTUM *are contributing editors and* STEVEN C.M. CHEN *is a contributing technical editor to* FAMILY COMPUTING.

homemade sugar cookies. He'd mentioned that they were his favorite foods and Linda wanted so much to please him. That morning, she arrived at the Superette with an extra-long shopping list. When she finally reached the checkout counter, Bill was there, smiling. She waved and blew him a kiss. Bill returned it, smiling wider as he recognized the ingredients for his favorite meal among her purchases—and as she passed through the line, Bill slipped what Linda assumed to be a new batch of romantic coupons into her shopping bag—one, two, three, four of them!

Linda excitedly read the coupons after leaving the store. To her dismay, she discovered that they were not the usual offerings, redeemable in pecks and cuddles, but a new kind, mysteriously banal, each offering 25 cents off the purchase of food in a particular category. Linda wondered anxiously if something was wrong. Had Bill confused her with someone else? Was there another shopper in his life? Fighting down a mounting sense of dread, Linda ran back to the Superette and searched the aisles for some meaning behind Bill's latest coupons. Did she find her answer? Was Love confirmed among the collard greens? Or did her fond hopes topple like an unbalanced stack of tomato-juice cans?

HOW TO PLAY

Set your computer to all uppercase letters before playing *Supermarket Sweethearts*. From the moment you type RUN, you'll be in Linda's shoes—shopping for the items she needs for her romantic anniversary dinner. Stroll up and down the aisles of the Superette, using the illustration as a guide. Buy as many items as you please. To buy an item, type in its name at the prompt, and press RETURN or ENTER. When you've finished shopping (and hopefully collected all the coupons) type END, and again press RETURN or ENTER. Now, by referring to the illustration, study the different items mentioned on the coupons. If you've missed a coupon, you may have to do some more shopping by pressing "S".

If you think you've figured out what Bill is up to, type "G" to guess. To win the game, you'll have to choose one special item from among those pictured in the illustration. If you guess incorrectly, press "H" for a helpful hint, or "V" to study the coupons some more. The solution will appear in next month's issue.

Base Version (TRS-80 Model III)/*Supermarket Sweethearts*

```
10 CLEAR 1000
20 DIM S$(12),FL(4)
30 DL=1600:TX=0:TRU=-1:WH=7:WL=64
40 FOR I=1 TO 4:FL(I)=0:NEXT I:C=1:FC=0
50 P$="PRESS <S> TO SHOP SOME MORE":Q$=CHR$(34)
90 FOR I=1 TO 12:T$="":READ K:FOR J=1 TO K:READ A$
100 V=ASC(LEFT$(A$,1))-64:FOR Z=2 TO LEN(A$)
110 N=ASC(MID$(A$,Z,1))-V
120 T$=T$+CHR$(N+TRU*26*(N<65)):NEXT Z:T$=T$+" "
130 NEXT J:S$(I)=LEFT$(T$,LEN(T$)-1):NEXT I
140 CLS:Z$="SUPERMARKET SWEETHEARTS":GOSUB 1000:PRINT
150 Z$="WHAT SHOULD LINDA BUY FOR DINNER?":GOSUB 1000
160 Z$="(ENTER "+Q$+"END"+Q$+" WHEN DONE.)":GOSUB 1000
:PRINT
170 PRINT "ITEM #";C;:T$="":INPUT T$:IF T$="" THEN 170
180 IF LEFT$(T$,3)="END" THEN 210
190 C=C+1:FOR I=1 TO 4:IF FL(I)=0 THEN GOSUB 3000
200 NEXT I:GOTO 170
210 CLS:IF FC<>0 THEN 230
220 Z$="YOU HAVE NO COUPONS.":GOSUB 1000:GOTO 270
230 Z$="YOU NOW HAVE COUPONS FOR ...":GOSUB 1000:PRINT
240 FOR M=1 TO FC
250 Z$="25 CENTS OFF ANY BRAND OF "+S$(M+4)
260 GOSUB 1000:NEXT M
270 GOSUB 4000:Z$=P$+" OR <G> TO GUESS.":GOSUB 1000
280 GOSUB 5000:IF K$="S" THEN CLS:GOTO 150
290 IF K$<>"G" THEN 280
300 CLS:Z$="AT DINNER, LINDA REPLIES TO BILL'S"
310 Z$=Z$+" MESSAGE BY GIVING HIM WHAT ITEM?"
320 GOSUB 1000:PRINT:T$="":INPUT T$:IF T$="" THEN 300
330 F=0:FOR I=9 TO 11:GOSUB 3000:NEXT I:IF F THEN 440
340 CLS:N$="WRONG!":GOSUB 2000:GOSUB 4000
350 Z$=P$+", <V> TO VIEW COUPONS, <G> TO GUESS,"
360 Z$=Z$+" OR <H> FOR A HINT.":GOSUB 1000
370 GOSUB 5000:IF K$="S" THEN CLS:GOTO 150
380 IF K$="G" THEN 300
390 IF K$="V" THEN 210
400 IF K$<>"H" THEN 370
410 CLS:Z$=S$(12)+".":GOSUB 1000:GOSUB 4000
420 Z$="PRESS ANY KEY TO CONTINUE.":GOSUB 1000
430 GOSUB 5000:GOTO 210
440 CLS:Z$="HARK! DO I HEAR WEDDING BELLS ... ?"
450 GOSUB 1000:FOR D=1 TO DL:NEXT D
460 END
1000 IF LEN(Z$)<=WL THEN N$=Z$:GOSUB 2000:RETURN
1010 J=WL+1:K=1:FOR I=J TO 2 STEP -1
1020 IF MID$(Z$,I,1)=" " THEN K=0:J=I:I=2
1030 NEXT I:N$=LEFT$(Z$,J-1):GOSUB 2000
1040 Z$=RIGHT$(Z$,LEN(Z$)-J+K):GOTO 1000
2000 IF LEN(N$)=WL THEN PRINT N$;:RETURN
2010 PRINT TAB((WL-LEN(N$))/2+TX);N$:RETURN
3000 K=LEN(S$(I)):FOR J=1 TO LEN(T$)-K+1
3010 IF MID$(T$,J,K)<>S$(I) THEN 3040
3020 IF I>8 THEN F=TRU:GOTO 3040
3030 FL(I)=1:FC=FC+1
3040 NEXT J:RETURN
4000 FOR I=1 TO WH:PRINT:NEXT I:RETURN
5000 K$=INKEY$:ON -(K$="") GOTO 5000:RETURN
7000 DATA 1,PIKWQH,1,KALDEL,1,ILQNNBN,1,READC
7010 DATA 1,RUZWWKW,2,WPXIXA,MQERFFVAT,2,PSQAU,NAWL
7020 DATA 2,KNLE,LRAAP,1,MZNFPNEN,2,WBVB,EIT
7030 DATA 1,NSMS!RC,7,PIKSSUII,IFRUU,LNQ
7040 DATA KESP,SIKHWNVM,JYP,KZMDPCGLETZY
```

Atari/*Supermarket Sweethearts*

```
10 DIM S$(117),DP(12),T$(43),A$(12),Q$(1),CL$(1)
20 DIM SP$(20),PITCH(38),DUR(38),FL(4)
30 FOR I=1 TO 4:FL(I)=0:NEXT I:C=1:FC=0:CL$=CHR$(125)
40 SP$=" ":SP$(20)=SP$:SP$(2)=SP$:Q$=CHR$(34)
50 OPEN #1,4,0,"K:":POKE 82,0:POKE 752,1
60 FOR I=1 TO 38:READ A,B:PITCH(I)=A:DUR(I)=B:NEXT I
70 FOR I=1 TO 12:T$="":READ L:FOR J=1 TO L:READ A$
80 V=ASC(A$)-64:FOR Z=2 TO LEN(A$)
90 N=ASC(A$(Z))-V:T$(LEN(T$)+1)=CHR$(N+26*(N<65))
100 NEXT Z:T$(LEN(T$)+1)=" ":NEXT J
110 DP(I)=LEN(S$)+1:S$(DP(I))=T$(1,LEN(T$)-1):NEXT I
120 PRINT CL$;SP$(1,8);"SUPERMARKET SWEETHEARTS":PRINT
130 PRINT SP$(1,3);"WHAT SHOULD LINDA BUY FOR DINNER?"
140 PRINT SP$(1,8);"(ENTER ";Q$;"END";Q$;" WHEN DONE.)
":PRINT
150 PRINT "ITEM #";C;:GOSUB 1000:IF T$="" THEN 150
160 IF LEN(T$)>2 THEN IF T$(1,3)="END" THEN 190
170 C=C+1:FOR I=1 TO 4:IF FL(I)=0 THEN GOSUB 2000
180 NEXT I:GOTO 150
190 PRINT CL$;:IF FC<>0 THEN 210
200 PRINT SP$(1,10);"YOU HAVE NO COUPONS.":GOTO 250
210 PRINT SP$(1,6);"YOU NOW HAVE COUPONS FOR ...":PRIN
T
220 FOR M=1 TO FC
230 T$="25 CENTS OFF ANY BRAND OF ":T$(LEN(T$)+1)=S$(D
P(M+4),DP(M+5)-1)
240 POSITION (40-LEN(T$))/2,M+2:PRINT T$:NEXT M
250 POSITION 1,20:PRINT "PRESS <S> TO SHOP SOME MORE O
R <G> TO":PRINT SP$(1,17);"GUESS."
260 GET #1,K:IF K=83 THEN PRINT CL$;:GOTO 130
```

```
530 PRINT TAB 9;"<G> TO GUESS."
540 LET K$=INKEY$
550 IF K$<>"S" AND K$<>"G" THEN GOTO 540
560 CLS
570 IF K$="S" THEN GOTO 270
580 PRINT "AT DINNER, LINDA GIVES BILL WHAT"
590 PRINT " ITEM TO REPLY TO HIS MESSAGE?"
600 INPUT T$
610 IF T$="" THEN GOTO 560
620 PRINT AT 3,0;T$
630 LET FS=0
640 FOR I=9 TO 11
650 GOSUB 1000
660 NEXT I
670 CLS
680 IF FS THEN GOTO 850
690 PRINT TAB 13;"WRONG."
700 PRINT AT 19,0;"PRESS <S> TO SHOP SOME MORE, <V>"
710 PRINT " TO VIEW COUPONS, <G> TO GUESS,"
720 PRINT TAB 7;"OR <H> FOR A HINT."
730 LET K$=INKEY$
740 IF K$<>"S" THEN GOTO 770
750 CLS
760 GOTO 270
770 IF K$="G" THEN GOTO 560
780 IF K$="V" THEN GOTO 410
790 IF K$<>"H" THEN GOTO 730
800 CLS
810 PRINT S$(P(12) TO 116);TAB 10;S$(118 TO 128);"."
820 PRINT AT 20,3;"PRESS ANY KEY TO CONTINUE."
830 IF INKEY$="" THEN GOTO 830
840 GOTO 410
850 PRINT " HARK, DO I HEAR WEDDING BELLS?"
860 PAUSE 900
870 STOP
1000 LET K=P(I+1)-P(I)-1
1010 IF K>LEN T$ THEN RETURN
1020 FOR J=1 TO LEN T$-K+1
1030 IF T$(J TO J+K-1)<>S$(P(I) TO P(I+1)-2) THEN GOTO
 1090
1040 IF I<8 THEN GOTO 1070
1050 LET FS=1
1060 GOTO 1090
1070 LET F(I)=1
1080 LET FC=FC+1
1090 NEXT J
1100 RETURN
2000 IF Z$(DI)="," THEN GOTO 2040
2010 LET DI=DI+1
2020 IF DI>LEN Z$ THEN GOTO 2040
2030 GOTO 2000
2040 LET X$=Z$(DJ TO DI-1)
2050 LET DJ=DI+1
2060 LET DI=DJ+1
2070 LET V=CODE X$(1)-37
2080 FOR Z=2 TO LEN X$
2090 LET N=CODE X$(Z)-V
2100 LET N=N+26*(N<38)
2110 LET S$=S$+CHR$ N
2120 NEXT Z
2130 RETURN
```

MODIFICATIONS FOR OTHER COMPUTERS

ADAM/*Supermarket Sweethearts*

Use the base version, with the following alterations. Add lines 60, 70, 470–490, and 6000–6100:

```
60 r=28000:FOR i=r TO r+5:READ a:POKE i,a:NEXT i
70 FOR i=1 TO 38:READ hi(i),lo(i),dur(i):NEXT i
470 POKE r+6,lo(i):CALL 28000:POKE r+6,144:CALL 28000
480 FOR d=1 TO dur(i)*100:NEXT d
490 POKE r+6,159:CALL 28000:NEXT i:END
6000 DATA 58,102,109,211,255,201
6010 DATA 141,35,6,141,26,4,141,26,2,141,26,12
6020 DATA 141,35,6,142,23,4,135,28,2,141,26,12
6030 DATA 141,35,6,141,26,4,129,20,2,129,20,6
```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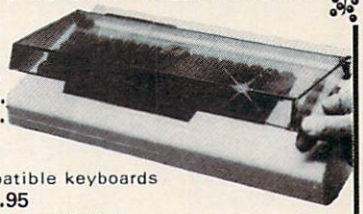

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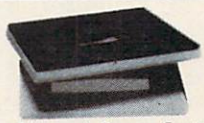

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```
6040 DATA 133,21,4,142,23,2,141,26,4,142,23,1
6050 DATA 141,26,1,135,28,4,141,26,2,142,23,12
6060 DATA 141,35,6,141,26,4,141,26,2,141,26,12
6070 DATA 141,35,6,142,23,4,135,28,2,141,26,12
6080 DATA 141,35,6,141,26,4,133,21,2,142,17,6
6090 DATA 133,21,4,141,26,2,142,31,6,142,23,4
6100 DATA 135,28,2,141,26,12
```

Change CLS to HOME in lines 140, 210, 280, 300, 340, 370, 410, and 440. Finally, change lines 10–30, 460, and 5000 to read as follows:

```
10 LOMEM: 29000
20 DIM s$(12),hi(38),lo(38),dur(38),fl(4)
30 dl=1200:tx=1:tru=1:wh=9:wl=31
460 FOR i=1 TO 38:POKE 28006,hi(i):CALL 28000
5000 GET k$:RETURN
```

Apple/*Supermarket Sweethearts*

Use the base version, with the following alterations. Delete line 10. Add lines 60, 70, 470, and 6000–6080:

```
60 FOR I=768 TO 796:READ A:POKE I,A:NEXT I
70 FOR I=1 TO 38:READ PITCH(I),DUR(I):NEXT I
470 POKE 8,PITCH(I):CALL 768:NEXT I:END
6000 DATA 165,8,74,133,10,164,8,173,48,192,136
6010 DATA 234,234,208,251,165,7,56,229,10,133
6020 DATA 7,176,237,198,6,208,233,96
6030 DATA 162,6,121,4,121,2,121,12,162,6,108,4,128,2
6040 DATA 121,12,162,6,121,4,91,2,91,6,96,4,108,2
6050 DATA 121,4,108,1,121,1,128,4,121,2,108,12
6060 DATA 162,6,121,4,121,2,121,12,162,6,108,4
6070 DATA 128,2,121,12,162,6,121,4,96,2,81,6
6080 DATA 96,4,121,2,144,6,108,4,128,2,121,12
```

Change CLS to HOME in lines 140, 210, 280, 300, 340, 370, 410, and 440. Finally, change lines 20, 30, 460, and 5000 to read as follows:

```
20 DIM S$(12),PITCH(38),DUR(38),FL(4)
30 DL=800:TX=1:TRU=1:WH=14:WL=40
460 FOR I=1 TO 38:POKE 6,DUR(I)*20
5000 GET K$:RETURN
```

Commodore 64/*Supermarket Sweethearts*

Use the base version, with the following alterations. Delete line 10. Add lines 60–80, 470–490, and 6000–6090:

```
60 FOR I=54272 TO 54296:POKE I,0:NEXT I
70 FOR I=1 TO 38:READ HI(I),LO(I),DUR(I):NEXT I
80 POKE 54277,100:POKE 54278,100
470 POKE 54273,HI(I):POKE 54272,LO(I):POKE 54276,17
480 FOR D=1 TO DUR(I)*60:NEXT D
490 POKE 54272,0:NEXT I:POKE 54296,0:END
6000 DATA 12,142,6,16,194,4,16,194,2,16,194,12
6010 DATA 12,142,6,18,208,4,15,210,2,16,194,12
6020 DATA 12,142,6,16,194,4,22,96,2,22,96,6
6030 DATA 21,30,4,18,208,2,16,194,4,18,208,1
6040 DATA 16,194,1,15,210,4,16,194,2,18,208,12
6050 DATA 12,142,6,16,194,4,16,194,2,16,194,12
6060 DATA 12,142,6,18,208,4,15,210,2,16,194,12
6070 DATA 12,142,6,16,194,4,21,30,2,25,30,6
6080 DATA 21,30,4,16,196,2,14,24,6,18,208,4,15
6090 DATA 210,2,16,194,12
```

Change CLS to PRINT CLS; in lines 140, 210, 280, 300, 340, 370, 410, and 440. Finally, change lines 20, 30, 460, 2010, and 5000 to read as follows:

```
20 DIM S$(12),HI(38),LO(38),DUR(38),FL(4)
30 DL=800:TRU=-1:WH=14:WL=40:CL$=CHR$(147)
460 POKE 54296,15:FOR I=1 TO 38
2010 PRINT SPC((WL-LEN(N$))/2);N$:RETURN
5000 GET K$:ON -(K$="") GOTO 5000:RETURN
```

IBM PC & IBM PC*jr*/*Supermarket Sweethearts*

Use the base version, with the following alterations. Add lines 70, 470, and 6000–6050:

```
70 FOR I=1 TO 38:READ PITCH(I),DUR(I):NEXT I
470 NEXT I:END
6000 DATA 392,6,523,4,523,2,523,12,392,6,587,4,494,2
6010 DATA 523,12,392,6,523,4,698,2,698,6,659,4,587,2
6020 DATA 523,4,587,1,523,1,494,4,523,2,587,12,392,6
6030 DATA 523,4,523,2,523,12,392,6,587,4,494,2,523,12
6040 DATA 395,6,523,4,659,2,784,6,659,4,523,2,440,6
6050 DATA 587,4,494,2,523,12
```

Change lines 10, 20, and 460 to read as follows:

```
10 KEY OFF:LOCATE ,,0
20 DIM S$(12),PITCH(38),DUR(38),FL(4)
460 FOR I=1 TO 38:SOUND PITCH(I),DUR(I)*2.5
```

Finally, if you have an IBM PC, change line 30 to read

```
30 DL=1100:TX=0:TRU=-1:WH=14:WL=80:WIDTH WL
```

If you have an IBM PC*jr*, change line 30 to read

```
30 DL=1200:TX=0:TRU=-1:WH=14:WL=40:WIDTH WL
```

TRS-80 Color Computer/*Supermarket Sweethearts*

Use the base version, with the following alterations. Add lines 70 and 6000–6040:

```
70 FOR I=1 TO 38:READ PITCH(I),DUR(I):NEXT I
6000 DATA 32,6,89,4,89,2,89,12,32,6,108,4,78,2,89,12
6010 DATA 32,6,89,4,133,2,132,6,125,4,108,2,89,4,108,1
6020 DATA 89,1,78,4,89,2,108,12,32,6,89,4,89,2,89,12
6030 DATA 32,6,108,4,78,2,89,12,32,6,89,4,125,2,147,6
6040 DATA 125,4,89,2,58,6,108,4,78,2,89,12
```

Also, change lines 20, 30, and 460 to read as follows:

```
20 DIM S$(12),PITCH(38),DUR(38),FL(4)
30 DL=800:TX=0:TRU=-1:WH=4:WL=32
460 FOR I=1 TO 38:SOUND PITCH(I),DUR(I)*2:NEXT I:END
```

TRS-80 Model 4/*Supermarket Sweethearts*

Use the base version, with the following alterations. Delete line 10. Also, change lines 30 and 460 to read as follows:

```
30 DL=1600:TX=0:TRU=-1:WH=14:WL=80:PRINT CHR$(15)
460 PRINT CHR$(14):END
```

VIC-20/*Supermarket Sweethearts*

Use the base version, with the following alterations. Delete line 10. Add lines 70, 470, and 6000–6050:

```
70 FOR I=1 TO 38:READ PITCH(I),DUR(I):NEXT I
470 FOR D=1 TO DUR(I)*75:NEXT D:POKE 36876:NEXT I:END
6000 DATA 215,6,225,4,225,2,225,12,215,6,228,4,223,2
6010 DATA 225,12,215,6,225,4,232,2,232,6,231,4,228,2
6020 DATA 225,4,228,1,225,1,223,4,225,2,228,12,215,6
6030 DATA 225,4,225,2,225,12,215,6,228,4,223,2,225,12
6040 DATA 215,6,225,4,231,2,235,6,231,4,225,2,219,6
6050 DATA 228,4,223,2,225,12
```

Change CLS to PRINT CLS; in lines 140, 210, 280, 300, 340, 370, 410, and 440. Finally, change lines 20, 30, 460, 2010, and 5000 to read as follows:

```
20 DIM S$(12),PITCH(38),DUR(38),FL(4)
30 DL=800:TRU=-1:WH=8:WL=22:CL$=CHR$(147)
460 POKE 36878,15:FOR I=1 TO 38:POKE 36876,PITCH(I)
2010 PRINT SPC((WL-LEN(N$))/2);N$:RETURN
5000 GET K$:ON -(K$="") GOTO 5000:RETURN
```

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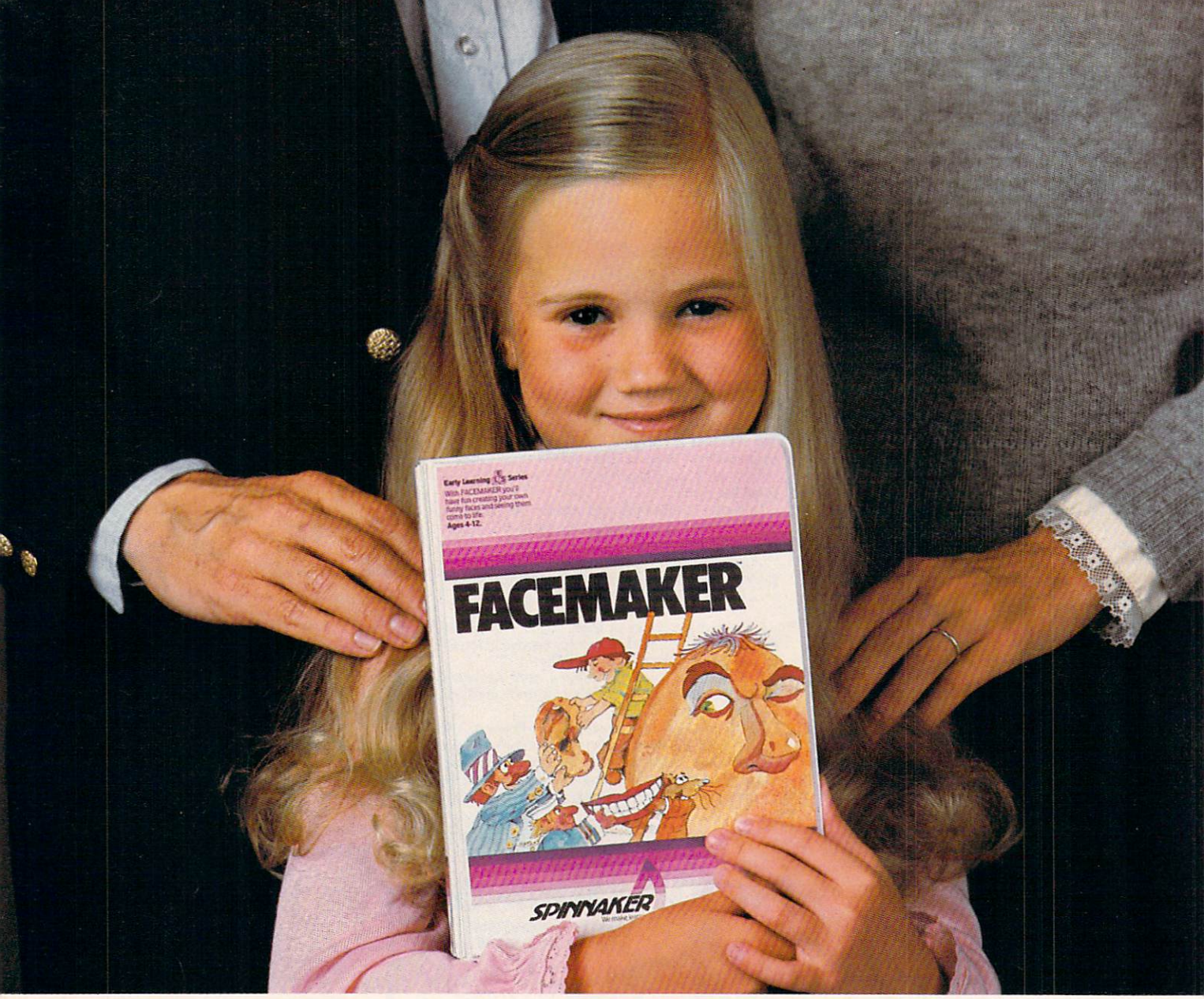

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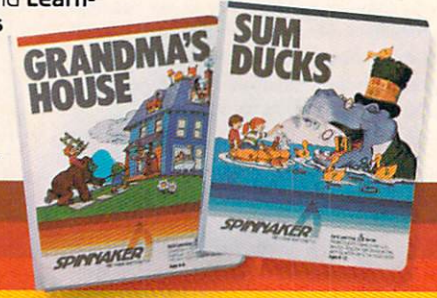

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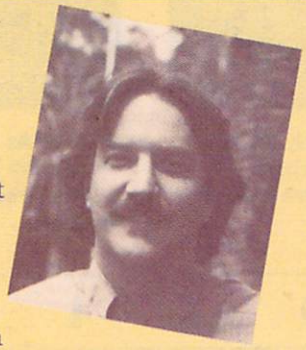
MUSIC PROGRAMS

BY JOEY LATIMER



Most of you computer maestros out there have discovered that your computer can play some great music. But did you know it can *compose* music, too?! Well, it can. And this month's Microtones program, *Tune Generator*, turns your computer into a songwriting machine. The program works by randomly selecting from a table of chords and associated notes. The *Tune Generator* makes compositions that range from downright folksy to airy and heavenly. Enjoy!

ADAM/*TUNE GENERATOR*

```
10 LOMEM: 29000
20 DIM chord(5,4),note(5,5,2)
30 HOME:PRINT TAB(9);"TUNE GENERATOR"
40 PRINT:PRINT "Please press <SPACE BAR> to"
50 PRINT "begin. Press <RETURN> to stop"
60 PRINT "the program."
70 IF PEEK(64885) <> 32 THEN 70
80 FOR x = 28000 TO 28005:READ a:POKE x,a:NEXT x
90 FOR x = 1 TO 5:READ chord(x,1),chord(x,2),chord(x,3
),chord(x,4)
100 FOR y = 1 TO 5:READ note(x,y,1),note(x,y,2)
110 NEXT y:NEXT x
120 FOR q = 144 TO 208 STEP 32:POKE 28006,q:CALL 28000
:NEXT q
130 t = INT(RND(1)*20)+20
140 FOR x = 1 TO t
150 r = INT(RND(1)*5)+1
160 IF x = 1 THEN r = 1
170 IF x = t THEN r = 4
180 FOR z = 1 TO 4
190 POKE 28006,chord(r,z):CALL 28000
200 NEXT z
210 FOR y = 1 TO 3:s = INT(RND(1)*5)+1
220 IF PEEK(64885) = 13 THEN FOR q = 159 TO 223 STEP 3
2:POKE 28006,q:CALL 28000:NEXT q:END
230 FOR z = 1 TO 2
240 POKE 28006,note(r,s,z):CALL 28000
250 NEXT z
260 FOR de = 1 TO 250:NEXT de:NEXT y:NEXT x
270 FOR q = 0 TO 15 STEP 0.1:FOR n = 144 TO 208 STEP 3
2
280 POKE 28006,n+q:CALL 28000
290 NEXT n:NEXT q
300 FOR q = 128 TO 192 STEP 32:POKE 28006,q:CALL 28000
310 POKE 28006,0:CALL 28000:NEXT q:GOTO 120
1000 DATA 58,102,109,211,255,201
2000 DATA 141,26,165,21,205,26,206,23,197,21,206,17
2010 DATA 205,26,129,20,175,15,193,20,206,17,207,15
2020 DATA 195,14,198,13,142,17,163,14,206,17,207,15
2030 DATA 195,14,198,13,207,11,143,15,166,13,207,15
2040 DATA 195,14,198,13,207,11,202,10,133,21,174,17
2050 DATA 206,17,197,21,195,14,202,10,207,8
```

ATARI/*TUNE GENERATOR*

```
10 DIM V0(5),V1(5),V2(5),N(5,5)
20 PRINT CHR$(125),"    TUNE GENERATOR"
30 FOR X=1 TO 5:READ A,B,C
40 V0(X)=A:V1(X)=B:V2(X)=C
50 FOR Y=1 TO 5:READ NO
60 N(X,Y)=NO
70 NEXT Y:NEXT X
80 TI=INT(RND(1)*20)+10
90 FOR X=1 TO TI
100 R=INT(RND(1)*5)+1
110 IF X=1 THEN R=1
120 IF X=TI THEN R=3
130 SOUND 0,V0(R),10,4
140 SOUND 1,V1(R),14,4
150 SOUND 2,V2(R),10,4
160 FOR Y=1 TO 3:S=INT(RND(1)*5)+1
170 SOUND 3,N(R,S),10,4
180 FOR DE=1 TO 75:NEXT DE:NEXT Y:NEXT X
190 FOR Q=6 TO 0 STEP -0.15
200 SOUND 0,144,10,Q:SOUND 1,96,10,Q
210 SOUND 2,60,10,Q:SOUND 3,N(R,S),10,Q
220 NEXT Q:FOR DE=1 TO 120:NEXT DE:GOTO 80
1000 DATA 121,96,81,60,53,47,40,60
1010 DATA 91,72,60,45,81,72,64,121
1020 DATA 162,128,108,81,72,64,60,53
1030 DATA 144,96,60,72,64,60,53,47
1040 DATA 193,128,81,81,96,64,47,40
```

COMMODORE 64/*TUNE GENERATOR*

```
10 DIM H1(5),L1(5),H2(5),L2(5),NH(5,5),NL(5,5)
20 PRINT CHR$(147);TAB(13);"TUNE GENERATOR"
30 S=54272:FOR I=S TO S+24:POKE I,0:NEXT I
40 FOR X=1 TO 5:READ H1(X),L1(X),H2(X),L2(X)
50 FOR Y=1 TO 5:READ NH(X,Y),NL(X,Y):NEXT Y,X
60 POKE S+5,34:POKE S+6,243:POKE S+4,17
70 POKE S+12,34:POKE S+13,243:POKE S+11,17
80 POKE S+19,34:POKE S+20,243:POKE S+18,17
90 T=INT(RND(1)*20)+20
100 FOR Q=0 TO 10:POKE S+24,Q:NEXT Q
```

COMPUCOPIA

SHORT-SHORT PROGRAMS

ADAM/*Bouncing Ball II*

```
10 DIM g(2),inc(2),x(2),xt(2),y(2),yt(2)
20 HGR2:HCOLOR= 3
30 HPLOT 0,0 TO 255,0 TO 255,191 TO 0,191 TO 0,0
40 FOR i = 1 TO 2:inc(i) = RND(1)*4+2:g(i) = 0:x(i) =
0:NEXT i
50 y(1) = RND(1)*40:y(2) = RND(1)*70+10:c = 0
60 FOR i = 1 TO 2
70 g(i) = g(i)+0.9:x(i) = x(i)+inc(i)
80 y(i) = y(i)+g(i):IF y(i) <= 190 THEN 100
90 y(i) = 190:g(i) = -g(i)/1.05
100 xt(i) = x(i)
110 IF x(i) > 254 THEN xt(i) = 254:h2 = x(i)-254:c = i
120 yt(i) = y(i):NEXT i
130 IF x(1) > 254 AND x(2) > 254 THEN FOR d = 1 TO 900
:NEXT d:GOTO 20
140 IF c = 0 OR y(1) = y(2) THEN 160
150 yt(c) = y(c)+(y(3-c)-y(c))*h2/ABS(x(1)-x(2))
160 HPLOT xt(1),yt(1) TO xt(2),yt(2):GOTO 60
```

Apple/*Bouncing Ball II*

```
10 DIM G(2),INC(2),X(2),XT(2),Y(2),YT(2):HCOLOR= 3
20 HGR2:HPLOT 0,0 TO 279,0 TO 279,191 TO 0,191 TO 0,0
30 FOR I = 1 TO 2:INC(I) = RND(1)*4+2:G(I) = 0:X(I) =
0:NEXT I
40 Y(1) = RND(1)*40:Y(2) = RND(1)*70+10:C = 0
50 FOR I = 1 TO 2
60 G(I) = G(I)+0.9:X(I) = X(I)+INC(I)
70 Y(I) = Y(I)+G(I):IF Y(I) <= 191 THEN 100
80 Y(I) = 191:G(I) = -G(I)/1.05
90 FOR J = 0 TO 2+I*I:S = PEEK(-16336):NEXT J
100 XT(I) = X(I)
110 IF X(I) > 279 THEN XT(I) = 279:H2 = X(I)-279:C = I
120 YT(I) = Y(I):NEXT I
130 IF X(1) > 279 AND X(2) > 279 THEN FOR D = 1 TO 600
:NEXT D:GOTO 20
140 IF C = 0 OR Y(1) = Y(2) THEN 160
150 YT(C) = Y(C)+(Y(3-C)-Y(C))*H2/ABS(X(1)-X(2))
160 HPLOT XT(1),YT(1) TO XT(2),YT(2):GOTO 50
```

TRS-80 Color Computer w/Extended Color BASIC/*Bouncing Ball II*

```
10 DIM G(2),INC(2),X(2),XT(2),Y(2),YT(2)
20 PMODE 3,1:SCREEN 1,0
30 PCLS 1:LINE (0,0)-(255,191),PSET,B
40 FOR I=1 TO 2:INC(I)=RND(4)+1:G(I)=0:X(I)=0:NEXT I
50 Y(1)=RND(40)-1:Y(2)=RND(70)+10:C=0
60 FOR I=1 TO 2
70 G(I)=G(I)+0.9:X(I)=X(I)+INC(I)
80 Y(I)=Y(I)+G(I):IF Y(I)<=191 THEN 110
90 Y(I)=191:G(I)=-G(I)/1.05
100 SOUND I*I*I*I,1
110 XT(I)=X(I)
120 IF X(I)>255 THEN XT(I)=255:H2=X(I)-255:C=I
130 YT(I)=Y(I):NEXT I
140 IF X(1)>255 AND X(2)>255 THEN FOR D=1 TO 200:NEXT
D:GOTO 30
150 IF C=0 OR Y(1)=Y(2) THEN 170
160 YT(C)=Y(C)+(Y(3-C)-Y(C))*H2/ABS(X(1)-X(2))
170 LINE (XT(1),YT(1))-(XT(2),YT(2)),PSET:GOTO 60
```

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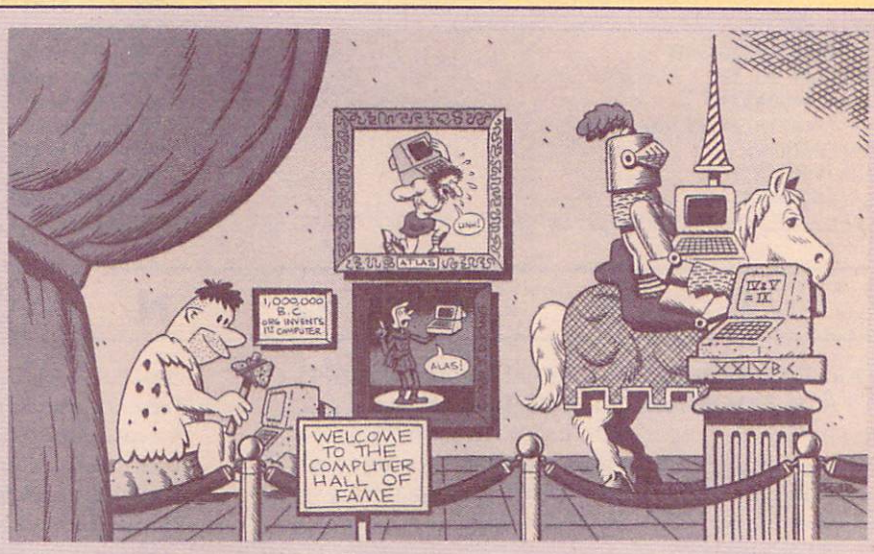
Fill out and send your entry to: K-POWER Hall of Fame, c/o K-POWER, 730 Broadway, New York, NY 10003. All entries must be received by Jan. 31, 1985. Don't forget to tell us what kind of computer you use!



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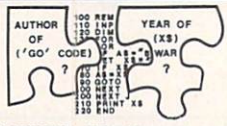

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