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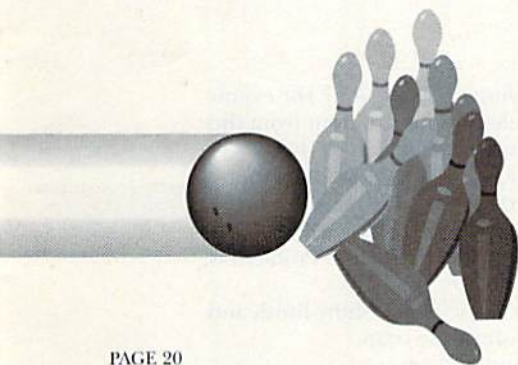


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COVER PHOTOGRAPHED BY ED JUDICE

RUN (ISSN 0741-4285) is an independent journal not connected with Commodore Business Machines, Inc. *RUN* is published bimonthly by TechMedia Publishing, Inc. (80 Elm St., Peterborough, NH 03458; 603-924-0100), a division of IDG Communications, Inc. Second-class postage paid at Peterborough, NH, and at additional mailing offices. Canadian second-class mail registration number: 9565. US subscription rates are \$24.00 per year (CA residents add 7.25% tax). In Canada, the yearly subscription rate is \$33.00, and in Mexico the yearly subscription rate is \$31.00, each with US funds drawn on a US bank. Foreign surface mail subscriptions are \$42.97 for one year, and foreign air mail one-year subscriptions are \$77.97, with US funds drawn on a US bank. *RUN* is nationally distributed by International Circulation Distributors. **POSTMASTER: Send address changes to *RUN*, Subscription Services, PO Box 58711, Boulder, CO 80322-8711. (Canadian address changes to *RUN*, PO Box 1051, Fort Erie, Ontario, Canada L2A 5N8.)**

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24-pin printers are not out of reach for the Commodore user. The Star Micronics NX-2430 is a perfect example—it's a luxury printer for the budget-minded consumer.

* Here in New England, no one stays inside when the mercury tops 65°. If you're too busy enjoying the sunshine to type in these programs, order the July/August ReRUN disk. Just call 800-824-5499.

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RUNNING RUMINATIONS

PAPER CHASE

Ever get the feeling your eyes are playing tricks on you? For example, you could swear that this issue somehow looks different from the previous issue, which looked different from the one before that.

Well, before you run to your local optician, you should know that *RUN* has been experimenting with several kinds of paper in the past few issues. We're investigating ways to reduce our costs, without compromising the high quality our readers expect from *RUN*. Problem is, we haven't decided which kind of paper to use.

This column is printed on coated stock (which has a shiny finish and reproduces colors well). The reason publishers use coated paper, which is more expensive, is to promote an image of quality to attract both advertisers and readers.

Our previous issue (May/June '92) was printed on uncoated stock (less expensive, and doesn't reproduce colors as well). Uncoated stock features a matte finish, which, because it eliminates glare, is easier to read. The two papers also differ in their opacity (the degree to which you can see through the paper to what's printed on the other side).

You don't have to be too discerning to note the difference. While some argue that we're inching toward a paperless society, paper grade remains important to many readers. To others, it's a non-issue.

We'll continue to experiment with paper over the next few issues and carefully weigh the cost/quality ratio. Which type of paper do you prefer? If you feel strongly about it, drop us a line.

While we experiment with magazine format, the content remains as strong as ever, as evidenced by this issue's lineup. First, turn directly to page 14 to discover the answer to perhaps the best-kept secret in computing. You'll learn how you can take advantage of a treasure trove of inexpensive, but high-quality, software. Selecting the best of the bunch is difficult, but we list our ten top picks from literally thousands of programs.

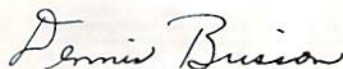
Next, go directly to the GEOS tutorial, where you'll find expert advice on how you can take full advantage of this exciting graphics environment. GEOS remains one of the best reasons to be a Commodore user. Then proceed to the article on taking care of your computer system. Follow the tips provided to ensure your peace of mind and your computer's longevity and ease of use.

Add a mix of software and hardware reviews, useful and entertaining type-in programs and lots more, and you have an issue bursting at the seams with information you've got to see to believe.

We feel that this issue's content reinforces *RUN*'s commitment to its readers. Blame the economy, blame the stars, but don't blame *RUN* if you're not getting value from your Commodore.

NEXT ISSUE: *RUN* focuses its spotlight on GEOS, with tips, tutorials and other helpful articles about how you can get the most from GEOS. For non-GEOS users, the lineup will include interesting program listings to type in, reviews of a new low-cost printer and the latest software, as well as the usual mix of tricks, tips and questions answered. Be sure to stay tuned.

*If the
magazine looks
different to you,
don't fault your
eyeglasses.*



Dennis Brisson
Editor-in-Chief

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MAIL RUN

Firsthand feedback on products by CMD and FGM, plus responses to articles and letters from issues past.

ARMED AND DANGEROUS (FINALLY)

I really didn't plan on making this a complimentary letter, I really didn't. After ordering RAMLink and a JiffyDOS drive ROM for my 1541 II, I patiently waited for UPS to bring me my little box of joy. And waited. And waited. When the box finally arrived—almost two months after I placed the order—I was fuming.

I set about installing JiffyDOS in my drive (a surprisingly painless procedure) and setting up RAMLink (less painless, but not bad overall).

Now that all of this is working, I just can't bring myself to complain as I had planned. RAMLink is incredible! Booting up the machine and GEOS takes all of 10 seconds (if I bother to set up the date and time). All my files are right there waiting on a one-megabyte partition. I don't even turn on a drive most of the time.

JiffyDOS is just as impressive as the RAMLink. The faster load-time is great, but the DOS wedge is truly fantastic.

In spite of the wait, I am 200 percent satisfied with these products. They turn a great little computer into a heavily armed killer. (IBM? Amiga? Why bother!)

—ANDY NIEBRUGGE, YANKTON, SD

IF THE COMPUTER FITS, USE IT

In "RUN for the Money?" (Mail RUN, March/April '92) Mr. Zemba raises some excellent points, but misses the main point of personal computing.

The reality is that you buy and use the computer that is right for you, but you don't expect it to be state of the art forever. If you're tired of hearing 8-bit bashing, don't listen. I use my C-128 frequently, and it serves my purposes very well. We also have an Amiga 500, which my son uses, and an Amiga 3000, which my wife uses for her home business; the C-128 is not appropriate for her needs.

Sure, someday I'll get rid of my trusty C-128, but it will be when I no longer have a need for it, not because it isn't the hottest machine on the market. I have no problem dumping to our Imagewriter and the quality is more than acceptable for my needs. And when I want to get fancy I use our LaserJet.

If you think you can get a great deal on a 16-bit SX-386 clone, buy one! Don't forget, though, you'll also have to buy an operating system (such as MS-DOS), a graphical user interface (such as Windows), a VGA card, a sound card, a hard drive interface card, a mouse and a minimum of 4MB of RAM for multitasking. I use a DX-486 and speak from experience: To use any of the newer software, consider getting a hard drive larger than 85MB, and memory in excess of 8MB.

Care to make that comparison again?

In spite of what you may think, *RUN* happens to be the only national (actually, international) magazine actively supporting 8-bit users, which is why I subscribe. If they happen to have a firm grasp on reality and publish their observations and opin-

ions, regardless of whether we agree with them or not, then I certainly believe they have that right. (Well, okay, they don't *always* have a firm grasp on reality.)

—JOHN COMERFORD, WOODLAND HILLS, CA

ARTISTIC COMPATIBILITY

I'm an artist who owns a C-64 with a Koala Pad and a paint program. I intend to purchase an Amiga, but I don't want to discard my 64. How, as you suggest, can the C-64 be used in conjunction with the Amiga?

—BRUCE MORGAN, POLLOCK PINES, CA

Our first suggestion is to make the most of both systems. Keep your C-64 up and running, especially for the core applications you have come to love and depend upon, and spend your time with the Amiga learning to use its excellent graphics capabilities.

On the subject of using the two in conjunction: First, you can easily translate word processing files back and forth between the C-64 and the Amiga. You will need a conversion program and a 1581 drive to accommodate the 3 1/2-inch Amiga disks. Second, you can also translate C-64 graphics files, including your Koala images, to an Amiga-compatible format without losing any quality. Realize, however, that Amiga graphics files are much more complex than C-64 files, so there are strict limitations when converting Amiga graphics to Commodore format.

For details, see "Share and Share Alike," by Tim Walsh, and "Converting Graphics Files," by Paul Hughes, both in the September/October 1991 issue of RUN.

—EDITORS

CURLY BRACES CAUSE CONFUSION

I can't understand one thing in your programs. In the middle of one of your programs, you have this in the line:

```
6 CT=0:PRINT" {SHIFT CLR} ":REM*56
```

What do the braces mean?

—DANIEL PAYNE, GREAT FALLS, MT

The curly braces in our program listings mean "perform the function described within these braces." In your example, you would type the quotation mark, then hold down the SHIFT key and press the CLEAR key (marked CLR HOME on your keyboard), then type the quotation mark again and press RETURN. You do not type in the curly braces!

For more examples using curly braces, and detailed instructions on typing in program listings, see the Checksum on page 45. We have recently rewritten the Checksum instructions to answer the questions that most first-timers have when typing in program listings. (Note: The Checksum program itself has not changed.)

—EDITORS

FUN GRAPHICS SUCCESS STORY

Last fall I needed a program to make forms, but I couldn't

find one. *RUN* to the rescue! Your November/December 1991 issue described two form creation programs. But again, disappointment—one was no longer available and no one had heard of the other, Fun Graphics Machine.

Once again, *RUN* to the rescue! In Coming Attractions, I read you were going to review Fun Graphics Machine in the March/April issue, and I found an ad for the program in your classified section. A quick call, priority mail, and some nice people had FGM in my hands the next day, and—WOW!

FGM makes the graphics and fonts stand out from the page! The thorough manual and inexpensive keyboard overlay had me—a three-thumbed newcomer—up and running in no time. I soon had a set of forms made up exactly to my specifications. The last print program I bought required the Amiga version for smoothing. Fun Graphics Machine has a smoothing routine built in. It's excellent.

—DICK KIMKER, COOS BAY, OR

ME AND MY 64: STILL GOING STEADY

I found Warren Buchanan's article, "ROM Is Where the Heart Is," (March/April) very entertaining. It touched on the deep loyalty we die-hard C-64 owners have for our computers.

I have often contemplated "upgrading," but have always stopped short, opting instead to dig deeper into my C-64. Be it software, an REU or some other add on, I see my computer as a "work in progress," always growing and improving.

As president of my local user's group, I have seen many members buy Amigas, but the C-64 and 128 continue to be the computers of choice. The lack of new software is a major concern, but with the thousands of already released programs, an old title, rediscovered, can be just as entertaining or useful.

—MITCH L. DURDLE, GALESBURG, IL

ACCOLADES AND REMONSTRANCES

I'll start by saying thanks for sticking with us C-64/128 users. Based on your reviews I have purchased a lot of stuff for my Commodore, including RAMLink, GateWay and JiffyDOS. (For the money I've spent I could have made a big down payment on an IBM, so it's your fault IBM is in such dire straits.) I don't program, and I doubt I ever will, so the issue of software availability is very important to me. Many of your advertisers have benefited from my purchases simply because of their ads.

For all this praise, I also have a complaint. Too often, when someone who is obviously a newcomer to computing asks a question in Commodore Clinic or Mail *RUN*, your answers are incomplete and lack content. Don't cut people short.

I would finally like to add a pitch for the new Perfect Print LQ for GEOS, from Creative Micro Designs: At last there is a simple and inexpensive way to print letter quality documents.

—RICHARD WARWICK, RENO, NV

HE'S BECOME A POWER USER

Based upon your advice, I put my old C-64 back into action. I replaced the 1541 disk drive with a 1571, retaining the 1541 as a backup. I bought an REU, collected useful software from *RUN*, its advertisers and military base exchanges. Of course, I also subscribed to *RUN* and to Re*RUN*.

For a year after that, I used the C-64 primarily to write letters. Then I joined the Coast Guard Auxiliary, and in December I took over editing and producing the monthly newsletter *Flotilla*. How was I to do the job? No problem. I have a C-64,

Print Shop, Newsroom, a word processing program, plus some utilities and accessories.

Recently I turned over the old Commodore 64 and the 1541 drive to my teenage daughter. (She loves to run games right when I need to get work done.) I replaced it with a new 64C that I found in the Sears catalog for \$150. UPS delivered it on Wednesday. Thank you for the encouragement.

—SHERWOOD STUTZ, HAVELOCK, NC

TPUG FOR MORE THAN PETS

Last year after *RUN* published a list of user's groups we received at least a dozen inquiries from PET owners. What isn't obvious from our name, *Toronto PET User's Group*, is that TPUG isn't just for PET owners. We try to support essentially everything Commodore has built. Well, almost: We don't support CDTV or Amiga UNIX yet. We have Plus/4 programs, but none explicitly for the C-16, and we have nothing for the Max or the new video game sold in Europe.

—IAN MCINTOSH, WILLOWDALE, ONT

Thanks for the clarification. TPUG is one of the most respected Commodore user's groups out there. TPUG accepts mail-in memberships, and is an excellent resource for all Commodore users.

—EDITORS ■

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COMMODORE UPGRADES

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By JOHN RYAN

THE SIMPSONS ARCADE GAME..... B-

Fans of the Coin-Op Original Won't Be Disappointed

Are you a fan of the Itchy and Scratchy show? When you think of clowns does the name Krusty come to mind? Perhaps you think that the "Bart Man" song should have been nominated for a Grammy.

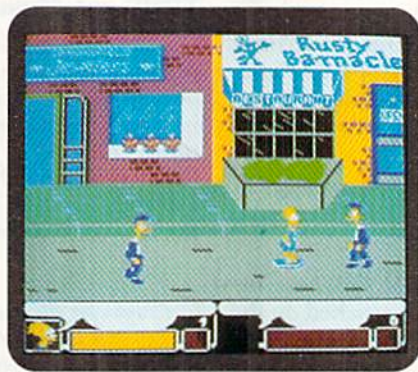
If you can answer yes to any of these questions, then you are undoubtedly a Simpsons fanatic. If that's the case, you'll want to get this game. Long available for Nintendo systems, the Simpsons arcade game has finally made its C-64 debut.

The scenario is simple: While taking a leisurely stroll through Springfield, the Simpson family literally stumbles into a thief making his getaway from a jewelry store heist. The thief drops a pacifier-shaped diamond which, naturally, Maggie finds and claims for her own. The thief snatches Maggie and makes his getaway. It is your job to recover Maggie from the clutches of this villain.

You can play the role of any one of the Simpsons: Bart, Lisa, Marge or Homer. Each character has special abilities to deal with the plethora of bad guys: Bart has his trusty skateboard, Lisa her jump rope, Marge metes out justice with a vacuum cleaner, and Homer, perhaps the sorriest hero of all, punches his way through the streets of Springfield with his rock-muscled arms (yeah, right).

As you maneuver your character through the scrolling streets of Springfield, you'll run across street toughs, executive yes-men, ghosts, giants and a host of other nasties. Along the way you'll find items to throw or use as weapons—even slingshots, one of Bart's favorite weapons. There are eight levels to play through, including Krustyland, Moe's Tavern and the Burns Mansion. You'll have to defeat a major foe on each level to advance to the next.

The Simpsons opening scene throws up some of the best full-screen animated graphics I've seen for the C-64. In fact, the graphics look a lot like the opening scenes on the Simpsons's television series.



Bart's skateboard makes a great weapon in *The Simpsons Arcade Game* by Konami.

The full-screen graphics of the game itself, while not particularly remarkable, do a fair job of imitating the familiar style of Matt Groening, the artist who created the Simpsons cartoon. For the most part, the characters are well drawn and true to form. Equally well done is the Simpsons's soundtrack that we have all come to love or loathe, as the case may be.

My only real disappointment with this game is its rather sloppy joystick operation. I found the character's response time a little slow as you move, jump or attack. Accordingly, this slow response can cost you precious lives in the early stages of the game. Moreover—and I'll not muse on the motives—it also seems that the damage you take from the main enemy on each level is rather excessive. You'll have to rely on quick thinking and coordination to advance.

All in all, the Simpsons is a game that will excite most fans. The loading times are bearable and two-player gaming is

supported. The Simpsons is no piece of cake, though, so plan on spending a lot of time getting to the last level. Whatever the case, don't have a cow, man.

(\$49.95/C-64. Konami, 900 Deerfield Parkway, Buffalo Grove, IL 60089-4510)

TMNT: THE ARCADE GAME... B+

Teenage Mutant Ninja Turtles Return to the C-64

Put the pizza order on hold! April O'Neil has been abducted by Shredder's Foot Clan. Now it's up to four lovable teenage turtles to come to her rescue.

Turtles? Yes, by now all of you should be familiar with the Teenage Mutant Ninja Turtles (TMNT). There's Leonardo, whose Katana blades are the next best thing to Ginzu knives; Raphael, armed with a mean pair of Sai daggers; Donatello, the most intelligent turtle of the bunch, wielding his head-splitting Bo stick; and last, there's Michaelangelo, who can swing nunchakus with the best of them.

This time, Shredder and his feeble-minded minions have whisked April away to some secret location in the city and you'll have to take one of the turtles through eight levels of shell-cracking action to get her back.

If you've ever had the opportunity to play the arcade version of TMNT, then you'll immediately feel comfortable with this superb translation. Admittedly, the C-64 version does not look quite as pretty, nor does it have all the options and graphics of the arcade or Nintendo versions. Nonetheless, it's good enough that you'll soon overlook any lacking features.

As one of the turtles, you guide your hero through the game's full-screen scrolling graphics. This adventure is no leisurely stroll. From the start you're beset by members of the notorious Foot Clan. Never fear. If you're Bruce Lee with a joystick, you'll make mincemeat of them; your turtle can drop-kick, attack, slash and whirl about the screen

Continued on p. 46.

SOFTWARE REPORT CARD

Outstanding	A
Good	B
Average	C
Below Average	D
Crummy	F

VIDEOFOX

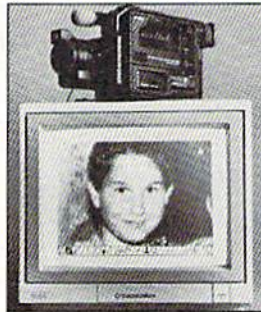
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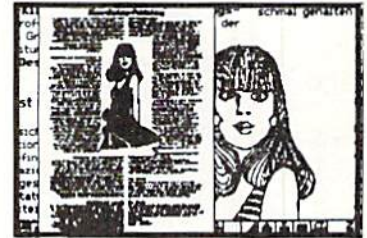
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MAGIC

Save the contents of your screen to disk, keep track of your disk drives and flash messages in either mode.

By TIM WALSH

\$5EE SCREEN PRINTER 64

While recently using the assembly language monitor Supermon v2, I thought it would be nice to write a memory-resident screen print utility. That way, I could make a hard copy of the assembly code I was developing.

Screen Print 64 is the result of my efforts. This program lets you send the current screen to the printer with a press of the CONTROL and LEFT-ARROW keys. After you've typed in the listing using RUN's Checksum on page 45 and saved it to disk, run it to activate the CONTROL/LEFT-ARROW sequence.

```
Ø REM SCREEN PRINT 64 - KELLY KIPFERL
:REM*249
1Ø FOR T=49152 TO 49368:READ D:CK=CK+D:POK
E T,D:NEXT :REM*84
2Ø IF CK <> 26569 THEN PRINT"ERROR IN DATA
...":END :REM*9Ø
3Ø PRINTCHR$(147)"PRESS CONTROL/BACKARROW
TO PRINT" :REM*15Ø
4Ø SYS 49329 :REM*241
5Ø DATA 165,2Ø3,2Ø5,59,3,24Ø,7,141,59,3,2Ø
1,57,24Ø,3,1Ø8,254,3,169,Ø :REM*94
6Ø DATA 162,8,16Ø,62,32,189,255,169,1,162,
4,16Ø,255,32,186,255,32,192 :REM*89
7Ø DATA 255,173,136,2,133,255,169,Ø,133,25
4,141,253,3,166,184,32,2Ø1 :REM*189
8Ø DATA 255,162,Ø,16Ø,Ø,177,254,2Ø1,128,14
4,6,141,253,3,56,233,128,2Ø1 :REM*171
9Ø DATA 96,144,7,24,1Ø5,64,2Ø1,96,176,18,2
Ø1,64,144,7,24,1Ø5,32,2Ø1,64 :REM*231
1ØØ DATA 176,7,2Ø1,32,176,3,24,1Ø5,64,141,
252,3,173,253,3,2Ø1,Ø,24Ø,5 :REM*121
11Ø DATA 169,18,32,21Ø,255,173,252,3,32,21
Ø,255,173,253,3,2Ø1,Ø,24Ø,1Ø :REM*11Ø
12Ø DATA 169,146,32,21Ø,255,169,Ø,141,253,
3,2ØØ,192,4Ø,144,172,169,13,32 :REM*99
13Ø DATA 21Ø,255,24,165,254,1Ø5,4Ø,133,254
,165,255,1Ø5,Ø,133,255,232,224:REM*179
14Ø DATA 25,144,147,32,2Ø4,255,169,1,32,19
5,255,1Ø8,254,3,173,2Ø,3,141 :REM*183
15Ø DATA 254,3,173,21,3,141,255,3,12Ø,169,
Ø,141,2Ø,3,169,192,141,21,3,88 :REM*94
16Ø DATA 96,12Ø,173,254,3,141,2Ø,3,173,255
,3,141,21,3,88,96 :REM*151
```

—KELLY KIPFERL, HORSEHEADS, NY

\$5EF DRIVE FINDER 64/128

If you're looking to add a unique drive identifying routine to your programs, Drive Finder 64 is for you. It's a one-of-a-kind program that shows how many drives are connected to your Commodore 64 or 128.

After typing in the program using RUN's Checksum on page 45 and saving it to disk, you can run it in either 64 or 128 mode. The program then reads and lists each drive con-

nected to your computer and its type, when identifiable, all in the span of a few seconds.

```
Ø REM DRIVE FINDER 64/128 - WARD SHRAKE
:REM*69
1Ø DIM DD(11),DD$(11):PRINT"CURRENT DRIVE
IS DEVICE";PEEK(186);"{CRSR LF}."{CRSR D
N}" :REM*72
2Ø FORDD=8 TO 11:OPEN 15,DD,15:CLOSE 15
:REM*37
3Ø PRINT"DEVICE NUMBER ";RIGHT$(STR$(DD),2
); :REM*13Ø
4Ø DD(DD)=ABS(ST) :REM*155
5Ø IFDD(DD)<125THENPRINT" IS PRESENT."
:REM*1Ø1
6Ø IFDD(DD)>124THENPRINT" IS NOT HOOKED UP
." :REM*89
7Ø NEXT :REM*2ØØ
8Ø PRINT"PLEASE WAIT..." :REM*2Ø9
9Ø FORDD=8TO11 :REM*2Ø2
1ØØ IFDD(DD)>124THEN17Ø :REM*16Ø
11Ø OPEN15,DD,15,"U:" :REM*45
12Ø TI$="ØØØØØØ" :REM*116
13Ø IFTI$<"ØØØØØØ2"THEN13Ø :REM*1Ø4
14Ø INPUT#15,X,DD$(DD):CLOSE15 :REM*132
15Ø IFDD$(DD)="OK"THENPRINT"TWO DRIVE";DD;
"{CRSR LF}'S FOUND, MODELS UNSURE.":GO
TO17Ø :REM*1Ø7
16Ø PRINT"DISK DRIVE";RIGHT$(STR$(DD),2);"
IS A MODEL ";RIGHT$(DD$(DD),4);"." :REM*133
17Ø NEXT :REM*45
```

—WARD SHRAKE, COVINA, CA

\$5FØ FLASHING PRINT 64/128

You may occasionally notice that some programs have messages that flash on the screen until a key is pressed or some other action is performed. This routine prints a message on the screen that flashes on and off in a reversed print until a key is pressed. By studying the lines of Basic code used to print the routine and the for/next loop that cycles the reversed text, you will see that it's a simple process. Use this routine in your own programs to provide a lively bit of animated text.

```
Ø REM FLASHING PRINT 64/128 - RAFAEL J. DI
AZ :REM*216
1Ø R$=CHR$(18):S$="PRESS A KEY!" :REM*85
2Ø PRINTR$;S$ :REM*37
3Ø GET A$:IF A$="" THEN FOR I=1 TO 35Ø:NEX
T:IF A$<>"" THEN 5Ø :REM*176
4Ø PRINT"{CRSR UP}";:PRINTS$:IF A$="" THEN
FOR I=1 TO 2ØØ:NEXT:PRINT"{CRSR UP}";:
GOTO 2Ø :REM*197
5Ø IF A$<>"" THEN PRINT"THANK YOU!"
:REM*232
```

—RAFAEL DIAZ, HOFFMAN ESTATES, IL ■



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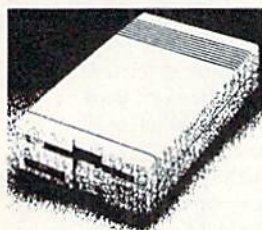
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NEWS AND NEW PRODUCTS

Commodore computer users have some unique needs. Here's a selection of the latest gadgets for using your Commodore safely and efficiently.

By JANICE CROTTY

GET IT TOGETHER

SCOTTS VALLEY, CA—Finally, Commodore users can organize their computer cords!

Most cord control products are not suited to Commodore computer systems. They typically hold only cords of a specific diameter, and they require that all of the cords attach at a specific point on your work table.

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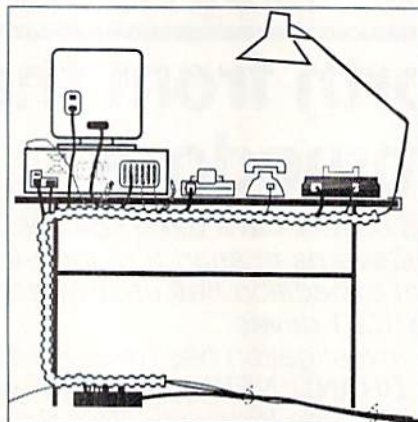
HILLSBORO, OR—Commodore users who spend long hours tapping at their keyboard or scooting about their mousepads should note that poor hand and wrist posture can lead to carpal tunnel syndrome, a very painful disorder. If you have felt fatigue in your wrists and hands after typing, consider adding a wrist rest to your collection of peripherals.

Two of the newest wrist comfort products are **Type Ease** (\$29.95) and **Mouse Ease** (\$24.95) from Gered. Both products are upholstered in a soft machine washable fabric and come with two foam inserts for high or low adjustment.

For more information, contact Gered at 2401 N.E. Cornell Road #125, Hillsboro, OR 97124; 800-852-8727.

INGENIOUS SPACE SAVER

JAFFREY, NH—I have discovered an interesting phenomenon: Commodore computer systems develop middle-age spread, with disk drives, cartridges, RAM



Cables tuck neatly away with Cord Control.

expanders, disk boxes, printers and manuals stacking up everywhere. Who among us has room on our work table for papers?

Curtis Manufacturing has a solution: **Top Shelf** (\$19.95). It's a two-basket system equipped with levers and feet that let it perch on top of your monitor. It makes a great place to stash oft-used reference cards, "to do" working papers or whatever you need to put your hands on



Top Shelf expands your workspace.

quickly. The Top Shelf system fits all monitors and assembles in a snap.

For more information, contact Curtis Manufacturing at 30 Fitzgerald Drive, Jaffrey, NH 03452.

ZAP FREE

CHICAGO, IL—Every time I bump the printer interface connection that plugs into my datasette port, static electricity reboots my computer. At the very least, the zap is annoying, but it could seriously damage my Commodore.

If you have trouble with static, consider setting your computer on an antistat mat, such as the new model from Computer Coverup, Inc. Their **Touch It** mat dissipates electrical charges through an 8-foot snap-on grounding cord. All you have to do is touch it (if you'll excuse the pun), and you're safe from the static zap.

The non-skid mat comes in several sizes, but even the smallest (\$16.96), measuring 10 inches by 20 inches, will accommodate Commodore keyboards.

You can contact Computer Coverup at 2230 S. Calumet, Chicago, IL 60616; 800-282-2541.

A DELICATE MATTER

SANTA ROSA, CA—Caution: Don't use window cleaner and paper towels on your Commodore's monitor! A very thin coating covers all optical glass, including your computer monitor, and that coating will be damaged by the ammonia and vinegar in glass cleaners, and by the wood fiber in paper. But who wants to keep a box of lens wipes on that already cluttered work table?

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SHARE

When it comes to Commodore software, some of the best things

What's the best terminal program for the C-128? Which utility will convert and display your graphics best? Where can you find top-of-the-line printer drivers for GEOS?

The answers might surprise you, because you won't find these products on store shelves or in a mail order list, and they cost very little or *nothing at all*. Some of the best software available is public domain and shareware. These programs are found on bulletin boards and in user's group libraries, and while some of the files might have a few rough edges, they are becoming the star players in the Commodore line-up.

Where do all these great files come from? They're written by users like you, folks who saw software needs and filled them. Some of these programmers have started their own small companies, selling their work by mail order, but most would rather devote all their energies to programming. So, unless they happen to find a company eager to market their creations, these mavericks release their programs as public domain or shareware.

PD AND SHAREWARE: WHAT'S THE DIFFERENCE?

If a piece of work is said to be in the "public domain," it means the work is available for anyone to copy and use as they wish. Public domain (PD) programs can be given away to other users without breaking copyright laws. These files are free, but they're far from worthless.

Shareware files are similar to public domain files, except that they aren't free. When you try out a shareware program, you make a decision whether or not you want to keep it. If you decide it's worth keeping, you send a small fee to the author of the program. If it isn't for you, you simply erase the file. Some of the finest files around are shareware, and some of the best programmers use this method of distribution to support their efforts. It's sort of an honor system.

The concept of shareware could prove to software companies what copy protection opponents have been trying to point out for years: that given an honest opportunity to try out a program before buying it, users will be less inclined to make illegal copies. Unfortunately, things seldom work out that way. Many shareware authors report very little money ever being returned on their programs. While a file may be widely touted as a great piece of work, users often treat it as if it were free for the taking.

As a result, shareware authors have come up with various methods of protecting their rights, while still releasing their work for honest users to try and buy. Often a file will be released in a "demo" version that demonstrates a few features of the complete program. Upon receipt of the shareware fee, the author sends the user a complete version.

Some programmers apply their programming skill to protecting their work. One method is to rig the file with "time bomb" code that, after a certain number of uses, erases the program. If the fee is paid, a bomb-free version is sent out. Bob Pellegrino created his own security method called "Share-lok" to stop theft of his shareware programs. Users can audition his programs, but to get the full use out of them they need to get a "key" from Bob by paying the five-dollar shareware fee. This system works quite well.

Most shareware authors, however, forego protection schemes and rely on the honor system. Considering the low fee requested (usually less than \$15), the excellent quality of the programs, and the fact that no fee need be paid until the file is tested, shareware files are excellent bargains.

WHERE CAN YOU FIND THESE FILES?

The best source for Commodore public domain and shareware files is QuantumLink, with its comprehensive selection of over 35,000 files that can be downloaded for a small fee. And Q-Link's Search features make it fairly easy to find files.

The largest areas on QuantumLink are the GEOS section, the SID music files, and the graphics pictures and utilities. There are also libraries of games and game aids, programming utilities, text files, and so on. Whatever your interests, you're likely to find something great to download. For example, last month on a whim I tried a search of the libraries using the search word "ambush," because a friend and I play the World War II board game Ambush once in a while. I was surprised to discover a character generator someone had uploaded a few years back. Q-Link has thousands of treasures just waiting to be discovered.

I realize, however, that many users don't have access to Q-Link. Where else can you turn? The first place to go is a user's group. Most user's groups maintain a library of public domain disks you can buy for a minimal cost. Often, if there's a particular file you want, the group can track it down for you.

If you can't get a file from your local group, check out the bulletin board systems (BBSs) in your area. Most Commodore BBSs include a file section where you'll find PD and shareware files. Even boards that are run on other systems often keep libraries of Commodore files. Plus, other users you meet online will be able to help you find files or advise you on using the files they have.

Some companies sell public domain files by the disk-full. You'll find advertisements for them in *RUN*. The money they charge generally pays for collecting, copying

WARE

in life are free...or almost.

By STEVE VANDER ARK

and advertising the files, and it's usually a small amount. Some of the larger user's groups, Fog International for example, sell their public domain disks through the mail. (See "Sources" at the end of this article.)

MY TOP TEN PD/SHAREWARE FILES

Once you start poking around for public domain or shareware files, brace yourself. There are *lots* of files out there. For example, if you were looking for a space adventure game for your C-64 on Q-Link, you'd be presented with 29 choices. If you add arcade games into the mix, you have more than 80 choices. It would be impossible to list the best files in every category. Heck, when I polled users on Q-Link to get their opinions about the best files of all time, the numero uno answer was "Gee, I dunno, there're so many."

So what was going to be a Top Ten Of All Time has become a list of the files I personally prefer. All the files on my list come from the Q-Link libraries, and therefore I've included the Q-Link file and uploader names to help you find them. Many are also found on GENie, CompuServe and BBSs nationwide. Here, then, are my top ten picks:

1. AUTOGRAPH, by Fuzzy Fox (filename: "autograph.sda" uploader: "Fuzzy Fox"). Just about whatever kind of graphics screen you have, this little gem will decode and display for you. It's slick and easy to use, operated with keystrokes from its on-screen menu. You can also convert your file from one format to another.

2. DESTERM, by Matthew E. Desmond (filename: "desterm" uploader: "Ridgerunner"). If you ask most 128 users which terminal program is the best, you will very likely hear the answer "Desterm!" They're right. This shareware program requires a \$25 fee, a bit steep by Commodore standards, but for a feature-laden package like this one, it's a steal. In fact, it's one of the best bargains in the Commodore world.

Want ANSI? You got it. Commodore C/G graphics? Yep. A plethora of protocols, baud rates up to 9600, emulations for various terminal configurations including European standards—you couldn't even begin to name all the features packed into this incredible program.

3. STEREOPLAYER, v10.3 by Mark A. Dickenson (filename: "stereo10.3a.sda" uploader: Mark AD I). If you want to play SID files, the most popular music file format around, you'll want Stereoplayer. It supports stereo as well as mono SIDs and will display the graphic or lyric files that accompany some music. With numerous extra commands, this player is a cut above the rest.

4. SCRAP IT by Terry Van Camp (filename: "scrap it v1.1" uploader: TerryV7). GEOS photo scraps were always limited in size to the area of the geoPaint window. This utility made full-page scraps possible. True, only geoPublish can handle scraps that big, but that's still enough to make Scrap It a must-have for any GEOS graphics user. ►

DOWNLOADING FROM Q-LINK

The best place to find public domain and shareware files is Q-Link. Downloading from their extensive libraries is simplified with the command Download Specific File. You'll find this in the Commodore Software Showcase under Software Libraries. To use this function you need the exact filename and the exact screen name of the uploader (also called a handle), such as the filenames and handles I listed with the programs above. For best results, have a blank, formatted, single-sided disk handy before you log on; there's no easy way to format a disk online, and

you'll waste a lot of expensive time shoving disks into your drive looking for enough space if you don't plan ahead.

Using the Download Specific File command results in a partial display of the information Q-Link maintains on the file. To see more, including the description provided by the uploader and any additional comments appended by users, use the Search from Software Libraries menu. When the prompt asks for your search word, use the filename or perhaps the uploader's handle. Sometimes the information you get

from this type of search will help you decide whether this is the file that you were looking for.

Some files on Q-Link won't show up in the regular search or in the Commodore Software Showcase. For example, the programs in the Special Premium Library, maintained by *RUN* Magazine in their area of the Commodore Information Network (path: Commodore Information Network/News & Reference/*RUN* Magazine Online). As the name implies, various programs, such as *RUN* Paint and the GEOS collections, can be downloaded

from the Premium library for an additional fee. If you can't find what you need, drop a line via e-mail to one of the sysops in the category you're interested in.

There is a catalog available through Q-Link which lists well over 35,000 files from the libraries. It is incomplete, not only because more files get uploaded every day, but also because some areas were inexplicably omitted. Still, it's a great resource—you can browse the libraries for hours without paying eight cents a minute to do so. □

—SVA

FILE TYPES YOU'LL ENCOUNTER

You might have noticed that several of the filenames listed in the "Top Ten" had the letters "sda" attached to them. Suffixes such as this tell you, the downloader, what type of file it is and how you should handle it.

An "sda" file is a "self-dissolving archived" file. An archived file is made up of one or more files that have been compressed into a single, smaller file that is quicker to upload and download. Before an archived file can be used, it needs to be returned to its original, uncompressed format, with each file separated.

For instance, if a program consists of three files that work together, then they would all be archived (abbreviated "arced") as a single file. Then, after you have downloaded it, you need to "unarc" the file and sep-

arate it into its original three files.

Some of the three-letter designations indicate how you are to go about breaking the file up into its component files. Since an SDA is a "self-dissolving" archived file, when you load and run an SDA, it will automatically write itself back into the uncompressed format and divide into the original files.

Other files have designations that tell you in which format the file was created, such as "mus," which tells you that the file is a music file that can be played with Stereoplayer and other SID music players.

What follows is a list of the most common file designations, and an explanation of each:

sda — As I said before, this type

of file can be broken into separate files by loading and running it with the Basic command LOAD "filename",8;. You must be in the correct mode when dissolving these files—64 mode for 64 files and 128 mode for 128 files.

sfx — These are similar to sda files, except they can be dissolved in either 64 or 128 mode, regardless of the mode in which they were originally created.

arc — These files require a separate unarc program, such as Omega-Q, probably the most comprehensive unarc utility available through Q-Link.

lynx — Similar to archived files, these require a separate delynx program to return them to their original, usable format.

mus — A SID music file, created with the SIDplayer Music System. Related designations give an idea of which types of support files are included, such as "msw" for a file with music, stereo and words files. The designation "sal" means the file is a SingALong, and includes lyrics. The "mus" files need no dissolving. The others dissolve themselves when you load and run them from Basic.

gif — This format for graphics files is something of a standard for images uploaded to bulletin boards. IBM boards often have large libraries of these. There are public domain viewers available for the Commodore, including an excellent one that transfers the image into geoPaint. □

—SVA

5. MENUMAKER by Bob Pellegrino (filename: "menu/64.sda" uploader: Xeno). One of the most basic parts of any program is the menu, the interface between you and the program. A well-designed menu makes any program look more professional, but getting them to do what you want with a minimum of fuss takes some time. If you want slick, user-friendly menus for your own programs, let this shareware utility automate the process.

6. SUPERMON+64 by Jim Butterfield (filename: "supermon+64" uploader: Butterfield). This classic machine language monitor program was written by one of the biggest names in Commodore programming; nobody is more qualified to design an ML monitor. If machine language is on your list of things to learn, you might want to search for one of the hard-to-find copies of his book *Machine Language For The Commodore 64, 128, and other Commodore Computers* to go with this program. You'll be LDA-ing and JSR-ing in no time.

7. INCREDIBOOT by Bob Pellegrino (filename: "inbootv7.sda" uploader: Xeno). It's no great trick to make your 128 autoboot a program from a disk. This utility, however, makes autobooting your chance to shine. You can customize the autoboot sequence with personalized messages, autoboot your C-128 into 64 mode, load and save customized boot screens and even relocate any data stored in the boot block of your disk to clear it for your autoboot code. Unfortunately, there is a drawback: Incrediboot will only work in 40-Column mode.

8. STAR FRONTIER by Seth Hopkinson (filename: "starfrontier.sda" uploader: "SethH15"). This addictive empire-building, space-fleet-battling game will keep you glued to your computer for hours. Seth is working on C-128 (80 columns) and Amiga versions of Star Frontier. For copies of the latest versions of the game and construction set, send \$1 and a blank disk to Seth Hopkinson, 22511 W. Stator Lane, Saugus, CA 91350-1127. If you decide to keep the files, return \$5 for each.

9. SCRAP GRAB by Michael Myers (filename: "scrap-grab" uploader: "geoLib PH"). With Scrap Grab, GEOS users can finally handle photo scraps intelligently. Being a desk accessory, this utility will reach out from anywhere and grab a scrap from a photo album on any active drive, which means you can finally tuck all those oversized clip art photo albums away on a separate disk. And you'll never have to chop one up to fit on a geoPublish work disk again. The application version, Photo Grab, is identical except that it can handle larger scraps.

10. SPIRIT OF ART by Chad Glynn and Ernie Deakne (filename: "soa complete.arc" uploader: "CyTR0ic"). Want to see what your computer can really do? Want to impress a skeptic with incredible animation and music pouring out of your "lowly" 64? Download this bit of computer magic and leave 'em wondering.

So, are these *really* my ten favorites? Well, this week . . . maybe. Of course, part of the fun is knowing that there's always something else out there, just around the corner. With all the great programs, it could take you a long time—maybe years—to exhaust the resources. But then, new ones are being added all the time. ■

Steve Vander Ark, one of RUN's newest regular writers, has a long history of Commodore computing. He spends much of his time scanning the networks for bargains he can add to his software library.

PD AND SHAREWARE SOURCES

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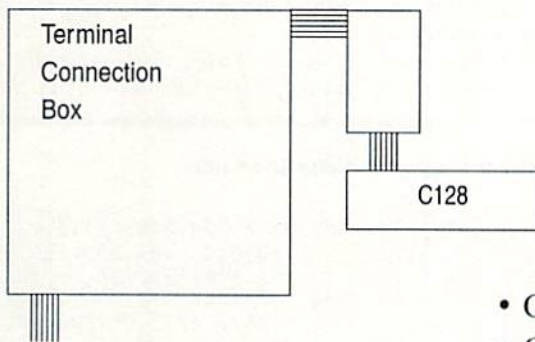
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Look and Load

By WAYNE MARTIN

Programmers love to stick pet machine language routines in the 4K of memory between \$C000 (49152) and \$CFFF (53247), so I wanted to find another, safer spot for a utility program I'd written. I'd never seen an ML program stored in RAM memory under the Kernal ROM, so I figured that would be a safe place.

When loaded, my program sits in the background waiting for the F7 key to be pressed. Then, it lists the disk directory and loads any program you choose, just by pressing F7 again. Because of its location, loading and running another program will not affect Look and Load.

Type in and save Listing 1 using the Checksum on page 45. Next, run the program; it will create and automatically save two machine language files on your disk, named KR Load and KR. Whenever you want to use Look and Load, type

```
LOAD"KR LOAD",8,1{RETURN}
SYS267{RETURN}
```

to load KR and reset the interrupt vector. If the interrupt vector is returned to normal (by pressing RUN-STOP/RESTORE or a reset button), SYS290 will direct it back.

During the interrupt period that oc-

curs every 1/60 of a second, the computer checks to see if F7 was pressed. If so, then upon return from the interrupt routine it will jump to the ML routine located in RAM under the Kernal ROM. My routine clears the screen and prints the disk directory.

Press the space bar to slow the directory and any other key to stop it. To resume scrolling, press the space bar again. Use the CURSOR UP/DOWN key to move the highlighted area to the directory listing that you want to load. Press F7 again to load the program.

You can load any Basic or ML program. If you do not wish to load a program, press RETURN to clear the screen and return to Direct mode.

HOW IT WORKS

Examine the program and you will see four sections of Data statements. The first copies the Basic and Kernal ROMs to their underlying RAM memory.

The second pokes the list and load program to an area in the newly copied Kernal RAM. The memory between \$F8E2 (63714) and \$FB96 (64406) is used only for tape operations, therefore I can poke my program in this area and still use the other Kernal routines.

Now comes the tricky part. In order to use the new Kernal RAM, the Kernal ROM must be turned off to force the computer to use the program in RAM memory.

This is done by changing the value in memory location #1 to 53. Upon completion of the program a 55 is stored there. The switching must be done in an area of memory that is not affected by other computer operations. There is an area between \$010B (267) and \$013E (318) that is only used during tape loading and cannot be overwritten by the stack, so the third set of Data statements pokes a short machine language routine into \$010B that will do the required bank switching. It also holds the KR Load program.

The last set of Data statements takes all the above and saves the two programs, KR Load and KR, to your disk. KR is an entirely new Kernal RAM.

One warning: If you use a FastLoad cartridge, do not use the Monitor function as it changes the interrupt vector in RAM under Kernal ROM and thereby causes the program to hang up. **R**

Wayne Martin, a self-taught programmer, started programming the C-64 in 1986.

Listing 1. Look and Load Source program. Also available on the July/August ReRUN disk. Call 1-800-824-5499.

```
10 REM LOOK AND LOAD PROGRAM BY          141,130,250,169      :REM*213    180 DATA 208,249,169,0,133,198,
   WAYNE MARTIN 1992      :REM*172    110 DATA 164,72,169,115,72,169,    240,8,32,204,255,169,0,141,
   FOR X=49152 TO 49185:READ A:          1,162,8,160,0,32,186,255,16     153,250,174,135      :REM*107
   POKE X,A:NEXT                    :REM*254    190 DATA 250,142,136,250,174,13
   SYS49152                          :REM*204    6,250,160,7,24,32,240,255,1
   40 DATA 169,160,133,252,169,224     255,162,1,32,198,255,162,0,    77,209,9,128,145    :REM*253
   ,133,254,169,0,133,251,133,2      32,207,255,232      :REM*47    200 DATA 209,200,192,29,208,245
   53,160,0,177      :REM*34    130 DATA 224,4,208,248,32,207,2    32,228,255,201,13,240,67,2
   50 DATA 251,145,251,177,253,145     55,201,66,240,88,201,18,208    01,145,240,14      :REM*180
   ,253,136,208,245,230,252,230     ,7,32,207,255      :REM*172    210 DATA 201,17,240,25,201,32,2
   ,254,208,237      :REM*6    140 DATA 208,251,240,228,201,34    40,36,201,136,240,81,208,23
   60 DATA 96                          :REM*210    ,208,234,32,234,232,173,135    1,165,214,205      :REM*170
   70 FOR X=63714 TO 64153:READ A:      ,250,240,3,206      :REM*126    220 DATA 135,250,240,224,206,13
   POKE X,A:NEXT                    :REM*44    150 DATA 135,250,162,24,160,7,2    6,250,32,30,250,240,196,169
   80 DATA 120,169,41,141,20,3,169     4,32,240,255,169,34,32,22,2    ,24,205,156,250    :REM*238
   ,1,141,21,3,88,76,57,1,186,1      31,32,207,255      :REM*164    230 DATA 240,209,238,136,250,32
   69,255,157,5,1      :REM*117    160 DATA 201,34,240,6,32,22,231    ,30,250,240,181,173,150,250
   90 DATA 169,248,157,6,1,76,49,2     ,24,144,243,32,22,231,32,20    ,240,196,32,30     :REM*110
   34,120,32,21,253,88,32,231,2      7,255,208,248,32   :REM*244    240 DATA 250,162,24,160,7,24,32
   55,32,68,229,169      :REM*13    170 DATA 204,255,165,198,240,16    ,240,255,76,54,249,32,204,2
   100 DATA 25,141,135,250,169,1,1    7,173,8,221,41,16,141,8,221    55,169,1,32,195    :REM*15
   41,153,250,133,204,169,166,      ,173,8,221,201,5   :REM*247    250 DATA 255,32,68,229,76,226,2
```

RUN it right: C-64

Use RAM under Kernal ROM to list and load programs with a single keystroke.




48,160,7,177,209,41,127,145 ,209,200,192,29 :REM*254	320 FOR X=267 TO 319:READ A :REM*208	44,160,192,32,189,255,169,1 1,133,253,169,1 :REM*64
260 DATA 208,245,96,240,226,32, 30,250,162,0,160,8,177,209, 201,34,240,23 :REM*124	330 POKEX,A:NEXT :REM*79	410 DATA 133,254,162,64,160,1,1 69,253,32,216,255,169,53,13 3,1,32,128,192 :REM*48
270 DATA 201,32,144,6,201,64,17 6,6,144,6,9,64,144,2,9,128, 157,137,250,200 :REM*25	340 DATA 169,2,162,62,160,1,32, 189,255,169,1,162,8,160,1,3 2,186,255,169,0 :REM*169	420 DATA 169,6,162,138,160,192, 32,189,255,32,192,255,162,1 ,32,201,255,169 :REM*91
280 DATA 232,208,227,138,72,32, 204,255,169,1,32,195,255,32 ,68,229,104,162 :REM*171	350 DATA 32,213,255,169,53,133, 1,76,226,248,165,203,201,3, 240,3,76,49,234 :REM*208	430 DATA 0,133,253,32,210,255,1 69,224,133,254,32,210,255,1 60,0,177,253,32 :REM*118
290 DATA 137,160,250,32,189,255 ,169,1,162,8,160,1,32,186,2 55,169,0,32,213 :REM*21	360 DATA 169,53,133,1,76,241,24 8,169,55,133,1,96,75,82 :REM*18	440 DATA 210,255,200,208,248,23 0,254,208,244,169,1,32,195, 255,32,204,255 :REM*176
300 DATA 255,144,5,169,119,141, 130,250,104,104,169,225,72, 169,166,72,76 :REM*70	370 FOR X=49186 TO 49302:READ A :POKEX,A:NEXT :REM*230	450 DATA 169,55,133,1,96,169,1, 162,8,160,1,32,186,255,96,7 5,82,44,80,44,87 :REM*213
310 DATA 226,248,24,0,32,70,73, 76,69,32,78,65,77,69,32,65, 82,69,65,32,1 :REM*172	380 OPEN15,8,15:INPUT#15,E,ES,T ,S:IFE=0THENSYS49186:INPUT# 15,E,ES,T,S :REM*225	460 DATA 75,82,32,76,79,65,68 :REM*4
	390 PRINT#E;T;S:CLOSE15:END :REM*70	
	400 DATA 32,128,192,169,7,162,1	

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Bowl 'n' Score

Here's a nifty little program that's right up your alley if you want to track and analyze your bowling statistics.



By RAFAEL DIAZ

I like to bowl, but let me dispell a few myths right off: My name's not Bud, I don't drive an El Camino, and I don't use personalized scorecards. Actually, stereotypes aside, bowlers are a progressive lot. All over America bowlers who own Commodores, like me, have been waiting for the right opportunity to join the computer revolution. And here it is: Bowling Scorekeeper 64!

This slick little program is menu driven and easy to use. It keeps track of your weekly game scores, the date, daily averages, overall average, and it calculates the average of your first, second, and third games throughout the season. It also records key statistics that will help you analyze your performance, including your highest game, your highest week, your total number of games over 200, and a summary of the entire season's scores.

USING THE PROGRAM

Type in Bowling Scorekeeper 64 from Listing 1 using RUN's checksum program on page 45. Save it to a formatted workdisk, and then run it.

When you run the program, you may choose to open a previously saved file, start a new file or display the disk directory. The first time you run the program, you will have to set up a new data file, so

choose the second option. The program presumes that you bowl three games each night, one night a week.

I set up each season as a separate file, such as RAFAEL91-92. You can have many data files on a single disk, but I prefer to keep each bowler on a separate disk, to ensure accurate recording. Bowling Scorekeeper lets you view data from any file, so you can compare your scores from year to year.

Once you've set up the file, the main menu appears, offering the following options:

Set Up Screen Colors. This option lets you quickly change the screen colors using the function keys.

Add New Bowling Scores. This option lets you add scores to your data file on a weekly basis. After displaying which week number the games will be stored under, the program will ask you for the date. Enter the date as a six-digit number in "MMDDYY" format with no spaces. For example, August 7, 1992 would be entered as 080792.

The program will then ask you to enter the scores of the three games you bowled that week.


Print Season's Bowling Summary. This option displays statistics from all of the games you bowled during the season. The date, the score for each game, the

pin total and average are displayed for each week of the season.

Print Bowling Statistics. This option displays the number of games bowled and not bowled, the number of games over 200, the highest game, the highest series, the total number of pins, the overall season average, and the averages of all your first games, second games and third games throughout the season.

This set of statistics is a potential gold mine. It can help you recognize trends in your bowling habits. For example, if you notice that your third game average is consistently lower than the others, it might indicate fatigue, or maybe that the lanes become dry, causing the ball to hook more. When you figure out the problem, you can figure out a solution and improve your performance.

Save Bowling Data. This option lets you write data to a specific file.

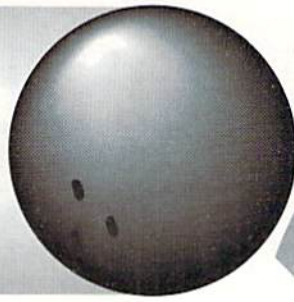
Bowling Scorekeeper will not only keep your records accurately and efficiently, it will give you the same kind of insight into your performance that the pros get. Who knows? Maybe this will shoot your team into the championship! 

Rafael Diaz is a software engineer at Motorola. He has been programming in Commodore Basic and assembly for several years.

Listing 1. Bowling Scorekeeper 64. Also available on the July/August ReRUN disk. To order, call 800-824-5499.

```
10 REM BOWLING SCOREKEEPER 64          (60,3),DA(60),TP(60),MI$(MI)      OM SCRATCH"          :REM*172
                                           :REM*42                          :REM*56      110 SYSAD,5,7:PRINT"3. VIEW DIR
20 DIM TG,WK,AV,P,Z,ZT,TW,W,T1,        60 FOR I=1 TO MI:READ MI$(I):NE      ECTORY"          :REM*179
   SV:R$=CHR$(18):H$=CHR$(19):C        XT:DEF FNRD(X1)=INT(X1*100+.      120 GOSUB 1260:GET A$:IF VAL(A$
   S=CHR$(44)          :REM*76          5)/100          :REM*101          )=1 THEN 160          :REM*202
30 F1$=CHR$(133):F3$=CHR$(134):        70 GOSUB 1910:GOSUB 2010:REM*21      130 IF VAL(A$)=2 THEN 150
   F5$=CHR$(135):BD=53280:BC=53        80 PRINT"{SHFT CLR}":PRINTTAB(1      :REM*99
   281:CHAR=646          :REM*187          0)R$"BOWLING SCOREKEEPER"          :REM*81
40 OS=CHR$(146):DIM L,F1,F3,F5,        :REM*253      140 GOSUB 1520:GOTO 80
   FF$,X$,T,S,AD,AE,G1,G2,G3,X,        90 SYSAD,5,5:PRINT"1. LOAD PREV      :REM*99
   Y          :REM*64          IOUS DATA"          :REM*217
50 MI=6:DIM D$(60),GM(60,3),GM$      100 SYSAD,5,6:PRINT"2. START FR      :REM*18
                                           :REM*50      160 GOSUB 1120          :REM*217
                                           :REM*50      170 IF T1=1 THEN 80
                                           :REM*50      180 PRINT"{SHFT CLR}":SYSAD,15,
```

RUN it right: C-64



Bowling Scorekeeper 64 just might boost your team into the championship!

```

5:PRINTR$"MAIN MENU"
:REM*110
190 Y=10:SYSAD,5,Y:FOR I=1 TO M
I:PRINTMI$(I):Y=Y+1:SYSAD,5
,Y:NEXT
:REM*246
200 GOSUB1260:GETA$:A=VAL(A$:I
FA<=MITHENY=9+A:SYSAD,5,Y:P
RINTR$;MI$(A):GOTO220
:REM*195
210 GOTO 180
:REM*38
220 SYSAD,2,21:PRINTR$"TYPE 'A'
TO ABORT PRESENT SELECTION
OR"
:REM*150
230 SYSAD,7,23:PRINTR$"HIT 'RET
URN' TO EXECUTE...":GOSUB12
60
:REM*25
240 GET A$:IF A$="A"THEN 180
:REM*176
250 ON A GOSUB 1740,310,580,900
,700,270
:REM*22
260 GOTO 180
:REM*84
270 IF SV <> 0 THEN CLOSE15:END
:REM*92
280 PRINTR$"DATA NOT SAVED, OK
TO QUIT? (Y/N)
:REM*89
290 GOSUB1260:GET A$:IF A$ = "N
" THEN RETURN:
:REM*15
300 CLOSE 15:END
:REM*51
310 PRINT"{SHFT CLR}":PRINTTAB(
10)R$"ADD BOWLING SCORES"
:REM*27
320 WK=WK+1:PRINT:PRINT"GAMES W
ILL BE STORED UNDER WEEK #"
;R$WK
:REM*120
330 PRINT:PRINT"ENTER DATE GAME
S WERE BOWLED ON (EXAMPLE 0
40992 FOR APR 9, 1992
:REM*125
340 INPUT "=>";D$:IF LEN(D$)=6
THEN D$(WK)=D$:GOTO 360
:REM*190
350 PRINTR$"INCORRECT DATE NOT
ENOUGH DIGITS!PLEASE RE-ENT
ER":GOTO 330
:REM*44
360 PRINT:PRINT"THE DATE ENTERE
D WAS ";R$;D$
:REM*130
370 PRINT"IS THIS CORRECT? (Y/N
)"
:REM*187
380 GOSUB1260:GET A$:IF A$="N"
THEN 330
:REM*1
390 PRINT:PRINT"ENTER 3 GAMES B
OWLED. ENTER 0 IF GAME(3 SP
ACES)WASN'T BOWLED."
:REM*164
400 PRINT:PRINT:PRINT:Z=0

```

```

410 FOR I=1 TO 3
:REM*228
420 PRINT"GAME #(CRSR LF)"R$;I:
INPUT"=>";G
:REM*178
430 PRINT"IS(CTRL 9)"G"(CTRL 0)
CORRECT? Y/N
:REM*79
440 GETA$
:REM*68
450 IF A$="" THEN 440
:REM*79
460 IF A$<>"Y" THEN 420
:REM*4
470 GM(WK,I)=G:GM$(WK,I)=STR$(G
)
:REM*92
480 IF G=0 THEN Z=Z+1:ZT=ZT+1:G
M$(WK,I)="**":GOTO 500
:REM*161
490 TG=TG+1:IF G>199 THEN TW=TW
+1
:REM*169
500 NEXT
:REM*116
510 TP(WK)=GM(WK,1)+GM(WK,2)+GM
(WK,3):IFZ=3THENDA(WK)=0:Z=
1:GOTO540
:REM*68
520 T1=FNRD(TP(WK)/(3-Z)):DA(WK
)=T1:P=P+TP(WK)
:REM*235
530 IFTG<>0THEN AV=FNRD(P/TG)
:REM*247
540 PRINT:PRINT"HIT A KEY TO SE
E THIS WEEK'S RESULTS...":G
OSUB1260:PRINT"{SHFT CLR}"
:REM*105
550 B=0:W=WK:GOSUB610
:REM*104
560 PRINT:PRINT"ENTER ANOTHER W
EEK? Y/N":GOSUB 1260:GET A$
:IF A$="Y"THEN 310
:REM*142
570 RETURN
:REM*202
580 PRINT"{SHFT CLR}":SYSAD,1,1
:PRINTTAB(5)R$"PRINT BOWLIN
G SUMMRY":B=WK-1:B1=0
:REM*157

```

```

590 B2=0:W=1
:REM*83
600 PRINT
:REM*243
610 PRINTSPC(2)"DATE"SPC(6)"GAM
ES"SPC(7)"PINS"SPC(3)"AVG":
PRINT
:REM*164
620 POKEA+132,7
:REM*221
630 FOR I=W TO W+B
:REM*253
640 PRINTD$(I)TAB(8)GM$(I,1)TAB
(12)GM$(I,2)TAB(16)GM$(I,3)
TAB(23)TP(I);
:REM*132
650 PRINTTAB(26):SYSAE,DA(I)
:REM*196
660 B1=B1+1:IFB1=15THENB1=0:PRI
NTR$"PRESS ANY KEY...":GOSU
B1260:PRINT"{SHFT CLR}"
:REM*62
670 NEXT
:REM*35
680 IF B=0THENRETURN
:REM*41
690 GOSUB1070:RETURN
:REM*48
700 IF L=1 THEN 720
:REM*42
710 PRINT"{SHFT CLR}":INPUT"FIL
ENAME";F$:PRINT:GOTO750
:REM*84
720 PRINT"{SHFT CLR}":PRINT"HIT
'RETURN' IF USING THE SAME
FILENAME"
:REM*3
730 PRINT"AS BEFORE, OTHERWISE
TYPE IN THE NEW"
:REM*109
740 INPUT"FILENAME";F$
:REM*18
750 SYSAD,1,7:PRINT"SAVING DATA
TO DISK UNDER:"
:REM*147
760 PRINTR$"F$"...
:REM*218
770 CLOSE15:OPEN 2,8,2,"0":F$
+",S,W"
:REM*49
780 GOSUB 860:IF T1=1 THEN T1=0
:RETURN
:REM*62
790 PRINT#2,TG;C$;WK;C$;ZT;C$;A
V;C$;P
:REM*143
800 FOR I=1 TO WK:PRINT#2,D$(I)
;C$;DA(I);C$;TP(I):NEXT
:REM*132
810 FOR I=1 TO WK
:REM*108
820 FOR J=1 TO 3:PRINT#2,GM(I,J
):NEXT:NEXT
:REM*169
830 CLOSE 2:SV=1
:REM*96
840 PRINT:PRINT:PRINT"DATA SAVE
D TO DISK. HIT A KEY TO RET

```

Continued on p. 32.

RUN it right: C-64

GEOS 101

Prepare to become more productive! Part One of an introductory course for those who have never harnessed the power of the graphical interface.



By STEVE VANDER ARK

Seems like just about everyone has GEOS. Some bought it when it first came out. Others received a copy bundled with their C-64 or 1541. Everybody talks about GEOS, user's groups run GEOS tutorials, and the GEOS section is the largest area on QuantumLink. So if everyone *owns* it, and everyone *talks* about it, why doesn't everyone *use* it?

I can think of several good reasons. One fellow at our user's group meeting told me that he had no intention of loading a whole new operating system into his machine when there was a perfectly good one built right in. Another couple said they were intrigued by GEOS, but hadn't time to learn all of its ins and outs (like how to get their printer to work). One woman admitted she had spent hours trying to set everything up, but never could get GEOS to boot.

Even so, these same people gathered around my geoPublish demo, oohing and aahing over the ease with which I could import graphics into my desktop publishing work. But even after they had seen the system run, they couldn't believe that they can do the same. To these folks and many others GEOS is a mystery, fascinating but elusive.

It doesn't have to be this way; using GEOS is not difficult. It's a remarkable operating system and its applications are some of the most exciting and advanced in the Commodore world.

If you've always wanted to try GEOS, this series of articles will help you. In this segment, I'll discuss the basic concepts behind GEOS. Then I'll guide you through the first time, getting GEOS up and running for you. Finally, I'll give you a tour of the GEOS universe, stopping to look at its major applications.

GEOS vs. COMMODORE DOS

GEOS is an *operating system*, a set of

routines that governs your computer's operation and its interaction with peripheral devices. As my friend in the user's group mentioned, there is an operating system already built into your computer. You use that operating system, called Commodore DOS, whenever you type one of those convoluted commands to format a disk or load a file.

GEOS provides a much more user-friendly way to get these jobs done. It's called a "graphical user interface," and is

"One fellow at our user's group meeting told me in no uncertain terms that he had no intention of loading a whole new operating system into his machine when there was already a perfectly good one built right in."

similar to the interface you find on Macintosh computers. With it, you give disk and file commands simply by clicking on menus with a pointer, not by typing in complicated commands.

GEOS, however, is much more than an easier way to send the same old disk commands. When you boot GEOS, your computer is given a new set of rules in which the disk drive assumes a more active role in the system.

As with your computer's native operating system, in GEOS you load pro-

grams from a disk to start things off and save your work back to a disk when you're finished. Unlike Commodore DOS, however, GEOS can use a file in sections, loading into memory only those portions that are needed at a given time. This allows GEOS to actually handle data files larger than the available memory in the computer! The disk drive acts almost like extra memory.

Commodore DOS files can't be handled a little bit at a time. A standard file must be loaded all at once, because the Commodore operating system knows of no other way to do it. But GEOS files, called VLIR files, exist on your disk as a series of separate pieces. It is this unique file type that allows individual data files to exceed your Commodore's memory.

Because the native Commodore operating system doesn't recognize this file type, you'll see VLIR files identified in your directory asUSR (user-defined) files. Accordingly, the VLIR structure is unrecognizable to Commodore DOS routines, so you

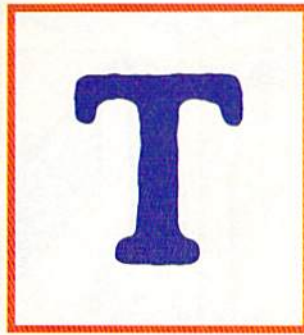
can't use standard file copy programs with GEOS, nor can you use the Validate command on GEOS work disks.

DISK DRIVES AND RAM UNITS

As mentioned above, some GEOS applications, surprisingly, are larger than the amount of memory your computer has in it. A prime example is geo-

Publish, which weighs in at 99K. It operates within the 64K by swapping in various sections of code as they are needed. You'll notice, for instance, that when you select some of the tools in geoPaint you have to wait for the drive to run before the tool is active. In this way, using VLIR files, your computer





can do tricks that wouldn't be possible otherwise.

Because GEOS uses the disk drive as memory and active storage while you work, speed can be a problem. Every time the drive has to kick in, your computer slows to a crawl, waiting for data from the drive.

Within your computer, all of the data is retrieved electronically, with the signals traveling at nearly the speed of light. But because disk drives are mechanical, the signals are produced much more slowly while the disk spins and the drive head jumps back and forth looking for the correct block of data. GEOS enhances the drive's speed with sophisticated turbo code, but even that doesn't eliminate the delay, only shortens it.

RAM devices, on the other hand, are not mechanical drives, so the data can be accessed almost as quickly as it can from the computer's own RAM. These devices, such as the Commodore REUs or the CMD RAMLink and RAMDrive, also help GEOS with other behind-the-scenes functions. It stands to reason, then, that loading your applications and data files into a RAM device will make GEOS run much more quickly and smoothly. In fact, the difference is astounding. Because of this, most GEOS users end up purchasing a RAM device of some kind.

DISPLAYING GEOS

Commodore DOS uses several methods, called display modes, to display information on a monitor screen. The three main Commodore display modes are Text (low resolution), Multicolor (medium resolution), and Hi-res (high resolution).

Each mode has its strengths and weaknesses that software designers consider when choosing which is best for their projects. For example, Text mode is faster, but Multicolor mode can show more colors in a given area.

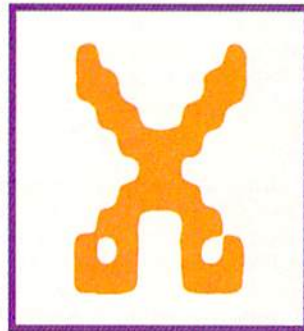
GEOS uses Hi-res mode, which allows more highly-defined images to be displayed. In fact, GEOS uses Hi-res mode for both graphics *and* text. Most programs that handle text use preprogrammed Text mode characters, but GEOS uses hi-res characters made up of patterns of dots, called bitmaps. This means that GEOS characters can be any shape or size, and can be combined with graphics wherever and however the user wishes. The computer has to plot each dot that makes up a character when it displays bitmapped text, so hi-res word processing is a little slow. It does, however, allow on-screen character formatting.

Many printers operate at the same resolution, measured in dots-per-inch (dpi), that GEOS displays on screen, so screen images translate faithfully to documents. Plus, most Commodore clip art is created in Hi-res mode (including Print Shop and Newsroom images), so they translate nicely into GEOS. In a way, Hi-res mode is something of a standard graphics format, so many images used by other computers, including the Macintosh, can also be converted to GEOS.

WINDOWS AND THE VIRTUAL PAGE

The first GEOS question I ever received from a reader was: "Why, when I print from geoWrite, does the printer always finish by advancing to the end of the page, even if a page full of text hasn't been typed?" The explanation points up another basic concept at work in GEOS: the *virtual page*. GEOS is always thinking of your document as an 8½ × 11-inch page of data. When you work on that document, the screen display you see is only one section of the whole page. Whether or not you fill it up, the rest of the page is there as far as GEOS is concerned.

The partial view GEOS applications provide for you to work in is called a *window*. You move that window around the document to work on it. In geoWrite 64, this means flipping from side to side across the page as you type along. In geoPaint it means using the scroll arrows to move across the image.



Only in geoPublish do you get the chance to work on a whole page at once, but even then a zoom window is available to let you see what you're doing in detail. In each of these cases, and throughout GEOS, everything

you do happens on a "sheet of paper" in memory, a sheet that can be printed out dot-for-dot using just about any dot-matrix printer.

NEXT UP: GEOS 202

You're probably wondering how GEOS knows how to use "just about any dot-matrix printer," or how to get your copy of GEOS set up to understand your system, or how to avoid getting mangled by GEOS's formidable copy protection scheme. Now that we've looked at some of the concepts that govern GEOS, we can address the practical questions that will get you up and running. Next time, we'll set up GEOS step by step, from boot disks to printer drivers to work disks.

You may still have reservations about GEOS, but take heart, one or two more lessons, and you'll be zipping around the deskTop like a pro! ■

Steve Vander Ark has been writing about Commodores and GEOS for a number of years. He also wrote our feature article this time on shareware and PD software.



SETTING UP YOUR EQUIPMENT

- Always follow the directions found in your hardware's manual for setting up your equipment. Be sure all switches are set to "off" before plugging in power supply and interface cables. (For switches that read "0" and "1," "0" is off and "1" is on.)
- Hardware with moving parts sometimes has screws or other devices that keep parts immobile in shipping but that must be removed before attempting to operate the device.
- Prevent overheating. Allow plenty of air flow around the power supply and other individual components of your system. Remove dust covers from any unit that is powered up. Don't stack books or papers on top of your monitor's air vents.
- Position the power supply away from the monitor and avoid snaking cables in or around the power supply.
- If your power supply fails, select a new model with a replaceable fuse.
- When a power supply fails, it sometimes unleashes a surge of current into your computer. Use an in-line power supply surge suppressor (e.g., Computer Saver 2) to prevent damage from a "hot" power supply.
- Don't place your computer system near an open window; avoid direct sunlight, temperature fluctuations and weather elements (moisture, extremes of heat and cold).

COMPUTER HYGIENE

- Avoid exposure to grease, smoke and steam. (The kitchen is not a good place to operate your computer!)
- Don't eat, drink or smoke around your computer.
- Wash your hands if greasy or dirty.
- A product called "Safeskin" will protect your keyboard from spills, grease and

dust while in operation. While not in use, dust covers will reduce the effects of environmental pollutants.

- Use a computer vacuum to clean your keyboard. Don't spray any kind of chemical cleanser or lubricant into your keyboard.
- Use a mild soap and water solution and *damp* (not wet!) rag or commercial computer cleaner on plastic surfaces. Unplug your system first!
- To avoid removing the protective coating, don't use window cleaner on your monitor screen.
- Clean your mouse by carefully removing the ball and wiping it with a mild soap and water solution or use a commercial mouse-cleaning kit. Brush dust out of the innards with a soft paintbrush.
- Use a mouse pad when you operate your mouse. This extends the life of your mouse by providing a clean operating surface and makes the mouse operations more efficient.
- Platen cleaner or alcohol will remove build-up of ink and other residues on your printer's platen.

CABLE CARE

- Label cables and sockets clearly. Attempting to plug your power supply into the serial port could spell disaster!
- Arrange cables where you can't trip over them. Tie up extra lengths of cable with cable ties, garbage bag twist ties or rubber bands. To prevent tripping on cables, use duct tape or commercially available cable ducting to cover any cable that crosses open expanses of the floor.

DISK DRIVE DOS AND DON'TS

- Make sure labels and write-protect tabs are securely attached so they won't come loose inside your disk drive.

- Store disks in a clean, dry place to prevent introducing grease, grape jelly or diet soda into your drive.
- Don't close the latch of double-sided drives (1571) without a disk present.
- If you use an ultrasonic humidifier in your home, use distilled water in it to prevent mineral deposits on exposed surfaces in your computer system, such as on drive read-write heads.
- If you encounter loading errors, try unplugging your joystick and other extraneous peripherals which might be tying up your communications channels. Your power supply or monitor may be emitting stray signals which might interfere with the serial link. Try relocating your disk drive away from these potential sources of interference.

PRINTER PRACTICES

- Don't advance paper by hand; use the line feed or form feed option.
- Don't move tractor-feed labels backwards. Tear or cut the strip behind the platen and advance them to eject. Spare labels can be used on disks, file folders, in the kitchen, etc.
- While printing, make sure paper is flowing freely and feeding without binding.

HABITS TO MAKE

- Press the keys gently—don't bang or allow young children to bang on them.
- To prevent condensation, don't put dust covers on while your system is warm.
- Plug your computer and peripherals into a power strip with a fuse. Turn off equipment when not in use for any length of time. Shut off the power strip (otherwise the AC-DC transformer in your power supply continues to work).
- Unplug electronics during electrical storms. Ditto for your modem surge suppressor. These devices are useful for con-

Rules

*Keep your system healthy
and happy with these good sense
guidelines of computer care.*

By ELLEN RULE

trolling damage from normal power fluctuations but won't protect your equipment from lightning strikes.

- Learn as much as you can about your system from computer user groups, at the library, and of course from magazines like *RUN*. (Refer to articles such as "Rx for Healthy Computing," April '89, "101 Ways to Better Computing," May '90, and "Cliff Diver or Couch Potato?," Nov/Dec '91, for more great ideas on keeping your computer—and you—healthy!) A basic understanding of your

equipment will not only assist you in preventive maintenance, but will also keep you from doing something really dumb!

- Keep your receipts and records of model numbers and serial numbers for warranty and insurance purposes.
- Promptly repair faulty equipment, loose cable connections, and so on to prevent further damage.
- Discharge static electricity prior to touching your equipment. You can use anti-static mats, "touch me first" strips,

and/or an anti-static mat under your chair. (These are "generic" computer products, available from most computer dealers, office supply stores and mail order suppliers.)

- Don't plug in peripherals or cartridges while your system is on.
- Use a cartridge port expander to reduce wear and tear on cartridge port connections. Many types provide the added benefit of a reset switch. (Some brands are not recommended with REUs.) ■

ORGANIZING YOUR SOFTWARE

by Don Radler

In the years that I've been using my Commodore, I've amassed quite a collection of software: Literally thousands of files on hundreds of disks. When I think of the time and effort that I've invested in collecting, writing, and using all of this software, I wince to think that a slip of the coffee cup or a spritz of Endust could render them useless.

As the collection grew, it became obvious that some sort of organization was necessary, not just so that I could find the disks that I needed, but to ensure that each disk had a "home"—a place where it belonged, safely out of harm's way.

The method evolved over time, and I ended up using Ray Martin's shareware program Disk Catalog Manager/Reporter, a database that files your disks under a four-letter code rather than the usual two-letter ID. This allows for disk codes that are true mnemonics.

DCMR has a built-in rapid sort by disk name or by four-letter code, and unlimited editing access. With it, I use Avery's #5253 labels, which provide 3 lines, one each for Ray's four-letter code, the disk name, and any comments or notes, such as XFL for "Remove the FastLoad Cartridge."

I began by organizing my files into categories: Utilities, Databases, Terminal Programs, Art, Music and Games. On each disk,

the first letter of the code indicates the category, U for utility, D for database, and so on. Then I used colored labels to make quick work of flipping through my disk boxes.

In the Utilities category, which I gave blue labels, a typical disk is UCOM (for computer), which houses the Abacus's Basic 64 and Blitz! Another, UEQUIP, holds 1541 Physical Exam, joystick and screen color testing programs.

UHS (for household helpers) contains utilities such as Metric Converter from the 6/91 *RUN*. I separate the programming utilities by memory area, one disk has routines that occupy the much-used area starting at 49152 (UPRA), and a second with those that reside in other locations (UPRB). This separation is a timesaver when I'm reaching for a compatible routine in the middle of a programming session.

On UOLI, I keep the original listings of Basic programs that I've compiled, just in case I need them again. UTTL holds my title screens disk, 40 or so that are awaiting use in future programs. UUNF holds unfinished programs.

Next come the databases, led off by the DCMR, Ray Martin's disk catalog program, followed by DFIL, *RUN*'s DataFile. Finally, there's DSPR, which holds my favorite spreadsheet, accompanied by DSPD, con-

taining the data files. Green labels mark the applications and yellow labels mark the data disks.

Then comes the Art category, starting with applications for multicolor work, graphics conversion, hi-res work, and the like. I also include clip art and my printer software. These disks are labeled in orange and have titles such as ADDL, for Doodle! and ANWS for Newsroom.

Under the Sound category, I have SFX1 and 2 (for sound effects), SIDD, which holds sound development programs, and others. As before, the music applications are in blue, and the data files in yellow.

Disks containing terminal programs, in green, have prefixes such as TQLK, for Q-Link's signature program.

Games, so many of which involve blowing up the world around you, are labeled in red, with disk codes such as GCRD for card games, GCHS for chess games, and GSPR for sports.

These are just a sample of the disks that I keep near my Commodore, ready to be used. Tucked away for infrequent use (or for permanent dead storage) are at least a thousand other programs. I have found that with a well-organized system I am more likely to use my software, and to keep it safely put out of harm's way. □

Leap Frog

You'll be knee-deep, knee-deep, knee-deep in fun when you dive into this game of amphibian action.



By TONY BRANTNER



Meet Ribbit the frog. Unlike most frogs, Ribbit is a strict vegetarian. Still, the dragonflies at his pond are irresistible, and he enjoys swatting them from the air with his long tongue. Unfortunately for Ribbit, a neighborhood snake has acquired a taste for frog.

To play Leap Frog, be sure to have your joystick plugged into port two. The game begins with Ribbit making his way to the center of a log. Use the joystick to move Ribbit to the left or right. Flies descend from above and then move about the screen. Press the firebutton to send Ribbit's tongue dart-

ing out to swat the dragonflies from the air. But be sure to dodge each one as it drops, because if one hits him, he will think that the snake is after him and he'll hop off to safety.

The snake moves randomly back and forth, with his head bobbing above the log. To hop over the snake, push the joystick up-left or up-right. If you touch the snake, Ribbit will hop off the screen and you'll lose one frog. You begin the game with three frogs, and earn an extra frog for every 2000 points.

Clear all of the dragonflies from the screen and you will move to the next, faster level. Use the SHIFT-LOCK key to pause the game,

and the RUN/STOP key to return to Basic.

Type in Leap Frog from Listing 1, using RUN's Checksum on page 45 to catch any errors. Save the program as Leapfrog.SC. Next, run Leapfrog.SC once to create the file Leapfrog.ML. To play the game, load Leapfrog.ML with the command LOAD"LEAPFROG.ML",8,1 and then run it. Now, the next time you're looking for a challenge, don't just sit there like a bump on a log, get hopping with Leap Frog. **R**

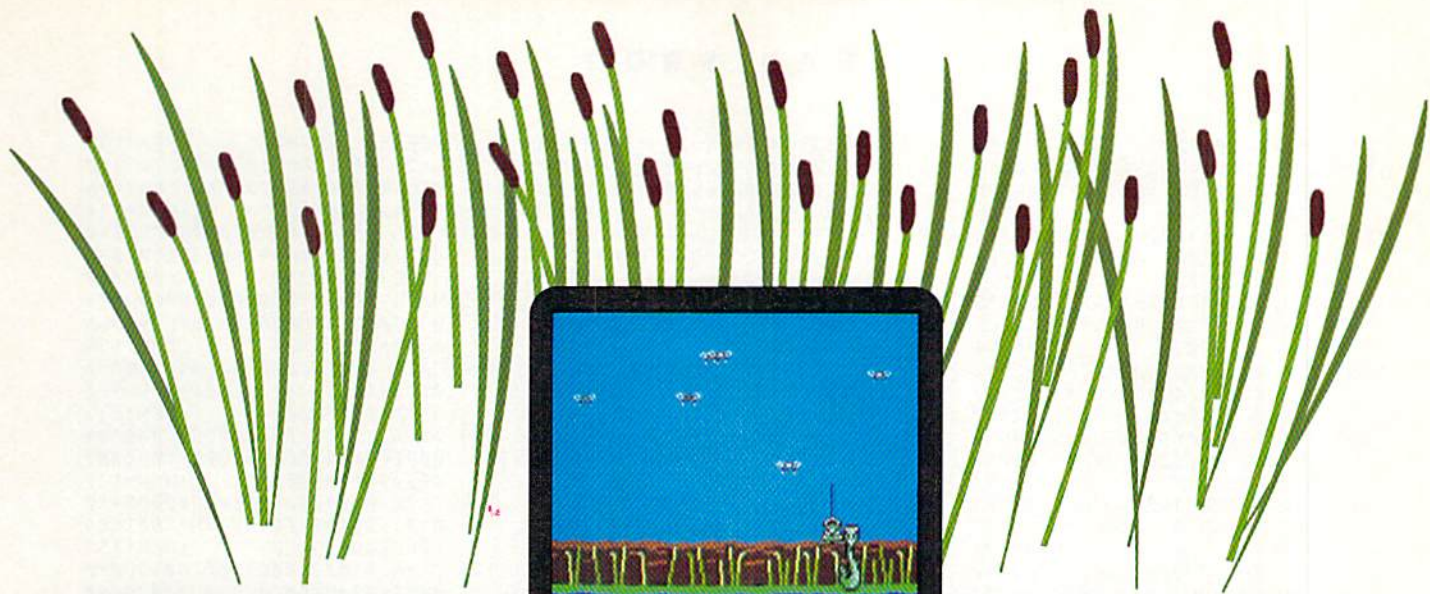
Programmer Tony Brantner manages to keep us all jumping with his constant output of excellent C-64 action games.

Listing 1. Leapfrog.SC program. Also available on the July/August ReRUN disk. Call 1-800-824-5499.

```

0 REM THIS LIST 1 CREATES (AND          0)+RIGHT$(A$,LEN(A$)-42)          107 DATA 660D8CC8078DC907A9000*A
SHOULD NOT BE CALLED) LEAPFRO          :REM*140                          899A913C8D0FA20DC0D*A20AA00
G.ML :REM*248                          70 FOR I=1 TO LEN(B$)/2:REM*221    F1820F0FFFA924 :REM*11
5 OPEN 8,8,8,"LEAPFROG.ML,P,W"        75 C$=MID$(B$, (I*2)-1,2):H$=LEF  108 DATA A00F201EABA9BC8DAF13*A
:REM*155                                T$(C$,1):L$=RIGHT$(C$,1)          D1BD4293F8DB713A901*8DBF132
6 CT=0:PRINT"{SHFT CLR}":REM*56        :REM*140                          0F80BA20620C5 :REM*17
10 READ A$:IF A$="-1" THEN CLOS        80 H=VAL(H$):IF H$>"9" THEN H=A  109 DATA 0CA9B48DB013AD1BD429*0
E0:PRINT:PRINT"ALL DONE!":EN        SC(H$)-55 :REM*56                  718690D8DA71320080E*A9FF8D1
D :REM*129                                85 L=VAL(L$):IF L$>"9" THEN L=A  5D0A200A041A9 :REM*227
12 PRINT"{HOME}READING LINE "+S      SC(L$)-55 :REM*84                  110 DATA 17202D0A20080EA20820*F
TR$(CT):CT=CT+1 :REM*141            90 BY=H*16+L:PRINT#8,CHR$(BY);    F0DADB813C9ACD0E8A2*0A20FFE
15 IF LEN(A$)<62 THEN 55              :REM*148                          9AD1ED0AD1FD0 :REM*28
:REM*254                                95 NEXT:GOTO 100 :REM*160          111 DATA 20E1FPD00100AD8D02C9*0
20 B$=MID$(A$,1,20)+MID$(A$,22,      100 REM :REM*243                    1F0F9E604EEF213ADF2*13C9119
20)+MID$(A$,43,20) :REM*242          101 DATA 01080B080A009E323036*3  02FA9008DF213 :REM*145
25 FOR I=1 TO 30 :REM*181              10000000A000B9A61099*003DB9A    112 DATA A217ADF513F01BA0C8A9*1
30 C$=MID$(B$, (I*2)-1,2):H$=LEF      61199003EB9A6 :REM*88              6202D0AADF413D017AD*C013F01
T$(C$,1):L$=RIGHT$(C$,1)            102 DATA 1299003FC8D0EBA9008D*2  2ADB813C95A90 :REM*171
:REM*209                                0D020280EA9A4A00E20*1EABA21    113 DATA 0B4C0F0AA041AD00DC20*2
35 H=VAL(H$):IF H$>"9" THEN H=A      2A0001820F0FF :REM*128            D0A20E60C20CD0BEEF1*13ADF11
SC(H$)-55 :REM*85                      103 DATA A942A00F201EABA9B0A0*0  3C92D900DADA6 :REM*35
40 L=VAL(L$):IF L$>"9" THEN L=A      F201EABA956A010201E*ABA9408     DATA 130A8DF11320F30B200F*0
SC(L$)-55 :REM*136                    D17D0A9008D1B :REM*106            C20080EADF513D02AAD*1ED0100
45 BY=H*16+L:PRINT#8,CHR$(BY);       104 DATA D08D1DD08D26D0A9FF8D*1  98DF51320B40D :REM*70
:REM*67                                CD0A90D8D25D0A9058D*2DD08D2     DATA 4CC209ADF313D017ADF4*1
50 NEXT:GOTO 100 :REM*115              ED0A5A24A4A4A :REM*137            3D012ADA713D00DA005*B9A913D
55 IF LEN(A$)<21 THEN B$=A$:GOT        105 DATA 4A29018D8602A209A007*1  0068810F84CC5 :REM*223
O 70 :REM*184                            820F0FFFA9A8A00E201E*ABAD00D   DATA 094C2B09A20AA00C1820*F
60 IF LEN(A$)<42 THEN B$=LEFT$(      C2910D0DFA209 :REM*83            0FFA930A00F201EABA9*048505A
A$,20)+RIGHT$(A$, (LEN(A$)-21      106 DATA 20FFE9A20A20FFE9A20C*2  218A041A91E20 :REM*127
)):GOTO 70 :REM*176                    0FFE9A9018DA613204E*0DA9032     DATA 2D0A20080EA20820FF0D*A
65 B$=LEFT$(A$,20)+MID$(A$,22,2      0590DADA61320 :REM*216            DF413D0EAC605D0E6A2*0A20FFE
    
```

RUN it right: C-64; joystick in port 2



Rabbit the frog goes hunting flies.

```

9ACA613C8C010 :REM*136
118 DATA B0038CA613A91920F70D*A
9008D15D04CAF08A900*8D15D0A
CA81388984820 :REM*206
119 DATA 590D68F0034CBB08AD00*D
C2910F0F94C7208863A*843BACF
313F0034CD10A :REM*62
120 DATA ACF413F0034C320BAA29*1
0D0034C970A8A4AB003*4C260B8
A4A4A2903A8B9 :REM*224
121 DATA 760EF036186DB813AAB9*7
A0E6DC013D007E43AF0*254C730
AE43BF01E8EB8 :REM*108
122 DATA 138DC0138A4A4A4A2903*A
88A2907D008B9820EF00*320A20
DB97E0E2CA9F5 :REM*83
123 DATA 8DF0760A9F48DF0738*A
DB813E915AA8502ADC0*13E9004
A660246024602 :REM*214
124 DATA 18A9A9650285FBA90669*0
085FC8A4A2903A8B98C*0E8506A
91185A7A0018C :REM*97
125 DATA F313C002B02F38A5FBE9*2
885FB85FDA5FCE9085*FC29030
9D885FEC6A7D0 :REM*208
126 DATA 06EEF3134C040BA000A9*0
291FDA50691FE209C0D*4C8F0B1
8A5FB692885FB :REM*202
127 DATA A5FC690085FCE6A7A000*A
5A7C912B007A92091FB*4C9C0D8
CF313608A4A4A :REM*185
128 DATA 2903853920740DA00098*4
A4AA838A9B4F9900E8D*B013A43
918ADB8137976 :REM*218
129 DATA 0EAAADC013797A0ED007*E
43AF0074C640BE43BD0*0898490
385394C6A0B8E :REM*146
130 DATA B8138DC013A2F538A9B4*E
DB013C9069006E8C90E*9001E88
EFF07EEF413AD :REM*146
131 DATA F413C9509005A9008DF4*1
360AD1FD08502A20046*02902DB
DEB13D028BDA9 :REM*59
132 DATA 13C9329021E9324A4A*3
8E5A7C905B015A000A9*2091FBE
EF313FEFB1320 :REM*133
133 DATA 880DAEA6134CFE0CE8E0*0
690CA60A5042907D01F*2A05BDA
913F015BDEB13 :REM*215
134 DATA F010C90EB009FEB13DE*A
9134CEF0BFEA913CA10*E360A20
620570CE63CA5 :REM*65
135 DATA 3C4A4A4AC9069004A900*8
53CA8B9860E8DFE0760*A205BDA
913D006209D0C :REM*158

```

```

136 DATA 4C240CBDEB13D0032028*0
CCA10EA60FEC113BDC1*13DDC81
39024A9009DC1 :REM*59
137 DATA 13BDA913C933B006FEA9*1
34C570CBCCF13187977*0EC932F
031C9B1F02D9D :REM*18
138 DATA A913FED613BDD613DDDD*1
3903AA9009DD613BCE4*1318BDB
11379770E8502 :REM*62
139 DATA BDB913797B0ED009A402*C
018B0094CC50CA402C0*41B0F78
503AD1BD4297F :REM*81
140 DATA F0EE989DB113A5039DB9*1
360ADA713F043CEA713*AD1BD42
9071869019D27 :REM*164
141 DATA D0A91E9DA913AD1BD409*2
09DB113A9009DB9139D*EB13AD1
BD429039DC813 :REM*27
142 DATA AD1BD429019DCF13AD1B*D
429039DD13AD1BD429*019DE41
360A5044A4A4A :REM*89
143 DATA 4A290109FEA205BCEB13*D
0039DF807CA10F560AD*A207850
2A00438B9A007 :REM*107
144 DATA 6900C93A9002A93099A0*0
78810EFCAD0E9ADA207*C502F00
F4AB00CACAC813 :REM*205
145 DATA C8C064B0049820590DA0*0
0B9A007D9B8079013D0*06C8C00
690F160A005B9 :REM*159
146 DATA A90799B8078810F760A0*0
5A93099A0078810FA60*8DA8132
0660D8CE4078D :REM*89
147 DATA E50760A030C90A9005E9*0
AC8D0F7093060A9038D*08D4A99
58D0AD4A9098D :REM*200
148 DATA 0CD4A2404C940DA9528D*0
8D4A9058D0CD4A2808E*0BD4E88
E0BD46038A913 :REM*111
149 DATA E5A70A8D01D4A9028D05*D
4A2108E04D4E8E04D4*6020DC0
DA9068D03D4A9 :REM*125
150 DATA 0A8D05D4A9418D04D4A0*2
6A200188A6908293FAA*8E01D4A
90220F70D8810 :REM*127
151 DATA EEA017A9009900D48810*F
A8C0ED48C0F4D4A9808D*12D4A98
F8D18D4601865 :REM*207
152 DATA A2C5A2D0FC60A000C8D0*F

```

```

DCAD0FA60A2078A0AA8*BDA9139
901D0BDB11399 :REM*213
153 DATA 00D0BDB9134A2602CA10*E
8A5028D10D06078A944*8D1403A
90E8D1503A900 :REM*254
154 DATA 8D12D0A91B8D11D0A981*8
D1AD05860AD19D08D19*D03007A
D0DDC584C31EA :REM*65
155 DATA AD12D0A002D96F0EB003*8
8D0F8B9730E8D21D0B9*700E8D1
2D04CBCFE00C8 :REM*16
156 DATA E5000009060001FF0000*0
0FF00F6F6F8F9070007*05FBFAF
BFCDFCF474748 :REM*16
157 DATA 6704070A0C0E10111212*1
3121211100E0C0A0704*00088E9
3001220922020 :REM*112
158 DATA 1220C692BE1220C692A1*1
220C692A120201220C6*92BE122
0C692A1122092 :REM*190
159 DATA B7A1122092B7BE0D202*2
020202020122092A2BB*122092A
2BB12209220A0 :REM*176
160 DATA 12209220202020122092*2
020122092DF12D02092*A2A1122
092A212AC0D0D :REM*107
161 DATA 1D1D1D1D1D1D1D1D1D1D*1
D1D50524553531D4649*5245425
554544F4E0005 :REM*142
162 DATA 47455420524541445921*0
0054C4556454C20434F*4D504C4
5544544210081 :REM*70
163 DATA A2B9A2A2B9B9A2B9A2B9*A
2A2B9AFB9AFB9A2B9C6*B9AFB9A
2D2AFB9A2D2AF :REM*254
164 DATA AFD2B9B9C6A2B9A2B9AF*C
6A399C91EC281B799D4*81A399C
9C281C499C981 :REM*53
165 DATA B7C499D981A31EC999D4*8
1A3C599C2D581C5B7C4*99C981A
399C2C9C281C5 :REM*129
166 DATA 99C981B7C499C281C51E*D
481A399C9C281B70020*2099C21
EC781A31EC220 :REM*9
167 DATA C299C720C281C5B71EC2*2
0C2C281A399C21EC899*C781C5B
799C21EC8C799 :REM*8
168 DATA C71EC2C72099C281B7C5*1
EC7C2C2C7C299C72090*AFA499C
81ED490A41ED9 :REM*37
169 DATA 90A41EC8D490A499C890*A
4AF1ED490A41EC8D990*A499C81
ED9D490A4AF1E :REM*214
170 DATA C8D9D4C8D490A41EC8*9
0AFA41ED4C8D9D4C8D4*90A41E1

```

RUN it right: C-64; joystick in port 2

LEAP FROG

171	DATA 2AFA4AFB9B9AF :REM*210 AFA4A4A4AFAFB9AFAFA4* FA4AFAFB9AFA4AFB9B9* B9AFB9AFAFA4A4AFA4AF :REM*168	182	DATA FF00355C000FF :REM*226 000355C00DD77037EBDC*3 CEB3C00EB000369C00D*7D7035C 35C36C39C00EBE :REM*45	193	DATA 000E70000E700 :REM*146 0035C00C3970373A7039*C D6C0EBE5C3AF95C3AA6*5C0EA96 C03A5B000FFC0 :REM*134
172	DATA B9AFA4AF009220200553*4 34F52452030303030303020202 02020202020202 :REM*77	183	DATA B03FBFCD6BE973FC3FC*2 600C300037DC003EBC0*0396C00 E55B00FFFF03 :REM*34	194	DATA 000000000000000000FFC0*0 3557003D5F003B7B003*A6B003D 5C003B70003AC :REM*90
173	DATA 2020202020484947482030*3 0303030300D20204C45*56454C2 03031202020202 :REM*154	184	DATA 55C000FF000355C00DD7*7 037EBDC3CEB3C03EB00*0D69C03 5BD703AC35C0F :REM*8	195	DATA 0003AC0000E70000E9C0*3 03A70DC3A9CE70E5B3B*F9973AA A573AA99B0E95 :REM*194
174	DATA 202020202020202020202*2 0202020202046524F47*5320303 00000000000000 :REM*77	185	DATA B39C00EBE035BEFC0FCE*9 70003FC2600C300037D*C003EBC 00396C00E55B0 :REM*13	196	DATA 6C03FFF0000000000000*0 0040010113C4410EB04*05EB500 33CC00300C000 :REM*232
175	DATA 000000000000000000D700*0 37DC00DF700DF700F*D7F00E6 9B003AAC003D7 :REM*164	186	DATA 0FFFF00355C000FF0003*5 5C00DD77037EBDC3CEB*3C00EBC 00369700D7E5C :REM*214	197	DATA C3000100400000000000*0 00000000000000000000*0 00000000000000 :REM*137
176	DATA C00DD7700D7D700F7DF0*3 5EB5C36699C0EEBB03F*BEFCD6B E973FC3FC2600 :REM*174	187	DATA 35C3AC36CEF00EBEB03F*B E5CD6B3F03FC0002600*0000000 00003FF000D55 :REM*222	198	DATA 000000000000000000004*0 010110044110044047D*1001EB4 000EB00033CC0 :REM*157
177	DATA 00000000000000000000*0 000C300037DC003EBC0*0396C00 E55B00FFFF03 :REM*58	188	DATA C00F57C00EDEC00E9AC0*0 357C000DEC003AC00*3AC000D B00036B000DAC :REM*54	199	DATA 0300C000C30001004000*0 00000000000000000000*0 00000000000000 :REM*62
178	DATA 55C003FFC00DD7700D7D*7 00F7DF035EB5C36699C*0EEBB03 FBFCD6BE973F :REM*199	189	DATA 0C36AC37E5B0DBD66FEC*D 5AAAC6E6AAC3956B00F*FFC0000 3FF000D55C00F :REM*254	200	DATA 00000000000000000000*0 00000000000000000000*0 00000000000000 :REM*236
179	DATA C3FC2600000000000000*0 300037DC003EBC00396*C00E55B 00FFFF00355C0 :REM*14	190	DATA 57C00EDEC00E9AC00357*0 000DF000FB0000EB00*00DB000 0DB00035C000D :REM*182	201	DATA 00000000000000000000*0 00000000000000000000*0 00000000000000 :REM*239
180	DATA 00FF000355C00DD7700D*E B7003EBC00D697035EB*5C36FF9 C0EBEB03FBFEC :REM*123	191	DATA 6C300DACDC39736C35BE*B 0356FAC359AAC396AB0*0E5AC00 3FF000000FFC0 :REM*21	202	DATA 00000000000000000000*0 00000000000000000000*0 00000000000000 :REM*238
181	DATA D6BE973FC3FC2600C300*0 37DC003EBC00396C00E*55B00FF	192	DATA 03557003D5F003B7B003*A 6B000D5C000F70000EF*0000EB0	203	DATA 000000 :REM*88
				204	DATA -1 :REM*62

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COMMODORE CLINIC



This time, prescriptions for questions about disk drives, GEOS and PC keyboards.

By TIM WALSH

Q *I purchased a Commodore 1581 3 1/2-inch disk drive and tried to use the 1581 Boot Disk Maker program found on RUN's GEOS Companion disk. All the program seems to do is format the disk in the 1581 and then lock up. Am I doing something wrong?*

Also, I can't get the shadow drive to appear on the GEOS deskTop. I didn't have the 1581 when I first began using GEOS and now I can't change the default settings. I have two 1581 disk drives.

—MARK NEWMAN
MIDDLEVILLE, MI

A You did not specify your system configuration, so I can only guess at the cause of your ailments. First, the 1581 Boot Disk Maker program will not work unless you have an REU (RAM expansion unit) connected to your computer. If you do not, the program behaves as you described—it formats the disk in the 1581 then “hangs up.”

Your second question, concerning the shadow drive, brings to mind that the problem is with your version of GEOS, not your computer. GEOS versions 1.3 and earlier did not support the 1581. To access that drive, you need GEOS 2.0.

If you have GEOS 2.0, run the Configure 2.0 program to set up your 1581 drives, and you should be all set.

Q *I've continually upgraded my collection of Commodore hardware over the years. I now have a C-128D, a Magnavox monitor and a 1541-II disk drive. Is there any way to use a PC-compatible keyboard on my 128D? I'd like to use the type of keyboard with the clicking keys.*

—MITCH RILEY
SHELTON, NE

A I've never seen an adaptor that would let you use a PC-compatible keyboard with the C-128D. There is such an adaptor for Amiga computers, but not for 8-bit Commodores.

Q *I use GEOS 128 2.0 and would like to purchase geoPublish, but I get the im-*

pression that it only works with GEOS 64. Is this true?

—GREGG ROBERTS
WINCHENDON, MA

A Unfortunately, yes. If you want to use geoPublish, you need GEOS 64. Because of its design, the program is not compatible with GEOS 128 2.0, even in 40-Column mode. There are no plans for a future release of geoPublish 128.

Q *I have a Commodore 128 and a Commodore 128D. Is it possible to connect the C-128 to the C-128D and use it as a RAM expansion unit?*

—EDOUARD BOULAY
QUEBEC, CANADA

A No, the C-128 cannot be connected to the C-128D and used as a RAM device. This really isn't an unusual request, though. Walk into RUN's editorial offices and you'll see various other brand-name computers connected to one another with telephone lines. Setting up a network of computers requires specialized software, hard drives, connectors and lots of troubleshooting.

Although the technology is available for setting up networks of PCs and Macs, it simply isn't available for the Commodore.

Q *A friend of mine is a teenager who is blind. I enjoy making talking programs for him with the use of SAM, a speech program for the C-64. I would like to find other talking programs. I have called stores, questioned other users, and written letters, all to no avail. Do you have any suggestions for other “talking” software?*

—TIM RUPPERT
ALBANY, NY

A During the 1980s there were several popular voice synthesis software and hardware products for the C-64, such as Covox and Hearsay. Since then, most of these products have fallen by the wayside, companies have moved on to other

computer platforms, and the products have become hard to find. And, if you do find one, technical support is nonexistent. User's groups still remain the best sources for hardware and software of this nature.

Last year, RUN sold the Covox Voice-Master Jr. through our Special Products catalog. Due to the large demand for the item, however, our inventory was rapidly depleted and we can no longer obtain that product.

Q *I purchased two FSD-2 Excelerator Plus disk drives some time ago. After many hours of flawless operation, one of the FSD drives began to smoke. Then the second FSD drive's power supply began to smoke.*

I bought two Commodore 1541-II drives to replace the FSD drives and I noticed that the power supplies used by the 1541-II drives have the same pin configuration and voltages as the FSD drives. Is the FSD power supply compatible with the 1541-II? Do the Commodore drives share any parts with the FSD drives?

—THOMAS HOLLINGER
GREENVILLE, OH

A You're lucky to have noticed the disk drive burning before the fire spread! While the FSD-2 drives are reliable units, they do have a limited lifespan, as you discovered.

I recommend that you trash the FSD drives altogether. Trying to salvage the power supplies and other components from the FSD-2 drives is a sure-fire recipe for disaster (no pun intended).

I am a long-time FSD-2 drive user, and to the best of my knowledge, the Commodore 1541-II and the FSD-2 drives may have similar connectors and wiring, but the parts are not interchangeable. ■

Do you have a problem or question about your Commodore computer system, software or programming? Send your questions to Commodore Clinic, RUN Magazine, 80 Elm St., Peterborough, NH 03458. Questions are answered only through this column, and, due to the volume of mail, only those likely to have broad appeal can be published.

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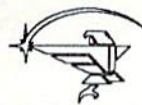
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B O W L ' N ' S C O R E

From p. 21.

```

URN TO MAIN MENU...":REM*123
850 GOSUB1260:RETURN :REM*214
860 CLOSE15:OPEN15,8,15:INPUT#1
5,E,ES:IF E=0 THEN T1=0:RET
URN :REM*121
870 PRINT:PRINT"DISK ERROR #"R$
;E;O$==">"R$;ES:PRINT
:REM*194
880 PRINT"CLEANING UP...":PRINT
#15,"IO":T1=1:CLOSE15:CLOSE
2 :REM*227
890 GOSUB1390:RETURN :REM*24
900 PRINT"{SHFT CLR}":SYSAD,1,1
:PRINTTAB(10)R$"BOWLING STA
TISTICS " :REM*139
910 PRINT:PRINT:PRINTSPC(5)"1.
PRINT TO SCREEN" :REM*249
920 PRINTSPC(5)"2. BACK TO MAIN
MENU" :REM*252
930 INPUT A:IF A=2 THEN RETURN
:REM*144
940 PRINT:PRINT"CALCULATING DAT
A. PLEASE WAIT...":GOSUB 12
70:PRINT :REM*244
950 GOSUB 1080 :REM*2
960 PRINT"1ST GAME AVG 2ND GAME
AVG 3RD GAME AVG" :REM*65
970 PRINT"*****
**** ***** " :REM*41
980 IF A=2 THEN PRINTTAB(3)G1TA
B(8)G2TAB(8)G3:GOTO1000
:REM*105
990 PRINTTAB(3);G1;TAB(16);G2;T
AB(29);G3 :REM*227
1000 PRINT:PRINT"TOTAL # OF GAM
ES MISSED ==>"ZT :REM*238
1010 PRINT:PRINT"TOTAL # OF 200
+ GAMES(3 SPACES)==>"TW
:REM*233
1020 PRINT:PRINT"HIGHEST GAME B
OWLED(5 SPACES)==>"HG
:REM*99
1030 PRINT:PRINT"HIGHEST SERIES
BOWLED(3 SPACES)==>"HS
:REM*120
1040 PRINT:PRINT"TOTAL # OF GAM
ES BOWLED ==>"TG :REM*254
1050 PRINT:PRINT"TOTAL # OF PIN
S TO DATE ==>"P :REM*41
1060 PRINT:PRINT"OVERALL SEASON
AVERAGE(2 SPACES)==>"AV
:REM*14
1070 PRINT:PRINT:PRINT"PRESS A
KEY TO RETURN TO MAIN MENU
...":GOSUB1260:RETURN
:REM*91
1080 G1=0:G2=0:G3=0 :REM*166
1090 FOR I=1 TO WK:G1=G1+GM(I,1
):G2=G2+GM(I,2):G3=G3+GM(I
,3):NEXT :REM*228
1100 G1=FNRD((G1/(WK-21))):G2=F
NRD((G2/(WK-22))):G3=FNRD(
(G3/(WK-23))) :REM*40
1110 RETURN :REM*224
1120 F$="":PRINT"{SHFT CLR}":PR
INT:INPUT"WHAT FILENAME";F
$ :REM*54
1130 IF F$="" THEN T1=1:RETURN
:REM*52
1140 SYSAD,1,6:PRINT"LOADING FI
LE:" :REM*205
1150 PRINTR$"F$" PLEASE WAIT
...":REM*235
1160 OPEN 2,8,2,"@:"+F$+",S,R"
:REM*121
1170 GOSUB860:IF T1=1 THEN RETU
RN :REM*15
1180 INPUT#2,TG,WK,ZT,AV,P
:REM*229
1190 FOR I=1 TO WK:INPUT#2,D$(I
),DA(I),TP(I):NEXT:REM*107
1200 FOR I=1 TO WK :REM*231
1210 FOR J=1 TO 3:INPUT#2,GM(I,
J):NEXT:NEXT :REM*142
1220 CLOSE 2 :REM*205
1230 GOSUB1460 :REM*41
1240 PRINT:PRINT"BOWLING DATA L
OADED. HIT ANY KEY...":L=1
:REM*175
1250 GOSUB1260:RETURN :REM*96
1260 POKE 198,0:WAIT 198,1:RETU
RN :REM*221
1270 ZT=0:TW=0:Z1=0:Z2=0:Z3=0:H
G=0:HS=0 :REM*163
1280 FOR I=1 TO WK :REM*40
1290 FOR J=1 TO 3 :REM*82
1300 IF GM(I,J)<>0 THEN 1340
:REM*204
1310 ZT=ZT+1:IF J=1 THEN Z1=Z1+
1 :REM*59
1320 IF J=2 THEN Z2=Z2+1:REM*14
1330 IF J=3 THEN Z3=Z3+1
:REM*109
1340 IF GM(I,J)>199 THEN TW=TW+
1 :REM*5
1350 IF GM(I,J)>HGTHEN HG=GM(I,
J) :REM*9
1360 NEXT:NEXT :REM*203
1370 FOR I=1 TO WK:IF TP(I)>HS
THEN HS=TP(I) :REM*172
1380 NEXT:RETURN :REM*12
1390 PRINT:PRINT:PRINTR$"HIT AN
Y KEY...":GOSUB1260:RETURN
:REM*141
1400 DATA "1) SETUP SCREEN COLO
RS" :REM*103
1410 DATA "2) ADD NEW BOWLING S
CORES" :REM*41
1420 DATA "3) DISPLAY SEASON'S
BOWLING SUMMARY" :REM*91
1430 DATA "4) DISPLAY BOWLING S
TATISTICS" :REM*202
1440 DATA "5) SAVE BOWLING DATA
" :REM*8
1450 DATA "6) QUIT" :REM*51
1460 FOR I=1 TO WK :REM*252
1470 FOR J=1TO3 :REM*29
1480 GM$(I,J)=STR$(GM(I,J)):IF
GM(I,J)=0THEN GM$(I,J)=" *
**" :REM*13
1490 NEXT J :REM*238
1500 NEXT I :REM*246
1510 RETURN :REM*114
1520 PRINT"{SHFT CLR}":CLOSE15:
OPEN15,8,15,"IO":OPEN2,8,2
,"#" :REM*86
1530 T=18:S=1 :REM*141
1540 PRINT#15,"B-R";2;0;T;S
:REM*171
1550 PRINT#15,"B-P";2;0 :REM*59
1560 GET#2,X$:IFX$=""THENX$=CHR
$(0) :REM*254
1570 T=ASC(X$) :REM*117
1580 GET#2,X$:IFX$=""THENX$=CHR
$(0) :REM*234
1590 S=ASC(X$) :REM*128
1600 FOR X=0 TO 7 :REM*203
1610 PRINT#15,"B-P";2;X*32+5
:REM*214
1620 F$="" :REM*219
1630 FOR Y=0 TO 15 :REM*36
1640 GET#2,X$:IFX$=""THENX$=CHR
$(0) :REM*174
1650 IF ASC(X$)=160THEN1680
:REM*102
1660 F$=F$+X$ :REM*72
1670 NEXTY :REM*189
1680 IF A=0THENA=1:PRINTF$;:GO
TO1700 :REM*32
1690 A=0:PRINTTAB(20);F$
:REM*94
1700 NEXTX :REM*209
1710 IF T<>0 THEN 1540 :REM*83
1720 CLOSE1:CLOSE2 :REM*233
1730 GOSUB 1390:RETURN :REM*83
1740 F1=0:F3=0:F5=0 :REM*8
1750 PRINT"{SHFT CLR}":PRINT:PR
INTTAB(5)R$"SCREEN COLOR D
ISPLAY SETUP":PRINT:REM*59
1760 PRINT:PRINT"F1 - SELECTS B
ORDER COLOR" :REM*32
1770 PRINT"F3 - SELECTS BACKGRO
UND COLOR" :REM*138
1780 PRINT"F5 - SELECTS CHARACT
ER COLOR":PRINT :REM*246
1790 PRINT"ANY OTHER KEY EXITS
TO MAIN MENU" :REM*16
1800 PRINT:PRINTR$"SELECT YOUR
COLORS..." :REM*28
1810 GOSUB1260:GET A$:IF A$<F1
$ AND A$<F3$ AND A$<F5$
THEN RETURN :REM*159
1820 ON -(A$=F1$) GOSUB1840:ON
-(A$=F3$) GOSUB1860:ON -(A
$=F5$) GOSUB1880 :REM*244
1830 GOTO 1810 :REM*103
1840 F1=F1+1:IF F1>15 THEN F1=0
:REM*73
1850 POKEBD,F1:RETURN :REM*73
1860 F3=F3+1:IF F3>15 THEN F3=0
:REM*19
1870 POKEBC,F3:RETURN :REM*106
1880 F5=F5+1:IF F5>15 THEN F5=0
:REM*245
1890 POKE CHAR,F5:SYSAD,0,17
:REM*203
1900 PRINT"YOUR CHARACTERS WILL
LOOK LIKE THIS!":RETURN
:REM*10
1910 FOR AE=849 TO 984:READ DA:
POKEAE,DA:NEXT :REM*141
1920 AE=849:RETURN :REM*178
1930 DATA 32,253,174,32,138,173
,32,221,189,32,102,3,32,30
,171,169,13,32 :REM*167
1940 DATA 210,255,96,169,69,32,
199,3,176,85,173,2,1,208,1
1,172,213,3,169 :REM*31
1950 DATA 48,153,2,1,136,208,25
0,169,46,32,199,3,168,144,
2,160,48,169,0 :REM*197
1960 DATA 32,199,3,152,157,0,1,
169,46,32,199,3,172,214,3,
232,136,208,252 :REM*44
1970 DATA 236,213,3,176,33,172,
213,3,169,0,153,1,1,189,0,
1,201,32,208,3 :REM*114
1980 DATA 173,216,3,153,0,1,202
,16,6,173,215,3,136,16,244
,136,16,231,169 :REM*168
1990 DATA 0,160,1,96,162,0,221,
0,1,240,6,232,224,12,208,2
46,24,96,9,2,32 :REM*130
2000 DATA 32 :REM*70
2010 FOR AD=828 TO 848:READ DA:
POKEAD,DA:NEXT :REM*64
2020 AD=828:RETURN :REM*224
2030 DATA 32,253,174,32,158,183
,138,72,32,253,174,32,158,
183,104,168,24 :REM*167
2040 DATA 32,240,255,96 :REM*16

```

★ RUN ★ ★ ★ ★ ★

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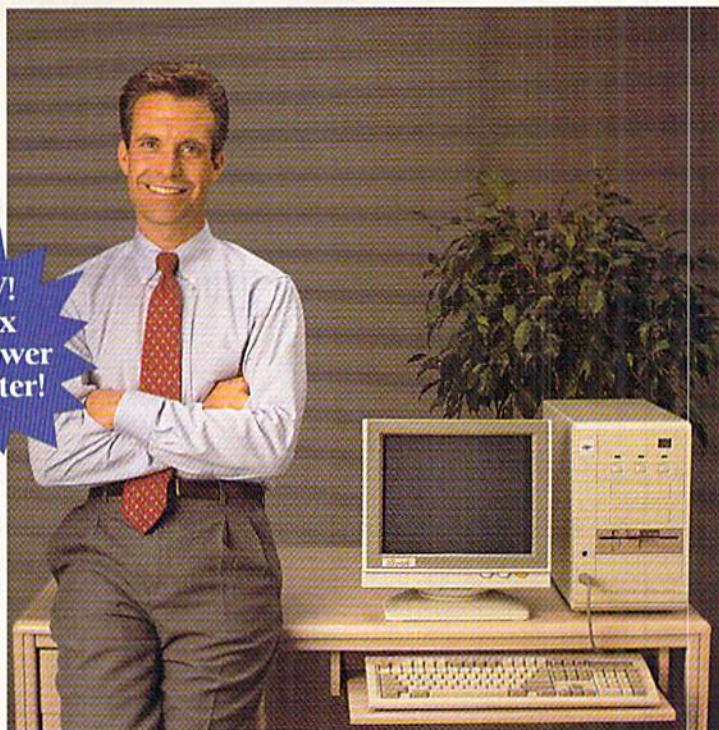
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128 MODE

Now you can rank sports teams just like the top analysts, with Roundball Roundup.

By MARK JORDAN

LAST SPRING I once again joined the legions of backyard heroes who filled out an NCAA basketball tournament bracket in hopes of picking the most winners. Like going one-on-one against Larry Bird, it's a formidable task: 64 teams are involved and one miss in the early rounds can cost you dearly.

I've tried various methods of making my picks, from intuition (forget that) to choosing the top-seeded teams (better) to consulting the last poll of the season (better still) to going hi-tech. Hi-tech in this case means reading *USA Today's* computer rankings by MIT grad Danny Sagarin. In the last three years, his rankings have consistently beaten the others.

OK, so an MIT grad with a roomful of computers can rate teams better than coaches and sportswriters, but how about a small liberal arts college grad with a C-128? I wrote this program to find out. If you picked any team but Duke to win this year's NCAA championship, you need this program. Be sure to use the Checksum on page 45 as you type it in.

Roundball Roundup gives each team a power rating of .500 to begin the season. The ratings change as wins and losses accrue based upon team strengths, wins, point spreads and home-court advantages. I've found that even with this limited information, the program produces results comparable to Sagarin's.

You start by creating a league with up to 400 teams. Select Teams from the main menu to add teams. When you've finished, press the LEFT-ARROW key and RETURN.

Record each game's results by selecting the Scores option. Cursor through the team list and press RETURN to select the first team. Use the cursor keys to enter the score: CURSOR UP/DOWN changes the score by ten points, CURSOR LEFT/RIGHT by one. Press RETURN to enter the score. Repeat the procedure for the opposing team. Once you've entered both scores, select the home/away teams, again using the cursor keys and RETURN. You'll be given one final chance to edit. *Don't rush through this step!* Once installed, your results cannot be edited.

When you're finished entering scores, press ESCAPE to return to the main menu, and select Rank to calculate the team standings. (Unless you've typed in some scores, the program will have nothing to compare for ranking the teams.)

You can view, print or save your results any time. Save often. Your league list is always presented in alphabetical, rather than ranked, order. Each time you save, the previous results will be saved as a backup with the file extension .BAK. Also, you should always add the prefix RK to your filenames. (The program prompts you to do so.) I'd recommend you experiment a bit before typing in three hours' worth of scores.

You can also use Roundball Roundup for baseball and football. You don't need a fancy degree, a roomful of technology, or even a pair of Air Jordans to predict this season's winners. All you need is Roundball Roundup. **R**

Mark Jordan (no relation to Michael) teaches high school English and can't wait until Indiana brings home another NCAA title.

Listing 1. Roundball Roundup program. Also available on the July/August ReRUN disk. Call 1-800-824-5499.

```

Ø REM TEAM RANKINGS BY MARK JO 17Ø INPUT T$:IFT$=""THEN17Ø 32Ø PRINT"{2 HOMEs}{SHFT CLR}";
RDAN :REM*219 :REM*2Ø7 :REM*237
2Ø GOSUB 244Ø :REM*98 18Ø IFT$="{LEFT ARROW}"THENEXIT :REM*217
3Ø DO :REM*8 :REM*1Ø8 34Ø PRINT"{2 HOMEs}{3 CRSR DNs}
4Ø GOSUB 23ØØ :REM*97 :REM*13 {SHFT S}ORTING..." :REM*117
5Ø GETKEYA$:P=INSTR(KY$,A$):FL= 2ØØ CHAR,Ø,7,LC$+"{CTRL 5}{SHFT 35Ø FORK=ØTOTZ-1:HI=K:CHAR,1Ø,3
P:IFP=ØTHENP=VAL(A$):REM*122 }I)S THIS CORRECT?(2 SPACES :REM*15
6Ø ON P GOSUB 11Ø,42Ø,147Ø,171Ø )}{SHFT Y)}/{SHFT N}" :REM*35 36Ø FORT=K+1TOTZ :REM*133
,186Ø,195Ø,212Ø,227Ø,227Ø 21Ø CHAR,Ø,6,"{UP ARROW}{2 SPAC :REM*118 37Ø IFTM$(HI)>TM$(T)THENHI=T
:REM*118 :REM*2Ø3
7Ø IFP>7THENEXIT :REM*6Ø 22Ø CHAR,Ø,5,"{CTRL 2}"+"S,1 38Ø NEXT :REM*255
8Ø LOOP :REM*61 :REM*159 39Ø S$=TM$(K):TM$(K)=TM$(HI):TM
9Ø IFP=8THEN CLR:GOTO2Ø:REM*242 :REM*126 4ØØ NEXT :REM*193
1ØØ END :REM*228 23Ø GETKEYA$:IFAS<>"Y"THEN15Ø 41Ø RETURN :REM*16
11Ø SCNCLR:WINDOWØ,Ø,23,23 :REM*26 42Ø IFTZ<1THEN19ØØ :REM*45
:REM*115 24Ø TM$(TT)=T$:PR(TT)=.5:TT=TT+ 43Ø PRINT"{2 HOMEs}{SHFT CLR}":
12Ø PRINT"{CTRL 9}{COMD 7}{3 SP :REM*32 44Ø GOSUB139Ø:CHAR,24,1,"{CTRL
ACES}{SHFT I}NPUT TEAMS{2 S :REM*179 :REM*84 2}"+"STR$(TS+1)+"-"+TM$(TS),
PACES}":PRINT"{CTRL 9}{LEF :REM*87 :REM*1225 1 :REM*225
T ARROW} WHEN FINISHED" :REM*87 :REM*175 :REM*175
13Ø TT=TZ+1:UU=Ø :REM*2Ø1 27Ø CHAR,Ø,UU,"":PRINTTT"{CRSR :REM*225
14Ø DO :REM*227 LF)-"T$ :REM*87 45Ø DO :REM*175
15Ø PRINT"{HOME}{2 CRSR DNs}"E$ :REM*118 28Ø WINDOWØ,Ø,23,23:PRINT :REM*19Ø 46Ø PRINT"{2 HOMEs}{COMD 6}{CTR
"@ :REM*55 :REM*12 47Ø PRINT"{CTRL 9}{SHFT P)RESS
16Ø PRINT"{COMD 8}{SHFT T)EAM # :REM*12 47Ø PRINT"{CTRL 9}{SHFT P)RESS
"TT+1 :REM*33 3ØØ TZ=TT-1 :REM*155
31Ø GOSUB34Ø :REM*134

```



Rank the teams with Roundball Roundup.

```

[SHFT A] TO ADD TEAM(2 SPA
CES)" :REM*14
480 PRINT"{COMD 7}{CTRL 9} {SHF
T E)SCAPE BACK TO MENU(2 SP
ACES){COMD 8}" :REM*143
490 GOSUB590:IFAS=E$ORAS="A"THE
NEXIT :REM*157
500 IFAS="E"THEN490 :REM*213
510 POKE208,0 :REM*99
520 GETKEY$:IFAS=E$THENEXIT
:REM*189
530 POKE208,1:POKE842,ASC(A$)
:REM*35
540 WINDOW0,4,23,24,1 :REM*202
550 PRINT"{2 HOME$}" :REM*54
560 LOOP :REM*31
570 IFAS="A"THEN110 :REM*144
580 RETURN :REM*208
590 CHAR,0,4,"{SHFT S}CORE"
:REM*89
600 TP=0:SC=0 :REM*89
610 FORT=0TO1:T1=T+1 :REM*138
620 CHAR,6,T1*5,"{COMD 7}{SHFT
T)EAM:" :REM*204
630 DO :REM*98
640 GETKEY A$:IFAS=CHR$(13)ORAS
=E$THENEXIT :REM*177
650 CZ=CU :REM*68
660 IFAS="{CRSR DN}"THENIFCU+TS
<TZTHENCU=CU+1 :REM*68
670 IFAS="{CRSR UP}"THENCU=CU-1
:IFCU<0ANDTS=0THENCU=0
:REM*13
680 IFAS="+ "THENCU=0:GOSUB1330
:REM*253
690 IFAS="- "THENCU=0:GOSUB1340
:REM*218
700 IFAS="A"THENEXIT :REM*191
710 IFCU>22THENGOSUB1330
:REM*251
720 IFCU<0THENCU=22:GOSUB1340
:REM*106
730 CHAR,24,1+CZ,"{CTRL 8}" +STR
$(CZ+TS+1)+"-"+TMS$(CZ+TS),0
:REM*131
740 CHAR,24,1+CU,"{CTRL 2}" +STR
$(CU+TS+1)+"-"+TMS$(CU+TS),1
:REM*106
750 CZ=CU :REM*184
760 LOOP:IFAS=E$ORAS="A" THENRE
TURN :REM*158
770 B=TS+CU:TM(T)=B :REM*111
780 CHAR,12,T1*5,"{CTRL 4}" +TMS
(B)+ " " :PRINT :REM*178
790 S=B:YY=T*5+6:GOSUB1270
:REM*85
800 PRINT"{2 HOME$}{CTRL 9}{CTR
L 4}{4 SPACES}{SHFT U}SE CU
RSOR KEYS{3 SPACES}"
:REM*243
810 PRINT"{CTRL 9}{5 SPACES}TO
SET SCORE{5 SPACES}"
:REM*138
820 SC=-10:POKE208,1:POKE842,17
:REM*220
830 DO :REM*45
840 GETKEY A$:IF A$=CHR$(13)OR
A$=E$THENEXIT :REM*206
850 IF A$="{CRSR DN}"THENAD=10
:REM*60
860 IF A$="{CRSR RT}"THENAD=1
:REM*227
870 IF A$="{CRSR UP}"THENAD=-10
:REM*190
880 IF A$="{CRSR LF}"THENAD=-1
:REM*110
890 SC=SC+AD:IFSC<0THENSC=0
:REM*5
900 SC$=STR$(SC) :REM*49
910 CHAR,0,T1*5,"{CTRL 2}{4 SPA
CES}":CHAR,0,T1*5,SC$
:REM*152
920 LOOP:IF A$=E$THENRETURN
:REM*241
930 T(T)=SC:TP=TP+SC:SC=0
:REM*220
940 NEXT :REM*42
950 PRINT"{2 HOME$}{CTRL 9}{COM
D 8}{3 SPACES}{SHFT W}HICH
TEAM HOME?{3 SPACES}"
:REM*96
960 PRINT"{CTRL 9} ({SHFT U)SE
CURSOR/{SHFT R)ETURN}{2 SPA
CES}" :REM*2
970 R=1:POKE208,1:POKE842,65
:REM*205
980 DO:GETKEY$:IFAS=CHR$(13)OR
A$=E$THENEXIT :REM*67
990 IFR=0THENR=1:R1=6:R2=11:ELS
E R=0:R1=11:R2=6 :REM*195
1000 CHAR,0,R2,"{CTRL 2}{SHFT H
}OME",1 :REM*76
1010 CHAR,0,R1,"{CTRL 3}{SHFT A
}WAY",1 :REM*228
1020 LOOP:IFAS=E$THENRETURN
:REM*84
1030 CHAR,3,3,"{CTRL 2}{SHFT P)
RESS {SHFT E) TO EDIT"
:REM*89
1040 GETKEY$: :REM*241
1050 CHAR,3,3,"{15 SPACES}"
:REM*150
1060 IFAS="E"THENWINDOW0,4,24,2
4,1:PRINT"{2 HOME$}":REUR
N :REM*247
1070 IN=1 :REM*234
1080 H=TP*.1:HH=-1 :REM*17
1090 IFR THENHH=1 :REM*126
1100 X=TM(0):Y=TM(1):TX=0
:REM*150
1110 IFT(1)>T(0)THEN X=TM(1):Y=
TM(0):TX=1 :REM*236
1120 TW(X)=TW(X)+1:TL(Y)=TL(Y)+
1 :REM*180
1130 TC(X)=TW(X)+TL(X) :REM*155
1140 TC(Y)=TW(Y)+TL(Y) :REM*227
1150 PD=T(TX)/TP :REM*226
1160 CP=PR(X)+PR(Y) :REM*26
1170 SB=CP*PD :REM*97
1180 HA=((SB-(CP/2))*2)*HH
:REM*244
1190 WT=SB+HA :REM*95
1200 LT=CP-WT :REM*74
1210 TT(X)=TT(X)+WT :REM*32
1220 TT(Y)=TT(Y)+LT :REM*186
1230 PR(X)=TT(X)/TC(X) :REM*135
1240 PR(Y)=TT(Y)/TC(Y) :REM*239
1250 FORK=0TO1:S=TM(K):YY=K*5+6
:GOSUB1270:NEXT :REM*104
1260 RETURN :REM*127
1270 CHAR,0,YY,"":FORRR=0TOTZ:I
FRA(RR)=S THEN1290:REM*183
1280 NEXT :REM*135
1290 PRINT"{COMD 8}{8 SPACES}"D
A$(0)":":TW(S)"- "TL(S)
:REM*129
1300 PRINT"{COMD 8}{8 SPACES}"D

```

The Game Plan: How Roundball Roundup Works

WHEN YOU INPUT a contest score, the computer adds the power rating of each participant. The first time teams play, this will add up to 1.000, since every team starts with a .500 rating. But from this point on, the results will differ. This value is the Contest Power (CP).

The Point Differential (PD) is calculated by dividing the winner's score by the total. Next, the program calculates a subtotal (ST) by multiplying the contest power by the point differential.

The home/away factor (HA) is calculated using a fairly complicated formula (line 1180 of Listing 1). Suffice it to say that it reduces the value of a home-court win, but never to the point that the losing team gets more than the winning team. (See lines 1150-1200.)

For example, suppose Indiana University, with a power rating of .675, plays Duke, which has a power rating of .735. Indiana wins at home, 81-76. The calculations would be:

$$CP = .675 + .735 = 1.41$$

$$PD = 81/157 = .515$$

$$ST = 1.41 \times .515 = .726$$

$$HA = .0042$$

$$ST - HA = .726 - .0042 = .721$$

IU gets this much (.721) for its win, and Duke picks up what's left over from the original contest power:

$$1.41 - .721 = .689$$

As you can see, Duke didn't lose too much ground in the process, because they played on the opponent's home court and kept the score close.

—MJ

1 2 8 M O D E

```

A$(1)":";RR+1 :REM*113 1760 FORK=0TOTZ:HI=K:CHAR,28,0, 2210 INPUT#2,TM$(T),TW(T),TL(T)
1310 PRINT"{COMD 8}{8 SPACES}"D STR$(K+1) :REM*223 ,PR(T),TT(T) :REM*136
A$(2)":";:PRINTUSING"###" 1770 FORT=K+1TOTZ :REM*9 2220 NEXT :REM*39
;PR(S) :REM*14 1780 IF RR(HI)<RR(T) THEN HI=T 2230 DCLOSE :REM*219
1320 RETURN :REM*179 2240 FORT=TZ+1TOTY:TM$(T)=":TW
1330 TS=TS+23:CU=0:GOTO1370 1790 NEXT :REM*135 (T)=0:TL(T)=0:PR(T)=.5:TT(
:REM*112 1800 S=RR(K):RR(K)=RR(HI):RR(HI T)=0:RA(T)=0:NEXT :REM*101
1340 TS=TS-23 :REM*33 )=S :REM*230 2250 IN=1:SO=0 :REM*31
1350 IFCU+TS=>TZTHENCU=TZ-TS+1 1810 S=RA(K):RA(K)=RA(HI):RA(HI 2260 GOTO1710 :REM*200
:REM*127 )=S :REM*119 2270 PRINT"{SHFT CLR}{SHFT A}RE
1360 IFTS<0THENTS=0 :REM*52 1820 NEXT :REM*153 YOU SURE?(2 SPACES){SHFT
1370 IFTS>TZTHENTS=TZ-22:CU=22 1830 P=3:PRINT:GOSUB1480:REM*49 Y}/{SHFT N}" :REM*43
:REM*212 1840 GOSUB1920 :REM*136 2280 GETKEY$:IFAS<>"Y"THENP=0
1380 CZ=CU :REM*45 1850 RETURN :REM*207 :REM*136
1390 WINDOW24,0,39,24,1 :REM*29 1860 PRINT"{SHFT CLR}{CTRL 2}": 2290 RETURN :REM*137
1400 PRINT"{CTRL 9}{CTRL 8}{5 S IFSO=0THEN1710 :REM*103 2300 PRINTES"M(2 HOMES){SHFT CL
PACES}{SHFT T}EAMS(6 SPACE R)"LC$CHR$(11) :REM*254
S}" :REM*63 1870 P=3:GOSUB1480 :REM*85 2310 CHAR,0,0,"{CTRL 6}{11 SPAC
:REM*34 1880 GOSUB1920 :REM*160 Es){SHFT C}-128 {SHFT T}EA
1410 FORK=0TO22 :REM*34 1890 RETURN :REM*247 M {SHFT R}ANKER{12 SPACES}
1420 PRINT K+1+TS"{CRSR LF}"-TM 1900 PRINT"{2 HOMES}{SHFT CLR){ :REM*5
$(K+TS) :REM*7 CTRL 2}{SHFT N}O DATA TO W
1430 NEXT :REM*30 ORK WITH YET!" :REM*99 2320 CHAR,0,2,"{COMD 6}{SHFT F}
1440 IFTZ=>TS+23 THENPRINT" {CT SLEEP2:RETURN :REM*194 ILE:"+FF$ :REM*223
RL 2}{CTRL 9}----{SHFT M}O 1920 PRINT"{2 HOMES}{CTRL 9}{8 :REM*223
RE----" :REM*239 SPACES}{SHFT P}RESS {SHFT CHAR,15,5,"{CTRL 2}..{SHFT
:REM*177 E){SHFT S}{SHFT C}{SHFT A} O)PTIONS..",1 :REM*208
1450 PRINT"{2 HOMES}" :REM*177 )}{SHFT P}{SHFT E} TO CONTIN 2340 CHAR,15,6,"{COMD 8}1-{SHFT
1460 RETURN :REM*68 UE(8 SPACES)" :REM*246 T}EAMS ({SHFT T})",1
1470 P=4:IFSO=0THEN1710:REM*125 1930 GETKEY$:IFAS<>E$THEN1930 :REM*168
1480 OPENP,P,7:SC=0 :REM*100 1940 RETURN :REM*42 2350 CHAR,15,7,"{COMD 5}2-{SHFT
1490 PRINT#P,"{7 SPACES}{SHFT :REM*78 S)CORES({SHFT S})",1
C)-128 {SHFT R}ANKINGS" 1950 PRINT"{SHFT CLR){SHFT S}AV :REM*12
:REM*27 E AS(2 SPACES)"FF$:IFTZ<1T 2360 CHAR,15,8,"{COMD 8}3-{SHFT
1500 PRINT#P,"{2 SPACES}{SHFT T }EAM{13 SPACES}{SHFT W){3 P)RINT ({SHFT P})",1
SPACES}{SHFT L}{5 SPACES}{ :REM*166 2370 CHAR,15,9,"{COMD 5}4-{SHFT
SHFT P)TS(4 SPACES){SHFT P :REM*244 R)ANK(2 SPACES){(SHFT R)
}WR%" :REM*184 1970 FK$=FF$+".BAK" :REM*184 ",1
1510 FORT=0TOTZ:SC=SC+1:REM*207 1980 SCRATCH (FK$) :REM*170 2380 CHAR,15,10,"{COMD 8}5-{SHF
1520 IFFL>3 AND SC=21 THEN GOSU RENAME (FF$) TO (FK$) :REM*44 T V)IEW(2 SPACES){(SHFT V
B1670:IFAS=E$THEN1550 :REM*44 )",1 :REM*39
:REM*220 2000 IFDSTHENDCLEAR :REM*253 2390 CHAR,15,11,"{COMD 5}6-{SHF
1530 GOSUB1570 :REM*93 2010 PRINT"{SHFT CLR){SHFT S}AV :REM*185 T S)AVE(2 SPACES){(SHFT A)
1540 NEXT :REM*128 ING..." :REM*132 )",1 :REM*71
1550 CLOSE :REM*73 2020 DOPEN#2,(FF$),W:PRINT#2,TZ 2400 CHAR,15,12,"{COMD 8}7-{SHF
1560 RETURN :REM*160 :REM*244 T L)OAD(2 SPACES){(SHFT L
1570 S=RA(T) :REM*191 2030 FORT=0TOTZ:CHAR,10,0,STR$( :REM*11
1580 AS=LEFT$(TM$(S)+"{12 SPACE :REM*223 2410 CHAR,15,13,"{COMD 5}8-{SHF
s}",13) :REM*29 T) :REM*88 CHAR,15,13,"{COMD 5}8-{SHF
1590 RS=RIGHT$("{2 SPACES}" +STR T N)EW(3 SPACES){(SHFT N)
$(T+1),3) :REM*18 2050 PRINT#2,TW(T) :REM*24 ",1 :REM*72
1600 PRINT#P,RS"-AS; :REM*90 2060 PRINT#2,TL(T) :REM*204 2420 CHAR,15,14,"{COMD 8}9-{SHF
1610 PRINT#P,USING"###";TW(S); 2070 PRINT#2,PR(T) :REM*228 T Q)UIT(2 SPACES){(SHFT Q)
:REM*115 2080 PRINT#2,TT(T) :REM*9 :REM*160
1620 PRINT#P,USING"####";TL(S); 2090 NEXT :REM*164 2430 RETURN :REM*6
:PRINT#P,"{3 SPACES}"; :REM*89 2440 A=0:A$="":AD=0:B=0:CP=0:CU
:REM*154 :REM*196 :REM*89 =0:CZ=0:H=0:HA=0:HH=0:HI=0
1630 PRINT#P,USING"###.##";TT(S) :REM*255 :K=0:KY$="" :REM*255
);:PRINT#P,"{3 SPACES}"; 2100 PRINT"{2 HOMES}{SHFT CLR){ :REM*245 LT=0:P=0:PD=0:R=0:R1=0:R2=
:REM*252 CTRL 2}{CTRL 9}{SHFT U}SE (LEFT ARROW) AS 1ST CHAR T :0:S=0:SB=0:SC=0:SC$="" :T=0
:REM*252 O ESCAPE(CRSR DN)":DIRECTO :TS$="" :TP=0 :REM*235
1640 PRINT#P,USING".###";PR(RA :REM*93 2460 UU=0:WT=0:X=0:Y=0:TZ=-1:SO
T)); :REM*170 TY=TZ :REM*142 =0:IN=0:TX=0:FF$="RK." :FF=
1650 PRINT#P, :REM*38 2140 PRINT"{HOME}{CRSR DN}{COMD :REM*5
1660 RETURN :REM*13 8}"TAB(14)FF$ :REM*13 2470 FK$="":FL=0:RS$="" :RR=0:SS=
1670 CHAR,0,24,"{SHFT P}RESS AN :REM*79 :REM*141 "" :T1=0:TS=0:TT=0:TY=0:YY=
Y KEY TO CONTINUE" :REM*87 0 :REM*141
1680 GETKEY$: :REM*124 2160 ILEFT$(A$,1)="(LEFT ARROW :REM*184 2480 DIM PR(400),TM$(400),TM(400
1690 PRINT"{HOME}{2 CRSR DN}s)"E :REM*184 )"THEN2290 :REM*184 0),TC(400),TW(400),TL(400)
$"a"; :REM*16 2170 FF$=A$:DOPEN#2,(FF$):INPUT :REM*25 2490 KY$="TSPRVALNQ"+CHRS(13)+E
1700 SC=0:RETURN :REM*199 #2,TZ:PRINT"{SHFT CLR}"TZ :REM*25 $
1710 PRINT"{SHFT CLR}":IFTZ<1 O :REM*123 2490 KY$="TSPRVALNQ"+CHRS(13)+E
R IN=0 THEN1900 :REM*82 2180 IFDSTHENPRINT"{SHFT CLR){C :REM*117
1720 SO=1:CHAR,14,0,"{CTRL 2}{S :REM*62 2190 PRINT"{SHFT CLR){SHFT L)OA :REM*117
HFT R)ANKING TEAM #":REM*1 :REM*66 2200 FORT=0TOTZ:CHAR,10,0,STR$( :REM*24
1730 FORT=0TOTZ :REM*113 2190 PRINT"{SHFT CLR){SHFT L)OA :REM*117
1740 RR(T)=PR(T):RANK(T)=T :REM*66 DING..." :REM*24
:REM*130 2200 FORT=0TOTZ:CHAR,10,0,STR$( :REM*24
1750 NEXT :REM*95 T) :REM*4 2520 RETURN :REM*108

```

RUN'S CHECKSUM PROGRAM AND TYPING HINTS

By BOB KODADEK AND THE RUN EDITORIAL STAFF

CHECKSUM IS A PROGRAM that proofreads your typing when you enter a listing from the magazine. It assigns a numerical value to each character that you type, adds up the values of the line you typed and displays the sum. (Checksum, therefore, means that it *checks* your typing by *summing* the characters.) It also verifies that you have typed the characters in the proper order. (Checksum won't tell you if you miss a line of code entirely, so verify that yourself.)

Checksum runs in the background when you type in lines of programming code. Whenever you type a line and press RETURN, the Checksum will display a value. Compare that value to the value published next to the line of code in the magazine (eg., :REM*123). If the numbers match, you've typed the line correctly. Simple.

TYPING IN CHECKSUM AND OTHER GOOD ADVICE

First, type in Checksum carefully from Listing 1 below. Be sure to press RETURN after every line to enter it into memory. Once you have typed the program, save it. In fact, save it a few times while you're typing, just to be safe. (This is good advice whenever you type in a program. I usually change the name each time I save; for example, Supergame1, Supergame2, and so on.)

Double check your work, making sure that you've typed in every line, and you've pressed RETURN after every line you've typed. If you make errors when typing in Checksum, a test run of Checksum will tell you which line is incorrect. (This safety feature works only in the Checksum program itself. It does not apply to any other listings in the magazine.) Whenever you find a typing error (in any program listing), fix it, press RETURN to enter the change, *save the program again*, and try another run. Repeat as often as necessary.

Important tip: Don't get discouraged if the program won't run. Be patient. Be thorough. It will work eventually.

You'll know your Checksum is ready when you see the line

```
TO TOGGLE ON OR OFF, SYS(number)
```

USING CHECKSUM AND EVEN MORE GOOD ADVICE

When you're ready to type in your first listing from the magazine, load and run Checksum. Make a note of the number that is displayed on the screen (49152 for the C-64; 3328 for the C-128). To activate and deactivate Checksum, type SYS followed by that number, then press RETURN. You need to have Checksum active whenever you're typing in a listing. Checksum must be deactivated, however, when you run the new program.

The next step is typing in a new program listing as it appears in the magazine. As you begin, you'll notice that at the end of each line is a colon, followed by the letters REM, an asterisk and a 1-3 digit number, like this:

```
:REM*123
```

Don't type any of this in: It's simply the Checksum value. Stop typing before the colon and press RETURN. If you've typed the line correctly, the number displayed on the screen will match the Checksum value. If the numbers don't match, you've made a mistake. Check the line carefully, make your changes and press RETURN. The computer won't know you've made a change unless you press RETURN to enter it.

A few type-in hints: The Checksum does not verify blank spaces in the program lines unless they are within quotation marks, because adding or omitting such spaces will not affect the operation of the program. The exception to this is hexadecimal Data statements. These are the Data statements, such as this one, that don't have commas:

```
100 DATA 12345678901234567890*12345678901234567890*123  
45678901234567890*
```

In statements such as these, you must have one space between the word DATA and the numbers that follow. Checksum will not catch that error.

One other common mistake is to type in the spaces that fall under the line number. In the example above you should not put a carriage return or spaces between the 3 and the 4 where the line breaks.

WHAT THE HECK ARE CURLY BRACES?

As you type, you will undoubtedly be confused the first time you see curly braces {}. These braces mean "perform the function explained within." For example, {22 SPACES} means that you need to press the space bar 22 times. Don't type the braces. Other common examples are:

{SHIFT CLR}—hold down the SHIFT key and press the CLR-HOME key.

{2 CRSR DNs}—tap the cursor down key twice.

{CTRL I}—hold the CONTROL key and press the I key.

{COMD T}—hold down the COMMODORE key and press the T key.

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

KEEP YOUR CHIN UP—ALL YOU NEED IS PATIENCE

Continue typing in your program, saving often and checking each checksum value with the one in the magazine, until you've finished the listing. Phew! So now you're ready to run your program, right? Not quite. First, save it. Second, deactivate Checksum by typing SYS followed by 49152 for the C-64 or 3328 for the C-128.

Now you can run. Don't be discouraged if you still get an error. It happens. There are only two errors that Checksum won't catch (omitting a line and the Data statement spaces). Use Checksum faithfully. Be patient. Be thorough. It will work eventually. ■

Listing 1. RUN'S Checksum program.

```
10 REM RUN'S CHECKSUM 64/128 - BOB KODADEK  
20 MO=128:SA=3328:IF PEEK(40960)THEN MO=64:SA=49152  
30 I=0:CK=0:CH=0:LN=190  
40 FOR K=0 TO 16  
50 FOR J=1 TO 10:READ B:IF B>255 THEN GOTO 170  
60 CH=CH+B:POKE SA+I,B:I=I+1:NEXT  
70 READ LC  
80 IF LC<>CH THEN GOTO 170  
90 CH=0:LN=LN+10  
100 NEXT K  
110 POKESA+110,240:POKESA+111,38:POKESA+140,234  
120 PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":PRINT  
130 PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO=128 THEN 1  
60  
140 POKESA+13,124:POKESA+15,165:POKESA+25,124:POKESA+2  
6,165  
150 POKESA+39,20:POKESA+41,21:POKESA+123,205:POKESA+12  
4,189  
160 POKESA+4,INT(SA/256):SYS SA:NEW  
170 PRINT"YOU HAVE A DATA ERROR IN LINE ";LN;"!":END  
180 REM DO NOT CHANGE THESE DATA STATEMENTS!  
190 DATA 120,162,24,160,13,173,4,3,201,24,884  
200 DATA 200,4,162,13,160,67,142,4,3,140,903  
210 DATA 5,3,88,96,32,13,67,152,72,169,697  
220 DATA 0,141,0,255,133,176,133,180,166,22,1206  
230 DATA 164,23,134,167,132,168,170,189,0,2,1149  
240 DATA 240,58,201,48,144,7,201,58,176,3,1136  
250 DATA 232,200,240,189,0,2,240,42,201,32,1386  
260 DATA 200,4,164,180,240,31,201,34,200,6,1276  
270 DATA 165,180,73,1,133,180,230,176,164,176,1478  
280 DATA 165,167,24,125,0,2,133,167,165,168,1116  
290 DATA 105,0,133,168,136,200,239,232,200,209,1638  
300 DATA 169,42,32,210,255,165,167,69,168,170,1447  
310 DATA 169,0,32,50,142,169,32,32,210,255,1091  
320 DATA 32,210,255,169,13,32,210,255,104,168,1448  
330 DATA 96,104,170,24,32,240,255,104,168,96,1289  
340 DATA 56,32,240,255,138,72,152,72,24,162,1203  
350 DATA 0,160,0,32,240,255,169,42,200,198,1304
```

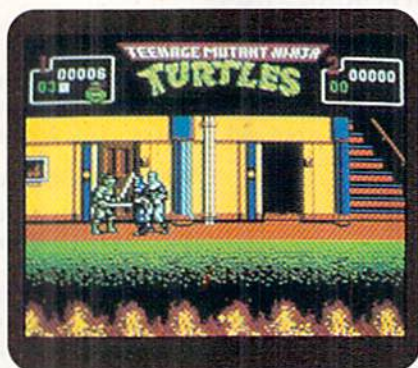
From p. 8.

like a dervish on the half shell.

The object, of course, is to fight your way through all eight levels, racking up points along the way. You only have three lives to begin with, but defeating each level's powerful enemy (and finding pizza to eat) can patch up a lot of damage accumulated during the game. This version allows you three "continues" if you die, after which you'll have to start the game over.

There are several noteworthy differences between the C-64 version and the arcade version. The most annoying? You cannot play two or more turtles at once. In two-player mode (if you want to call it that) two players take turns moving through each level—hardly a cooperative effort.

The background graphics, nicely drawn and colorful, generally follow those of the arcade version. The C-64's turtles are small and not as nimble as you may be used to. While the joystick



Leonardo slashes through Shredder's henchmen in the Turtles Arcade Game.

operation is okay, you'll find the turtles' response just a wee bit sluggish. Unlike the arcade version, you cannot jump-kick and change direction in midair; this can be important if you're being swarmed by the Foot Clan. On the plus side, there doesn't seem to be as many enemies to contend with in this version.

Also on the plus side is the game's great soundtrack. Soundtracks and sound effects have become a hallmark of Konami's C-64 games.

This is one of those games that really doesn't require much documentation, especially if you've played other versions. Moreover, fast load routines keep disk access times relatively short and painless. With its fast, colorful graphics, humorous atmosphere and superb replayability, TMNT is pretty cool, dude!

(\$49.95/C-64. Konami, 900 Deerfield Parkway, Buffalo Grove, IL 60089-4510)

THE BLUES BROTHERSA

Pardon me, Ma'am, We're on a Mission From God

The boys are back in town—Jake and Elwood, the best known brothers of white-boy blues since Stevie Ray and Jimmy Vaughan. They've arrived for a

SWAP.....B

High Scores Aren't Everything in This Game from Titus

I love logic puzzles, so when Swap crossed my desk this spring, I tore into it. I opened the manual and read, "The human brain weighs about 1.3kg. It is more mysterious than the center of the atom, and less understood than the Big Bang...." Immediately, I tossed the book aside and booted up the game—with an introduction like that, I knew Swap was going to be different.

As it happens, I was right.

In Swap, there are no bad guys to kill, no treasures to find, and the computer skips you quickly past elementary levels if you perform well. The basic idea is simple: You clear a playing board by clicking on adjacent tiles. The tiles swap places with each click, and when you get tiles of like color next to each other, they disappear. At higher levels, a time limit pushes you to work faster, while earned credits and smaller tiles make advancing more difficult.

Even so, the game is simple to play, and within a half hour of opening the box I had figured out shortcuts (like the avalanche feature, which drops all of the tiles to the bottom of the screen), and, already at level 23, I was growing bored. (A few key swaps, an avalanche or two, and I was qualified for the next level. Big, fat, hairy deal!) A bit disappointed, I returned to the manual.

There I found the answer: I needed to approach Swap differently. Instead of taking the quickest route to the next level, I should have concentrated on clearing the board—solving the puzzle, if you will.

When viewed in this light—as a purely mental challenge—Swap shines brightly. To "solve" the various levels, you must approach the board methodically, considering the number and shape of the tiles, and looking for patterns within the board. If you want to set up specific challenges, all the better—Swap's Practice mode lets you set up the board with a selection of variables. The manual even gives a sample challenge. In this regard, Swap has tremendous staying power.

The program has excellent graphics and adequate controls through all of the



If you enjoy the mental gymnastics of solving logic puzzles, try Swap.

lower levels. As you advance, though, the tiles become smaller, and it is occasionally difficult to position your joystick pointer in the correct spot.

My biggest gripe with Swap, fortunately, can be easily overlooked: scoring. The "points" I scored with each level seemed to have little relation to the speed with which I cleared the board. (This, of course, contributed to my initial frustration: Where's the fun if you can't rack up points and win the game?)

The programmers obviously took pains to create a scoring mechanism that takes into account the intricate nature of the puzzles. Unfortunately, that mechanism is not explained in the manual, which left me wondering—Is it better to work quickly, or to work logically? Should I use extra tiles to clear the board completely, or should I simply go on to the next level?

The answer is simple: Ignore the scores, enjoy the challenge. In fact, I recommend abandoning the competition mode altogether.

To programmers, mathematicians, Mensans, and other puzzle-solvers, Swap will provide endless hours of unusual entertainment. If, however, you need the thrill of victory to drive your interest, I suggest you look elsewhere.

(\$39.95/C-64. Titus Software, 20432 Corisco St., Chatsworth, CA 91311)

—Janice Crotty
New Products Editor

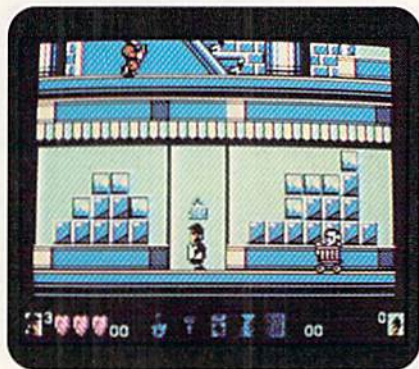
SOFTWARE GALLERY

big show, complete with Rubber Biscuit, but their instruments have been stolen and the sheriff wants them out of town.

Do they listen? Of course not. These are the Blues Brothers.

And you—as either Jake or Elwood—must guide your man through five groovin' levels of high-rise buildings, chutes, ladders and other obstacles. This is Super Mario with sunglasses and a worn out fedora.

Using a joystick, you must climb,



The Blues Brothers is like Super Mario with a worn out fedora and a pair of shades.

jump, scoot, swim and stumble your way through each level in search of the piece of equipment associated with that level, with full-screen graphics detailing your surroundings. Along the way, you'll find bad guys who want to put a serious hurt on you—monsters and madmen alike—with names like Crazy Doc, Banana Split, Herman and Big Dug. While you don't have weapons, you can pick up boxes and toss them. One good hit and you're own your way.

Blues Brothers presents you with graphics screens that are *very* busy. There's a lot going on here. Bad guys move back and forth. Elevators move up and down. Escalators escalate. Flying critters bomb you. There are balloons and umbrellas galore to lift or float you to safety. There are fences to climb over, springs to bounce on, ladders galore... I think you get the picture.

Blue Brothers starts at a frantic pace and never lets up. If you loved Mario Brothers, Donkey Kong or the classic Jump Man, then you'll absolutely revel in this game. The smoothly scrolling screens are colorful, lively and, admittedly, plain fun to get around in. In fact, I was having such a good time moving up and down elevators and swimming through water tanks that I was loath to move further into the game.

And what would the Blue Brothers be without the blues? Throughout the game, musical soundtracks accompany

your frantic race through town. And, of course, Konami's usual superb job on sound effects are evident throughout.

There's certainly nothing about the Blue Brothers to complain about. It's fast, pretty to look at, and plenty of fun to play. This is, perhaps, one of the best arcade games to come down the pike for the C-64 in a long while. So grab your sunglasses, put on your G-man suit and get a firm hold on the joystick. The Blues Brothers are comin' to take you for a ride.

(\$39.95/C-64. Titus Software, 20432 Corisco St., Chatsworth, CA 91311)

TONY LA RUSSA'S ULTIMATE BASEBALL.....A

*Put This Simulation on the
Top of Your Roster*

I've always taken a dim view of software with the word *ultimate* stuck somewhere in the title. It seems arrogant. And, like arrogant people, these games typically don't live up to their self-styled reputation. Thankfully, I found that Tony La Russa's Ultimate Baseball can afford its ostentatious title—this baseball simulation is one of the finest I've played.

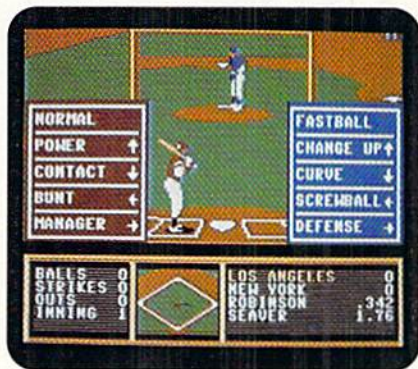
Some simulations give you great graphics, but little control over managerial decisions; others give you a lot of statistics and managerial control, but fall short in the graphics department. Tony LaRussa has hit on the right mix.

Let's talk about the graphics first. Great stuff—full-screen graphics with a huge, very detailed ball park. I was impressed with how quickly the detailed high-resolution screen scrolls to and fro as the action unfolds. The park takes up over two-thirds of the screen, and even then it's only a portion of the entire field. The lower screen shows a score box, a small overhead diagram of the park and an information window. A close-up of the pitcher and batter overlays the main screen during batting sequences. When a player hits the ball, the window disappears and a full-screen animation details the play in full. If your team is on defense, the fielder closest to the ball (unless it's a home run) will move toward the play. If you're batting, you'll obviously be moving your runner around the bases.

The controls are very easy to use. Each player on the roster has his own stats and abilities; this is not a simulation where brute joystick strength is the deciding factor. All of the options are available throughout the game by summoning pop-up menus. Pitchers can not only throw the standard pitches, they can also

serve up knuckle balls, sliders and screwballs. They can throw high or low, inside or outside—all accomplished by moving the joystick. Tony LaRussa even lets you pick off a runner who's led himself too far from base. In the same manner, batters can bunt, power swing or choke up on the bat.

When it comes to managing your team, the pop-up windows let you direct both teams. You can send your manager to the mound and check the pitcher's



The possibilities for matching up teams are astounding in this exceptional simulation.

condition. Likewise, you can change pitchers, send them to the bullpen or back to the bench. You can make changes to the infield and outfield, instructing players to play back or play in, hold runs or play off base runners. The managing options for both teams go on and on.

Above all, this game is easy to use. Game play is so smooth and intuitive, in fact, that the documentation is incidental. Rarely will you find a simulation that can make such a claim.

There are twenty-six teams from both conferences available, including some of the biggest names in baseball—all with statistics. You can select the starting lineup and batting order of your teams, or allow the computer to do it for you.

If you get bored with the teams provided, you can purchase separate team disks such as Great Teams 1901-1968. The disk contains historically accurate statistics and rosters from the best teams in history. You'll find Chicago, 1906, Baltimore, 1969 and more. The possibilities for matchups are astounding.

Whether you're a baseball fanatic with a closet full of trading cards, or a connoisseur of simulation games, you'll find this baseball simulation on the top of your roster. Tony LaRussa is one of the few games I have ever played that truly deserves the often used, much abused moniker, ULTIMATE.

(\$49.95/C-64. SSI, 675 Almanor Ave., Suite 201, Sunnyvale, CA 94086) ■

CURTAIN CALL

RUN's column where worthy products step into the spotlight and take a bow.

Star Micronics NX-2430

Traditionally, when Commodore users purchase a printer, they have to choose between low price and nice print features. Typically, the low price wins. Thanks to rapid advancements in printer technology, there's no longer a need to sacrifice features for price. The so-called "low-end" printers of 1992 sport more features than you could get even on the expensive printer models of 1990.

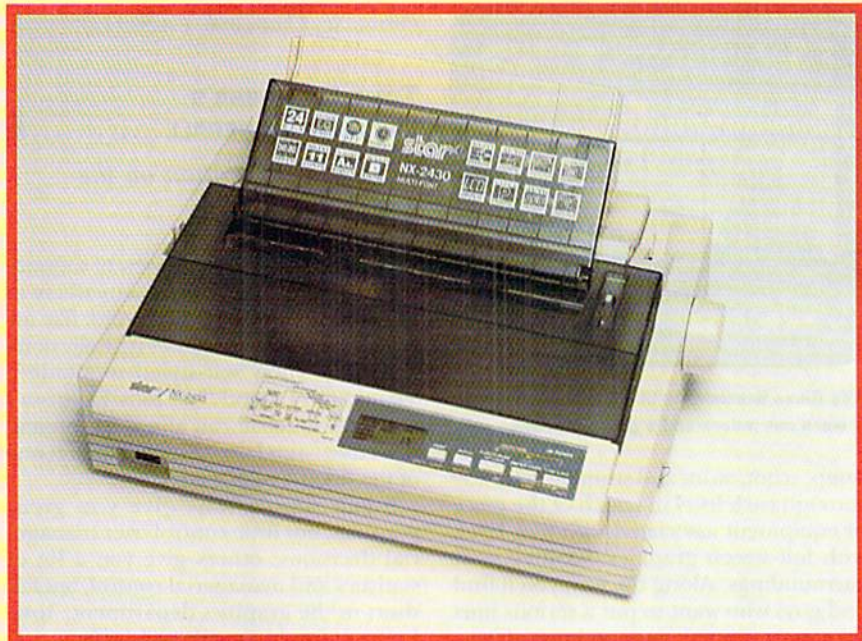
At a suggested retail price of \$399, the Star Micronics NX-2430 is a luxury printer for the budget-minded consumer. This printer abounds with features, produces crisp output (see sample printout, bottom right) and works well with your Commodore when combined with an interface such as the Xetec Super Graphix.

Star Micronics printers of both the 9- and 24-pin variety have traditionally been plagued by lighter-than-acceptable printing. Apparently, Star Micronics has heeded the criticism, because the NX-2430 has dark, well-defined printing in nearly all of its modes, including 24-pin graphics mode. And, let me say, this printer has *many* modes.

The NX-2430 offers nine fonts in its Letter Quality print mode (not to be confused with the Near Letter Quality print mode available on 9-pin printers). It can print graphics in densities ranging from 60 to 360 dpi. And, it features a staggering number of print options. In fact, the NX-2430 is the most option-laden printer I've used in recent memory.

All of the print modes are accessible through either the printer's control panel or through software control codes. The NX-2430 sports an LCD menu display window, similar to those found on laser printers. Still, the most impressive feature of the the control panel is the EDS (Electronic DIP Switch) mode. When the "EDS" message appears in the LCD window, you can use the control panel to make printer emulation changes that require DIP switch settings on most other dot-matrix printers.

For example, with EDS mode, you can toggle between Epson LQ-850 and IBM



modes, Auto linefeed with carriage return, graphics direction (bi- or unidirectional) printing, and an Auto Emulation Change (AEC) option.

Regarding print speed, the NX-2430 does not disappoint. Its 240 character-per-second printing is above average, and the overall output is faster than its competition in nearly every mode, particularly graphics modes.

Paper handling is first rate, and includes tractor-feed sprockets for continuous labels and forms. A paper guide is included for single sheets, as well as a "mute cover" to reduce noise.

This is a top-notch printer, and a good bargain for Commodore users who want to print graphics, newsletters, or professional documents. ■

—Tim Walsh

Star Micronics
420 Lexington Ave.
Suite 2702-25
New York, NY 10170

This low-cost 24-pin printer quickly delivers crisp output in all of its many modes.

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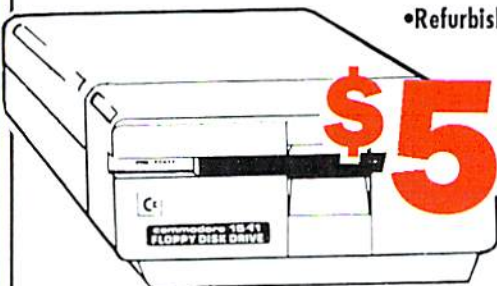
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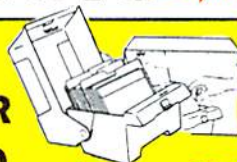


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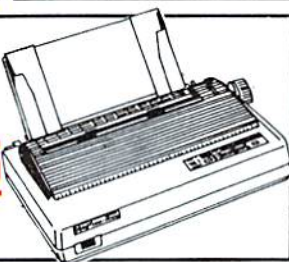
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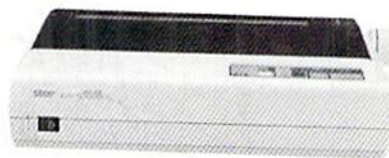
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