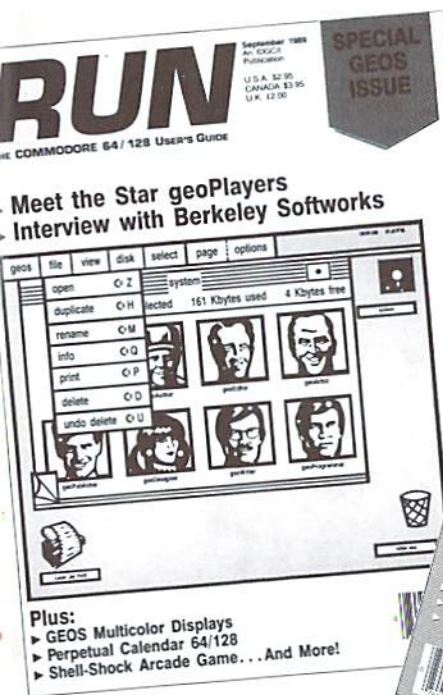


September-October 1989 Edition

# RE RUN

## RUN Programs on Disk

For the C-64 and C-128



Plus: Extra Bonus Programs!

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# Introduction

*September–October '89 ReRUN*

I LOOK FORWARD to compiling the programs for each new edition of ReRUN mainly because the software is so varied and interesting. In this issue, you'll find a number of games, with a fair sampling for both the C-64 and C-128, and I can testify that they are good ones. As a balance, we've included a couple of GEOS utilities and various other useful programs. As with all of our ReRUN disks, you'll find that this one contains an excellent selection of programs to make your C-64 and C-128 a more interesting and productive experience.

The feature article in the September issue of *RUN* concerned outstanding people who create and use GEOS, and both that issue and this disk contain one of the best and most useful GEOS utilities we have published to date: geoSlides. Run the program and follow the prompts, and it'll write a copy to your GEOS work disk. You'll then be able to display high-resolution Doodle! graphics and multi-color Koala graphics files from within the GEOS environment. As a bonus, you can also display RUN Paint med-res and hi-res screens from within GEOS by loading them into geoSlides.

For Commodore users, myself included, who are always looking for new disk drive utilities, we offer Quikmat, a high-speed, machine language disk formatter for the C-64. Since it resides in memory as a transparent utility, programmers can incorporate it into their own programs as a fast disk-formatting option.

Next on the disk is another September program, called Day-of-the-Week Calendar, which provides a rapid way for you to find the day of the week when some special past event occurred, or upon which a future holiday will fall. It can be used in either 64 or 128 mode.

Then you'll find Word Wonder, a game for both C-64 and C-128 modes that's lots of fun for both kids and adults. Given the first letter of a five-letter word, try to determine the word by five successive trials at typing in the other letters, aided by the program continually showing you where you've placed letters correctly.

Following that is one of the best two-player games I've found in years: the C-64 game entitled Shell Shock, but also known as Gantry.



It requires two joysticks and both a defensive and offensive posture. The defensive stance is needed to avoid getting hit by your opponent, while offense is also crucial, since you must destroy your opponent's tank to win. Challenge your friend, co-worker or spouse to a rousing round of Gantry, and you'll release all your aggression.

The final September program is Match Games, for the C-128, a surprisingly difficult concentration game, in which either one or two players must locate the positions of patterns and colors within an array in a limited amount of time.

October is represented first by another GEOS program, geo-Invaders, a game that puts to rest the wrong assumption many users have that GEOS can't display color on the C-128 80-column screen.

This is followed by Functional Keys, which allows the C-64's keys to be assigned keywords and commands similar to the C-128's Key command. Furthermore, it offers Key-on and Key-off commands for toggling the utility on and off.

Next comes yet another C-64 game, called Maze Run. This innovative program creates random mazes that you must traverse in a minimal amount of time without retracing your steps. The playability and appearance of the screen are of commercial quality.

The final October entry is 3-D Surfaces, which gives you a look at the world of graphics on the C-128 in 40-Column mode. With it, you create one of eight graphic landscapes in low, medium or high resolution.

The first bonus program in this edition is The Battle, a two-player game for the C-128, with a nuclear war scenario that provides an animated enactment of bombing and capturing regions of the United States. While it might not be the most uplifting game we ever published, the graphics and animation are first-rate.

Finally, our second bonus offering is a GEOS-compatible program that squeezes a density of 120 dots per inch out of your printer from within GEOS, even if your printer is not normally configured to provide that high a resolution. We consider this a small breakthrough in printer-driver technology for GEOS.

That's all for now. I'll be back before you know it with the next edition of ReRUN.



*Technical Editor*  
ReRUN



# Directory

PAGE	DOCUMENTATION	DISK FILENAME	FILE TYPE
		*MENU 128 _____	BASIC
		MENU 64 _____	BASIC
1	# GEOSLIDES	GEOSLIDES _____	BASIC
3	QUIKMAT	QUIKMAT _____	BASIC
3	DAY-OF-THE-WEEK CALENDAR	CALENDAR 64/128 _____	BASIC
4	WORD WONDER	WORD WONDER _____	BASIC
5	SHELL SHOCK	GANTRY _____	BASIC
		GANTRY LIST _____	BASIC
		GANTRY.ML _____	ML
6	MATCH GAMES	*MATCH GAMES _____	BASIC
8	# GEOINVADERS	*GEOINVADERS _____	BASIC
9	FUNCTIONAL KEYS	FUNCTIONAL KEYS _____	BASIC
		F-KEY.LIST _____	BASIC
		KEY64 _____	ML
10	MAZE RUN	MAZE RUN _____	BASIC
		MAZE RUN.LIST2 _____	BASIC
		MAZE.OBJ _____	ML
11	3-D SURFACES	*3-D SURFACES _____	BASIC
12	£ THE BATTLE	*THE BATTLE _____	BASIC
		*ML-BATTLE _____	ML
13	#£ CUSTOMIZER: A GEOS 120-DPI PRINTER DRIVER	CUSTOMIZER _____	BASIC
		PRT.OBJ _____	ML

\* — C-128 mode only

£ — Bonus program

# — Requires GEOS

Before you run a program, carefully read the documentation that pertains to it.



# How To Load

## LOADING FROM MENU

To get started, C-64 users should type LOAD "MENU 64",8 and press the return key. When you get the Ready prompt, the menu is loaded and you should type RUN to see a list of the programs on your disk. C-128 users need only press the shift and run-stop keys. When all the programs are displayed on the screen, you can run the one you select by pressing a single key.

## LOADING FROM KEYBOARD

If you do not wish to use the menu program, follow these instructions.

**C-64:** To load a C-64 program written in Basic, type: LOAD "DISK FILENAME",8 and then press the return key. The drive will whirl while the screen prints LOADING and then READY, with a flashing cursor beneath. Type RUN and press the return key. The program will then start running. To load a C-64 program written in machine language (ML), type: LOAD "DISK FILENAME",8,1

**C-128:** All C-64 programs can be run on the C-128 as long as your computer is in C-64 mode. All C-128 programs are clearly labeled on the directory page. Your C-128 *must* be in C-128 mode to run these programs. To load a C-128 mode program, press the F2 key, type the disk filename and then press the return key. When the program has loaded, type RUN.

## MAKING COPIES OF ReRUN FILES

Many programs on your ReRUN disk have routines that require a separate disk onto which the program writes or saves subfiles. To use these programs, you must first make a copy of the original program onto another disk that has enough free space on it to hold these newly written subfiles.

It's simple to make a copy of a Basic program. Just load it into your computer as outlined above, and then save the program back onto a separate disk that has plenty of free space for extra files.

Copying an ML program is not so simple. You cannot simply load and save an ML program; you'll need to use a disk-backup utility program, such as the one on your Commodore Test Demo disk.

# geoSlides

*By Joe Buckley*

SINCE PURCHASING GEOS V1.2, I've developed the annoying habit of trying to do most, if not all, of my computing from within GEOS. When I come across something that supposedly "can't be done" in that environment, I attempt to write a program to fill the gap.

For instance, I like to view Doodle! and Koala files (both uncompressed and compressed versions) on my C-64. Normally, I do this with the help of the public domain display/conversion utilities DKCOMPRESS and DKSLIDE. But because I'm handy with geo-Programmer, I decided to look for a way to view the Doodle! and Koala files from within GEOS. This program, geoSlides, is the result.

## PICTURES ON DISPLAY

GeoSlides is strictly a display utility; it cannot perform file conversions. (For a conversion utility, see my "Import Runner" program on RUN's GEOS Power Pak II disk.) GeoSlides lets you display both normal (uncompressed) and compressed Koala- and Doodle!-format files.

Because the display is completely automated, standard file-naming conventions must be followed: Normal Doodle! files must have the "DD" prefix; compressed Doodle! files must begin with "JJ"; and compressed Koala files must start with "GG". Uncompressed Koala files, however, are an interesting exception to the conventions.

If the file to be viewed doesn't conform to the above conventions, then it's automatically assumed to be an uncompressed Koala file. This is due to the fact that standard Koala filenames all begin with a nonstandard graphic character that tells the C-64 to print orange text. Under GEOS, since the graphic character is not recognized, it causes garbage characters to be displayed. For example, try renaming one of these files under GEOS. You can do it, but the display looks weird.

If you wish to avoid this corruption of the display, you can rename the Koala file to whatever you want, as long as the first two characters



don't match any of the above conventions.

Just as RUN Paint can load and display Doodle! and Koala files that have been renamed, geoSlides can display RUN Paint screens if they're renamed to conform to the standards above. Only the high-resolution screens need to be renamed to the Doodle! standard; the multi-color, Koala-compatible files will be displayed in accordance with the above assumption.

## MODES OF OPERATION

GeoSlides has two modes of operation. In View mode (Commodore/V), you're given a dialog box from which you can select and view any one of the first 160 Commodore DOS files. (These are the files with the default CBM logo file folder as an icon.) You don't have to tell geoSlides what type of file you wish to view; it makes the proper display decisions based solely on the filename. The file remains displayed until you press the mouse button, which returns you to the file-handler dialog box and highlights the file you just viewed.

In Slide mode (Commodore/S), you're given a slide show of the first 160 files on the current disk, each remaining on the screen for approximately ten seconds. If you want to abort the present file but continue the slide show, click the mouse button quickly, and you'll move on to the next. To abort the show and return to the main menu, hold down the mouse button.

The Slide option assumes the default drive, and will not prompt you for the drive you want to display from in a multi-drive system. To view files on another disk or drive, first go through the View option's dialog box and select Disk or Drive. In an REU-equipped system, the file handler allows you access to three disk drives.

Thanks to the GEOS turboDOS routines, geoSlides can load a file almost three times faster than DKCOMPRESS or DKSLIDE.

GeoSlides displays the Koala-format files using the VIC II chip's multi-color, medium-resolution Graphics mode. To my knowledge, this is the first program to do so from within GEOS.



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RUN it right: C-64; 1541 disk drive

# Quikmat

*By Stacey Hughes*

LET'S FACE IT: Formatting a disk the usual way wastes time. Why not use Quikmat? This C-64 utility lets you format a disk on your 1541 drive in about 15 seconds, markedly faster than the normal 90- to 120-second time.

When you're ready to use Quikmat, run "QUIKMAT" from Menu 64. Then, following the screen instructions, insert the disk to be formatted in the drive, enter the name and ID number you want it to have and press return. In about one-sixth of the usual time, you'll have a newly formatted disk, enabling you to move on to more important things.

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RUN it right: C-64 or C-128 (in 40-Column mode)

# Day-of-the-Week Calendar

*By James Schwartz*

HOW OFTEN HAVE YOU fumbled through almanacs looking for a perpetual calendar that shows a past or future year, or needed to know on which day of the week someone was born? Well, no more searching when you use Calendar 64/128, a program that instantly displays any month in any year from 1950 to 2050. Calendar can be used in Direct mode or easily added to your own programs. It's especially helpful with word processing and financial programs, where quick access to a calendar is sometimes needed.





## FINDING A DATE

To load the C-128 version of Calendar into memory, select "CAL64/128" from Menu 128. Then activate it with BANK15:SYS4864,M,Y, where M is the month (1-12) and Y is the year (0-99) you want to see. Note that when Y is 0-49, the year displayed will be in the range 2000-2049; when Y is 50-99, the year will be 1950-1999.

To use the C-64 version of Calendar, load "CAL64/128" from Menu 64 and access it with POKE180,M:POKE181,Y:SYS49924, where M and Y are the desired month and year.

You can scroll through the months with the cursor keys; press cursor-up to increment the calendar (move ahead) and cursor-down to decrement (move back). When you're finished using Calendar, press the space bar to return to your previous screen.

## PROGRAM NOTES

The program displays a white calendar on your current background screen color. You can change the color of the calendar by entering the command POKE4899,C for the C-128 or POKE49955,C for the C-64. C is the color number you want, from 0 to 15.

Both versions of Calendar reside in memory locations generally considered safe from Basic programs. However, if you're using it with other machine language programs, you should be aware of Calendar's locations. The C-128 version resides in 4864-6199, bank 15, and the C-64 version is stored in 49700-51035.

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RUN it right: C-64 or C-128 (in 40-Column mode)

# Word Wonder

*By Jason Scott*

IF YOU LIKE PLAYING with words, you'll get a kick out of Word Wonder, a two-player guessing game that's educational for children and just plain fun for adults. It's also easy to learn and to play, and the program is relatively short, so it doesn't take long to type in.

The object of Word Wonder is to guess five-letter words, most of which have no two letters the same. The program displays the first letter of a word, then gives you five tries to correctly guess the other four. In each try, you type five letters and press the return key. The program then jumps down a line and redisplay the letters you got right in the positions in which you placed them. Those in the correct position for the word you're guessing appear in red, and those in the wrong position appear in green. Blanks are left for the letters you haven't guessed yet.

When you guess a word, you earn a point and another turn. When you don't guess it in five tries, the program displays the word and passes control to your opponent. To begin the next turn, press the return key. The first player to reach 20 points wins.

After playing several times, you may start to recognize words. If so, you can change the ones I supplied by replacing them in the Data statements.

See what kind of strategy you can come up with, and E \_ J \_ \_ !

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RUN it right: C-64; two joysticks

## Shell Shock

*By Colin Adams*

THE CLATTER AND CLANK of metal treads will fill your imagination, if not your ears, as you play Gantry, a two-person game depicting an intense tank battle. A C-64, two joysticks and a friend are required to play.

The game screen shows two tanks separated by two lines of rubble. Your mission is to shoot through the rubble and reduce your opponent's tank to scrap metal.

Joystick 1 controls the left tank, joystick 2 the right. Using your joystick, move your tank up and down the screen to position it for firing and to dodge incoming shells. Press the firebutton to shoot, with accompanying sound effects.

To destroy the enemy, you have to bring down some rubble, but watch out—each shot makes your tank more vulnerable!



Every time a tank is hit, its damage indicator at the top of the screen increases—from none to minor to medium to severe to scrap. When one tank is finally reduced to scrap, the game is over.

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RUN it right: **C-128 (in 40-Column mode); joystick**

# Match Games

*By Leonard Morris*

**MATCH GAMES IS A SERIES** of nine colorful pattern-matching games for one or two players. In One-Player mode, you race against a timer to make 25 pattern matches; in Two-Player mode, you race against your opponent. Each game, played with joysticks, features a different type of pattern and offers three difficulty levels. Easy-listening music complements the graphics.

## HOW TO PLAY

When playing Match Games alone, plug your joystick into port 2; when playing an opponent, players 1 and 2 use ports 1 and 2, respectively.

The program starts by asking how many players there will be, their names and the difficulty level desired. Then it displays a menu of the nine games. After you make your choice, a patterned background is drawn, followed by a game board with the first of 25 patterns to be matched on the right and an array of 25 possible matches on the left. Within the array, there appears a large square cursor for each player.

To make a match, use the joystick to move your cursor to the pattern in the array that you think matches the pattern on the right, then press the firebutton. If you're right, a beep will sound and another pattern will appear on the right; if you're wrong, a buzzer will sound and you can try again. There's no penalty for a mistake except losing time. It helps to focus on only one area of each pattern, rather than the whole thing.

In a one-person game, the timer is first set at three minutes. When you better that, your time becomes the one to beat. In other words,



the better you get, the better you must become. The timer and the time to beat are always shown at the bottom of the screen. The game is over when time runs out or you've matched all 25 patterns.

The two-player game has no time limit; the only object is to make matches faster than your opponent. The game is over when the 25 matches have been made. Note that when two are playing, the cursors are distinguished by brightness; if they aren't sufficiently different, adjust the brightness control on your monitor.

At the end of play, the menu reappears so you can select another game. You can also change the number of players and difficulty level at this time.

## THE CHOICES

The nine Match Games and the types of patterns they feature are:

1. **Shapies**—these are black geometrical shapes within lighter geometrical shapes.

2. **Colors**—blocks composed of three bands, each of a different color chosen from a field of eight.

3. **Letters**—three-by-three blocks composed of the letters T, U, V, W and X.

4. **Numbers**—three-by-three blocks composed of the numbers 4, 5, 6, 7 and 8.

5. **Pointer**—three-by-three blocks of horizontal and vertical arrows. I find this game the hardest.

6. **Diangie**—blocks filled with diagonal lines criss-crossing each other.

7. **Perpend**—blocks filled with horizontal and vertical lines, some intersecting, others passing over and under each other.

8. **Curlies**—blocks filled with curvy lines.

9. **Rectang**—blocks filled with small rectangles of various sizes.

The three difficulty levels are:

**Easy**—where all but the Colors patterns appear in white against a black background, providing good contrast, and where patterns disappear from the array as they're used, to reduce confusing clutter.

**Hard**—where all but the Colors patterns appear in the screen border color against a patterned background, and where patterns remain in the array after being used. In Colors, the colors in each block are chosen from five, not eight, possibilities, so they're less easily distinguished.

**Extra-hard**—like Hard, except the pattern to be matched keeps flashing in various colors.



Don't start playing Match Games unless you have plenty of time. You're sure to get hooked into trying each one.

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RUN it right: C-128 (80-Column mode); GEOS; mouse; keyboard or joystick for input

# geoInvaders

By William Coleman

ONE OF THE QUICKEST ways to convince me to write a program is to tell me it can't be done. Recently, a friend of mine mentioned that it's too bad GEOS 128 has only a monochrome screen. I told him that it has color; unfortunately, no one utilizes it. Unbelieving, he said it must be impossible because *everyone* says GEOS 128 doesn't have color.

I couldn't let this mind-set continue, so I created geoInvaders—an 80-column, color, arcade-style game for GEOS 128 that's a variation of the classic Space Invaders game.

Run geoInvaders from Menu 128; then place a GEOS disk in drive 8, making sure that it's a 1541 or 1571 drive and *not* a 1581. Then run the program; it creates geoInvaders on the disk.

To play, simply double-click on the geoInvaders icon from the 128 deskTop. (Take note that this program will *not* run with GEOS 64.) If you're not in 80-Column mode, the deskTop asks if you want to switch. Once the playing screen is drawn, you'll see four icons: New, Play, Info and Quit. To start or continue a game, click on the Play icon. To pause, press escape. Click on New to set up a new game.

The current and high scores are displayed, along with the number of the present round. S's located to the right of the round indicate the number of ships remaining.

The keyboard or mouse are the best input devices to use with geoInvaders. A joystick doesn't work as well—it's a bit jerky when the screen is full.

I hope this program puts to rest the misconception that GEOS 128 can't display color on an 80-column screen. Enjoy!

# Functional Keys

By Andrew Little

USER-DEFINABLE FUNCTION KEYS are a boon to C-128 programmers, but unfortunately the C-64 doesn't offer them. My Function Key 64 program fills that gap. Written in 6502 assembly language, it lets you define the eight function keys on the C-64 just as on the C-128.

The program resides at memory address \$C000, so the SYS 49152 command turns it on. QUIT turns it off until you SYS 49152 again.

Enter the word KEY to display a list of the eight function keys as they are currently defined. Table 1 shows the definitions I've given them.

How do you install your own definitions? Try typing KEY 2, "LOAD"+CHR\$(34)+"\$"+CHR\$(34)+"8"+CHR\$(13)+"LIST"+CHR\$(13) and pressing return. You have just defined F2 to print the following:

```
LOAD "$",8 <RETURN>
LIST <RETURN>
```

Now press F2 and see what happens. A listing of the disk directory appears, right? Wrong. Unlike user definitions on the C-128, these can be turned on and off as desired, which lets you run programs that expect the function keys to do what Commodore said. KEYON turns them on, and KEYOFF turns them off.

**Table 1. Function keys as defined in the program.**

Key 1	—LOAD
Key 2	—undefined
Key 3	—SAVE
Key 4	—undefined
Key 5	—LIST+CHR\$(13)
Key 6	—undefined
Key 7	—RUN+CHR\$(13)
Key 8	—undefined



Your definitions must consist of strings in quotes, such as "LIST", and character controls, such as CHR\$(13), tied together with plus signs. Follow the same rules as for assigning string variables. You can assign up to 25 characters to each key. For example, "LIST" counts as four characters and CHR\$(13) as one. If you assign more than 25 characters to a key, it will overwrite the following key.

Add Function Key 64 to your programming repertoire. With it, you can make your programs a lot more versatile!

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RUN it right: C-64; joystick

# Maze Run

*By Lysle Shields*

WHETHER YOU'RE AN OLD maze addict or have just come to the pastime, Maze Run will amuse you for hours with its infinite supply of puzzles to be solved in a race against the clock. As you start the program, it generates a new maze every two seconds until you press the space bar to select one. Then you must maneuver the glowing ball—with a joystick in either port—from the upper-left corner of the maze to the E in the lower-right corner within the time allotted and with the least retracing of steps.

Each time the ball passes a fresh space, the computer emits a beep and adds a point to your score. If you send the ball back over a previously traveled space, a lower-pitched beep sounds and you lose a point. If the ball passes through the same space several times, you lose a point each time, but Maze Run doesn't use negative numbers, so your score can't go below zero.

When the ball reaches the E at the end of the maze, you get a bonus of 100 points for each second left on the clock. If you run out of time, the game ends, and you can choose another maze.

At first, a full minute is allowed, but whenever you complete a maze before time runs out, the program calculates the allotted time for your next race by adding five seconds to one-and-a-half times the seconds you had left.

As you play, the top of the screen always shows your highest score

so far in the session, the number of seconds left to solve the current maze and your score so far for the current maze.

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RUN it right: **C-128 (80-Column mode)**

# 3-D Surfaces

*By Brandon Corfman*

HAVE YOU EVER BEEN awed by those three-dimensional surface models in science-fiction movies and wished you could do the same on your home computer? Now, with 3-D Surfaces, you can create your own landscapes on your C-128. Using the multicolor screen, the program can generate surface models at three levels of complexity—and even turn them upside down!

## USING THE PROGRAM

When you run 3-D Surfaces, the program gives you a choice of several options. First, you can plot any one of eight different landscapes by pressing numbers 1 to 8 on the keyboard. You're next asked whether you want to plot your chosen landscape in low, medium or high resolution. (The higher the resolution, the longer your 128 takes in calculating and drawing time.) The final option is whether to plot the surface upside down. Once you've answered yes or no to this question, you're well on your way.

To decrease execution time, 3-D Surfaces kicks the 128 into Fast mode for making all its calculations. Unless you are using the highest resolution, however, the computing time should not be very long. If you have an RGB monitor, you can track the program's progress on the 80-column screen. The program returns to Slow mode when it's ready to plot.

## SAVING AND LOADING SCREENS

If you like a particular screen and want to save it to disk for use in your own programs or for later viewing, just break out of the program with the run-stop key and use the following command, with your own filename in place of "picture."



BSAVE "picture",B0, P7168 TO P16383

To load the same screen for viewing, use these commands:

BLOAD "picture":GRAPHIC 3

I hope you enjoy the landscapes 3-D Surfaces provides.

---

RUN it right: C-128 (in 40-Column mode); two joysticks

# The Battle

*By Leonard Morris*

THE BATTLE IS A STRATEGY GAME for two or three players. Your objective is to control all the regions (territories) on a map.

Play begins with each participant choosing a different color for identifying his or her territories, which can be randomly distributed by the computer, or players can alternate in selecting them. Player 1 plugs his joystick into port 1, and player 2 plugs into port 2. If you are player number 3, you use the numeric keypad as a joystick, with number 5 as your firebutton and the keys around 5 for selecting directions (8 is up, 6 is right, and so on).

Initially, each player is given one army per territory. After they have claimed all the territories, the players take turns in placing an additional 64 armies, 16 at a turn. A maximum of nine armies can be positioned on any one territory. A word of caution: It is not wise to place all your armies in one area. You'll see why as you read on about your and your opponent's options.

Prior to selecting their deployment action, players are given still more armies to place on their territories. The number given is determined by the number of territories they occupy and the different zones they control: one army for each territory and seven armies for each zone. There are 12 zones on the battlefield, but I'm not going to tell you which territories make up the zones!

After placing these armies, the action begins with the first player selecting one of these options: attacking opponents (Attack), "nuking" an entire area (Radiation), or transferring armies from one territory to another (Evacuation).



You select the first option, Attack, by pressing the A key. From there, you use your joystick to choose the base from which to launch your attack. After moving to that base, press the firebutton. If your base has more than one army, you'll be prompted to choose a target territory for your attack. If you already own the territory you select, or if it doesn't border your selected base, then you won't be able to complete this option.

The battle now automatically begins. It will stop only if you press the asterisk key, pausing the action, or if you're reduced to one army. The attack will also cease if you defeat your opponent's armies. You'll then control the target territory, and half (or more) of your attacking force moves to the newly owned territory. You can continue to use the Attack option as long as you wish or can legally attack, but once you use either option 2 or 3, it becomes the next player's turn.

The second option is called Radiation. This lets you nuke an area. All territories that border your currently selected base experience a drastic reduction in armies. In fact, when the smoke clears, you'll see that there will only be one army left in each of the nuked territories.

The third option, Evacuation, lets you move armies from any one of your territories to another. However, you can do this only once per turn, so I'd advise that you make this your last action, *after* you've finished attacking.

The winner of the game is the player who ends up owning every area on the map.

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RUN it right: C-64; GEOS 64

## Customizer: A GEOS 120-dpi Printer Driver

*By Stephen Allen*

LOVE IT OR HATE IT, you can't ignore the fact that GEOS has provided a new lease on life for the venerable Commodore 64 computer. But even with all the features GEOS offers, most of its



users have at least a short wish list of desired improvements and upgrades. Perhaps number one on that list is a printer driver that will improve the print quality of GEOS applications. After all, isn't it the final printout that is most important?

The fact that GEOS is based on 80-dpi (dots-per-inch) resolution, whereas most Commodore-compatible printers are 60 dpi, is perhaps the most limiting factor for those of us who own 60-dpi printers. Probably you remember the anticipation of printing that first geoPaint masterpiece, only to find that what you saw was not what you got.

If you have a 60-dpi printer that is capable of 120 dpi, eight-bit graphics, then get ready to take a giant step up in the print quality of all your GEOS applications. With this custom printer driver, you can print all of your geoPaint and geoFile documents and use the default margins and tabs of geoWrite. In fact, this printer driver will print full page, 120-dpi graphics in all GEOS applications, while improving the proportions of the graphics printout.

## USING THE PROGRAM

To use the custom printer driver, you load CUSTOMIZER from Menu 64. Before running the program, you must do a little preparation. First, you need a blank GEOS-formatted disk. Second, dust off your printer manual and keep it handy.

When you run Customizer, it will pause while loading the machine language program, then present you with a list of options. If you own one of the printers listed, simply choose that option. You are then asked if you wish to save the printer driver or edit any of the parameters. If your printer is listed, the only option you might want to change is the device number. When you're ready to save the printer driver, press the S key to write it to the GEOS-formatted work disk.

If you own a printer that's not included in the main menu, simply select the Other Printer option. The Customizer will present you with a series of questions. By entering the correct information from your printer manual, you'll be able to tailor the driver to your particular printer.

## THE CONTROL CODES

After you enter a printer name, the Customizer will ask for the printer control codes for NLQ mode, line spacing, 120-dpi Graphics mode, printer initialization code and, finally, the device number.



Enter the decimal value for each control code, separating the code numbers with commas. The program expects a four-byte code for each command, so if your printer uses less than four bytes for any of the commands, you must enter the trailing zeroes.

For NLQ, enter the near-letter-quality command for your printer. If your printer does not support NLQ mode, simply enter four zeroes, separated by commas.

Next, you enter the command code for  $\frac{8}{72}$  lines per inch. Some printers do not provide for  $\frac{8}{72}$  per inch line spacing; if your printer does not, you need to convert  $\frac{8}{72}$  to the correct value for your printer. Just enter the converted value.

When prompted for the 120-dpi code, do not enter it exactly as listed, for the code listed in your manual probably includes two trailing bytes (e.g., 27, 76, n1, n2), which tell the printer how many bytes of graphics data to expect. Enter zeroes in place of the byte-count codes (27, 76, 0, 0 for the above example). The printer driver will supply the correct codes for printing.

The next control code, Initialize Printer, is the command to reset your printer to its default settings. Simply enter it as listed in your printer manual.

Finally, you're asked for the device number you wish to use. You have the choice of either device 4 or 5. The only reason you might want to use device 5 is if you use two printers with GEOS. The device number you enter is the only device that the printer driver will work with. If you use two printers and often switch their device numbers, you may want to customize two different printer drivers so you can use a printer no matter what device number it might have. If you do this, be sure to give each driver a descriptive name to avoid confusion.

After you supply answers to all the questions, the Customizer gives you the option of saving or editing the printer driver. If all is correct, simply press S to save the printer driver to disk. Be sure to insert a blank GEOS-formatted disk when prompted.

When the printer driver has been written to disk, you're given the choice of exiting to Basic or booting GEOS. If you'd like to try out the printer driver, boot GEOS, and then copy the printer driver to your application disk. Make sure you select the custom printer driver before going to any application. That's all there is to it. ■





# **RE** **== RUN**

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