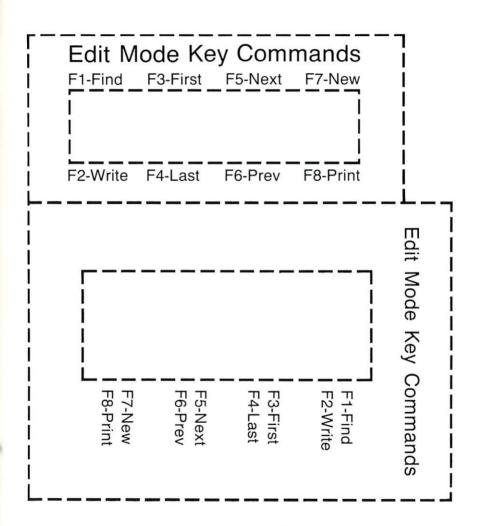# RUN's
# SUPER STARTER PAK

# Seven programs that meet all your essential computing needs.

**Word Processor. . .Database. . .
Spreadsheet. . .Terminal Program. . .Paint and
Draw. . .DOS Shell. . .Mailing Label Program**

❖

All programs for both C-128 and C-64 modes.

# Edit Mode Key Commands

F1-Find    F3-First    F5-Next    F7-New

F2-Write    F4-Last    F6-Prev    F8-Print

**Keyboard overlays for RUN File 1.0.**

# Introduction

## Welcome to RUN's Super Starter Pak, 1989

WHETHER YOU'RE A PROUD new Commodore owner or a seasoned C-64 or C-128 user, we're sure you'll find *RUN*'s Super Starter Pak a gold mine of useful applications. Here, in one handy package, is a full spectrum of *RUN*'s most powerful programs, meeting almost any need you may have in bringing high productivity to your personal or small-business computing. And all seven programs will run on either the 64 or 128.

Leading off is RUN Script Plus, our first-rate word processor that now includes a spelling checker and user-expandable dictionary. Following that comes RUN File, a comprehensive database you can use for collecting, organizing and printing all sorts of records. Then, to simplify any sort of number handling you must do, we include RUN Calc, our popular and effective spreadsheet program.

For all those of you involved in telecommunications, we offer RUN Term, an extremely user-friendly terminal program that will enable you to go online in style. And for all the artists out there who want to create dazzling screen images, RUN Paint fills the bill as the most sophisticated graphics program that you can find in any computer publication.

We also include an extremely practical program in RUN Shell, a versatile disk-operating-system utility that you can use with any Commodore disk drive. Finally, we present Label Base, a top-notch mailing label program.

We hope the programs on this Starter Pak disk will bring you the same computing satisfaction that they have provided for thousands of *RUN* readers in the past.

—Editors

# Directory

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

# How To Load

All C-64 programs are on side 1 of the disk, and all C-128 programs are on side 2.

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. For the C-128 menu, users need only press the shift and run-stop keys. When all the programs on either menu are displayed on the screen, you can run the one you want by pressing the appropriate key.

# RUN Script Plus *see inside Front Cover*

*By Robert Rockefeller*

RUN SCRIPT 64 & 128 were substantially upgraded following their initial publication in *RUN*. New features included a spelling checker equipped with a dictionary-maintenance utility; label-printing and RAM-expander capabilities; and the ability to load files and issue disk commands from a disk-directory listing.

The first part of the following documentation reviews the operation, commands and features of the main RUN Script Plus word processing program. Those readers who are already familiar with RUN Script may wish to proceed to the section on the new commands and, following that, to the description of the spelling checker and dictionary.

## LOADING PROCEDURE

Following the loading directions on the opposite page, C-64 users load and run RUNSCRIPT 64, a machine language program. Similarly, C-128 users load and run RUNSCRIPT 128.

As you're reading this documentation, keep in mind that when two names of keys are separated by a slash, the keys should be pressed simultaneously. When they are separated by a comma, the keys should be pressed one after the other.

## EDITING FUNCTIONS

RUN Script Plus offers many editing functions, which I tried to keep as intuitive as possible.

RUN Script Plus uses one line at the top of the screen to display prompts, operation and error messages. This leaves 24 lines free for displaying text. About 34,000 bytes are available for storing text in the C-64 version, and about 65,000 bytes in the C-128 version.

## ABORTING OPERATIONS

You may abort almost any operation, including saving, printing and loading text, by pressing the CTRL key along with the Com-

modore key. About the only operation you can't stop is the replace-string function, once replacing has begun; but pressing the CTRL/Commodore key combination during the input stage of this function will abort it.

In RUN Script Plus, the restore key aborts operations but has been modified from earlier versions of RUN Script. See the section marked $ under New RUN Script commands.

## MOVING THE CURSOR

In RUN Script Plus, seven keys and key combinations function as cursor controls. These include the four cursor keys (eight on the C-128), the home key, the CTRL/back-arrow combination and the shift/return combination. To use the CTRL/back-arrow, press the CTRL and back-arrow keys together; likewise, press the shift and return keys simultaneously for shift/return.

**Cursor keys**—By pressing the cursor-down key or the (shifted) cursor-up key, you can scroll vertically through the text area. By pressing the cursor-right-and-left key, you can move the cursor horizontally.

With RUN Script Plus's word-wrap feature, a given screen line may have anywhere from one to 79 spaces at the end of it. The empty spaces appear as small dots that don't exist in the text area in memory, but are printed to the screen to pad out the line. When moving the cursor horizontally, you'll find it will skip over these small dots.

**Shift/return**—This key combination moves the cursor to the start of the next line.

**Home**—Pressing the home key once moves the cursor to the upper-left corner of the screen. Pressing it twice moves the cursor to the start of the manuscript.

**CTRL/back-arrow**—Pressing the CTRL and back-arrow keys moves the cursor to the bottom-left corner of the screen, and pressing this combination twice moves the cursor to the end of the text.

## INSERTING TEXT

There are three ways to insert text with RUN Script Plus:

**Shift/INST**—Simultaneously press- ing the shift key and the INST key inserts one space at the position of the cursor.

**CTRL/I**—Pressing the CTRL key and the I key toggles you in and out of Insert mode. Whenever you press a key in this mode, a character is inserted at the cursor position.

**Run-stop**—When you need to insert text at the start of a long document, press the run-stop key to insert a block of 200 spaces. To insert more than 200 spaces, press the run-stop key continuously until the insert block is large enough to suit your needs.

**Shift/run-stop**—This key deletes a block of inserted spaces. Just position the cursor at the beginning of the block and press shift/run-stop.

## DELETING TEXT

The four methods of deleting text with RUN Script Plus are:

**DEL**—Pressing the DEL key deletes the character to the left of the cursor.

**F7**—Pressing F7 also deletes the character under the cursor, and the cursor does not move.

**F8**—Pressing F8 deletes a block of text. Position the cursor over the first character of the section of text you wish to delete and press F8. A "delete block" message will appear on the status line. Then move the cursor to the last character of the block you want deleted and press the return key. The block of text will be removed, but not yet lost, in case you change your mind.

The deleted block is copied to a buffer at the top of memory. To retrieve the block, press F6 twice. A "select insert point" message will then appear on the status line. Move the cursor to where you want the deleted text to appear and press the return key again.

**F8,F8**—Pressing F8,F8 will delete all text from the cursor position to the end of the text area. You will be prompted to answer y/n before erasing is performed. You can abort both F8 key functions without deleting any text by simultaneously pressing the CTRL and Commodore keys.

## MOVING AND COPYING TEXT

**F5**—To move a block of text, position the cursor over the first character of the block and press F5. A "move block" message will appear. Then move the cursor to the last character of the block and hit the return key. The text will be deleted and a "select insert point" message will now appear. Position the cursor where you want the text inserted, press the return key, and the block of text will appear in the new position.

**F6**—To copy a portion of the text in memory to another position, press F6 once after positioning the cursor over the first character of the block to be copied. A "copy block message" will appear on

the status line. Next, move the cursor to the last character of the block to be copied and hit the return key. A "select insert point" message will be displayed. Move the cursor to the position where you want the block inserted, hit the return key, and the block will appear in the new location.

**F6,F6**—To insert the contents of the text buffer into your document, press F6 twice. After a "select insert point" message appears, move the cursor to the insert point and press the return key. The contents of the buffer will be inserted. This feature allows you to make multiple copies of the same text block or to recover a deleted block as explained above.

## SEARCH AND SEARCH-AND-REPLACE

**F2**—To search for a string between the cursor position and the end of the text, press F2 once and a "search string?" prompt will appear. Type in the string you wish to find, then press the return key. If a match is found, the cursor will appear over the match. If no match is found, a "string not found" message will be displayed. After entering a search string, you can search for multiple occurrences of the string by pressing F2 twice in rapid succession.

**F4**—Use F4 to replace strings within the text area. A search string and replace string will be requested as above, but at each occurrence of the search string, the string will be displayed so you can elect to replace it or bypass it.

**F4,F4**—This prompts you to input a search string and a replace string. After you've done this, all the occurrences of the search string from the cursor position to the end of text will be replaced by the replace string.

## CHANGING DISPLAY COLORS

To change the colors of the RUN Script Plus screen display, use the following key combinations:

**CTRL/1**—to change the text color.

**CTRL/2**—to change the background color. Changes C-128 screen color.

**CTRL/3**—to change the color of the status line.

**CTRL/4**—to change the border color (C-64 version only).

## OTHER EDIT FUNCTIONS

**Return**—Pressing the return key when entering text signals the end of a paragraph.

**CTRL/x**—This combination interchanges the two characters to the left of the cursor—a fast method of correcting transposed letters.

**CTRL/6**—This combination toggles RUN Script Plus in and out of Shift Lock mode. When the "*cap*" message is displayed on the status line, all alphabetic characters typed will be capitalized.

**CTRL/ = **—If you should want to replace the line-padding dots with some other character, press the CTRL and equals-sign keys simultaneously. A "*chr*" message will appear on the status line. Then type the replacement character, and it will replace the dots. Once this is done, you cannot retrieve the dots.

**HELP**—(C-128 version only). Moves the cursor to the other text area when the display is split. If it's in area 1, it'll move to area 2, and vice versa.

**CTRL/z**—Prints five spaces to the screen. This function is useful for indenting paragraphs.

**CTRL/u**—Enables you to select a new character to be inserted into the text area when you press the run-stop key. Type CTRL/u, then any character. The default character is the space.

**F1**—Pressing the F1 key after a prompt for a filename activates a screen-read feature.

Somewhere at the start of a document, within the first 256 characters, create a comment with the .cm dot command. Following the .cm command, type the document's filename surrounded by double quotes, such as .cm "0:filename".

When you save the file with the F1,@ or F1,s command, if you press the F1 key after the "filename ?" prompt appears, RUN Script Plus will read the filename from the screen into the input line. This saves you from having to type the filename every time.

## THE F1 KEY

When you press F1, a "command ?" prompt will appear. You then enter the letter corresponding to the function (as listed below) that you wish to execute.

**d**—F1,d selects the device with which all saving and loading will take place. This may be device 8 or 9, the disk drive. The default device is number 8.

**s**—F1,s saves text to the selected device.

**@**—F1,@ saves with replace. The old file is automatically scratched before the new file is saved.

**l**—F1,l loads a text file from the disk.

**a**—F1,a is an append function for combining a text file on disk

with the one in memory. The file coming from disk is appended starting at the cursor position and replaces any text that follows the cursor. (This append function is not intended for use with sequential files.)

**t**—F1,t selects whether characters will be output and input in ASCII or Commodore ASCII. The default mode is Commodore ASCII.

**w**—F1,w writes the text in memory to disk as either a sequential or a user file. If you want to save it as a sequential file, you must append the string ,s,w to the filename when entering the filename at the prompt. If you want to save the text as a user file, it's necessary to append ,u,w to the filename.

With the w function, you can write the text to disk using either Commodore ASCII or true ASCII, depending on how RUN Script Plus is configured. (See the t function, above.) Also, if you change file types between a read and a write, you need to rename the file. Finally, you can do a save-with-replace by inserting @0: before the filename. This is not recommended with the 1541, because of its DOS bug.

**r**—F1,r loads a sequential or user file from disk. Just enter the filename at the prompt.

**$**—F1,$ lists the disk directory. The $ command has been modified for RUN Script Plus. See "New RUN Script Commands."

**> or <**—F1,> issues a disk drive command, while F1,< reads the disk error channel.

**f**—F1,f reports the number of free bytes remaining.

**x**—F1,x exits to Basic.

**p**—F1,p prints text. After selecting the print function, you'll be asked how many copies to make. You can choose up to 99. Next, you'll be asked to select the output device. Output may be directed to device 3, the screen; device 4 or 5, the printer; or device 8 or 9, the disk drive.

If you select the printer or screen as the output device, you can output one page at a time. Simply answer n for no at the "continuous (y/n) ?" prompt. A "next output (c/p/s) ?" prompt will then be displayed before each page is output.

If you enter s for screen at this point, the next page will be printed to the screen. If you enter p for printer, the next page will be sent to your printer. If you enter c at the prompt, output from that point onward will be continuous, and the "next output (c/p/s) ?" prompt will no longer appear.

**0**—F1,0 loads a new character set. In Special Graphics mode, the business-graphics characters of this set would be printed using the printer's Dot Graphics mode.

**1–9**—F1,1 loads a new print set number 1. F1,2 through F1,6 load new print set numbers 2–6. F1,7 through F1,9 load new print set numbers 7–9, but work only in the C-128 version.

**Cursor-up** and **cursor-down**—F1 with the vertical cursor controls selects the Fast Scroll mode, which rapidly moves the text up or down. You leave this mode by pressing any other key, or abort it with the Commodore and CTRL keys.

**Cursor-left** and **cursor-right**—F1 with the horizontal cursor controls selects the Page mode. In this mode, pressing the cursor-right and cursor-left keys scrolls the text up and down 24 lines, respectively. Exit this mode by pressing any other key, or abort it by simultaneously pressing the Commodore and CTRL keys.

**c**—F1,c changes the case of all text from the cursor position to the document end. Uppercase letters become lowercase, and vice versa.

**R**—F1,R saves a copy of the table of redefined characters to the current save device. First, redefine characters with the .dc command (see the dot commands, below); then print the file to allow the .dc commands to execute; then save the table. Now you can load the saved characters at any time with the .lr command.

**o**—F1,o prints a document with one copy, output to printer device 4 and continuous output.

**Z**—F1,Z (C-128 version only) swaps text memory in RUN Script Plus's text area in bank 1 with the memory in bank 0. Pressing F1,Z again restores the original text. You can keep one text file in bank 1, one in bank 0, and switch between them with F1,Z. This permits up to 65,000 bytes of text to be stored in memory.

**M**—F1,M selects the macro characters that should be turned off before printing the left margin, a header or a footer. This prevents problems such as underlining in the left margin. RUN Script Plus expects the same macro letter to be used to activate and deactivate printer functions. For example, if underlining is turned on with uppercase U, a lowercase u is needed to cancel it, and vice versa.

At the prompt, just enter the macro characters—up to 13 of them—that need to be cancelled. Only enter the macros that activate functions.

**m**—F1,m loads a set of macros as defined with the Define Macros program (see discussion below). If you're using a C-128, you must

run Define Macros in C-64 mode, not 128 mode. However, the macros table it creates can be used with the C-128 version of RUN Script Plus.

**g**—F1,g enables and disables the Special Graphics mode.

**G**—F1,G selects the type of printer. If you have an MPS-803 or compatible, MPS-801, 1525 or MPS-1000 (Commodore mode), you answer yes at the prompt. Answer no if you don't have one of these printers. This function determines how RUN Script Plus will print dot-graphics characters.

**C**—F1,C selects the secondary address used to print dot graphics and sends macro command strings to the printer. Unlike the .ca dot command, this function changes the permanent secondary address inside RUN Script Plus.

**S**—F1,S splits the RUN Script Plus text display into two separate areas. Type F1, then S, and the prompt "how many text areas (1/2) ?" will appear. If you answer 1, RUN Script Plus will remain unchanged.

If you enter 2, the prompt "size of area two ?" will appear. You may choose any number from 1 to 18, and text area 2 will be allocated that many kilobytes of memory. Since all of the current text is erased before the splitting occurs, there is a third prompt in this function, "erase text (y/n) ?". If you enter y for yes, the text area will split, and the cursor will appear at the start of text area 1.

**A**—F1,A provides movement between the two text areas. At the prompt, enter either 1 or 2, depending on which area you wish to access.

**T**—F1,T selects the secondary address used to print text to the printer. Unlike the .ta dot command, this function changes the permanent secondary address inside RUN Script Plus.

**L**—F1,L specifies whether a line-feed character should be printed after each carriage-return character. Unlike the .lf dot command, this function changes a permanent flag inside of RUN Script Plus.

**q**—F1,q saves a copy of RUN Script Plus, including any printer macros, the current color settings, the current settings from the F1,S, F1,T, F1,G, F1,C, F1,L, F1,M, F1,d, F1,t, F1,g, CTRL/= and CTRL/u commands, and the settings from the .gc, .gb, .ge, .bs and .ff dot commands. To customize RUN Script Plus, use these commands to configure it, then save it with F1,q.

## DEFINING PRINTER MACROS

The printer-macro feature of RUN Script Plus enables you to

customize your copy of this word processor so you can take full advantage of whatever capabilities your printer may possess.

An idiosyncrasy of RUN Script Plus is that the printer must be turned on when output to the screen is taking place, because a file is always opened to the printer when you select output to the screen. If RUN Script Plus ever seems to "hang up" mysteriously during a printout, check your printer.

You may select any upper- or lowercase alphabetic character to be a macro character. You then create a table of printer macros with the Define Macros program. Each macro character represents a string of user-defined characters. When a macro character is encountered during printing, this string, rather than the macro character itself, will be sent to the output device.

For example, let's say you own a printer that requires the sequence ESC X (decimal values 27 and 88) to start printing double-width characters. With Define Macros, you can select a character—D, for instance—to represent this two-character string. Then, when D is encountered during printing, the decimal sequence 27,88 will be sent to the printer to produce double-width characters. You could define another character, perhaps d, to represent the sequence to stop printing double-width characters.

To create a double-width heading, first place the cursor in front of the heading, then press the F3 key. A "*mac*" message will appear on the status line. Next, press the upper- or lowercase alphabetic character you've chosen to activate the double-width capability (in my example, D). Finally, move the cursor to the end of the heading, press F3 again, and press the key you've chosen to deactivate the double-width feature (d, in my example).

Your table can consist of 52 different macro definitions, each of which can be from one to 20 characters long.

## CUSTOMIZING MACROS

Before running Define Macros, make a list of the alphabetic characters you want to represent the various functions your printer can handle. These will be your macro characters. Then run the Define Macros program.

First you'll be prompted to select a macro character. Enter any upper- or lowercase character from A to Z. (If you make a mistake and wish to cancel a macro definition, use the * key.) You'll then be asked how many characters will be represented by the macro character you've entered.

Next, enter the decimal value of each character in the string, starting with the first and continuing until all have been entered. Once you've done this, you'll have defined one macro. The prompt, "finished all definitions (y/n) ?" will then appear.

## DOT COMMANDS

RUN Script Plus is a post-formatted word processor. This means that the text is not formatted until it's printed, so your screen display will vary from your printout. To specify output format, RUN Script Plus has about 40 dot commands, so called because each command must be preceded by a dot (a period). These commands are embedded in the text to specify margin widths, define headers and footers, and so forth.

A dot command is executed when text is printed, and only text following the dot command is affected.

Four steps must be followed for dot commands to be interpreted correctly. First, the line immediately preceding a line of one or more dot commands must end with a return. Second, the line of dot commands must start in the first screen column. Third, multiple dot commands in a string must not be separated by spaces. Fourth, each string of dot commands must end with a carriage return.

The dot commands are:

**.lj**—Left-justifies printed text.

**.rj**—Right-justifies printed text.

**.cn**—Centers printed text between the left and right margins. Your text must begin on the next line below the .cn command.

**.pl**—Sets the page length. This command must be followed by a number from 1–240, to set the number of lines that will constitute a full page.

**.pw**—Sets the page width, defined as the maximum number of characters printed on one line.

**.lm**—Sets the left-margin width. The .lm directive must be followed by a number from 1–240.

**.rm**—Sets the right-margin width. The .rm directive must also be followed by a number from 1 to 240.

**.tm**—Sets the top-margin depth. It must be followed by a number from 1 to 240.

**.bm**—Sets the bottom-margin depth and must be followed by a number from 1 to 240.

**.hd**—Defines a header to be printed at the top of every page. The command may be followed by up to 255 characters and must end

with a carriage return. This means that the carriage-return character cannot be part of the header string and that no dot commands can follow the .hd directive, since they would be interpreted as part of the header string. For this reason, and to enhance readability, I recommend that the .hd and .ft (see below) dot commands appear on lines by themselves. The # character following the .hd (or .ft) has special significance. Entered just once at the beginning of a document, .hd# automatically prints the page number of each page.

The .lj, .rj, .cn, .pw, .lm and .rm dot commands have no effect on the header. The header string is printed exactly as defined, starting in the first column on the page and continuing until it has been printed in its entirety. If, for example, you wish to center a title, the title must be preceded by the correct number of spaces.

You may embed macro characters (see discussion above) in the header string if you wish. The header will be printed at the line position equal to the .tm setting plus 1. So, if you set the top margin to 6, the header will be printed on the seventh line.

**.ft**—Defines a footer to be printed at the bottom of every page. It works exactly like that of the header. The footer will be printed at the line position equal to the .pl setting minus the .bm setting minus 1.

**.hs**—Defines the number of lines to be left between the header and the main body of text. The command must be followed by a number.

**.fs**—Defines the number of lines to be left between the footer and the main body of text.

**.ls**—Sets the line spacing. You can print one or more blank lines between each line of text. For double-spacing (one blank line between lines of text), set .ls to 1.

**.l+**—Indents text from the current left-margin setting. For example, if the left margin is set with .lm8 and you execute .l+3, text will be indented as though you'd set .lm at 11. To cancel an indent, use .l+0 or .l−0.

**.l−**—"Outdents" text, such as a subheading, to the left of the left margin. For example, if the left margin setting is .lm8 and .l−3 is executed, text will begin printing at the sixth column, just as though .lm had been set at 5. Outdents are canceled with .l−0 or .l+0.

**.fp**—Forces a new page. When this command is executed, no more text will be output to the current page. If a footer was defined, the footer and bottom margin will be printed, and then a new page will be started.

**.fl**—Links files to be printed. The command must be followed by a device number and a filename, separated by a comma. When the .fl directive is executed, the specified file will be loaded from the specified device and begin printing. The permissible device numbers are 8 or 9 for disk. If two disk drives are used, one document could even slightly exceed 340,000 characters in length.

**.p#**—Sets the page number of the next page to be output.

**.lf**—Prints a line-feed character after every carriage return. Some non-Commodore printers require this. (.lf1 enables line feeds; .lf0 disables them.)

**.cm**—A handy dot command that lets you leave a comment for yourself that won't be printed.

**.r+**—Indents the right margin. This code must be followed by a number from 0 to 255. For example, if you set the right-margin width to 10 spaces with .rm10, and then execute .r+5, the effect is the same as if you had executed .rm15. A right indent is canceled by executing .r+0 or .r−0.

**.r−−**—Makes a right outdent. The command must be followed by a number from 0 to 255. For instance, if you've set the right margin to 10 with .rm10, and then execute .r−5, the effect is the same as if you had originally executed .rm5. A right outdent is canceled by executing .r+0 or .r−0.

**.bj**—Stands for "both justify" and prints the ensuing text with both the left and right margins justified. You cancel the .bj command by executing an .lj, .rj or .cn command.

**.pr**—Sends a sequence of up to 98 bytes to the printer using a specified secondary address. The secondary address must immediately follow the command; then the bytes to be sent to the printer, separated by commas, must follow after the secondary address.

**.ta**—Stands for "text address" and must be followed by a number from 0 to 31. The number is the secondary address that will be used to print the ensuing text, and it lasts for only one printout. You can set the default (permanent) text secondary address with the F1,T command.

**.ca**—Defines a new, temporary secondary address. This is the secondary address that will be used to send macro strings to the printer and to print dot-graphics characters. Set the default (permanent) secondary address with the F1,C command.

**.dc**—Stands for "define character." This command takes three forms that enable you to redefine any character on the keyboard except @, to a total of 127 characters, then to undefine them. The

total is enough to redefine the entire keyboard if you wish.

Example: .dca,66. To define a character, follow the .dc command with the character to be redefined, a comma and the new decimal value of the character. The Commodore ASCII decimal value for the letter "a" is 65. Here, the value has been changed to 66, which is the value for "b." Therefore, at printout time, all the a's in the document will print out as b's.

Example: .dca—. The minus sign following the character undefines that character. This example would undefine the character "a," removing it from the table of redefined characters.

Example: .dc@. This would erase the entire table of redefined characters, effectively undefining all of them.

**.lr**—Stands for "load redefined characters." This command is used only after you've performed three steps. First, you must define a number of characters with .dc commands. Second, you must print the current document; third, you must save the table of redefined characters to disk with the F1,R command. Then you can use .lr to load the saved characters during a later printout. This is useful when you have to redefine many characters—to access special characters on a printer, for example. The .lr command must be followed by a device number, a comma and a filename.

Example: .lr8,filename. This example would load the file of redefined characters named "filename" from device 8, the disk drive.

**.lc**—Stands for "load characters" and enables you to load a new character set or a new print set during printout. The .lc command must be followed by a number from 0 to 9 (0–6 for a C-64) that specifies the set to be loaded. A 0 loads a new set onto the screen; the numbers 1 through 9 load a new set into the printer. After the number comes a comma, followed by the device number from which the set is to be loaded, then another comma and the filename of the character or print set.

**.el**—Stands for "empty lines" and prints the specified number of carriage returns.

**.st**—Stands for "stop." This command works only with the printer or the monitor, not the disk drive.

Example: .st. When not followed by any parameters, the .st command terminates Continuous mode during printout and starts Single Sheet mode after the current page is done. The command may be placed anywhere within the text area.

Example: .st5. When followed by a parameter, .st interrupts continuous output at a specified page number, anywhere from 1 to

65535, and enters Single Sheet mode. In this example, if continuous output has been selected with F1,p or F1,o, the first four pages will print in Continuous mode, then at page 5 the "next output (c/p/s) ?" prompt will appear.

**.po**—Stands for "page order" and must be followed by three numbers, separated by commas. This command enables you to print on both sides of a page or in a number of columns, as in a newsletter. Any number of columns can be printed across one page—2, 3, 4 or even more. The .po command works only when continuous output is selected.

Example: .po1,2,1 and .po2,2,1. This combination of .po settings lets you print on both sides of the page, with text extending across the full width of the page.

The first setting is for the first pass. The first parameter in this setting sends the first page to the printer or disk; the second parameter specifies that every second page after that will also go to the printer or disk. For example, the odd-numbered pages might be printed and the even-numbered pages not—a phenomenon I call "page cycle." The last parameter in the first setting indicates how many pages will be output before the page number is incremented. It should equal the number of columns across the page.

The second setting is for the second pass. Notice that the last two parameters are unchanged. The new first parameter, however, now sends the even-numbered pages to the printer. You print on the same paper as in the first pass, but now you use the back side. You can even define different headers or footers for the odd- and even-numbered pages—to place page numbers on opposite sides of the page, perhaps.

Example: .po20,1,1.st21. You can combine the .po and .st commands to print only one page out of a document. In this example, pages 1–19 will not be printed, but page 20 will. After page 20, the .st command will bring up the "next output ?" prompt, at which point you can abort the print operation.

**.ff**—Stands for "form feed." The .ff command must be followed by number 0 or 1. If you select 1, the bottom margin will be printed by sending the form-feed character to the printer. The Default mode, .ff0, prints the bottom margin with carriage returns.

**.fc**—Stands for "force conditionally" and must be followed by a number from 0 to 255. If less than the specified number of lines remain on a page when .fc is executed, no more text will be printed on that page. Instead, a force page will be executed, printing the

footer (if any) and bottom margin immediately and resuming text on the next page.

**.dg**—Stands for "define graphics character." This command lets you change any character, in any print set or the screen character set, without using a character-set editor.

The command must be followed by ten byte numbers, separated by commas. The first byte number specifies the set in which the character to be changed is situated. As always, 0 specifies the screen character set, 1–9 specify a print character set.

The second byte is the screen-code value of the character to be changed. The last eight bytes define the character itself.

**.gc**—Stands for "graphics characters." The .gc command is followed by two parameters, separated by a comma. The parameter settings are saved within RUN Script Plus, and are permanent until you turn off the computer or execute another .gc command.

The first parameter is a number, 0 or 1, that specifies the orientation of dot-graphics characters printed when you select either a print set or Special Graphics mode. Only one setting is correct for any one printer. If you select the wrong setting, all characters printed in Graphics mode will be printed upside down. The only way to determine the correct setting for your printer is by experimentation.

The second parameter sets the width of Graphics Mode characters in dots. Standard Commodore characters are eight dots wide. So, if you set this parameter to 6, only the first six dots of each character will be printed. If you set this parameter to 10, ten dots will be printed—eight dots of character and two dots of space.

To make use of the full eight-dot width of a Commodore character and print 80 characters per line, you need a printer with a dot density of $8 \times 80 = 640$ dots per line. Use a dot width of eight if you have such a printer.

In general, use the following formula to calculate the correct dot width: dot width = dots per line ÷ characters per line. If the result is a dot width of less than eight, you'll need a print set that uses only that many columns of a Commodore character.

**.gb**—Stands for "graphics begin" and defines the string of bytes that is sent to the printer to activate Graphics mode. The string is sent before each character is printed in Dot Graphics mode.

The MPS-803 and its compatibles require just one character, CHR$(8), to activate graphics mode. This character will put the printer into Graphics mode until it receives a byte value of less than 128, at which point it will return to normal Text mode. Most other

printers handle graphics differently, however, and require that more than one character be sent.

**.ge**—Stands for "graphics end." The string of bytes following the .ge command will be sent to the printer after each dot-graphics character. Some printers require this command in order to return to Text mode.

## PRINTERS

RUN Script Plus expects a Commodore printer connected to the serial bus. A combination of a non-Commodore printer and an interface that emulates a Commodore printer will also work.

If your system includes neither of these, you can still use RUN Script Plus by putting the printer interface into Lock mode and using the RUN Script Plus F1,t function to output true ASCII. Another method is to use the Define Macros program (see previous discussion) to create a customized set of macros that RUN Script Plus can use to control your printer.

Note that you cannot use an RS-232 printer with RUN Script Plus. If you have such a printer, you must output your text to disk and then use a Basic program to print it.

## DAISYWHEEL PRINTERS

RUN Script Plus can do underlining and double-strike characters with daisywheel printers that recognize the back-space character. Type F3, then the ( character to start underlining; type F3, followed by ) to end underlining. Type F3, then the [ character to start double-strike; type F3, followed by ] to end double-strike. (See also the .bs command.) To change the print wheel, type F3, then *. When RUN Script Plus encounters the reversed * character, it will stop until you press a key.

## GRAPHICS MODE

Most dot matrix printers can print dot-addressed graphics and ordinary text on the same line, and RUN Script Plus takes advantage of this feature. When you put RUN Script Plus into a graphics mode, instead of outputting normal text, it uses the printer's dot-graphics capability to print each character. This allows printers such as an MPS-803 to print italics, boldface or underlining and print foreign character sets.

There are two ways to create graphics with RUN Script Plus. One is through a "print set," which is half of a normal character set. A

character set contains 256 characters, 128 non-reversed and 128 reversed, so a print set contains 128 characters. How does it work?

You select a print set with the F3 key, the same key that selects macro characters. After you press F3, choose a numeral from 0 to 9. The numeral will appear at the cursor position in the text, in reverse field.

Pressing 0 selects normal Text mode, which is the default; pressing 1–9 enables the Graphics mode. Within that mode, 1 specifies the first print set, 2 specifies the second set, and so on, up to the maximum number of sets your computer can have (six for the C-64, nine for the C-128).

For example, say you chose print set 3 and the next character to be printed is an a. The letter a is the second character in the standard Commodore character set (see the *C-64 Programmer's Reference Guide*, page 376, for a listing of the character set), so RUN Script Plus will go to set 3, take the second character of that set, and print it using dot-addressed graphics.

Only six print sets are available in the C-64 version of RUN Script Plus, but you can still press the 7, 8 or 9 key after the F3 key. If you press 7 or 8, RUN Script Plus will use the non-reversed characters of the character set as a print set; if you press 9, it'll print the reversed characters.

Print sets and the character set are loaded into memory by the boot program, which also loads the RUN Script Plus machine language program and initializes the RUN Script Plus system.

You also can print graphics with the Special Graphics mode. It's activated by the F1 key, then g, then answering y at the prompt "enable special graphics (y/n) ?".

When the Special Graphics mode is functioning, the business-graphics characters of the character set, which are accessed by simultaneously pressing the Commodore logo key and any other key, will be printed using the printer's Dot Graphics mode. This occurs only when normal Text mode is selected. All other characters will be printed as normal text characters.

## NEW RUN SCRIPT COMMANDS

There are three new key-press commands (preceded by F1) for the main RUN Script Plus program: ↑, $ and Q (which accesses the spelling checker). (The $ command is not really new, but it now functions differently.) In addition to the new commands, the <, > and @ commands have been modified to work with Commodore's

RAM disk software. There is also one new dot command, .lb, which activates the label printer.

↑—Press F1, then ↑. This command saves your text twice, first to device eight for permanent storage, and then to device nine, which is normally the device number of a RAM expander when used as a RAM disk. After your text is saved to the RAM disk, it can be loaded in about one second or less. (Note: At this point, the RAM disk software for Commodore's 1700 and 1750 RAM expander cartridges for the C-128 has not been formally released, so we cannot guarantee that the RAM disk capability will work properly for the C-128. This discussion of the RAM disk is therefore at present applicable only to the C-64.)

To use RUN Script Plus with Commodore's 1764 RAM expander employed as a RAM disk, you first run the RAM disk initialization program, pressing return at each prompt. Then you load and run RUN Script.

$—Press F1, then $ *twice* to load a directory from disk into memory. The directory is displayed as it loads in. Press the run-stop key to terminate the load when the desired filename appears. Then position the cursor over the filename. Next, press the appropriate key from the list below to perform the action you want:

l—Load a text file.
r—Read in a sequential or user file.
>—Issue a disk command.
<—Read the disk error channel.
m—Load a macro table.
0—Load a character set.
1 to 6—Load a print set.

After you enter a command letter, a prompt appears. Pressing the F3 key reads the selected filename from the screen directly into the input line.

However, this command has a few idiosyncrasies. First of all, the directory is loaded into text memory. If an insufficient amount of memory remains, a Text-Area-Full message appears, and only a portion of the directory is loaded.

Always exit the Directory mode by pressing the Commodore and control keys simultaneously, thus erasing the directory. Pressing the restore key leaves the directory embedded in your document.

Q—The command F1,Q accesses the spelling checker. (See the section on the spelling checker, below.)

**.lb**—The dot command .lb activates the label printer. RUN Script Plus can now generate mailing labels. You must enter the labels into the RUN Script Plus text area, pressing return at the end of each line and two returns at the end of the last line of each label.

After the program encounters the .lb dot command in the text, it activates a special printing routine that only recognizes three dot commands: .pl, .pw and .lb. The .pw command is used in the normal way.

The .lb command requires a variable number of parameters, but it is always followed by at least two numbers. The first number, from 1 to 9, specifies the number of labels to be printed across the page. The next number specifies the starting column position of the first label. The columns are numbered starting with zero.

## THE SPELLING CHECKER

The most significant addition to RUN Script is the spelling checker. It works by comparing each word in a document with a list of words stored in a dictionary. Any word not located in the dictionary is marked. Later, you can edit these words if misspelled, replace them, add them to the dictionary or ignore them.

A short dictionary on this disk contains about 3000 words. You can store a dictionary of about 35,000 words on a 1541 drive, and a maximum of about 75,000 and 172,000, respectively, on the 1571 and 1581 drives.

"Personalized" dictionaries that contain only those words most commonly used are recommended.

With 10,000 words or less in the RUN Script Plus dictionary, spelling checks with a 1541 drive take about one to two minutes to check a 100 block document. If you're using a C-64 with a RAM expander, you can copy a personalized dictionary to the RAM disk for incredibly rapid spelling checks.

Another technique that increases the efficiency of spell-checking is to limit the process to checking only those words having lengths equal to or exceeding a user-defined limit.

RUN Script Plus's minimum length default value is five letters, although the length is adjustable from three to nine characters.

The spell checker recognizes as words only those groups that are formed solely of the letters a–z and A–Z. Consequently, contractions cannot be placed in the dictionary; they would be interpreted as two words.

Two methods exist for activating the spell checker. One way is via

the F1,Q command from within RUN Script Plus. When this command is used, any text is preserved, and it's possible to exit from the spell checker back to RUN Script Plus by using the F1,x command. Another way is by running the spell checker as a stand-alone program.

## SPELLING CHECKER COMMANDS AND OPERATION

Nine commands are available within the spelling checker, all of them activated by pressing the F1 command key, and then the appropriate letter, just as in RUN Script Plus. You cannot edit text while using the spell checker; instead, use RUN Script Plus for that purpose. Some of the nine commands are identical to those in RUN Script Plus, with one area of procedural difference: All commands that access the disk drive require you to enter a device number to make working with two disk drives easier. The nine spell checker commands are listed after the following description of the spelling checker operation.

Q—Press F1 and then Q to activate the spelling checker. With the C-64, the spelling checker program prompts you for the device number for the spell checker, then to insert the correct disk and press a key. In a few seconds, you'll be able to proceed with the spelling check.

Press F1,Q again and you'll be prompted to enter the device number of the drive containing the dictionary. After you do this, the spelling check proceeds with its work. Words in your document that have a length equal to or greater than the specified minimum length (see command F1,W, below) will be compared with words in the dictionary. Any words not in the dictionary are marked.

After the check is completed, each word that was marked becomes highlighted on the screen, and a prompt appears presenting the available options: 1—edit word; 2—add word; 3—skip word.

Pressing the 2 key saves the word for later addition to the dictionary. Pressing the 3 key skips the word, so it is neither edited nor added to the dictionary.

Press the 1 key when you encounter a misspelled word. An "edit ?" prompt is displayed. If you then press the F1 function key, the word appears on the input line, where you can edit it. After you've corrected the spelling, you press the return key to terminate the edit process, and the following prompt then appears: 1—prompt; 2—replace all; 3—skip word.

If the 1 key is pressed, a "replace (y/n) ?" prompt is displayed

before each occurrence of the word. This allows you to replace words on a case-by-case basis. After all occurrences of a word have been dealt with, the next marked word will be displayed, and the process repeats.

After you've either edited, skipped or added all the highlighted words, the time comes to save to disk all the words you designated to be added. First, prompts appear requesting a device number and a filename; then the list of words is saved. The list should be saved on the dictionary disk. However, the words do not actually become part of the dictionary until the DICT MAINT program (see below) has been used on them.

## THE NINE COMMANDS

The nine commands, all preceded by the F1 command key, that you can use when within the spelling checker are as follows:

l—Load a text file.

s—Save a text file.

@—Scratch the old text file, then save a new copy to disk.

<—Read the disk error channel.

>—Issue a disk command.

$—Print out a disk directory listing.

x—Exit to Basic or RUN Script Plus.

E—Counts the number of *unique* words in the document, with the exception of those below the minimum specified length (see the F1,W command, below); if you then press F1 again, you get the total number of *all* occurrences of *all* the words in the document.

W—Sets the minimum length for the words that you want to have checked.

## DICTIONARY MAINTENANCE

The dictionary maintenance program, called RS DICT MAINT, is used to add new words to the dictionary. The list of words to be added can be the file created by the spelling checker, or you can create it with RUN Script Plus by typing words in, then saving them to disk. If you use this method, the RUN Script Plus file must be loaded into DICT MAINT, then sorted with the F1,O command (see F1,O, below).

When you're typing dictionary words into RUN Script Plus, you must ensure that each word is separated from any of the other words by some non-alphabetic character, such as a space or carriage return.

Twelve commands in the DICT MAINT program are activated by first pressing the F1 command key, then the appropriate key listed below.

l—Load a text file.

s—Save a text file.

a—Append a text file to the end of a text file already existing in memory. Note that this operation differs from the way the F1,a command operates in RUN Script, where the file would be loaded beginning at the cursor position. This command permits several lists of added words to be loaded and then merged into one large list, using the F1,O command (see F1,O and F1,D, below).

$—List the disk directory.

>—Issue a disk command.

<—Read the disk error channel.

x—Exit to Basic.

E—Count the number of unique words and the total number of all words in the document currently residing in memory.

O—Sort any words in memory into alphabetical order, then save the entire sorted list to disk. It is necessary to use this command after combining several lists of words using the F1,a command because the F1,D command, which merges new words into the dictionary, requires a sorted list of words on disk.

Also, use this command on lists of words previously created with RUN Script Plus, perhaps copied from a dictionary. Doing this ensures both that the list is sorted and that it's stored in a format compatible with the F1,D command.

U—Unpack a dictionary file into text. RUN Script Plus dictionary files are stored in a packed format that allows 2000 to 3000 words to be stored in only 8000 bytes, which is the maximum for one dictionary file.

The purpose of unpacking a dictionary file is that it allows text to be edited with RUN Script Plus. Words can be freely deleted or added as you wish. Just make sure that improper words are not added to a particular file.

For example, words beginning with C are divided into two files, "RS.C" and "RS.CM". You must make sure that no words starting with CM, CO, CP, etc., are placed into the "RS.C" file. If "RS.A" is being edited, be certain that no words that begin with other letters are added to that file. If this rule is not followed, the spelling checker will not function properly.

Use the following procedure if you wish to edit a dictionary file:

(1) Load and run the DICT MAINT program. Press F1, then U.

(2) Enter the filename corresponding to the desired dictionary file, from "RS.A" up through "RS.Z."

(3) After the file is unpacked, save the unpacked file with either the F1,s or F1,@ commands.

(4) Edit the file with RUN Script Plus and re-save it.

(5) Load and run the DICT MAINT program.

(6) Load in the edited file.

(7) Press F1,O to sort the words and save them to disk.

(8) Load in the file saved with the F1,O command. At this point you can, if you wish, press F1,E to see how many words there are in this file.

(9) Use the F1,P command to re-pack the file into dictionary format. Make sure the file is assigned the correct filename.

**P**—Packs a list of words into dictionary format. The words must be in alphabetical order, and each word must be followed by a carriage return character (see F1,O).

**D**—Merges a list of words into the dictionary. The list must already exist in the correct format; e.g., the list must be created either by the spelling checker or by the F1,O command. Lists of words created with RUN Script Plus require processing through the F1,O command before they are acceptable. The word list and the dictionary files (if any—see Personalized Dictionary, below) must share the same disk.

First, a "device number for dictionary?" prompt appears. Enter the device number containing the dictionary files. This can be a conventional disk drive, a 1581 3¼-inch drive or a RAM disk. Next an "added words filename?" prompt appears. Enter the filename of the list of words you want merged into the dictionary. Finally, a "device number for new dictionary?" prompt is displayed. Enter the device number on which to store the new dictionary files.

Be forewarned that dictionary files larger than 8000 bytes can crash the spelling checker.

## PERSONALIZED DICTIONARY

For maximum speed, it's best to create a personalized dictionary, which contains only words that you commonly use. Start by loading and running the spell checker. It doesn't matter that no dictionary exists. Just use any blank, formatted disk as a dictionary disk. Next,

load in four or five of your old RUN Script text files and use the F1,Q command on them. If you do not have any old text files, create one with RUN Script Plus by typing in common words from a dictionary (the book type).

After you've created a few files of added words, exit the spell checker and run the DICT MAINT program.

Use the F1,a command to load all your files of added words into memory. Keep in mind that the DICT MAINT text area holds only about 35,000 characters, or between 4000 and 5000 total words. Also DICT MAINT can only handle about 4000 unique words at one time. Use the F1,E command to be certain these limits are not exceeded.

After you place a large file in memory, execute the F1,O command to write the unique words out to disk. Next, execute the F1,D command. Since no dictionary file exists as yet, the initial use of F1,D creates one and gets you started.

### OVERLAYS

The figure on the inside front cover shows a set of RUN Script function key overlays for the C-64 and the C-128. Cut out the appropriate one and place it over the function keys on your computer to make RUN Script Plus easier to use.

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RUN it right: **C-64; C-128; printer (optional)**

# RUN File 1.0

*By David Darus*

RUN FILE 1.0 is a database program for the C-64 and C-128 that's designed to do all the management tasks involved in keeping records such as mailing lists and inventories. It maintains the records in an indexed order and provides utilities to manipulate the data into sets of information.

The program requires a C-64 or C-128, a monitor and a 1541, 1571 or 1581 disk drive. A printer is optional.

After some set-up time, the Main menu screen appears. The work

area is in the top 22 lines of the screen, with program and database identification next, followed by the Main menu command line and a message line.

The command line offers six options: Close, Edit, New, Open, Utils and eXit. To select a command, either press the capitalized letter in the command, such as N for New or X for eXit, or use the right-and-left cursor key to highlight the command, then press return.

There are some restrictions on when commands can be executed. You can't close or edit a database or execute the Print, Seq and Usr commands unless you've opened the database first. Also, you can't open more than one database at a time, and you can't create a new database or exit the program if a database is open.

## NEW

The New command is for creating a new database form. You'll be prompted to enter a filename that's anywhere from one to 14 characters long for the database, and the program will automatically give the filename a .f extension. (Don't include the extension when you type in the filename.)

In the first 22 lines of the screen, you can define and fill up to 30 fields, each having a maximum length equal to the screen width minus 1—that is, either 39 or 79 characters. The total length of all fields in the record can be up to 254 characters long, not including field names. As you type in text, use the delete key to correct mistakes.

To define a field, type its name (such as LAST NAME or STREET). To define the length of the field, press control/F to mark its start, press the space bar as many times as you want and press control/F again to mark the end. As you do this, you'll notice a field-length counter and a total-record-length counter at the bottom of the screen. You can use the delete key to shorten a field as you're defining it, but you can't use it to erase the field name. To do that, you must press control/D to blank the line out. The total record length will be adjusted accordingly.

Any time you press the enter key on a line, the part of the line that isn't highlighted becomes the new content of that line and the high-lighted region becomes blank. For this reason, use the cursor keys to bypass lines you've already edited and wish to keep as they are.

When you're satisfied with the layout of the line, press return for the computer to accept it. If you press the cursor up-and-down key without pressing return, the line won't be accepted.

When you're satisfied with the entire form on the screen, press the run-stop key in 64 mode or the escape key in 128 mode. The current field will be highlighted, and the following list of field types will appear at the bottom of the screen: Alpha Key Num Special. You'll be prompted to choose a type for each of the fields in the form by pressing the capitalized letter of your choice.

You can select the Key attribute only once, and it should be assigned to the field that distinguishes records from each other, such as record number, employee ID number or inventory number. If you don't specify a key field, the program will automatically assign the first field in the database to that purpose. Other fields can be assigned one or more of the other types—Alpha, Num and Special. You can cancel a field-type selection for the current field by pressing the capitalized letter again.

Alpha fields can contain upper- and lowercase letters A–Z and spaces. Num fields can contain ( ) * + , − . / 0 1 2 3 4 5 6 7 8 9 and spaces. Special fields can contain ! # $ % & ' ( ) * + , − . / : ; < > = ? @ [ ] ↑ ← £ and spaces. Once you've set the types for the current field, press run-stop in 64 mode or escape in 128 mode to make the computer accept them and go on to the next field. When you've specified a type for every field, the form will be saved to disk and you'll return to the Main menu.

## OPEN

The Open command is used to access a particular database and to read its form and index into memory. When you choose Open at the Main menu, you'll be prompted for the name of the database you want. (Again, don't include the extension to the filename.) The first time you open a database, you must estimate the number of records you'll want to put in the file, so disk space can be allocated. This estimate by no means limits the number of records you can enter, as long as you don't exceed the maximum of 1000 records in 64 mode or 2000 in 128 mode.

After you've entered your estimate, an index file (with a .i extension on the filename) will be created, along with a relative data file (with a .d extension).

## EDIT

The Edit command lets you access, browse through and update records. When you enter Edit mode, the cursor appears on the first field in the form. Use the up-and-down cursor key (keys, in 128

mode) to move from field to field, without disturbing the contents of the fields. After you've typed in or altered the content of a field, press return.

Edit mode provides a number of function-key commands, including Find, Write, First, Last, Next, Previous, New and Print.

*Find (F1)* is a search function. When you press F1, the program prompts you to select (via the cursor keys) the field you want to search by. Press return to highlight the field you want, then press the run-stop key in 64 mode or the escape key in 128 mode. Next, you'll be prompted for the search string. Enter only as much of the string as is needed to make it unique, and keep in mind that the case of the letters is significant; then press return. If the search field is an index key field, the program goes directly to the matching record, if present, or to the next highest record. If the field you select isn't an index key field, the disk is searched for a match. When one is found, press return to find the next matching record, or press run-stop (C-64) or escape (C-128) to abort the search. While in this mode, you can press F8 to print the screen.

*Write (F2)* stores the record using the index key that's in the key field, along with all the other field data. In Write mode, you can change an existing field by typing over it, pressing return and then F2. Depending on the content of the index key field at that time, a new record will be created or an existing one overwritten (if it has the same key field contents). After editing the last field you want to change, press F2 instead of return.

*First (F3)* displays the first record in the database, according to the index key value.

*Last (F4)* displays the last record in the database, according to the index key value.

*Next (F5)* displays the next record in the database with an index key field greater than the current one.

*Prev (F6)* displays the previous record in the database with an index key field less than the current one.

*New (F7)* blanks out all data in the current form, leaving an empty form for entering new data.

*Print (F8)* prints the first 22 lines of the screen on the device 4 printer.

To exit Edit mode, press run-stop in 64, or escape in 128, mode.

## UTILS

The Main menu Utils command brings up a submenu of the

following commands: Dir, Dos, Drive#nn, Print, Seq and Usr. To select one of these commands, use the cursor keys to highlight it and press return. (Remember, the Print, Seq and Usr commands can be executed only if a database is currently open.) You can press run-stop in 64 mode or escape in 128 mode to return to the Main menu from Utils.

To select fields to be output by the *Print*, *Seq* or *Usr* command, move the cursor to each field you want and press return. When you move the cursor from that field, the field will be highlighted. You can't cancel a field selection, so be careful in making your choices. You can select the fields in any order—the key field has no effect here—and the order you choose will determine how the output records are built.

The Print, Seq and Usr commands include a Sort option. If you choose this option, the order in which you select fields will determine the sorted order of the records that are output.

*Dir* displays the directory of the disk in the drive. In C-64 mode, pressing the space bar once pauses the directory scrolling and pressing it a second time reactivates the scrolling. In C-128 mode, use the no-scroll key to pause the display. When you're done with the directory, press return to go back to the form.

*Dos* lets you issue DOS (disk) commands to the current drive, and these use Basic 2.0 syntax, as described in your disk drive manual.

The *Drive#nn* command, where nn is the current device number of the disk drive, changes the device number to any number from 8 to 11. Just enter the number you want at the prompt and press return. If you enter a number that's out of range, the number won't change. The current device number is displayed on the Utils command line. The Drive command enables you to use multiple drives for your files.

*Print* produces hard copies of your data in report or label format. Report format prints all the data in a horizontal line, while label format prints one line at a time. The Print command lets you select fields in the order you want them printed, if your printer is device 4. Also, you can sort the records in the database before printing. If you're planning to use the Print option for mailing labels or as a report generator, keep the final printed output in mind when you're designing the database form.

*Seq* creates a sequential file of selected fields, in the order you select them and sorts them if you wish. The format of a Seq file is one field of data, followed by a carriage return. There's an extra

carriage return at the end of each record in the file. The Seq files can be read directly into many word processors.

*Usr* creates a user file of selected fields, in the order you select them, and sorts them if you wish. These files can be used in your programs.

## CLOSE

The Close command in the Main menu closes a database, updates the index on the disk and clears the form from the screen. This command is especially important because of the index update. As a safeguard, you can't exit RUN File 1.0 without closing the current database. However, this safeguard doesn't work during a power failure. If the power goes out, the index won't be updated and all the records you've added to the database since the last closing will be unaccounted for in the index. Close and open your database periodically to update the index when you're doing a lot of data entry at one time.

## EXIT

The eXit command is used to leave RUN File 1.0.

## IMPROVING PERFORMANCE

Performance of the database can be improved by proper design of the file form. Making the key field small and placing it first in the form, as well as making the entire record small, improves speed. Also, it's good database practice to design your form on paper first, resolving any problems before defining it in the program. This will save you a lot of work and frustration.

The figure on the inside back cover is a set of RUN File 1.0 function key overlays for you to cut out and use with your C-64 or C-128 computer.

# RUN Calc 128

*By Mike Konshak*

RUN CALC 128 is a spreadsheet for the C-128 for managing home budgets and keeping track of expenses.

Spreadsheets such as RUN Calc 128 organize data in cells, which are located at the intersections of rows and columns. Each cell is identified by the row and the column it's in. The concept of a cell is the primary difference between a spreadsheet and other types of programs.

A cell can contain one of two types of data: a label or a value. Labels are alphanumeric text data such as names, addresses, quantities, ages, dates, and so forth. A value can be a number entered into a cell and used in obtaining a result that appears elsewhere on the spreadsheet. A value can also be a formula or equation assigned to a cell, the result of which appears in that cell after a calculation has been performed.

Formulas are hidden and don't appear on the spreadsheet itself, although they can be viewed and edited when you position the cursor at that particular cell. RUN Calc 128 recognizes a number or a formula as a value if it's preceded by a plus ($+$), minus ($-$) or at symbol (@). Otherwise it's treated as a label. Labels are normally left-justified within a cell, whereas values default to right justification with two decimal places, which brings us to another nice feature of RUN Calc 128.

The cells within each column of a spreadsheet can be formatted specifically for the type of data that will appear within it. RUN Calc 128 is no exception and permits several types of justification and ways to present numerical data. Also, the width of each column can be set according to the length (in characters) of the data that will reside in the cells in that column. Because a spreadsheet can combine text like a word processor, repeat data like a database and make calculations like an adding machine, it's sufficiently versatile to create many types of forms (to fill in the blanks later) and reports.

RUN Calc 128 behaves like a commercial spreadsheet. You can

write the formulas exactly as you would write a Basic expression, and you can enter the special functions, like @SUM(A1..Z250). In an effort to appease fans of Datafile, *RUN*'s database program, I've provided for importing up to 250 Datafile record files.

When you first run RUN Calc 128, you'll notice that rows are numbered 1–250 and columns are labeled A–Z. Cells are designated by column, then row, such as A1, B26 and Z250. There are 6500 cells available, although you may run out of memory before you use that many. Column widths default to ten characters, but may be changed.

Whenever an error occurs or you press an inappropriate key, the computer beeps (if you have the monitor's volume turned up). Also, any time the computer is working, a Wait message flashes in the upper-right corner of the screen. A nonflashing Ready message means the computer is ready to accept input from the keyboard. You'll also encounter other status messages (i.e., Disk, Print, Error, Calc1, Calc2, Edit, Input, Entry) as you perform various operations.

Additional status information as to the cell content, cell position and data type within the cell are shown in the upper-left corner of the screen.

## GETTING OUT OF TROUBLE

Should you forget the function of a key or the syntax of a function, press the help key in the top row of keys. A full screen of explanations will be displayed to assist you. Press the escape key (or any other key) to exit back to your worksheet.

Pressing escape in the Worksheet mode displays the Main menu at the top of the screen. Once a menu is present, escape exits back to a previous menu or, ultimately, back to the worksheet. You can also obtain the Main menu by pressing the slash (/) key. Escape will also exit safely from disk drive routines and generally keep you out of trouble.

## MOVING THE CURSOR

The cursor keys are used to move to a particular cell. The up-and-down cursor key positions to adjacent rows and the left-and-right cursor key moves to adjacent columns. This applies to both sets of cursor keys on the keyboard. Once you begin entering or editing the data within a cell, only the left-and-right cursor keys are active.

You'll find that moving horizontally or vertically through your

worksheet becomes time-consuming if you move cell by cell. Pressing the control key and one of the four upper cursor keys will move the cursor to the adjacent screen in the direction noted by the arrows on the keys. Control plus up or down jumps 20 rows at a time. Control plus left or right displays the next group of columns. The actual number of columns that will fit on a screen depends on the width of the columns.

Pressing the home key once moves the cursor to the upper-left cell shown on the screen. Pressing home again moves the cursor to the beginning of your worksheet (cell A1).

## ENTERING DATA

To begin entering or replacing data in a cell, move to the desired cell with the cursor keys and then begin typing in your data. As I mentioned earlier, data is classified as a label or a value. If the data begins with a plus, minus, or at symbol, then the program interprets the data as a value. You'll notice that the characters you're typing in as values are automatically converted to uppercase.

After you press return to make the computer accept the data you've entered, it identifies all cells referred to by the formula and converts everything else to lowercase. The result of the value or formula is printed within the cell, normally right-justified with two decimal places. The contents of the cell, consisting of the data and the result, are also displayed at the top of the screen.

Immediately after the cell identification, the result appears, followed by a left arrow. After the left arrow, the data you entered for the cell is displayed. It may consist of a number value or a formula or function. A value entered as $+25$ appears on the status line as A1: $25 \leftarrow +25$. A formula entered as $+25*100/2$ appears as A1: $1250 \leftarrow +25*100/2$. The left arrow points from the formula to the result.

Labels are simpler and don't involve a result—or rather, the data you type in immediately becomes the result. Labels are normally printed left-justified within a cell, and they may consist of any character typed from the keyboard, including punctuation and Commodore graphics characters, but excluding the plus, minus, at and back-arrow characters, which denote values and formulas. Only the graphics characters generated with the Commodore key are available, since the shift key produces uppercase letters.

When typing in labels, you don't have to keep track of the width of the columns, since RUN Calc 128 automatically overlaps text data

into the columns to the right, assuming they're empty. If the column to the right already contains data, only the number of characters that will fit in the current cell are printed. The entire text string appears at the top of the page, even if it's too long to fit in the cell.

I'll explain how to expand the width of a cell a little later. If you do expand its width, as many of the original characters as will fit will automatically be printed in the cell. Because of the overlapping feature, you'll be able to write small paragraphs in your worksheet. The maximum number of characters you can enter inside or outside a cell is 74. Formulas in other cells that refer to cells containing numeric labels will perform correctly, even when the referenced cell data hasn't been identified as a value. Alphabetical characters possess a value of zero in these instances.

## EDITING, ERASING AND EXITING A CELL

Once the cursor is positioned in a cell, pressing the return or enter key will let you edit the data within the cell. After you make your corrections to the data, return or enter exits the cell. If the cell contains a label, the label will be printed within the cell. If it contains a value or a formula, a recalculation will occur and the result will be printed within the cell.

You can erase the data within a cell quickly by moving to the cell, then pressing return, the space bar and return once more. When you're entering data at menu prompts, you must always press return to accept the input.

## RECALCULATION

Any time you exit a cell containing a value by pressing return, the formula within that cell is recalculated and the result displayed. If you've extensively altered your worksheet and want to recalculate it entirely, press the equals (=) key and go make a cup of coffee while the program analyzes and recalculates each of the cells within the current range. Two passes are required to ensure accuracy.

The status line displays Calc1 on the first pass and Calc2 on the second. Obviously, the larger the spreadsheet, the more time the recalculation requires. Usually, it's faster to just recalculate individual cells by moving to the cells and pressing return twice.

## MEMORY

Pressing the English pound (£) key displays the number of bytes free in the memory bank. When you're creating a large worksheet,

periodically check the available memory. An Out of Memory error is the only one that can't be recovered, since it can't be trapped.

## FORMULAS AND FUNCTIONS

Once again, RUN Calc 128 recognizes values and formulas by the presence of a plus or minus sign as the first character of an expression. A number, such as +100, is the most simple, producing a result of 100. A formula is more complex and might resemble $+E2 - F4*(\sin(2*3.14159))\uparrow2$.

Most of the functions and operators that can be used in writing a Basic program can also be used in a formula within a cell. Because RUN Calc 128 uses the same Kernal routines that Basic programs use, a good rule-of-thumb is that if it causes a syntax error in Basic, it'll cause a syntax error in RUN Calc 128, so keep your *C-128 Programmer's Reference Guide* handy.

Basic expressions and formulas perform operations on regular variables, such as X, a% and RR, and on subscripted variables, such as a(1) and r%(2,2). A typical formula written in Basic might appear as $X = A + B$. In a spreadsheet, variables are substituted by cell coordinates.

In $X = A + B$, X is the cell where the cursor is currently positioned, and the variables A and B represent values located in other cells. If the cursor is positioned at cell A4 and you wish to add the contents of cells A1 and A2, A4 is shown to the left of your prompt, along with an equals sign. You type in +A1 +A2, and when you press return, the two cells are added and the result is printed within cell A4. Also, the cell coordinates, the result, a left arrow and the formula appear in the upper-left corner of the screen. Two rows below this status line, the program also informs you that this is a value.

## OPERATORS

The Basic operators listed in Table 1 can be used in RUN Calc 128 formulas. They include arithmetic operators, as in $X = A + B$, and logical operators, as in $X = A < B$. In the latter example, if A is less than B, the expression is true and X is assigned a value of $-1$. If A is greater than or equal to B, the expression is false and X is given a value of 0. You can convert your result to a positive number by using the absolute function, such as $ABS(-1)$, which equals 1.

## BASIC FUNCTIONS

Functions perform mathematical calculations on an argument.

The argument is contained within parentheses and may be any number or cell coordinates. Refer to your *C-128 Programmer's Guide* for an expanded explanation of the functions. The functions in Table 1 are known to work properly in RUN Calc 128 formulas.

As you type in an equation, the characters appear in uppercase, but after you press return, only the cell coordinates remain capitalized. The functions in the table are always converted to lowercase letters, so the Kernal can understand them. Functions not allowed by RUN Calc 128 are obvious, because the function letters remain in uppercase.

The trigonometric functions, ATN( ), COS( ), SIN( ) and TAN( ), always return an angle in radians, not degrees. To convert a result in cell A1 from radians to degrees, use the expression +A1*180/3.14159. The parentheses are used exactly as in Basic program expressions.

## @ FUNCTIONS

The @ functions simplify mathematical operations on a range, or block, of adjoining cells. For instance, rather than typing +A1+A2+A3+A4+A5, it's simpler to type @SUM(A1..A5). The @ symbol must be the first character in the formula, preceding the three-letter function identifier. Cell coordinates must be enclosed within parentheses and separated by two periods (no spaces allowed). The available @ functions are also listed in Table 1.

The first cell set of coordinates is for the From cell, and the second is for the To cell. The @ functions can refer to some or all of the cells in one row or one column, or a block of cells consisting of multiple rows and columns. When you're defining a block of cells, the From, or first, cell must be in the upper-left corner of the block and the To, or second, cell must be the lower-right corner of the block.

To sum the values in all 250 rows and 26 columns of a worksheet, the function would be written as @SUM(A1..Z250). An @ function can't coexist in the same cell with a conventional formula. This syntax is important for the proper operation of RUN Calc 128, and it will also be used later for determining which portion of your worksheet will be saved, printed or erased.

## SAMPLE WORKSHEET

The sample worksheet in Figure 1 is typical of RUN Calc 128 applications. The income and expenses of the family are totaled and

compared to produce discretionary income. Savings and retirement expenses are self-calculating, based on amount of income. Once the worksheet has been entered, it's a simple matter to see how much money is available to play with as income and expenses vary.

The sample worksheet adds the two family incomes together, producing a result of 3550. Savings and retirement expenses are calculated by multiplying the total income by .1, producing 355 for each item. The expenses are totaled, producing a result of 3345, which is subtracted from the total income to yield $205 worth of "play" money for the month.

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**Figure 1. Sample RUN Calc 128 worksheet.**


### Family Home Budget

| | |
|---|---|
| Dad's Income | 2000.00 |
| Mom's Income | 1550.00 |
| Total Monthly Income | 3550.00 |
| | |
| Mortgage | 800.00 |
| 2nd Mortgage | 200.00 |
| Auto Loans | 600.00 |
| Insurance | 80.00 |
| Fuel | 120.00 |
| Utilities | 150.00 |
| Phone | 35.00 |
| Food | 400.00 |
| Clothes | 250.00 |
| Savings | 355.00 |
| Retirement | 355.00 |
| Total Expenses | 3345.00 |
| | |
| Discretionary Income | 205.00 |

---

Move to the cell identified and type in the data as follows, pressing return after each entry. If you need to edit a cell, move to it, press return and make your changes. If you just start typing, you'll erase the previous data.

C1: Family Home Budget
A2: !! Press shift/* 50 times for a horizontal line.
A3: Dad's Income
C3: +2000
A4: Mom's Income
C4: +1550
A5: Total Monthly Income
D5: +C3+C4
A7: Mortgage
C7: +800
A8: 2nd Mortgage
C8: +200
A9: Auto Loans
C9: +600
A10: Insurance
C10: +80
A11: Fuel
C11: +120
A12: Utilities
C12: +150
A13: Phone
C13: +35
A14: Food
C14: +400
A15: Clothes
C14: +250
A15: Savings
C15: +D5*.1
A16: Retirement
C16: +C15
A17: Total Expenses
D17: @SUM(C7..C16)
A19: Discretionary Income
D19: +D5−D17

Now I'm going to describe the "bells and whistles" that make
RUN Calc 128 serviceable and more flexible for individual needs.

## MENUS AND HELP

As I mentioned earlier, pressing the help key displays a Help
screen that describes the functions of keys and the RUN Calc 128
syntax. This Help screen also appears whenever you boot up the

program. The escape key is used to exit the worksheet to the Main menu (the slash key also performs this function), or to exit subsequent menus or input routines to get back to your worksheet.

Menus and input prompts are always displayed in the top three rows of the screen. Menu selections are made by pressing the key corresponding to the first letter of the selection, shown in reversed light gray.

Prompts requiring an input are accompanied by a flashing cursor. Press return after responding to any prompt. You'll notice that the Status Flag in the upper-right corner of the screen displays ENTER any time you're dealing with menus. Worksheet operations always work on the column or row where the cursor is positioned.

## MAIN MENU

Pressing the escape or slash key when working on your worksheet displays the Main menu. From the Main menu, you can go on to other menus or quit the program by pressing Q. Any option that will destroy your worksheet will display an "Are you sure?" prompt.

Pressing C clears, or erases, all the cells in the entire worksheet, leaving the column widths as you last defined them. To start over completely, with the default column values, you must quit the program and run it again.

P prompts you for the range, or block, of cells to be printed. The current cell coordinates are preprinted in the prompt. Enter the starting cell coordinates and the ending cell coordinates in the form From..To, as in A1..F20. The starting, or From, cell is in the upper-left corner of the block, and the ending, or To, cell is in the lower-right corner of the block.

This arrangement will appear consistently in other routines, also. The borders shown on the screen aren't printed.

Set up your printer before running RUN Calc 128, because the program isn't capable of sending printer commands after it's activated. RUN Calc 128 prints the worksheet exactly as it appears in memory. If the character width of your chosen block is greater than the character width of your printer, then the rows wrap around and use extra lines on the paper. If your worksheet is wider than 80 characters, you must either put your printer in a compressed mode or print your worksheet in several blocks or sessions. RUN Calc 128 also ignores page perforations, so if you don't want your rows printed on multiple continuous sheets, either limit the size of the block or increase the number of lines per inch on your printer.

RUN Calc 128 sends straight ASCII text, using Basic's PRINT #4,USING token, and it works with any Commodore or compatible printer. Please note that 4 is the default device number for the printer. You can change this address at your leisure right in the program. Graphics characters can only be produced on printers with Commodore graphics.

Pressing W at the Main menu sends you to the Worksheet menu, where you can define and modify the layout of your worksheet.

Pressing F at the Main menu transfers you to the Disk Files menu, where you can perform all operations related to the disk drive. Note that RUN Calc 128 only uses drive device 8. Make appropriate changes to the program if this doesn't meet your needs.

## WORKSHEET MENU

The Worksheet menu is where you can alter the width and print format of the columns, as well as delete, insert and erase data selectively. Press escape to exit this and all other menus.

Pressing *F* at the Worksheet menu sends you to an additional *Format Column menu*, where you can specify how you want the data printed in the cells to be justified.

Pressing *W* at the Worksheet menu produces a prompt asking for the *width* of the current column. The current column is the column where the cursor was last positioned before you accessed the menus. The current width of the column will be preprinted for you. You can enter a width of 1–74 characters, and some column formats may require a width of at least four characters.

After you press return, the column and screen are reprinted with the necessary adjustments. Column formats return to the default settings after a width adjustment, so you have to reset the format at the Format Column menu.

When you press *D* at the Worksheet menu, you can *delete* either the column or row that the cursor is currently positioned in. Press C for column, R for row or escape to exit. When a column is deleted, all columns and the data in them are shifted to the left (column E becomes D, and so forth). Deleted rows make data below the current row shift up a row (row 100 becomes 99, and so forth). RUN Calc 128 automatically adjusts the cell coordinates if @ functions occur in a cell, but normal formulas and functions such as +E1*D4 need to be adjusted manually.

If *I*, for *Insert*, is pressed at the Worksheet menu, followed by C or R, either a column or row is inserted to the left of or above the

current cursor position. Columns to the right of the insert shift right (E becomes F, and so forth), and rows below the insert shift down (99 becomes 100, and so forth). Cell coordinates within formulas may have to be adjusted accordingly.

*Erase* is a selective way of removing data from cells, as opposed to Clear at the Main menu. Pressing *E* at the Worksheet menu displays the Erase menu. Pressing C or R from that menu erases the data within the current column or row. The column width and format remain unchanged.

One additional option, called *Global Range*, lets you erase the data within a block of cells. Choose Global Range by pressing *G*, followed by the From..To cell coordinates. Again, the coordinates of the current cell are preprinted as the first cell coordinates. If you want, you can overtype them with other coordinates. You can also press escape at any time to exit safely without affecting your data.

## FORMAT COLUMN MENU

The selections in this menu determine how the data prints within the cells on the screen and in printouts. There is also an option for switching the data type from labels to value, and vice versa. Individual cells can't be formatted separately from the rest of the column. However, labels normally ignore formats intended for values.

The default values are left-justified for labels and right-justified with two decimal places for values. Changing the width of a column normally resets the format for that column to the default values. A cell fills with asterisks (**********) if, for some reason, you improperly select a numeric format for the type of data or number of digits that's to be printed within the cell.

Press *L* and your label data will be *left-justified* in the cell in the current column. Values continue to be right-justified.

Press *R* and both labels and values become right-justified in the cells in the current column.

If *C*, for *center*, is pressed, labels are centered in the cells in the current column. Values are still flush on the right.

When you press the *D* key, you're prompted to choose how many *decimal* places you want in values. Make sure the column is wide enough to contain the numbers that appear to the left and to the right of the decimal point.

Pressing *M* provides right justification with two decimal places, like the default setting for values, with the exception that a dollar sign ($) is printed directly to the left of the value, as in $125.50.

*Scientific notation,* also called engineering notation, is a popular format for expressing very large or very small numbers that's used by (who else?) scientists and engineers. As an example, this option would print .001234 as $-1.234E-3$. Specify scientific notation by selecting *S*.

Pressing *T* provides two options for *type* of data. An *L* converts data in the column to a *label* by removing the plus or minus sign at the beginning of each cell. The @ functions aren't affected by switching data types. *V* converts labels to *values* by appending a plus sign to the beginning of the cell data. You'll see the data switch the way it's justified once the screen is reprinted. This option was included to help you import Datafile records into RUN Calc 128 by letting you select specific fields (which become columns) to be converted from strings (or labels) to values.

## DISK FILES MENU

RUN Calc 128 works with disk device 8, so keep your data disk in that drive. Also, store a copy of the program on the same disk as your worksheets. Worksheets are saved on the disk with a 12-character name of your choosing, preceded by cf]. When typing in worksheet filenames, don't type in these special characters. Any time the program is accessing the disk drive, the status line displays a flashing DISK.

Pressing *D* clears the worksheet and displays a *directory* of all files on the disk. Pressing escape exits the directory listing and redisplays your worksheet on the screen.

Pressing *L* clears the worksheet, prints only RUN Calc 128 worksheets (those sequential files beginning with cf]) listed in the directory and initiates a prompt asking you to enter the name of the worksheet file. Then, when you press return, the worksheet file is loaded into the cells from which they were originally saved. Loading a worksheet file doesn't clear the current worksheet, which means you can combine several sheets, as long as they don't occupy the same cells. You can move the cells of the current worksheet by inserting the appropriate number of columns or rows to make room for the incoming worksheet file. The last worksheet file loaded determines the column format settings for the entire worksheet.

When you press *S* at the Disk Files menu to *save* the current worksheet, a prompt appears asking for the worksheet filename. Enter a filename that's 12 characters or less and hasn't been used before on the disk. If you want to reuse a filename, you can rename

and erase the old worksheet file on the disk. Worksheets are saved to disk with the cell coordinates to make sure they'll be placed back in the same cells upon loading. As a consequence, you must input the range, or block, of cells to be saved, by making use of the From..To format.

To format a disk, press *H*, for *header*, and you'll be asked for a 16-character disk name and a two-character disk ID. If the disk has already been headed, you can dispense with the ID by pressing return without an entry. Press escape to exit at any time.

At some time, you may want to *rename* a worksheet file so you can save your current worksheet using an existing name. Press *R* to have the program display a listing of existing RUN Calc 128 worksheets on the disk for your examination. Enter the name you want changed after the From prompt and the new name after the To prompt.

*Erase* is another term for scratch, which means to delete excess files on your disk. Pressing *E* displays a directory of RUN Calc 128 worksheets and a prompt for the name of the file to be erased.

---

**Table 1. RUN Calc 128 operations and functions.**

### BASIC LANGUAGE ARITHMETIC OPERATIONS

| Symbol | Operation | Examples |
|--------|-----------|----------|
| + | Add | +A1+B2, +100+Z250, +H7+H8+H9 |
| − | Subtract | +A1−B2, −B2+35, +C12−C11−C10 |
| * | Multiply | +A1*B2, +A1*(−B2), +10*4 |
| / | Divide | +A1/B2, +A1/−B2, −10/2 |
| ↑ | Exponent | +A1↑B2, +2↑2, +G16↑−3 |

### BASIC LANGUAGE LOGICAL OPERATIONS

| Symbol | Operation | Examples |
|--------|-----------|----------|
| = | Equal to | +A1=B1, +A1=100 |
| < | Less than | +A1<B1, +A1<100 |
| > | Greater than | +A1>B1, −20>−30 |
| <= | Less than or equal to | +A1<=B1, +X5<=X6 |
| >= | Greater than or equal to | +A1>=B2, +1>=F15 |
| <> | Not equal to | +A1<>B2, +100<>J23 |

## BASIC LANGUAGE FUNCTIONS

| Symbol | Function | Examples |
|--------|----------|----------|
| ABS( ) | Absolute | +ABS(A1), +A1+ABS(B1=B2) |
| ATN( ) | Arctangent | +ATN(A1), +2*ATN(2*3.14159) |
| COS( ) | Cosine | +COS(A1), +ATN(COS(2*3.14159)) |
| EXP( ) | Exponent | +EXP(A1), +25*EXP(X1) |
| FRE( ) | Free memory | +FRE(0) |
| INT( ) | Integer | +INT(A1), +INT(A1*100+.5)/100 |
| LOG( ) | Logarithm | +LOG(A1), +EXP(A1)/log(A1) |
| RND( ) | Random number | +RND(1), +INT(RND(1)*6+1) |
| SGN( ) | Sign | +SGN(A1), +A1*SGN(B1−C1) |
| SIN( ) | Sine | +SIN(A1), +2*SIN(30*2*3.14159) |
| SQR( ) | Square root | +SQR(A1), +SQR(A1↑2) |
| TAN( ) | Tangent | +TAN(A1), +TAN(SIN(A1)/COS(A1)) |

## @ FUNCTIONS

| Symbol | Function |
|--------|----------|
| @SUM(A1..A10) | Sum, or add, the values in a range of cells. |
| @AVG(A1..Z1) | Find the average value for a range of cells. |
| @MAX(A1..Z250) | Find the maximum value in a range of cells. |
| @MIN(Z1..Z50) | Find the minimum value in a range of cells. |

Erasing is more or less permanent, so be sure you really won't need the worksheet anymore.

Pressing *I* at the Disk Files menu accesses a routine that reads and *imports* a sequential record file created by Datafile 3.6 (available on ReRUN Productivity Pak II, and January-February and March-April 1987 ReRUNs). RUN Calc 128 analyzes the structure of the record file, then begins loading the records into corresponding rows. Each column's width is set according to the width of the fields.

The record's file data is brought in as labels, and you're limited to 250 records using 26 fields (the maximum spreadsheet size). You can convert numeric string fields to values and select column formats by going to the Format Column menu at a later time.

If you have more than 250 records or 26 fields in your record file, you must make a subset of the file using DFClone (ReRUN, July–August 1987). Keep in mind that you may need extra rows in which to place titles and equations for totaling your data. You may

want a few extra columns also, but in most cases you'll probably delete unnecessary columns holding fields that aren't needed. RUN Calc 128 produces a more customized report than is possible with the database programs themselves.

Place your database record file disk in the drive. Then, when you press *I* at the Disk Files menu, RUN Calc 128 displays a directory of compatible record files. Datafile record filenames are preceded by dfl. Type in the name of the record file you want and the program will load it and convert it into a worksheet. The records are transferred in the same sorted order they have in the record files, so perform any sorting operations before importing. Once the Datafile files are imported, they can't be exported back to the databases.

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RUN it right: **C-64**

# RUN Calc 64

*By Trent Busch*

RUN CALC 64, an electronic spreadsheet program for the C-64, can be used for calculations that range from checkbook balancing to complex investment analysis. This article takes you step by step through the program's features.

RUN Calc 64 appears on the Super Starter Pak disk as a compiled program that offers maximum speed. (The original Basic program, RUN Calc 64.bas, which also appeared in Productivity Pak III, had to be omitted here because there was insufficient disk space to include it.)

## VIEWING THE SPREADSHEET

After loading and running RUN Calc 64, examine the display. The flashing cursor at the top-left of the screen is on the data-entry line. Running across the screen below it is a solid comment line that the program uses to display important information. The initial screen also displays the numbers 0, 1 and 2, which represent columns, and the letters A–T, which identify the rows. Each of the columns is limited to holding a maximum of nine characters.

RUN Calc 64 has a total of 30 columns and 26 rows, but only three columns and 20 rows are visible on the screen at one time. It's like looking through a window that reveals only a portion of the landscape outside.

The cursor keys let you move this window around the spreadsheet. Press the cursor-down key, and the quickly redrawn display shows you rows B–U. Experiment with the cursor keys to move the viewing window over all the columns and rows.

## ENTERING DATA

The intersection of a spreadsheet column and row is called a cell, designated by the row letter and column number. RUN Calc 64 provides 780 cells: A0–Z29. Pressing the home key at any time will return the window to the initial A0 position.

To enter information into a cell, follow this simple procedure. First, type in the cell location, with the row first, the column second, and no spaces between the characters. Next, type a colon to separate the cell location from the data. Then type in your text or numeric data up to nine characters in length. The nine characters include control codes, which each count as one. As examples of cell input,

A0:BUDGET 88

would enter a label in cell A0, and

C12:250

would enter the value 250 in cell C12.

Text information can include almost any character, but mustn't begin with a number or a plus or minus sign. You can highlight text information by inserting color changes or reverse imaging, but be sure to change the color back to normal afterwards. Numeric information *must* begin with a number or a plus or minus sign.

After typing the information you want in a cell, press the return key. If you typed everything correctly, the data should appear in the proper cell.

It's very important that you enter information by the proper method. If you don't, RUN Calc 64 displays an error message on the comment line to help you locate the problem. When you're ready to enter the line again, press any key and just retype it.

Numeric data is automatically aligned flush right in a cell, and text data is aligned flush left. You can insert spaces to move the text over if you want.

To clear a cell, enter the cell coordinates, followed by a colon, and then press return. This procedure will clear text, but not formulas. To clear the entire spreadsheet, press shift/clear and answer Y to the question on the comment line.

## ENTERING FORMULAS

Up to now, all you've done is create neat columns and rows. The real power of RUN Calc 64 lies in its ability to perform mathematical operations using the data in the cells. For example, you can add cell A0 to cell A1 and place the answer in cell A2 by putting the formula A1+A2 in cell A2. Here's the proper format:

A2:[F1]A1+A2

The F1 appears as a reverse F and is printed by pressing the F1 key (don't type the brackets). This key accesses special features of RUN Calc 64. If you forget to press F1 when entering a formula, it will be displayed in the cell as text. If you do press F1, the result of the computation will appear in the cell.

When typing in a formula, leave out all spaces and enter the cell first and the formula second.

A special View command lets you view the formula in a particular cell. This is the only way to view formulas that are more than nine characters long. As an example of this command, if you enter

A2:[F1]V

and there's a formula in cell A2, it'll be printed on the comment line, along with the full value of the numeric data in the cell.

RUN Calc 64 fills a cell with asterisks when it contains a formula that's more than nine characters long. The asterisks alert you to use this View command to examine the contents of the cell.

## DOING ARITHMETIC

RUN Calc 64 can perform the following mathematical operations:

—Addition: cell+cell or cell+constant
—Subtraction: cell−cell or cell−constant
—Multiplication: cell*cell or cell*constant
—Division: cell/cell or cell/constant
—Exponentiation: cell↑cell or cell↑constant

The program doesn't handle complex formulas, but you can do involved computations by storing an intermediate answer in a spare cell.

when you have to enter lots of identical information. In this example, the contents of cell D3 will be copied into cells D4 through D29. Only text and numeric information can be copied in this way; formulas must be typed in individually. This command works with rows or columns.

## THE FUNCTION KEYS

The role of F1 in entering formulas has already been discussed.

Pressing F2 shows you formula results on the comment line to a degree of accuracy up to six decimal places. RUN Calc 64 automatically rounds formula results to two decimal places. To display a different degree of accuracy, press F2 and then a number from 0 to 6 to indicate the number of decimal places you want. This command doesn't affect the accuracy of the calculations, and you can always use the View command to see the actual value. As mentioned, the precision setting pertains only to numbers that are the results of formulas. Other numeric data must be typed in just as you want it.

Press F3 and follow the screen directions to load the spreadsheet template from disk.

Press F4 and follow the screen directions to save the template to disk. Be sure to pick a filename that suggests the subject of the data the template holds.

Press F5 and follow the screen directions to print the spreadsheet template on paper. You can print the whole template, or you can print a portion of it by entering the coordinates of the top-left and bottom-right cells of the part you want. If you specify more than seven columns, RUN Calc 64 will automatically break the printout into sections.

Press F6 and follow the screen directions to print the formulas in the template on paper.

Press F7 to change the background screen color, F8 to change the border color and the control key with a number key, 1–8, to change the text color. After you enter any color change, press return; ignore the error message and press return again.

Whenever the status line is visible, you're in Terminal mode, and the main commands are active. After you enter one of these commands to select a program option, the status line and menu disappear, and the other commands are no longer available until you get back to Terminal mode.

When you return to Terminal mode, the screen is usually just as you left it, the exception being after you've used Conference mode. In both the C-64 and C-128 versions, the screen is preserved after file transfers. Some commands don't change the screen at any time during execution.

## THE STATUS LINE

The top line of the screen is called the status line, and it displays information on the program's internal settings. At the right end of the line is the clock. If your modem can detect a carrier, you'll see a lowercase c to the left of the time. At the left end of the line the baud rate—either 300 or 1200—is displayed (see ↑ below). To the right of the baud rate a set of single letters indicates what RUN Term functions are activated. These letters include b, e, w, j, t, d, s and r, and their meanings are as follows:

**b**—The text buffer is open to receive characters from the modem for later retrieval. (See B below.)

**e**—The Echo function is on. (See E below.)

**w**—The Buffer Wrap function is on. (See W below.)

**j**—Linefeeds from the modem will be printed to the screen. (See J below.)

**t**—ASCII translation during Xmodem file transfers is activated. (See * below.)

**d**—DLE screening during Xmodem file transfers is on. (See * below.)

**s**—Padding will be stripped from the end of files downloaded using any Xmodem option. (See * below.)

**r**—The RAM expander (1700, 1750 or 1764) buffer is open to receive characters from the modem. Note that this buffer is completely separate from the regular buffer. (See R below.)

When any of the above letters don't appear in the status line, those options aren't in use.

## THE TRANSLATION TABLE

The default state for all keys in RUN Term is the same as in the VT100 program found on the 1670 demo disk, and RUN Term uses the same translation tables as VT100. However, RUN Term is

want to start over, or use the delete key to erase individual characters as usual. Your line of text won't be sent until you hit the return key.

Characters received from the modem are printed at the bottom of the screen. I recommend that you instruct the online service *not* to echo your characters back while you're using this option.

The *only* way to exit Conference mode is with the stop key, because none of the command keys are available. However, settings such as buffer open/close, echo and baud rate that are selected in regular Terminal mode are active in Conference mode. In other words, open the buffer *before* entering Conference mode!

**D**—Downloads, or receives, a file from another computer. This option now works with the currently active disk drive. You have a choice of Punter protocol or one of three Xmodem protocols: Checksum, CRC and WXmodem.

Don't worry if you don't know which Xmodem to use—Checksum is the standard, and RUN Term automatically switches from WXmodem to CRC and from CRC to Checksum if it doesn't connect properly using the protocol you've selected. WXmodem, which stands for Windowed Xmodem, is relatively new to Commodore users. Currently available only on PeopleLink, it transfers four Xmodem blocks at a time, so it's faster than Checksum or CRC.

Punter indicates that a block has transferred correctly by printing a hyphen to the screen, incorrectly by printing a colon. Xmodem clearly lists the number of blocks and the number of errors in the transfer as ASCII digits. In addition, upon completion of an Xmodem transfer, a status report is printed in reverse-video on the Terminal mode screen.

During any Xmodem transfer (up- or download), the file moves by on the 40-column screen. If you're using a C-128 in 80-Column mode and want to watch the file, switch to 40 columns by using the composite/RGB switch on your monitor.

Since Xmodem files must be transmitted in blocks of 128 bytes, you may have to add bytes to the last block to fill it out. This is called file padding and is done with either control/Zs or CHR$(0)s (zero bytes). The Xmodem standard requires the transmitting program to make sure the byte used for padding is *different from* the last byte of the file. A few Xmodem programs (including *RUN*'s RUNning Board BBS) fail to do this, so downloads from them using the Pad Stripping option may be garbled. To remedy this situation, turn off Pad Stripping by using the appropriate option from the Defaults submenu (see * below).

Remember that the Terminal mode screen is preserved, though invisible, during such functions as loading the buffer. If you have the main menu on the screen before the buffer load, you'll find the buffer write pointer unchanged when you are returned to Terminal mode. Press F1 (C-64) or the help key (C-128) to see the updated pointer.

**R**—Takes you to the RAM Expansion Unit (REU) menu. All three RAM expanders—the 1700, 1750 and 1764—are supported, but note that RUN Term doesn't know which you're using. Each REU is divided into several "banks" of memory that are each 64K in length and numbered starting at zero. You should know which banks are available.

The REU menu lets you turn the REU buffer on and off, manually set the REU bank and memory address write pointers, load a sequential file into the REU and save the contents of the REU to the screen, printer or disk. When saving REU memory, keep in mind the memory limitations of the word processor you'll be using. Each REU bank must be saved separately, and you can select the start and stop points for the save. Note, however, that these points will be rounded to even page boundaries before the save begins.

If you select the Save command by mistake, it can be aborted by answering the prompts with incorrect (or no) information. This is generally true for RUN Term.

**S**—Saves your choice of the entire standard buffer area or the area from the start of the buffer to the buffer write pointer. The first of these options is handy for use with the Buffer Wrap feature and the second for saving short pieces of data. Whichever area you select, it's sent to your choice of three devices: to disk, as a standard sequential file; to the printer (see F above); or to the modem (with ASCII translation).

**T**—Sets the on-screen clock. By pressing return at the AM/PM prompt, you can instantly zero the clock.

**U**—Uploads (sends) a file via Punter or one of two Xmodem protocols: Checksum or CRC. Due to hardware limitations in the C-128 and 64, WXmodem (see D, above) isn't available for uploading.

**V**—Lets you view the text buffer. The text is formatted on the screen, with a left arrow taking the place of a return. The following key commands are active in this option:

>**Cursor-down**—Scrolls the buffer forward (advances through the text).

>**Cursor-up**—Scrolls the buffer backward (toward the start).

strip file padding at the end of downloads. This option defaults to "on" (indicated by a letter s on the status line), because some programs won't work unless this extra padding is removed. Turn the option off, and any bytes added to the end of the file during transfer to your computer are left intact.

↑—Toggles between 300 and 1200 baud. Don't select 1200 baud unless you have a 1200 baud modem! Also, don't change baud rates while online. Modems that support 1200 baud, such as the 1670, set their own baud rate when you enter the ATD command to dial, and that setting can't be changed until you hang up!

**1, 2 and 3**—These number keys each send one of the three phonebook strings to the modem, with translation to ASCII. Note that you must have dialed with the Phonebook option and that the selected phonebook must still be in memory, so don't load another while you're still online. These three keys are deliberately sent slowly, due to problems I've had at 1200 baud with some services.

**F3 or Escape**—Commodore/F3 on the C-64 or alt/esc(ape) on the C-128 returns you to Basic. Don't hit run-stop/restore! To re-enter RUN Term, insert the RUN Term disk in drive 8 and then type in RUN.

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RUN it right: **C-64 or C-128 (in 40-Column mode); joystick or 1351 mouse**

# RUN Paint

*By Robert Rockefeller*

RUN PAINT is a sophisticated, joystick-based paint program that lets C-64 and C-128 users create and print out bit-mapped graphics. It runs in 40-Column mode and uses both hi-res and multicolor screens. An easy-to-use system of nested, pop-down menus makes it unnecessary to study and memorize sets of complicated commands or to continually refer to the documentation.

### GETTING STARTED

Before starting to use RUN Paint, make sure you have a joystick

Calculations aren't made immediately as data is entered, but are triggered by your pressing the left-arrow key at the top-left of the keyboard. The calculations take a while, depending on the number of formulas in the spreadsheet. They're performed column by column, from top to bottom, with one column completely calculated before the next one is started.

Sometimes this can result in calculations being done in the wrong sequence. For example, say cell A0 contains F9*G6. If cell F9 has a formula in it, the results of that formula will not be calculated until *after* cell A0 is computed. To get around this problem, press the left-arrow key twice.

After the program has completed all computations, the spreadsheet is redrawn, with the results displayed in the proper cells. An error message will appear if you attempt to divide by zero, and, if a result of exponentiation is too large, an overflow note will appear in the affected cell.

## SPECIAL FORMULAS

RUN Calc 64 provides the following special formulas. They're presented here with sample data inserted.

**A1:[F1]SUMA2–Z2** places the sum of cells A2 through Z2 in A1.

**Z29:[F1]AVGB3–B12** calculates the average of cells B3 through B12 and places the answer in cell Z29.

**C12:[F1]MIND0–G0** searches for the minimum number in cells D0 through G0 and places the answer in cell C12.

**F5:[F1]MAXZ0–Z29** returns the maximum value in a range.

These formulas work only on a range of cells in one row or in one column. They will not work on diagonal groupings of cells.

## SPECIAL COMMANDS

RUN Calc 64 also provides the following special commands, which are again presented with sample data.

**A0:[F1]T** leaves row A and column 0 titles displayed on the screen, so you can see what each cell is supposed to be as you move the window around. You must use cell A0 in this command.

**A0:[F1]O** turns off the title mode. The cell must be A0.

**C15:[F1]A** clears a single cell of formula, text and numeric data.

**F25:[F1]J** jumps the display window to a particular area of the spreadsheet. Sometimes this is faster and easier than using the cursor keys.

**D3:[F1]COPD4–D29** copies the contents of a cell, which is handy

# RUN Term

*By Tom Brown*

THERE ARE TWO versions of RUN Term on this Starter Pak disk. RUN Term 128 was originally published in the January 1988 issue of *RUN* and is updated here. RUN Term 64, first published in RUN Works (1988), is essentially identical in operation to RUN Term 128, the main differences being the use of the Commodore key to issue commands (instead of the C-128's alt key), the lack of programmable function keys and, of course, the lack of an 80-column screen.

## PRELIMINARIES

You'll find it convenient to power up RUN Term with default baud rate, echo and buffer settings customized to your system. To set this up, copy RUN Term to a work disk, then load and run the Change Defaults program, following the prompt to change each item or pressing the return key to keep the original setting. The Change Defaults program creates a file called Configure on a work disk in drive 8. Be sure to copy this file to your RUN Term work disk.

To activate the C-128 version, either use Menu 128 or enter RUN "BOOT.RUNTERM128". For the 64 version, either use Menu 64 or enter LOAD "RUNTERM 64",8 and RUN. If you intend to use the auto-dialer option, it's important to turn your modem *on* (if it has an on/off switch) and to have it off-line when activating RUN Term. Some modems, such as Hayes-compatibles, have a "reversed" carrier, which would confuse the dialer. If your modem doesn't have a carrier detect (such as early Commodore 1660s), you may not be able to use the auto-dialer.

When you activate RUN Term, there's a pause as the program loads itself into memory. Then the screen flickers momentarily, and prompts for the time to appear. Pressing the return key at the first prompt (AM/PM) zeros the clock and exits to Terminal mode.

Next, the status line (see below) appears at the top of the screen, accompanied by a brief menu that lists the main program commands (see below).

not specifically designed to produce VT100 emulation. The extra keys needed in VT100 emulation are as follows:

**Left curly bracket ({) = shifted plus**
**Right curly bracket (}) = shifted minus**
**Vertical bar (|) = Commodore key/minus**
**Tilde (~) = shifted up-arrow (↑)**
**Carat = up-arrow**
**Backslash (\) = British pound sign (£)**
**Accent mark = shifted commercial at sign (@)**

Note that escape sequences are not supported by RUN Term, so the program may not operate properly on remote full-screen editors.

## THE COMMANDS

To view RUN Term's main menu, press the F1 key on the C-64 or the help key on the C-128. To send *any* of the commands in the menu to the terminal, hold down the Commodore key on the C-64 or the alt key on the C-128 as you press the desired command key. The following are the commands available:

**A**—Accesses Auto-Dial mode. First you must specify your modem type, then the number of seconds you want to elapse between dial attempts. Finally, you can enter a number directly or use the phonebook.

The phonebook commands are straightforward: Load, Save and Edit. If you choose to edit with nothing in memory, a new, blank book is created for you. There's room for nine entries in a phonebook, with each including the name of the online service, its phone number and three strings that can be used to send a log-on sequence. If you're using the 1670/Hayes option, the first character of *every* phone number must be a *p* or a *t* (note the lowercase) to indicate pulse or tone dialing. With the 1650 or 1660 dialing option, an asterisk in the phone number will delay dialing for one second.

**B**—Toggles the text buffer open and closed. To find out where you are in the buffer, access the main menu, and below the list of commands you'll see the present address in the buffer write pointer, with the maximum possible pointer value in parentheses. The buffer size in the 64 version is about 28K, in the 128 version about 60K.

**C**—Selects Conference mode (also called CB mode), which facilitates multiuser connections on services such as PeopleLink and GEnie. At the top of the screen, you'll see a row of 80 reverse-video spaces, where your characters will appear as you type. There's no cursor in this mode. Press control/X to erase the whole line if you

To abort Punter transfers, hold down the Commodore key. To abort Xmodem transfers, hold down the stop key.

**E**—Toggles the Echo mode—sometimes referred to as *half-duplex*—on and off. When Echo mode is off, you're in *full-duplex*. If you can't see what you're typing because the service you're connected to doesn't echo characters back to your computer (as with GEnie, for example), turn on Echo mode.

**F**—Reads a sequential file. Use this command to send a file to the screen, printer or modem. The file is translated to ASCII when sent to the modem.

**H**—A modem, like a phone, can be "off the hook" or "on the hook." This option is designed primarily for the 1650 and 1660 modems, and it's a toggle, because the pick-up command for the 1650 is the hang-up command for the 1660.

When you're using a 1670 or Hayes modem, the H command only hangs the modem up. It sends three plus signs, with a two-second pause before and after, which hang up the 1670 or put the Hayes-compatible into Command mode. Follow the H with the characters ATH (in ASCII uppercase) and a return to hang up the Hayes. These commands are harmless to a 1650 or 1660 modem.

To pick up on a 1670/Hayes modem, enter an uppercase ATD to access Originate mode (like dialing without a phone number) or an uppercase ATA to force the modem into Answer mode (not to be confused with Auto-Answer mode). If your Hayes-compatible won't accept the ATD command, use ATO to force the modem online in Originate mode.

**J**—Toggles linefeed printing. This option actually changes the input translation table. Some services always send CHR$(10) (a linefeed) with each return, and if you have linefeed on, you'll end up with double-spaced text. I'd suggest that you turn linefeeds off, unless you specifically need them.

**K**—RUN Term 128 redefines only the help key and the shifted run-stop key, but, using Basic 7.0 commands in Direct mode, you can define a set of function keys for your own special use while online. This option, which is unavailable in the C-64 version, lets you load and save these keys easily.

**L**—Loads a sequential file into the text buffer, starting at the address held by the buffer write pointer. When the load is finished, the write pointer is updated, so you can append several other sequential files. To force the load into the start of the buffer, first zero the buffer (see Z below).

**Plus sign**—Scrolls forward 256 characters.

**Minus sign**—Scrolls backward 256 characters.

**Home**—Moves to the start of the buffer.

Any other keypress exits to Terminal mode.

**W**—Toggles the Buffer Wrap function. Sometimes it's inconvenient to have a buffer close in the middle of a transmission. This option forces the buffer write pointer back to the start of the buffer to continue writing, without the buffer closing. Note that Buffer Wrap works only when you're saving the entire text buffer (see S above). If this option is turned off, the buffer closes when it's full.

**Z**—Zeros (empties) the entire buffer, then fills it with CHR$(13)s (returns). When you press Z, the Terminal mode screen doesn't change, but, in the C-128 version, the cursor vanishes, then reappears when the zeroing is done.

**@**—Presents the Disk Drive menu, as follows:

   **1**—View the directory of the disk in the current drive.

   **2**—Change the current drive device number. This specifies which drive you'll be using throughout RUN Term.

   **3**—Read the current drive's error channel. Use this option when the drive's error light flashes.

   **4**—Sends a disk command. When you're prompted for a command string, input a dollar sign to read the directory. Pattern matching is possible here, as in the C-128's machine language monitor and the C-64's DOS Wedge. Disk commands are sent the same way as with the DOS Wedge, except you can omit @ as the first character.

**\***—Changes several system defaults. Select the proper menu options to change foreground and background colors, Punter protocol block size and parity, stop bits, word length and delete key values. However, *don't* change the above parameters unless you know what you're doing, and keep in mind that changing the delete key value alters the input and output translation tables. RUN Term's default delete key value is CHR$(20), while some computers you call may use CHR$(127) or CHR$(8).

You can also opt for three Xmodem features through the Defaults menu. One is ASCII translation, which makes text files more readable if they were written on another computer using true ASCII. The second is DLE screening. Long-distance services, such as PC Pursuit, use the same Xmodem commands for their own operation as you use for file transfers. If the other computer has DLE screening available, then turn this option on. The third Xmodem option is to

or 1351 mouse plugged into port 2 (do not plug them in with the power on). Then turn on the computer. RUN Paint defaults to a joystick in port 2, so if you're using a 1351 mouse instead, press the F3 key at this point. Pressing F1 will reselect the joystick.

To start RUN Paint in either 64 or 128 mode, just load the program called RUNPAINT and run it. After half a minute or so, the screen clears and a flashing arrow appears in the center. The arrow is a pointer that you move around with the joystick or mouse to make menu selections and to draw on the screen.

The rest of this article will take you step by step through each of RUN Paint's functions. By the time you've finished, you'll have a good working knowledge of the power and sophistication of this program. After that, you can use the documentation as a reference guide.

## THE MENU SYSTEM

You can't draw anything until you select an option from a menu. To activate the menu system, move the pointer at least five pixels above the top of the screen border and press the firebutton. When the main menu appears, select one of the options thereon by moving the pointer onto it and pressing the firebutton. This operation is known as "clicking." Take care not to move the pointer off the menu until you're finished with it, because the menu will then disappear.

Clicking an option displays a submenu from which you can make further selections. Some of the submenu options perform an action, and some make yet another submenu pop down. Accessing some of RUN Paint's features requires descending through three levels of submenus.

Many of the program's menus include an option that's indented two spaces, possibly with an asterisk beside it. These are options you can click on and off. The asterisk means the option is turned on.

## THE MAIN MENU

The main menu contains six options and four arrows. The latter are "scroll arrows" that you use to move the screen within the page buffer (see below). To observe these arrows in action, draw something on the screen. Here's how:

Activate the menu system by clicking on the Draw option in the main menu; then, when a submenu appears, click the Freehand option. You should note that making a selection may cause the menu to disappear.

Now, position the pointer on the arrow pointing right and press

the firebutton. This will make the contents of the screen seem to scroll left, because the screen is being moved to the right through the page buffer. Releasing the firebutton stops the scrolling and makes the main menu re-appear. There are arrows corresponding to the other three directions also, but the up and down arrows are nonfunctional on the C-64 because of insufficient memory.

Following is an explanation of the functions accessed through each of the six main menu options.

### THE PEN SUBMENU

The two main drawing tools in RUN Paint are the pen and the brush, and the various options associated with them are controlled through the Pen submenu. There are six different pen styles, and an unlimited number of brush shapes and patterns are possible, since RUN Paint allows saving and loading of brushes and patterns. Brushes work by painting the part of the screen covered by the brush with the current pattern whenever the firebutton is pressed. Here's an example:

Activate the menu system, click on Pen, then move the pointer down to Use Brush and click on a brush for drawing. Next, move the cursor back onto the main menu and click on Draw, followed by Freehand. When you move the brush around while pressing the firebutton, the current brush pattern appears wherever the brush goes. RUN Paint lets you select from 11 different brushes and 35 different patterns at any one time.

Following are descriptions of the options in the Pen submenu:

**Select Color** lets you choose the color you want to draw with. When you click on a color, the border color changes to your choice to indicate the current drawing color.

**Use Pen** and **Use Brush**, which specify the pen or the brush for drawing, are mutually exclusive; if you select one, you deselect the other. An asterisk is always present beside the currently selected tool. The drawing modes in which you can select either pen or brush are Freehand, Lines, Rays, Spray, Ellipse and Box. Flood always uses the pen, regardless of which tool you've selected.

**Affect Color**. This option is either on or off. When it's off, none of RUN Paint's graphics commands affect color memory. If you want to use a Monochrome mode, just turn off Affect Color after activating the program.

**Reflect On** simultaneously creates up to three mirror images of an object as you're drawing it. Here's an example:

Enable the menu system, click on Pen, then on Set Reflect and on X in the Set Reflect submenu. Next, return to the Pen submenu and activate Reflect On. Now move back to the main menu and click on Draw, then on Freehand. As you move the pointer around while pressing the firebutton, you can verify that a mirror image is drawn, reflected in the x-axis. Try the other options in the Set Reflect submenu, namely Y and XY. (See Set Reflect and Move Mirror, below.)

**Set Reflect** displays a submenu of reflection modes you can choose from when Reflect On is enabled. X produces reflection on the x-axis, Y on the y-axis and XY in the opposing quadrant. (Also see Reflect On, above, and Move Mirror, below.)

**Move Mirror** is the option you use to position the reflective x and y axes anywhere you want on the screen.

**Select Pen** lets you choose one of six pens for drawing when the Use Pen option is on. The first option draws normal solid lines and the second draws double-width solid lines. The third to sixth options produce one of four styles of dotted lines. In Freehand mode, only solid lines can be used. The dotted lines work only in the Lines and Rays modes.

**Select Brush** lets you choose a brush shape to use when Use Brush is on. Just click on a brush.

**Select Pattern** lets you choose a pattern when Use Brush is on. Just click on any pattern.

## THE DRAW SUBMENU

The Draw submenu is used more frequently than any of the others, since it contains most of the commands for placing graphics on the screen.

**Alter Color** changes colors on the screen. You'd use it, for example, if you drew a flower with white petals and then decided it would look better in red. Selecting Alter Color brings up a submenu containing two options: **Card** and **Screen**. Card restricts the color change to a single card (see Technical Notes, below), which you select with the pointer. Screen makes the color change affect the entire screen. After selecting one of these options, a third submenu pops down from which to select the new color. In our example, you'd select red.

Once you select a color, the menus disappear, the border color changes to the color you selected, and you're ready to initiate the color change. Position the tip of the pointer over the color you want

to alter and press the firebutton. The border color changes to match the color of the pixel under the pointer. If this is indeed the color you wish to change, press the firebutton and the change takes place.

If nothing happens, you probably have the pointer positioned on a blank pixel. Move the pointer a little bit and try again. If the pointer is placed on the wrong color, you can abort the change by executing an Undo (see below) or by activating the menus, then moving the pointer off the menus back onto the screen to try again.

**Wash** lets you change the background color on a card-by-card basis in Hi-Res mode. When you select Wash, a menu pops down from which to choose the new color. After you select a color and the menus disappear, move the pointer onto a card and press the firebutton to change the backgound color of that card.

**Flood** fills an enclosed area with a solid color. Here also, a menu pops down from which to select the color you want, and the menus disappear after you choose. Then position the pointer over the area you want to fill and press the firebutton. You can abort a fill in progress by executing an Undo (see The Undo Feature, below).

**Freehand** makes a freehand drawing. Pressing the firebutton while moving the pointer around draws a line. (See the Pen submenu, above.)

**Lines** is the option used for drawing straight lines. Position the pointer where you want a line to start and press the firebutton; then move the pointer to the line-end position and press and hold down the firebutton until the line is completely drawn. (See the Pen submenu, above.)

**Rays** draws lines that radiate from a common origin. Move the pointer to the desired starting point and press the firebutton; then move the pointer to a line-end position and press the fire-button again to draw the line. Draw additional lines by moving the pointer to new end positions and pressing the firebutton again. As in the Lines option, you must hold the firebutton down until the line is complete. (See the Pen submenu, above.)

**Spray** produces a spray effect. When you select this option, a submenu pops down with three additional choices—Light, Medium and Heavy—which specify the intensity of the spray effect.

Spray uses either the pen or the brush and works on a timer. In Heavy mode, it plots a point or paints a brush shape every $2/_{60}$ of a second. The corresponding times for Medium and Light modes are $5/_{60}$ and $15/_{60}$ seconds, respectively.

If Use Brush is on, you can get an airbrush effect by selecting a

brush consisting of a grid of dots. (See Select Brush, above.)

**Eraser** mode erases the screen card by card.

**Edit** lets you modify either a section of the screen, the brushes, the patterns or the current character font. Selecting Edit displays a sub-menu. To modify a section of the screen, click on Pixel Edit. After your selection, the menus vanish and the pointer appears, surrounded by a flashing box. Position the box over the part of the screen you want to edit and press the firebutton. This enlarges the screen inside the box, copies it to the bottom of the display, and then brings a color menu to the center of the display, from which you select a new drawing color. The top of the display shows an unmagnified section of the screen, so you can see the effect of your edits.

You edit pixels by positioning the pointer over them and pressing the firebutton. To erase a pixel, set the drawing color to the screen color. You can select a new area to edit by moving the pointer to the top of the screen and pressing the firebutton.

The Font, Brush and Pattern editing modes operate in a similar manner. After selecting one of them, the screen clears and the font, brushes or patterns are copied to the top of the screen. Select a character, brush or pattern for editing by clicking on it. The center of the screen shows a color bar containing two colors: blue and black. Select blue to erase pixels and black to set pixels. You select a different character, brush or pattern to edit by moving the pointer into the top area of the screen and pressing the firebutton.

**Ellipse** uses either the pen or the brush to draw ellipses. Click twice to set two opposing corners of a box, and an ellipse will be drawn within the box.

**Box** uses either the pen or the brush to draw boxes. Click twice to set two diametrically opposite corners, and a rectangle appears.

**Solid** determines how Ellipse and Box work. When this option is on, ellipses and boxes are drawn filled-in. When it's off, they appear as outlines.

## THE SHAPE SUBMENU

The Shape submenu contains commands for cutting and pasting or erasing rectangular areas of the screen, along with whatever is within those areas. It uses a special area of memory called the "shape buffer," where shapes you cut or copy from the screen are stored. In Paste mode, the shape in the buffer is pasted on the screen. Note that it's impossible to paste a hi-res shape on a med-res (multicolor) screen, or vice-versa.

**Cut** duplicates a rectangular area and its contents from the screen to the shape buffer and erases it from the screen. Move the pointer to one corner of the shape and click, then to the opposite corner and click again.

**Copy** copies a shape on the screen into the shape buffer, but the shape remains on the screen. Execute this exactly as you would Cut.

**Paste** places a shape that's in the shape buffer onto the screen. In this mode, the pointer is surrounded by a box of the same size as the shape in the buffer. Move the box to where you want it located and click once.

**Erase** eliminates the contents of a rectangular portion of the screen. Move the pointer to one corner of the rectangle and click, then move it to define the opposite corner and click again.

**Flip X**. When this option is on, the shape is pasted and flipped horizontally about the y-axis.

**Flip Y** pastes the shape and flips it vertically about the x-axis.

**RVS** pastes the shape in reverse field. This option works well in Hi-Res, but not so well in Med-Res (Multicolor) mode.

**Cover** mode makes the shape completely cover the screen area where it's pasted. Normally, any areas of the shape that are blank are not pasted.

## THE TYPE SUBMENU

The Type submenu is used to place text on the screen. Type is essentially monochrome and uses the current color.

**Font**. Clicking this option selects a new character font and enables Type mode. After you click, a submenu will appear offering an additional three options. The first corresponds to the RAM font, which RUN Paint can load in via the Load submenu (see Disk, below). If this option is blank, a font hasn't been loaded yet. RUN Paint can use either standard Commodore 8-bit character sets or special RUN Paint fonts, which are 16 bits wide and 16 high.

**Graphics**, the second Type option, selects the built-in ROM character set that consists of the uppercase alphabet and special graphics characters.

**Text**, the third Type option, selects the ROM character set that contains the upper- and lowercase alphabets and business graphics characters.

After clicking on an option, you can begin typing. A flashing box shows where the next character will appear, and, when you press the firebutton, you can move this box anywhere you wish on the

screen. Press the firebutton again after the box is positioned. The following are special features available while typing:

**Cursor keys**: Move the flashing box around.

**Control/RVS On**: A standard Commodore character set has 256 characters, numbered 0–255, but RUN Paint can use only 128 characters at a time. Simultaneously pressing the control and 9 keys selects characters 128–255 for typing.

Normally, characters 128–255 are just reversed images of characters 0–127, and Commodore uses them to provide a flashing cursor. RUN Paint doesn't need these reversed characters, so they can be replaced by another font, such as italics. This lets two 8-bit character sets reside in memory at once. RUN Paint provides no way to replace the reversed characters.

**Control/RVS Off**: Simultaneously pressing the control and 0 keys selects characters 0–127 for typing.

**Home**: Moves the typing box to the home position.

**Return**: Moves the typing box to the start of the next line.

**DEL**: Pressing the insert-delete key deletes the character to the left of the cursor.

Now, getting back to the Type submenu:

**Width** displays a submenu with three options: Normal, Double and Quadruple. Click on the character width you want.

**Height** also produces a choice of Normal, Double and Quadruple. Click on the height you want.

The next five options, affecting how text is placed on the screen, are mutually exclusive; only one can be activated at a time.

**Cover**, which is the Default mode, makes characters you place on the screen completely cover the area inside the typing box. In this mode, it's impossible for you to make a character blend in with the background.

**RVS** is similar to Cover, except that characters are reversed before being placed on the screen.

**Or** places characters on the screen using the logical Or operation, thus letting them blend in with the background.

**And**. When this option is selected, characters are placed on the screen using the logical And operation. To see how this works, paint the entire top of the screen with a pattern using a large brush, then select the Quadruple option and the And option on the Type submenu. Now choose one of the fonts, position the typing box on the pattern and begin typing.

**XOr** lets you place selected characters on the screen using the

logical Exclusive-Or operation. This means the characters can blend in with the background.

## THE DISK SUBMENU

The Disk submenu is used to save and load files to disk, as well as to issue disk commands and select the disk device number. RUN Paint filenames must not contain any spaces.

**Load.** This option on the Disk submenu can load a number of types of files, which are selected from a submenu. After you select a file type, RUN Paint displays a list of the files of that type available on the disk. Just move the pointer onto the filename you want and press the firebutton.

RUN Paint can load standard Commodore character sets, as well as files created with other programs, such as Koala Painter, Doodle! and Flexidraw. These files must be renamed to conform with RUN Paint format. (See Load Font, Monochrome, Hi-Res Screen and Med-Res Screen, below.)

Use the **Font** option in the Load submenu to load a font. As mentioned above, RUN Paint can use standard Commodore character sets. However, the file must be renamed according to RUN Paint format before the program can load them. All RUN Paint font filenames must begin with the letters RPF and a period. For example, a character set named ITALICS would have to be renamed RPF.ITALICS. Remember, no spaces are allowed in a filename.

The **Page** option loads an entire page, **Shape** loads a shape, **Patterns** loads a set of patterns, and **Brushes** loads a set of brushes.

**Monochrome** provides a way to load a straight 8K monochrome bit map with no color. Flexidraw saves pictures in this format. Before you can load a Flexidraw picture into RUN Paint, you must rename it. For example, a Flexidraw file named JAGUAR would have to be renamed RPO.JAGUAR. Once again, there can't be any spaces in the filename.

After loading a monochrome bitmap, RUN Paint enters a special mode where you can copy a section of the screen to the shape buffer. If you go to a menu, the screen is copied to the page buffer. If you perform an Undo, the screen will go back to what it was before loading.

**Hi-Res Screen** loads high-resolution screens that include color, such as Doodle! picture files. As with Flexidraw files, Doodle! files must be renamed to RUN Paint format before they can be loaded. A Doodle! file named DD.FIELD would be renamed RPH.FIELD.

Also as with Flexidraw files, after loading, RUN Paint enters a special mode enabling you to copy a section of the screen to the shape buffer. If you go to a menu, the screen is copied to the page buffer, and an Undo restores the screen as it was before loading.

**Med-Res Screen** loads medium-resolution (multicolor) screens, such as Koala picture files. Like the other file types I've mentioned, Koala files must be renamed according to RUN Paint format before they can be loaded. A Koala file named APIC A FIELD would be renamed RPM.FIELD.

As with the previous two commands, RUN Paint enters a special mode where you can copy a section of the screen to the shape buffer. Going to a menu copies the screen to the page buffer, and an Undo restores the screen as it was before loading.

The **Utility** option enables RUN Paint to load in and execute user-defined, machine language utility programs that can give RUN Paint more capabilities. The programs must be assembled to run at address $6C00, and their filenames must begin with the letters RPU and a period.

**Save.** This option on the Disk submenu displays a further submenu from which various types of files can be saved. After selecting a file type, enter the desired filename, omitting a prefix, since RUN Paint will install it automatically. For example, if you enter ITALICS as the name of a font, RUN Paint will save it as RPF.ITALICS. As before, don't include any spaces in the filename.

There are eight commands for saving files, representing eight different file types. **Font, Page, Shape, Patterns** and **Brushes** are self-explanatory. **Monochrome** saves the contents of the screen as a straight 8K monochrome bit map with no color. **Hi-Res Screen** saves the contents of the screen as a Doodle!-compatible file. **Med-Res Screen** saves the screen as a Koala-compatible file. After you enter the filename for a med-res screen, the text screen will fill with strange colors. Don't worry. This is just because the text screen and the med-res screen share the same color memory.

Other Disk submenu options are:

**Command.** Select this option from the Disk submenu to issue a command to the disk drive for formatting a disk or scratching or renaming a file.

**Set Device** lets you specify device 8 or 9 for saving and loading.

## THE MODE SUBMENU

The Mode submenu is a catch-all for commands that don't fit in

anywhere else. It lets you set the screen and pointer color, print, select high or medium resolution, and more.

**Cursor**. This Mode submenu option displays a further submenu that offers three options: Solid, Flash and Card Restricted. **Flash**, the default, produces a flashing cursor. With **Solid**, you get a non-blinking cursor. You must also select the cursor color from a sub-menu. **Card Restricted** restricts cursor movement to coordinates that coincide with the upper-left corner of a card. This is often useful in Type mode and when pasting shapes.

**Screen Color** displays a submenu from which to alter the screen color. The color is actually changed for the entire page, not just the screen, and on the C-128 this takes a second or two. The change isn't finalized until the cursor is moved off the Screen Color submenu.

**GoTo**. This Mode submenu option lets you move around the page buffer quickly. On the C-64, three options are available in this submenu: Left, Middle and Right. On the C-128, you have an additional four options: Top, Bottom, Screen Up and Screen Down. As mentioned above, the page buffer is wider than the screen. In fact, it's 80 cards wide. Clicking on **Left** brings columns 0–39 of the page buffer to the screen. **Middle** and **Right** display columns 20–59 and 40–79, respectively. Clicking on **Top** moves the screen to the very top of the page buffer on the C-128. **Bottom** moves the screen to the bottom of the page buffer. **Screen Up** and **Screen Down** move up and down through the page buffer approximately half a screen at a time.

**Clear Screen**. This option in the Mode submenu predictably clears the screen. This action can be reversed with an Undo command.

**Clear Page** clears the entire page and cannot be undone.

**Print**. Various printout options are accessed through this sub-menu. They let you print part or all of a screen or page.

**Screen** prints just what is currently displayed. If the Define option (see below) is on, you can specify the number of screen lines to print. If Define is off, the full screen is printed.

**Page** prints the page buffer. Similar to printing a screen, if the Define option is on, you can specify the number of lines to print from the page. If Define is off, the full page is printed.

**Rectangle** defines a rectangular area of the screen to be printed. This area can be of any size. After the menus disappear, click once to define one corner of the rectangle, then move the pointer to define the diametrically opposite corner and click again to start printing. Rectangle doesn't work with the Prowriter printer.

**RVS.** If this is set to on, the printout will be in reverse field.

**Disk.** When Disk is on, the printer output will be sent to the disk. You must enter a disk filename before printing begins.

**Define** works with Screen and Page, but not Rectangle. As mentioned above, this option lets you define the number of lines to print from the screen. After you choose to print a screen, the menus disappear and a horizontal line appears. Move the line to define the bottom of the part of the screen you want printed and press the firebutton. The screen will be printed from the top down to the line.

You can also define the bottom line when you print a page, but printing takes place from the top of the page buffer down to the line. You can use Screen Up and Screen Down to position the screen in any part of the page buffer on the C-128.

Click on **Select Printer** to tell RUN Paint what type of printer you have. The program supports three printers and their compatibles: the Commodore 1515, the Epson and the C.Itoh Prowriter. If you have one of the printer interfaces that offer 1515 emulation, you should be able to use the 1515 printer driver, regardless of the type of printer you own.

Click twice on **Quit** to leave RUN Paint and return to Basic. On the second click, press the button for at least a second.

Use the **Device** option to tell RUN Paint whether you're using a joystick or a mouse.

**Hi-Res** and **Med-Res** specify either High Resolution or Medium Resolution mode. These options are mutually exclusive; selecting one unselects the other.

### THE UNDO FEATURE

I'll wrap things up with a look at RUN Paint's most useful feature: Undo. Undo is not selected through the menu system, so I'll illustrate it with an example. Draw something on the screen, then activate Undo by moving the pointer five pixels below the bottom border of the screen (as far down as it will go) and pressing the firebutton. The screen will clear, "undoing" the last function performed.

Each time you access the menus, the screen's contents are copied to the page buffer, and Undo works by copying the page buffer back to the screen. This means you can reverse any action performed since the last time the menus were accessed.

### TECHNICAL NOTES

The VIC chip in the C-64 and C-128 organizes the graphics screen

into little rectangles called "cards." The screen contains 25 rows of cards, with 40 cards per row. In Hi-Res mode, each card contains eight pixels horizontally and eight pixels vertically, and only two colors are possible per card: a foreground color and a background, or screen, color. If you try to add a third color to a card, the foreground color will change to the new color.

In Med-Res mode, also called Multicolor mode, three different foreground colors are possible per card, and the background color is the same for all cards. The luxury of having three foreground colors is paid for by decreased screen resolution. The pixels are twice as wide as in Hi-Res mode, and a card contains only four pixels horizontally by eight vertically.

## THE PAGE BUFFER

RUN Paint uses the screen as a window atop a larger area, referred to as the "page buffer." On the C-64, RUN Paint can handle drawings up to 640 pixels wide and 200 pixels high. With its larger memory, the C-128 can handle a full $8^1/_2 \times 11$-inch page, allowing drawings of up to $640 \times 792$ pixels.

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RUN it right: **C-64; C-128 (in both 40- and 80-Column modes); 1541, 1571 or 1581 disk drive**

# RUN Shell

*By John Ryan*

RUN SHELL, a DOS utility that's compatible with both the C-64 and C-128 and all three disk drives, is the newest and most powerful DOS shell to date. It is a file-maintenance and disk-archiving program that runs in both 64 and 128 modes. It also supports both 40- and 80-column output; Burst mode; all three Commodore RAM expansion modules, to a limited degree; and partitioning and sub-directory access on the 1581 drive.

## GETTING STARTED

Activate RUN Shell by using either Menu 64 or Menu 128. If you

intend to employ a RAM expansion module, be sure it's installed before power-up.

The program can be loaded in either 64 or 128 mode, but don't try to load it in one mode and switch to another, because it configures itself to fit the particular machine. You may, however, toggle between 80- and 40-Column modes.

Although it's a stand-alone program, RUN Shell will operate with many machine language programs that don't occupy memory from $1300 to $5000. However, due to the way it configures itself under the Basic of both machines, it won't operate with many Basic programs. This limitation affects users of RAM expansion modules, but more on that later.

Almost all of the options available in RUN Shell bring to the shell window a directory from which you can select files to work on. To choose a file for some operation, use the cursor keys to move the directory arrow to your selection. Then highlight the filename by pressing the space bar. If you change your mind, just deselect the file with the F5 key.

When you're finished highlighting all the files you want for any particular operation, you activate the operation by pressing the F7 key. In many cases (but not all), a Y/N prompt will ask you to verify your selection before pressing F7.

You can usually abort to the main menu by pressing the stop key. If not, there'll *always* be a Y/N prompt later to abort the operation.

There will be instances where RUN Shell expects a keypress from you to continue an operation (when swapping disks during a file copy, for example). The rule here is to press the space bar to continue or the stop key to abort to the main menu.

To exit RUN Shell, press the F1 key, and press it again to re-enter. C-64 owners must reinitialize the program after using the run-stop/restore combination by entering SYS 4864.

## THE OPTIONS

**Disk Setup**—You can configure RUN Shell to operate under two different logical drives (logical meaning that device numbers and drives are handled internally with the shell program). As you'll see, these logical drives—drive A and drive B—can be set up for any combination of disk or RAM drives, as well as device numbers 8–11. To keep things straight, I'd suggest that you set the lower device number to drive A and the higher device number (including RAM drives) to drive B.

You can also configure RUN Shell for single-drive operation by setting both the A and B drives to the same device number.

**Rename a File**—With the Rename utility, you can rename all the files in a directory. The directory is displayed in the shell window, and you select and highlight the filename you want to change by using the cursor keys and space bar as described above. When the highlight bar appears, enter a new filename that's no longer than 16 characters; then press return and continue the operation. When you're ready to activate all the new names for the directory, press the F7 key.

**Scratch a File**—This option operates much like Rename. Use the cursor keys and space bar to select and highlight filenames you wish to scratch. When all selections are made, press F7. The F5 key deselects a file if you change your mind after highlighting, and the stop key aborts to the verification prompt. Neither the Rename nor Scratch option works with RAM drives.

**Format a Disk**—Formatting is one of the most frequently used options in RUN Shell. First, the Format routine attempts to read a disk header from the selected drive. If an error occurs, it assumes the disk hasn't been formatted before and prompts for a header name and two-letter ID. If the disk has been formatted before, the header name appears in the input window. Then you can reformat with the same header name by pressing the return key, or you can type in a new name, with or without a two-letter ID.

If the drive selected is a RAM device, you needn't enter a header name, but you do have to specify the type of device at the prompt. *All* modules must be formatted before being used as a logical drive or you'll get a RAM Disk Full error message.

**Clean Up a Disk**—This is a collect operation, and no verification is involved, so be sure the disk is in the proper drive.

**Copy File**—Using this option, you can copy files (except relative files) between any two disk drives other than a RAM expander (see RAM, below). Just highlight the files you want to copy and then press F7.

Commodore 64 users are limited to copying files of 90 disk blocks or less, while C-128 users can go up to 180 blocks. Use the Copy Disk routines to copy disks with larger file sizes.

To copy files from a 1581 subdirectory, you must first open the subdirectory with the Directory routine. With a single 1581 drive, you can copy only 90/180 disk blocks at a time, because RUN Shell won't detect previously opened directories after each disk swap.

(RAM expansion users have a way around this limitation.)

**Copy Disk**—The Copy Disk option completely reproduces a disk. It works best with two drives, although it can be used with one. If you have a 1581, keep in mind that trying to single-copy 800K of data with a C-64 takes about 26 disk swaps (16 for the C-128), so use the Copy File routine when appropriate. It's very important that 1541/1571 users format the target disk either before entering the Copy Disk routine or while in the routine to ensure faithful data reproduction; 1581 users must format their disks beforehand.

To contrast C-64 and C-128 copying times, the C-64 option single-copies a 1581 disk in about 50 minutes and a 35-track disk in about 25 minutes. The C-128, with its Burst protocol, single-copies the same disks in about 12 minutes and a little over seven minutes, respectively. These times are slightly lower in dual-drive operation.

You can't copy from a 1581 drive to a 1541/71, because of the different formats involved.

**Create Dir/RAM**—These two options are for 1581 and RAM expansion module owners only. With Create Dir, you can create partitions and subdirectories on the 1581 disk drive more easily than with the utility supplied on the demo disk. Just select the starting track of your partition with the + or − key (pressing the space bar to lock in the selection); then use + or − to scroll through the size of directory desired, and RUN Shell will automatically make the calculations for creating the partition. Press the space bar again to lock in the block size, and then answer the prompts as they appear.

To create a subdirectory from the partition, answer the formatting prompts as they come on-screen. You don't need to format a subdirectory within this option. You can format the partition by opening it within the Directory option and then using the Format option. Formatted partitions will always be 40 blocks less than your selected number in order to accommodate the partition directory.

Use this option only on new disks, as the partition routine overwrites any data already in the selected tracks of the disk.

You can create nested directories (directories within directories) as long as each encompasses at least three tracks and doesn't fall on the directory track (the first track of the directory) of the previous partition. Consider the following mock directory:

Main subdirectory #1: tracks 1–20

Subdirectory #2: tracks 2–5 (within main)

Subdirectory #3: tracks 6–18 (within main)

Notice that all the directories are at least three tracks long (minus

nested subdirectories), and none starts on the first track of the other.

Once a directory is in place, you must access the "root" directory by pressing the stop key (see Directory, below). Then you must reopen the directory in which you want to nest the new subdirectory before you access the Create Partition option. I'd advise you to play around with this option before attempting any serious partitioning, and to refer to the 1581 user's guide for more information on partitions and subdirectories.

**RAM**—This option for owners of RAM expansion modules is a supplement to Commodore's RAMDOS utility, not a replacement. It includes three suboptions and requires that your RAM expander must be previously formatted.

The System to Expansion suboption lets you load disk files into the RAM drive. When RUN Shell asks you which logical drive to use, always select the logical RAM drive as the target (to load to) and a disk drive as the source (to load from). Then highlight the desired files and press F7 to initiate the load. *Don't* attempt to load files containing more than 90 disk blocks on the C-64 or 180 blocks on the C-128, or you might corrupt the computer's memory. You'll notice that the number of blocks the drive has free corresponds to the bytes available in each RAM expansion module (less the overhead directory space that's maintained in each module).

The second suboption loads files from the RAM drive into system memory. Here again, select whichever logical drive is assigned to the RAM drive. (This may sound confusing, but you'll get the hang of it.) With this suboption, you never load from a disk drive.

Plan on this operation handling only sequential files and machine language programs. Since Basic is reconfigured to accommodate RUN Shell, many Basic programs won't work properly with it.

With this option, you don't have to load a word processor to examine a sequential file. Just load the file into the RAM drive and download it into system memory; then, using the cursor keys, scroll through it in the directory window. If you have a machine language file that doesn't occupy the same memory area as RUN Shell ($1300–$5000), you can download it, then exit the Shell and SYS to the program.

Machine language programmers might like to know that the Power Assembler can function when RUN Shell is active, since Basic memory is moved up to location $5000. This may be true for other assembler systems, as well.

The third RAM suboption lets you "dump" all RAM directory

files to disk and provides a handy way of copying files from one subdirectory to another. Just open a subdirectory on your 1581 drive and select Disk to Expansion to load the files into memory. Then close the subdirectory (see Directory, below), open the target subdirectory and select Expansion to Disk.

Select the logical RAM drive as the source and the logical disk drive as the target for this suboption. There's no need to select files here, since the entire RAM directory is dumped to disk.

This suboption will appeal to those who want to make multiple copies of disk files without a multitude of disk swaps, and it's handy for cataloging disks. Normally, grouping similar programs together on a single disk involves dozens of disk swaps and a big headache. With this RUN Shell feature, you can selectively load files from several dozen disks into the RAM drive, then dump them all to a single disk.

**Disk Log**—The Disk Log option reports the starting and ending addresses of a selected file, as well as the total number of bytes it contains. It handles only one filename at a time, and, with sequential files, only the total number of bytes is significant, since the starting and ending addresses reported are those used by RUN Shell.

**Directory**—This option displays a disk directory in the directory window, and, if the device is a 1581 drive, it lets you open a partition, as well. Anytime a partition is the active directory, you'll see a message to that effect. You can access the root directory whenever you want by pressing the stop key. Don't deselect a 1581 drive or change disks without first returning to the root directory.

## ERRORS AND OTHER THINGS

As with any disk-intensive program, there's always the possibility that an important disk or file will get lost or corrupted—through either carelessness or distraction. RUN Shell is designed to avoid such disasters through extensive error checking and verification, but, since I couldn't anticipate every user error that could occur, you should know about the following RUN Shell strengths and limitations.

All normal DOS errors are displayed in the message window during disk access (press the space bar to recover from the error), except during Copy Disk routines. If you attempt to copy a disk with track errors or a nonstandard GRC format (copy-protected), RUN Shell will just skip over the bad track, or worse, freeze up.

RUN Shell won't detect Device Not Present errors and will seem

to lock up while trying to access a drive that hasn't been turned on. If this occurs, press the run-stop/restore combination, turn on the offending drive, then reinitialize the program.

Be sure you set up the logical drives according to the disk drives you actually have connected to your computer. If you have a 1541 and tell RUN Shell it's a 1581, you'll be in for an unpleasant surprise as the program tries to access track 41! If this, or something similar, happens, quickly turn off your drive or reset the computer! Likewise, don't attempt to set up a logical RAM device without a RAM expansion module connected.

All files in a RAM expansion device will remain intact unless you turn off your computer or reload RUN Shell, which resets important expansion directory pointers.

Pay close attention to which are the *source* and *target* disks during disk copies. There's nothing worse than staring at a Writing to Destination Disk message while you're holding the destination disk in your hand!

If you're a fan of using "flippies" (disks that have been double-notched to allow writing to both sides), be prepared to have occasional problems with the 64-mode Copy Disk routine. The routine attempts to read track 41 of the disk to determine whether the disk is single- or double-sided (35 or 70 tracks).

Occasionally, RUN Shell will interpret a "flippie" track as a 1571 disk and attempt to copy 70 tracks of data. This won't hurt your drive; all you do is press run-stop/restore if the drive seems to stop, then re-enter RUN Shell and clean up the target disk. You should find that all the copied files have been faithfully reproduced.

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RUN it right: **C-64 or C-128, in 40- or 80-Column mode; printer**

# Label Base

*By Bob Kodadek*

LABEL BASE is an integrated database program for maintaining names, addresses and telephone numbers, with built-in printing routines that let you instantly print both mailing labels, in any

quantity, and a personalized telephone directory. Because the program is menu-driven and its files are memory-based, it's fast and easy to move around in, and, since the record format is predefined, you can start inputting your data immediately.

What really sets Label Base apart from many other Basic programs of this type is its use of "pure" sequential files, which means that file data can be exchanged readily between Label Base and some popular programs, such as Superbase. You can even create or edit your files with a word processor that uses sequential files, such as RUN Script.

Best of all, Label Base will run on both a C-64 and a C-128 in either 40- or 80-Column mode with no modifications. In 80 columns, the program automatically takes advantage of the "wider" screen and runs in Fast mode.

## CUSTOMIZING THE PROGRAM

Label Base is self-modifying, so the program can be used for both the C-64 and C-128. By default, it operates in Uppercase mode, but you can use lowercase by merely changing PS = 0 in line 40 to read PS = 7. This affects both screen and printer output. I believe that labels printed in uppercase have a better appearance and are easier to read; also, it's easier and faster to enter data in this mode. However, since this is a matter of personal preference, I feel it's important to have lowercase available.

Label Base is configured to print "one-across" mailing labels of the standard size, which measure $^{15}/_{16}$ of an inch wide by $3^{1}/_{2}$ inches long. If you're using a wider label, you'll need to adjust the amount of vertical space between labels by increasing variable LL in line 40.

After you've gotten the program working, type in a few sample records, then test for the proper spacing by printing them on a plain sheet of paper and placing the printout next to a strip of your labels for comparison. If the records are too close together, increase LL in line 40 and try again until you achieve the proper positioning of the text. After making this, or any other, change to the program, be sure to save the new version to disk.

## USING LABEL BASE

When you run Label Base, it first determines which machine you're using and the number of screen columns available, then appropriately introduces itself as Label Base 64 or Label Base 128 and displays the main menu. If it finds itself in the 80-Column RGBI

mode of a C-128, it automatically switches the 8502 processor to 2 MHz and blanks out the composite video screen.

The main menu is shown in Figure 1. To select one of the functions, press the designated function key. At any point in the program, you may return to this main menu by pressing the return key.

The Load, Save, Directory and Alphabetize functions are self-explanatory. Of course, Load and Save actually mean read and write, since Label Base files are sequential.

Note that when it's writing files, the program adds the prefix .LB to each filename. This limits the maximum number of characters in a name to 13, but enables Label Base to distinguish its files from others on the same disk and display only those files when you ask for a directory. When you're reading or writing a file, don't enter the prefix, since the program does it for you. By entering no filename, you can abort a read or write operation without affecting the current file in memory. The error channel is read and reported after each disk operation. To erase the current file in memory and start a new one, press F1 and enter NEW as the filename.

The Enter Data function lets you add new records to a file directly from the main menu. The blank record, or template, is displayed, complete with field names and designated field lengths, so all you have to do is enter the required data into each field and press the return key. The custom input routine automatically limits the amount of data entered.

To correct an error in the current field, use the delete key. To leave a field blank, just press return and move on. After entering the last field, press the space bar to do another record, or press the return key for the main menu. If necessary, records may be further edited from the Select Records menu described below.

While the machine language input routine will accept most characters and punctuation except the quotation mark, it's important not to use commas or colons in your data. If you do, Basic's Input# command will ignore any data after the comma or colon when the file is later read back into memory. While the Get# command will read every byte of data, I found it far too slow for reading large sequential files.

Both the Select Records and Print Menu functions provide sub-menus to work from.

## THE SELECT RECORDS MENU

Whenever you choose Select Records, the current record is dis-

played on the screen, along with a menu of "quick-key" commands. Control/P instantly prints the current record on as many labels as you indicate; it can be aborted by pressing 0 and return. To find out what the one-letter, quick-key commands do, press ? to go to the Help screen, shown in Figure 2.

The first four one-letter commands instantly locate the First, Next, Previous or Last record in the current file. Key Field Match finds a record by last name, even if you don't remember the correct spelling of the entire name. In most instances, only the first one or two characters will do.

To do a Key Field search, press the K key, and, when prompted for the key field, enter the first portion of the last name and press return. The first record beginning with those characters will appear. Then use the Next Record command to quickly locate the record you want. For this to be effective, the file must be in alphabetical order, so, if necessary, return to the main menu and sort the file by pressing the F4 key.

The remaining commands on the Select Records menu let you add new records or delete, replace and edit the current record. When you're editing a record, each field is presented individually. Edit uses Basic's own Input# routine to take data directly from the screen, so all the cursor control keys are functional. However, the Input routine doesn't limit the length of input, so be careful not to enter strings longer than Label Base will allow.

Unlike the C-128's Input# command, the C-64's won't accept an empty string (containing only spaces) from the screen or logical device #1. As a result, when using a C-64, you must represent an empty field with an asterisk on the screen, though it'll be stored as

| Figure 1. Main menu. | Figure 2. Select Records Help commands. |
| --- | --- |
| F1 — LOAD FILE | F — FIRST RECORD |
| F3 — SAVE FILE | N — NEXT RECORD |
| F5 — SELECT RECORDS | P — PREVIOUS RECORD |
| F7 — DIRECTORY | L — LAST RECORD |
| F2 — ENTER DATA | K — KEY FIELD MATCH |
| F4 — ALPHABETIZE | A — ADD RECORD |
| F6 — PRINT MENU | D — DELETE RECORD |
| | R — REPLACE RECORD |
| | E — EDIT CURRENT RECORD |

a space character. For this reason, I recommend Edit only for making minor changes to a record. Otherwise, use the Replace command to re-enter the entire contents of the record.

## THE PRINT MENU

The Print menu lets you print the current record, all the records in your file or a phone directory of all the records. You'll be prompted for the number of labels you wish to print from each record, the default being 1. If, at this point, you decide not to print a label, enter 0 for the quantity and press return.

All the printing routines check for the presence of a printer with device number 4. If this printer isn't found, the command to print will simply be ignored.

The listings in the phone directory printout are formatted like those in a real phone directory and include no city, state or zip code. The paging feature in this print routine is based on the normal page length of 66 lines.

The number of files you can input using Label Base is unlimited. However, the maximum number of records per file is 250 for the C-64 and 350 for the C-128. This should be more than enough for the average home computer user.

Even if you're used to another program for printing your labels, try Label Base. It can print a small quantity of labels so fast that you can be finished before a larger database, such as Superbase 128, is done loading. ∎

# *RUN*'S SUPER STARTER PAK

F1      F3      F5      F7

COMMAND   MACROS   MOVE BLOCK   DELETE

SEARCH     SEARCH     COPY     DELETE

STRING     W/REPLACE     BLOCK     BLOCK

F2      F4      F6      F8

F8 DELETE BLOCK

F7 DELETE

F6 COPY BLOCK

F5 MOVE BLOCK

F4 SEARCH WITH REPLACE

F3 MACRO

F2 SEARCH STRING

F1 COMMAND

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