

# VISICALC™

## REFERENCE CARD

	A	B	C	D
1	PAYEE	CHECKS	DEPOSITS	BALANCE
2				545.20
3				
4				
5	ELECTRIC	14.95		
6	OIL	102.15		
7	PHONE	36.80		
8	DENTIST	42.00		
9	SALARY		395.00	
10	RENT	350.00		
11	GAS CARD	12.93		
12				
13	TOTALS	558.83	395.00	381.37
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## A Visible Calculator

For the

## APPLE II

Program created and written by

**Software Arts, Inc.**

Distributed Exclusively By

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## MOVING THE CURSOR

- ← → The arrow keys move the cursor left, right, up or down.
- space bar* Switches the direction indicator between horizontal (→) and vertical (↓).
- ;
- > If two windows, moves the cursor from one window to the other.
- > Go to command. Type the coordinates of the entry where you want the cursor to go; end with RETURN.

## EDITING

**ESC KEY** Used to recover from simple typing mistakes. It usually erases the last thing that you typed. If you press ESC enough times, it will cancel what you are doing and return VisiCalc to a blank prompt line.

**/E COMMAND** Allows editing of the entry contents of any entry position by redisplaying it on the edit line. The arrow keys move an edit cue left and right. ESC erases the character to the left of the cue. New characters typed are inserted to the left of the cue.

**CTRL-E KEY** Allows editing of what is displayed on the edit line. Editing operation is the same as /E. Can be used when entering a label, value, file name, or /P setup string.

## THE CTRL-C KEY

This is equivalent to pressing ESC enough times to return VisiCalc to a blank prompt line. It will also cancel most operations such as file input and printing.

## SETTING A LABEL ENTRY

Label entries start with a letter (A-Z), or with a quote character ("). Terminate entering a label entry by pressing an arrow or RETURN. Correct errors by pressing the ESC key or the CTRL-E key (see **EDITING**, above). The prompt line will say LABEL while a label entry is being typed.

## SETTING A VALUE ENTRY

A value entry displays the calculated value of the expression stored at the entry. Expressions consist of numbers, coordinates of other value entries (value references), functions (such as @SUM), arithmetic operators (+ - \* / ^ ) and/or parentheses. Expressions are evaluated strictly from left to right except as modified by parentheses. You must start an expression with a +, a digit (0-9), or one of the symbols @ - ( . or #. The prompt line will say VALUE while an expression is being typed. Terminate entering an expression by pressing an arrow key or RETURN. Errors can be corrected by pressing the ESC key or the CTRL-E key (see **EDITING**, above).

Examples of expressions are:

12.34	A normal number
.1234E2	A number in scientific notation
2+2	An arithmetic expression
+B4	A value reference
2*B4	An expression with a value reference
2*(3+4)	An expression with parentheses

If you press ! while entering an expression, VisiCalc will calculate the value of the expression so far and replace the expression on the edit line with the number which results from the calculation.

## VALUE REFERENCES

An expression at one entry can refer to the value of another entry, and the value of such an expression can be automatically recalculated when the value of the other entry changes. Value references are allowed in expressions wherever numbers are allowed. A value reference is made by either typing the coordinate of the desired entry (such as B5), or by "pointing" to the entry with the cursor (in this case, the coordinate will be "typed" automatically by VisiCalc). If an expression starts with a value reference, it must be preceded by a + character.

In order to insert the current value of another entry into an expression as a number, which will be unaffected by later changes to the other entry, type a value reference followed by the character # (e.g. B5#). If # is used by itself, it will be replaced by the current value of the expression stored in the entry you are changing.

## FUNCTIONS

- @SUM(*list*)            Calculates the sum of the values in *list*. See **LISTS**, below.
- @MIN(*list*)            Calculates the minimum value in *list*.
- @MAX(*list*)            Calculates the maximum value in *list*.
- @COUNT(*list*)        Results in the number of non-blank entries in *list*. Maximum number of entries in the list is 255.
- @AVERAGE(*list*)      Calculates the average of the non-blank values in *list*. Maximum number of entries in the list is 255.
- @NPV(*dr* , *range*)    Calculates the net present value of the cash flows in *range*, discounted at the rate specified by expression *dr*. The first entry in the range is the cash flow at the end of the first period, the second entry is the cash flow at the end of the second period, etc. See **ENTRY RANGES**, below.
- @CHOOSE(*n*, *list*)     Results in the *n*th value in *list*.

<b>@LOOKUP(<i>v</i>, <i>range</i>)</b>	Compares the value <i>v</i> to the values of successive entries in <i>range</i> , and selects a corresponding value from the column or row immediately to the right or below the entries in <i>range</i> , as the result of the function. The values in <i>range</i> are normally in ascending order, and the result is the value corresponding to the last entry in <i>range</i> that is less than or equal to <i>v</i> before an entry greater than <i>v</i> is found. If the first entry in <i>range</i> is greater than <i>v</i> , the result of the function is NA.
<b>@NA</b>	Results in a "Not Available" value that makes all expressions using the value display as NA.
<b>@ERROR</b>	Results in an "Error" value that makes all expressions using the value display as ERROR.
<b>@PI</b>	Results in 3.1415926536.
<b>@ABS(<i>v</i>)</b>	Results in the absolute value of <i>v</i> .
<b>@INT(<i>v</i>)</b>	Results in the integer portion of <i>v</i> .
<b>@EXP(<i>v</i>)</b> <b>@SQRT(<i>v</i>)</b>	Calculates the appropriate function.
<b>@LN(<i>v</i>)</b> <b>@LOG10(<i>v</i>)</b>	The trigonometric calculations are done in radians.
<b>@SIN(<i>v</i>)</b> <b>@ASIN(<i>v</i>)</b>	
<b>@COS(<i>v</i>)</b> <b>@ACOS(<i>v</i>)</b>	
<b>@TAN(<i>v</i>)</b> <b>@ATAN(<i>v</i>)</b>	
<b>@TRUE</b>	Results in logical value TRUE.
<b>@FALSE</b>	Results in logical value FALSE.
<b>@NOT(<i>logical value</i>)</b>	Results in the appropriate logical value.
<b>@AND(<i>list</i>)</b>	
<b>@OR(<i>list</i>)</b>	
<b>@IF(<i>logical value</i>, <i>v1</i>, <i>v2</i>)</b>	Results in value <i>v1</i> if <i>logical value</i> is TRUE; otherwise <i>v2</i> .
<b>@ISNA(<i>v</i>)</b>	Results in TRUE if value <i>v</i> is NA; otherwise FALSE.
<b>@ISERROR(<i>v</i>)</b>	Results in TRUE if value <i>v</i> is ERROR; otherwise FALSE.

## LOGICAL OPERATORS

<b>&lt;, &gt;, =, &lt;=, &gt;=, &lt;&gt;</b>	Compares two numeric values and results in either the logical value TRUE or FALSE.
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## EXAMPLES OF FUNCTIONS

**@SIN(C7\*@PI/180)**  
**@SUM(B4...B15)**  
**@MIN(100, F4...F11, @SUM(B4...B15))**  
**@MAX(0, F4-F5)**  
**@NPV(.15, B4...F4)**  
**@IF(@OR(A1>7, A1<1), 2, 2\*B5)**  
**@CHOOSE(B14, E5...E23)**

## ENTRY RANGES

An entry range consists of a number of entries that are next to each other in a row or column, such as B2, B3, and B4, or B2, C2, D2, and E2. You enter an entry range by specifying the coordinate of the first entry in the range, then typing an ellipsis (...—you need only type the first period. VisiCalc will fill in the others), and then specifying the last entry. For example, the entry ranges just mentioned would be B2...B4 and B2...E2, respectively. Coordinates are specified by either typing them, or “pointing” to the desired entry with the cursor.

## LISTS

A list consists of a series of expressions and ranges separated by commas. See the examples of lists in **EXAMPLES OF FUNCTIONS**, above.

## COMMANDS

- /B Sets an entry to blank. Doesn't take effect unless you follow it with an arrow or RETURN. Does not affect /F formats set at the entry.
- /C Clears the sheet, setting all entries to blank, resetting formats, windows, titles, etc., but does not reset any remembered file name qualifiers. VisiCalc will wait for you to type a Y to confirm that you indeed want to clear the sheet.
- /D Deletes the row (/DR) or column (/DC) on which the cursor lies.
- /E See **EDITING**, above.
- /F Sets the display format of an entry to one of the following formats:
  - /FG General
  - /FI Integer
  - /F\$ Dollars and cents
  - /FL Left justified (used for values)
  - /FR Right justified (used for labels)
  - /F\* Graph
  - /FD Default. Resets an entry to use the global default format instead of an explicit format set with a /F command.
- /G Global commands. These apply to the entire sheet or window.
  - /GC Sets the column width. Requests a number greater than 2; end with RETURN. The column width can be changed on a per window basis.
  - /GF Sets the global default format that determines the display format of all entries without explicit format settings set with a /F command. Requests one of the same display formats used by the /F command. The global default format is a per window setting.
  - /GO Sets the order of recalculation to be down the columns starting at entry A1 (/GOC), or across the rows starting at entry A1 (/GOR).



- /GR** Sets the recalculation to be automatic (**/GRA**) or manual (**/GRM**). You can always cause a manual recalculation of all entries by pressing the ! key.
- /I** Inserts a row (**/IR**) or a column (**/IC**) just above or to the left of the row or column on which the cursor lies.
- /M** Moves an entire row or column to a new position. Prompts you to move the cursor from the row or column which you want to move to the destination row or column just before which the entries moved should reappear. End with RETURN.
- /P** Print command. See **PRINTING**, below.
- /R** Replicate command. See **REPLICATE**, below.
- /S** Storage command. See **STORAGE COMMANDS**, below.
- /T** Sets a horizontal title area (**/TH**), a vertical title area (**/TV**), sets both a horizontal and vertical title area (**/TB**), or resets the window to have no title areas (**/TN**).
- /V** Displays VisiCalc's version number on the prompt line. The version number will disappear as soon as you type something else.
- /W** Window control. Splits the screen into two windows at the cursor position (**/WH** for horizontal, **/WV** for vertical), or returns the screen to one window (**/W1**). Windows may be synchronized (**/WS**) or returned to unsynchronized (**/WU**).
- /-** Repeating label. Requests the contents of a label entry; end with an arrow or RETURN. The contents of the label will be repeated over and over to fill the entry, no matter what the column width.

## PRINTING

The **/P** command lets you output a VisiCalc sheet to a printer or disk drive. Output sent to a disk drive is saved as a text file which may be read by a BASIC program.

Position the cursor at the upper left corner of the rectangle of entries you wish to output and type **/P**.

### To output to a printer:

- 1) VisiCalc will prompt for the slot number of a printer card. Type the number followed by RETURN. If you just type **P**, it will scan the slots and pick the first one that has an appropriate device.
- 2) VisiCalc will then prompt with three printer options:
  - LOWER RIGHT** Move the cursor to (or type the coordinates of) the lower right corner of the rectangle of entries to be printed, press RETURN, and printing will begin.
  - "SETUP** To output a special sequence of alphanumeric, control or escape characters to setup the printer, e.g., for character width, type ", then type the setup string and press RETURN to send to the printer.

Non-printable characters may be inserted into the setup string by typing:  $\wedge C$  *char* produces CTRL-*char*;  $\wedge E$  produces an ESC character;  $\wedge Hnn$  produces the single ASCII character defined by hex number *nn*;  $\wedge R$  produces a CR character;  $\wedge L$  produces a LF character;  $\wedge \wedge$  produces a  $\wedge$ .

- *or* & Lines printed by VisiCalc are usually terminated by the character pair CR/LF. To suppress the LF, type a minus (-). To reinitiate a LF that was suppressed during a previous printing, type an ampersand (&).

### To output to a file:

- 1) Type **F**. VisiCalc will prompt for the file name.
- 2) Type the name followed by RETURN. (See **FILE NAMES** below.)
- 3) Move the cursor to (or type the coordinates of) the lower right corner of the rectangle of entries to be printed out, and press RETURN.

Note: The screen may be overwritten by the printer controller. It will be returned to normal when the /P command is finished. You may stop printing at any time by pressing CTRL-C.

## REPLICATE

The /R command allows you to make copies of entries.

- 1) Position the cursor on the first entry that you wish to replicate, and type /R.
- 2) VisiCalc will ask for the coordinates of the source (what you want to replicate). If you are just replicating the current entry, press RETURN. If you want to replicate a range of entries, type an ellipsis and provide a coordinate to complete the entry range specifying the source, ending with RETURN.
- 3) VisiCalc will ask for the coordinates of the target (where you want the copies to go). This may be a single coordinate or an entry range. End the target with RETURN. If you are replicating a source range of entries, the first source entry will be replicated into the entire target range, and succeeding source entries will be replicated into correspondingly succeeding target ranges.
- 4) If the expression being replicated contains value references VisiCalc will ask you, for each value reference, whether it should not be modified (respond by typing N), or should always refer to the entry in the same relative position (type R).

## FILE NAMES

Some of the VisiCalc commands prompt for a file name. You may respond in one of two ways. In the first way, you type a file name (with optional qualifiers, defined below) followed by RETURN. VisiCalc will use the file name that you type. In the second way, you do not type a full file name. You respond with a blank line, or optionally a specification for which disk drive you are referring to. You then press the right arrow key.

VisiCalc will display the name of the first file it finds on the diskette. If that is the name of the file that you wish to use, press RETURN; otherwise press the right arrow key and VisiCalc will show you the name of each successive file on the diskette. When you have found the file name that you want to use, press RETURN. You may edit the file name before executing the command by typing additional characters to add to the name, using the ESC key to erase part of it, or by using CTRL-E (see **EDITING**).

In order to distinguish between the various types of files used by VisiCalc, it is recommended that file names end with .VC for saved sheets (/SS), .DIF for DIF™ files (/S#S), and .PRF for print files (/PF).

The following qualifiers are allowed: slot number (, S followed by a number), drive number (, D followed by a number), and volume number (, V followed by a number). The , S qualifier can be used to specify output to a non-disk I/O card, such as a printer. The qualifier , SP specifies the first non-disk device found by scanning the I/O slots.

## STORAGE COMMANDS

The /S commands let you save and load the current entries using a diskette, initialize diskettes, and exit from VisiCalc.

The storage commands can be cancelled by pressing CTRL-C.

- /SS Save all entries, titles, and window settings in a file. Prompts for a file name.
- /SL Load the contents of all entries that were saved in a file. This command does not blank out all entries before doing the load; if that is desired use the /C command first. Prompts for a file name.
- /SD Deletes the specified file on the diskette. Prompts for a file name, then asks you to type a Y to confirm.
- /SI Initializes a diskette on the indicated drive. This erases whatever was on the diskette and formats it. The specification of which disk drive will be used is displayed and may be edited like a file name. Press RETURN to start initialization.
- /S#S Saves data in a DIF file. Prompts for a file name, then requests the lower right coordinate of the rectangle of entries to be saved. Move the cursor or type the coordinate, and then press RETURN. Finally, it asks whether the data is to be saved by rows (R or RETURN) or by columns (C).
- /S#L Loads data in a DIF file. Prompts for a file name, then asks whether the data is to be loaded by rows (R or RETURN) or by columns (C).
- /SQ Quits out of VisiCalc and returns to the operating system. VisiCalc will prompt for the slot number from which to boot. Type the number and then press RETURN.





Entry Type:  
 V for value.  
 L for label.  
 /- for repeating label.

Current Entry's coordinates

Explicit Format indication

Entry Content

Entry Contents Line

Prompt Line

Edit Line:  
flashing block  
means awaiting input

Row and  
Column labels

Dollars and  
Cents Format  
(/F\$)

Label Entry

Cursor

Two windows when the screen is split.

The screenshot shows a terminal window with a dark background and white text. At the top, there are three lines of text: "B9 /FI (V) 1.2\*B7", "VALUE", and "+B8\*B7". Below this is a table with columns labeled "A" and "B". The table contains several rows of data, including "1 COST/SLS : 8", "2 OVHD INC : 10", "3 SLS GRW : .29", "4", "5 YEAR", "6", "7 # SOLD", "8 PRICE", "9 SALES \$", "10 COST", "11 OVHD", "12 PROFIT", "13", "14", "15", "16", "17", "18", "19", "20". A cursor is visible on the right side of the "SALES \$" row. The interface is annotated with blue lines and text labels pointing to various elements.

# VLC™ Screen:

Recalculation Order Indicator:

If R, across rows:

if C, down columns.

Direction Indicator:

If I, arrow keys will move cursor up and down:

if -, arrow keys will move cursor left and right.

Memory Indicator:

How many K memory available.

If flashing M, out of room.

The screenshot shows a terminal window with the following content:

```

C!
25

K      L
1 RATE: 25
2 NPU: 62.0151
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