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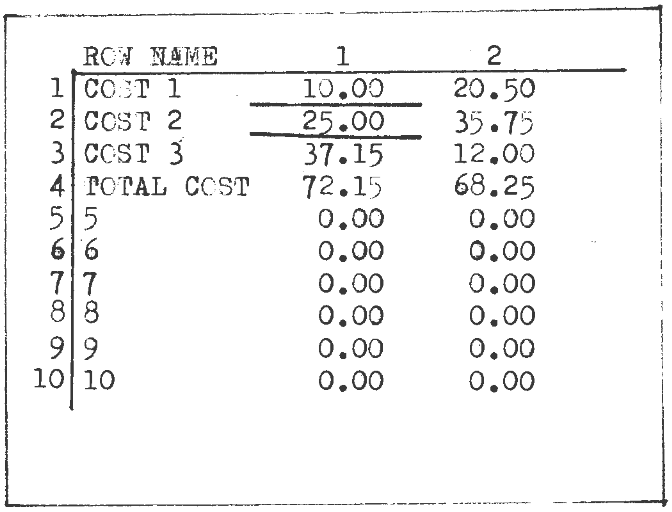
Snap-Calc^{TM} by Gary Strauss and the HCM Team

The spreadsheet program is a handy tool for doing many financial calculations simultineously. Its inherent versatility turns a computer into a super "What if. .." machine. Using very simple commands you can easily customize a spreadsheet for your own applications. These could include tracking your investments, evaluating alternative purchase options, calculating your company payroll, or tabulating accounts receivable. Snap-Calc^{tm} is such a spreadsheet program written in BASIC.

The Snap-Calc^{tm} spreadsheet itself is a matrix of numeric values. After you have entered values into the program, it will execute calculations that you have previously specified, and display the results through screen windows.

With Snap-Calc^{tm} you will be able to create a formula for each row of the matrix. This same formula will then be used for all of the columns. You may also create names for each of the rows, and indicate which rows are to be included in the printed reports. (You may want to use certain rows to calculate other data.) In addition, you can specify the number of columns the spreadsheet will have, and set up a totals column which sums all columns used. The photo below is an example of the data entry screen.



```
   ROW NAME          1        2
 1 COST 1          10.00    20.50
 2 COST 2          25.00    35.75
 3 COST 3          37.15    12.00
 4 TOTAL COST      72.15    68.25
 5 5                0.00     0.00
 6 6                0.00     0.00
 7 7                0.00     0.00
 8 8                0.00     0.00
 9 9                0.00     0.00
10 10               0.00     0.00
```

DATA ENTRY IS A SNAP

To make an entry in any field, simply move the cursor to the field that you wish to change and type in the new value. A second set of cursor keys lets you move three columns left or right, of five rows up or down at one time. Not only is the screen updated with every key press, but the current value on the screen is stored in the spreadsheet. You can leave that entry field at any time, and the value displayed will be saved autpmatically.

LOGIC ENTRY MODE

When you select this mode, the screen will clear and a prompt will appear at the bottom of the screen. At this point you can enter logic commands. These commands will let you specify the totals column and last column in the spreadsheet. You can also assign a logic name to your model, s well as row labels. The most powerful aspect to this option is that it lets you define equations for any of the rows in the spreadsheet. (See r=eq below(above).)

Two types of commands are used in this option: immediate action commands, and logic function commands. The immedaite action commands are as follows:

NEW When this command is used, the memory will clear and you will be prompted to enter onr of four suboptions. If you select Data. then all of the data entered on the spreadsheet will be cleared. If you select logic, your current logic model will be erased from memory. If the third suboption-Both Data And Logic- is selected, both the data and logic model will be cleared from the memory. The fourth suboption, Abort New Command, is an escape which allows you to return to t the normal logic entry screen without clearing any memory.

This command should not be confused WITH the BASIC command NEW, which erases the program in memory. Exercise caution when using this command. Always save your data and logic model to disk first.

LIST This command will list the logic model on the screen. The first item listed is the logic name. If no logic name has been assigned, then the message LOGIC NAME IS with no name following will be printed.

TOTAL COLUMN IScol is always on the second line; here col is the totals column. If col is set to 0, then the totals column has been turnde off. The default value for the totals is 13.

LAST COLUMN IS col is always the next item listed and col is the last column in which data can occur. This value must always be less than the total column value. The default for this value is 12.
From this point on, the information listed is determined by the logic commands that you have entered into the m del. If you created a row label for a row, the message r IS nnn will list, where r is the row number and nnn is the name of the row. Even if you entered the row name in the data ENTRY section of the program, it will be displayed here. Following the row name will be all equations defined for that row. The message r=eq will list, where r is the row number and eq is the equation for that row.

PRINT This command performs the same functions as the LIST command except that the output is directed to the system printer.

MOVE xx TO yy This command allows you to move all of the data from column xx into column yy. You would then have duplicate entries- the information in column xx is not erased af ter the transfer.

END This command will cause you to exit the Logic Entry mode and return to the Data Entry mode. You may at any time rteurn to Logic Entry mode and append changes to your logic model.
The following logic function commands affect the logic model itself:

LOGIC NAME IS nnn This command lets you create or change the name of the logic model, where nnn is the name of your logic. LOGIC NAME IS SAVINGS, for example. The name you assign to your loige model will be used as the file name when you save your model to disk or tape.

TOTAL COLUMN IS col or TOTAL COLUMN IS OFF This command lets you create or change the column that you want to use as your totals column. If the Off option is used, then the totals column will be set to zero and wil not be claculated when the logic model is calculated.

LAST COLUMN IS col This command creates or changes the last column in which you will be able to enter data.
Logically this should be the column just before the totals column (if the totals column is used), because you may not move your cursor beyond the LAST column when entering data. If the totals column is several columns beyond that point you may not be able to dispaly it on the screen.

The only restriction in designating the last column is ~~tat~~ THAT it must be A lower column number than the totals column is turned off. In that case you can make the last column any value your machine will allow. The computer system you use will determine the maximum number of columns available.

r IS nnn This command is used for naming any of the rows in the spreadsheet. The row number is r and nnn is the name you assign to the row. An example might be: 3 IS ROW#3, where the name ROW#3 is given to row number 3.

r = e This is by far the most powerful of the logicmode.'s commands. It lets you assign an equation eq to a row r. The equation ena be made up of other row numbers called constants; an operator cakked LAG, which lets you access a previous column; or arithmetic operators. Rules for construsting the equation are as follows:

1) A row can be specified by simply using the row number in the equation. For example 5=1+2 means that the value from row 1 is to be added to the value in row 2 and the total is to be placed in row 5. This same equation format is then used for all of the columns in the spreadsheet. Notice that there are spaces between eachcitem. This is a requirement of the system so that the computer can decipher it easier, and execute it more quickly.

2) Areal number can be used as a constant in the e uation when placed within parentheses. Taking the example from the previous paragraph. let's try: 5=1+2 * (12.53). The equation will not take the sum of row 1 plus row 2 and multiply it times 12. 3. There is no prioority of multiplication over addition- everything is executed from left to right. Rows 1 and 2 are added together before the sum is multiplied by 12.53.

Cont.

You can use the data from the previous column with the LAG modifier. When this modifier precedes a row number, the information will come form the same row number, but from the prevoius column. For example: 5=1+LAG 2. Here row 1 from the current column will be added to row 2 from theprevoius column. If the column currently being calculated is 8, then LAG 2 would cause t e value from column 7 row 2 to be used. If you set up an equation such as: 5=LAG 2, then the value of the previous column, row 2 would be placed in row 5. In another example, 5=4+ LAG £, a running total for row 4 would be created in row 5.

There are four operators that you can use in your equations. They are: + add
- subtract * Multiply / Divide.
The lenght of an equation is limited only by the maximum string length for each system. There are minor differences in how the equation is to be entered on each machine, so consult the Snap-Calc^{tm} section which covers your machine. Once you have entered one of the above logic function commands, you can use the LIST command to check wether the command has been recieved and interpreted properly, or to wimply check logic statements that have alre dy been entered.

CALCULATE MODEL
When the key for the Calculate Model function is pressed, the computer will begin calculating your logic model usong the data currently entered on the spreadsheet. All of the equations for each row will be executed in ascending order of row number. For example, if an equation in row 3 uses the result of an equation in row 5, you may have a problem. Because you can't enter data into a calculation field, field number 5 will probably be set to zero and will not contain the proper infromation when row three does its calculation. You should design your ogic model with this in mind.

In addition, Calculate Model provides an automatic row total in the totals column. The totals column defaults to column 13 when the program is first run, but you may move it to a different column, or turn it off completly using logic model statements. If t e totals column has be n turned off with a logic statement, then the row total will not be claculated.

LOAD DATA FILE
When you select the Load Data File option, a menu of three suboptions, will prompt you for the type of file to be l aded. The first suboption loads the data file only, which contains the data that has been entered into your spreadsheet. Slect the second suboption if you wish to load the logic model. The third usboption lets you load both data and the logic model in one step. Once you have entered your file type, you will be prompted for the file name of the file you requested. The name you enter must reside on the data currently in the drive, or on a cassette tape.

SAVE DATA FILE
The primary differense between the Save Data File and the Load Date File options is in creating the file names. If you choose to save the logic model in either the Load Logic Only, or Load Data and Logic Modes, the file created for the logic model will use the LOGIC NAME as the name of the file. This is important to keep in mind so that the lrgal in the file system being used. If the logic name has not been declared, then you will be prompted for the name of the file. That name will then become the logic name fot that model when l aded at a later time. If you no longer want to keep a logic name, or wish to create a modified version, a logic name can be chaged at any time.

CLEAR FIELD/ERASE
The Clear Field Erase option can be used to back out of an entry and clear the field, or to simply reset the field back to zero. To use this function, place the cursor over the value that you wish to set to zero and press the key associated wit this functi n. If the field is a row label, it will be erased and left balnk. Erasing a label from a row does not effect the rest of the row or any equations set up for the row.

PRINT REPORT

The print report allowsyou to generate a hard-copy of your spreadsheet data on your system printer. Before the program starts printing, you will be prompted for the title of the report, the date, and the maximum number of rows to be printed in the report. The report here is formated for an 80-column printer. This limitation restricts the report to printing only six columns of data across the page. Since there are more than six columns in most spreadsheets, the report will print all of the rows for the next sheet of paper and print the next six columns. This continues until all of the columns have been printed. The report will include every column up to the column designated as the totals column (or the column designated as the last column, if the total column is turned off). An asterisk(*) as the first or only character in a row name willprevent that row from being printed in the report. Thisallows you to "pretty up" your report by not printing rows that contain intermediate data for calculations. You may want to print only a summary report, and not a detailed report on every row in your spreadsheet.

EXIT

If you want to exit any of the programs you can do so by pressing the exit key for your machine, as described in the text for each computer. The exit option allows you to go back out and return to the data entry screen-but you will first be prompted with a message inquiring wether you want to halt the program and lose any data currently in memory.

REQUIRED EQUIPMENT: TI Extended BASIC

The TI-99/4A is the machine on which Snap-Calc^{tm} was originally designed. The TI version differs from the other versions because of the 99/4A's keyboard layout and screen size incompatabilities.

The Keyboard

The TI keyboard does not have separate function keys. On the 99/4A, you select functions by pressing the(FCTN) key in the lower right corner of the keyboard, in conjunction with the numeris keys. The functions erform as follows:

Press (FCTN)	for FUNCTION
1	Load data from disk or cassette
2	Save data to disk or cassette
3	Cancel entry/erase
5	Calculate the logic model
6	Print Report
7	Logic entry mode
9	Exit Snap-Calc^{tm}

In addition, several other keys work with the(FCTN) key to move the cursor:

KEYS	FUNCTIONS
(FCTN) E	Move the cursor up 1 cell
(FCTN) S	Move the cursor left 1 cell
(FCTN) D	Move the cursor right 1 cell
(FCTN) X or ENTER	Move the cursor down 1 cell

The (CTRL) key is useful for moving the entire window of the spreadsheet.

Press(CTRL)	for FUNCTION
E	Move up 5 cells
S	Move left 3 cells
D	Move right 3 cells
X	Move down 5 cells

Screen Size

The 99/4A is capable of printing 28 columns, using the PRINT and DISPLAY AT commands. This limits screen dis lays of row labels to nine characters wide, and numeric entries to seven characters wide-including a decimal point.

SNAP-CALC (TI99/4A) Explanation of the Program

Line Nos	
100-160	Program header.
170-200	Initialize program variables and functions.
210-280	Main control loop for data entry mode.
290-300	Exit program doutine.
310-320	Subroutine to cle r an entry and display the new value.
330-470	Subroutine to calculate the logic model.
480-490	Subroutine to return the value to be used in the equation.
500-690	Control loop for logic entry mode.
700	Subroutine to return a numeric from the entry string.
710	Subroutine to delete the cursor.
720-750	Subroutine to take entry dtring apart by placing each word into a cell of the F$0 array.
760-910	Subroutine to rebuild the entry string for listing to the screen or printer.
920-1090	Subroutine for file handling.
1100-1120	Builds the row names from the entry string.
1130-1140	Creates a cell v lue fro the spreadsheet data entry mode.
1150-1160	Control loop repaints the data entry screen.
1170	Routine to display the current mode.
1180-1190	Input the logic entry string.
1200	Dir ct output to either the screen or the printer.
1210	Key scan routine.
1220	Relocate the cursor.
1230-1250	Key scan routine waits for a different key to be pressed before continuing.
1260-1300	Display the data entry screen.
1310-1390	Move the cursor up, doen, left and right one position.
1400-1490	Print the report.
1500-1520	Image formats for printing single items.
1530-1540	Clears the logic model from memory.
1550-1570	Error routine.
1580-1590	Image format for a full screen.
1600-1630	Open and close the printer port.

Cont.

Data Storage
The 99/4A is capable of saving and recalling information from both a cassette recorder and a disk drive. Either device will work with this program. When you select either SAVE or LOAD, you must decide wether you want to work with the spreadsheet data of the l gic model, which are kept in two different files. After making your selection, you are promoted to input the device name. If you are using a cassette, simply type CS1 and press(ENTER). For disk drive, enter DSK1 or DSK2. It is not necessary to enter the period separator or the file name at this time, because the computer will just ignore them.

If you sleected a device other than a cassette, you will also be prompted for the file name. The only exception to this is when you are saving the logic model. In this case, if you have already assigned a logic name, the logic model will automatically use that name for the file. If no name has been assigned, or you are loading the logic model, you will be prompted for the file name. The file name will then be use as the logic model name. When saving of loading data you are always asked toe the file name.

Reports
The 99/4A can work with a maximum of only 13 columns because of its memory limitations, so this programis designed to print all 13 columns on one page. To do this, it is necassary to set the printer on condense mode, which allows an 80-column printer to print 132 columns. This is dome in line 1440. CHR$(15) sets condensed mode on most printers. If your printer requires a different code to enter condensed mode, however, you may need to change line 1440 to your printer's specifications.

Logic Mode
The maximum string length on the 99/4A is 127 characters. You are limited to t this size when you enter commands. If the calculation you enter gets too big, it should be broken down into smaller parts.
It's in this mode that you set up your logic model. It can include row labels, a totals column, a last column, a name for your model, and row equations. If you assign a row name longer than nine characters, it will be truncated. All spaces are removed. If you want spaces in your row name, you can enter them directly in Data Entry Mode.
The maximum number of rows you can use for data or equation is 20, and the maximum number of columns is 13. But, if you run the program with the 32K memory expansion connected, you could easily modify the progra to accept more columns and rows. The modifications are simple using the following procedure:
In line 190 change the value assigned to A to the number or fows you want. Then change the value assigned to B to reflect the munber of columns you want. You alsonneed to change the values used to dimension the arrays in this same line. D$() and E$() need to be expanded to the number of rows you wish to use. TheJ() array shoul have its first value set to the number of rows you wish to use, and the second value set to the prpper number of columns.

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